UNIVERSITÀ
DI SIENA
1240

Essays on Economic and Social aspects of emigration: Evidence from Kyrgyzstan

Sara Paulone
Ciclo: XXXI

Supervisor: Maria Alessandra Rossi

Academic year: 2018 - 2019

Acknowledgements

To David, words cannot express how grateful I am to you.

I would not have been able to write this dissertation without the support of my colleague and friend Nicola. I would like to thank my colleagues from the University of Siena for their support and friendship, and in particular Alberto and Virna.

I would also like to thank my supervisor Maria Alessandra Rossi for her many useful suggestions and comments on the following essays. My gratitude goes to Artjoms Ivlevs for giving me the unique opportunity to spend my visiting period at the University of Bristol and write a paper with him.

To my family and closer friends, I express my gratitude for their unconditional support and patience throughout these years.

Summary

International migration is one of the most important issues of the global policy agenda for it generates enormous economic, social, and cultural implications worldwide. According to ILO (2017), there are 258 million international migrants globally and the majority of them (63,7%) migrate for reasons related to work. In developing countries, labour migration is often a household decision in response to economic uncertainty. Some countries have made migration a real key component of their development strategies, with migrant monetary transfers (henceforth, remittances) that provide a lifeline for millions of households across the world. Emigration of a family member alleviates poverty by increasing income sources at disposal of households left behind and smoothing their consumption. However, besides pure monetary gains, emigration and remittances have also social impacts on the origin country.

This dissertation investigates - from an empirical perspective - two social implications of emigration in the migrant countries of origin: (1) whether emigration contributes to changes in gender norms; (2) whether emigration contributes to alcohol consumption. In fact, the empirical evidence produced in this analysis confirms the presence of these two channels, suggesting that emigration affects negatively the development of the origin country. A discussion on the persistence of the phenomenon requires to explore its causes, since they may be related to either structural or short-term reasons. A crucial element in this regard is represented by the weakness of the labour market. On the one hand, the lack of vacancies enhances the incentive of people to migrate; on the other hand, informal jobs usually entail low social protection - due to unregular payments and the absence of an health insurance - and may push workers to leave the country and search for better working conditions, especially when the likelihood to find a formal job is very low. The third chapter offers a discussion on these issues, while a direct exploration of the relationship between international migration and emplotment condition is the purpose of future researches.

The analysis focuses on the Kyrgyz Republic, the second most remittance-dependent economy in the world (after Tajikistan), with remittances equivalent

to 30.1% of GDP (World Bank, 2016). In addition to being heavily affected by emigration and remittances, the Kyrgyz Republic also displays some notable societal features that make it an interesting object of investigation for the purpose of the above-indicated research questions.

In particular, in Kyrgyzstan discrimination and gender-based violence against women are widespread due to the presence of deep-rooted patriarchal attitudes and stereotypes concerning the roles of women in the family and society (CEDAW, 2015). At the same time, per capita consumption of alcohol in the country has increased by 40% between 2000 and 2014, topping the list of 57 Asia-Pacific countries with the highest rate of alcohol use disorders (Rehm et al., 2016). In addition, according to the National Statistic Committee of the Kyrgyz Republic (2011), about 70% of the Kyrgyz labour force in 2010 was employed informally.

The first essay of this thesis thus explores the impact of remittances on gender norms, suggesting that emigration of household members leads to a more conservative opinion on gender roles among the families staying behind. This occurs, presumably, because having a household member abroad relaxes budget constraints, raises reservation wages and increases the likelihood of women conducting unpaid household work, all features that typically place women in a subordinate and more vulnerable position, consistent with the conservative Kyrgyz society norms. Moreoveor, in a patriarchal society, in which older male members in intergenerational households take care of children in the absence of migrant fathers, migrant remittances may be spent on educational expenditure that disproportionately benefit boys and discriminate against girls.

The second essay of this thesis connects the practice of receiving remittances with alcohol consumption, suggesting that the emigration of household members leads to a greater use of alcoholic beverages among families staying behind through the relaxation of budget constraints. By contrast, the other outlined mechanisms through which emigration may affect alcohol consumption - i.e. social remittances and psychological distress - found not to be relevant in the case of Kyrgyzstan.

The third essay of this thesis focuses on informal employment in the Kyrgyz Republic. It provides some preliminary and not conclusive answers to the question whether the Kyrgyz labour market is segmented - i.e. if there exists a marginal, poor, informal sector of the urban economy, in which the poorest work, delimited in contrast to the formal one. It also identifies some drivers of the over-time belonging to formal, rather than informal sector, distinguishing between salaried workers and the self-employed.

Contents

Abstract

While growing gender discrimination and international migration are salient features of many developing countries, the links between the two remain underexplored. I study the relationship between emigration of household members and opinion on gender roles of families staying behind in Kyrgyzstan, a poor post-socialist country that has recently witnessed both large-scale emigration and a rise in female poverty. Using a cross-sectional household survey dataset, I find that receiving remittances is associated with a higher composite indicator of conservative gender norms. I discuss possible mechanisms through which emigration and remittances may affect opinion on gender roles, including the labour supply of women left behind and investments in children's schooling. Overall, my findings suggest that emigration of household members and receiving remittances contribute to more conservative attitudes concerning the roles of women in the family and society of households staying behind.

Chapter 1

Does emigration affect attitudes towards gender roles among migrant families staying behind?

1.1 Introduction

It is now widely acknowledged that the post-socialist transition and the associated economic uncertainty has had a greater impact on women than men. Significant disparities have emerged along many dimensions, from labour market opportunities to bargaining power within the household (Piccoli, 2017). At the same time, since the 1990s many post-socialist countries have witnessed high levels of out-migration. Migrant monetary transfers (remittances) continue to provide a lifeline for millions of households across the region, with countries such as Tajikistan, Kyrgyzstan, Armenia, Georgia, Moldova, Bosnia and Herzegovina, and Kosovo being among the most remittance-dependent economies in the world (World Bank, 2016). Given the salience of both gender norms and emigration in the post-socialist countries, it is important to understand the linkage between the two. The existing literature, concerning both post-socialist countries and other countries, has focused on the relationship between migration and the empowerment of women staying behind in the countries of origin, looking in particular at intra-household allocation of tasks (Antman, 2015; Chen, 2006, 2013; Torosyan et al., 2016). The effect of out-migration on gender norms has received much less attention. I fill this knowledge gap, focusing on the question: does emigration affect attitudes towards gender roles among migrant families staying behind?

To test whether emigration contributes to changes in gender norms, I focus on the Kyrgyz Republic, a low-income country in Central Asia and one of the succes-

sor states of the former Soviet Union. Discrimination and gender-based violence against women are widespread in the country, and the presence of deep-rooted patriarchal attitudes and stereotypes concerning the roles of women in the family and society is reflected in women's limited educational and job opportunities, limited participation in political and public life, and unequal status in marriage and family relations (CEDAW, 2015). In addition, Kyrgyzstan is the second most remittance-dependent economy in the world (after Tajikistan), with remittances equivalent to 30.1% of GDP (World Bank, 2016).

At the conceptual level, out-migration of household members may affect attitudes towards gender roles of families staying behind in different ways. First, money sent to migrants may relax household budget constraints and reduce the likelihood of employment for remittance-receiving women. Second, the impact of remittances on investments in children may be characterized by gender inequality. Both may strengthen the conservative Kyrgyz society norms that view women primarly as mothers and wives who are inferior to men, suggesting that emigration of household members would lead to a more conservative opinion on gender roles among the families staying behind.

My empirical investigation of the relationship between emigration and gender norms is based on the 2013 wave of the "Life in Kyrgyzstan" survey, consisting of a nationally representative sample of 1,951 households. To deal with potential endogeneity, I employ the Instrumental Variables (IV) approach that addresses the endogeneity issue, proper to migration-related empirical studies (Antman, 2018).

The remainder of the paper is organised as follows. Section 2 outlines the context of female poverty, gender relations and emigration in Kyrgyzstan. Section 3 reviews the literature on the effect of migration on the stay-behind women's bargaining power. Section 4 discusses conceptual channels through which emigration may affect attitudes towards females in the migrant countries of origin. Section 5 presents data and variables. Section 6 displays estimation strategy. Section 7 reports the results. Section 8 presents an alternative model as robustness check, followed by a discussion and conclusion in Section 9.

1.2 Socio-economic context

1.2.1 Female poverty in Kyrgyzstan

During Soviet times, the government supported education for women, encouraged their full participation in the labour force (Khalid 2007), established civil marriage, eased restrictions on women requesting divorce, promoted women's freedom of movement and land ownership, and increased access to abortion (Ishkanian 2003). The state offered free medical services, education and a high level of social protection to the entire population. These benefits quickly eroded during the post-Soviet transition period, which in Kyrgyzstan has been characterized by an increasing gender inequality (UNDP, 2012). During the transition period, cuts in state funding were accompanied by the introduction of payment for medical and other public services, and permission was given to educational institutions to charge fees for attendance. The near-collapse of the welfare state resulted in a decrease in the quantity and quality of public services provided, an increase in social inequality, and the marginalization of vulnerable groups, including women (Ibraeva et al., 2011). Many of the former welfare state functions, especially in the domains of child and elderly care, were transferred to women, reducing their possibilities to be engaged in economic and public activities. The female job loss has been impressive: prior to the independence, three quarters of women worked in formal sectors and dominated the workforce in education, health care, and social activities (sectors supported by an extensive network of public services); after ten years, the percentage of working women dropped to 30 percent, while the share of working women was 70 percent (National Statistical Committee of the Kyrgyz Republic, 2013). Reduced employment opportunities, along with the closure of kindergartens, childcare facilities and social support institutions, have contributed to unfair distribution of resources, as well as the resurgence of patriarchal norms and values in Kyrgyzstan (UNDP, 2012).

A crucial factor contributing to conservative gender stereotypes has been the process of Re-Islamization that took place in Kyrgyzstan (mostly in the South) during the post-Soviet era. The propaganda of atheism under the Soviet rule denied access to religion, considering it "opium for the people", and eliminated formal practices and institutions of Islam. The independence process opened the country to people and ideas from different countries, including Muslim states (Heyat, 2004). According to Chotaeva (2005), after the independence Islam has become an instrument for overcoming mass alienation, social inequality and people's needs to look for their new identities. A study conducted by Heyat (2004) in Southern Kyrgyzstan documents the post-independence re-Islamization process, reporting an

increasing number of mosques (from 39 in 1991 to 931 officially registered in 2001) and pilgrimages to Mecca and a resurgence of Muslim practices (marrying women at a very young age, arranged marriages, bride payments - kalym, polygamy, veiling women). The author emphasizes that new practices of Islam are especially widespread among young females, whereas older people who grew under secular Soviet state are more resistant. Since religion affects family formation processes and the social role of women (McQuillan 2004), the process of re-Islamization has resulted in changes within the Kyrgyz families. The traditional Muslim family is intergenerational, the man is considered the head of the household and elderly parents are respected on account of their life experiences and their hierarchic position within the family unit. In marriage, husband and wife have complementary roles, as the men mainly participate in the public sphere to secure the livelihood, and the women principally manage the family and household (Dhami and Sheikh, 2000).

1.2.2 Emigration from Kyrgyzstan

Kyrgyzstan is the second poorest (after Tajikistan) country in the Commonwealth of Independent States, with GDP per capita of $3,351 (World Bank, 2017). Since proclaiming its independence in 1991, the country has struggled to implement institutional and political reforms and ensure economic development; it has also witnessed, in 2010, armed conflict. In the 1990s, the breakdown of supply chains and demand of the Soviet planned economy brought about a near-collapse of the Kyrgyz industry and mass job losses. The lack of job opportunities and a weak social model led to a large-scale emigration from Kyrgyzstan, mainly to Russia but also Kazakhstan, both of which experienced a resource-driven economic boom in the early 2000s.

Between 1990 and 2014, 779,000 people emigrated from Kyrgyzstan, equivalent to 18% of the country's population in 1990 (Ablezova and Ibraeva, 2016). Nine out of ten Kyrgyz migrants go to Russia, where they tend to be employed in relatively low-skilled occupations (retail, construction, services), and migrants going to Kazakhstan are employed mainly in agriculture. While in the early stages of transition emigration was dominated by the ethnic Russian minority (9% of the country's population in 2009), the share of ethnic Kyrgyz as well as the ethnic minority Uzbeks (14% of the country's population in 2009) increased rapidly in the 2000s. International migrants from Kyrgyzstan are more likely to be men (around 70%), young (average age is 28 years), have lower levels of education than domestic workforce (two thirds of migrants have a general secondary education

which is expected in low skilled jobs in Russia), and tend to engage in circular migration (especially those working in construction) (World Bank, 2015).

1.3 Literature review

This study contributes to the broader literature on the relationship between emigration and female bargaining power in developing countries. Empirical evidence on this topic is scarce and contradictory. The relationship has been studied both by focusing on objective outcomes, such as time-use and questions about who makes the decisions within the household and, to a much more limited extent, by looking at the effect on gender norms, which feeds back on real and perceived bargaining power.

The first category of studies, examining the relationship in terms of objective outcomes, is by far the most developed. Three main channels of transmission of effects on women have received particular attention. The first is the impact of male out-migration on the decisional autonomy of spouses left behind. Findings from this literature point to a shift in bargaining power in favour of left behind spouses when a male household head migrates. De Hass and Van Rooij (2010) explain this by the fact that when the male head is absent women in nuclear households decide independently on the use of remittances and have more responsibilities related to children's education. This occurs because in developing countries, and especially in rural areas, household decisions are typically made by male household heads, without the possibility of joint discussion. Antman (2015) explores this circumstance in Mexico, investigating data on who is responsible for making decisions on children's education and clothing within households while household male heads are absent. She finds that the absence of male head allows for an increase in women's decision-making power, which results in a shift of resources to daughters relative to sons. However, in some cases women's autonomy is only temporary, because migrants take back the authority once they return home. Chen (2006; 2013) and Torosyan et al. (2016) find the same result analysing the impact of male migration on time allocation of women left behind in China and Georgia, respectively. In these studies, the absence of male partners leads to an increase in women's engagement in gender-atypical household tasks, but this effect is limited to the period of the migrant's absence.

A second important channel of transmission of the effects of migration on women emancipation that has received great attention in empirical studies is the impact of remittances on investments in children's schooling, often characterized

by gender inequality (Antman, 2018). Some studies suggest that migrant remittances are spent on educational expenditure that disproportionately benefit boys (for instance, see Giannelli and Mangiavacchi, 2010; Mansour, Chaaban and Litcheld, 2011; Vogel and Korinek, 2011). This effect may thus go in the opposite direction of the previous channel, counterbalancing the positive effect of the absence of the male household head on women bargaining power, as decisions may shift to older males in the family rather than to women (Giannelli and Mangiavacchi, 2010).

Finally, the third important channel of transmission explored by this literature is given by the impact of remittance income on the labour supply of women left behind. The existing literature suggests that female labour supply decreases when a household member is abroad and the family receives remittances (Antman, 2018). Empirical studies support the idea that remittances may relax budget constraints, raise reservation wages and reduce the likelihood of employment for remittance-receiving women (for instance, see Hanson, 2007; Lokshin and Glinskaya, 2009). In particular, the literature indicates that out-migration of a household member reallocates labour supply of non-migrant women from paid jobs to household work (for instance, see Binzel and Assaad, 2011; Cabegin, 2006; Karymshakov and Burulcha, 2017; Mendola and Carletto, 2008).

To my knowledge, the only studies looking at the effect of out-migration on gender norms are Matz and Mously (2017) and Tuccio and Wahba (2015). Both studies focus exclusively on migrants' spouses. Matz and Mously (2017) investigate the impact of migration of male household heads on the self-assessed autonomy of spouses left behind in Ethiopia. To capture the self-assessed autonomy, the authors explore the degree to which the spouse of the household head agrees with three different statements ("My life is determined by my own actions", "I have the power to make important decisions that change the course of my life", and "I am usually able to protect my personal interests") about their own autonomy. They find opposite results depending on the empirical model employed. The household fixed effects estimation reveals a negative relationship between the out-migration of household heads and spouse self-assessed autonomy. On the contrary, the instrumental variable approach, where current out-migration is predicted with past local migration, shows a positive effect of male migration on female self-determination, decision-making power, and (to a lesser extent) the ability to protect ones's interests.

Tuccio and Wahba (2015) have a different focus and investigate whether in Jordan return migrants can transfer foreign values, transform attitudes and reduce gender discrimination at home .in line with Levitt's (1998) social remittances hypothesis. Looking at the self-perceived role of women, their freedom of mobility

and the extent to which women can make decisions in their households, they argue that return migration encourages greater discrimination against women. This is particularly true if returnees are from Arab countries, which are more conservative.

I contribute to the extant literature on the effect of out-migration on gender norms in two main ways: by focusing on a country where this relationship has not so far been explored, and by focusing on a sample of households heterogeneous in terms of the nature of the head of the household, i.e. including both female and male heads.

1.4 Hypothesis formulation

Since emigration of household members involves changes in the allocation of household tasks and women's role in societies of sending countries, I can argue that out-migration in Kyrgyzstan is affecting the traditional structure of the family (Laurent et al., 2016). However, there are reasons to think that the channels of transmission of a positive impact of emigration on women bargaining power may not operate effectively in this country.

First of all, the positive effect on spouse's autonomy and bargaining power deriving from the absence of the male head of household is likely not to be at play in the case of Kyrgyzstan. According to the World Bank (2015), in Kyrgyzstan labour migration is often a collective household choice, driven by low income and social assistance levels. Although the proportion of women among migrants is on the rise, emigrants are usually young and able-bodied men, who go abroad to provide income sources for their families (Laurent et al., 2016). Labour migrants are increasingly the sons of the heads of households, rather than heads of households themselves (World Bank, 2015). Moreover, even when the male who emigrates is married, in traditional families, mainly in rural areas, women live with their in-laws after their wedding and stay with them while their husbands are abroad. Wives of male migrants are often subordinated to their husbands' parents, and do not receive remittances directly from their partners or do not have control of them (Laurent et al., 2016). There are many cases when, before emigration, young men marry mainly with the purpose of leaving someone at home to look after their parents. According to Laurent et al. (2016), migration has contributed to forced marriages and bride-kidnapping, a practice that has recently been on the rise (Agadjanian and Nedoluzhko, 2013). According to the 2013 wave of the "Life in Kyrgyzstan" survey, which I use in my empirical analysis, most women in Kyrgyz

migrant households are either household head spouses (42%) or daughters-in-law (25%); much lower proportions are heads of household (15%) or daughters (14%). Given that women living in nuclear migrant households have more responsibilities and control over the use of remittances sent by their husbands (De Haas and Van Rooij, 2010), the positive effect of migration on women empowerment may only concern a small part of household in Kyrgyzstan.

Second, the negative effect of emigration on women bargaining power through shifts in labour supply outlined in section 2 appears to be at play in Kyrgyzstan. A study by Karymshakov and Burulcha (2017), based on the 2011 wave of the "Life in Kyrgyzstan" survey, explores the impact of migration on labour supply and time-use of women left-behind in Kyrgyzstan. It shows that having a household member abroad increases the likelihood of women conducting unpaid household work, which typically places women in a subordinate and more vulnerable position (ILO, 2012). The reallocation of female labour supply from labour market to domestic work might also be driven by the conservative Kyrgyz society norms that view women primarily as mothers and wives, who are inferior to men.

Finally, the negative effect of migration on women empowerment through gender-unequal investments in children's schooling appears likely to be at play in the country. The larger negative impact for girls in the Kyrgyz Republic might be driven by traditional barriers imposed by the patriarchal society, in which older male members in intergenerational households take care of children in the absence of migrant fathers and more likely benefit boys and discriminate against girls (Giannelli and Mangiavacchi, 2010).

Overall, the channels presented above suggests that, in the Kyrgyz Republic, emigration of household members would lead to a more conservative opinion on gender roles among the family members staying behind. This is the main hypothesis to be tested in the empirical analysis.

1.5 Data and variables

1.5.1 Data

Data for this study come from the "Life in Kyrgyzstan Panel Study 2010-2013" ("LiK Study")[1], a panel survey conducted annually between 2010 and 2013 by

[1] A detailed account of the survey methodology can be found at the survey website https://datasets.iza.org/dataset/124/life-in-kyrgyzstan-study-2010-2013.

the German Institute for Economic Research (DIW Berlin) in collaboration with Humboldt-University of Berlin, the Centre for Social and Economic Research (CASE-Kyrgyzstan) and the American University of Central Asia. The data were collected at the individual, household, as well as community level: individual questionnaires were completed by all adults aged 18 and above in the sampled households; household questionnaires were completed by the most knowledgeable household member (such as the head of household), and community questionnaires were completed by the representatives of the community administration. All interviews were face-to-face, conducted in either Kyrgyz or Russian. No weights have been assigned to observations since the sampling of households and respondents was taken proportional to population size in each of the surveyed regions. This work is based on the 2013 wave, as the previous waves have no information on the opinion on gender roles. Overall, 1,951 households take part in the final sample.

1.5.2 Dependent variable, main regressor and control variables

To measure gender norms, I use information - included in the household questionnaire and recorded for the head of household - on the attitudes towards the roles of females in the society. Specifically, all respondents were asked how much they agreed (on a four-point scale from "strongly disagree" to "strongly agree") with the following eight statements:

1) "Important decisions should be made by the husband rather than the wife";
2) "A man's job is to earn money; a woman's job is to look after the home and family";
3) "A woman is really fulfilled only when she becomes a mother";
4) "A husband's career should be more important to the wife than her own";
5) "A university education is more important for a boy than for a girl";
6) "Being a housewife is just as fulfilling as working for pay";
7) "A pre-school child is likely to suffer if his/her mother works";
8) "Woman should not work outside her home due to religious considerations".

The answers to each question are coded from 1 to 4. I then combine these eight ordinal variables to construct a composite index of conservative gender norms,

which takes values between -3.81 and +1.74. This index is computed using the Principal Component Analysis (PCA), a multivariate statistical technique of dimensionality reduction, which enables a set of original correlated variables to be reduced into a new set of uncorrelated variables (principal components) that are a linear weighted combination of the original variables (Kumaranayake and Vyas, 2006, see Appendix Ch.1 for more details).

To create the main regressor, I use information on whether, at the moment of the interview, households receive any money from abroad sent by family members. I construct a dichotomous variable capturing remittance-receiving migrant households.

The set of control variables includes the presence of family members aged 65 and over, the total number of children aged 5 and under and females within the family. The domains of children and elderly care may, indeed, reduce women's possibilities to be engaged in economic and public activities, but this effect should be weaker if there are more females within the family. The total household income (net of migrant remittances and log transformed) is also included in the model, as well as characteristics recorded for the head of household: age, gender, ethnicity (Kyrgyz, Russian, Uzbek, other), marital status (single, married, separated, widowed), three levels of education (illiterate/primary, secondary, tertiary), trust in religion. Type of residence (urban/rural) and region of residence, on the contrary, are not included in the model since they are captured by the community-level control.

1.5.3 Descriptive statistics

Table 1 compares characteristics of households that receives remittances (14.0%) and households that do not receive remittances (86.0%). The relevant differences are outlined in this section. Families in the first group tend to be more conservative, suggesting *prima facie* a positive relationship between emigration and traditional attitudes toward gender norms in Kyrgyzstan. These households are more likely to be affected by earthquakes (17.1%) relative to non-migrant households (8.7%), and are less likely to be affected by death or illness of another household member or relative (0.4% relative to 3%). The total number of females is greater in migrant households (3.3 relative to 2.6), probably because households with more females - who generally are less likely to be employed in comparison with males - need more income sources and are more likely to have a member abroad.

The average age of the household head is 6.4 years old higher in the first group, in line with the information that in Kyrgyzstan emigrants are usually young and able-bodied men. A total of 10,6 % of respondents in migrant households have completed higher professional education, compared to 18.4% of heads in non-migrant households. The percentage of ethnic Russian is zero for migrant households and 10.9% for non-migrant households. Lastly, the percentage of the widowed is notably higher for migrant households (25.6% relative to 18.8%), while the percentage of the separated is considerably lower in this group (2.2% relative to 8.05%).

Table 1.1: Summary statistics

	Migrant	Non Migrant
PCA Index	-0.194	-0.439
Instruments		
Earthquakes	0.171	0.087
Death of hh member/relative	0.004	0.030
Male	0.719	0.708
Age	56.74	51.27
Marital status		
Married/with partner	0.715	0.713
Single	0.007	0.019
Separated	0.022	0.080
Widowed	0.256	0.188
Ethnicity		
Kyrgyz	0.832	0.680
Uzbek	0.124	0.113
Russian	0.000	0.109
Other	0.044	0.098
Education		
Illiterate/Primary	0.146	0.180
Secondary	0.748	0.636
Tertiary	0.106	0.184
Trust in religion	0.715	0.598
Number of children < 5 years old	0.792	0.692
Number of females	3.314	2.571
Elderly	0.157	0.140
Household income excluding remittances	21,082.21	17,422.55
N	274	1,677

Source: own calculations based on LiK Study 2013

1.6 Empirical strategy

The main challenge in estimating the effect of emigration on gender norms of families staying behind is the potential endogeneity due to omitted variables and reverse causality. Indeed, there may exist household characteristics that affect both gender norms and the decision to migrate: for example, open-minded familes would have more progressive gender norms and their members would be more likely to engage in international migration. In addition, people unhappy with the gender norms within their household may choose to emigrate – a type of reverse causality. To address potential endogeneity, I employ the IV strategy (see e.g. Amuedo-Dorantes and Pozo 2006; Antman, 2011; Mansuri, 2006; McKenzie & Rapoport 2007, 2011; Woodruff & Zenteno, 2007). The usual IV model to be estimated would be comprised of the following two linear equations:

$$Index_i = b_0 + b_1 R_i + b_2 X_i + u_i \quad (1)$$

$$R_i = c_0 + c_1 X_i + c_2 Z_i + e_i \quad (2)$$

In equation (1) for each individual i, $Index_i$ is the indicator of opinions on gender roles, R_i is the receiving-remittances variable, X_i is a set of individual characteristics, u_i is a zero-mean error term. R_i included in (1) is obtained from equation (2), where Z_i is a set of instrumental variables and e_i is the error term. If the migration variable is endogenous and the model is with OLS, the point estimate of the migration variable will be biased and inconsistent, since the error term will be correlated with it. To obtain non-biased results, valid instruments – factors that are correlated with the likelihood of having relative abroad but having no direct effect on gender norms, except through the migration variable - are needed. In (2), R_i is decomposed in two terms: $c_0 + c_1 X_i + c_2 Z_i$ captures the part of R_i which is exogenous (uncorrelated with u_i); e_i captures the part of R_i potentially correlated with u_i. In addition, community fixed effects are taken into account in the regression, in order to capture within-community effects that might influence the household attitudes towards the roles of females in the society.

Because R_i is a dummy variable, the conditional expectation function associated with the first stage is probably nonlinear. So the usual OLS first stage is an approximation to the underlying nonlinear conditional expectation function. I might, therefore, fit a probit model in an attempt to come closer to the conditional expectation function. The fitted value of R_i would be then:

$$Pr(R_i = 1|X_i, Z_i) = \prod(c_1 X_i + c_2 Z_i) \quad (3)$$

where $\prod$ is the standard normal cumulative distribution function. Estimating the second stage equation with OLS that includes this fitted value instead of the original dummy variable, however, will rarely produce consistent estimators (Wooldridge, 2002). Only OLS estimation of the first stage is guaranteed to produce residuals that are uncorrelated with fitted values and covariates (Angrist and Pischke, 2008)[2]. I, therefore, employ a simple alternative method, which consists of doing regular linear IV using the fitted value as an instrument, but the original dummy as the regressor (Cameron and Trivedi, 2009). Nonlinear fits-as-instruments has the advantage that, if the nonlinear model gives a better approximation of the first-stage conditional expectation function than the linear model, the resulting estimates will be more efficient than those using a linear first stage (Angrist and Pischke, 2008).

To sum up, I compute three steps and not just two. In the first stage, I fit a probit model and regress the endogenous regressor on all exogenous variables; in the second stage, I regress the endogenous regressor on the fitted value and computes the prediction R_i; in the third stage, I regress the dependent variable on all exogenous regressors and the prediction R_i.

Moreover, an issue on estimation strategy concerns the problem of measurement error in the amount of reported income, typical of sample surveys. This variable cannot be precisely measured in the available data, because respondents may well be reluctant to report such information to an interviewer if this is viewed as sensitive. This measurement error represents a source of endogeneity since the true model is that in eq (2), but instead of $X_i^{'*}$ I observe $X_i^{'} = X_i^{'*} + u_i$, where u_i is a mean-zero error process, because there is a measurement error in the amount of reported income. If I assume that the measurement error is uncorrelated with the true explanatory variable, $cov(X_i^{'*}, e_i) = 0$. Then, $(cov(X_i^{'*} + u_i), e_i) \neq 0$ by construction, and the estimated regression will have a correlation between its explanatory $X_i^{'*}$ variable and the composite error term, causing the regression to be biased and inconsistent (Wooldridge, 2010).

To deal with this source of endogeneity, I employ the control function approach, which is explained in details in section 8. Through instruments - factors which are correlated with the amount of income but are independent from gender norms - I can obtain non-biased estimates. There are several candidates for instruments that are common in the context of measurement errors. I select the three-groups

[2] A formal proof is given in Green (2008).

method suggested by Kennedy (2008), in which the observations are split in three equal-sized groups, on the basis of the size of the regressor, and then the slope coefficient is estimated by the line joining the arithmetic means of the three groups. This corresponds to using an instrument with values $-1, 0$, and $+1$. The idea behind this method is that, by averaging the data in this way, the measurement errors are also averaged, reducing their impact.

The results (see Table 5 in Appendix Ch.1) show that the regressor is not endogenous, meaning that the estimates obtained without instrument for the total household income are unbiased.

1.6.1 Instruments

To be valid, instruments must be correlated with the endogenous regressor R_i, uncorrelated with the error term u_i (also referred to as exclusion restriction), without having a direct influence, apart from the influence through the endogenous regressor, on the dependent variable $Index_i$. Selected instruments are dummy ("Yes=1", "No=0") including two different shocks that affected Kyrgyz at community or household level in the past.

The first candidate instrument relates to natural disasters. It comes from the 2013 community questionnaire and is based on the question "During the last 12 months, has your community been affected by an earthquake?"; 17.15% of respondents in households receiving remittances, and 8.71% of respondents in households non receiving remittances answered 'yes' to this question. Migration and remittances can be viewed as a coping strategy to deal with natural shocks, in particular when livelihoods are destroyed. It mitigates the consequences of natural disasters by providing new opportunities and resources to affected people who do not have many alternatives at their disposal but can still afford migration costs. Moreover, remittances from migrants abroad play an important role in supporting those who cannot afford migration costs or do not choose to leave, reducing their vulnerability to the effects of shocks (Mbaye and Zimmermann, 2017). According to the World Bank (2017), the Kyrgyz Republic is exposed to a harsh seismic risk, with expected annual damage to buildings exceeding 280 million USD (over 4% of GDP). The country is indeed a high seismic risk area, mainly in the northern Tien Shan and in the south – close to the Ferghana Valley and the Chinese border.

The second candidate instrument comes from the 2011 household questionnaire and is a dummy variable capturing the fact that during the previous 12 months a household has been affected by at least one of the following shocks: death of a

major breadwinner; death of other household member; death of close relative (non-member of household); and illness of other household member. Overall, 0.36% of respondents in households receiving remittances, and 3.04% of respondents in households non receiving remittances, answered 'yes' to at least one of these questions. Following Dustmann et al. (2017), I expect these events to induce migrants to return home and household members to be less likely to migrate (and receive remittances) in the first place.

To be employed, instruments must be relevant – highly correlated with the endogeneous regressor. To check the instruments' relevance, I use the F test of excluded instruments (Stock and Yogo 2004), which tests the hypothesis that the instruments' coefficients in the first-stage equation are jointly equal to 0. The commonly used threshold for the F-test statistics is 10. In addition, instruments must be also exogenous – not correlated with the error term of the second-stage equation. If an instrument is not exogenous, it cannot capture the exogenous variation in the endogenous regressor, and the estimator is inconsistent. To test the orthogonality condition, I employ the Sargan-Hansen test, which should suggest to not reject the over-identifying restrictions – that instruments are uncorrelated with the error term, and that the excluded instruments are correctly excluded from the estimated equation.

1.7 Results

The second colum of Table 2 shows the results of the first stage equation. As expected, people belonging to a community affected by earthquakes are more likely to receive remittances; in contrast, respondents belonging to a household that has been affected by death or illness of another household member or relative are less likely to receive remittances. The instruments jointly satisfy the relevance condition, with the value of the F test of excluded instruments equal to 19.75. The validity of the instruments is further confirmed by the overidentification test, which rejects the hypothesis that instruments are endogenous (p-value = 0.8410). In addition, the endogeneity test is also reported in table 2 (p-value = 0.0972), indicating that endogeneity is present in the model and the instrumental variables approach should be used.

The first column of Table 2 contains the results of the second stage equation, which includes the estimated value of the key explanatory variable from the first stage, and control variables. These results show that migration has considerable effects on gender norms: receiving remittances increases the attitude to

be conservative by 0.863 points. Some controls have the expected sign. Being male is associated with an indicator of opinion on gender roles 0.565 point higher. Relative to secondary educated, tertiary educated household heads result to be less traditional, reporting an indicator of conservative gender norms 0.192 points lower. Age is also correlated with less conservative opinions on gender roles, in line with the re-Islamization process that is especially widespread among the young; however, as people get older this effect is weaker. In addition, relative to married household heads, the indicator of conservative gender norms among singles results to be 0.605 point lower, while for the widowed is 0.284 point greater. Relative to Kyrgyz, Russians are less conservative, while Uzbeks result to be more traditional. Moreover, a one percent increase in the value of income is associated with an increment of 0.035 point of the conservative attitude. This result is consistent with the idea that increasing income may relax budget constraints, raise reservation wages and reduce the likelihood of employment for women of the household. Lastly, the presence of the elderly and the total number of females have no significant effect on the opinion on gender roles. A rising number of children within the family, on the contrary, increases the attitude to be conservative by 0.863 points, in line with the idea that the domain of children may reduce women's possibilities to be engaged in economic and public activities, and consequently their emancipation.

Table 1.2: Instrumental variables estimation

	PCA Index IV	Receive remittances Probit
Receive remittances	0.863*	
	(0.447)	
Male	0.565***	-0.077
	(0.108)	(0.160)
Ethnicity		
Kyrgyzs	Ref.	Ref.
Uzbek	0.415*	-0.142
	(0.212)	(0.171)
Russian	-0.302***	-1.628***
	(0.110)	(0.397)
Others	0.194	-0.553**
	(0.160)	(0.279)
Age	-0.041**	0.115***
	(0.016)	(0.027)
Age squared	0.000**	-0.001***
	(0.000)	(0.000)
Marital status		
Married	Ref.	Ref.
Separeted	-0.007	-0.594**
	(0.130)	(0.236)
Widowed	0.284**	-0.145
	(0.116)	(0.155)
Single	-0.605**	0.122
	(0.276)	(0.386)
Education		
Primary/illiterate	0.239***	-0.214**
	(0.079)	(0.105)
Secondary	Ref.	Ref.
Tertiary	-0.192***	-0.318***
	(0.067)	(0.107)
Trust in religion	0.240***	0.201**
	(0.078)	(0.093)
Household income excluding remittances (ln)	0.035*	-0.110***
	(0.019)	(0.022)
Number of children	0.062*	-0.167***
	(0.038)	(0.050)
Number of females	-0.027	0.201***
	(0.024)	(0.031)
Elderly	0.032	-0.295
	(0.142)	(0.185)
Instruments		
Earthquakes		0.562***
		(0.164)
Death of hh member/relative		-0.991***
		(0.312)
N	1,951	1,951
Overidentification test (p-value)	0.8410	
Weak identification	19.75	
Endogeneity (p-value)	0.0972	

Clustered standard errors at the community level in parenthesis ***p<0.01 **p<0.05 *p<0.1

1.8 Robustness check

To assess the robustness of these estimates, I employ the control function approach (CF). The CF relies on the same kind of identication conditions - i.e. relevance and orthogonality condition - on the IV method, which is employed above. This approach works even outside the linear framework, and thus represents an alternative method to IV for models that are nonlinear in endogenous variables. Because of the nonlinearity in R_i, the CF approach is here based on the conditional mean, rather than on a linear projection. The model to be estimated is, therefore, the following:

$$E(Index_i|X_i, R_i) = b_1 R_i + b_2 X_i + E(u_i|X_i, R_i) \quad (4)$$

that requires an assumption about $E(u_i|X_i, R_i)$, that is:

$$E(u_i|X_i, R_i) = E(u_i|X_i, v_i) = E(u_i|v_i) = r_1 v_i \quad (5), \text{ where } v_i$$

is the error term obtained from $Pr(R_i|X_i, Z_i) = \prod(c_1 X_i + c_2 Z_i) \quad (6)$

The CF works through the inclusion of v_i in (4), that allows to "control" for the endogeneity of R_i and obtain unbiased estimates (for more details, see Wooldridge 2002). The linearity assumption in (5) holds if (u_i, v_i) is independent of Z_i; consistency of the estimator depends on this assumption, along with equation (6) being correctly specified.

The CF is, therefore, a two-step procedure: I first estimate the endogenous regressor as a function of instruments employing a probit model, then use the errors from this model as an additional regressor in the main model. In addition, I take into account community fixed effects, as in IV estimates.

The robustness check presented above, and reported in Table 3, shows that results in Table 2 are robust to the CF approach, confirming the presence of endogeneity in the model and the instruments' relevance. The overall coefficients are consistent with those in Table 2. This strengthens the evidence that receiving remittances increases the attitude to be conservative and support the validity of the procedure employed as empirical strategy.

Table 1.3: Robustness check

	PCA Index CF	Receive remittances Probit
Receive remittances	0.883*	
	(0.456)	
Male	0.534***	-0.077
	(0.110)	(0.160)
Ethnicity		
Kyrgyzs	Ref.	Ref.
Uzbek	0.392**	-0.142
	(0.197)	(0.171)
Russian	-0.255**	-1.628***
	(0.126)	(0.397)
Others	0.227	-0.553**
	(0.175)	(0.279)
Age	-0.041**	0.115***
	(0.016)	(0.027)
Age squared	0.000**	-0.001***
	(0.000)	(0.000)
Marital status		
Married	Ref.	Ref.
Separeted	0.027	-0.594**
	(0.129)	(0.236)
Widowed	0.286**	-0.145
	(0.117)	(0.155)
Single	-0.578**	0.122
	(0.275)	(0.386)
Education		
Primary/illiterate	0.260***	-0.214**
	(0.078)	(0.105)
Secondary	Ref.	Ref.
Tertiary	-0.158**	-0.318***
	(0.066)	(0.107)
Trust in religion	0.210**	0.201**
	(0.083)	(0.093)
Household income excluding remittances (ln)	0.043*	-0.110***
	(0.022)	(0.022)
Number of children	0.073*	-0.167***
	(0.038)	(0.050)
Number of females	-0.042	0.201***
	(0.030)	(0.031)
Elderly	0.022	-0.295
	(0.145)	(0.185)
Residuals	**-0.804***	
	(0.465)	
Instruments		
Earthquakes		0.562***
		(0.164)
Death of hh member/relative		-0.991***
		(0.312)
N	1,951	1,951

Clustered standard errors at the community level in parenthesis ***p<0.01 **p<0.05 *p<0.1

1.9 Discussion and conclusions

This paper aimed to study the impact of emigration of household members and the associated receipt of migrant monetary remittances on gender norms in Kyrgyzstan. I first outlined three possible reasons of this connection, proposed by the broader literature on the relationship between emigration and female bargaining power in developing countries: the impact of male out-migration on the decisional autonomy of spouses left behind; the effect of remittances on investments in children's schooling, often characterized by gender inequality; the impact of remittance income on the labour supply of women left behind. I then tested these channels on the Kyrgyz Republic, where this relationship has not so far been explored and there are reasons to think that the receipt of migrant monetary remittances is associated with a negative impact on women bargaining power. Specifically, I contributed to the strand of literature on the effect of out-migration on gender norms, which relies on real and perceived bargaining power - rather than on objective outcomes, such as time-use and questions about who makes the decisions within the household. In contrast to the two previous studies, which had considered exclusively migrants' spouses left behind, I focused on a sample of households heterogeneous in terms of the nature of the head of the household, i.e. including both female and male heads. To test the relationship between emigration and gender norms, I employed the 2013 wave of the "Life in Kyrgyzstan" household survey and used the Instrumental Variables (IV) approach. This allowed me to solve the endogeneity issue, due to omitted variables and reverse causality, proper to migration-related empirical studies.

Overall, the results suggest that in the Kyrgyz Republic emigration of household members lead to a more conservative opinion on gender roles among the family members staying behind. I outlined possible ways in which the theoretical considerations presented above may work in the case of Kyrgyzstan. First, the positive effect on spouse's autonomy deriving from the absence of the male head of household is likely not to be at play in the case of Kyrgyzstan. This is in particular due to the fact that in traditional families, mainly in rural areas, women live with their in-laws after their wedding and stay with them while their husbands are abroad. In this way they are often subordinated to their husbands' parents, and do not receive remittances directly from their partners or do not have control of them. Second, having a household member abroad relax budget constraints, raise reservation wages and increases the likelihood of women conducting unpaid household work, which typically places women in a subordinate and more vulnerable position. This effect may also be strengthened by the conservative Kyrgyz society norms that view women primarily as mothers and wives, who are inferior to men. Third, in a patriarchal society, in which older male members in intergenerational

households take care of children in the absence of migrant fathers, migrant remittances may be spent on educational expenditure that disproportionately benefit boys and discriminate against girls.

The evidence that in the Kyrgyz Republic receiving remittances increases the attitude to be conservative is also supported by a different estimation strategy, i.e. the CF approach, which I employed as robustness check. However, the analysis might be refined including a measure that captures more directly the intergenerational characteristics of the Kyrgyz households. This would allow to test more completely the hypothesis formulations adopted to explain the negative impact of emigration on gender norms in the country.

Bibliography

[1] Ablezova M. K. and Ibraeva G. K., 2016. Kyrgyzstan - extended migration profile 2010 - 2015. National Institute for the strategic studies of the Kyrgyz Republic. Bishkek: IOM.

[2] Agadjanian V. and Nedoluzhko l., 2013. Arranged and forced marriages in Kyrgyzstan: persistence or change? National Council for Eurasian and East European Research. Seattle (WA): University of Washington.

[3] Amuedo-Dorantes C. and Pozo S., 2006. Migration, Remittances, and Male and Female Employment Patterns. American Economic Review, 96(2): 222-26.

[4] Angrist J. D. and Pischke J. S., 2008. Mostly Harmless Econometrics: An Empiricist's Companion. Princenton, New Jersey: Princeton University Press

[5] Antman F., 2018. Women and migration. Discussion Paper 11282. Bonn: IZA.

[6] Antman F., 2015. Gender discrimination in the allocation of migrant household resources. Journal of Population Economics, 28(3): 565-592.

[7] Antman F., 2011. The Intergenerational Effects of Paternal Migration on Schooling and Work: What Can We Learn from Children's Time Allocations? Journal of Development Economics, 96(2): 200-208.

[8] Binzel C. and Assaad R., 2011. Egyptian Men Working Abroad: Labour–Supply Responses by the Women Left Behind. Labour Economics, 18 (1): 98–114.

[9] Cabegin A., 2006. The Effect of Filipino Overseas Migration on the Non-Migrant Spouse's Market Participation and Labor Supply Behavior. Discussion Paper 2240. Bonn: IZA.

[10] Cameron A. C. and Trivedi P. K., 2009. Microeconometrics: Methods and Applications. New York: Cambridge University Press.

[11] CEDAW, 2015. Concluding Observations on Kyrgyzstan, 11 March.

[12] Chen, Joyce J. 2006. Migration and Imperfect Monitoring: Implications for Intra-household Allocation. American Economic Review, 96(2): 227-231.

[13] Chen, Joyce J. 2013. "Identifying non-cooperative behavior among spouses – child outcomes in migrant sending households" Journal of Development Economics, 100: 1-18.

[14] Chotaeva C., 2005. The ethnic and religious situation in Kyrgyzstan. Central Asia and the Caucasus, 3(33): 69.

[15] De Haas H. and Van Rooij, A, 2010. Migration as emancipation? The impact of internal and international migration on the position of women left behind in rural Morocco. Oxford Development Studies, 38 (s1): 43–62.

[16] Dhami S and Sheikh A., 2000. The Muslim family: predicament and promise. Western Journal of Medicine, 173(5): 352-356.

[17] Doss C., 2013. Intrahousehold Bargaining and Resource Allocation in Developing Countries. Policy research working paper 6337. Washington D.C.: World Bank.

[18] Dustman C. et al., 2017. Risk Attitudes and Household Migration Decisions. Discussion Paper 10603. Bonn: IZA.

[19] Fagen P. W. and Bump M., 2006. Remittances in Conflict and Crises. International Peace Academy, New York.

[20] Giannelli G. C. and Mangiavacchi L., 2010. Children's Schooling and Parental Migration: Empirical Evidence on the Left-behind Generation in Albania. Labour, 24(s1): 76–92.

[21] Greene W. H., 2008. Econometric Analysis. Prentice Hall, Upper Saddle River, New Jersey.

[22] Hanson G. H. 2007. Emigration, Remittances, and Labor Force Participation in Mexico. Integration and Trade Journal, 27: 73-103.

[23] Heyat F., 2004. Re-Islamisation in Kyrgyzstan: gender, new poverty and the moral dimension. Central Asian Survey, 23(3-4): 275-287.

[24] Ibraeva G.K. et al., 2011. Gender equality and development. World Report Development 2012. Washington D.C.:World Bank.

[25] International Labour Organization, 2012. Global Employment Trends for Women 2012. Geneve.

[26] International Labour Organization, 1993. Resolution concerning the International Classification of Status in Employment (ICSE). Geneve.

[27] Ishkanian A., 2003. VI. Gendered Transitions: The Impact of Post-Soviet Transition on Women in Central Asia and the Caucasus. Perspectives on Global Development and Technology, 2(3-4).

[28] Karymshakov K. and Burulcha S., 2017. Migration impact on left-behind women's labour participation and time-use. Evidence from Kyrgyzstan. WIDER Working Paper 119.

[29] Kennedy P., 2008. A Guide to Econometrics, 6th Edition. Hoboken, New Jersey: Wiley-Blackwell.

[30] Khalid A., 2007. Islam after Communism: Religion and Politics in Central Asia. Berkeley: University of California Press.

[31] Kolenikov S. and Angeles G., 2004. The Use of Discrete Data in Principal Component Analysis With Applications to Socio-Economic Indices. CPC/MEASURE Working paper 85.

[32] Kumaranayake L. and Vyas S., 2006. Constructing socio-economic status indices: how to use principal components analysis. Health Policy and Planning, Volume 21 (6): 459468.

[33] Laurent M., Ferry M. and Mikheev S., 2016. Women and children from Kyrgyzstan affected by migration. Paris: International Federation for Human Rights.

[34] Lokshin, M. and Glinskaya E., 2009. The effect of male migration on employment patterns of women in Nepal. World Bank Economic Review 23 (3): 481–507.

[35] Malyuchenko I., 2013. Labour migration from Central Asia to Russia: economic and social impact on the societies of Kyrgyzstan, Tajikistan and Uzbekistan. Bishkek: OSCE Academy.

[36] Mansuri G., 2006. Migration, Sex Bias, and Child Growth in Rural Pakistan. World Bank Policy Research Working Paper 3946.

[37] Mansoor A. and Quillin B., 2007. Migration and Remittances: Eastern Europe and the Former Soviet Union. Washington D.C: World Bank.

[38] Mansour W., Chaaban J. and Litchfield J., 2011. The Impact of Migrant Remittances on School Attendance and Education Attainment: Evidence from Jordan. International Migration Review, 45(4): 812–851.

[39] Mbaye L. M. and Zimmermann K. M., 2017. Natural Disasters and Human Mobility. International Review of the Environmental and Resource Economics, 10 (1): 137-56.

[40] McQuillan, K., 2004. When does Religion Influence Fertility? Population and Development Review, 30: 25-56.

[41] McKenzie D. and Rapoport H., 2011. Can Migration Reduce Educational Attainment" Evidence from Mexico? Journal of Population Economics, 24: 1331-1358.

[42] McKenzie D. and Rapoport H., 2007. Network Effects and the Dynamics of Migration and Inequality: Theory and Evidence from Mexico. Journal of Development Economics, 84: 1–24.

[43] Mendola M. and Carletto C., 2008. Migration and Gender Differences in the Home Labour Market: Evidence from Albania. Labour Economics, 19: 870-880.

[44] Mously L. and Matz J. A. M., 2017. Migration and the autonomy of women left behind. WIDER Working Paper 64.

[45] Piccoli L., 2017. Female poverty and income household inequality in transition economies. Article. Bonn: IZA.

[46] Stock J. H. and Yogo M., 2004. Testing for Weak Instruments in Linear IV Regression. Working Paper. Cambridge, MA: Harvard University, Department of Economics.

[47] Torosyan K. et al., 2016. Migration, Household Tasks, and Gender: Evidence from the Republic of Georgia. International Migration Review, 50 Number (2) : 445–474.

[48] Tuccio M. and Wahba J., 2015. Can I Have Permission to Leave the House? Return Migration and the Transfer of Gender Norms. Discussion Paper 9216. Bonn: IZA.

[49] Ullah A. A., 2017. Male Migration and Left–behind Women: Bane or Boon? Environment and Urbanization Asia, 8(1): 1–15.

[50] UNDP, 2012. Gender Equality and Women's Empowerment in Public Administration. New York.

[51] Vogel A. and Korinek K., 2012. Passing by the Girls? Remittance Allocation for Educational Expenditures and Social Inequality in Nepal's Households 2003-2004. International Migration Review, 46(1): 61–100.

[52] Woodruff C. and Zenteno R. M., 2007. Migration Networks and Microenterprises in Mexico. Journal of Development Economics, 82: 509–528.

[53] Wooldridge J.M., 2002. Econometric Analysis of Cross Section and Panel Data. Cambridge, MA: MIT Press.

[54] World Bank, 2016. Migration and Remittances Factbook 2016. Washington D.C.

[55] World Bank, 2017. Mesauring Seismic Risk in Kyrgyz Republic. Final Report. Washington D.C.

[56] World Bank Group, 2015. Labour migration and welfare in the Kyrgyz Republic (2008-2013). Washington D.C

Abstract

The paper studies the relationship between emigration of household members - receiving remittances (migrant monetary transfers) - and alcohol consumption of migrant households staying behind in Kyrgyzstan, a poor post-socialist country that has recently witnessed both large-scale emigration and a rise in alcohol-related health problems. Using a longitudinal survey, I test whether an increase in migrant remittances and the changes in household migration status are associated with a higher likelihood of consuming alcohol, as well as an increase in spending on alcoholic beverages. I discuss possible mechanisms through which emigration and remittances may affect the alcohol consumption of families staying behind, including the relaxation of budget constraints, social remittances and psychological distress. Overall, my findings suggest that the emigration of household members contributes to a greater alcohol consumption among those staying behind through the relaxation of budget constraints, while no significant impact is found in the case of social remittances and psychological distress.

Chapter 2

Emigration and alcohol consumption among migrant households staying behind: Evidence from Kyrgyzstan

2.1 Introduction

Six percent of global deaths and five percent of the global burden of disease and injury are attributable to alcohol consumption (World Health Organization, 2014a). The post-socialist countries of the former Soviet Union and Eastern Europe are particularly affected: they report some of the world's highest rates of alcohol consumption and alcohol use disorders, as well as alcohol-related disease, death and harm (World Health Organization, 2014a). At the same time, since the 1990s many post-socialist countries have witnessed high levels of out-migration. Migrant monetary transfers (henceforth, remittances) continue to provide a lifeline for millions of households across the region, with countries such as Tajikistan, Kyrgyzstan, Armenia, Georgia, Moldova, Bosnia and Herzegovina, and Kosovo being among the most remittance-dependent economies in the world (World Bank, 2016). Given the salience of both alcoholism and emigration in the post-socialist countries, it is surprising how little is known about the linkages between the two. Among the underexplored questions are some rather fundamental ones, such as whether emigration contributes to alcohol consumption in the migrant countries of origin. This is the focus of this study. In a related paper, written jointly with Artjoms Ivlevs, I have already provided some preliminary evidence on this issue. The latter paper focuses on the effects on individuals left behind and outcomes such as the frequency of consuming alcohol and the amount of consumed beer and

vodka, and highlights important differences between ethnicities. The present paper disregards these ethnic aspects and focuses on househod spending on alcoholic beverages and control variables proper to the household-level analysis. It also improves on the previous one by strengthening the methodology of the estimation strategy.

To my knowledge, no other work considers the role of emigration in explaining changes in alcohol consumption among households left behind in transition and developing countries. Previous contributions have focused on the effects of emigration on health and healthy lifestyle behaviours of migrant families staying in the countries of origin, looking at outcomes such as subjective health evaluation, obesity, body mass index, mental health, ability to perform daily tasks, nutritional diversity, and childbirth indicators (Anton, 2010; Antman, 2010; Antman 2016; Bohme et al., 2015; Creighton et al., 2011; Hildebrandt and McKenzie, 2005; Kanaiaupuni and Donato, 1999; Kroeger and Anderson, 2014; Kuhn et al., 2011; Mosca and Barrett, 2016; Riosmena et al., 2012).

On a conceptual level, out-migration of household members may affect the alcohol consumption of families staying behind in a variety of ways. First, money sent back by migrants may relax household budget constraints and enable households to buy more alcohol. Second, in accordance with the "social remittances" hypothesis (Levitt, 1998), migrants may transfer drinking norms and behaviours from host to home countries. Third, the departure of household members may be associated with psychological distress among those staying behind, which in turn may lead to higher alcohol consumption.

To test whether emigration is related to the alcohol consumption of families staying behind, I focus on Kyrgyzstan - a poor country in Central Asia and one of the successor states of the former Soviet Union. Since 2000, Kyrgyzstan has seen increasing levels of alcohol consumption and alcohol-related health problems (Reim et al., 2016; World Health Organization, 2014a; World Health Organization, 2017). It has also witnessed, over the same time period, high rates of international out-migration, predominantly to Russia, and is currently the second most remittance-dependent economy in the world (after Tajikistan), with remittances equivalent to 30.1% of GDP (World Bank, 2016). My exploration of the relationship between emigration and alcohol consumption is based on the "Life in Kyrgyzstan Panel Study 2010-2013" (LiK Study), a nationally representative household survey consisting of repeated in-depth interviews with the same 3,000 households over four years. I then take advantage of the panel nature of the data and estimate models (conditional logit and Tobit) with the household fixed effects; this allows to see whether the changes in household migration status are associated with the changes in alcohol consumption.

The remainder of the paper is organised as follows. Section 2 reviews the literature on the effects of emigration on the health outcomes of migrant families staying in the countries of origin. Section 3 presents the context of alcohol consumption and emigration in Kyrgyzstan. Section 4 outlines conceptual channels through which emigration may affect alcohol consumption among those staying behind. Section 5 describes data and variables. Section 6 displays estimation strategy. Section 7 reports the results. Section 8 presents an alternative model as robustness check, followed by a discussion and conclusion in Section 9.

2.2 Literature review

This study contributes to the literature on the effects of emigration on the health outcomes and healthy lifestyle behaviours of migrant relatives staying in the countries of origin. A strand of the literature has focused on the impact of adult children's migration on their parents' physical and mental health. Antman (2010; 2016) finds evidence of negative impacts on health outcomes (poor self-rated health status, obesity, feelings of depression and loneliness) of elderly parents in Mexico due to the emigration of their children to the U.S. She argues that elderly parents may suffer emotionally when their children are absent. This might be particularly true if migrants entered the country of destination illegally, as this would potentially impose worries on parents left-behind and usually would imply a lower frequency of contact and visits. In addition, elderly parents may lose physical support in the form of hours of care from their children when one child migrates and there may be no close substitutes. Similar conclusions are found by Mosca and Barrett (2016), who find evidence of increased levels of depressive symptoms and feelings of loneliness among the mothers of emigrants, but not for fathers in Irland. On the contrary, Bohme et al. (2015) provide evidence that international migration can have a beneficial effect on the health of elderly people left behind in Moldova. Testing for a variety of health outcomes (self-reported health indicator, cognitive capacity, chronic and acute diseases, psychological well-being, ability to perform daily tasks), they support an income effect that allows for a dietary change and a change in time allocation: migration allows elderly people to eat a more diverse diet and to spend more time on leisure and sleep instead of working in subsistence farming. This corresponds with an increase in physical health dimensions, while no systematic effect of migration on mental or cognitive health is found. Kuhn et al. (2011) analyze the impact of internal migration on elderly parents' self-reported health status, self-reported mobility status and mortality in Indonesia, and find that having a migrant child is associated with reduced risk of negative health outcomes and lower mortality. Their findings support the idea

that remittances from migrants to families left behind can improve the standard of living of elderly parents, contributing to their health care and providing financial transfers during a health crisis.

The literature on emigration and health also includes several studies that have focused on children's health outcomes. Some of them (see for instance: Anton 2010; Hildebrandt and McKenzie, 2005; Kanaiaupuni and Donato, 1999; Kroeger and Anderson, 2014) have demonstrated that receiving remittances households are significantly associated with better nutritional status of children and lower infant mortality. They suggest a direct income effect of remittances on the households receiving them, that is lowering food deprivation and thus increasing total caloric consumption. On the contrary, Creighton et al. (2011) highlight that household migration impacts children's health negatively in Mexico. They outline the link between migrant networks and becoming overweight or obese, arguing that transnational ties may help diffuse nutritional norms and eating habits prevalent in the U.S., where high-fat foods are largely widespread. Children in networked households are potentially exposed to social norms derived from the U.S., which could influence changes in diet and behavior. Riosmena et al. (2012) provide similar conclusions, focusing on Mexican adults and investigating the relationship between community-level migration intensity and the individual risk of being overweight and obese. They point to the role of return migration: as migrants bring these practices back to their communities of origin, they may successively influence the food preferences of people at home.

2.3 Context

2.3.1 Alcohol consumption in Kyrgyzstan

Across the post-socialist world, the excessive use of alcohol is partly attributable to the economic, political and social transition from planned to market economy in the 1990s (Bhattacharya et al., 2013; Brainerd, 2001; Brainerd and Cutler, 2005; Stuckler et al., 2012), while the alcohol-related problems have, in turn, contributed to the depth of economic, demographic and social crises (Srivastava, 2010; Terza, 2002), not least through an adverse effect that alcohol consumption has on educational attainment (Mangiavacchi and Piccoli, 2018). There is, however, an important variation in the level of alcohol consumption between, as well as within, post-socialist countries. Thus, per capita alcohol consumption in Kyrgyzstan (5 litres of pure alcohol in 2014) and other Central Asian countries can be considered modest relative to some other post-Soviet countries such as Russia, Belarus,

Moldova and Lithuania (at least 14 litres of pure alcohol per capita in 2014). Relative to the latter, the practice of consuming alcohol in Central Asia is less usual and the social stigma attached to drunkenness is greater, partly due to the fact that the majority of people are Muslims. This said, ethnic Russian minorities living in Central Asian countries have relatively high alcohol consumption rates, which highlights the importance of social, cultural and religious determinants of alcohol use and, among other things, explains the "Russian mortality paradox" – the higher mortality of people belonging to the ethnic Russian minority despite their generally greater socio-economic status (Guillot et al., 2013).

While per capita consumption of alcohol is relatively low in Kyrgyzstan (by both post-socialist and European standards), it has increased by 40% between 2000 and 2014, a trend that has also been observed in neighbouring Kazakhstan and Uzbekistan (Rehm et al., 2016). Among the 54 European and Central Asian countries (the world region with the highest per capita consumption of alcohol), Kyrgyzstan currently has the 7th highest standardised rate of mortality from alcohol-attributable disease and injury (Rehm et al., 2016). Alongside Mongolia, South Korea, Kazakhstan, Uzbekistan and Turkmenistan, Kyrgyzstan tops the list of 57 Asia-Pacific countries with the highest rate of alcohol use disorders (5.2%) (Monzavi et al., 2015). Growing alcohol consumption in Kyrgyzstan is increasingly recognised as a major social issue, with measures to limit alcohol use recently taken at both the national and local levels (AsiaNews, 2017; Radio Free Europe, 2017).

2.3.2 Emigration from Kyrgyzstan

Kyrgyzstan is the second poorest country in the Commonwealth of Independent States (after Tajikistan), with GDP per capita of $3,351 (World Bank, 2017). Since proclaiming its independence in 1991, the country has struggled to implement institutional and political reforms and ensure economic development; it has also witnessed armed conflict in 2010. In the 1990s, the breakdown of supply chains and demand in the Soviet planned economy brought about the near-collapse of Kyrgyz industry and mass job losses. The lack of job opportunities and a weak social model led to a large-scale emigration from Kyrgyzstan, mostly to Russia and in small part Kazakhstan, both of which experienced a resource-driven economic boom in the early 2000s.

Between 1990 and 2014, 779,000 people emigrated from Kyrgyzstan, equivalent to 18% of the country's population in 1990 (Ablezova and Ibraeva, 2016). Nine out of ten Kyrgyz migrants go to Russia, where they tend to be employed in

relatively low-skilled occupations (retail, construction, services), and migrants going to Kazakhstan tend to be employed in agriculture. While in the early stages of transition emigration was dominated by the ethnic Russian minority (9% of the country's population in 2009), the share of ethnic Kyrgyzs as well as the ethnic minority Uzbeks (14% of the country's population in 2009) increased rapidly in the 2000s. International migrants from Kyrgyzstan are more likely to be men (around 70%), young (the average age is 28 years), have lower levels of education than the domestic workforce (two thirds of migrants have a general secondary education which is expected in low skilled jobs in Russia), and tend to engage in circular migration[1] (especially those working in construction), (World Bank, 2015).

According to the "Life in Kyrgyzstan Study" survey, which forms the basis for my empirical analysis, 16% of households in Kyrgyzstan reported having a family member abroad and 14% reported receiving migrant remittances in 2013 (the year of the last wave of the survey).

2.4 Theoretical considerations

One can conceives of several mechanisms through which emigration may affect alcohol consumption among households staying behind. Below I outline three possible channels related to 1) the relaxation of budget constraints; 2) social remittances; and 3) adverse psychological states.

2.4.1 The relaxation of budget constraints

There is a general consensus in the literature on migration that consumption is the predominant use of remitted income (Davis and Lopez-Carr, 2010). Some works have suggested that remittances are not used for long-term investments, but instead allow for cospicuous consumption (see for instance: Chami, 2008; Clément, 2011). This supports the pessimistic view on remittances, for which they are consumed rather than invested and thus do not help to improve the economic development of migrant-sending countries. From this perspective the decision of a household member to out-migrate and send money back to family

[1]Circular migration can be defined as "systematic and regular movement of migrants between their homelands and foreign countries typically seeking work" (Constant and Zimmermann, 2011) .

members relaxes household budget constraints, and higher income should result in modified consumption patterns first in basket necessities, such as food and clothing, and later in luxury goods and vices, such as alcoholic beverages, tobacco, and foreign consumer goods. This is particularly true in countries where a large part of the population lives below the poverty line and then uses remittances to cover basic needs. Moreover, in some countries low quality of schools and poor qualification of teachers prevent families from investing in education, while lack of business opportunities and financial institutions moderates investments into capital (Clément, 2011). Education and financial sector are usually considered in the literature as crucial areas for productive investments and economic growth.

In the Kyrgyz Republic, the poverty rate measured at the international level for low-middle income countries was equal to 19 percent of the population in 2016 (World Bank 2018[2]); the quantity and quality of education services started to decline after independence in 1991 due to lack of resources (the education budget fell by 50% from 1991 to 1995, without increasing consistently in after year), (ADB, 2013); and access to financial products and services is insufficient, due to lack of institutional capacity and high level of institutional corruption. In addition, in Kyrgyzstan the large informal sector is one of the most important factor limiting financial inclusion, since not completely transparent accounts and activities do not allow entrepreneurs to get enough funding, and the population receiving informal wages cannot prove their creditworthiness (Hasanova, 2018). From this perspective I would expect remittance-recipient households in Kyrgyzstan to increase their consumption and to consume more alcohol than non-migrant households.

2.4.2 Social remittances

In her seminal work, Levitt (1998) defines social remittances as "ideas, practices, identities, and social capital that flow from receiving- to sending-country communities". Levitt shows that migrants internalise the ideas, practices, identities and social capital of host countries, and through correspondence, visits and return migration, transmit these intangibles, exerting considerable influence on home country processes.

As the vast majority of migrants from Kyrgyzstan goes to Russia, they are exposed to a more intense drinking culture. In Russia there exists an inherent "culture of alcohol": binge-drinking is very common and is an innate part of social rituals (birthdays, weddings and others) (Guillot et al., 2013). It is likely that

[2]Data on poverty trend in the Kyrgyz Republic can be found at the website http://povertydata.worldbank.org/poverty/country/KGZ.

migrants absorb Russia's norms and practices surrounding alcohol consumption and transfer them back home, when they engage in visits, circular migration or return home permanently. Thus, seen through the lens of the social remittances framework, migrant households in Kyrgyzstan would be expected to consume more alcohol than non-migrant households.

2.4.3 Adverse psychological states

Out-migration can lead to increased alcohol consumption through the deterioration of mental health, both among migrant workers and families staying behind. While abroad, migrants may develop feelings of loneliness or isolation and depression due to lack of social networks, being away from families, employment uncertainty and poor working conditions (Alcántara et al., 2014), and thus resort to alcohol to mitigate these mental states (Ismaylova, 2014; see also Geiger and MacKerron, 2016, showing that alcohol consumption is associated with higher levels of experienced positive affect, or happiness).

At the same time, a greater likelihood of feeling lonely, depressed and stressed has also been documented among migrant family members staying in the countries of origin (Antman, 2016; Antman, 2010; Mosca and Barrett, 2016; Parrado et al., 2005; Ivlevs et al., 2018). Most often, these feelings are brought about by the separation from their loved ones; however, adverse mental states can also be caused by increased workload or a change in the head of household after a family member moves abroad. For example, Hegland (2010) reports greater levels of stress and depression among women left behind in Tajikistan (a post-Soviet Central Asian country neighbouring, and in many respects similar to, Kyrgyzstan), who after the departure of their husbands face a double burden of caring for children and the elderly and taking over the tasks previously performed by their husbands. In extreme cases, struggling women become sex workers and are tricked into human trafficking, as well as facing the increased likelihood of their children being abandoned or killed (Hegland, 2010). It is not impossible that in such circumstances women staying behind would also resort to alcohol. Hegland (2010) also documents that, after husbands leave, it is the wives' parents-in-law rather than the wives themselves who become *de facto* heads of household, for example, controlling the use of monetary remittances, keeping the daughters-in-law busy with domestic work and interfering in children's education. This further exacerbates the problems of stress and depression among women staying behind and may lead to alcohol consumption.

Overall, all of the channels presented above suggest that, in Kyrgyzstan, the emigration of household members would lead to a greater alcohol consumption among families staying behind. At the same time, I note that the Kyrgyz case does not allow to test all the theoretical mechanisms presented above. In particular, a convincing test of the social remittances channel would ideally require substantial proportions of migrants residing in countries with sufficiently different drinking cultures; in Kyrgyzstan, however, the vast majority of migrants goes to Russia. According to the "Life in Kyrgyzstan Study" survey, 360 households out of 388 reported having a family member in Russia in 2013. This said, in my empirical analysis I am able to differentiate between remittance-recipient and non-recipient migrant households, which should provide some answer on the question whether the relaxation of the budget constraints mechanism and adverse psychological states are at work.

2.5 Data and variables

2.5.1 Data

Data for this study come from the "Life in Kyrgyzstan Panel Study 2010-2013" ("LiK Study")[3], a panel survey conducted annually between 2010 and 2013 by the German Institute for Economic Research (DIW Berlin) in collaboration with Humboldt-University of Berlin, the Centre for Social and Economic Research (CASE-Kyrgyzstan) and the American University of Central Asia. The data were collected at the household, individual as well as community level: the household questionnaires were completed by the most knowledgeable household member (such as the head of household), individual questionnaires were completed by all adults in the sampled households aged 18 and above, and the community questionnaires were completed by the representatives of the community administration. All interviews were face-to-face, conducted in either Kyrgyz or Russian. No weights have been assigned to observations since the sampling of households and respondents was taken proportional to population size in each of the surveyed regions. From the original sample of 3,000 households identified in 2010, 2,041 households participated in all four waves of the project.

[3] A detailed account of the survey methodology can be found at the survey website https://datasets.iza.org/dataset/124/life-in-kyrgyzstan-study-2010-2013.

2.5.2 Variables

In this section I provide a description of the variables of interest: outcome variable, main regressors and control variables.

My dependent variable is the alcohol consumption of respondents, i.e. how much money (measured in the local currency - the Kyrgyz *som*) per week/month/ quater/year the household spent on alcoholic beverages in 2010, and on beer and vodka (separately) in 2011, 2012, 2013. I use this information to construct two household-level variables: 1) a dichotomous variable - alcohol incidence - at the household level, equal to 0 if no money was spent on alcoholic beverages and 1 otherwise, and 2) a continuous variable - yearly spending on alcoholic beverages. I adjust this variable for the Alcohol Affordability Index (AAI), calculated by the World Health Organization Regional Office for Europe (2017). This index gives a measure of relative affordability of alcohol by comparing the relative changes in the price of alcohol with changes in disposable household income over the same period. Moreover, I use a log-transformation of this variable, as typical in alcohol demand literature and other health economics literature (see for instance Manning, Blumberg, and Moulton, 1995). Log transformation is generally used to deal with variables skewness: it makes skewed distribution (positive alcohol demand in this case) approach normal distribution, which is critical in some parametric models requiring normality assumption. In Tobit model, the dependent variable should have a homoskedastic normal distribution and in some cases the logarithmic transformation can be used to make this assumption more plausible. The logarithmic transformation also eases the interpretation of the coefficient values for log transformed income in Tobit model (as in linear models): it is simply income elasticity of alcohol demand. Lastly, taking logs also reduces the extrema in the data, and curtails the effects of outliers (Wooldridge, 2002; Wooldridge, 2010). According to the World Health Organization (2014a), beer and vodka are the main types of alcoholic beverages consumed in Kyrgyzstan, constituting, respectively, 23% and 73% of all alcohol consumption (in terms of pure alcohol). I thus assume that the sum of spending on beer and vodka for 2011-2013 captures the same information as the expenditure on alcoholic beverages for 2010.

From the household-level questionnaires I use two migration-related questions to construct the main regressors: 1) "How many adult members of your household are currently staying abroad (for more than one month, excluding business trips, vacation and visiting)?" and 2) "During the last 12 months, how much money (in local currency – *soms*) did you receive from members of this household staying abroad?" Combining the answers to these two questions, I construct two non-overlapping variables: 1) a continuous variable - amount of remittances (log

transformed) and 2) a dichotomous variable - migrant household not receiving remittances. In addition, at the individual level, respondents were asked, "During the last 12 months, have you been abroad for more than one month?" I use this information to create a dichotomous household-level variable capturing the recent migration experience (which could be either circular or return migration) of at least one household member. I thus have three dichotomous variables capturing migration at the household level: the amount of migrant monetary remittances received from abroad, migrant households not receiving remittances and households with recently returned/circular migrants.

The set of control variables includes characteristics recorded for the head of household: individual's age, gender, marital status (single, married, separated, widowed), three levels of education (illiterate/primary, secondary, tertiary), ethnicity (Kyrgyz, Russian, Uzbek, other). It also includes type of residence (rural or urban), region of residence (seven dummies for regions and two main cities), trust in religion and the total monthly household income (net of migrant remittances and log transformed).

A summary of descriptive statistics is reported in Table 1. Among time-invariant characteristics and variables that slightly change over time, the average age of the household head is 51 years old, most are men (74.2%), most are ethnically Kyrgyz (69.54%), though a substantial minority are Uzbek (11.3%) and Russian (9.67%). In Kyrgyzstan, moreover, 62.37% of people live in rural areas. A total of 81,42 % of respondents have completed secondary or higher professional education, and 73.9 % of them is married, though a consistent fraction of individuals (16.8%) are widowed. Finally, about 53.7 % of respondents answered "yes" to the question "Do you generally trust in religious leaders?". Looking at migrant and non migrant households separately, some differences arise. In particular, the percentage of migrant households living in rural areas is higher (76.8%) relative to non-migrant households (60.1%); a total of 11,2 % of respondents in migrant households have completed higher professional education, compared to 18.8% of individuals in non migrant households. Lastly, the percentage of ethnic Russian is notably lower for migrant households (1.5%), relative to non migrant households (10.9%).

Among time-varying characteristics, the average amount of spending on alcoholic beverages, and the average volume of remittances, are small due to the large number of households in the sample that do not consume alcohol and receive monetary transfers from abroad. However, the amount spent on alcohol is 0.06 percentage point higher and, most importantly, increased over the period for households that have a family member abroad. The drinking incidence, on the contrary, is about 1% lower for migrant households, relative to non-migrant

households. Finally, the household income is 0.80 percentage point greater for families with relatives abroad.

Table 2.1: Summary statistics

	Mean	Migrant	Non Migrant
Drinking incidence	0.292	0.278	0.294
Spending on alcohol	787.391	830.3372	780.773
Value of remittances	5,550.958	41,576.17	-
Migrant in the household but no remittances	0.018	0.138	-
Returned/circular migrant in the household	0.033	0.064	0.028
Male	0.742	0.775	0.737
Age	51.17	55.54	50.50
Marital status			
Married/with partner	0.739	0.782	0.732
Single	0.072	0.005	0.023
Separated	0.021	0.033	0.078
Widowed	0.168	0.180	0.167
Ethnicity			
Kyrgyz	0.695	0.775	0.683
Uzbek	0.113	0.162	0.106
Russian	0.097	0.015	0.109
Other	0.095	0.048	0.102
Education			
Illiterate/Primary	0.185	0.183	0.186
Secondary	0.637	0.705	0.626
Tertiary	0.178	0.112	0.188
Trust in religion	0.537	0.584	0.530
Village	0.624	0.768	0.601
Household income excluding remittances	15,281.36	16,422.31	15,105.56
N	1,864	1,090	7,074

Source: own calculation based on LiK Study 2010-2013.

2.6 Estimation strategy

The model to be estimated can be expressed as follows:

$$A_{it} = B * X'_{it} + a_i + t + e_{it} \quad (1)$$

where, for household i in year t, A stands for variables capturing alcohol consumption (incidence of alcohol consumption or spending on alcoholic beverages), X is a vector of variables capturing migration incidence at the household level (migrant in the household sending remittances, migrant in the household not sending remittances, returned/circular migrant in the household) and household-level controls, a are household fixed effects, t are year effects[4], and e is the idiosyncratic error term. With panel data and fixed effects[5] model it is possible to controls for characteristics that do not change across time whether they are measured or not. These variables include such things as sex and ethnicity, as well as more difficult to measure variables such as family background. At the same time, time-varying variables (e.g. migration status, amount of remittances and income) are explicitly included and estimated in the model. Consequently, fixed effects methods help to control for omitted variable bias when omitted variables are stable, while they don't control for unobserved variables that change over time. Thus, a failure to include a time-varying variable in the model could still cause fixed effects coefficients to be biased (Wooldridge, 2010). Most importantly, the panel nature of the survey relates the changes in the household migration status and the amount of received monetary remittances to the changes in alcohol consumption over time of the same families, thus mtigating the potential endogeneity that arises if unobserved household characteristics affect both emigration and alcohol consumption.

Where the outcome variable is binary (incidence of alcohol consumption), I estimate the models with logit. For all other outcomes, which take the value of zero if the respondents does not consume alcohol and some positive value if

[4]To see if time fixed effects are needed, after the fixed effect regression I run a joint test that verifies if the dummies for all years are equal to zero (the null hypothesis). The result rejects the null hypothesis and suggests that year fixed effects are needed.

[5]To decide between fixed or random effects, I run a Hausman test after saving the estimates of a random and a fixed effects regression. It basically tests whether the unique errors (e_{it}) are correlated with the regressors: the null hypothesis is they are not and suggests the random effects model (see Wooldridge 2002). In this case, I reject the null hypothesis and select the fixed effects estimator.

she does, I estimate the models with Tobit as formulated by Honoré (1992). Although estimating a fixed effects model for non linear regressions can introduce an "incidental parameters problem" in short panels, logit and Tobit in panel data produce consistent estimators. An "incidental parameters problem" occurs when a is treated as a fixed parameter, then as $N \to \infty$, for fixed time periods T the number of parameters a increases with the number of observations N. This means that a can be consistently estimated for fixed T only if an estimator allows a to be accurately eliminated (for more details, see Cameron and Trivedi 2005).

2.6.1 Logit in panel data

The logit model specifies the probability of consuming alcohol as follows:

$$\Pr(A_{it}|X'_{it}, a_i, t, \sum A_{it}) = F(X'_{it}B + a_i + t + \sum A_{it}) \quad (2)$$

where $A_{it} = 1$ if some money was spent on alcoholic beverages and $A_{it} = 0$ otherwise, F is the logistic cumulative distribution function and is equal to $\frac{\exp}{1+\exp}$ and $\sum A_{it}$ is the outcome series. The estimator is a conditional logit estimator, i.e. a logit estimator conditioned on the outcome series. Estimating the model by means of conditional log likelihood function is crucial to eliminate the fixed effects and obtain consistent estimates (for more details, see Cameron and Trivedi 2005). Moreover, in the model a_i and X'_{it} are assumed to be uncorrelated with the error term, and the error term follows a logistic distribution.

2.6.2 Tobit in panel data

The Tobit model is used to cope with a substantial fraction of the sample being at the courner solution of zero and the remainder of the sample having a larger number of different values of spending on alcoholic beverages. Since a significant fraction of a population decides to consume zero amounts of alcohol, a linear regression model may not be well suited to describe the outcome variable. In particular, a linear model potentially produces negative predictors for the outcome variable. On the contrary, the Tobit model, using the maximum likelihood estimator, does not imply negative predictions for some choices of the independent variables. This can be achieved by specifying a latent variable:

$$A_{it}^{*} = B * X_{it}^{'} + a_i + t + e_{it} \quad (3)$$

where I only observe $A_{it} = \max(0, A_{it}^{*})$.

Since conditional on independent variables A_{it}^{*} has a continuous distribution, it follows that A_{it} has the same continuous distribution when $A_{it}^{*} > 0$. Furthermore, when $A_{it}^{*} < 0$ or $A_{it}^{*} = 0$, it follows that A_{it} has point maximum at $A_{it} = 0$. In Honoré's model the distribution of error term e_{it} is unspecified and the estimation is semiparametric. Data are artificially trimmed, and then fixed effects are subsequently eliminated by appropriate diffrencing (for more details, see Honoré 1992).

2.6.3 Main issues on estimation

When households are asked to report their spendings on alcoholic beverages, there is a risk of measurement error because people cannot declare many purchases they have made, due to high social stigma associated with alcohol consumption in Muslim societies. If measurement error is observed in the dependent variable, the problem can be explained as follows: the true value of the variable can be expressed as A_{it}°, where only $A_{it} = A_{it}^{\circ} + u_{it}$ is observed and u_{it} is a mean-zero error process. Then, u_{it} becomes a component of the regression error term and, since I can assume that u_{it} is not correlated with the independent variables, this form of measurement error purely weakens the model without introducing bias (Wooldridge, 2010). However, to mitigate this weakness, I assess the sample variability, i.e. the extent to which the measures of the sample differ from the measure of the Kyrgyz population, by using the bootstrap method and bootstrapping standard errors of estimates.

The bootstrap, which was invented by Efron (1979), is a method for estimating sampling distributions. It works by repeatedly drawing samples of the same size as the original with replacement. In this random drawing, some of the original observations will appear once, some more than once, and some not at all. The model is then run using the resampled dataset. This process is repeated many times (50 times in this case); each time a new random sample is drawn and the statistics are recalculated. This process builds a dataset of replicated statistics. From these data it is possible to calculate a more accurate distribution then those obtained from the original dataset (for more details, see Deaton 1997).

Another issue concerns the problem of measurement error in the amount of remittances and reported income, typical of sample surveys. These variables cannot be precisely measured in the available data, because respondents may well be reluctant to report such information to an interviewer if these are viewed as sensitive. In contrast to measurement error in the dependent variable, measurement error in an explanatory variable is a more serious problem and arises if the true model is:

$$A_{it} = B * X_{it}^{'*} + a_i + t + e_{it}, \quad (4)$$

but instead of $X_{it}^{'*}$ I observe $X_{it}^{'} = X_{it}^{'*} + u_{it}$, where u_{it} is a mean-zero error process, because there is a measurement error in the amount of remittances and/or reported income. If I assume that the measurement error is uncorrelated with the true explanatory variable, $cov(X_{it}^{'*}, e_{it}) = 0$. Then, $(cov(X_{it}^{'*} + u_{it}), e_{it}) \neq 0$ by construction, and the estimated regression will have a correlation between its explanatory $X_{it}^{'*}$ variable and the composite error term, causing the regression to be biased and inconsistent (Wooldridge, 2010).

To deal with this source of endogeneity, I employ the control function approach. The advantage of this approach is that it works even outside the linear framework and allows to test the presence of errors of measurement in logit and Tobit models. The control function approach relies on the same kinds of identification conditions of instrumental variable methods which are employed in most models that are linear in parameters (for more details, see Wooldridge 2002). Through instruments - factors which are correlated with the amount of remittances (income) but are independent from the alcohol consumption - I can obtain non-biased estimates. There are several candidates for instruments that are common in the context of measurement errors. I select the three-groups method suggested by Kennedy (2008), in which the observations are split in three equal-sized groups, on the basis of the size of the regressor, and then the slope coefficient is estimated by the line joining the arithmetic means of the three groups. This corresponds to using an instrument with values $-1, 0$, and $+1$. The idea behind this method is that, by averaging the data in this way, the measurement errors are also averaged, reducing their impact.

Control function estimators first estimate the model of endogenous regressors as a function of instruments, then use the errors from this model as an additional regressor in the main model. If this error is significantly related to the dependet variable, then the instrumented variables are endogenous and instruments are needed to obtain non-biased estimates. I test for the endogeneity of the amount

of remittances and reported income separately (see Appendix Ch.2) and in both cases the regressor is not endogenous, meaning that the regression results obtained without instruments are unbiased.

2.7 Results

Table 2 reports average elasticities for the fixed effects logit model, and coefficients for the fixed effects Tobit model (the calculation of average effects is not possible after the *pantob* command in Stata used to estimate the fixed effects Tobit models). Marginal effects after fixed effects estimations can be problematic, because margins, used in Stata after the usual *clogit* command, gives the probability of a positive outcome assuming that the fixed effect is zero. This may be an unreasonable assumption. The *aextlogit* command instead solves this problem and transforms the estimated coefficients to average (semi-) elasticities (for more details, see Santos Silva and Kemp, 2016). This only uses observations where the outcome changes over time, hence a lower sample size. Overall, the results show that, among migration variables, only the coefficient of the amount of remittances is statistically significant, while the departure of a migrant abroad that is not followed by a transfer of remittances back home and having a return/circular migration within a household are not significantly associated with a greater consumption of alcoholic beverages. More details can be obtained for the probability of consuming alcohol. Specifically, a one percent increase in the value of remittances is associated with an 0.017 percentage point higher probability, on average, of consuming alcohol. In terms of control variables, the association with income is positive and significant for both alcohol consumption and spending on alcoholic beverages. Specifically, a one percent increase in the value of income (net of migrant remittances) is associated with an increment on average of 0.042 percentage point. Being separeted or widowed increases, on average, of 0.455 and 0.714 percentage point, respectively, the likelihood of consuming alcohol. In addition, people who are widowed increase their spending on alcoholic beverages. Lastly, age is also positively and significantly related to the changes in alcohol consumption in Kyrgyzstan; however as people get older the effect of age is weaker.

Table 2.2: Fixed effects estimations

	Drinking incidence FE logit	Spending on alcohol FE Tobit
Value of remittances (ln)	0.017*	0.084**
	(0.010)	(0.042)
Migrant in the household but no remittances	0.179	0.720
	(0.198)	(0.843)
Returned/circular migrant in the household	0.126	0.370
	(0.176)	(0.755)
Age	0.156*	0.452*
	(0.080)	(0.262)
Age squared	-0.001**	-0.004*
	(0.001)	(0.002)
Marital status		
Married	Ref.	Ref.
Separeted	0.455**	1.113
	(0.216)	(0.722)
Single	0.535	1.363
	(1.573)	(1.519)
Widowed	0.714**	2.690***
	(0.294)	(0.932)
Education		
Primary/illiterate	0.108	0.307
	(0.227)	(0.743)
Secondary	Ref.	Ref.
Tertiary	0.149	0.622
	(0.339)	(1.311)
Trust in religion	0.058	0.209
	(0.061)	(0.205)
Household income excluding remittances (ln)	0.042*	0.216***
	(0.025)	(0.082)
Year fixed effects	Yes	Yes
Household fixed effects	Yes	Yes
Observations	4,120	8,164
Pseudo R2	0.176	
Adjusted Pseudo R2	0.185	
Chi2		196.48
Prob > Chi2	0.0000	0.0000

Bootstrapped standard errors ***p<0.01 **p<0.05 *p<0.1

2.8 Robustness check

To assess the robustness of these estimates, I run a correlated random effects model, which provides a synthesis of fixed effects and random effects methods. This is an alternative to fixed effects that allows a_i to be correlated with the average level of the time-varying variables. The correlated random effects model can be expressed as follows:

$$A_{it} = B * X'_{it} + s + g\overline{X}_i + r_i + e_{it} \quad (5)$$

where a_i is replaced by the linear relationship $a_i = s + g\overline{X}_i + r_i$, in which $\overline{X}_i$ is the average level of the observed explanatory variables and r_i is a time-constant effect. This implies that a_i and $\overline{X}_i$ are correlated whenever g is not zero. Equation 5 has a composite error term, $r_i + e_{it}$, consisting of r_i and the idiosyncratic shock e_{it}, which are both assumed to be uncorrelated with each X_{it}, and thus with $\overline{X}_i$. Under these assumptions, the model results in a random effect model with the important addition of the time-average variable $\overline{X}_i$ (for more details, see Wooldridge 2010).

This approach represents a good robustness check because it is easy to compute for non linear models and avoids the "incidental parameters problem" typical of many non linear fixed effects models. It is particular useful for Tobit in panel data since it is more widely used then the fixed effect model and provides a way to obtain marginal effects after the regression (Wooldridge, 2010). A more general reason to run the correlated random effects model is that it provides a profile of typical consumers of alcohol in Kyrgyzstan, estimating the effects of stable characteristics, which are dropped in fixed effects models.

Since random effects models for binary dependent variables are complex, as maximizing the likelihood requires the evaluation of multiple integrals and the standard normal distribution (employed in probit models instead of the logistic function) has simple forms for some of these integrals, a probit random effect model is here preferred to a logit random effect. Logit and probit models are both appropriate when attempting to model a dichotomous dependent variable, and yield similar (though not identical) inferences. The choice between the two is usually driven, like in this case, by technical issues. Otherwise, economists tend to favor the normality assumption for e_i and to prefer the probit model (Wooldridge, 2010).

The results (marginal effects) in table 3 suggest that, in Kyrgyzstan, people who receive greater amounts of migrant remittances spend more (2.6 percent)

on alcoholic beverages, while the effect of remittances on alcohol consumption is nearly zero. On the contrary, the other migration-related variables are statistically insignificant. Among the controls variables, age, being widowed and reported income continue to be significant. Age is again positively and significantly related to the changes in alcohol consumption, but as people get older this effect is weaker. Relative to married people, individuals who are widowed are more likely to consume alcohol (0.15 pecentage point), and nearly double their spending on alcoholic beverages. At the same time, an increase of one percent in the value of reported income is associated with a 0.01 percentage point greater likelihood of consuming alcohol and an increment of spending on alcoholic beverages equal to 7.9%.

Moreover, while the household fixed effects estimations exclude time-invariant characteristics (gender, ethnicity and rural or urban area of residence), the results presented in table 3 report these characteristics and are helpful for estabilishing the general profile of people consuming alcohol in Kyrgyzstan. Specifically, being male is associated with a 0.093 percentage point greater likelihood of drinking alcohol and more spending on alcoholic beverages (60%). As expectable, relative to ethnic Kyrgyzs, ethnic Russians are more prolific drinkers, while the other minorities tend to consume less. Specifically, being Russian is associated with 0.149 percentage point higher probability of consuming alcohol and nearly two times higher amount of spending on alcoholic beverages; while being Uzbek is associated with 0.167 percentage point lower likelihood of drinking alcohol, and nearly two times lessen amount of spending on alcohol. Finally, living in rural areas does not have a significant effect on the alcohol consumption, compared to living in urban places.

Table 2.3: Correlated random effects estimations

	Drinking incidence CRE probit	Spending on alcohol CRE Tobit
Value of remittances (ln)	0.004*	0.026*
	(0.002)	(0.014)
Migrant in the household but no remittances	0.048	0.325
	(0.042)	(0.289)
Returned/circular migrant in the household	0.023	0.123
	(0.036)	(0.204)
Male	0.093***	0.601***
	(0.025)	(0.172)
Ethnicity		
Kyrgyzs	Ref.	Ref.
Uzbek	-0.167***	-0.988***
	(0.029)	(0.162)
Russian	0.149***	0.921***
	(0.024)	(0.167)
Others	-0.160***	-0.931***
	(0.030)	(0.207)
Rural areas	-0.023	-0.121
	(0.020)	(0.122)
Age	0.030*	0.179*
	(0.016)	(0.096)
Age squared	-0.000**	-0.002**
	(0.000)	(0.001)
Marital status		
Married	Ref.	Ref.
Separeted	0.079	0.447
	(0.049)	(0.363)
Widowed	0.150**	0.963**
	(0.061)	(0.401)
Single	0.048	0.293
	(0.075)	(0.463)
Education		
Primary/illiterate	0.021	0.111
	(0.047)	(0.273)
Secondary	Ref.	Ref.
Tertiary	0.038	0.265
	(0.067)	(0.482)
Trust in religion	0.012	0.077
	(0.013)	(0.061)
Household income excluding remittances (ln)	0.010*	0.079**
	(0.006)	(0.037)
Region effects	Yes	Yes
Year effects	Yes	Yes
Variable means	Yes	Yes
Observations	8,164	8,164

Bootstrapped standard errors ***p<0.01 **p<0.05 *p<0.1

2.9 Discussion and conclusions

This paper set out to determine whether the emigration of household members and the associated transfer of migrant monetary remittances affect alcohol consumption among migrant households staying behind. I first outlined possible reasons why emigration may affect alcohol consumption among families staying behind: the relaxation of budget constraints as monetary remittances flow in; transfer of alcohol consumption norms and practices from destination to host countries; and psychological distress. I then tested the relationship between the two phenomena using a household panel survey, conducted in Kyrgyzstan in 2010-2013. The fact that the survey interviews are conducted with the same households over four years allowed to relate the changes in the household migration status to changes in household' alcohol consumption. This helped mitigate a potential endogeneity that may exist if household characteristics affect both alcohol consumption and the decision to migrate. Other sources of endogeneity (measurement error in the amount of remittances and reported income) were tested using the control function approach and were ruled out.

The results suggested that the increase in the amount of received remittances is associated with a higher consumption of alcohol. This finding lends some support for my first hypothesis – that emigration of household members is associated with greater alcohol consumption among families staying behind through the relaxation of budget constraints. This effect can be included in a more general income effect, of which migrant monetary transfers are a source. Also the amount of household income has, indeed, a positive and significant impact on the alcohol consumption of families left behind. In addition, I found that the departure of a migrant abroad that is not followed by a transfer of remittances back home, as well as having a return/circular migrant within a household, is not significantly associated with a greater consumption of alcoholic beverages. This may indicate that the other mechanisms, social remittances and psychological distress, are not at work. However, these results should be interpreted with caution, given that a direct test and disentanglement of the social remittances mechanism is not possible in the case of Kyrgyzstan, as most migrants go to the same country (Russia). Future research could focus on the experience of countries where migrants go to a variety of destinations with different alcohol consumption norms and behaviours.

Second, I have refrained from providing an interpretation for return/circular migration results, because of the complexity of the return/circular migration decision. Return migrants in particular are subject to non-random selection both at home and abroad and, without further information on the reasons for emigration and return, any interpretation would be highly speculative. Nevertheless, an

exploration of the links between own return and circular migration experience on the one hand, and alcohol consumption on the other, could be a further important direction for future research.

Finally, I tested the psychological distress channel using the variable "Migrant in the household but no remittances", since I have supposed that households not receiving remittances do not have a strong social bond with emigrants, and for these the social remittances mechanism, as well as the relaxation of budget constraints channel, probably does not work. Hence, a look at outcomes such as feeling lonely, depressed or stressed and satisfaction with family life would capture more directly the psychological distress channel, and constitutes an avenue for an additional analysis.

Overall, my study suggests that the emigration of household members has a slight impact on the likelihood of consuming alcohol, while the effect on the amount spent on alcoholic beverages is more robust. However, in both cases the changes in household migration status affect the alcohol consumption of those staying behind only through the relaxation of budget constraints, while no significant influence is found in the case of social remittances and psychological distress. The analysis also shows that being separated or widowed, as well as being older, is associated with increased alcohol use. This support the idea that feelings of loneliness lead migrant's families staying in the countries of origin to resort to alcohol, in order to mitigate their mental status. At the same time, for older people these feelings may be brought about by the separation from their sons. The results have interesting policy implications. The government, indeed, could provide measures (such as health awareness campaigns and activities to promote social inclusion) in support of these categories, in order to reduce the alcohol consumption in the country.

Bibliography

[1] Ablezova M. K. and Ibraeva G. K., 2016. Kyrgyzstan - extended migration profile 2010 - 2015. National Institute for the strategic studies of the Kyrgyz Republic. Bishkek: IOM.

[2] ADB, 2013. Country Partnership Strategy: Kyrgyz Republic, 2013–2017. Country Planning Documents.

[3] Alcántara C., Chen C.-N. and Alegría M., 2014. Do post-migration perceptions of social mobility matter for Latino immigrant health? Social Science & Medicine, 101: 94-106.

[4] Amuedo-Dorantes C., 2014. The good and the bad in remittance flows. IZA World of Labor: 97.

[5] Antman F. M., 2010. Adult Child Migration and the Health of Elderly Parents Left Behind in Mexico. American Economic Review, 100(2): 205–208.

[6] Antman F. M., 2016. How Does International Migration Affect the Health of Elderly Parents Left Behind? Evidence from Mexico. Working Paper. Boulder: University of Colorado.

[7] Anton J. I., 2010. The impact of remittances on nutritional status of children in Ecuador. International Migration Review, 44(2): 269-299.

[8] AsiaNews, 2017. More and more villages ban the sale and consumption of alcohol. Available online at http://www.asianews.it/news-en/More-and-more-villages-ban-the-sale-and-consumption-of-alcohol-39913.html

[9] Bhattacharya J., Gathmann C. and Miller G., 2013. The Gorbachev anti-alcohol campaign and Russia's mortality crisis. American Economic Journal - Applied Economics, 5(2): 232-260.

[10] Böhme M. H., Persian R. and Stöhr T., 2015. Alone but better off? Adult child migration and health of elderly parents in Moldova. Journal of Health Economics, 39: 211–227.

[11] Brainerd E., 2001. Economic reform and mortality in the former Soviet Union: A study of the suicide epidemic in the 1990s. European Economic Review, 45: 1007-1019.

[12] Brainerd E. and Cutler D., 2005. Autopsy on an empire: Understanding mortality in Russia and the Former Soviet Union. Journal of Economic Perspectives, 19(1): 107-130.

[13] Cameron A. C. and Trivedi P. K., 2009. Microeconometrics: Methods and Applications. New York: Cambridge University Press.

[14] Chami R., 2008. Remittances and Institutions: Are Remittances a Curse? IMF Working Paper.

[15] Cheah Y. K., 2015. Socio-economic determinants of alcohol consumption among non-Malays in Malaysia. Hitotsubashi Journal of Economics, 56: 55-72

[16] Cutler D. M. and Glaeser E. L., 2005. What explains differences in smoking, drinking and other health-related behaviors? American Economic Review, 95: 238–242.

[17] Clément M., 2011. Remittances and Expenditure Patterns in Tajikistan: A Propensity Score Matching Analysis. Asian Development Review, 28 (2): 58-87.

[18] Colen L. and Swinnen J., 2016. Economic Growth, Globalisation and Beer Consumption. Journal of Agricultural Economics, 67 (1): 186–207.

[19] Constant A. F. and Zimmermann K. F., 2011. Circular and Repeat Migration: Counts of Exits and Years Away from the Host Country. Population Research and Policy Review, 30 (4): 495-515.

[20] Creighton M. J., Goldman N., Teruel G. and Rubalcava L., 2011. Migrant networks and pathways to child obesity in Mexico. Social Science and Medicine, 72 (5): 685-693.

[21] Davis J. and Lopez-Carr D., 2010. The effects of migrant remittances on population–environment dynamics in migrant origin areas: international migration, fertility, and consumption in highland Guatemala. Population and Environment, 32(2-3): 216–237.

[22] Deaton A., 1997. The analysis of household surveys: a microeconometric approach to development policy. Baltimora: The Johns Hopkins University Press.

[23] Edgar A., 2006. Bolshevism, Patriarchy, and the Nation: The Soviet "Emancipation" of Muslim Women in Pan-Islamic Perspective. Slavic Review, 65 (2): 252-272.

[24] Efron B., 1979. Bootstrap methods: Another look at the jackknife. Annals of Statistics 7: 1–26.

[25] Fogarty, J., 2009. The demand for beer, wine and spirits: a survey of the literature. Journal of Economic Surveys, 24(3): 428.

[26] Gallet, C. A., 2007. The demand for alcohol: a meta-analysis of elasticities. The Australian Journal of Agricultural and Resource Economics, 51(2): 121-135.

[27] Geiger, B. B. and MacKerron, G., 2016. Can alcohol make you happy? A subjective wellbeing approach. Social Science & Medicine, 156: 184-191.

[28] Gibson J., McKenzie D. and Stillman S., 2011. The impacts of international migration on remaining household members: Omnibus results from a migration lottery program. The Review of Economics and Statistics, 93(4): 1297–1318.

[29] Global Health Data Exchange - online database, 2017. Institute for Health Metrics and Evaluation. Seattle (WA): University of Washington.

[30] Guillot M., Gavrilova N., Torgasheva L. and Denisenko M., 2013. Divergent paths for adult mortality in the Russian Federation and central Asia: evidence from Kyrgyzstan. PloS One, 8 (10): e75314.

[31] Ivlevs A. and King R., 2017. Does emigration reduce corruption? Public Choice 171 (3-4):389–408.

[32] Ivlevs A., Nikolova M. and Graham C., 2018. Emigration, remittances and the subjective well-being of those staying behind: Evidence from the Gallup World Poll. IZA Discussion Paper No. 11437.

[33] Hamilton E. and Choi K., 2015. Community Level Migration and Birth Weight: Low Birth Weight, Normal Birth Weight, and Macrosomia. Social Science and Medicine, 132: 278-286.

[34] Hasanova S. (2018). Financial Inclusion, Financial Regulation, Financial Literacy, and Financial Education in the Kyrgyz Republic. ADBI Working Paper No. 850.

[35] Hegland M. E., 2010. Tajik Male Labour Migration and Women Left Behind. Can They Resist Gender and Generational Hierarchies? Anthropology of the Middle East, DOI: 10.3167.

[36] Herzfeld T., Huffman S. and Rizov M., 2014. The dynamics of food, alcohol and cigarette consumption in Russia during transition. Economics and Human Biology, 13: 128–143.

[37] Hildebrandt N. and McKenzie D., 2005. The effects of migration on child health in Mexico. Economia 6(1): 257-289.

[38] Honoré, Bo E. 1992. Trimmed Lad and Least Squares Estimation of Truncated and Censored Regression Models with Fixed Effects. Econometrica 60 (3):533-565.

[39] Ismayilova L. et al., 2014. Mental Health and Migration: Depression, Alcohol Abuse and Access to Health Care Among Migrants in Central Asia. Journal of Immigrant Minority Health, 16: 11381148.

[40] Kanaiaupuni S. M. and Donato K. M., 1999. Migradollars and mortality: The effects of migration on infant survival in Mexico. Demography, 36(3): 339-53.

[41] Kennedy P., 2008. A Guide to Econometrics, 6th Edition. Hoboken, New Jersey: Wiley-Blackwell.

[42] Kroeger A. and Anderson K., 2014. Remittances and the human capital of children: New evidence from Kyrgyzstan during revolution and financial crisis. Journal of Comparative Economics, 42(3): 770–785.

[43] Kumaranayake L. and Vyas S., 2006. Constructing socio-economic status indices: how to use principal components analysis. Health Policy and Planning, 21 (6): 459-468.

[44] Kuhn R., Everett B. and Silvey R., 2011. The effects of children's migration on elderly kin's health: A counterfactual approach. Demography, 48(1): 183-209.

[45] Levitt P., 1998. Social Remittances: Migration Driven Local-Level Forms of Cultural Diffusion. International Migration Review, 32 (4): 926-948.

[46] Mangiavacchi L. and Piccoli L. 2018. Parental alcohol consumption and adult children's educational attainment. Economics and Human Biology, 28: 132-145.

[47] Manning W. G., Blumberg L., and Moulton L. H.,1995. The demand for alcohol: The differential response to price. Journal of Health Economics, 14:123-148.

[48] Mokdad A. A. et al., 2014. Liver cirrhosis mortality in 187 countries between 1980 and 2010: a systematic analysis. BMC Med, 12: 145.

[49] Mosca I. and Barrett A., 2016. The impact of adult child emigration on the mental health of older parents. Journal of Population Economics, 29 (3): 687 - 719.

[50] Monzavi S. M., Afshari, R. and Rehman, N., 2015. Alcohol Related Disorders in Asia Pacific Region: Prevalence, Health Consequences and Impacts on the Nations. Asia Pacific Journal of Medical Toxicology, 4(1): 1-8.

[51] Nelson J. P., 2013. Meta-analysis of alcohol price and income elasticities – with corrections for publication bias. Health Economics Review, 3(1): 1-10.

[52] Parrado E. A., Flippen C. A. and McQuiston C., 2005. Migration and relationship power among Mexican women. Demography, 42 (2): 347.

[53] Paulone S. and Ivlevs A., 2019. Emigration and alcohol consumption among migrant household members staying behind: Evidence from Kyrgyzstan. Social Science & Medicine, 22: 40-48.

[54] Radio Free Europe, 2017. Kyrgyz vodka goes down the drain. Available online at https://www.rferl.org/a/Kyrgyzstan-alcohol-ban/28637126.html

[55] Rehm J., Rylett M. and Shield K. D., 2016. Public health successes and missed opportunities: trends in alcohol consumption an attributable mortality in the WHO European Region, 1990-2014. Copenhagen: WHO Regional Office for Europe.

[56] Riosmena F., Frank R., Akresh I. R. and Kroeger R. A., 2013. US migration, translocality, and the acceleration of the nutrition transition in Mexico. Annals of the Association of American Geographers, 102 (5): 1209-1218.

[57] Santos Silva J.M.C. and Kemp Gordon C.R., 2016. Partial effects in fixed effects models. 22nd London Stata Users Group Meeting.

[58] Srivastava P., 2010. Does Bingeing Affect Earnings? Economic Record, 86 (275): 578-595.

[59] Stuckler D., King L. and McKee M., 2012. The Disappearing Health Effects of Rapid Privatization: A Case of Statistical Obscurantism? Social Science and Medicine, 75 (1): 23–31.

[60] Terza J. V., 2002. Alcohol abuse and employment: a second look. Journal of Applied Econometrics, 17: 393404.

[61] Wooldridge, J.M. 2002. Econometric Analysis of Cross Section and Panel Data. Cambridge, MA: MIT Press.

[62] Wooldridge, J. 2010. Econometric analysis of cross section and panel data. Cambridge, MA: MIT Press.

[63] World Health Organization, 2014a. Global status report on alcohol and health 2014. Copenhagen: Regional Office for Europe.

[64] World Health Organization, 2014b. Indicator Code Book. Global Information System on Alcohol and Health. Available online at: http://www.who.int/substance_abuse/activities/gisah_indicatorbook.pdf

[65] World Health Organization, 2017. Alcohol taxation policy in Kyrgyzstan. Copenhagen: Regional Office for Europe.

[66] World Bank, 2015. Labor migration and welfare in the Kyrgyz Republic (2008-2013). Report No. 99771-KG. Washington D.C.

[67] World Bank, 2016. Migration and remittances Factbook. Washington D.C.

[68] World Bank Data, 2017. Online dataset. Washington D.C.

Abstract

This paper aims to understand informal employment in transition countries, focusing on the particular case of Kyrgyzstan. A panel dataset from Kyrgyzstan, "Life in Kyrgyzstan Panel Study 2010-2013" (LiK Study), enables to provide some empirical evidence on informal employment at the micro-level. Although informality is widespread in developing countries, this topic has not been analyzed thoroughly due to lack of appropriate data. I contribute to the literature on informal employment in transition countries filling the data gap for one economy. I provide an analysis of the labour market in the Kyrgyz Republic and focus on the determinants of mobility patterns across the labour market states, distinguishing between salaried workers and the self-employed. I can estimate the determinants of mobility patterns in the labour market using a new estimation strategy - i.e. the multinomial logistic regression with fixed effects - which has not been previously employed in addressing this topic.

Chapter 3

Informal Employment in Transition Countries: a case study on the Kyrgyz Republic

3.1 Introduction

The concept of informality was not significantly addressed until the 1970s (Bangasser, 2000), when the first definition of informal sector was coined in a report of the International Labour Organization (1972)[1], suggesting that there exists a marginal, poor, informal sector of the urban economy, in which the poorest work, delimited in contrast to the formal one. There is no general consensus on what constitutes the informal sector worldwide, because over the past 40 years the term has been used to describe a wide spectrum of activities that escape taxation and regulation. The division between formal and informal sector is a form of labour market segmentation, which is connected to multiple vulnerabilities for those who work informally. Informal workers face risks since there is no security of employment, payments might be irregular and there is inadequate social and health protection.

On the contrary, it is undisputed in the literature that informality is a fundamental characteristic of underdevelopment (La Porta and Shleifer, 2008). Informality is indeed perceived as a barrier to full participation in the economy and an obstacle to long-term economic growth and poverty reduction. Job performances,

[1]International Labour Organization, 1972. Employment, incomes and equality: a strategy for increasing productive employment in Kenya. Geneva.

without doubt, determine a country's economic development and are fundamental to improve standards of living. The capacity of an economy to create jobs for those seeking work and to ensure productive and high-quality jobs for the broad population is a key measure of a country's economic growth.

In the majority of developing countries the informal sector produces about 35 percent of GDP and employs 70 percent of the labour force (Loayza, 2016). Developing countries are, indeed, usually characterized by less developed and more segmented markets. This is also true of transition countries, a category that includes many countries at different stages of transition from planned to market economies with deep differences in cultural and historical backgrounds. The highest estimates of the informal sector within this group of countries are in the European Commowealth Independent States (CIS[2]) and the Caucasus, with heterogeneous sizes ranging in 2008 from about 15 percent of GDP in Uzbekistan to more than 35 percent in Armenia. In Armenia and the Kyrgyz Republic, more than 58 percent of the labour force lacks pension coverage (Abdih and Medina, 2013).

This paper aims to understand informal employment in one transition country, the Kyrgyz Republic, by exploring the information provided by a micro-level data panel dataset from Kyrgyzstan, "Life in Kyrgyzstan Panel Study 2010-2013" (LiK Study). Although informality is widespread in Kyrgyzstan, this topic has not been analyzed thoroughly due to lack of appropriate data. I contribute to the literature on informal employment in transition countries filling the data gap for one economy. I provide some answers to the question whether the Kyrgyz labour market is segmented - i.e. if there exists a marginal, poor, informal sector of the urban economy, in which the poorest work, delimited in contrast to the formal one. To do this, I follow the literature and provide a descriptive analysis of the labour market, which includes a summary of statistics and a transition matrix. I also provide some drivers of the over-time changes in employment status, employing a new estimation strategy - i.e. the multinomial logistic regression with fixed effects - which allows to estimate mobility patterns in the labour market. Overall my findings suggest that the formal salaried turns out to be the most desiderable category, while the issue of segmentation is not completely figured out. Moreover, being tertiary educated and working in agriculture are the main drivers to be employed, respectively, formally and informally.

The paper is organized as follows. The next section provides a brief literature review on informality in transition countries. Section 3 discusses the evolution of

[2]The CIS consists of all the successor states of the former Soviet Union, excluding the three Baltic States. Georgia and Ukraine withdrew in 2008 (finalized in 2009) and 2014 respectively.

the labour market in the Kyrgyz Republic since its independence in 1991. Section 4 includes the data and sample selection criteria. Section 5 provides a descriptive analysis of the labour market in Kyrgyzstan. Section 6 illustrates the main drivers of the over-time changes in employment status based on a multinomial logit analysis. The final section discusses the paper's findings and conclusions.

3.2 Literature Review

Over the past decades, theoretical and empirical works have tried to give a view of the relationship between formal and informal activities and to explain participation in informal employment. These studies can be classified by two opposite perspectives with regard to the issue of segmentation. One view suggests that there exists a marginal, poor, informal sector of the urban economy, separate from and defined in constrast to the formal one. Its existence is therefore explained by rigidities in the urban labour market, where there is an excess of individuals who would want to work in formal jobs but are unable to find them and are thus left with informal activities as their only option (Bangasser, 2000).

Critics of the dualistic perspective argue that labour market states are not separate and independent, but integrated and competitive (Maloney, 2004). Workers might have personal reasons to prefer informal employment, in particular when the quality of government insurance programs is low. They have different skills, abilities and preferences and might supply labour in accordance with job amenities and their risk attitude. A large number of studies, indeed, emphasize that a part of the informal sector, the self-employed, is voluntary, while informal salaried workers correspond to involuntary entry (Bosh and Maloney, 2010). Existing researches are ambigous about which of these perspectives better represents the reality of the labour market in transition economies. It is clear, however, that they have different implications in mobility patterns: if labour markets are segmented, flows between formal and informal employment should have one prevailing direction in accordance with labour maket conditions. Informal workers are likely to feel trapped in the inferior position, in terms of wages and social benefits, and wait for better, more formal opportunities. On the contrary, competitive labour markets imply that flows between formal and informal sectors should go in both directions and there is no incontestable evidence for state dependence on informality (Gimpelson and Slonimczyk, 2013).

The introduction of accurate panel datasets has involved a number of attempts to model mobility across labour market states. Some empirical works try

to test the dualistic theory, analyzing mobility patterns across more states and not only formal and informal sectors. Concerning transition countries, Bernabé and Stampini (2009) deal with labour market segmentation in Georgia during the economic transition (1998-1999). They look at turnover rates, shares of temporary mobility, transition tendencies and effects of negative exogenous shocks on mobility. In addition, they study how individual characteristics affect the likelihood to move across labour market states. The authors' findings are consistent with the competitive labour market model. In both urban and rural areas, formal employment is preferred to informal employment. Unemployment is almost exclusively in urban areas where individuals with higher education wait for formal jobs. The evidence on self-employment is not univocal, some self-employments are less desirable, short-term in nature and consistent with a segmented labour market, while other types of self-employment have higher risks and potentially higher return activities. Finally, there are considerable barriers to non-agricultural employment, as there is very little mobility into non-agricultural employment if the previous status is unemployment, inactivity or farming.

Kristic and Sanfey (2007) study the labour mobility in Bosnia and Herzegovina using two waves of a panel data (2001 and 2004). They try to answer to the question "How much movement is there among labour market states in Bosnia and Herzegovina?"Ḟirst, they group individuals into employed, unemployed and inactive, and compare the overall mobility level of Bosnia and Herzegovina to other transition countries: they conclude that the transition is higher in Bosnia and Herzegovina. Secondly, they differentiate between formal and informal employment and clarify that the informal sector has played a major role in facilitating out-flows from unemployment to employment. The authors also identify the typical individual and household characteristics associated with mobility patterns, estimating the probability of moving from informal to formal employment. Educational level, service sector, remaining in the same job and residential status are found to be the most significant explanatory variables.

Lehman and Pignatti (2007) analyse the Ukrainian labour market using panel data for the period 2003-2004. They derive mobility patterns across four and six labour market states (excluding and including the distinction between salaried workers and the self-employed) and assess the probability of moving across the different states according to individual characteristics. They also estimate changes in earnings associated with labour market transitions. The study points to the existence of a segmented labour market in Ukraine, where workers try to move into formal jobs at any stage of their working life, while some of them are forced to work informally, and just a minority are engaged in informal jobs voluntarily. The wage analysis suggests that most involuntary informal jobs are badly remunerated and bring no gain when workers move into them. In addition, the study concludes

that informal self-employment in urban areas is voluntary since movements into this status are associated with large gains in earnings.

Finally, one interesting study of Pagés and Stampini (2009) provides a comparative analysis of labour mobility patterns including three transition countries (Albania, Georgia and Ukraine) and three Latin American countries (Argentina, Mexico and Venezuela). The authors test the labour market segmentation hypothesis in two alternative ways, distinguishing between skilled and unskilled workers. First, they estimate changes in earnings associated with labour market transitions across five different states (inactive, unemployment, formal employment, informal employment, and self-employment). Second, they derive mobility patterns and compare the results to the transitions that would result from a counterfactual situation with no labour market segmentation – i.e. all states are equally preferred and, conditional on a given labour market position, all workers have the same probability of ending up in a status, independently of their initial status. The results display a high level of mobility between formal salaried and informal salaried workers. Measures of wage differentials suggest higher segmentation across types of jobs in Latin American countries than in Eastern Europe and Central Asia, while the transition analysis indicates the opposite. In general, the results display a high level of mobility between formal salaried and informal salaried workers, but a low level of mobility between the self-employed and those who are formal-salaried.

3.3 The Evolving Employment Market in Kyrgyzstan

The Kyrgyz Republic is the second poorest country in the Commonwealth of Independent States, after Tajikistan, with GDP per capita of $3,351 (World Bank, 2017[3]). Since proclaiming its independence in 1991, the country has experienced serious difficulties in establishing an independent economy; it has also experienced violent conflict on several occasions, including ethnic clashes in 2010. In the 1990s, the breakdown of supply chains and demand of the Soviet planned economy brought about a near-collapse of the Kyrgyz industry. The Soviet Union, indeed, had internally integrated all member countries' production systems, involving the transport of the inputs across vast distances and making elaborate cross-republic supply chains. Over the 1990s, the economic collapse associated with the

[3]The main indicators of the Kyrgyz economy are available at the website: https://data.worldbank.org/country/kyrgyz-republic?view=chart

Soviet Union dissolution led to a considerable contraction of all the industrial and manufacturing sectors. The only industrial driving force continued to be mining and, more importantly, gold extraction. Kyrgyzstan is, indeed, rich in natural reserves of minerals (coal, gold, uranium and other rare earth metals), which over the 1990s have continued to encourage the participation of foreign investors in extracting and processing, notably the Kumtor gold mine - the largest gold mine operated in Central Asia by a Western company (World Bank, 2015). The latter accounted for about 10 percent of the Kyrgyz GDP in 2017 (World Bank, 2017).

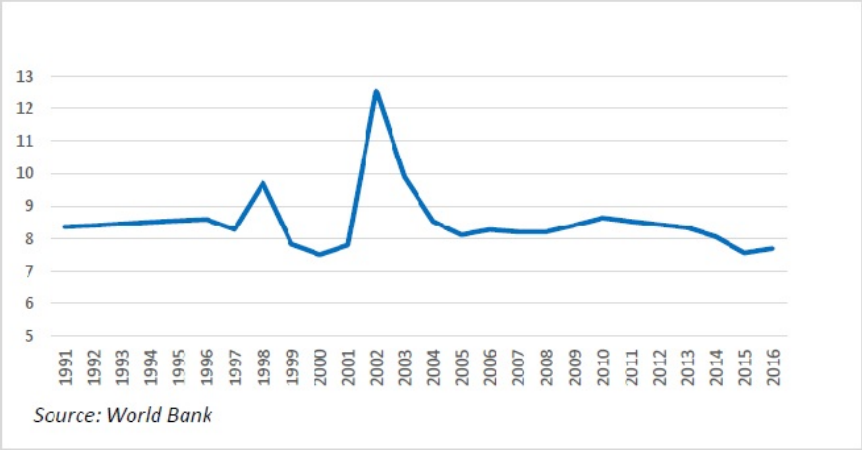
The unemployment rate remained substantially stable from 1991 to 2016 (see figure 1), with only two peaks in 1998 and 2002, following the Russian financial crisis and a Kyrgyz's political turmoil. Additionally, the unemployment rate in rural areas was lower than in urban areas (see figure 2), probably because people displaced from industries and returned to villages in consequence of mass privatization of state-owned enterprises and distribution of private plots for many people, both of which were planned after the independence. Agriculture was often the only means of subsistence.

The labour model was also shifted from a regular wage employment system, largely guaranteed under the Soviet centralised system, to predominantly irregular and self-employment. This exceptional increases in informal employment was also due to the near-collapse of the welfare state, which resulted in a decrease of governments' ability to provide social security. With no regular income from employment and no state social safety net, people have resorted to a variety of informal, low-skilled and precarious activities to survive (World Bank, 2015). A further consequence of the lack of job opportunities and a weak social model was a large-scale emigration from the country, mainly to Russia but also Kazakhstan, both of which experienced a resource-driven economic boom in the early 2000s. The Kyrgyz economy is, indeed, one of the most remittance-dependent economies in the world: in 2017 remittance inflow emerged as 27% of the GDP (World Bank, 2018[4]).

Since it is a problem to obtain reliable and consistent estimates of informal sector, the most recent information dates back to 2010. According to the National Statistic Committee of the Kyrgyz Republic (2011) about 70% of the Kyrgyz labour force in 2010 was employed informally. The degree of informality was not homogenous, but varied by some factors: a) type of residence - four out of five jobs in rural areas were not formal, while about 50% of the employed in urban environments worked informally; b) type of employment - about 63% of

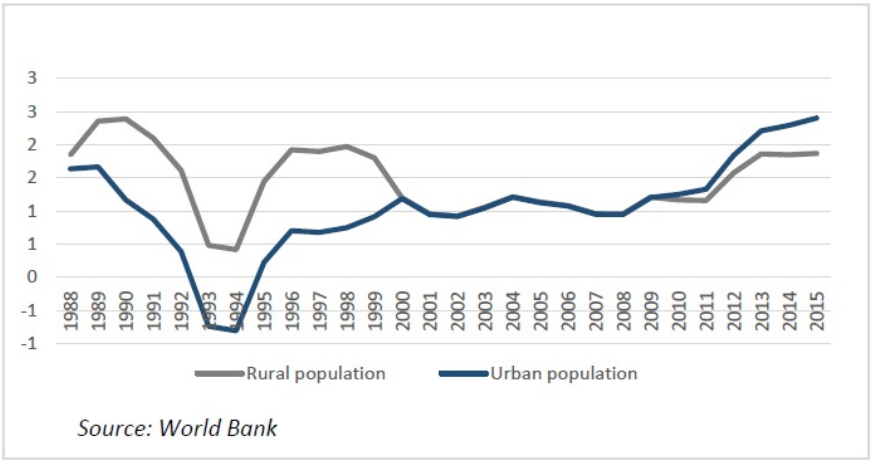
[4]Data on remittance inflows in the Kyrgyz Republic can be found at the website https://data.worldbank.org/indicator/BX.TRF.PWKR.DT.GD.ZS?locations=KG.

Figure 3.1: Unemployment rate in Kyrgyzstan - % of total labour force



the employees of the informal economy were self-employed; c) sector of economy - informal activity in the Kyrgyz Republic was mostly concentrated in agriculture (about 45%) and trade (almost 20%); d) size of organization - 85% of the more informal enterprises were small (less than 9 people).

Figure 3.2: Employment rate by sector - % of total labour force



3.4 Data and variables

3.4.1 Defining informality

Defining and measuring informality is a complex issue due to the multiplicity of criteria used in the literature. A conceptual framework for defining informal employment was proposed in a ILO report (2000)[5], with the purpose of connecting the enterprise-based concept of the informal sector with a job-based concept. The two definitions were coined separately. The first one was defined in January 1993, during the *Fifteenth International Conference of Labour Statisticians* (15th ICLS). It is based on the ILO definition (1972) and distinguishes between formal and informal sector according to enterprises' characteristics. Thus, for instance, while formal sector firms are characterised by large-scale production and the use of capital-intensive technologies, informal sector firms involve small-scale production (typically family owned) and use labour intensive technologies. The second one was offered by PREALC, the ILO's World Employment Programme in Latin America, and is based on income and employment. It identifies the informal sector with some states in employment - including domestic servants, casual labourers, the self-employed, and all individuals working in enterprises employing a maximum number (4-10) of people - and all people whose income is below a minimum level (Bernabé, 2002).

The 2000 ILO report defined five states in employment: own-account workers, employers, contributing family workers, employees, and members of producers' cooperatives. It introduces the "legalistic" definition of informal employment, which identifies the above categories as informal if they are outside the framework of regulations because the firms in which the jobs are located are not registered, or the employers, even if in the formal sector, decide to not register the activity of some workers. It may be also the case that legislation does not specifically cover (or is not applied to) some categories of jobs (such as temporary or home-based jobs) or subcontracting arrangements in production chains, so that the involved jobs (and, therefore, their incumbents) are informal because unprotected by labour legislation.

[5]International Labour Office, 2000. Resolution concerning statistics of employment in the informal sector, adopted by the Fifteenth International Conference of Labour Statisticians (January 1993). Current International Recommendations on Labour Statistics. International Labour Office, Geneva.

3.4.2 Data

Data for this study come from the "Life in Kyrgyzstan Panel Study 2010-2013" (LiK Study)[6], a panel survey conducted annually between 2010 and 2013 by the German Institute for Economic Research (DIW Berlin) in collaboration with Humboldt-University of Berlin, the Centre for Social and Economic Research (CASE-Kyrgyzstan) and the American University of Central Asia. The data were collected at the individual, household, as well as community level: individual questionnaires were completed by all adults aged 18 and above in the sampled households; household questionnaires were completed by the most knowledgeable household member (such as the head of household), and community questionnaires were completed by the representatives of the community administration. All interviews were face-to-face, conducted in either Kyrgyz or Russian. No weights have been assigned to observations since the sampling of households and respondents was taken proportional to population size in each of the surveyed regions. I selected the final sample in a way to comprise only the labour force between 18-64 years of age who are present in at least two consecutive years of the survey. Overall, 7,235 individuals are identified in 2010, 7,308 in 2011, 7,457 in 2012 and 4,464 in 2013.

To construct the dependent variable, I follow the "legalistic" perspective, and consider the employment relationship between employer and employee informal if the employee does not sign a written contract. In the case of own-account workers, by contrast, the self-employed operates informally if she/he does not register her/his business. The individual questionnaire, indeed, makes a distinction between salaried workers and the self-employed. Usually, the employer does not register the job relationship in order to escape the payment of taxes and social security contributions, in this way preventing the employee from acquiring pension rights as well as other job benefits and securities that occur with the registration of a written contract. According to this view, I can consider the informal salaried activity involuntary. In the same way, I can identify workers who do not want to register their activity as voluntary informal self-employed. Moreover, I select unemployed and inactive individuals. The unemployed are those who answer "yes" to the question: "Have you been looking for work during the past seven days?". While inactive are respondents who reply "no" to the same question. I then combine the replies to the above questions to construct a dependent variable - employment status, which assumes six values: 1 = formal employee (FE), 2 = informal employee (IE), 3 = formal self-employed (FSE), 4 = informal

[6]A detailed account of the survey methodology can be found at the survey website https://datasets.iza.org/dataset/124/life-in-kyrgyzstan-study-2010-2013.

self-employed (ISE), 5 = unemployed (UE), 6 = inactive (NA). This analysis covers only informality with regard to the main employment, without capturing all individual activities in the shadow economy.

The set of control variables includes individual characteristics: age, gender, marital status (single, married, separated, widowed), three levels of education (illiterate/primary, secondary, tertiary), ethnicity (Kyrgyz, Russian, Uzbek, other), having a chronic illness and sector of activity (agriculture, manifacturing, construction, services, education, health). It also includes characteristics of households to which individuals belong: type of residence (rural or urban), region of residence (north or south region) and household size.

3.5 Descriptive analysis

3.5.1 Summary statistics

Table 1 presents summary statistics for a number of observable characteristics of the individuals in the sample that are likely to affect their labour market status. The results in Table 1 show clearly that individuals in different states differ widely in their observable characteristics. Some of them are helpful to distinguish between self and wage-employed workers, while others contribute to differentiate between formal and informal people. Males, for instance, are more likely to work as self-employed than females, while their participation in the wage-employed sectors is around 50%. Moreover, they are less likely to be inactive, probably because a large share of women in Kyrgyzstan is housewife. The lack of jobs among females is a consequence of the collapse of the welfare state in the country: within ten years from its independence, the percentage of working women dropped from 70% to 30% (National Statistical Committee of the Kyrgyz Republic, 2013)[7].

The mean age is lower for unemployed and informal wage-employed, while for the other workers it stands at around 40 years old. Inactives are, on average, 36 years old.

The statistics also suggest that, although Russians represent a small part of the entire sample, their participation in the formal salaried sector is equal to 17,46%; the share of Uzbeks in this category is, instead, 4,65%. This is probably due to the anti-Uzbeks sentiment, which is widespread in the Kyrgyz Republic

[7]For more details, see the first paper of this thesis.

and might lead discriminations in job opportunities for Uzbeks. Many Kyrgyz feel that their sovereignty is intimidated by their neighbor Uzbekistan and that Uzbeks, who live mostly in southern of Kyrgyzstan, constitute a threat. Uzbeks are highly active in trade, construction and agriculture sectors in the south and this encourages Kyrgyz to think that wealthy Uzbek leaders attempt to turn this economic influence into political power, promoting a militant Uzbek nationalism in Kyrgyzstan (Laurelle, 2012). However, Uzbeks do not contribute only to the informal sector, their participation in the formal self-employed is equal to 14,01%, nearly the same than their presence in the other categories.

The statistics by marital status indicate that the percentage of married people (the majority of the Kyrgyz population) is higher in self-employed than in wage-employed jobs. On the contrary, single and separated individuals are more likely to be salaried workers. Education helps to distinguish between formal and informal workers. The percentage of high educated workers is notably higher for the formal salaried (44,73%), while the primary educated people and illiterate represent only a smaller amount of formal employees (7,38%), relative to their share in the other categories. Secondary educated are, instead, highly present in all sectors, given that the majority of the population of Kyrgyzstan completed secondary schools. The education system under the Soviet Union, indeed, featured total access to primary and middle education for all citizens (Elliot and Tudge, 2007).

The analysis by sectors shows that individuals who work in education and health (public servics) are formal-employed. On the contrary, working in agriculture excludes almost totally the possibility to be formal wage-employed. Moreover, individuals who work in manifacturing and construction are more likely to be salaried workers than self-employed, and working in services decreases the likelihood to be in the informal wage-employed. Lastly, living in the north, instead of the south, increases the likelihood to work formally rather than informally.

Table 1 also reports mean monthly earnings in local currency - *soms.* It shows that formal workers earn, on average, more than informal employed. This suggests that the informal sector is less desiderable than the formal one. At the same time, informal self-employed result to earn less than the other workers. However, these people might be reluctant to report the information on their profits, which can be viewed as sensitive, to an interviewer.

Table 3.1: Summary statistics

	FE	IE	FSE	ISE	UE	NA
Male	0.4940	0.5089	0.7626	0.7398	0.5491	0.3043
Ethnicity						
Kyrgyzs	0.7007	0.6541	0.6897	0.7065	0.7185	0.6720
Uzbek	0.0465	0.1586	0.1530	0.1401	0.0946	0.1475
Russian	0.1746	0.0869	0.0381	0.0425	0.1086	0.0640
Other	0.0782	0.1004	0.1192	0.1109	0.0783	0.1165
Age	39.48	35.20	40.79	39.44	31.06	36.15
Marital status						
Married	0.6899	0.6638	0.8427	0.8053	0.4568	0.6719
Separated	0.0886	0.0702	0.0352	0.0499	0.0701	0.0468
Widowed	0.0484	0.0254	0.0373	0.0365	0.0245	0.0511
Single	0.1731	0.2406	0.0848	0.1083	0.4486	0.2302
Education						
Primary/illiterate	0.0738	0.1489	0.1196	0.1445	0.1741	0.1775
Secondary	0.4789	0.7289	0.7339	0.7694	0.6164	0.7302
Tertiary	0.4473	0.1222	0.1439	0.0861	0.2114	0.0923
Chronic illness	0.2329	0.1812	0.2207	0.2097	0.1519	0.2725
Sector						
Agriculture	0.0198	0.4123	0.5408	0.4828	-	-
Manifacturing	0.0888	0.0622	0.0163	0.0232	-	-
Construction	0.1080	0.1464	0.0145	0.0819	-	-
Service	0.3807	0.2662	0.4088	0.4003	-	-
Education	0.2456	0.0650	0.0043	0.0051	-	-
Health	0.1228	0.0336	0.0109	0.0038	-	-
Other	0.0343	0.0143	0.0043	0.0029	-	-
Rural area	0.4453	0.6840	0.7191	0.4395	0.5303	0.6184
North region	0.6315	0.4863	0.5483	0.4977	0.5771	0.4489
Household size	4.96	5.66	5.67	5.76	5.45	5.88
Income	7419.172	6441.615	7686.128	5715.143	-	-
Observations	4,730	5,661	2,759	3,148	856	9,310

Source: own calculation based on LiK Study 2010-2013.

3.5.2 Transition Analysis

The panel survey used, which tracks individuals' employment status over four consecutive years, allows to identify changes in the labour force over time. Table 2 provides a transition matrix (P-matrix) to map the dynamics of respondents' labour market transitions over the four years. In the table, a cell contains the probability in percentage to transition from a row employment status in year 2010 to a column employment status in year 2013. The main diagonal measures inertia, i.e. the proportion of individuals who is in the same occupation over the period. In Table 2, the value in each cell is obtained by the formula:

$$p_{sj} = \frac{N_{sj}}{N_s} \quad (1)$$

where N_{sj} is the number of transitions from status s to j and N_s is the number of transitions out of status s. Given a finite set of states $S = \{1, ...S - 1\}$ and denoting with X_t the status of a given individual at time t, p_{sj} is thus the conditional probability:

$$p_{sj} = (t-1, t) = \Pr(X_t = j \mid X_{t-}1 = s) \quad (2)$$

i.e. the probability of moving from status s to j at time t [8].

The transition matrix in Table 1 shows that the largest share (31.57%) of people in Kyrgyzstan is inactive, followed by informal employees (22.18%), formal employees (19.50%), formal self-employed (11.54%), informal self-employed (12.41%) and unemployed (2.80%). The analysis of the flows between sectors provides some results compatible with the dualistic perspective, which sees the informal sector as a survivalist alternative to the formal employment, and others that are in contrast with this perspective and support the competitive view of the labour market.

Formal employed represents the most unchanging category: 70.02% of individuals who are initially formal employed remain in the same category. This result is consistent with the dualistic approach, given that once an individual becomes formal employed she/he is unlikely to leave this status. However, if labour markets are segmented, flows between formal and informal employment should have one prevailing direction in accordance with labour maket conditions. In Table 1 the

[8] For more details, see Nichols 2014.

Table 3.2: Transition matrix

Initial Status	2010 - 2013 Final Status					
	FE	IE	FSE	ISE	UE	NA
FE	70.02	15.45	3.05	2.99	1.55	6.95
IE	12.34	52.22	7.32	9.10	2.06	16.96
FSE	4.73	10.09	54.45	18.70	1.03	0.11
ISE	4.96	11.66	18.96	46.11	1.26	17.04
UE	15.67	21.98	3.58	7.67	18.40	32.71
NA	6.06	13.84	4.33	6.20	3.50	66.07
	19.50	22.18	11.54	12.41	2.80	31.57

Source: own calculation based on LiK Study 2010-2013.

amount of people moving from the formal employed to informal employed and the amount of individuals moving in the opposite direction is nearly the same (15.45% vs 12.34%). The same thing occurs for the amount of people moving from the formal self-employed to informal self-employed and the amount of people moving in the opposite direction (18.70% vs 18.96%). These results are in contrast to the dualistic perspective and seem to suggest the existence of a partially integrated labour market in Kyrgyzstan. Then, the percentage of workers leaving the formal employed for the informal self-employed is slightly higher than the one of those moving in the opposite direction (2.99% vs 4.96%). Likewise, the amount of formal self-employed in transit to the informal employee is slightly greater than the one of people moving in the opposite direction (10.09% vs 7.32%).

Table 1 also shows that individuals who are initially unemployed have the greatest propensity to move, becoming mainly inactive (32.71%), informal employees (21.98%) and formal employees (15.67%).

3.6 Multinomial logit analysis

3.6.1 Model set-up

This section provides the analysis based on a fixed effects multinomial logit, in order to to see whether the changes in individual characteristics are associated with the changes in employment status. With panel data and fixed effects model it is possible to controls for characteristics that do not change across time whether they are measured or not. Consequently, fixed effects methods help to control for omitted variable bias when omitted variables are stable[9]. Since a fixed effects estimator for polytomous discrete dependent variables had not been available for any statistical software package before Pforr (2017), previous studies (for instance, see Bernabé and Stampini, 2009; Kristic and Sanfey, 2007; Lehman and Pignatti, 2007; Pagés and Stampini, 2009) had employed the pooled multinomial logistic or the multinomial logistic with random effects, without controlling for characteristics that do not change across time (Pforr, 2017). The analysis is performed twice. I first include all employment states, and then I exclude the unemployed and inactive, in order to take into account the sectors of activity.

The probability of working in each status can be thus expressed as follows:

$$\Pr(s_{i,t} = j | X'_{i,t}, t, a_i) \quad (3)$$

where j indicates each possible status of individual i at time t, $X_{i,t}$ is the set of individual characteristics, t are year fixed effects and a_i are individual fixed effects (effectively, a set of dummies for each individual). I employ the multinomial logit because of the discrete nature of the dependent variable, which takes more than two outcomes and has no natural ordering. I thus obtain a set of coefficients, $b^1, b^2, b^3, b^4, b^5, b^6$ (b^1, b^2, b^3, b^4 when I exclude the unemployed and inactive) corresponding to each outcome, according to the formula:

$$\Pr(s = j) = \frac{e^{Xb^1}}{e^{Xb^1} + e^{Xb^2} + e^{Xb^3} + e^{Xb^5} + e^{Xb^6}} \quad (5)[10]$$

To obtain them, I set the informal self-employed to zero, such that the coefficients of the other states capture the effect of individual characteristics on the

[9] see Wooldridge, 2010.

[10] The formula becomes $\Pr(s = j) = (\frac{e^{Xb^1}}{e^{Xb^1} + e^{Xb^2} + e^{Xb^3}})$ when I exclude the unemployed and inactive.

probability of being in each of the alternative categories relative to the informal self-employed[11]. In (3), direct estimation of the individual a_i might create an "incidental parameters problem", which would lead to inconsistent estimators with asymptotics solely based on $N \to \infty$. An "incidental parameters problem" in short panels occurs when a is treated as a fixed parameter, then as $N \to \infty$, for fixed time periods T, the number of parameters a increases with the number of observations N. This means that a can be consistently estimated for fixed T only if an estimator allows a to be accurately eliminated (for more details, see Cameron and Trivedi 2005). However, with two additional assumptions I can consistently estimate the coefficients. These assumptions are: (1) the observed covariates are strictly exogenous conditional on the unobserved heterogeneity; (2) the error terms are independent across the four years (for more details, see Pforr 2017.).

3.6.2 Results

While the data presented in Tables 1 and 2 are helpful for establishing the general profile of workers in Kyrgyzstan, the results in Table 3 and 4 - reporting the individual-fixed effects estimations - allow to determine how the over-time changes in control variables are related to the over-time changes in employment status of the same individuals. This empirical strategy also allows to collect the benefits proper of a fixed effect analysis, i.e. controlling for unobserved heterogeneity (a fundamental challenge in empirical research). Note that the individual fixed-effects estimations exclude time-invariant characteristics, such as gender and ethnicity. Moreover, the results are obtained employing the *femlogit* command in Stata, which only uses observations where the outcome changes over time, hence a lower sample size.

The coefficients in Tables 3 and 4 - relative to the informal self-employed category - cannot be interpreted in a straightforward manner due to the functional form of the logit model. Differently from many non-linear models, for which, as confirmed by the literature[12], it is convenient to get marginal effects and interpret the results as probabilities, the calculation of marginal effects in Stata is not possible after the command *femlogit*. I can only draw some conclusions on the sign and significance of the coefficients.

Overall, the results show that age is positively associated with the probability to work in the formal employed and negatively with the eventuality to become

[11] For more details, see Green 2012.
[12] For instance, see Wooldridge 2010.

inactive. This probably reflects the fact that older people have more skills and experiences and are more likely to get a job, and, among different categories of jobs, to get a formal salaried one. However, as people get older the age effects become weaker. Being single is also associated with the probability to be employed formally. This effect indicates that unmarried people are more likely than married ones to participate in the formal salaried category probably because the latter must provide income source for their families, and, to do this, in some cases might have informal activities as their only option. In line with the conventional wisdom, the highest completed education level has also a positive impact on the likelihood to get a formal job, while it is negatively associated with the probability to be inactive. As argued by Pages and Stampini (2009), the opportunity cost of working informally, as well as the risk of being subject to involuntary layoffs, is lower for low-skilled individuals. On the contrary, having a chronic illness, as well as belonging to a household with a greater size, increases the likelihood to be inactive. The effect of household size might capture the labour supply of women, which might be reallocated from labour market to domestic work if the number of members increases within a household. This might be driven by the conservative Kyrgyz society norms that view women primarily as mothers and widowed[13].

Analysing the subsample of active workers allows to take into account the impact of belonging to specific sectors. Some characteristics - i.e. age, being single, having a chronic illness and household size - cease to explain the employment categories, suggesting the fact that they are mainly relevant to determine the active/inactive condition. By contrast, as seen in Table 4, the sectors of activity turn out to have great relevance in explaining the likelihood of workers moving across the different categories. Compared to the base category of services, working in agriculture decreases the probability to be a formal employee. This is in line with the widespread idea that if the proportion of own-account workers (self-employed without hired employees) is sizeable in a country, it may be an indication of a large agriculture sector and low growth in the formal economy. The other sectors result to be mainly relevant to determine the wage-employed/self-employed condition. Working in manufacturing, construction, health and education, indeed, increases the likelihood to be an employee, relative to self-employed. This is probably due to the intrinsic entrepreneurial nature of service sector that, according to Faggio and Silva (2014), might be considered a proxy for self-employment categories, since individuals in this sector mainly offer consumer goods and services (such as car repair, housing construction and improvement, real estate services, legal services, beauty shop services) by means of private businesses.

Table 4, in line with the results in Table 3, also shows that being tertiary

[13]For more details, see the first paper of this thesis.

educated is determinant to move into the formal salaried category. Moreover, the positive relationship between being widowed and formal employee can be interpreted in the same way as the effect of being single in Table 3, given that they are both unmarried.

Table 3.3: Fixed effects multinomial logit (without sectors of activity)

	FE	IE	FSE	UE	NA
Age	0.436***	-0.010	0.170	-0.001	-0.250**
	(0.127)	(0.103)	(0.126)	(0.172)	(0.105)
Age squared	-0.005***	-0.001	-0.002	0.000	0.003***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
Marital status					
Married	Ref.	Ref.	Ref.	Ref.	Ref.
Separeted	0.514	0.215	-0.505	-0.158	-0.011
	(0.366)	(0.322)	(0.402)	(0.477)	(0.309)
Widowed	0.560	0.370	0.746	0.181	0.201
	(0.522)	(0.466)	(0.593)	(0.858)	(0.423)
Single	0.655**	0.298	0.169	0.517	0.137
	(0.305)	(0.223)	(0.316)	(0.357)	(0.227)
Education					
Primary/illiterate	0.923	0.442	0.053	-0.144	0.041
	(0.386)	(0.298)	(0.305)	(0.392)	(0.258)
Secondary	Ref.	Ref.	Ref.	Ref.	Ref.
Tertiary	1.260***	0.124	0.520	1.302***	-0.684**
	(0.354)	(0.355)	(0.402)	(0.458)	(0.335)
Chronic illness	-0.038	-0.141	-0.117	-0.067	0.385***
	(0.149)	(0.130)	(0.130)	(0.220)	(0.117)
Household size	0.049	-0.050	-0.018	0.117	0.184***
	(0.055)	(0.042)	(0.049)	(0.078)	(0.040)
Individual fixed effects	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	16,303	16,303	16,303	16,303	16,303
Pseudo R2			0.0541		
Prob > Chi2			0.0000		

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 3.4: Fixed effects multinomial logit (with sectors of activity)

	FE	IE	FSE
Age	0.0706	-0.161	0.0318
	(0.181)	(0.136)	(0.189)
Age squared	-0.00128	0.000674	0.000410
	(0.00198)	(0.00163)	(0.00159)
Marital status			
Married	Ref.	Ref.	Ref.
Separeted	0.450	0.0401	-0.464
	(0.489)	(0.442)	(0.479)
Widowed	1.535*	0.999	0.985
	(0.797)	(0.656)	(0.691)
Single	0.643	0.180	0.0524
	(0.421)	(0.281)	(0.399)
Education			
Primary/illiterate	1.649	0.602	0.110
	(0.652)	(0.426)	(0.357)
Secondary	Ref.	Ref.	Ref.
Tertiary	0.901**	0.250	0.637
	(0.457)	(0.445)	(0.484)
Chronic illness	0.252	0.0437	-0.0615
	(0.212)	(0.174)	(0.155)
Sectors			
Service	Ref.	Ref.	Ref.
Agriculture	-2.284***	-0.00969	-0.00358
	(0.260)	(0.148)	(0.149)
Manifacturing	2.150***	1.708***	-0.604
	(0.418)	(0.395)	(0.519)
Construction	0.863***	1.227***	-1.765***
	(0.234)	(0.190)	(0.330)
Education	3.668***	2.458***	0.704
	(0.591)	(0.580)	(0.750)
Health	3.071***	2.396***	0.581
	(0.637)	(0.658)	(0.707)
Other	1.399**	1.245**	0.667
	(0.664)	(0.633)	(0.750)
Household size	0.0404	-0.0832	-0.00355
	(0.0773)	(0.0570)	(0.0601)
Individual fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Observations	7,981	7,981	7,981
Pseudo R2	0.1400	0.1400	0.1400
Prob > Chi2	0.0000	0.0000	0.0000

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

3.7 Conclusions

This paper examined the Kyrgyz labour market with a specific emphasis on mobility patterns and the determinants of formal and informal employment. It contributed to the empirical literature that had studied the relationship between formal and informal activities and to explain participation in informal employment. This topic had not been previously analyzed thoroughly, due to lack of appropriate data. I contributed to the literature on informal employment in transition countries filling the data gap for one economy. I provided some answers to the question on whether in the Kyrgyz Republic there exists a marginal, poor, informal sector of the urban economy, in which the poorest work delimited in contrast to the formal one. I also provided some drivers of the over-time changes in employment status, employing a new estimation strategy - i.e. the multinomial logistic regression with fixed effects - which allows to estimate mobility patterns in the labour market and has not been previously employed in addressing this topic before the implementation of the command *femlogit* in Stata.

The work consists of a descriptive analysis and a fixed effect estimation. I conducted the descriptive analysis in two steps: I first reported data on the main characteristics of the people in the different categories and then I employed a transition matrix to compute the individuals' propensities to move across the labour market states. I also took advantage of the longitudinal nature of the data and estimated a multinomial logit with the individual fixed effects, to see whether changes in individual characteristics are associated with the changes in employment status.

Overall, the results show some interesting findings. The descriptive analysis reports that, among the observable characteristics, three can be considered determinants of formal employment: being tertiary educated, living in the north and working in the field of health and education. On the contrary, being primary educated or illiterate and living in the south are drivers for the informal sector. The analysis of wages shows that individuals who work formally earn more than those who are employed in the informal sector. This result supports the idea that the informal sector is less desiderable than the formal one.

The transition analysis of the flows between sectors provides some results compatible with the dualistic theory, which sees the informal sector as a survivalist alternative to the formal employment, and others that are in contrast with this perspective and support the competitive view of the labour market. Moreover, the formal salaried individuals turn out to be the most reluctant to leave their

status, confirming the traditional theory which sees formal employment as the ultimate desirable labour market condition.

The multinomial logit analysis confirms the positive association of high education with the formal sector. This suggests an interesting policy implication that allows to confirm for this transition country the intuitive policy prescription that investing in education may increase individuals' chances of finding formal employment. Moreover, as suggested in summary statistics, working in agriculture turns out to be negatively related to the formal salaried sector, confirming the connection between the existence of a large agricurture industry in a country and its low growth in the formal sector. The analysis also shows some characteristics - i.e. age, being single, having a chronic illness and household size - that are mainly relevant to determine the active/inactive condition. By contrast, working in manufacturing, construction, health or education, compared to working in services, is decisive to be wage-employed relative to self-employed. I supposed it depends on the entrepreneurial nature of service sector, in which individuals mainly lead consultancies or set up retail chains.

Finally, it needs to point out that my work is not without limitations, which suggest direction for future research. In particular, the fixed effect multinomial logit presents at least two restrictions. Firstly, its results are not easy to interpret, since they are relative to a base-category and cannot be transformed into marginal effects. In addition, the standard procedure to run a fixed effect model in this case is to cluster standard errors at the househol level and account for interdependence of labour market outcomes between household members, but this option is not available for the command *femlogit* in Stata. This empirical strategy allows to collect the benefits proper to a fixed effect analysis, i.e. controlling for unobserved heterogeneity (a fundamental challenge in empirical research), and provide some interesting findings of the mobility patterns in the Kyrgyz labour market. Further refinement of the empirical strategy would thus allow to overcome these drawbacks.

Bibliography

[1] Abdih Y. and Medina L., 2013. Measuring the Informal Economy in the Caucasus and Central Asia. Washington: International Monetary Fund Working Paper No. 137.

[2] Babetskii I., Kolev A. and Maurel M., 2003. Kyrgyz Labour Market in the Late 1990s: The Challenge of Formal Job Creation. Comparative Economic Studies, 45: 493-519.

[3] Bangasser P. E., 2000.The ILO and the Informal Sector: An Institutional History. Geneva: ILO Paper No. 9.

[4] Bernabè S., 2002. Informal employment in countries in transition: a conceptual framework. Centre for Analysis of Social Exclusion. London: London School of Economics.

[5] Bosch M. and Maloney W. F., 2010. Comparative Analysis of Labour Market Dynamics using Markov Process: An Application to Informality. Labour Economics, 17 (4): 621-631.

[6] Cameron A. C. and Trivedi P. K., 2009. Microeconometrics: Methods and Applications. New York: Cambridge University Press.

[7] Elliot J. and Tudge J., 2007. The impact of the west on post-Soviet Russian education: change and resistance to change. Journal of Comparative Education, 43: 93-112.

[8] Greene, W. H., 2012. Econometric Analysis. 7th ed. Upper Saddle River. New York: Prentice Hall.

[9] Gimpelson V. and Slonimczyk F., 2013. Informality and Mobility: Evidence from Russian Panel Data. Bonn: Intistute for the Study of Labour Discussion Paper No. 7703.

[10] International Labour Organization, 1972. Employment, incomes and equality: a strategy for increasing productive employment in Kenya. Geneva.

[11] International Labour Office, 2000. Resolution concerning statistics of employment in the informal sector, adopted by the Fifteenth International Conference of Labour Statisticians (January 1993). Current International Recommendations on Labour Statistics. Geneva: ILO.

[12] International Labour Office, 2002. Decent Work and the Informal Economy. IV Report of the Director-General. International Labour Conference, 90th Session. Geneva: ILO.

[13] Kristic G. and Sanfey P., 2007. Mobility, Povertry and Well-being among the Informally Employed in Bosnia and Herzegovina. Economic Systems, 31 (3), 311-335.

[14] La Porta R. and Shleifer A., 2008. The Unofficial Economy and Economic Development. Booking Papers on Economic Activity, Fall: 275-352.

[15] Lehmann H., 2014. Infromal Employment in Transition Countries: Empirical Evidence and Research Challenges. Bonn: Intistute for the Study of Labour Discussion Paper No. 8687.

[16] Lehmann H. and Pignatti N., 2007. Informal Employment Relationship and Labour Market Segmentation in Transition Economies: Evidence from Ukraine. Bonn: Intistute for the Study of Labour Discussion Paper No. 3269.

[17] Loayza N. V., 2016. Informality in the Process of Development and Growth. Washington D. C.: World Bank Policy Research Working Paper No. 7858.

[18] Maloney W., 2004. Informality Revisited. World Development, 32 (7): 1159-1178.

[19] Laruelle M., 2012. The paradigm of nationalism in Kyrgyzstan. Evolving narrative, the sovereignty issue, and political agenda. Communist and Post-Communist Studies (45): 39-49.

[20] Pagés C. and Stampini M. 2009. Between Education and Labor Market Segmentation. Journal of Comparative Economics, 37 (3): 387-401.

[21] Nichols A., 2014. Measuring mobility. Boston: Stata Conference, July.

[22] National Statistic Committee of the Kyrgyz Republic, 2001. Employment and Unemployment. The summary of the Integrated Households Survey in 2011. Bishkek City.

[23] National Statistical Committee of the Kyrgyz Republic, 2013. Food Security and Povertry. Bishkek City Information: Bullettin of the Kyrgyz Republic. No 2.

[24] Pforr K., 2014. Femlogit-Implementation of the multinomial logit model with fixed effects. Stata Journal, StataCorp LP, 14(4): 847-862.

[25] Wooldridge, J. 2010. Econometric analysis of cross section and panel data. Cambridge, MA: MIT Press.

[26] World Bank, 2014. Kyrgyz Republic Public Expenditure Review. Policy Notes. Pensions. Report No. 89007. Washington D.C.

[27] World Bank, 2015. Transitioning to Better Job in The Kyrgyz Republic: A Job Diagnostic. Report No. 99777. Washington D.C.

A.1 Appendix Chapter 1

PCA Analysis

PCA analysis is multivariate statistical technique of dimensionality reduction, which involves more steps. The first step entails a correlation or covariance matrix of the original correlated variables, and basing everything else on it. Standard methods of performing PCA analysis are based on a matrix of Pearson's correlations, which assume that the variables are continuous and normally distributed. Since the model includes variables that are ordinal, I perform PCA analysis in STATA14 using a polychoric correlation matrix. Polychoric correlations assume the variables are ordered measurements of an underlying continuum, they don't need to be truly continuous and normally distributed. Polychoric PCA is interpreted in the same way as standard PCA analysis.

The correlation matrix, creating in the first step of the PCA analysis, represents the set of original correlated variables to be reduced into a new set of uncorrelated variables (principal components) that are a linear weighted combination of the original variables. The PCA creates the same number of components as there are original variables, ordered in terms of the amount of variance each explains. Usually, only a few capture enough variance (measured by its eigenvalue) to be useful to construct the composite index. In this case, the first principal component explains the largest proportion of the total variance (eigenvalue = 3.995667) and it is employed to obtain the composite index of conservative gender norms.

The first principal components Y_1 is given by the linear combination of the variables $X_{1,}X_2...X_p$:

$$Y_1 = a_{11}X_1 + a_{12}X_2 + ... + a_{1p}X_p$$

The first principal component is calculated such that it accounts for the greatest possible variance in the data set, where weights are calculated with the constraint that their sum of squares is 1.

$$a_{11}^2 + a_{12}^2 + ... + a_{1p}^2 = 1$$

The second principal component is calculated in the same way, with the condition that it is uncorrelated with (i.e., perpendicular to) the first principal component and that it accounts for the next highest variance. This continues until a total of principal components have been calculated, equal to the original number of variables. At this point, the sum of the variances of all of the principal

components will equal the sum of the variances of all of the variables, that is, all of the original information has been explained or accounted for. Collectively, all of these transformations of the original variables to the principal components is: $Y = AX$. The rows of matrix A are called the eigenvectors of matrix S_x, the variance-covariance matrix of the original data. The elements of an eigenvector are the weights a_{ij}. The elements in the diagonal of matrix S_y, the variance-covariance matrix of the principal components, are known as the eigenvalues. Eigenvalues are the variance explained by each principal component.

Table 5: Test of income endogeneity

	PCA Index CF
Receive remittances	0.621
	(0.406)
Male	0.372**
	(0.167)
Ethnicity	
Kyrgyzs	Ref.
Uzbek	0.685**
	(0.304)
Russian	-0.375***
	(0.107)
Others	0.241
	(0.173)
Age	-0.048**
	(0.021)
Age squared	0.000**
	(0.000)
Marital status	
Married	Ref.
Separeted	0.135
	(0.158)
Widowed	0.216*
	(0.125)
Single	-0.387
	(0.290)
Education	
Primary/illiterate	0.246***
	(0.074)
Secondary	Ref.
Tertiary	-0.351**
	(0.136)
Trust in religion	0.169*
	(0.100)
Household income excluding remittances (ln)	0.043*
	(0.022)
Number of children	0.063
	(0.061)
Number of females	-0.086
	(0.067)
Elderly	0.262
	(0.270)
Residuals of income	**-0.498**
	(0.374)
N	1,951

Clustered standard errors at the community level in parenthesis ***p<0.01 **p<0.05 *p<0.1

A.2 Appendix Chapter 2

Table 6: Test of remittances endogeneity

	Drinking incidence FE logit	Spending on alcohol FE Tobit
Value of remittances (ln)	0.015	0.074
	(0.021)	(0.070)
Migrant in the household but no remittances	0.238	0.887
	(0.173)	(0.703)
Returned/circular migrant in the household	0.139	0.558
	(0.139)	(0.625)
Age	0.102*	0.384*
	(0.053)	(0.214)
Age squared	-0.001**	-0.003*
	(0.000)	(0.002)
Marital status		
Married	Ref.	Ref.
Separeted	0.093	0.108
	(0.238)	(0.916)
Widowed	0.279	0.908
	(0.235)	(0.968)
Single	0.783	2.122
	(0.605)	(2.089)
Education		
Primary/illiterate	0.124	0.355
	(0.197)	(0.720)
Secondary	Ref.	Ref.
Tertiary	0.394	1.192
	(0.296)	(1.105)
Trust in religion	0.065	0.275
	(0.051)	(0.221)
Residuals of remittances	**-0.000**	**-0.005**
	(0.022)	(0.068)
Household income excluding remittances (ln)	0.050**	0.240***
	(0.025)	(0.082)
Year fixed effects	Yes	Yes
Household fixed effects	Yes	Yes
Observations	4,120	8,164

Bootstrapped standard errors ***p<0.01 **p<0.05 *p<0.1

Table 7: Test of income endogeneity

	Drinking incidence FE logit	Spending on alcohol FE Tobit
Value of remittances (ln)	0.015	0.094
	(0.099)	(0.427)
Migrant in the household but no remittances	0.239	0.950
	(0.322)	(1.407)
Returned/circular migrant in the household	0.139	0.614
	(0.246)	(1.009)
Age	0.102	0.373
	(0.065)	(0.350)
Age squared	-0.001*	-0.003
	(0.000)	(0.003)
Marital status		
Married	Ref.	Ref.
Separeted	0.094	0.391
	(1.239)	(5.176)
Widowed	0.279	1.003
	(0.585)	(2.293)
Single	0.783	2.297
	(2.258)	(3.279)
Education		
Primary/illiterate	0.124	0.369
	(0.222)	(0.716)
Secondary	Ref.	Ref.
Tertiary	0.393	1.001
	(0.837)	(3.589)
Trust in religion	0.065	0.221
	(0.226)	(1.002)
Residuals of income	**-0.002**	**-0.497**
	(2.057)	(8.925)
Household income excluding remittances (ln)	0.052	0.736
	(2.057)	(8.926)
Year fixed effects	Yes	Yes
Household fixed effects	Yes	Yes
Observations	4,120	8,164

Bootstrapped standard errors ***p<0.01 **p<0.05 *p<0.1