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ABSTRACT

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Despite the growth of alcohol consumption and international migration in many developing countries, the links between the two remain underexplored. We study the relationship between emigration of household members, receiving remittances (migrant monetary transfers), and alcohol consumption of migrant household members 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 large longitudinal survey, we find that, among the ethnic majority (Kyrgyz), an increase in migrant remittances is associated with a higher likelihood and frequency of consuming alcohol, as well as an increase in the consumption of beer. Among ethnic Russians, the emigration of family members who do not send remittances back home is associated with an increased likelihood and frequency of alcohol consumption. We discuss possible mechanisms through which emigration and remittances may affect the alcohol consumption of those staying behind, including the relaxation of budget constraints and psychological distress. Overall, our findings suggest that the emigration of household members contribute to a greater alcohol consumption among those staying behind, and highlight the role of remittances and cultural background in understanding the nuances in this relationship.

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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: Does emigration contribute to alcohol consumption in the migrant countries of origin? This question is the focus of this study.

On a conceptual level, out-migration of household members may affect the alcohol consumption of those staying behind in a variety of ways. First, money sent back by migrants may relax household budget constraints and enable people 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 family members staying behind, we 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). Our 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 people (over 8,000 individuals from 3,000 households) over four years. Importantly, the panel nature of the survey allows us to relate 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 people, thus mitigating the potential endogeneity that arises if unobserved household characteristics affect both emigration and alcohol consumption.

Our analysis of individual-fixed-effect logit and tobit models shows that an increase in the amount of migrant monetary remittances is associated with an increase in the consumption of beer among migrant household members staying behind, but is not significantly related to the incidence and frequency of alcohol consumption more generally, or to the consumption of spirits

(vodka). The effect of remittances on beer consumption is most pronounced among ethnic majority (Kyrgyz); an increase in remittances is also associated with a higher likelihood and frequency of alcohol consumption among this ethnic group. We also find that having a migrant abroad who does not send remittances back home is associated with a greater likelihood and frequency of alcohol consumption among the ethnic Russian minority. These results lend support to the existence of both income and emotional distress effects.

Our 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. Previous contributions have focused on 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; Gibson et al., 2015; Hamilton and Choi, 2015; Hildebrandt and McKenzie, 2005; Kanaiaupuni and Donato, 1999; Kroeger and Anderson, 2014; Kuhn et al., 2011; Mosca and Barrett, 2016; Riosmena et al., 2012). Adverse health behaviours have remained overlooked and we fill this gap by focusing on alcohol consumption in Kyrgyzstan. More broadly, we also add to the literature exploring the individual- and country-level determinants of alcohol consumption across the world (Cheah, 2015; Cutler and Glaeser, 2005; Colen and Swinnen, 2016; Herzfeld et al., 2014). To our knowledge, our study is the first to consider the role of emigration in explaining changes in alcohol consumption, with a particular focus on transition and developing countries.

The remainder of the paper is organised as follows. Section 2 presents the context of alcohol consumption and emigration in Kyrgyzstan. Section 3 outlines conceptual channels through

which emigration may affect alcohol consumption among those staying behind. Section 4 describes data, variables and estimation strategy. Section 5 reports the results, followed by a discussion and conclusion in Section 6.

2. CONTEXT

2.1. 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 per capita in 2014) and other Central Asian countries (2-9 litres of pure alcohol per capita) 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) (Rehm et al., 2016). 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).

Notwithstanding the relatively low per capita consumption of alcohol 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 highest mortality rate from alcohol-attributable liver cirrhosis (285.3 deaths per million) and 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).

2.2. 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, 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 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 (especially those working in construction) (World Bank, 2015).

According to the "Life in Kyrgyzstan Study" survey, which forms the basis for our 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).

3. THEORETICAL CONSIDERATIONS AND TESTABLE HYPOTHESES
3.1. Theoretical mechanisms

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

3.1.1 Monetary remittances and the relaxation of budget constraints

Migrant money sent to family members back home relaxes household budget constraints, and, according to the standard neo-classical economic approach, higher income should result in a greater consumption of normal goods. There is a general consensus that all types of alcohol (wine, beer, spirits) are normal goods (Fogarty, 2009; Gallet, 2007; Nelson, 2013), and from this perspective we would expect people in remittance-recipient households to consume more alcohol. It is also likely that higher incomes will result in the consumption of better quality alcohol, which is important in the context of Kyrgyzstan where only 60% of all alcohol consumption is recorded in formal sales (World Health Organization, 2017). This argument is consistent with the literature showing that migrant monetary remittances tend to be spent disproportionately on status and luxury goods (Amuedo-Dorantes, 2014).

At the same time, if migrants consider it problematic that family members staying behind start consuming alcohol excessively and/or develop an addiction to it, they may condition monetary transfers on not spending them on alcohol. It is, however, another question whether migrants have full control over how remittances are spent – this is likely to depend on the balance of intra-

household decision-making. Informational asymmetries may also play a role, as it is generally difficult for migrants to monitor household expenditure back home.

3.1.2. Social remittances

In her seminal work, Levitt defines social remittances as "ideas, practices, identities, and social capital that flow from receiving- to sending-country communities" (Levitt, 1998, p.926). 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. Importantly, migrants can transmit both 'good' and 'bad' behaviours, and the characteristics of the migrant matter: for example, migrants sending money back home can stop doing so if family members back home do not adopt new norms and behaviours (Ivlevs and King, 2017).

As the vast majority of migrants from Kyrgyzstan go to Russia, they are exposed to a more intense drinking culture (see Section 2.1 on per capita alcohol consumption in the two countries). It is likely that migrants absorb Russia's norms and practices surrounding alcohol consumption and transfer them back home - through visits, circular or return migration. 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.

3.1.3. Adverse psychological states

Out-migration can lead to increased alcohol consumption through the deterioration of mental health, both among migrant workers and family members staying behind. While abroad, migrants may develop feelings of loneliness or isolation and depression due to the lack of social networks, being away from families, employment uncertainty and poor working conditions (Alcántara et al., 2014) and 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). Arguably, migrants would be more likely to turn to alcohol in countries with more intense drinking cultures, such as Russia. If these migrants engage in circular migration or return home permanently, they may bring with them their newly acquired taste for, or dependence on, alcohol.

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., 2019). 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.

3.2. Testable hypotheses

Overall, all of the channels presented above suggest that, in Kyrgyzstan, the emigration of household members would lead to a higher incidence of alcohol consumption among family members staying behind. This leads us to the main hypothesis to be tested in the empirical analysis:

H1: People in migrant households have a greater likelihood of consuming alcohol than people in non-migrant households

At the outset, we note that it is not our primary objective to test or disentangle the individual theoretical mechanisms presented above (rather, our objective is to test whether emigration is associated with higher or lower alcohol consumption in general), nor would the Kyrgyz case allow us to fully do so. For example, 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 go to one country

(Russia). This said, in our empirical analysis we will be able to differentiate between remittance-recipient and non-recipient migrant households, which should provide some answer on whether the relaxation of the budget constraints mechanism is at work.

Furthermore, Kyrgyzstan represents an instructive case for testing whether people's ethnic and cultural background affects the relationship between emigration and alcohol consumption among those staying behind. As mentioned previously, a substantial proportion (9%) of Kyrgyzstan's population are ethnic Russians – a group culturally and religiously distinct from the ethnic majority Kyrgyz. As the habits and social norms surrounding alcohol consumption of Kyrgyzstan's ethnic Russians are likely to be aligned with those observed in Russia, our first expectation is that ethnic Russians in Kyrgyzstan will have greater alcohol consumption than the ethnic Kyrgyz. One may also hypothesise that, because of less prolific drinking among the ethnic Kyrgyz, emigration has a greater potential to increase their alcohol consumption – through monetary remittances, social remittances, psychological distress or a combination thereof. In contrast, if the baseline alcohol consumption level among ethnic Russians is already high, then the emigration of household members and receipt of monetary remittances may have little effect on it. Furthermore, the transfer of alcohol-related social norms is unlikely to be affecting people in Kyrgyzstan's ethnic Russian households, as the majority of migrants go to Russia. This leads us to an additional hypothesis:

H2: In Kyrgyzstan, the emigration of household members increases the consumption of alcohol to a greater extent among the ethnic Kyrgyz than ethnic Russians.

4. DATA, VARIABLES AND ESTIMATION STRATEGY

4.1. Data

Data for this study come from the "Life in Kyrgyzstan Panel Study 2010-2013" ("LiK Study"), 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 "LiK Study" included a nationally representative sample of 3,000 households (over 8,000 individuals), interviewed over four years. 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 the household), and community questionnaires were completed by representatives of the community administration. All interviews were face-to-face, conducted in either Kyrgyz or Russian.

All members of the 3,000 original households selected in 2010 were tracked over time. If a member left a household, for example to establish own household, he or she would still be part of the sample and other members (e.g. spouse) of the new household would be included in the sample as well. All children in the originally selected households became part of the sample (i.e. were interviewed) once they turned 18. Overall, 8,160 individuals were interviewed in the first wave, 8,066 in the second wave, 8,177 in the third wave, and 7,681 in the fourth wave. Out of these, 5,623 individuals were interviewed in all four waves, 1,768 in three waves, and 1,099 in two waves. All these respondents are included in our empirical analysis. Finally, we have

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checked if the attrition of respondents was correlated with the alcohol-consumption-related and migration-related variables. We did not obtain significant correlation with either group of variables, implying a low risk of attrition bias on our results.

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 dataset is publicly available and can be accessed through the same website.

4.2. Variables

The objective of our study is to estimate the relationship between alcohol consumption (outcome) and the emigration of household members (main regressor), controlling for a range of socio-demographic characteristics. This section explains how we construct each set of variables.

4.2.1. Outcome: alcohol consumption

Respondents were asked if they drank alcoholic beverages and, if yes, how often did they do so in the month before the interview. We use this information to construct two individual-level variables: 1) a dichotomous variable *alcohol incidence at the individual level,* which is equal to 1 if the interviewee reported alcohol consumption and 0 otherwise; and 2) a categorical variable *frequency of alcohol consumption* ranging from 0 to 5, where 0 corresponds to no consumption of alcohol in the past, 1 corresponds to alcohol consumption in the past but not in the month before the interview, 2 corresponds to 1-3 times in the month before the interview, and 3, 4 and 5

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correspond to consuming alcohol 1-3, 4-6 and 7 days a week, respectively. In addition, people

who reported the consumption of alcohol were asked about the volume of different types of

alcohol (beer, spirits, vodka) consumed. Using this information, we construct two continuous

variables capturing the *amount* of consumed *beer* and *vodka*, which we express in millilitres

(ml). According to the World Health Organization (2014a), beer and spirits are the main types of

alcoholic beverages consumed in Kyrgyzstan, constituting, respectively, 23% and 73% of all

alcohol consumption (in terms of pure alcohol); our data also confirm a strong preference for

beer and vodka to other types of alcohol in Kyrgyzstan. Finally, following the World Health

Organization (2014b) codebook, we also obtain the volume of *pure alcohol* (in ml) of all types of

alcoholic beverages consumed by an individual.

4.2.2. Main regressor(s)

From the household-level questionnaires we use two migration-related questions: 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 – som) did you receive from members of this household staying

abroad?" Combining the answers to these two questions, we construct two non-overlapping

variables: 1) a continuous variable *amount of remittances* (we use a log-transformation of this

variable) 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?" We use this information to create a dichotomous

variable capturing *recent migration experience* (which could be either circular or return

migration) at the individual level, as well as to create a dichotomous household-level variable capturing the recent migration experience of at least one household member. We 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), and one dichotomous variable capturing recent return/circular migration at the individual level.

4.2.3. Control variables

Our set of control variables includes individual's age, seven age groups, gender, marital status (single, married, separated, widowed), three levels of education (primary, secondary, tertiary), employment status (in labour force or not), ethnicity (Kyrgyz, Russian, Uzbek, other), subjective health (drawing on the question "How satisfied are you with your health?", measured on a scale from 0 (completely dissatisfied) to 10 (completely satisfied)), type of residence (rural or urban) and region of residence (seven dummies for regions and two main cities). We also use individual income groups (no income; 0-4000 som; 4000-8000 som; >8000 som; non-reported income) and a household wealth/asset index, based on whether the household possesses specific types of assets (see Supplementary Information for the full list), from which we extract the first component (Eigenvalue = 4.982). The analysis of the variance inflation factors (VIF), reported in Table S1a of the Supplementary Information document, suggests that the risk of multicollinearity is low (all VIFs are lower than 10).

The summary statistics of all the variables, for the whole sample as well as for migrant/non-migrant households and ethnic Kyrgyz/ethnic Russian respondents, are available in the Supplementary Information document.

4.3. Estimation strategy

The model to be estimated can be expressed as follows:

$$A_{ijt} = \beta_1 * M_{jt} + B * X'_{ijt} + \rho + \tau_t + \nu_i + \varepsilon_{ijt} \tag{1}$$

where, for individual i from household j in year t, A stands for variables capturing alcohol consumption (incidence of alcohol consumption, frequency of alcohol consumption, volume of beer consumed, volume of spirits consumed, volume of all alcoholic beverages consumed (in pure alcohol)), M stands for 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), X is a vector of individual-level controls (including personal migration experience), ρ are the region-fixed effects, τ are year-fixed effects, ν are individual-fixed effects, and ε is the idiosyncratic error term.

Where the outcome variable is binary (incidence of alcohol consumption), we will estimate the models with binary logit. For all other outcomes, which take the value of zero if the respondents does not consume alcohol and some positive value if s/he does, we will estimate the models with tobit. For all outcomes, we will first estimate pooled models, which do not take into account

unobserved individual or household heterogeneity (i.e., without the individual-fixed effects in Equation 1). This will provide us with a profile of typical consumers of alcohol in Kyrgyzstan. We will then take advantage of the longitudinal nature of the data and estimate models with the individual-fixed effects; this will allow us to see whether the changes in individual/household migration status are associated with the changes in alcohol consumption.

5. RESULTS

Table 1 reports the results of a pooled cross-sectional analysis (logit and tobit marginal effects), which does not account for the unobserved heterogeneity of individuals. The results suggest that, in Kyrgyzstan, people who receive greater amounts of migrant remittances are more likely to consume alcohol in general, consume alcohol more frequently, and consume greater amounts of alcohol (pure alcohol equivalent). Specifically, an increase of one percent in the value of received migrant remittances is associated with a 0.2 percentage point greater likelihood of consuming alcoholic beverages, more frequent consumption of alcohol (an increase of 0.009 on a 0 to 5 scale), as well as a greater amount of alcohol consumed (0.28 ml in terms of pure alcohol equivalent). At the same time, people with relatives abroad who do not send remittances back home are 2.6 percentage points less likely to consume alcohol in general; they also consume alcohol less frequently (by 0.105 units on a 0 to 5 scale) and consume lower amounts of alcohol (beer, vodka and pure alcohol equivalent). The associations between being a return/circular migrant and having a circular/return migrant in the household, on the one hand, and all alcohol consumption variables, on the other, are statistically insignificant.

Among the control variables, both younger and older people consume alcohol less than those in the middle of the age distribution (age 35-44). This finding is consistent with the previous literature showing that age, when included in the analysis as a continuous linear variable, is not a statistically significant predictor of either frequent drinking or heavy vodka drinking in Kyrgyzstan (Cockerham et al., 2004) and that alcohol consumption is highest among the middle-aged in a post-Soviet context (Cockerham, 2000). It also corroborates the fact that, in the context of re-Islamisation that has been taking place in Kyrgyzstan (and other Central Asian countries) since the dissolution of the Soviet Union, young people are particularly likely to turn to religion, including radical, non-traditional forms of Islam (Heyat, 2004; ICG, 2016), which could lead to more conservative attitudes towards consuming alcohol among the young.

Women and single people are less likely to consume alcohol. Relative to respondents with secondary education, both the primary and tertiary educated are less likely to consume alcohol and less likely to consume it frequently; in addition, the tertiary educated drink less beer in particular. The association with income groups is mostly insignificant, except for the significantly lower consumption of beer by respondents with no income. This said, respondents with more household assets drink alcohol more frequently; they also tend to drink more beer and less vodka. Being in the labour force is associated with more frequent alcohol consumption and more prolific consumption of vodka in particular. As expected, relative to ethnic Kyrgyzs, ethnic Russians are more frequent and more prolific drinkers, while the other ethnic minorities tend to consume alcohol less. Those satisfied with their health are more likely to consume alcohol in general and consume it more often, but not necessarily more likely to consume greater amounts

of any type of alcoholic beverages. Finally, respondents from rural areas are less likely to consume alcohol.

Table 1. International migration and consumption of alcohol in Kyrgyzstan, pooled-cross-section logit and tobit marginal effects

| | Drinking incidence | Drinking frequency | Amount of alcohol consumed (ml) | | |
			Equiv. of pure alcohol	Beer	Vodka
	Logit	Tobit	Tobit	Tobit	Tobit
Value of remittances (ln)	0.002***	0.009***	0.282**	1.206	0.561*
Migrant in the household but no remittances	-0.026**	-0.105**	-5.707***	-50.109*	-12.879***
Returned/circular migrant in the household	0.010	0.046	-0.056	-1.292	-3.455
Respondent is return/circular migrant	0.018	0.121	1.039	27.322	7.485
Age group					
18-24	-0.158***	-0.766***	-26.046***	-95.228***	-74.242***
25-34	-0.062***	-0.298***	-9.550***	-14.622	-29.254***
35-44	Ref.	Ref.	Ref.	Ref.	Ref.
45-54	0.016**	0.056*	3.549***	-24.275*	11.499***
55-64	-0.008	-0.038	-1.314	-98.939***	3.918
65-74	-0.073***	-0.347***	-12.151***	-230.112***	-18.420***
75+	-0.135***	-0.642***	-25.151***	-1,601.6***	-49.307***
Male	0.219***	1.048***	37.757***	306.366***	89.325***
Marital status					
Single	Ref.	Ref.	Ref.	Ref.	Ref.
Married/with partner	0.041***	0.185***	6.871***	39.013**	20.435***
Separated/divorced	0.081***	0.360***	13.571***	75.145***	36.596***
Widowed	0.062***	0.280***	10.963***	17.471	35.197***
Education					
Primary	-0.014*	-0.072**	-0.529	-17.913	-1.835
Secondary	Ref.	Ref.	Ref.	Ref.	Ref.
Tertiary	-0.015**	-0.063*	-3.055**	-52.866***	-4.778
Income group					
No income	-0.013	-0.066	-1.141	-75.279***	2.087
0-4000 som	-0.004	-0.018	0.212	-4.394	1.227
4000-8000 som	Ref.	Ref.	Ref.	Ref.	Ref.
> 8000 som	-0.001	0.002	0.335	18.508	-2.424
Wealth index	0.002	0.010*	-0.033	8.376***	-1.442**
In labour force	0.049***	0.250***	6.227***	-8.860	18.300***
Ethnicity					
Kyrgyz	Ref.	Ref.	Ref.	Ref.	Ref.
Uzbek	-0.126***	-0.603***	-19.891***	-159.698***	-44.594***
Russian	0.109***	0.510***	16.533***	154.656***	29.007***
Other	-0.082***	-0.391***	-13.829***	-62.615***	-35.907***
Health satisfaction	0.003***	0.012**	0.246	3.349	0.443
Rural area	-0.021***	-0.116***	-3.905***	-32.464**	-9.393***
Region-fixed effects	Yes	Yes	Yes	Yes	Yes
Year-fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	29,339	29,339	28,222	28,222	28,222
Prob > Chi^2	0.000	0.000	0.000	0.000	0.000

Notes: *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors, clustered at the individual and household level, used to calculate the regressors' level of significance. See Table S1 of Supplementary Information for complete econometric output.

While the results presented in Table 1 are helpful for establishing the general profile of people consuming alcohol in Kyrgyzstan, they do not allow us to determine how the changes over time in migration within a household are related to the changes over time in alcohol consumption of the same household members. Augmenting the model with the individual-fixed effects (effectively, a set of dummies for each individual) enables us to conduct such within-individual/household analysis; these results are reported in Table 2. Note that the individual fixed-effects estimations exclude time-invariant characteristics, such as gender and ethnicity, while the age effects are now captured by the year dummies.

Table 2. International migration and consumption of alcohol in Kyrgyzstan, individual fixed-effects logit and tobit results

	Drinking incidence	Drinking frequency	Amount of alcohol consumed (ml)		
			Equiv. of pure alcohol	Beer	Vodka
	FE Logit	FE Tobit	FE Tobit	FE Tobit	FE Tobit
Value of remittances (ln)	0.004	0.023	0.286	46.891*	-0.947
Migrant in the household but no remittances	-0.039	-0.133	-26.607*	-163.144	-66.238
Returned/circular migrant in the household	0.002	0.102	28.463	329.636	51.823
Respondent is return/circular migrant	0.000	0.073	-64.935**	-486.392	-175.07**
Marital status					
Single	Ref.	Ref.	Ref.	Ref.	Ref.
Married/with partner	0.015	-0.319	16.086	-572.82*	111.503*
Separated/divorced	-0.029	-0.781	0.501	-265.175	44.034
Widowed	0.066	0.203	32.469	-462.576	162.525
Education					
Primary	Ref.	Ref.	Ref.	Ref.	Ref.
Secondary	0.034	0.194	26.502	285.412	44.660
Tertiary	0.081	0.359	48.933	578.659	90.456
Income group					
No income	-0.012	-0.175	20.394	-412.366	65.890
0-4000 som	-0.015	-0.177	3.382	66.456	-8.467
4000-8000 som	Ref.	Ref.	Ref.	Ref.	Ref.
> 8000 som	0.005	0.002	9.001	299.603*	3.889
Wealth index	0.006	0.058	1.183	26.560	4.639
In labour force	0.094***	0.842***	21.716	-469.330	82.370*
Health satisfaction	0.007**	0.053**	2.344	23.961	8.041*
Rural area	-0.102**	-1.958	-1.387	-7.530	-1.373
Region-fixed effects	Yes	Yes	Yes	Yes	Yes
Year-fixed effects	Yes	Yes	Yes	Yes	Yes
Individual-fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	8,122	29,339	28,222	28,222	28,222
Prob > Chi^2	0.000	0.000	0.000	0.000	0.000

Notes: *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors, clustered at the household level, used to calculate the regressors' level of significance. Marginal effects reported for the FE logit model, and coefficients reported for the FE Tobit model (the calculation of marginal effects not possible after the *pantob* command in Stata used to estimate the FE tobit models). The *clogit* command in Stata used to calculate the FE logit model only uses observations where the outcome changes over time, hence a lower sample size. See Table S2 of Supplementary Information for complete econometric output.

The results of the fixed-effects estimations show that the coefficients of all four migration variables are statistically insignificant in the drinking incidence and the drinking frequency models (Columns 1 and 2 of Table 2). However, a one percent increase in the value of

remittances is associated with a greater consumption of beer, while the association between remittances and consumed vodka and pure alcohol equivalent are statistically insignificant. The departure of a migrant abroad that is not followed by a transfer of remittances back home is associated with a decrease in the amount of alcohol consumed (in terms of pure alcohol equivalent); the estimated coefficients of the variable in other specifications are negative but statistically insignificant. The association between having a return/circular migration within a household and a change in the consumption of alcohol among non-migrant household members is statistically insignificant. Finally, becoming a circular migrant is associated with a lower amount of consumed vodka and pure alcohol equivalent but not beer.

In terms of control variables, getting married is associated with a greater consumption of vodka and a lower consumption of beer. Moving into the highest income category is associated with a greater consumption of beer. Both joining the labour force and reporting greater health satisfaction is associated with a greater incidence of alcohol consumption, more frequent alcohol consumption, and greater amounts of consumed vodka. Finally, moving to a rural area is associated with a lower likelihood of consuming alcohol.

The next set of regressions explores the relationship between the emigration of household members and alcohol consumption among the ethnic Kyrgyz and ethnic Russians (Panel A and B of Table 3); to save space we only report the coefficients of the variables of interest. For the ethnic Kyrgyz, an increase in migrant remittances by 1 percent is associated with a 0.6 percentage point higher probability of consuming alcohol, a higher frequency of consuming alcohol and a greater amount of consumed beer. The departure of a migrant who does not send

remittances back home is associated with a lower consumption of vodka (and pure alcohol equivalent). Finally, becoming a circular/return migrant is associated with a lower consumption of vodka.

For ethnic Russians, the emigration of a household member who does not send remittances back home is associated with an increase of 26 percentage points in the likelihood of consuming alcohol as well as a greater frequency of doing so. The coefficients of other migration variables are insignificant in all specifications.

Table 3. International migration and consumption of alcohol in Kyrgyzstan, individual fixed-effects logit and tobit results, for ethnic Kyrgyz and ethnic Russians

| | Drinking incidence | Drinking frequency | Amount of alcohol consumed (ml) | | |
| | | | Equiv. of pure alcohol | Beer | Vodka |
	FE Logit	FE Tobit	FE Tobit	FE Tobit	FE Tobit
A.ETHNIC KYRGYZ					
Value of remittances (ln)	0.006**	0.037*	0.622	44.971**	-0.456
Migrant in the household but no remittances	-0.060	-0.327	-45.586***	-187.538	-125.415***
Returned/circular migrant in the household	0.033	0.337	20.257	-262.463	83.479
Respondent is return/circular migrant	0.026	0.338	-57.085	485.224	-226.476**
Individual controls	Yes	Yes	Yes	Yes	Yes
Region-fixed effects	Yes	Yes	Yes	Yes	Yes
Year-fixed effects	Yes	Yes	Yes	Yes	Yes
Individual-fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	5,970	19,517	18,751	18,751	18,751
Prob > Chi^2	0.000	0.000	0.000	0.000	0.000
B.ETHNIC RUSSIANS					
Value of remittances (ln)	-0.002	0.069	-1.257	45.871	-11.637
Migrant in the household but no remittances	0.261*	1.349***	64.809	694.975	207.520
Returned/circular migrant in the household	-0.069	-0.315	2.468	-154.539	-162.863
Respondent is return/circular migrant	0.051	0.637	-79.819	-2017.912	40.279
Individual controls	Yes	Yes	Yes	Yes	Yes
Region-fixed effects	Yes	Yes	Yes	Yes	Yes
Year-fixed effects	Yes	Yes	Yes	Yes	Yes
Individual-fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	995	2,781	2,566	2,566	2,566
Prob > Chi^2	0.000	0.000	0.000	0.000	0.000

Notes: *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Robust standard errors, clustered at the household level, used to calculate the regressors' level of significance. The same individual controls as in Table 2 included in all regressions. Marginal effects reported for the FE logit model, and coefficients reported for the FE Tobit model (the calculation of marginal effects not possible after the *pantob* command in Stata used to estimate the FE Tobit models). The *clogit* command in Stata used to calculate the FE Logit model only uses observations where the outcome changes over time, hence a lower sample size. See Table S3 of Supplementary Information for complete econometric output.

6. DISCUSSION AND CONCLUSION

6.1. Discussion

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 household members staying behind. We first outlined possible reasons why emigration may affect alcohol consumption among those 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. We then tested the relationship between the two phenomena using a large household panel survey, conducted in Kyrgyzstan in 2010-2013. The fact that the survey interviews were conducted with the same individuals over time allowed us to relate the *changes* in the household migration status to *changes* in individuals' alcohol consumption. This helped mitigate a potential endogeneity concern where both emigration and alcohol consumption are driven by the some unaccounted for household-level characteristics.

The full-sample results suggested that the increase in the amount of received migrant monetary remittances was associated with a higher consumption of beer. This finding lends some support for our first hypothesis – that emigration of household members is associated with greater alcohol consumption among those staying behind – possibly through the relaxation of budget constraints (provided that beer is a normal good). We also found that the departure of household members that is not followed by the receipt of remittances is associated with lower volumes of consumed alcohol (in terms of pure alcohol equivalent). This may be an indication of the household budget channel working in the opposite direction: if before departure migrants were earning money in the home country, emigration that is not followed by the receipt of remittances would reduce household incomes.

In a further analysis of the relationship between the emigration of household members and the alcohol consumption of those staying behind, we found important differences between the ethnic Kyrgyz and ethnic Russians. Among ethnic Kyrgyz, an increase in migrant monetary remittances was associated with an increase in the likelihood and frequency of alcohol consumption, as well as a higher amount of consumed beer. These findings point to the household budget relaxation channel. The fact that people drink more beer rather than vodka as remittances increase may reflect the common finding in the literature that remittances are disproportionately spent on high-status, luxury products: in an environment where three quarters of consumed alcohol beverages are spirits (mainly vodka), beer may be considered a more sophisticated, high-status alternative to vodka. We also found that, among ethnic Kyrgyz, the departure of household members who do not send remittances back home is associated with a reduction in the amount of consumed vodka. This again would support the household budget relaxation (or, more precisely, tightening) channel – if migrants contributed to the household budget prior to departure.

A different picture emerges for ethnic Russians. First, an increase in monetary remittances is not associated with an increase in the likelihood, frequency or volume of consumed alcohol, implying that the relaxation of budget constraints mechanism is not at work for this ethnic group. A possible explanation is that the already higher-than-average consumption of alcohol among ethnic Russians – as highlighted in the literature (Guillot et al., 2013) and confirmed by our analysis (Table 1) – has little room to increase further in response to bigger household budgets. At the same time, we find that the emigration of household members who do not send remittances back home is associated with an increased likelihood and frequency of alcohol consumption among ethnic Russians staying behind. This type of emigration could increase

alcohol consumption either through social remittances or psychological distress channels. Given that the former is unlikely to be at work for Kyrgyzstan's ethnic Russians (because the majority of migrants go to Russia), we are left with the emotional distress channel – people turn to alcohol to mitigate the pain of separation from their loved ones. It is noteworthy that we do not observe a similar effect for ethnic Kyrgyz (for this group, the emigration of household members who do not send remittances back home is not associated with an increase in alcohol consumption). It is an open question as to whether the ethnic Kyrgyz experience less psychological distress than ethnic Russians when family members emigrate (unlikely), or alcohol is a more important mechanism of coping with psychological distress for ethnic Russians than ethnic Kyrgyz (likely); we leave this question for future research.

6.2. Limitations and future research

Our work is not without limitations, which open directions for future research. First, while we have provided some insights into whether emigration drives the alcohol consumption of those left behind through the relaxation of budget constraints or psychological distress, a direct test and disentanglement of the "social remittances" mechanism (Levitt, 1998) 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, our results have shown that circular/return migration is associated with lower alcohol consumption. We have refrained from providing an interpretation for this result. This is partially

because the focus of our paper is on those staying behind (rather than migrants themselves) and partially 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 an important direction for future research.

Third, due to data restrictions we have not been able to explore the effects of household member emigration on other alcohol-related outcomes, such as alcohol dependency, alcohol use disorders or alcohol-related disease. A look at such outcomes would capture the effect of emigration on alcohol-related health issues more directly, and we leave such explorations for future research.

Fourth,

6.3. Conclusion

This paper explored the links between emigration, migrant monetary transfers (remittances), and alcohol consumption of migrant household members staying behind. Using longitudinal data from Kyrgyzstan, a poor post-socialist country that has recently experienced both high out-migration and a growth in alcohol-related health problems, we found that an increase in remittances is associated with a greater likelihood and frequency of alcohol consumption, as well as a greater amount of consumed beer among the ethnic Kyrgyz. Among ethnic Russians, the

likelihood and frequency of alcohol consumption increases when family members emigrate but do not send remittances back home. Possible theoretical mechanisms to explain these results include the relaxation of budget constraints through remittances and attempts to cope with the pain of separation with alcohol. Overall, our study suggests that the emigration of household members may increase the likelihood and frequency of alcohol consumption as well as the amount of consumed alcohol, and highlights the importance of remittances and ethnic/cultural background in understanding the nuances in this relationship.

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SUPPLEMENTARY INFORMATION

Contents

LIST OF THE ASSETS INCLUDED IN THE CALCULATION OF THE HOUSEHOLD WEALTH INDEX

Property/ Vehicles:
Main dwelling
Another house/another flat
Garage
Bicycle
Motorcycle, scooter
Car, minibus
Tractor, truck, other agricultural machine

Domestic appliance/Furniture:
Refrigerator
Gas stove
Electric stove
Microwave
Air conditioner
Sewing machine
Washing machine
Vacuum cleaner
Sofa
Wardrobe
Bed
Kitchen furniture

Media appliances:
Radio/Cassette player
Complete music system
Television
Video/DVD player
Video camera
Photo camera
Digital photo camera
Personal computer/Laptop
Satellite dish
Mobile phone
Landline phone
Internet connection

SUMMARY STATISTICS OF THE VARIABLES INCLUDED IN THE ANALYSIS

	Full sample (n=29339)				Non-migrant households		Migrant households[a]	
					Ethnic Kyrgyz (n=16,008)	Ethnic Russians (n=2,667)	Ethnic Kyrgyz (n=3,509)	Ethnic Russians (n=104)
	Mean	Std. Dev.	Min	Max	Mean	Mean	Mean	Mean
Incidence of alcohol consumption	0.167	0.373	0	1	0.179	0.303	0.179	0.375
Frequency of alcohol consumption	0.666	1.523	0	5	0.714	1.210	0.716	1.510
Pure alcohol (ml)	14.364	54.712	0	1625	15.478	26.580	15.160	34.355
Beer (ml)	48.094	305.068	0	10000	49.390	109.826	41.891	209.677
Vodka (ml)	28.351	120.579	0	4000	31.139	47.865	31.465	51.075
Value of remittances (ln)	1.180	3.282	0	13.592	0	0	7.315	3.123
Migrant in the household but no remittances	0.042	0.201	0	1	0	0	0.250	0.365
Returned/circular migrant in the household	0.044	0.206	0	1	0	0	0.210	0.365
Respondent is return/circular migrant	0.014	0.118	0	1	0	0	0.062	0.173
Age 18-24	0.186	0.389	0	1	0.187	0.107	0.177	0.106
Age 25-34	0.216	0.412	0	1	0.232	0.182	0.190	0.154
Age 35-44	0.186	0.389	0	1	0.208	0.137	0.119	0.135
Age 45-54	0.199	0.399	0	1	0.188	0.183	0.268	0.250
Age 55-64	0.125	0.331	0	1	0.105	0.210	0.164	0.240
Age 65-74	0.050	0.218	0	1	0.044	0.108	0.055	0.067
Age 75+	0.037	0.190	0	1	0.036	0.073	0.029	0.048
Male	0.468	0.499	0	1	0.483	0.396	0.459	0.452
Single	0.164	0.370	0	1	0.170	0.165	0.155	0.192
Married	0.700	0.458	0	1	0.709	0.543	0.723	0.606
Separated	0.054	0.226	0	1	0.047	0.118	0.042	0.087
Widowed	0.082	0.274	0	1	0.074	0.174	0.080	0.115
Ethnic Kyrgyz	0.665	0.472	0	1	1	0	1	0
Ethnic Uzbek	0.131	0.338	0	1	-	-	-	-

Ethnic Russian	0.095	0.293	0	1	0	1	0	1
Other ethnicity	0.109	0.312	0	1	-	-	-	-
Primary education	0.178	0.382	0	1	0.147	0.171	0.119	0.269
Secondary education	0.659	0.474	0	1	0.666	0.565	0.750	0.577
Tertiary education	0.163	0.370	0	1	0.187	0.264	0.131	0.154
No income	0.464	0.499	0	1	0.459	0.377	0.512	0.423
Income 0-4000 som	0.131	0.337	0	1	0.138	0.106	0.119	0.192
Income 4000-8000 som	0.155	0.362	0	1	0.161	0.215	0.142	0.163
Income > 8000 som	0.160	0.367	0	1	0.167	0.228	0.113	0.106
Income not reported	0.090	0.286	0	1	0.075	0.074	0.113	0.115
Household wealth index	0.073	2.209	-4.506	10.269	-0.063	1.540	-0.208	0.370
In labour force	0.532	0.499	0	1	0.552	0.564	0.509	0.481
Health satisfaction	6.984	2.473	0	10	7.076	6.478	7.359	6.269
Lives in rural area	0.628	0.483	0	1	0.659	0.258	0.776	0.433
Bishkek	0.173	0.378	0	1	0.175	0.533	0.052	0.279
IssykKul region	0.082	0.275	0	1	0.123	0.109	0.026	0.077
JalalAbad region	0.153	0.360	0	1	0.140	0.021	0.309	0.077
Naryn region	0.044	0.206	0	1	0.073	0	0.006	0
Batken region	0.081	0.273	0	1	0.088	0.004	0.151	0.038
Osh region	0.211	0.408	0	1	0.193	0	0.327	0
Talas region	0.037	0.188	0	1	0.054	0.014	0.044	0.125
Chui region	0.171	0.376	0	1	0.130	0.296	0.053	0.346
Osh city	0.048	0.213	0	1	0.026	0.022	0.030	0.058

Note: ᵃ migrant household if any of the variables "value of remittances", "migrant in the household but no remittances", "returned/circular migrant in the household", "respondent is return/circular migrant" takes the value greater than 0.

Table S1. International migration and consumption of alcohol in Kyrgyzstan, pooled-cross-section logit and tobit marginal effects (corresponds to Table 1 of the manuscript)

| | Drinking incidence | Drinking frequency | Amount of alcohol consumed (ml) | | |
			Equiv. of pure alcohol	Beer	Vodka
	Logit	Tobit	Tobit	Tobit	Tobit
Value of remittances (ln)	0.002***	0.009***	0.282**	1.206	0.561*
	(0.001)	(0.003)	(0.125)	(1.696)	(0.316)
Migrant in the household but no remittances	-0.026**	-0.105**	-5.707***	-50.109*	-12.879***
	(0.010)	(0.051)	(1.774)	(26.098)	(4.613)
Returned/circular migrant in the household	0.010	0.046	-0.056	-1.292	-3.455
	(0.011)	(0.055)	(2.030)	(31.751)	(5.264)
Respondent is return/circular migrant	0.018	0.121	1.039	27.322	7.485
	(0.019)	(0.093)	(3.580)	(46.726)	(9.438)
Age 18-24	-0.158***	-0.766***	-26.046***	-95.228***	-74.242***
	(0.012)	(0.056)	(2.087)	(22.447)	(5.922)
Age 25-34	-0.062***	-0.298***	-9.550***	-14.622	-29.254***
	(0.008)	(0.036)	(1.312)	(14.150)	(3.508)
Age 45-54	0.016**	0.056*	3.549***	-24.275*	11.499***
	(0.007)	(0.032)	(1.186)	(14.175)	(3.010)
Age 55-64	-0.008	-0.038	-1.314	-98.939***	3.918
	(0.009)	(0.041)	(1.479)	(19.645)	(3.699)
Age 65-74	-0.073***	-0.347***	-12.151***	-230.112***	-18.420***
	(0.015)	(0.069)	(2.531)	(37.945)	(6.249)
Age 75+	-0.135***	-0.642***	-25.151***	-1,601.59***	-49.307***
	(0.019)	(0.091)	(3.454)	(17.328)	(8.374)
Male	0.219***	1.048***	37.757***	306.366***	89.325***
	(0.006)	(0.026)	(1.303)	(14.934)	(3.337)
Married	0.041***	0.185***	6.871***	39.013**	20.435***
	(0.010)	(0.051)	(1.772)	(18.552)	(5.174)
Divorced/Separated	0.081***	0.360***	13.571***	75.145***	36.596***
	(0.015)	(0.071)	(2.551)	(26.708)	(6.961)
Widowed	0.062***	0.280***	10.963***	17.471	35.197***
	(0.016)	(0.077)	(2.690)	(39.521)	(7.281)
Ethnic Uzbek	-0.126***	-0.603***	-19.891***	-159.698***	-44.594***
	(0.010)	(0.048)	(1.763)	(22.856)	(4.506)
Ethnic Russian	0.109***	0.510***	16.533***	154.656***	29.007***
	(0.010)	(0.043)	(1.684)	(17.069)	(4.553)
Other ethnicity	-0.082***	-0.391***	-13.829***	-62.615***	-35.907***
	(0.011)	(0.053)	(1.912)	(21.995)	(4.982)
Less than secondary education	-0.014*	-0.072**	-0.529	-17.913	-1.835
	(0.007)	(0.035)	(1.253)	(14.751)	(3.221)
Tertiary education	-0.015**	-0.063*	-3.055**	-52.866***	-4.778
	(0.007)	(0.035)	(1.235)	(14.471)	(3.211)
No income	-0.013	-0.066	-1.141	-75.279***	2.087
	(0.009)	(0.044)	(1.576)	(22.083)	(4.105)

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0-4000 som	-0.004	-0.018	0.212	-4.394	1.227
	(0.007)	(0.034)	(1.214)	(15.636)	(3.112)
> 8000 som	-0.001	0.002	0.335	18.508	-2.424
	(0.007)	(0.033)	(1.139)	(13.338)	(2.990)
Income not reported	-0.039***	-0.166**	-6.697***	-98.242***	-9.987
	(0.014)	(0.065)	(2.327)	(34.620)	(6.109)
Household wealth index	0.002	0.010*	-0.033	8.376***	-1.442**
	(0.001)	(0.006)	(0.215)	(2.397)	(0.579)
In labour force	0.049***	0.250***	6.227***	-8.860	18.300***
	(0.009)	(0.043)	(1.533)	(21.535)	(4.015)
Health satisfaction	0.003***	0.012**	0.246	3.349	0.443
	(0.001)	(0.005)	(0.178)	(2.115)	(0.459)
Lives in village	-0.021***	-0.116***	-3.905***	-32.464**	-9.393***
	(0.008)	(0.036)	(1.308)	(15.062)	(3.239)
IssykKul region	0.076***	0.387***	11.418***	-2.797	35.325***
	(0.013)	(0.059)	(2.155)	(23.716)	(5.712)
JalalAbad region	0.068***	0.318***	12.217***	50.343**	36.423***
	(0.011)	(0.052)	(1.960)	(20.098)	(5.156)
Naryn region	0.054***	0.225***	10.266***	-13.135	32.172***
	(0.014)	(0.065)	(2.379)	(26.678)	(6.350)
Batken region	-0.034**	-0.172***	-6.415***	-152.256***	-2.998
	(0.013)	(0.062)	(2.241)	(30.730)	(5.838)
Osh region	-0.014	-0.088	-1.196	-70.473***	7.713
	(0.012)	(0.057)	(2.085)	(22.666)	(5.553)
Talas region	0.138***	0.676***	13.435***	11.014	46.285***
	(0.015)	(0.069)	(2.438)	(29.148)	(6.225)
Chui region	0.053***	0.276***	7.870***	-23.810	28.692***
	(0.012)	(0.054)	(1.943)	(21.818)	(5.148)
Osh city	0.041***	0.179**	7.285***	41.575	16.857**
	(0.016)	(0.075)	(2.674)	(28.207)	(7.303)
Year 2011	-0.025***	-0.105***	-5.633***	-3.990	-13.894***
	(0.005)	(0.023)	(0.814)	(10.997)	(2.161)
Year 2012	-0.028***	-0.130***	-3.453***	-10.155	-6.196***
	(0.005)	(0.024)	(0.856)	(11.790)	(2.225)
Year 2013	-0.008	-0.031	-7.085***	12.972	-19.594***
	(0.006)	(0.028)	(0.984)	(13.752)	(2.670)
Observations	29,339	29,339	28,222	28,222	28,222
Prob > Chi^2	0.000	0.000	0.000	0.000	0.000

Notes: *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors, clustered at the individual and household level, in parentheses. Omitted categories are: Age 35-44; single; secondary education, Income 4000-8000 som; ethnic Kyrgyz; Bishkek city; year 2010.

Table S1a. Variance Inflation Factors

Variable	VIF	1/VIF
No income	4.98	0.20
In labour force	3.94	0.25
Region: Osh	3.59	0.28
Income non reported	3.25	0.31
Region: JalalAbad	2.72	0.37
Married	2.71	0.37
Region: Chui	2.71	0.37
Age 18-24	2.49	0.40
Widowed	2.37	0.42
Village	2.18	0.46
Year 2013	2.15	0.46
Region: Batken	1.86	0.54
Region: IssykKul	1.79	0.56
Income > 8000 som	1.79	0.56
Age 25-34	1.78	0.56
Age 45-54	1.71	0.59
Income 0-4000 som	1.67	0.60
Year 2012	1.62	0.62
Age 55-64	1.60	0.62
Year 2011	1.59	0.63
Separated	1.58	0.63
Age group 75+	1.53	0.65
Region: Naryn	1.53	0.65
Age group 65-74	1.46	0.68
Region: Talas	1.43	0.70
Osh city	1.43	0.70
Household wealth index	1.35	0.74
Returned/circular migrant in the household	1.34	0.74
Respondent is return/circular migrant	1.3	0.77
Uzbek	1.28	0.78
Russian	1.28	0.78
Tertiary education	1.26	0.79
Other ethnicity	1.25	0.80
Health satisfaction	1.25	0.80
Male	1.22	0.82
Value of remittances (ln)	1.22	0.82
Primary education	1.20	0.83
Migrant in the household but no remittances	1.16	0.86

Note: variance inflation factors were calculated after estimating the drinking incidence model (the first result column in Table 1) with OLS.

Table S2. International migration and consumption of alcohol in Kyrgyzstan, individual fixed-effects logit and tobit results (corresponds to Table 2 of the manuscript)

	Drinking incidence	Drinking frequency	Amount of alcohol consumed (ml)		
			Equiv. of pure alcohol	Beer	Vodka
	FE Logit	FE Tobit	FE Tobit	FE Tobit	FE Tobit
Value of remittances (ln)	0.004	0.023	0.286	46.891*	-0.947
	(0.003)	(0.020)	(1.267)	(26.934)	(3.690)
Migrant in the household but no remittances	-0.039	-0.133	-26.607*	-163.144	-66.238
	(0.035)	(0.252)	(14.395)	(318.343)	(42.020)
Returned/circular migrant in the household	0.002	0.102	28.463	329.636	51.823
	(0.037)	(0.298)	(22.486)	(532.911)	(59.553)
Respondent is return/circular migrant	0.000	0.073	-64.935**	-486.392	-175.065**
	(0.056)	(0.511)	(29.306)	(695.528)	(85.797)
Married	0.015	-0.319	16.086	-572.822*	111.503*
	(0.056)	(0.484)	(23.334)	(328.610)	(66.049)
Divorced/Separated	-0.030	-0.781	0.501	-265.175	44.034
	(0.071)	(0.475)	(23.796)	(409.439)	(66.575)
Widowed	0.067	0.203	32.469	-462.576	162.525
	(0.088)	(0.746)	(40.919)	(415.357)	(107.481)
Less than secondary education	-0.034	-0.194	-26.502	-285.412	-44.660
	(0.054)	(0.387)	(26.968)	(570.376)	(61.204)
Tertiary education	0.048	0.165	22.432	293.246	45.796
	(0.077)	(0.637)	(36.401)	(514.682)	(176.638)
No income	-0.012	-0.175	20.394	-412.366	65.890
	(0.030)	(0.249)	(15.458)	(340.713)	(45.256)
0-4000 som	-0.015	-0.177	3.382	66.456	-8.467
	(0.022)	(0.157)	(10.083)	(199.341)	(28.799)
> 8000 som	0.006	0.002	9.001	299.603*	3.889
	(0.020)	(0.150)	(9.114)	(154.167)	(27.760)
Income not reported	-0.071*	-0.580	-63.131**	-742.232	-102.990
	(0.043)	(0.364)	(25.456)	(487.775)	(67.130)
Household wealth index	0.006	0.058	1.183	26.560	4.639
	(0.005)	(0.037)	(2.808)	(34.196)	(8.319)
In labour force	0.095***	0.842***	21.716	-469.330	82.370*
	(0.030)	(0.253)	(16.231)	(344.637)	(46.121)
Health satisfaction	0.007**	0.053**	2.344	23.961	8.041*
	(0.003)	(0.025)	(1.667)	(29.487)	(4.607)
Lives in village	-0.104**	-1.958	-1.387	-7.530	-1.373
	(0.041)	(3.827)	(0.000)	(0.000)	(0.000)
Year 2011	-0.061***	-0.271***	-12.583**	29.928	-40.843**
	(0.016)	(0.103)	(6.394)	(116.858)	(19.273)
Year 2012	-0.058***	-0.257**	20.447***	235.550**	40.194**
	(0.017)	(0.111)	(7.385)	(119.511)	(20.042)
Year 2013	0.006	0.178	-52.876***	674.560***	-225.465***
	(0.019)	(0.127)	(7.431)	(151.978)	(23.216)

Observations	8,122	29,339	28,222	28,222	28,222
Prob > Chi^2	0.000	0.000	0.000	0.000	0.000

Notes: *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors, clustered at the household level, in parentheses. Omitted categories are: single; secondary education, Income 4000-8000 som; year 2010. Marginal effects reported for the FE Logit model, and coefficients reported for the FE Tobit model (the calculation of marginal effects not possible after the *pantob* Stata command used to estimate the FE Tobit models).

Table S3A. International migration and consumption of alcohol among ethnic Kyrgyz, individual fixed-effects logit and tobit results (corresponds to Panel A of Table 3 of the manuscript)

| | Drinking incidence | Drinking frequency | Amount of alcohol consumed (ml) | | |
| | | | Equiv. of pure alcohol | Beer | Vodka |
	FE Logit	FE Tobit	FE Tobit	FE Tobit	FE Tobit
Value of remittances (ln)	0.006**	0.037*	0.622	44.971**	-0.456
	(0.003)	(0.020)	(1.360)	(21.245)	(4.103)
Migrant in the household but no remittances	-0.060	-0.327	-45.586***	-187.538	-125.415***
	(0.040)	(0.282)	(13.174)	(350.712)	(38.081)
Returned/circular migrant in the household	0.033	0.337	20.257	-262.463	83.479
	(0.044)	(0.352)	(24.007)	(345.177)	(67.138)
Respondent is return/circular migrant	0.026	0.338	-57.085	485.224	-226.476**
	(0.070)	(0.600)	(36.975)	(1,152.096)	(104.840)
Married	0.005	-0.361	6.713	-648.426**	80.966
	(0.061)	(0.502)	(23.779)	(317.170)	(68.445)
Divorced/Separated	0.062	-0.327	25.833	312.005	105.092
	(0.083)	(0.564)	(26.511)	(524.608)	(74.883)
Widowed	0.172	0.843	38.791	-935.249**	192.884
	(0.106)	(0.810)	(47.774)	(476.607)	(124.737)
Less than secondary education	-0.003	0.038	-0.636	557.405	-49.147
	(0.063)	(0.478)	(29.267)	(595.888)	(71.828)
Tertiary education	0.059	0.390	64.702**	238.925	228.823*
	(0.084)	(0.750)	(32.596)	(763.143)	(132.868)
No income	-0.010	-0.161	13.479	-592.074	71.968
	(0.034)	(0.283)	(18.046)	(395.372)	(50.423)
0-4000 som	-0.027	-0.242	-7.327	-180.158	-18.034
	(0.025)	(0.179)	(12.184)	(215.234)	(33.443)
> 8000 som	-0.003	-0.028	5.075	24.206	10.375
	(0.024)	(0.171)	(11.047)	(209.642)	(31.114)
Income not reported	-0.086*	-0.713*	-83.800***	-1,570.850***	-127.713
	(0.050)	(0.425)	(31.205)	(581.080)	(83.899)
Household wealth index	0.006	0.063	0.645	-40.121	5.428
	(0.006)	(0.047)	(3.520)	(51.004)	(9.197)
In labour force	0.115***	0.985***	14.079	-593.645	75.936
	(0.033)	(0.289)	(18.542)	(399.031)	(48.689)
Health satisfaction	0.005	0.036	3.540*	28.728	9.347*
	(0.004)	(0.030)	(1.926)	(35.439)	(5.321)
Lives in village	-0.086*	-1.781	-1.949	-7.458	-3.273
	(0.047)	(3.846)	(0.000)	(0.000)	(0.000)
Year 2011	-0.071***	-0.356***	-20.070***	3.929	-62.181***
	(0.018)	(0.123)	(7.343)	(153.763)	(20.370)
Year 2012	-0.059***	-0.316**	27.061***	378.161**	58.215**
	(0.020)	(0.134)	(9.269)	(149.852)	(24.435)
Year 2013	0.010	0.129	-56.080***	795.025***	-224.914***
	(0.022)	(0.149)	(9.262)	(190.995)	(27.350)

Observations	5,970	19,517	18,751	18,751	18,751
Prob > Chi^2	0.000	0.000	0.000	0.000	0.000

Notes: *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors, clustered at the household level, in parentheses. Omitted categories are: single; secondary education, Income 4000-8000 som; year 2010. Marginal effects reported for the FE Logit model, and coefficients reported for the FE Tobit model (the calculation of marginal effects not possible after the *pantob* Stata command used to estimate the FE Tobit models).

Table S3B. International migration and consumption of alcohol among ethnic Russians, individual fixed-effects logit and tobit results (corresponds to Panel B of Table 3 of the manuscript)

	Drinking incidence	Drinking frequency	Amount of alcohol consumed (ml)		
			Equiv. of pure alcohol	Beer	Vodka
	FE Logit	FE Tobit	FE Tobit	FE Tobit	FE Tobit
Value of remittances (ln)	-0.002	0.069	-1.257	45.872	-11.637
	(0.017)	(0.059)	(5.562)	(92.692)	(15.211)
Migrant in the household but no remittances	0.304**	1.349***	64.809	694.975	207.520
	(0.146)	(0.489)	(47.245)	(709.092)	(181.820)
Returned/circular migrant in the household	-0.080	-0.315	2.468	-154.539	-162.863
	(0.147)	(0.739)	(53.039)	(464.802)	(160.089)
Respondent is return/circular migrant	0.059	0.637	-79.819	-2,017.912	40.279
	(0.177)	(1.046)	(79.679)	(0.000)	(473.352)
Married	0.018	0.257	62.872	-429.561	270.913*
	(0.186)	(0.940)	(47.454)	(1,009.070)	(153.267)
Divorced/Separated	-0.430**	-1.410*	-10.208	-1,429.333	-20.652
	(0.168)	(0.845)	(56.914)	(1,150.886)	(241.062)
Widowed	-0.227	-0.926	60.689	381.397	231.675
	(0.237)	(1.721)	(55.728)	(1,145.399)	(169.767)
Less than secondary education	-0.251*	-0.899	-180.826**	-3,871.605	-175.999
	(0.148)	(0.795)	(85.636)	(0.000)	(170.651)
Tertiary education	-0.228	-1.507	-71.371	3.715	-798.362
	(0.210)	(0.993)	(79.611)	(719.509)	(0.000)
No income	-0.021	-0.047	53.194	159.361	-38.909
	(0.128)	(0.631)	(60.131)	(388.112)	(137.906)
0-4000 som	0.057	0.178	62.185**	266.463	140.467
	(0.076)	(0.473)	(31.565)	(400.840)	(116.685)
> 8000 som	0.068	0.136	33.668*	757.583***	23.083
	(0.058)	(0.325)	(19.769)	(255.099)	(89.233)
Income not reported	-0.171	-1.027	5.215	1,217.972	-162.806
	(0.145)	(0.838)	(69.078)	(758.417)	(169.860)
Household wealth index	0.002	0.052	2.308	206.483***	-15.844
	(0.013)	(0.083)	(4.395)	(68.312)	(22.334)
In labour force	0.045	0.655	66.324	-88.200	79.131
	(0.123)	(0.629)	(68.571)	(444.377)	(202.980)
Health satisfaction	0.008	0.059	2.406	60.822	19.393
	(0.008)	(0.049)	(4.058)	(59.927)	(17.108)
Lives in village	-	0.203	9.021	50.315	18.245
		(0.000)	(0.000)	(0.000)	(0.000)
Year 2011	0.004	0.248	25.584	-109.344	120.738
	(0.041)	(0.222)	(19.096)	(180.616)	(79.385)
Year 2012	-0.038	0.043	18.699	-0.878	29.189
	(0.044)	(0.245)	(14.252)	(205.085)	(51.881)
Year 2013	0.063	0.732***	-11.473	661.961**	-109.373*
	(0.051)	(0.258)	(13.285)	(299.787)	(56.955)

Observations	5,970	19,517	18,751	18,751	18,751
Prob > Chi^2	0.000	0.000	0.000	0.000	0.000

Notes: *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors, clustered at the household level, in parentheses. Omitted categories are: single; secondary education, Income 4000-8000 som; year 2010. Marginal effects reported for the FE Logit model, and coefficients reported for the FE Tobit model (the calculation of marginal effects not possible after the *pantob* Stata command used to estimate the FE Tobit models).