GOVERNMENT OF THE RUSSIAN FEDERATION

NATIONAL RESEARCH UNIVERSITY

HIGHER SCHOOL OF ECONOMICS

Faculty of Social Sciences

Asylgul Kanatbekova

name, surname

_____

signature

TERM PAPER

Effects of Household Welfare on Migration Participation: Case of Kyrgyzstan

Field of study 38.04.04 Public Administration and Municipal Management

Master's program 'Population and Development'

Scientific Supervisor

Ph.D. in Economics

_____

signature

Eugenia Chernina

full name

Moscow 2019

CONTENT

LIST OF ABBREVIATION 3
INTRODUCTION 4
1.Literature review 7
1.1. Theories of labour migration 7
1.2. Empirical framework 11
2. Empirical analysis 14
2.1. Empirical model 14
2.2. Methodology 15
2.3. Country context 17
3. Data and Results 19
3.1. Data Description 19
3.2. Results and discussion 24
Conclusion 28
APPENDIX 30
References 34

LIST OF ABBREVIATION

CIS	Commonwealth of Independent States
GDP	Gross Domestic Product
NELM	New Economics of Labour Migration
OECD	Organisation for Economic Co-operation and Development
US	United States
HH	Household Head

INTRODUCTION

Rapidly growing global trend of labour migration from developing to developed countries is a solution for many people to improve their financial situation and contribute to economy of origin and host countries. Like many other developing countries, Kyrgyzstan has been known as one of the leading migrants sending countries in Central Asia within the three previous decades. After the USSR collapse, Kyrgyzstan, as well as other member countries, fell into deep economic crisis, driven by break-down of the Soviet industrial links with other Soviet countries and loss of support from Moscow. It led to the industrial collapse and massive unemployment, which became the main causes of growing international migration from Kyrgyzstan that continues till nowadays.

The main push factors to migrate from Kyrgyzstan are unemployment and low average salary per month. According to the National Statistical Committee of the Kyrgyz Republic (2018), the monthly average salary in Kyrgyzstan by 2018 reached 240$ and unemployment rate was equal to 7.2%. However, migration becomes part of social and economics in Kyrgyzstan, contributing to the economy micro and macro levels. Labour migrants from Kyrgyzstan have boosted the country's economy by impressive remittances especially from Russia. Money transfers of migrants contribute a large share of the economy in Kyrgyzstan. In 2018 labour migrants' remittances were equal to 1/3 of national GDP (World Bank, 2018).

For people with poor human capital, it is hard to find a job and accumulate experience in developing countries in a situation of high unemployment and competition. Thus, for them, labor migration could be the best opportunity to find a job in foreign countries with large capital and less workforce that draw high demand for the low skilled migrants. But the question is "Can every family afford international migration?". Since international migration requires investments e.g. learning a foreign language, cost of trip and insurance, not every household can cover expenses of labour migration. Thus, despite the strongest motives for migration the poorest households don't have access to migration. Clearly, poor households are trapped by high unemployment rate and low emigration. As a result of such financial constraint, the relation between household income and migration seem to be an inverted-U shape (McKenzie & Rapoport, 2010).

Our research based on the Neoclassical Theory of Migration and the New Economics of Labour Migration. The first theory was supported by the assumption of Todaro (1970) and Lewis (1954) that migrants motivated by wage differences between source and destination countries. According to this assumption people migrate to maximize their welfare. This theory also was

explained by a push and pull factors by Lee (1966), that factors in the destination country and origin country tend to deter migration. At the micro level Sjaastad (1962) suggests that migration is the way of returns to human capital. Lately supporters of the new economics of labour migration (Stark and Taylor, 1986) argued with the neoclassical theory that migration is a household decision and could be explained by relative income as well.

Migration seems to be massive from places with high socio-economic inequality and driven from low-income households as Todaro (1970) has tested in US immigrants, but his statement was criticized by Chiquiar and Hanson (2002) and Chiswick (1999) with claiming that due to high migration cost negative self-selection cannot be possible. Lately, examples of Mexico-US income and migration relationship gave different results, McKenzie and Rapoport (2007, 2010) found that migration is driven from low-income households thanks to social and migration network in the community. Angelucci (2015) found that migration from Mexico is sourced from low-income households, due to the antipoverty program that encourages poor households to be able to send migrant out.

Meanwhile households with sufficient income tend to more investment in human capital, which increase the attractiveness of their members for local and foreigner employers. Thus, in case of critical migration selectivity from middle-income households, migration remittances will be distributed unequally prior to the richer households. Mentioned factors will create a poverty trap, where poor households are trapped under conditions of high unemployment and inability to invest in migration. Holmvall (2007) found that migration from Philippines mostly sourced by urban places with a small share of poor households. As a result, remittances are higher in urban places, where welfare households getting better off, while poor households mostly from rural areas stay in poverty. Any household that receives remittances from abroad will improve its position on the income and social scale within community (Dimzon, 2005), meaning that if the poor household receives remittances are expected to move up in income distribution and it will reduce income inequality align with reducing poverty. Remittances usually is the main income source for poor household, but the inability to cover migration cost prevent many poor households from expecting benefits of remittances (Bang at al. 2015).

The importance of relative deprivation can compete with absolute income because the motivation of households for migration is to improve position within the reference group as they are looking to improve their welfare (Stark and Taylor, 1991a). Controlling for absolute income they found that, relatively deprived households tend to migrate (in the experience of Mexican migrants to the US). If absolute income is independent amount of money household gets, then relative income depends on the well-being of other households in society. Further, the more

deprived is household the more incentive its member become to migration. Thus, Stark (1984) concluded that a decision to migrate is affected by the feeling of deprivation of household relative to their reference group. Following Stark's theory have been conducted studies with both absolute and relative income effect on migration.

Both absolute poverty and socio-economic inequality can affect people's incentives to migrate, which make this topic valuable for policymakers and deserves further investigation. Does absolute income predict migration? How do migration patterns change with relative deprivation?

The current paper is aimed to examine the effect of household welfare on migration participation. Under welfare, we will consider household income. Our aim is to find explanation to migration outflow through the absolute income or relative deprivation. Results of this research will show us evidence of poverty trap in terms of income-migration relation in Kyrgyzstan.

We will employ a panel survey of households and individuals in Kyrgyzstan "Life in Kyrgyzstan", which provides data about 3000 households and 8000 individuals over 2010-2013 years. This dataset is representative at the national, urban/rural and regional level. Our main focus is household income, also we are going to consider the influence of other factors like household head demographic and socio-economic aspects, household characteristics and community information as well on migration participation.

Examining the impact of absolute income and relative deprivation in the context of Kyrgyzstan is crucial because country has constant poverty rate of 25.6% (population lives below the poverty line in country) (World Bank, 2016) and net income Gini index reached 34.10% in 2018 (The World Economic Forum's Inclusive Development Index 2018). Both absolute poverty and relative deprivation are high, that can be important in explanation for persistent labor migration flow from the country.

The strategy of the research study is twofold. In order to get answers to our questions we do the following:

1. We attempt to estimate the effects of household's income on migration. We adjust household income with OECD equivalence scale. Controlling demographic and socio-economic characteristics of households we will run a regression to see whether absolute income can explain migration. Thereby, *the first hypothesis is middle-income households tend to send migrants out and with increasing income migration's probability lowers,*

while high-income households are not motivated to go abroad for employment purpose and low-income households cannot afford migration cost even if they are motivated.

2. We analyse the household's decision to migrate controlling the relative position of household's income within the community. We estimate relative income as ratio of absolute income to the mean income in the reference group. In this way, the *second hypothesis is as lower the relative income to the mean income in the reference group the bigger the probability of migration.* At the end of the research, our probable outcome should explain selection into migration by income.

The current research contributes to labour migration literature. According to our knowledge, this is the first empirical study of the link between relative income (social inequality) and migration in Kyrgyzstan. This study supposed to help policymakers to create an effective program toward sustainable development.

The rest of the paper is organized as follows, the next section states main migration theories on the relationship between income and migration, supported with empirical analysis. The second section provides the empirical model and methodology, further country context. The third section describes the data, result of the analysis and discussion. Finally fourth section contains conclusion.

1.Literature review

1.1. Theories of labour migration

The main problem of migration with much literature is in the definition of it. There is no standard description of migration, it varies from country to country and research context. The general explanation of migration could be the definition by Stark and Yitzhaki (1988), that explains migration is a movement from one place to another with a range of types depending on time, place and purposes, etc. In this research, we consider migration as a movement of individuals to another country for a time period of more than one month for economic (job) purpose.

Various theoretical studies have been done to analyze international migration, it's causes and motivation, which is still an interesting focus of research. We will start with traditional migration theory "Neoclassical theory of migration" (Lewis, 1954., Todaro, 1970), which identifies migration as an independent individual decision. Wage differences between countries make people think about job seeking abroad, where he or she can earn more money than in their origin country. The pay gap between countries is not the only reason for migration, but there are also a

lot of factors that influence the household decision to migrate. As a result, pull factors in the recipient country and push factors in the origin country of the migrant can be observed as a key predictor of migration. Pull and push factors of migration was first explained by Lee (1966), who argued that migration decision is taken under the effect of attractive factors in the destination country and by negative factors that push migrants from their source country. Push and pull factors identified various demographic, economic and social factors.

No doubt that the oldest and widely used theory of international migration was firstly contributed to explaining labour migration during economic development (Lewis, 1954; Harris and Todaro, 1970). By this scenario main cause of migration is labour market differences. From the macro theory concept countries with large workforce compare to capital will have low equilibrium wage (as fact it happens with developing countries), while countries with large capital and small manpower have high wage rates (it happens due to lack of labours in developed countries, that overcome demographical transition and now have more aging population compare to the economic active population). Probable consequences of this movement can be increasing market wage in the capital-poor country due to decreased labour supply, while in economically developed country wage will decrease as labour market will be filled.

Opposite movement can happen also widely when labour migrants move from high capital to low capital countries in order to gain in their own income and invest in developing countries because market opportunities in low-income countries are high to develop income without monopolists and competitors. Majority of migrants from high-income countries are highly qualified and skilled professionals move to develop countries to gain returns to fill occupation, that cannot be filled by local under the absence of professional skills and education. According to neoclassical macro theory, the end of international labour migration will be established only with eliminating wage differences between countries.

Micro theory of neoclassical economics assumes that international migration is an outcome of the rational decision taken by an individual in order to maximize income. The micro theory reveals to human capital approach, which was developed first by Sjaastad (1962). In this scenario, individual calculate cost and benefit of migration expect a positive net return from this movement. The micro theory assumes migration like an investment of individual in order to get a higher return to human capital. The expected return is determined by the expected cost and benefit of migration. Potential migrant chooses a country to move, where they can be productive with their skills; but before that, they consider investing in human capital as learning language and culture, investment as the cost of traveling and insurance, probable physical difficulties with adaptation to the new place and looking for work. Not everyone can admit the cost of

international migration, due to unequal distribution of income among the population some households and individuals may have income constraints. Micro-level of neoclassical theory assumes that as lower the migration cost benefit from movement will increase, which will raise the probability of international migration.

Lately, supporters of theory “New Economics of Labour Migration” challenged the assumptions of neoclassical theory with a statement that migration decision is made not by isolated individual, but by unit of people as household or family in order to not only maximize income but especially to minimize risks and to overcome income constraints from market failure(Stark and Taylor.1986, 1989. 1991a.1991b). The new economics of labour migration was found by Oded Stark in 1980ss in cooperation with Edward Taylor. According to NELM approach migration identified as a decision to maximize income, welfare and minimize risks.

Referring to NELM potential migration is influenced by the motivation to gain income and by improvement relative income as well. Stark (1991) argued that relative income is one of the main push factors for migration. According to Stark's approach relative income is the social status of household relative to their community. Social status is not an irreplaceable indicator of relative deprivation, it could be proxied by monetary values. From this logic migration will benefit the absolute income of the household with his relative income. The related hypothesis holds that household in lower income tail and relatively deprived tend to migrate. But Stark (1991) stated that prediction does not work for the whole population since poor and deprived households cannot afford migration cost, instead, they need to cover their basic needs.

The second aspect of NELM reveals household risks minimization or risk sharing among household members. Todaro (1970) highlighted migration with risk minimization from labour market failures. Especially in developing countries with imperfect social protection, household send some of the members abroad in case of the local market will fail. Migration cost will be compensated between all household members and migrant will send remittances back after time. That is why it is important to consider demographic characteristics of households, like dependency ratio to know how much migration cost can be spread among household members in economically active age. Migration is like coinsurance between household members in two or more countries because migrant also can be in a situation when he or she will not be able to find a job abroad, then members in origin country will support him to return or to wait until find job.

Developing countries suffer from the economic crisis, with no possibilities to minimize their risks through income insurance from the state or private sector, that used in developed ones. In developed countries, the monetary system is well structured with support to households,

affordable credit system, and income insurance, while in developing countries people don't have such conditions with increasing pressure to leave the country. Some of the developing countries have very tight social network relations, which can be a solution for households without resources to cover their international migration costs. On the other hand, in developing countries, it is hard to borrow money from someone or take a credit provided by the bank, because families' economic situation correlates with a high risk of default. As a source of lending money, in this case, come moneylenders with high percent charge or tight social network, in this situation international migration over and over becomes an attractive source of income to gain improvements in productivity and support stability in the economic situation of the family. That is why poor families have more incentive to send their member abroad than a family with higher well-being.

Other observations indicate that migration is influenced by many factors, that vary from conditions under which decision was taken. According to this approach communities with more migrants will have more migrants in the future. Many observations found despite high migration cost poor households with relative deprivation were able to send migrant out (see for example Stark and Taylor.1991a, Mckenzie and Rapoport.2007, Angelucci.2015, Tsegai.2007, Stark et al.2009, Winters.2018) they found that social network decreases migration cost and lower financial constraints. Mckenzie and Rapoport (2007) found evidence that migration net is one of the main factors that help migrants from poor households able to migrate, Angelucci (2015) defined that migration is possible even for poor thank to antipoverty program in Mexico that encouraged poor households with money transfers. Migration net in community set channel and communication for potential migrants, that minimize the risk of being failed abroad. At meso level migration appears as a circular phenomenon (Massey.1990) where migration becomes more common in the community after pioneer migration and being part of local culture with changing economic and social life of the population. Of course, migration is not the infinite process of population, it starts to decrease with the absence of manpower in origin country with children and elderly people left behind by Massey (1990) making overall migration inversed u-shaped. The most well-known theory of stagnating potential migration was made by McKenzie and Rapoport (2007), where they argued that migration starts to decrease when migrant reached expected net return from migration and ready to go back home, the relationship between income and migration is inversed u-shaped curve too.

As it was highlighted by Neoclassical theory at the micro level pay differences between countries and poverty become a push and pull factors for potential migrant. Potential market risk also could be the reason for migration. As a determinant of migration could be different factors,

that is why it is crucial to consider personal and household attributes as well in order to see who tend to migrate. At this stage, it is important to see whether migration can be predicted by the absolute income of the household. By hypothesis poor households tend to be incentive to migration but have no assets to cover migration cost.

According to theory migration should be higher from communities with high inequality rate. More deprived households relative to their reference group are vulnerable to migrate. Migration cost could be lower with social network and migration net, that is why in communities with large migration net would have more migrants.

1.2. Empirical framework

Traditional migration theories argue that migrants are non-random part of population, it is selective by different demographic and socioeconomic characteristics at micro and meso level. Large number of papers empirically estimated the impact of income on migration, both absolute income and relative income/relative deprivation. Discussions about selection into migration, created space for different empirical studies with various approaches.

Borjas (1987) predicted negative self-selection from country with unequal income distribution, which was supported by the result of a test on US immigrant's data. He explained the skill of workers by their wage as income is return for the skill (income could be proxy for all human capital indicators). Several studies, for instance, Chiquiar and Hanson (2002) and Chiswick (1999) have made an opposite statement that due to the presence of high migration cost migration is positively (high-skilled) self-selected. Studies by migrant recipient countries like the US and OECD countries mostly focus on migrants' skills, because they are interested in labour migrants with rich human capital. More recent evidence (Liebig and Alfonso, 2004) demonstrated with the empirical test of OECD immigrant's data, that high-income inequality in migrant's origin country foster emigration overall with no disaggregating to skills. They found positive self-selection of migrants to OECD countries with an insignificant number of low-skilled workers. Since migration can be responsive to many factors, the OECD case is explained by restriction of a visa system for low-skilled migrants and attractive conditions for high-skilled even from countries with high inequality of income distribution.

Several studies tried to analyze empirically hypothesis of Stark, that poor household would be more incentive to migrate but probably cannot do it in depth of insufficient income. Nonetheless, the lack of opportunities and scarcity of employment will make poor people move even for short distance. In the case of Nepal (Gurung, 2012) poor households tend to migrate to other villages or cities inside of Nepal, while rich households migrate to other countries. Clearly,

that wealthier household have more assets to migrate and richer human capital, that increase employment possibilities inside of the country and abroad. From this logic destination countries and reasons of migration for rich households will differ from a poor one.

Coming back to Mexico-Us migration McKenzie & Rapoport (2010) suggest, that migrants come from neither from high skilled nor low skilled population groups, so it comes from somewhere middle-skill distribution (middle-income distribution) as it was claimed by Massey (1990) as well. In fact, households from high-income distribution have resources to cover migration cost but don't have the motivation to migrate, because they will not get a net benefit from migration, while lower-income households are motivated in migration but cannot afford it. Their findings illustrate, that probability of migration first increases and then decreases with household wealth and will rise in community with large migration network. When the migration network not well developed yet, migration flow comes from middle welfare distribution with a U-shaped relationship between wealth and migration. With growing network migration cost does not bind constraints and probability of migration from low-income households increase, thus reduce inequality. In the prevalence of imperfect credit market, households with low income cannot afford migration cost and especially if initial risks observed as high (in case of international migration).

From sociological observations, we assume that first migrants from the community are those people with enough resources to afford the migration expenses and risks, but who find foreign labour attractive. Reduction of migration cost will increase the probability to migrate for poor households. External factors like government policy of host and origin country also impact migration outcome and bias migration self-selection. From outcomes of Mckenzie & Rapoport (2010), we know that social network lower migration cost or antipoverty system, that gives poor households afford migration cost, which was supported later by Angelucci (2015). Following the last theoretical framework, the author sorted individuals by their income with the testing hypothesis that high migration cost will prevent low skilled labour migration from Mexico to the US. Since poverty is negatively correlated with education and skills, he took income as a proxy to human capital. His probable outcome that high migration cost will deter low-skilled migration to the US was failed, because of the antipoverty program in Mexico. After becoming an entitlement to a transfer low-income household could afford international migration and pay for cost trip. The result shows that new migrants more and more worsen skill distribution of migrants if Mexico develops micro institutes that maintain poor households. Similarly to Angelucci (2015) study by Ambrosini and Peri (2012) found that migration from Mexico to the US is driven from low-skilled distribution and they pointed out that results could differ between

the assumption of Chiquiar and Hanson (2002) and Chiswick (1999) and studies sometimes due to unobservable migration (unofficial).

Literature on relation between relative deprivation and migration argue that relative deprivation important as absolute income when someone considers migration. By the definition of Winters et al. (2018) welfare is growing utility of having something, but deprivation is increasing the function of not having something that others have. That means in case of relative deprivation income is relative function and depends on the income of other households. The theoretical framework of relative deprivation impact on migration is built based on the study of Stark and Taylor (1989), that announced that members of households pursue not necessarily maximize their income but to improve the households' position in the community they belong or live. Welfare approach depends on own income maximization, while relative deprivation approach involves income of other households in reference group (Stark and Yitzhaki, 1988). The more deprived household the more incentive it becomes to migrate because migration can be a solution for not only income gaining but for minimizing deprivation of household among reference group.

Stark (1984) made a statement that migration can be explained only by relative deprivation, households send migrant out in order to make better their position and increase the level of satisfaction within the community they belong to, not to income maximization. However, lately Stark and Taylor (1991a) found in their study that both absolute and relative income can be simultaneously used for better understanding migration. Their findings illustrate that both absolute and relative income of household can predict international migration, while for internal migration both incomes are neutral, in depth of Mexico-US labour migration. Households with high relative deprivation tend to be incentive to migrate to another country, while for internal it does not matter. The results of relative deprivation approach can vary on the country as well as an author. In context of Ghana study by Tsegai (2007) confirmed the evidence of positive relation between inequality and internal migration. Recently Stark et al. (2009) in context of Poland showed the correlation between Gini coefficient and migration holding absolute income controlled because it is fair to reveal a higher level of absolute income will respond high propensity to migrate.

Winters et al. (2018) using household survey from five sub-Saharan African countries, found that more deprived household, relative to their reference group more susceptible it becomes to migration. Mentioned theories have focused on how social inequality induces migration, while there is also study (McKenzie and Rapoport 2007) that migration increases social inequality as

well, in case of migration was driven from middle-income distribution of communication and not from low income.

2. Empirical analysis

2.1. Empirical model

Upon controlling for demographic and household attributes we estimate impact of household welfare (absolute income) and relative income (social inequality) on migration. We use same variables for each year for comparability and easy interpretation purpose. Our base for empirical study is panel data "Life in Kyrgyzstan", conducted four year 2010-2013.

Equation (I) is the estimation of migration decision with the effect of absolute and relative incomes.

$$M_i=\alpha_0+\alpha_1 I_{it-1}+\beta_1 RI_{irt}+\beta_2 S_{it}+\beta_3 DR_{it}+\beta_4 MN_{irt}+\beta_5 HA_{it}+\beta_6 HS_{it}+\beta_7 HE_{it}+\beta_8 HM_{it}+\beta_9 E_i+\beta_{10} O_{it}+\beta_{11} R_{it}+\varepsilon \quad \text{(I)}$$

Where *i* indicates a household identical number (same for each year of observation), *r* is reference group and *t* is time period. M_{it} indicates whether the household *i* has migrant (1) or not (0), $I_{i\,t-1}$ is the logarithm of income per adult adjusted through OECD equivalence scale of household for the previous year and RI_{irt-1} means relative deprivation of household related to their reference group for the previous year. Controlling all other variables, we estimate whether household migrate to overcome their poverty or to overcome their relative position in community. There would be multicollinearity bias in regression due to link between absolute and relative income, because basis for relative income is absolute income of household, but we need to control each of income indicators to find what is motivating people to migrate.

Since migration cannot be explained only by economic assets, we will consider other factors that probably impact selection into migration. S_{it} is the household size, from the literature it is known that bigger household has a higher probability of labour surplus, which can be allocated abroad for risk sharing purposes as well. DR_{it} reveals household dependency ratio, we expect to see negative effect of dependency ratio to migration decision. MN_{irt} is migration net in the community, which identifies the share of migrant household in the reference group.

The probable outcome of migration depends on household head's characteristics, since opinion of head could have more value than other members in the family, sometimes it could be the only one who could control all actions in the household. HA_{it} shows head age, what we want to see is whether age differences can determine migration. HS_{it} represents the gender of household head, according to Tsegai (2007) male household head more likely to send migrant

out as a result of by relative deprivation. HE_{it} is the household head's education level, this indicator is a contributing factor in order to know how the education level of the household impact migration decision or it does not matter and HM_{it} is marital status of household head.

$\beta_9 E_i$ is an ethnic group of households, this variable will show us presence of ethnical allocation of migrants. O_{it} indicates the geographical region or "oblast", where the household lives, we use it in order to find different patterns of migration from different sources and R_{it} indicates where in the city or in village household lives.

2.2. Methodology

In this paper we are going to estimate the impact of household welfare on migration, to see whether households were able to send migrant out or not in the observed period. We will employ two types of income: absolute income with estimated OECD equivalence scale and relative deprivation. We employ the OECD equivalence scale (OECD Project on Income Distribution and Poverty) for the income of households in order to adjust the real well-being of each household in depth of household size and age of members. Every country has own equivalence scale based on their national content, in case of Kyrgyzstan (that didn't set own equivalence scale yet) it is appropriate to use standard "old OECD equivalence scale" which is called also "Oxford scale". Household consumptions grow not in a proportional way with each additional member. For example, needs for housing like electricity or food will not be five times high for a household with five members than for a single person. In the reference group, we might have two families with equal income but with different size. First household has one adult, while second household has two adults with one child. Of course, for household number 1 income will be more valuable and real well-being will be higher than for household number 2. Equivalence scale for each household will be calculated as a summary of values: 1 for first adult household member (who reached age 14), 0.7 for each additional adult members and 0.5 to each child (below 14) in the household (II).

Equivalence scale= 1+0.7*number of adults (<14) +0.5*number of children (>14) (II)

In order to estimate income by equivalence scale, we need to divide the absolute income of household into equivalence scale.

Our second estimation of income is the relative income of the household. Relative income should be specific about who is considered as a "reference group". Since we are working mainly on pre-migration period of households, the reference group is source country. Sociologically reference group is community, where geographically household belongs to. Many researchers

follow (Stark and Taylor, 1991) measure of relative deprivation in equation (III), which we write here:

$$RD_i = \int_{yi}^{yh} g[1 - F(x)]dx, \qquad \text{(III)}$$

In equation (II) RD_i represents relative deprivation of household *i*, y_h indicates the highest income in community and y_i is the income of household i. In simply algebraic explanation of relative deprivation, it is equal to the mean income of households richer than households with income y_i multiplied to the proportion of households that have a higher income than households with income y_i. Any gaining to the income of households richer than household *i* will increase relative deprivation of household *i* and vice versa any increase in income of household *i* (decline the share of households richer than household *i*) will decrease relative deprivation of household *i*.

Motivation to improve the household's position in the reference group explains why in equation every household's income should be compared to the income of households that are richer. But in our case, we cannot use relative deprivation due to the scarcity of data about all households. Our data contains household survey with strata every 16th household in the community, which means we will not be able to find deprivation of household without consideration every household in the community. And highlighting the logic of Stark theory relative deprivation is the feeling of the household of not having someone has, which means it is more about feeling and satisfaction, which income seem to be cannot replace. That is why we take relative income into consideration.

Our estimation of relative income is quite simple, already defined by Vernazza (2013), which will be explained below in equation (V).

$$RI(y, j) = \frac{y}{E(Yj)} \qquad \text{(IV)}$$

RI is relative income equal to the ratio of income of household y to the mean income in reference group j. From the sociology, we know that households tend to compare their welfare to the welfare of household on average position. Relative income is the sense of happiness relative to mean, in our case household happiness will be greater if its welfare will be above mean. In nature relative income is symmetric, so in this case, the relatively richer household will be out if norm. Through relative deprivation method of estimation every household lower than richest one threated as a deprived. We don't know to whom every household want to be equal, either to higher position or to average. It is possible that relatively deprived but average income household is happier than not average richer household or poorer household in community and exactly disparity might be the cause of migration of rich household to more relatively high

average income community and for a low-income household in order to get the level of an average household. And we think that relate everyone below highest position to relatively deprived is not right with condition that there was no qualitative research about feelings of the household. The feeling of deprivation depends on the values of each household and its self-concept of satisfaction. Another explanation of our choice is that in case we would use relative deprivation our hypothesis will be accepted because everyone (lower, middle-income class) except richest will be deprived and will be more likely to migrate.

2.3. Country context

Kyrgyzstan is Central Asian country with approximately 6.4 million inhabitants according to the National Statistical Committee of the Kyrgyz Republic (2019). With GDP per capita 3.735.4$ (World Bank, 2017) Kyrgyzstan is the second poorest country among CIS countries after Tajikistan.

After the USSR collapse country has got its independence in 1991 and since then been struggling to implement economic development programs and political reforms, which has not always favourable consequences neither for population neither for the state. On the way striving for prosperity Kyrgyzstan has been experienced two revolutions “Tulip revolution” in 2005 (“What Was the Tulip Revolution?”, 2017) and “Second Kyrgyz Revolution” in 2010 (Hiro, 2010), but still there are no improvements. As any other member countries of USSR Kyrgyzstan has experienced a breakdown of industrial chain and demand for products from the country, which brought the country to a deep economic crisis. For the population, it has been expressed in mass unemployment. Imperfect social model and increasing unemployment led to mass migration from the country mainly to Russia and Kazakhstan. Figure 1. contains international migration trend and balance of Kyrgyzstan, as it was expected after 90ss was mass migration outflow till 1998 and after that, it was fluctuations in the outflow of migrants. Fluctuations in the migration trends can be explained by mentioned above revolutions and socio-economic crisis. The reason for the rapid recession of emigration in 2012-2014 is in the increasing deportation and prohibition of entering Russia for Kyrgyz citizens.

Russia is the leading migrant recipient countries among CIS countries, because of its economic development and changing the demographical structure of the local population. Moreover, international migration requires investment in human capital e.g. learning a foreign language, accountable education level, experience, cost trip, and insurance. For Kyrgyz migrants, Russia is the best choice to migrate in the reason of having common culture and history back to USSR, despite that more of them want to move to South Korea or Europe countries where

monthly wages relatively high. Even before Kyrgyzstan threated unemployment as a significant problem. According to the data of Trading Economics (2017) in 2017, Kyrgyzstan had 7.2% of the unemployment rate. At the same time, Russia and Kazakhstan have the lowest unemployment rate in the region with 4.7% and 4.8% for the end of 2018. In generally Russia and Kazakhstan offer the highest average wage per month in the region which is 689$ and 526$ respectively with contrast by Kyrgyzstan's average monthly salary 240$. Unemployment levels and the average salary in Kyrgyzstan explain migration trends throughout the region.

Labour migrants from Central Asia have boosted an impressive remittance rate, especially from Russia. Remittances keep playing a significant role in the economy of migrant source countries, making countries dependent on migrant host countries. According to the World Bank (2018), Kyrgyzstan's 35.9% of GDP consists of remittances as it was mentioned earlier. These statistics demonstrate that Kyrgyzstan is in benefit from labour migration and have own motivation to keep doing so.

779 thousand people emigrated from Kyrgyzstan since 1990 till 2014, which is equal to 18% of the population of Kyrgyzstan in 1990 (Ablezova & Ibraeva, 2016). Almost ninety percent of migrants from Kyrgyzstan move to Russia (Figure 2) with employment purpose, where they occupied low-skill jobs. Other ten percent of Kyrgyz migrants go to Kazakhstan and work in the agricultural sector. Since independence people from Russian ethnic started to move to Russia massively, but the share of Kyrgyz and Uzbek ethnics also increased since the 2000s. The portrait of an average migrant from Kyrgyzstan is more likely to be men (share of men among the migrants is about 70%), in economically active age (mean age of migrants is 28 years), being experienced in the domestic labour force. Education level and skill of migrants from Kyrgyzstan is quite ambiguous since migrants with higher education prevailed until the middle of 2012 over low skill, but then it turned to be reverse (Figure 3). The probable explanation of this change is that high skilled migrants working in Russia became less productive and the dropping value of Russian currency in 2014 also lead to it.

From the basis survey "Life in Kyrgyzstan" (the data we use in our empirical analysis) we found out that 16% of reports households have a member in other countries and 14% of them get migrant remittances in 2013 (final year of panel survey).

3. Data and Results

3.1. Data Description

The basis for empirical analysis for current paper is dataset from the survey "Life in Kyrgyzstan" panel study, which was conducted between 2010-2013 by the association of DIW Berlin, Humboldt-University of Berlin, the Center for Social and Economic Research (CASE-Kyrgyzstan) and American University of Central Asia. Since the study is based on panel survey, it follows the same 8000 individuals and 3000 households over four years 2010-2013 in all seven oblasts (regions) of Kyrgyzstan and two cities of republic type (Bishkek & Osh). The survey consists of information at the individual, household and community levels. Data on individual and households level contain information about demographic aspects of household's member, expenditures, incomes, migration, weather shocks, and many other topics. All households' members aged 18 and above answered questions at the individual level, the household's survey was completed by the most knowledgeable person in the household. Community survey was responded by community administration. The languages of interviews were Russian and Kyrgyz, all the data were conducted personally.

All individuals from 3000 households were chosen to be tracked in the first wave in 2010 and over time. Children of selected households should have been tracked as they reach 18 and be part of the sample. If some household's member left the household to create own family, he or she will not be excluded from the sample, backward his or her new family were included into the sample with new individuals who meet requirements. The first wave of survey in 2010 contains information about 8160 individuals, while in 2011 8066, in 2012 8177 and 2013 wave 7681 individuals were interviewed. 5623 respondents have been interviewed for four years, while 1768 have been interviewed three years and 1099 only two years. Data is supposed to be representative at the country level since households were drawn by random two-stage stratification in Bishkek, Osh cities and rural/urban in oblasts.

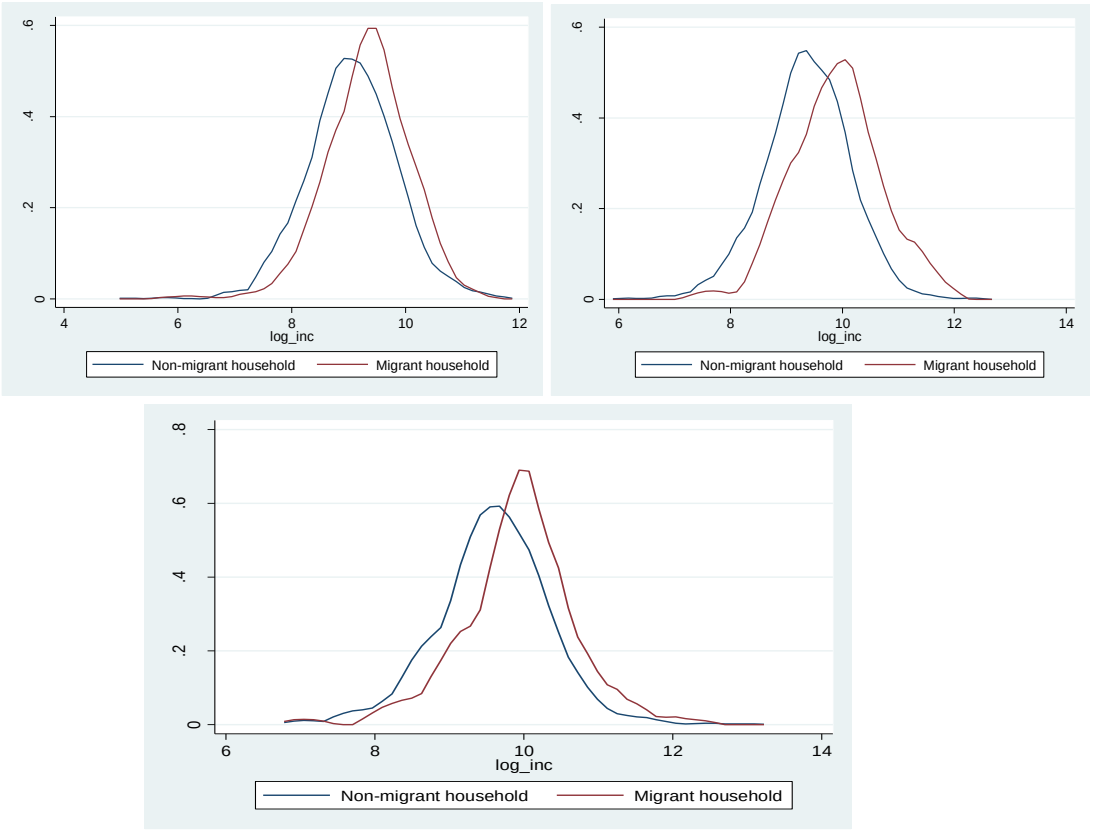
Researchers studied income-migration relation used different data, some of them did a comparison of income of the migrant household with non-migrant household. When we have survey analysis on the panel data it is even better, since our research question requires panel data, because we must know the income of a migrant household in the previous year before they sent migrant out (to check what income level household has the propensity to migrate). In addition to income, we use a list of variables that might explain migration from the household.

However, Life in Kyrgyzstan survey also has limitations, first of all, this is not large dataset information of 3000 household does not comprehensively characterize the whole

population. Furthermore, the dataset contains missing values in some variables, that is also limit the scope of used variables in the regression. Despite around 8000 individuals were interviewed in 2010, only 90% of them re-interviewed in following years.

Since our focus of interest is absolute income and relative income relation to migration, we build Kernel density estimates for both indicators of the monthly income of households that sent migrant out (*migrant household*) and who did not (*non-migrant household*). Figure1. shows density estimation for absolute income per month by migrant and non-migrant household for 2011, 2012 and 2013.

Figure 1. Kernel density for income per month of households



These graphs suggest, that migration selectivity based on income and prior to households with sufficient income. As we suggested migration declines with an increasing income of the household, here we see that as a household at 10 logarithms of income has less propensity to migrate and start to quit migration.

Talking about the link between relative income and migration participation (Figure 2) we can assume that relative income induces migration because it has a positive effect. But this assumption is rather controversial to our hypothesis. We estimate relative income around mean income in the reference group. So deprived household to the average income in the community

has less probability to migrate than middle-income households. In depth of relative deprivation feelings of the middle or lower-middle-income household, it is obvious that they want to have more or less equal income as richer in the community. But we see that migration grows until household reach means income in the community after what migration became less attractive for them, probably this is because as we expected that base for the income comparison is the middle-income class in the community.

Figure 2. Kernel density for relative income per month of households

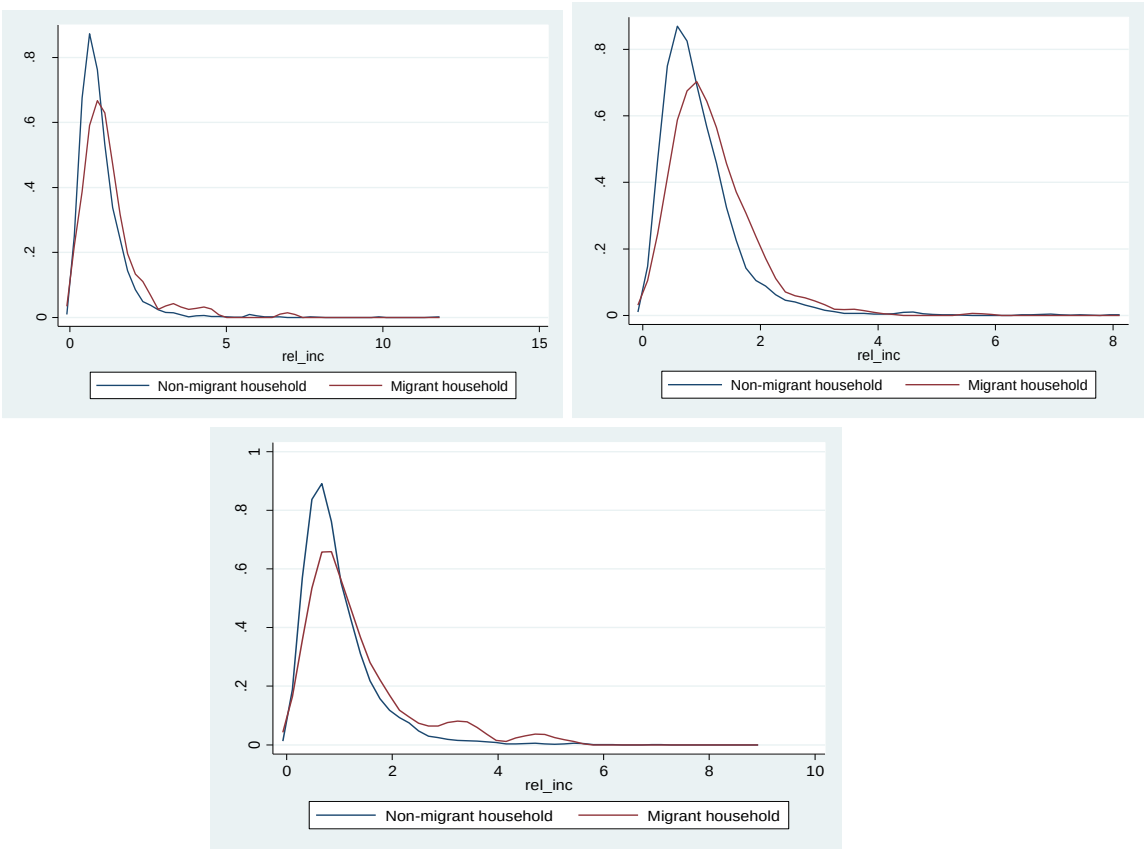


Table 1 provides descriptive statistics of numeric explanatory variables in our empirical analysis. The number of observations decreased during data cleaning and manipulating. Values of income logarithm are increasing per annum. Income currency in this research presented in national soms, all other international currencies were converted into the soms through the exchange rate set by the National Bank of Kyrgyz Republic for each observed panel year. From mean of relative income we can suggest that average household from Kyrgyzstan is in the middle position in reference group, it says about more balanced income distribution within community. Migration network become larger every year; it could be explained by increasing trends of emigration from communities. Average household in Kyrgyzstan consist around 5 members and could reach 15 with prevailed by working age members. The maximum age in our sample size was 99 in 2011, while mean age is 51.3.

Table 1. Descriptive statistics of numeric variables

	Variable	Obs	Mean	Std.Dev.	Min	Max
2011	The logarithm of OECD adjusted income	2824	9.096	.777	5.112	11.74
	Relative income	2824	1	.713	.015	8.011
	Migration net	2824	12.296	13.528	0	52
	Household size	2824	4.788	2.285	1	15
	Dependency ratio	2824	.317	.259	0	1
	Age of household head	2824	51.383	14.077	16	99
2012	The logarithm of OECD adjusted income	2760	9.387	.78	6.031	12.335
	Relative income	2760	.997	.738	.025	6.986
	Migration net	2775	13.831	16.466	0	76
	Household size	2819	4.877	2.394	1	15
	Dependency ratio	2819	.311	.255	0	1
	Age of household head	2819	52.026	13.801	18	97
2013	The logarithm of OECD adjusted income	2268	9.605	.757	6.908	13.102
	Relative income	2270	1	.79	0	11.719
	Migration net	2270	15.029	16.943	0	68
	Household size	2270	5.248	2.437	1	15
	Dependency ratio	2270	.304	.233	0	1
	Age of household head	2270	52.163	13.066	17	95

Table 2 presents information about time invalid variables in our sample. Individual characteristics like age, gender, marital status and education level revealed to household head. Data provides evidence that more than 70% of households held by males, 70% of heads are married. Household heads are mostly got basic or technic education, we can assume that in sample there are predominance of low educated household heads. More than half of households belong to Kyrgyz ethnicity. As population diversity approximately 60% of households live in rural places and mostly from south regions.

Table 2. Descriptive statistics of categorical variables

Year	Variable	Frequency	Percent	Cummulative
2011	Sex			
	male	2035	72.06	72.06
	female	789	27.94	100.00
	Marital status			
	Married 1	1989	70.43	70.43
	Widowed 2	532	18.84	89.27
	Single 3	303	10.73	100.00
	Education			
	Illiterate 1	90	3.19	3.19
	Basic 2	343	12.15	15.33
	Technical 3	1873	66.32	81.66
	High 4	518	18.34	100.00
	Ethnicity			

	Kyrgyz 1	1878	66.50	66.50
	Uzbek 2	322	11.40	77.90
	Other 3	624	22.10	100.00
	Oblast			
	Issyk-Kul 1	265	9.38	9.38
	Jalal-Abad 2	467	16.54	25.92
	Naryn 3	125	4.43	30.35
	Batken 4	216	7.65	38.00
	Osh 5	462	16.36	54.36
	Talas 6	121	4.28	58.64
	Chui 7	471	16.68	75.32
	Bishkek 8	569	20.15	95.47
	Osh 9	128	4.53	100.00
	Residence			
	city	1153	40.83	40.83
	village	1671	59.17	100.00
2012	Sex			
	male	2018	71.59	71.59
	female	801	28.41	100.00
	Marital status			
	Married 1	1988	70.52	70.52
	Widowed 2	547	19.40	89.93
	Single 3	284	10.7	100.00
	Education			
	Illiterate 1	89	3.16	3.16
	Basic 2	62	2.20	5.36
	Technical 3	2173	77.08	82.44
	High 4	495	17.56	100.00
	Ethnicity			
	Kyrgyz 1	1871	66.37	66.37
	Uzbek 2	330	11.71	78.08
	Other 3	618	21.92	100.00
	Oblast			
	Issyk-Kul 1	259	9.19	9.19
	Jalal-Abad 2	461	16.35	25.54
	Naryn 3	123	4.36	29.90
	Batken 4	224	7.95	37.85
	Osh 5	489	17.35	55.20
	Talas 6	123	4.36	59.56
	Chui 7	450	15.96	75.52
	Bishkek 8	578	20.50	96.03
	Osh 9	112	3.97	100.00
	Residence			
	city	1145	40.63	40.63
	village	1673	59.37	100.00
2013	Sex			
	male	1653	72.82	72.82
	female	617	27.18	100.00
	Marital status			
	Married 1	1602	70.57	70.57
	Widowed 2	431	18.99	89.56
	Single 3	237	9.44	100.00
	Education			
	Illiterate 1	64	2.82	2.82
	Basic 2	48	02.11	4.93
	Technical 3	1781	78.46	83.39

	High 4	377	16.61	100.00
	Ethnicity			
	Kyrgyz 1	1574	69.34	69.34
	Uzbek 2	273	12.3	81.37
	Other 3	423	18.63	100.00
	Oblast			
	Issyk-Kul 1	234	10.31	10.31
	Jalal-Abad 2	372	16.39	26.70
	Naryn 3	103	4.54	31.23
	Batken 4	204	8.99	40.22
	Osh 5	429	18.90	59.12
	Talas 6	119	5.24	64.36
	Chui 7	331	14.58	78.94
	Bishkek 8	391	17.22	96.17
	Osh 9	87	3.83	100.00
	Residence			
	city	840	37.00	37.00
	village	1430	63.00	100.00

For checking more about “Life in Kyrgyzstan” study methodology and specifications, please visit their website https://datasets.iza.org/dataset/124/life-in-kyrgyzstan-study-2010-2013.

3.2. Results and discussion

The results of the migration selection equation (I) for 2011, 2012, 2013 estimated by logistic regression are presented in Tables 3,4,5 (in Appendix respectively). We are not able to find causality effect of income to migration here because of the short panel data survey, but we present a correlation between income related to the period of migration. Analysis of main migration determinants requires controlling both income approaches. We experimented with regression, adding variables gradually. In regression (1) we run our regression with key predictor variables, regression (2) includes household head characteristics, (3) with all variables. Considering that relative income was subtracted from absolute income of household, we want to reduce risk of multicollinearity by running regression separately for each income approach holding all other variables controlled in regressions (4) and (5).

We start with first regression (1), in which probability of migration is explained by the log of OECD equivalence scale adjusted income for previous year (*log_inc*), relative income for previous year (*rel_inc*), household size (*hhsize*), migration net (*mig_net*) and dependency ratio (*DepRat*), which is shown in first column of each year regression output (Table 3, 4, 5). We find evidence that dependent variable is an increasing function of log of income, household size and migration net, while dependency ratio has significant negative effect to outcome variable. Relative income is statistically insignificant in this regression. As we expected every increasing unit in income will increase probability of migration, shown that selection to migration is

significantly driven by income, poor households cannot afford it. Relative income has negative relation to migration, but it is statistically insignificant, and we cannot assume that as deprived households as more probability to send migrant. Migration network is statistically significant and has a positive effect on migration participation (*mig_net)* as expected and suggested by (McKenzie and Rapoport, 2007). Despite slight coefficient of migration net that varies from 1 to 4% year, an increasing number of migrants from reference community lower migration cost for potential migrants and especially from poor households. Following our expectations household size (*hhsize*) correlates with migration positively, suggesting that household with the bigger size is more likely to send migrant out. This result provides a statement of Todaro (1970) and Stark (1993), that large household can divide the burden of migration investment among working members and tend to send migrant out in order to minimize risks of market failures in the home country. Meanwhile, dependency ratio has a negative effect on migration participation of household, with a quite big coefficient. Every increasing unit in dependency ratio (*DepRat*) will decrease the probability to migrate by 2.2 log odds in 2011, 2.3 in 2012 and 3 in 2012. This picture was naturally expected since household with more economically inactive members like children under age 14 and elderly people above 65 years old with nor the proportional number of economically active members will deter from migration or at least postpone it. Adults in working age are tied to the household with old parents and young children because there is no one who can replace them in the household or take responsibility. Another explanation of negative dependency ratio effect is that the presence of an economically inactive member in household reserve income of working member, thus deterring from investing to migration. Last explanation to dependency ratio could be agglomeration impact on agricultural activities of the household. This picture especially occurs in a rural area, where each additional child is considered as help for the farm or land. Children usually contribute to domestic work, hence contribute to the manpower of the household.

Adding household head characteristics to regression (2) increase coefficient of log of income, which means that income of household mostly depends on household head age, gender, marital status and education level. Household head age (*HH age*) is statistically significant only in 2012, where it shows that as older the head as more likelihood to migrate. Age of household seems to have a very little impact on migration decision, since its coefficient magnitudes from 0.013 to 0.016. The effect of HH gender has large effect to migration, we can assume that household with female head would have about 0.11 log-odds higher probability to migrate than male head households in 2011, 0.65 in 2012 and 0.40 in 2013. Marital status (*MARST*) was estimated compare to the base (single), our findings overall show no statistically significant

evidence to the effect of marital status to the migration. Education level (*EDUC*) of household head has statistically significant effects in 2011 and 2012. Each of education level compare to the base (*illiterate*) got negative coefficients, which suggests that being from household with illiterate household head increase likelihood to migrate. We can assume that emigration is negative by skill and education, because we consider HH education as an overall education level in family (educated head would try to give as minimum his own education level to his household members).

Regression (3) includes rest household characteristics, that increased log income coefficient. We can assume that household income is depend on region, residence and ethnicity. Within all observed years only in 2013 ethnicity (*ETHN*) get statistically significant coefficient, which means in previous year migration outflows were driven equally from all ethnicities. 2013 regression shows that Uzbek and other ethnicities compare to Kyrgyz have negative effects to migration participation, this year migration outflow prevailed among Kyrgyz ethnic households. The statistically significant negative coefficient of some ethnic categories (*ETHN*) suggests that migration net builds by ethnic enclave's effect migration strongly. Migration net of Kyrgyz ethnic indicates to be strong the last year of observation.

Regional (*Oblast*) distribution of migration patterns was different in each year. As a base we tool *Issyk-Kul,* for all year's south regions like Jalal-Abad (*JA*), Batken (*BT*) and Osh (*SH*) have statistically significant positive coefficients to migrate compare to Issyk-Kul. North regions like Chui (*CH*) and Bishkek city (*cBS*) have negative effect compare to south regions. Positive effect of south regions indicates about high population growth and job scarcity. Household residence have no statistically significant effect to the outcome.

In regression (4) we dropped relative income and run regression holding all other variables controlled. Decreased coefficient of log of income without relative income confirms about that relative income correlates with poverty we could say, if it would use as relative income subjective relative deprivation feelings. But in our case, it just high correlation between variables. Regression (5) exclude log of income, in order to see effect of relative income its absence of correlation bias and test second hypothesis. Relative income got positive statistically significant coefficient, which means the better the position in society the more household more likely to migrate.

Migration is reflection of poverty through job scarcity, work conditions or low salaries. In our empirical analysis we analysed selection into migration through the different household characteristics and find evidence that not everyone has equal access to migration. As we hypothesized migration is driven from middle or lower middle-income households, who can bear

the cost, while households in the tail of income distribution don't have enough financial assets to afford it. From the coefficient of 2012 (0.463) we could say that migration required high migration cost, prior to wealthier potential migrants. Within three years happened no sharp crisis or inflation and we couldn't suggest that some economic or political situations lead to decrease migration from poor household. Low emigration rate for lower income households creates poverty trap, when poor people are trapped under condition of high unemployment and low emigration rate. Nevertheless, not everyone has equal benefit from migration, considering different education and skill background of migrant, their net returns from migration could be remitted to home at different size. Not touching after migration process, we predict that proceeding selection to migration will exacerbate income inequality in home country, because migrant household is better off than another non-migrant household. Remittances of labour migrants will benefit those families, making better their position in income distribution. Against the background of the improved migrant household position in community, feelings and position of non-migrant household will be deteriorated.

Apparent lack of correlation between relative income and migration can be justified by balanced income distribution between households within community. Despite the fact that our results are contradictive to our second hypothesis, we can assume that relative deprivation induce migration in light of the fact that average income household in community are incentive to migrate in order to get higher position as their richer counterparts. But as it was earlier mentioned migration propensity decreases with increasing income, which means wealthier households stop or decrease migration.

Conclusion

Current paper underlines the importance of income assets to migration participation. Theoretically and empirically all models suggest that migration can be explained by absolute income. This research provides understanding in topical issue of Kyrgyzstan: migration selection by household's income. We have managed to find poverty trap in income-migration relation. The evidence from this study suggest that, migration is prior for middle or lower-middle income households, poorest households trapped under poverty conditions with low probability to migrate and rich people show no interest in migration (inverted U-shaped curve).

Our main findings lead to assumption that even if labour migration became part of the social and economic life of the population, not every household can afford it. For poor household's migration seem to be the last chance to overcome poverty, but instead of that, they trapped in poverty. However, we predict following consequences of migration patterns from Kyrgyzstan, that it will exacerbate income inequality, where position of non-migrant household will be worsening, while migrant household improves its position within community.

The outcome of the regression justifies our expectations and confirm our first hypothesis about absolute income. Holding absolute income controlled relative income become statistically insignificant. This means that poverty is main pusher of migration not social inequality. But in case of dropping absolute income relative income became significant and got positive effect. In general, we reject second hypothesis, because first relative income is statistically insignificant with absolute income and second migration is increasing function of relative income. Keeping in mind these results, we reject our second hypothesis. Insignificancy of relative income effects is reflection of balanced income distribution within community, which means households are allocated where their income is suitable to the average income in reference community.

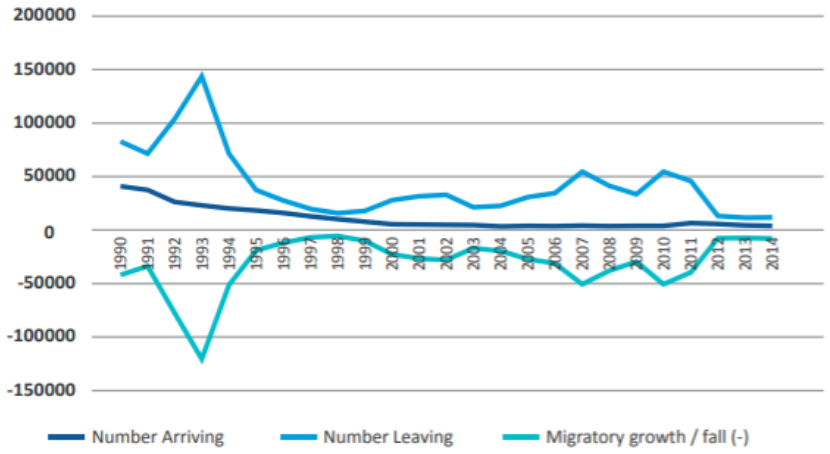
Nevertheless, findings from regression estimation showed the effect of migration net and household size are positive, while the effect of dependency ratio turned to be negative. Dependency ratio provides evidence of Stark’s prediction about reallocation of labour and minimizing risks of market failure. The geographical effect is statistically significant and highlighted three sought oblasts: Jalal-Abad, Osh, and Batken, that are the large migrant source regions. HH characteristics overall little effect to migration probability but correlates strongly with income. Overall, we conclude that migrants are driven from middle or lower-middle-income households with bigger household size, where manpower prevailed the number of dependent members, from south regions and Kyrgyz ethnic.

Finally, there should be considered the number of limitations. First, monetary income in agricultural land could not be accurate, because households in rural areas might partly earn income in natural form. But there is space for future research to consider expenditures as well. Second, the method of relative income estimation could be biased due to not subjectivity. Feelings of deprivation must be reported from the qualitative data of respondents, as far we don't know who the reference base for household relative income estimation is, for some households it could be their relatives, while for other colleagues.

Migration has both cure and curse effect to the migrant source country, pluses that remittances will boost the economy, making families more independent and wealthier, but it has Dutch disease effect on the macroeconomy and exacerbates inequality. It is complicated to measure prevalence of positive or negative effects of this phenomenon because it relates to all demographic, economic, social and political sectors of the country. Generally positive consequences of migration prevail negative effects. Our findings suggest that if government think that poor households can overcome it independently, they are wrong, since poorest households are trapped in poverty. There should be antipoverty policy implication, targeted to the poorest households. With support from government poorest households can invest in human capital, health and living conditions or as evidence from Mexico invest in migration. Findings of our empirical results could be the base for policy implication toward reducing or boosting migration. Moreover, for the real estimation of income migration effect would be better to use panel data of more than three years.

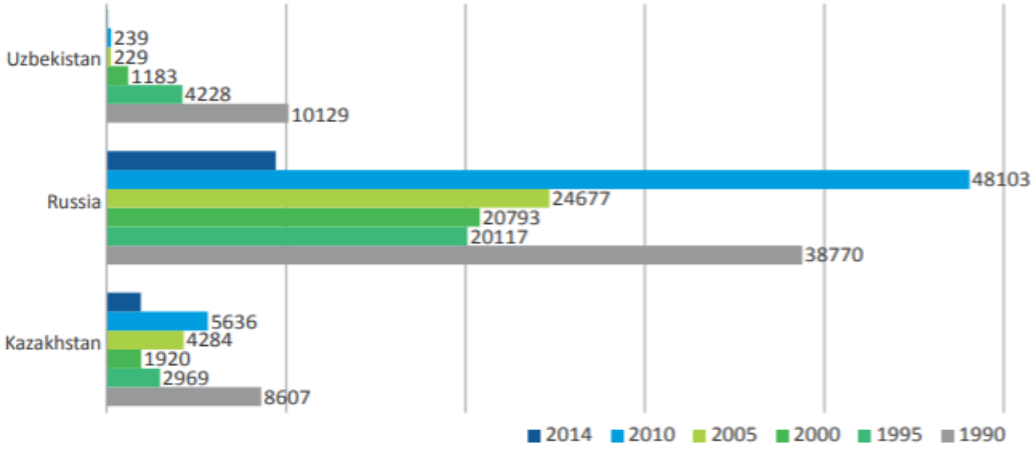
APPENDIX

Figure 1. International migration trends and balance in Kyrgyzstan (person)



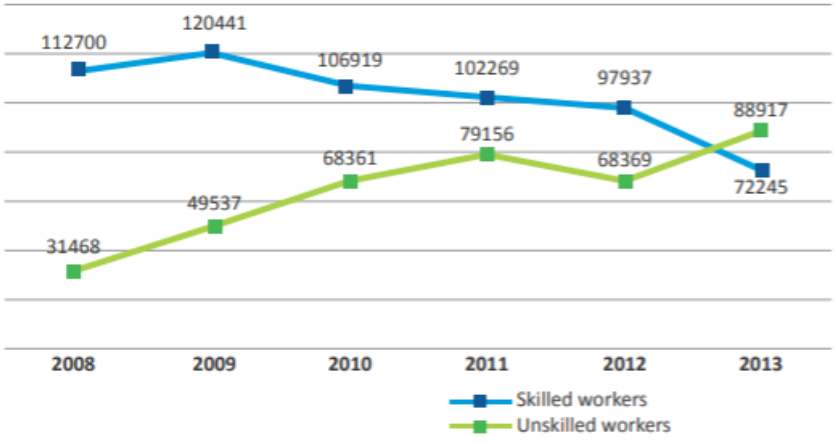
Source: National Statistics Committee

Figure 2. Emigration from Kyrgyzstan to top three CIS countries destination



Source: National Statistics Committee

Figure 3. The proportion of skilled and unskilled migrants from Kyrgyzstan abroad



Source: Kyrgyz integrated household survey and Life in Kyrgyzstan survey

Table 2. Results of migration equation (I) 2011

VARIABLES	(1) mig_2011	(2) mig_2011	(3) mig_2011	(4) mig_2011	(5) mig_2011
log_inc	0.278*	0.349*	0.411**	0.337***	
	(0.178)	(0.180)	(0.181)	(0.122)	
rel_inc	-0.033	-0.054	-0.094		0.186*
	(0.170)	(0.170)	(0.172)		(0.108)
hhsize	0.266***	0.265***	0.281***	0.279***	0.288***
	(0.037)	(0.039)	(0.042)	(0.042)	(0.042)
DepRat	-2.217***	-2.660***	-2.847***	-2.834***	-2.870***
	(0.456)	(0.483)	(0.490)	(0.490)	(0.490)
mig_net	0.041***	0.041***	0.014**	0.014**	0.013*
	(0.006)	(0.006)	(0.007)	(0.007)	(0.007)
HH age		-0.005	-0.008	-0.008	-0.006
		(0.008)	(0.009)	(0.009)	(0.009)
HH sex		0.117**	0.317***	0.315***	0.297***
		(0.320)	(0.354)	(0.354)	(0.354)
1.MARST MR		0.194	-0.006	0.013	0.115
		(0.418)	(0.436)	(0.434)	(0.430)
2.MARST WD		0.424	0.128	0.145	0.236
		(0.449)	(0.467)	(0.466)	(0.464)
2.EDUC BS		-1.192***	-0.878**	-0.883**	-0.890**
		(0.361)	(0.370)	(0.370)	(0.371)
3.EDUC TC		-1.613***	-1.387***	-1.383***	-1.370***
		(0.302)	(0.308)	(0.308)	(0.307)
4.EDUC HG		-2.358***	-1.922***	-1.924***	-1.886***
		(0.416)	(0.427)	(0.428)	(0.427)
2.ETHN UZ			0.019	0.031	0.078
			(0.232)	(0.231)	(0.231)
3.ETHN TH			-0.048	-0.056	-0.066
			(0.329)	(0.329)	(0.330)
2.oblast JA			1.163**	1.199**	1.337***
			(0.521)	(0.517)	(0.515)
3ooblast NR			-	-	-
4.oblast BT			0.804	0.851	1.035*
			(0.548)	(0.541)	(0.536)
5.oblast SH			0.314	0.356	0.500
			(0.533)	(0.528)	(0.526)
6.oblast TL			0.575	0.612	0.775
			(0.604)	(0.601)	(0.598)
7.oblast CH			-1.076*	-1.031	-0.843
			(0.639)	(0.634)	(0.630)
8.oblast cBS			-1.290*	-1.239*	-1.010
			(0.675)	(0.668)	(0.663)
9.oblast cSH			-0.334	-0.276	-0.059
			(0.686)	(0.678)	(0.674)
residence			-0.287	-0.280	-0.268
			(0.224)	(0.224)	(0.224)
Constant	-6.873***	-5.951***	-5.967***	-5.454***	-2.914***
	(1.516)	(1.649)	(1.688)	(1.413)	(1.026)
Observations	2,824	2,824	2,699	2,699	2,699
Pseudo R2	0.136	0.168	0.205	0.205	0.201

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

Table 3. Results of migration equation (I) 2012

VARIABLES	(1) mig_2012	(2) mig_2012	(3) mig_2012	(4) mig_2012	(5) mig_2012
log_inc	0.281***	0.334***	0.463***	0.380***	
	(0.146)	(0.169)	(0.189)	(0.178)	
rel_inc	-0.037	-0.047	-0.092		0.148***
	(0.153)	(0.176)	(0.185)		(0.083)
hhsize	0.211***	0.209***	0.168***	0.170***	0.151***
	(0.032)	(0.034)	(0.036)	(0.036)	(0.036)
DepRat	-2.284***	-2.431***	-2.574***	-2.578***	-2.454***
	(0.397)	(0.414)	(0.421)	(0.418)	(0.419)
mig_net	0.038***	0.038***	0.015***	0.009**	0.010**
	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)
HH age		0.016**	0.014*	0.013*	0.012
		(0.007)	(0.008)	(0.008)	(0.008)
HH sex		0.656**	1.202***	1.188***	1.202***
		(0.279)	(0.326)	(0.324)	(0.325)
1.MARST MR		0.424	0.260	0.194	0.146
		(0.381)	(0.416)	(0.418)	(0.416)
2.MARST WD		-0.519	-1.104***	-1.086***	-1.140***
		(0.394)	(0.408)	(0.404)	(0.406)
2.EDUC BS		-2.307***	-1.992***	-2.104***	-2.005***
		(0.675)	(0.689)	(0.691)	(0.691)
3.EDUC TC		-2.080***	-1.740***	-1.739***	-1.754***
		(0.267)	(0.270)	(0.269)	(0.270)
4.EDUC HG		-2.236***	-1.662***	-1.690***	-1.756***
		(0.343)	(0.355)	(0.351)	(0.352)
2.ETHN UZ			0.000	-0.017	-0.018
			(0.207)	(0.202)	(0.204)
3.ETHN TH			-0.422	-0.466	-0.433
			(0.328)	(0.325)	(0.327)
2.oblast JA			1.733***	1.597***	1.651***
			(0.440)	(0.437)	(0.438)
3ooblast NR			-0.458	-0.610	-0.574
			(0.820)	(0.817)	(0.819)
4.oblast BT			1.492***	1.113**	1.204***
			(0.472)	(0.462)	(0.461)
5.oblast SH			1.305***	0.973**	1.065**
			(0.449)	(0.443)	(0.443)
6.oblast TL			1.054**	0.707	0.782
			(0.534)	(0.526)	(0.525)
7.oblast CH			-0.037	-0.285	-0.239
			(0.522)	(0.516)	(0.517)
8.oblast cBS			-1.680**	-2.006***	-1.950***
			(0.725)	(0.719)	(0.718)
9.oblast cSH			0.882	0.452	0.586
			(0.578)	(0.568)	(0.568)
residence			-0.044	-0.016	-0.002
			(0.204)	(0.202)	(0.203)
Constant	1.356	2.103	-0.172	-4.805***	-4.236***
	(1.227)	(1.377)	(1.541)	(1.274)	(0.949)
Observations	2,760	2,760	2,759	2,759	2,759
Pseudo R2	0.139	0.178	0.229	0.213	0.222

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

Table 3. Results of migration equation (I) 2013

VARIABLES	(1) mig_2013	(2) mig_2013	(3) mig_2013	(4) mig_2013	(5) mig_2013
log_inc	0.284*	0.337**	0.424**	0.334***	
	(0.168)	(0.171)	(0.181)	(0.115)	
rel_inc	-0.043	-0.055	-0.087		0.153*
	(0.127)	(0.128)	(0.136)		(0.082)
hhsize	0.217***	0.224***	0.186***	0.186***	0.201***
	(0.034)	(0.035)	(0.037)	(0.037)	(0.037)
DepRat	-2.981***	-3.114***	-3.051***	-3.061***	-3.165***
	(0.458)	(0.470)	(0.467)	(0.467)	(0.464)
mig_net	0.039***	0.038***	0.019***	0.019***	0.021***
	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)
HH age		0.007	0.007	0.007	0.008
		(0.008)	(0.008)	(0.008)	(0.008)
HH sex		0.400**	0.753**	0.743**	0.715**
		(0.304)	(0.337)	(0.336)	(0.334)
1.MARST MR		0.195	0.120	0.120	0.149
		(0.393)	(0.414)	(0.414)	(0.413)
2.MARST WD		0.181	-0.185	-0.176	-0.148
		(0.397)	(0.416)	(0.416)	(0.414)
2.EDUC BS		0.452	0.302	0.279	0.225
		(0.612)	(0.634)	(0.633)	(0.631)
3.EDUC TC		-0.062	-0.015	-0.028	-0.038
		(0.371)	(0.375)	(0.374)	(0.375)
4.EDUC HG		-0.537	-0.565	-0.569	-0.510
		(0.447)	(0.455)	(0.455)	(0.454)
2.ETHN UZ			-0.888***	-0.881***	-0.856***
			(0.258)	(0.257)	(0.256)
3.ETHN TH			-1.709***	-1.701***	-1.673***
			(0.481)	(0.481)	(0.480)
2.oblast JA			1.098**	1.125**	1.216**
			(0.492)	(0.490)	(0.488)
3ooblast NR			-1.275	-1.242	-1.109
			(1.094)	(1.093)	(1.091)
4.oblast BT			1.322***	1.367***	1.522***
			(0.485)	(0.480)	(0.477)
5.oblast SH			0.865*	0.922*	1.107**
			(0.481)	(0.472)	(0.469)
6.oblast TL			0.491	0.543	0.739
			(0.553)	(0.547)	(0.544)
7.oblast CH			-0.334	-0.288	-0.111
			(0.601)	(0.597)	(0.594)
8.oblast cBS			-0.115	-0.087	0.035
			(0.575)	(0.573)	(0.572)
9.oblast cSH			1.147*	1.202**	1.360**
			(0.610)	(0.604)	(0.605)
residence			0.169	0.149	0.063
			(0.234)	(0.232)	(0.230)
Constant	-7.010***	-7.726***	-8.994***	-8.202***	-5.268***
	(1.548)	(1.706)	(1.914)	(1.454)	(1.034)
Observations	2,268	2,268	2,268	2,268	2,270
Pseudo R2	0.157	0.163	0.210	0.210	0.206

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

References

Ablezova, M. K., & Ibraeva, G. K. (2016). Kyrgyzstan - extended migration profile 2010 - 2015.

Bang T James, Mitra Aniruddha and Phanindra V Wunnava. 2015. The Impact of Remittances on Poverty and Income Inequality in Kenya: An Instrumental-Variable Quantile Regression Analysis.

Borjas, G. J. (1985): “Assimilation, Changes in Cohort Quality, and the Earnings of Causation of Migration." Population Index 56(1): 3-26.

Countryeconomy.2019. Retrieved from https://countryeconomy.com/demography/life-expectancy/kyrgyzstan?year=2010

Chiswick, Barry. 1999. "Are Immigrants Favorably Self-Selected?" American Economic Review, 89 (2): 181-185.

Daniel Chiquiar & Gordon H. Hanson, 2005. "International Migration, Self-Selection, and the Distribution of Wages: Evidence from Mexico and the United States," Journal of Political Economy, University of Chicago Press, vol. 113(2), pages 239-281, April

Daniel R. Vernazza, 2013. Does Absolute or Relative Income Motivate Migration. , London School of Economics and Political Science

Daniel Tsegai, 2007. Migration as a Household Decision: What are the Roles of Income Differences? Insights from the Volta Basin of Ghana. June 2007European Journal of Development Research 19(2):305-326

David Mckenzie and Hillel Rapoport, 2007. Network Effects and the dynamics of Migration and Inequality: Theory and Evidence from Mexico, Journal of Development Economics, 84(1): 1-24 (2007).

David Mckenzie and Hillel Rapoport, 2010. Self-selection patterns in Mexico-U.S.migration: The role of migrant networks. The Review of Economics and Statistics Vol. 92, No. 4

Dimzon. Carmelita S, 2005, - Migration policies, remittances, and economic development analysis,” American Economic Review 60: 126-142.

Douglas S. Massey, Joaquin Arango, Graeme Hugo, Ali Kouaouci, Adela Pellegrino, J. Edward Taylor, 1993. Theories of International Migration: A Review and Appraisal. Source: Population and Development Review, Vol. 19, No. 3 (Sep. 1993), pp. 431-466

Ghatak, S., Levine, P. and Price, S.W., 1996, 'Migration Theories and Evidence: An Assessment', Journal of Economic Survey, Vol.10, No.2, pp.159–197.

Gurung, Yogendra Bahadur (2012) "Migration from Rural Nepal: A Social Exclusion Framework," Himalaya, the Journal of the Association for Nepal and Himalayan Studies: Vol. 31: No. 1, Article 12

Harris, J and M.P Todaro.1970. "Migration, unemployment and development: A two-sector Analysis" The American Economic Review Vol. 60, No. 1 (1970), pp. 126-142 (17 pages)

Hiro, D. (2010, April). Kyrgyzstan's second tulip revolution. The Guardian.

Holmvall Peter 2007. Remittances and Poverty – a Case Study of the Philippines. Retrieved from http://lup.lub.lu.se/luur/download?func=downloadFile&recordOId=1334556&fileOId=1646529

Immigrants," Journal of Labor Economics, 3, 463–489.
in the Philippines – Chapter 5 in: OECD – Migration, Remittances and

J. William Ambrosini & Giovanni Peri, 2012. "The Determinants and the Selection of Mexico–US Migrants," The World Economy, Wiley Blackwell, vol. 35(2), pages 111-151, February. Journal of Population Economics, 1(1), 57–70.

Kau, J.B. and Sirmans, C.F., 1977, 'The Influence of Information Cost and Uncertainty on Migration: A Comparison of Migrant Types', Journal of Regional Science, Vol.17, pp.89–96.

Lewis, W Arthur. 1954. "Economic development with unlimited supplies of labor", The Manchester School of Economic and Social Studies 22: 139-191.

Liebig, Thomas and Sousa-Poza, Alfonso, Migration, Self-Selection and Income Inequality: An International Analysis. Kyklos, Vol. 57, pp. 125-146, February 2004.

Massey, D. S. (1990). "Social Structure, Household Strategies, and the Cumulative
Milanovic, Branko, 1987. Remittances and income distribution. Journal of Economic Studies 14 (5), 24-37.

National Institute for the strategic studies of the Kyrgyz Republic.2016. Kyrgyzstan Extended Migration Profile 2010-2015. Retrieved from http://www.mainstreamingmigration.org/sites/default/files/2017-06/Migration-Profile-Extended-Kyrgyzstan-Eng-2010-2015%20%282%29.pdf

National Statistical Committee of the Kyrgyz Republic, 2018. http://www.stat.kg/en/

National Statistical Committee of the Kyrgyz Republic, 2019. Retrieved from http://stat.kg/en/

Oded Stark and J. Edward Taylor. 1991a. MIGRATION INCENTIVES, MIGRATION TYPES: THE ROLE OF RELATIVE DEPRIVATION. The Economic Journal, 101 {September 1991), 1163—1178 Printed in Great Britain

Oded Stark and J. Edward Taylor. 1991b. Relative deprivation and migration: theory, evidence, and policy implications (English). Policy, Research, and External Affairs; no. WPS 656. Welfare and human resources. Washington, DC: World Bank.

OECD Project on Income Distribution and Poverty. WHAT ARE EQUIVALENCE SCALES? Retrieved from http://www.oecd.org/els/soc/OECD-Note-EquivalenceScales.pdf

Sjaastad, L. (1962). "The Costs and Returns of Human Migration." Journal of Political Economy 70(5): 80-93.

Stark, O., 1993, The Migration of Labour, Cambridge: Blackwell.

Stark, O. (1984). Rural-to-Urban Migration in LDC's: A Relative Deprivation Approach.

Stark, O. (1991). The Migration of Labour. Oxford, Blackwell Publishers.
Stark, O., and Yitzhaki, S. (1988). Labour Migration as a Response to Relative Deprivation.

Stark, Oded & Micevska, Maja & Mycielski, Jerzy, 2009. "Relative poverty as a determinant of migration: Evidence from Poland," Economics Letters, Elsevier, vol. 103(3), pages 119-122, June.

Stark, Odel, Taylor, J.Edward, Yitzhaki, Shlomo, 1986. Remittances and inequality. Economic Journal 96 (383), 722-740

The World Economic Forum's Inclusive Development Index 2018

Trading Economics, 2017. https://tradingeconomics.com/uzbekistan/unemployed-persons

UNFPA, Child marriage in Kyrgyzstan (Overview), 2014, (accessed June 2018)

What Was the Tulip Revolution? (2017, August). World Atlas.

World Bank, 2017. Retrieved from https://data.worldbank.org/indicator/ny.gdp.pcap.pp.cd

World Bank, 2018. Migration and remittances. International Monetary Fund; World Development Indicators; World Bank staff estimates.

World Bank, Global Poverty Working Group, 2016. https://data.worldbank.org/country/kyrgyz-republic

Yanyan Liu and Futoshi Yamauchi, 2014. Population density, migration, and the returns to human capital and land: Insights from Indonesia. Food Policy Volume 48, October 2014, Pages 182-193