The Impact of the 2014-2016 Russian Financial Crisis on Remittances, Consumption, and Credit:

The Case of Kyrgyzstan

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Abstract

What is the impact of an exogenous shock to the Russian economy on welfare outcomes for remittance-receiving households in Central Asia? In this paper we consider the medium-term impact of the Russian Financial Crisis of 2014-2016 on remittances, consumption patterns, and credit in the Kyrgyz Republic. Using panel data from the Life in Kyrgyzstan survey and employing a difference-in-difference approach, we show a significant drop in migration to Russia and remittances from Russia on the extensive and intensive margins. We demonstrate that households with a migrant abroad in Russia just prior to the crisis experience an average fall in real per capita income and an increase in poverty. All households with and without a migrant experience an increase in food share expenditure and decrease in leisure expenditure, consistent with a re-balancing of the consumption basket during an economic downturn. Households with migrants still in Russia but no longer sending remittances are more likely to apply for a loan and less likely to save after the crisis. Our paper contributes to the literature by demonstrating a negative medium term impact of the Russian Financial Crisis on Kyrgyz families and families of migrants in particular, though these households are resilient to this transitory shock. Our results suggest that the current conflict in Ukraine and the associated negative shock to the Russian economy is likely to have a similar impact on closely-linked Central Asian economies.

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1 Introduction

Kyrgyzstan, or the Kyrgyz Republic, is known to be one of the most remittance-dependent countries in the world, with much of its population relying heavily on labour migration as a way to alleviate poverty and sustain consumption. In 2020, a reported $2.4 billion were received by Kyrgyz households in remittances, amounting for 31.3% of the country's total GDP, which was the highest percentage recorded across the Central Asia region that year and second only to Tonga's 38% at the global level. This was no anomaly; for over a decade, remittances have constituted approximately 25-30% of Kyrgyzstan's GDP,[1] and are considered to be the country's biggest driver of consumption-led economic growth.[2] According to the National Bank of the Kyrgyz Republic, remittances from Russia account for more than 95% of all remittances received each year (Ruslanova, 2022). This is not particularly surprising given Russia's geographical proximity, language affinity, relatively superior employment opportunities, and strong diaspora networks, which are all pull factors that combine to make for a highly attractive destination for Kyrgyz labour migrants. Therefore, as a result of these migration and remittance channels, the Kyrgyz economy is left remarkably exposed and vulnerable to any substantial shocks to the Russian economy.

The Russian Financial Crisis of 2014-2016 was the cumulative result of a variety of shocks. The Kremlin's decision to annex Crimea in February 2014 and the subsequent sanctions imposed on it by the West catalysed the first period of economic disruption, as banks and firms were cut off from Western capital markets. Russia's problems were then quickly compounded by the plummeting price of crude oil, the country's biggest export,[3] which saw a barrel halve in value between July 2014 and January 2015, while the rouble concurrently lost 30% of its pre-annexation value (against the US dollar) by November 2014.[4]Despite the Kremlin bailing out numerous Russian banks, financial turmoil persisted throughout 2015 due to continued oil price volatility and additional sanctions. Consequently, a recession ensued as GDP fell for six consecutive quarters until early 2016 when a 0.3% increase in GDP initiated a tentative recovery. In this paper, we will analyse the extent to which the financial crisis in Russia produced aftershocks in Kyrgyzstan's remittance-receiving households and what this meant in the medium term for their income, consumption patterns, and propensity to save or apply for a loan.

To the best of our knowledge, there is no existing quantitative research into how the 2014-2016 Russian financial crisis affected remittances and migrant families' consumption and loan outcomes in Kyrgyzstan. Hence, this paper seeks to not only make a unique contribution to the remittance literature but to also answer a question that is more pertinent now than ever before due to Russia's recent invasion of Ukraine. Forecasters are predicting dramatic reductions in Russian remittances to all of the Central Asian republics this year (Ratha and Ju Kim, 2022)[5] following the reintroduction of (more severe) sanctions and renewed economic instability. Therefore, through empirical analysis of a very similar set of circumstances in the past, and given that Kyrgyzstan is representative of the majority of Central Asia vis-à-vis its dependence on Russia for remittances, this paper will hopefully help to inform the present debate surrounding the war in Ukraine's impact on Central Asia. Additionally, there are numerous studies across many countries which positively link remittances, consumption, and food security (see section 3); however this literature suffers from a general lack of exogenous shocks that truly isolate the effect of remittances from other household characteristics that engender self-selected migration and consumption preferences. The Russian Financial Crisis of 2014-2016 undoubtedly provides the exogenous shock that is essential to understanding how sudden changes in remittances impact the consumption patterns of Kyrgyz households.

In order to answer our research question, we make use of longitudinal panel data collected by the Life in Kyrgyzstan survey, which tracks a nationally representative sample of 3,000 households across years 2010-2013 (inclusive) and 2016. Each round of the survey questions households on the origin and amount of remittance they received that year in addition to how said remittance is spent across different consumption categories including foodstuffs, education, medical expenses and family celebrations. Data from the 2013 and 2016 rounds allow us to carry out a simple difference-in-difference regression to examine the return rate of Kyrgyz migrants from Russia (in comparison to migrants in other destinations), the correspondent change in remittances post-crisis, and how this in turn affects consumption and credit.

We hypothesise that the Russian Financial Crisis precipitates an increase in return migration to Kyrgyzstan and a fall in total remittances received. In turn, partly based on findings by Chi et al.

[1] Source: World Bank

[2] See World Bank Report No. 99772-KG

[3] see OEC database: https://oec.world/en/profile/country/rus?yearSelector1=exportGrowthYear20

[4] see https://www.economist.com/briefing/the-end-of-the-line/21633816

[5] The authors predict an overall decline of 33% in remittances sent to Kyrgyzstan from Russia.

(2019), we anticipate that this leads to a decrease in affected households' spending shares across all consumption categories except foodstuffs, and increases the likelihood of the household applying for a loan. Indeed, our results confirm that many of the Kyrgyz migrants that were in Russia in 2013 have returned by 2016, and, as expected, the spending share allocated to food increases in 2016. Subsequently we find that remittance-receiving households are more likely (with statistical significance) to apply for a loan in 2016 compared to 2013. However, we find no statistically significant effect of the crisis on any other consumption category. These results are mirrored by parallel changes in the rest of the Kyrgyz population, suggesting that Kyrgyzstan was affected by the Russian Financial Crises through several direct and indirect channels. As The Life in Kyrgyzstan survey was not carried out in 2014 and 2015, and the Russian economy began to recover in 2016, we believe these results capture the medium-term effects of the shock rather than the immediate impact. In this way, we hope to understand the extent to which the shock was transitory or persistent.

The rest of this paper is organised as follows: section 2 provides more detail on the Kyrgz-Russian relationship and the Russian Financial Crisis, section 3 outlines the relevant literature and section 4 describes the data we use. Section 5 presents important descriptive statistics, section 6 explains the methodologies we employ before sections 7 and 8 present and discuss our results. Section 9 concludes.

2 Background

2.1 History of Kyrgyz Labour Migration to Russia

Kyrgyzstan is a mountainous landlocked republic in Central Asia. It is considered a lower-middle-income country with rich reserves of arable land, minerals, and metals, including gold. However, despite these favourable natural resources, the Kyrgyz economy is heavily reliant on remittances, as recent estimates place around 800,000 to 1,000,000 Kyrgyz workers abroad (Shamyrbekova, 2021). As previously mentioned, the vast majority of these workers are in Russia, and this financial dependency on Russia has grown over the last three decades for two main reasons.

Firstly, ever since gaining independence from the Soviet Union in 1991, Kyrgyzstan has been plagued with political instability and corruption, which has seen three deposed presidents in 2005, 2010 and 2020. Consequently, its economy has suffered from poor governance and prolonged spells of high unemployment, leaving many of the Kyrgyz people to resort to migration to find work. In fact, following 2002, the year in which unemployment reached an all-time high of 12.6%, the amount of remittances Kyrgyzstan received began to escalate dramatically from 1.9% to 18.5% of total GDP in just five years, before reaching 30% in 2013 with the unemployment rate hovering, on average, around 8% over the last 15 years.[6]

Secondly, the fact that Kyrgyzstan once formed part of the Soviet Union makes Russia a more attractive migration destination than other Asian/Eurasian countries, for reasons highlighted in the introduction. Moreover, compared to other post-Soviet nations such as Georgia and Ukraine, Kyrgyz-Russo relations have generally remained harmonious since the Soviet Union's dissolution; Russian maintains official language status in Kyrgyzstan, the two countries have shared a military base in Kyrgyzstan's capital of Bishkek since 2012, and approximately 10-20% of their respective overall trade is bilateral (Hashimova, 2022).

2.2 The Impact of the Russian Financial Crisis

Ties between the two countries were further strengthened in 2014, at least symbolically if not economically, by the creation of the Eurasian Economic Union (EAEU), a treaty founded by Russia, Belarus, and Kazakhstan that establishes an economic union for post-Soviet states. Similar to the European Union, the EAEU allows for the free movement of goods, services, and labour between all member states. As a result, from January 2015 onward when Kyrgyzstan was admitted, Kyrgyz migrants were no longer required to apply for work permits in Russia. In theory, this should have led to an influx of Kyrgyz migrants, or at the very least averted a decrease in the existing stock of Kyrgyz workers in Russia. Therefore, it is all the more exceptional that remittances received by Kyrgyzstan actually drop from \$2.2 billion in 2014 to \$1.69 billion in 2015 (30% to 25% of GDP) at a time when migration had supposedly become easier than ever (see Figures 11 14).[7] Naturally, this implies that the damage caused by the Russian Financial Crisis was sufficient to negatively impact employment opportunities or wages of Kyrgyz migrants, and by extension the remittances they were able to send home.

[6]Source: World Bank
[7]Source: World Bank

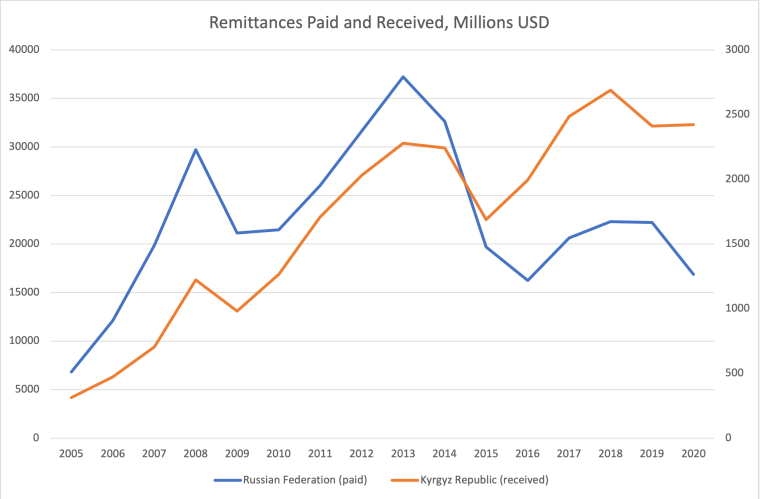


Figure 1: Remittance Flows Macro Trends (World Bank)

Likewise, as mentioned in the introduction, in 2014 the rouble suffered a severe depreciation following Western sanctions and the oil price shock. This had particularly detrimental effects on neighbouring remittance-receiving Central Asian countries, as Russian wages lost purchasing power and local currencies, including Kyrgyzstan's som, followed the rouble downwards against the US dollar (Toktonaliev and Trilling, 2014). As Figure 15 demonstrates, the som depreciated less than the rouble and therefore Russian imports, of which refined petroleum comprised 56% at the time, should have decreased in price. However, the depreciation of the som was nevertheless sizeable and therefore imports from China, which accounted for almost 50% of all Kyrgyzstan's imports in 2014, became more expensive as the yuan was largely unaffected by the rouble's depreciation.[8]Indeed, the International Monetary Fund predicted consumer prices in Kyrgyzstan to grow 8% and 8.9% in 2014 and 2015 respectively, before the Kyrgyz Economics Ministry reported increases of 20-25% in food prices in Bishkek in October 2014 (Toktonaliev and Trilling, 2014). Therefore, as a result of large pre-existing remittance flows which exposed Kyrgyzstan to Russian economic shocks, there is strong evidence to suggest that the 2014 Financial Crisis and its negative consequences were felt by Kyrgyz households.

3 Literature Review

3.1 General Effects Of Remittances

There is a general lack of consensus among the existing literature on remittances and their overall impact on recipient countries. A substantial branch of the debate puts emphasis on the role of remittances as a force of divergence between receiving and non-receiving households (Milanovic, 1987; Adams, 1991; Rodriguez 1998). These papers do not necessarily repudiate the positive effect remittances can have at the household-level, but cite the self-selected nature of migrants – i.e. the tendency of migrants to come from households or localities of a higher socioeconomic status ex-ante which affords them to meet the initial fixed costs of migration – as evidence that remittances can exacerbate overall income inequality in origin countries. Alternative hypotheses suggest remittance inflows can significantly alleviate household poverty and the liquidity constraints of migrants' families, thereby facilitating consumption smoothing and food security for recipients (Stark et al., 1986; Ahlburg, 1996; Taylor Wyatt, 1996; Giuliano Ruiz-Arranz, 2009; Amuedo-Dorantes et al., 2011; Ali et al., 2014). Our paper generally aligns with this side of the debate, for multiple reasons. Firstly, the Life in Kyrgyzstan data indicates that remittances are largely spent on essential household expenditures (see Figure 16). Secondly, as discussed in section 7, the poverty rate declines for all Kyrgyz households in 2016, except for migrant households. Thirdly, as discussed in section 5, we find that non-remittance income of households with and without a Russian migrant does not differ significantly, nor is the education level of migrant families higher on average.

[8]See OEC database: https://oec.world/en/profile/country/kgz

3.2 The Impact of Crises and Exogenous Shocks

In regard to how crises can cause disruption to remittance flows, the literature offers a limited number of findings, and therefore this paper will hopefully make a useful contribution in its examination of the impact of Russian Financial Crisis. Danzer & Ivaschenko (2013) use panel data and descriptive statistics to argue that the 2008 global financial crisis had a negative impact on remittance flows to Tajikistan, a country for which remittances currently account for approximately 27% of GDP and is therefore highly comparable to Kyrgyzstan. In contrast, Ratha (2005) and Mohapatra et al. (2012) suggest that remittances are resilient or even counter-cyclical in their response to crises and natural disasters, which is supported by Duval and Wolff (2016) in their finding that remittances to war-torn Kosovo in the 1990s increased the consumption of the poorest households. However, there is not (to the best of our knowledge) a comprehensive body of literature that employs a shock that is truly exogenous to the recipient country to study its consequences on household remittance inflows, with the notable exception of Yang (2008) which exploits heterogeneous shocks to exchange rates across the globe during the Asian Financial Crisis to analyse micro-level effects on remittances to the Philippines. [9] This significant gap in the literature ought to be addressed; exogenous shocks can help to disentangle the endogenous relationship between the household's ex-ante income and the amount of remittances it receives, which in turn allows for improved analysis of remittances' impact on consumption outcomes.

3.3 Consumption

The literature which examines the impact of remittances on consumption outcomes is abundant and generally consistent in concluding that remittances help to maintain or increase household consumption. In terms of how remittances affect specific consumption choices, Dhakal and Kumar Oli (2020) find that receiving households tend to spend more on health and education than non-receiving households in Nepal. Similarly, Tabuga (2007) finds that remittance receivers in the Philippines spend more on education, medical care, housing and durable goods, but also consume more conspicuously on leisure than non-receivers. While Irnazarov (2015) estimates that a disproportionate amount of remittances sent from Uzbeks working in Russia is spent on wedding and dowry expenses. This is indicative of an apparent cultural tendency to allocate excessive amounts of income to weddings in Central Asia (Najibullah, 2007 and Ganyeva 2016). Arguably the most similar research to that of our paper is authored by Chi et al. (2019), which also uses the Life in Kyrgyzstan study to examine how household spending varies according to the amount of remittance received. The authors find increases in remittances tend to decrease the household's food share and modestly increase the share attributed to medical expenses, but no significant differences to all other consumption categories. Our findings partly reinforce this conclusion, however, Chi et al. only makes use of the data from rounds 2011-2013, and therefore the additional contribution of our paper lies in its analysis of the survey data from the 2016 round, which captures the impact of the Russian Financial Crisis on remittances.

3.4 Credit

Regarding the sparse literature on the interaction between remittances and credit, Mbaye (2021) finds that remittance-receivers in rural Senegal are more likely to apply for loans due to increased credit-worthiness whereby remittances can be offered as collateral. However, the majority of authors on this topic tend to find that the household's extant debt and likelihood of applying for credit declines as the remittance received by the household increases. For example, Hassan et al. (2022) find that remittances reduce household debt severity in Cambodian households, and Ambrosius and Cuecuecha (2013) argue that remittance-receiving households in Mexico are less reliant on debt-financing as they use remittances as a substitute for credit in response to health shocks. Our paper supports these conclusions by showing that the reverse is also true; Kyrgyz household indebtedness increases as remittances decrease.

3.5 Food Security

The literature which examines the influence of remittances on food security is mostly unanimous in concluding that there is a positive relationship between the quantity of remittance received and food

[9] It should be noted that Sedrakyan (2021) finds that sharp drops in Russian GDP, as a result of 2014-2015 sanctions, corresponded with decreases in the overall stock of immigrants from Central Asia and Eastern Europe and their remittance outflows. However, this broader macro approach is highly limited; the real effects of the crisis on households' income or consumption do not enter the equation.

consumed by the household. For example, in Latin America, Ibarrarán et al. (2021) and Carte et al. (2019) find that receiving remittances is associated with increased caloric intake and dietary diversity in Venezuela and Honduras respectively. In Kyrgyzstan, the only paper (to the best of our knowledge) to examine the relationship between remittances and diet is Otunchieva et al. (2022), which finds that women of reproductive age in remittance-receiving households have more nutrient-dense diets than those in non-receiving households. However, this finding is based solely on descriptive statistics for just 423 women and therefore our paper will hopefully provide a more detailed contribution using econometric methods and a much larger and diverse sample of the population.

3.6 Other region-specific considerations

Despite Kyrgyzstan's substantial dependence on income from abroad, the current literature does not offer a particularly comprehensive range of insights on how this reliance on remittances impacts the wider Kyrgyz economy and people. Kumar et al. (2018) carry out a comparative analysis of the impact of remittances versus financial development[10] to determine which of the two factors is most pivotal to long-run output growth in Kyrgyzstan, before concluding that it is indeed remittances. In contrast, Anderson and Kroeger (2014) find that children aged 14-18 years old in Kyrgyz remittance-receiving households are less likely to be enrolled in school than other children, which perhaps gives some weight to the argument that remittances can impede a developing country's overall economic growth by disincentivising work and education.[11]

Considering all of the above, we believe our contribution to the literature to be unique; none of the aforementioned papers on Kyrgyzstan or Central Asia examine simultaneously how remittances and their subsequent allocation across different consumption categories is altered by any type of exogenous shock, nor how this affects the household's propensity to apply for credit.

4 Data

4.1 Life in Kyrgyzstan

Life in Kyrgyzstan is a longitudinal survey of households and individuals in Kyrgyzstan[12]. It was first conducted in 2010 and repeated four times in 2011, 2012, 2013 and 2016. It tracks the same 3,000 households and 8,000 individuals over time in all seven Kyrgyz administrative districts (oblasts) and the two cities of Bishkek and Osh. The original Life in Kyrgyzstan sample was representative nationally and at the regional level (East, West, North, South), and for that reason population weights were not included. Considering that the survey was not conducted in the years 2014 and 2015 – namely the years during which the Russian economy was the most severely hit – this paper makes use of the data available for 2013 (the year before the financial crisis) and 2016 to analyze the medium-term effect of the shock.

4.2 Dependent Variables

To assess the impact of the Russian Financial Crisis on migrant families' remittances, consumption patterns and credit applications, we look at three main groups of related outcomes: 1) migration, remittances and income. 2) consumption shares and dietary variety. 3) savings and credit application patterns.

4.2.1 Migration and Remittances

Our first outcome of interest is the extensive and intensive margin of remittances – that is, whether a household has a migrant working abroad ($HasMigrant$) and receives remittances ($ReceivesRemit$), and if so how much per month. The Life in Kyrgyzstan survey asks about remittances in two different sections: Household Form 5 (Income) and Form 6 (Migration). These two forms generally agree on which families receive remittances, though not always on the amount of remittance received. Since Form 5 reports remittance income alongside all other sources of non-transfer income in soms, we use remittance income reported on Form 5 for our measure of monthly remittance income ($RemitInc$).

[10] Financial development is defined as the growth in capital stock.
[11] https://www.imf.org/external/pubs/ft/op/259/op259.pdf
[12] The questionnaire in available at https://lifeinkyrgyzstan.org/

Table 1: Summary Statistics

	2013					2016				
Variables	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max
Has migrant (dummy)	2494	0.16	0.37	0	1	2494	0.11	0.31	0	1
Has Russian migrant (dummy)	2494	0.15	0.36	0	1	2494	0.10	0.29	0	1
Has Non-Russian migrant (dummy)	2494	0.01	0.11	0	1	2494	0.01	0.10	0	1
Receives remittances (dummy)	2494	0.14	0.34	0	1	2494	0.09	0.29	0	1
Remittances income per month (1000 soms)	2318	0.91	4.92	0.00	90.00	2065	0.75	5.35	0.00	190.00
Non remittances income per cap per month (1000 soms)	2318	4.98	5.41	0.00	91.00	2063	7.75	11.70	0.00	224.34
Total income per cap per month (1000 soms)	2318	5.24	5.57	0.00	91.00	2063	7.95	11.73	0.00	224.34
Income quantile (dummy)	2318	2.97	1.41	1	5	2065	2.99	1.41	1	5
Poverty (dummy)	2494	0.35	0.48	0	1	2494	0.34	0.48	0	1
Food expenditure per cap per year (1000 soms)	2448	19.20	11.34	2.36	165.04	2189	27.99	20.50	0.00	223.34
Other expenditure per cap per year (1000 soms)	2493	25.77	25.15	0.25	379.44	2187	26.61	22.67	0.00	336.32
Food share	2449	0.46	0.13	0.05	0.90	2171	0.52	0.15	0.00	1.00
Education share	2494	0.01	0.03	0.00	0.56	2494	0.01	0.03	0.00	0.39
Medical share	2494	0.02	0.03	0.00	0.37	2494	0.02	0.03	0.00	0.34
Celebration share	2494	0.06	0.08	0.00	0.71	2494	0.03	0.06	0.00	0.72
Food variety	2449	26.59	7.43	8	42	2191	27.31	7.41	1	41
Food groups	2449	10.06	1.18	5	12	2191	9.89	1.65	1	12
Savings (dummy)	2471	0.23	0.42	0	1	2174	0.24	0.43	0	1
Loan (dummy)	2479	0.12	0.33	0	1	2174	0.12	0.32	0	1
Loan amount (1000 soms)	2479	10.98	65.29	0.00	2000.00	2174	10.01	61.24	0.00	2000.00
Female head of HH (dummy)	2494	0.28	0.45	0	1	2103	0.28	0.45	0	1
Number of adults in HH	2494	3.36	1.64	1	10	2103	3.59	1.64	1	10
Number of children in HH	2494	1.75	1.53	0	8	2103	1.83	1.61	0	9
Residence (urban/rural dummy)	2494	0.61	0.49	0	1	2494	0.61	0.49	0	1
Community	2494	71.75	40.66	1	124	2494	71.75	40.66	1	124
Oblast	2494	6.86	4.22	2	21	2494	6.86	4.22	2	21

To create a consistent measure of total monthly household income ($TtlInc$), we sum all income listed on Form 5 (Income), plus social transfer income. Note that we also construct a non remittance income measure ($NonRemitInc$) by simply subtracting $RemitInc$ to $TtlInc$. Per-capita measures are calculated by counting only members of the household who are listed as living at home in a given year. We furthermore construct an income quantile dummy variable $IncQ$ (1-5). A poverty measure ($Poverty$) is constructed by identifying households whose per-capita income is less than $2 USD per day.[13]

4.2.2 Consumption Shares and Dietary Variety

Each wave of the Life in Kyrgyzstan survey asks the respondent to report household expenditure and production of both food and non-food items over the past year in Household Form 4. As shown in Figure 16, remittances are most likely to be used for current expenditures (including food), with other households reporting spending the money on savings, weddings, education, and medical expenses. Using expenditure data, we can construct the household's expenditure share for food, education, medical expenses, and traditional celebrations including weddings and funerals. We also construct yearly measures of per-capita total food expenditure ($FoodExp$) and total other expenditure ($OtherExp$).

The questionnaire asks in detail about the household's consumption of a variety of foods. From this data and in the spirit of Ibarrarán et al. (2021), we can construct two measures of diet variety: total variety and number of food groups. The total variety is simply a count of the number of distinct foods purchased or produced by the household. The number of possible items shifts slightly from year to year depending on what is asked in the survey. We harmonize these categories to create a consistent measure across 2012-2016. For a more basic measure of dietary variety, we also count the number of food groups consumed by the household.

[13]The amount in som is adjusted to USD by the yearly average exchange rate reported by the National Bank of the Kyrgyz Republic.

4.2.3 Savings and Credit Application

In 2013, the Life in Kyrgyzstan survey (Form 2) began asking respondents about savings, investment, and credit activity. From this data, we construct binary variables that capture whether the household applied for credit ($Dloan$) or whether the it made financial savings ($Dsaving$) within the past twelve month. We collected the amount of the loan obtained ($LoanAmt$) in thousands of soms.

4.3 Independent Variable

4.3.1 Migration Status

Our main regressor of interest $MigrantStatusR$ (Migrant Status Restricted) is a household's migration status in 2013, the year before the onset of the Russian Financial Crisis. Respondents to Life in Kyrgyzstan report whether they have a family member living abroad for work, and if so, where they work. In our main regressions, we compare households which have a migrant abroad in Russia to households that have migrants abroad elsewhere.

In one of our robustness checks (Section 7.2.3), we compare households without any migrant abroad to households that have a migrant in Russia but also to those that have migrant elsewhere. In the regressions we consider the full sample rather than the one restricted only to households having a migrant. $MigrantStatusR$ becomes $MigrantStatus$.

4.4 Control Variables

To account for omitted variable bias, we include controls for non-remittance income, gender of the household head, highest education status achieved in the household, residence (urban or rural) and number of adults and children in the household.

Table 2: Summary Statistics - By Type of Migrant Household - 2013

2013	**No Mig**			**Russian**			**Kazakh**		
Variables	N	Mean	SD	N	Mean	SD	N	Mean	SD
Number of migrants	2090	0.00	0.00	376	1.40	0.49	28	1.32	0.48
Receives remittances (dummy)	2090	0.00	0.00	376	0.85	0.36	28	0.64	0.49
Remittances income per month (1000 soms)	1926	0.00	0.00	366	3.75	9.35	26	0.96	2.84
Non remittances income per month (1000 soms)	1926	4.96	5.33	366	5.03	5.81	26	6.38	5.32
Total income per cap per month (1000 soms)	1926	5.07	5.38	366	6.03	6.40	26	6.88	5.47
Income quantile (dummy)	1924	2.90	1.39	366	3.35	1.43	26	3.38	1.33
Poverty (dummy)	2090	0.36	0.48	376	0.32	0.47	28	0.21	0.42
Food expenditure per cap per year (1000 soms)	2050	18.91	10.75	370	20.74	14.03	28	18.89	12.08
Other expenditure per cap per year (1000 soms)	2089	25.56	26.01	376	26.49	20.06	28	31.33	20.45
Food share	2050	0.46	0.13	370	0.45	0.12	28	0.40	0.12
Education share	2090	0.01	0.03	376	0.01	0.03	28	0.01	0.02
Medical share	2090	0.02	0.03	376	0.01	0.03	28	0.02	0.04
Celebration share	2090	0.06	0.09	376	0.07	0.09	28	0.10	0.07
Food variety	2050	27.10	7.40	371	23.43	6.85	28	29.54	7.39
Food groups	2050	10.11	1.17	371	9.71	1.15	28	10.43	1.32
Savings (dummy)	2071	0.21	0.41	375	0.34	0.48	25	0.24	0.44
Loan (dummy)	2077	0.12	0.33	374	0.11	0.32	28	0.21	0.42
Loan amount (1000 soms)	2077	11.52	69.89	374	7.82	32.73	28	13.82	31.47
Female head of HH (dummy)	2090	0.29	0.45	376	0.26	0.44	28	0.25	0.44
Number of adults in HH	2090	3.10	1.50	376	4.71	1.66	28	3.71	1.18
Number of children in HH	2090	1.72	1.54	376	1.93	1.50	28	1.61	1.42
Residence (urban/rural dummy)	2090	0.58	0.49	376	0.78	0.42	28	0.89	0.31

Table 3: Summary Statistics - By Type of Migrant Household - 2016

2016	**No Mig**			**Russian**			**Kazakh**		
Variables	N	Mean	SD	N	Mean	SD	N	Mean	SD
Number of migrants	2231	0.00	0.00	237	1.41	0.49	26	1.27	0.45
Receives remittances (dummy)	2231	0.00	0.00	237	0.85	0.36	26	0.81	0.40
Remittances income per month (1000 soms)	1811	0.00	0.00	230	2.75	5.88	24	1.54	3.86
Non remittances income per month (1000 soms)	1811	7.71	11.79	230	7.77	11.10	24	10.90	10.57
Total income per cap per month (1000 soms)	1809	7.84	11.84	230	8.50	10.95	24	11.16	10.47
Income quantile (dummy)	1811	2.93	1.41	230	3.40	1.39	24	4.08	0.97
Poverty (dummy)	2231	0.35	0.48	237	0.35	0.48	26	0.12	0.33
Food expenditure per cap per year (1000 soms)	1928	28.53	21.08	235	23.50	14.85	26	28.57	15.50
Other expenditure per cap per year (1000 soms)	1927	26.73	22.39	234	25.10	25.13	26	31.84	19.66
Food share	1912	0.52	0.15	233	0.51	0.14	26	0.48	0.12
Education share	2231	0.01	0.03	237	0.01	0.03	26	0.03	0.04
Medical share	2231	0.02	0.03	237	0.02	0.03	26	0.02	0.02
Celebration share	2231	0.03	0.05	237	0.05	0.08	26	0.04	0.11
Food variety	1930	27.47	7.49	235	25.77	6.57	26	29.88	6.45
Food groups	1930	9.90	1.68	235	9.73	1.48	26	10.62	1.10
Savings (dummy)	1913	0.24	0.42	235	0.30	0.46	26	0.46	0.51
Loan (dummy)	1913	0.11	0.31	235	0.16	0.36	26	0.31	0.47
Loan amount (1000 soms)	1913	9.54	61.84	235	12.54	57.11	26	21.92	52.75
Female head of HH (dummy)	1853	0.30	0.46	225	0.21	0.41	25	0.16	0.37
Number of adults in HH	1853	3.37	1.51	225	5.22	1.78	25	4.88	1.17
Number of children in HH	1853	1.79	1.59	225	2.18	1.66	25	1.76	1.92
Residence (urban/rural dummy)	2231	0.59	0.49	237	0.80	0.40	26	0.77	0.43

5 Descriptive Statistics

5.1 Basic Facts About Kyrgyz Migrants

Remittances play a large role in the lives of households that receive them. In 2013, 13.59% of households received remittances, and on average remittances comprised over 50% of their total income in all years except 2010 and 2016 (4). Over all survey years of Life in Kyrgyzstan after 2010, households receiving remittances report a per capita income larger than families who do not receive remittances. This gap widens from 388 KGZ (8 USD) per person month in 2011 to 1521 KGZ (31.40 USD) per person per month in 2013.[14] In 2013, 35.05% of households in the sample were living below the poverty line[15], while 32.71% of Russian migrant households lived in poverty. The average per capita income is generally higher for migrants to countries other than Russia (only 14.28% in poverty), though the level of remittances received is smaller.

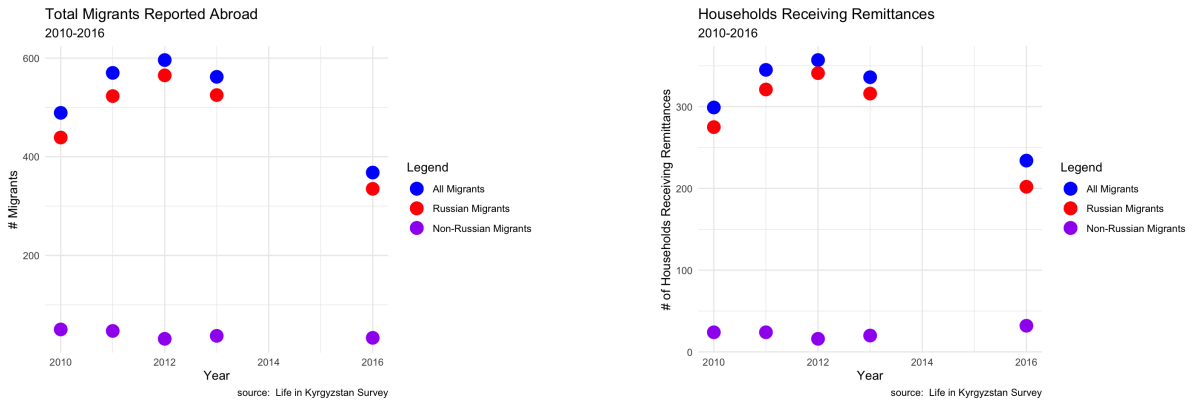
Year	Mean Remit Share
2010	0.27
2011	0.41
2012	0.57
2013	0.61
2016	0.46

Table 4: Remittance Share of Income Among Remittance Receivers

When comparing non-remittance income, families with and without a Russian migrant are closer on a per capita basis, though the highest education level of migrant families is not higher on average. Taken together, these facts suggest that families with a migrant do better economically because they can take

[14]For context, in the entire sample average per capita monthly income was 3,699 KGZ (80 USD) in 2011 and 5,020 (104 USD) in 2013.

[15]Poverty is defined as living on less than $2 USD per capita per day.



(a) Total Migrants Abroad

(b) Households Receiving Remittances

Figure 2: Migration and Remittances Drop

advantage of economic opportunities abroad that are better than those at home, but not necessarily because they are more skilled. Kyrgyzstan is a largely rural country, and 77.66% of migrants come from rural areas, as compared to 57.70% of non-migrant households.

From the panel data, we can extract a quite detailed picture of Kyrgyz migrant activity. Over the course of the study, 66.15% of reported migrants are male, with an average age of 29 in 2013 and the majority between the ages of 20 and 40 years old. Around half (56.48%) of migrants are married.

Over 90% of Kyrgyz migrants in every year live and work in Russia, while a small minority live mainly in Kazakhstan and other countries including Turkey, China, and European countries (see Figure 20). This travel abroad is financed primarily by savings (50.35%), with other common sources including help and loans from family members at home or abroad.

Most migrants are employed in the sectors of construction, trade and repair, and hotels and restaurants (see Figure 19). Out of all migrants in 2013, 72.46% had reached no more than a general secondary education level. The most common job titles are unskilled worker (66.67%), service worker/shop or market sales worker (14.54%), and technician (10.11%). As for the seasonal nature of work, 21.10% were identified as seasonal workers, 53.90% as non-seasonal workers, and 25.00% did not know how classify.

5.2 Data Narrative

Before running our main specification, we confirm that our data do show a drop in both migration and remittances on the extensive and intensive margins between 2013 and 2016..

5.2.1 Migration

Figure 2a confirms a substantial drop in migrants between 2013 and 2016, accounted for chiefly by a drop in migrants to Russia. Russian migrants decrease from 525 to 335, a drop of 36.19%. By contrast, the number of non-Russian migrants decreases from 37 to 33, a drop of 10.81%. Overall, the number of households with a migrant in Russia decreases from 15.08% in 2013 to 9.50% in 2016.

What happens to Russian migrants who were abroad in 2013? A closer inspection reveals that 65.96% of these migrants are reported as home in 2016; 16.14% are reported as still abroad; 4.74% are elsewhere in Kyrgyzstan; and 13.16% are unaccounted for. Of those that remain abroad, 84.21% continue to send remittances back to Kyrgyzstan. Of those that are back home, 23.23% report outside the home, many of them as unskilled workers. 15.2% report working on a farm or business owned or rented by the household. Only 13.16% report having a permanent job, business, or income-generating activity. Out of non-workers, 40.43% would like to have a paid job, but only 8.8% report looking for work in the past 7 days. Those not looking for a job explain that they are waiting for the busy season (23.53%), need to attend to children (19.12%), or believe they have no possibility of finding a job (23.53%). 9.56% report they are not looking because they are planning to move abroad again, or elsewhere in Kyrgyzstan. One the whole we see a picture of prime working age men who have returned home but are unable to provide the same financial support as they did before.

5.2.2 Remittances

As for remittances, the data show the same pattern of steep decrease. There is a sharp drop in the number of households that receive remittances (Figure 2b and an overall drop in total remittances received, both from Russia and elsewhere. Reassuringly, Figure 3 confirms the large drop in remittances observed in the macro data (Figure 1). We also should keep in mind that the gap in our data between 2013 and 2016 probably masks an even larger drop in remittances in 2015 that is reflected in the macro data.

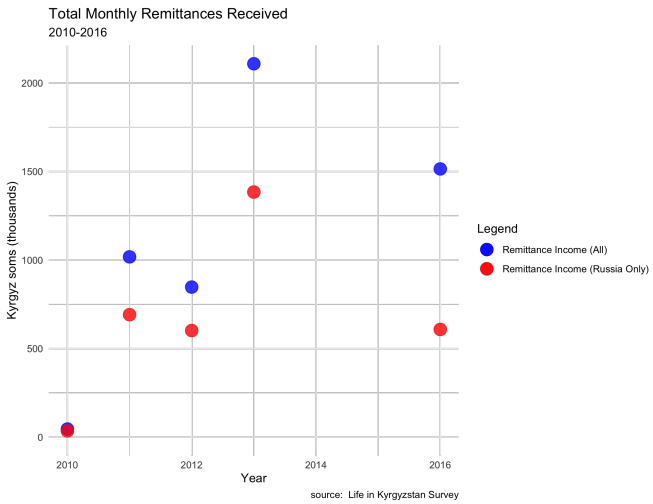


Figure 3: Total Remittances Received, 2010-2016

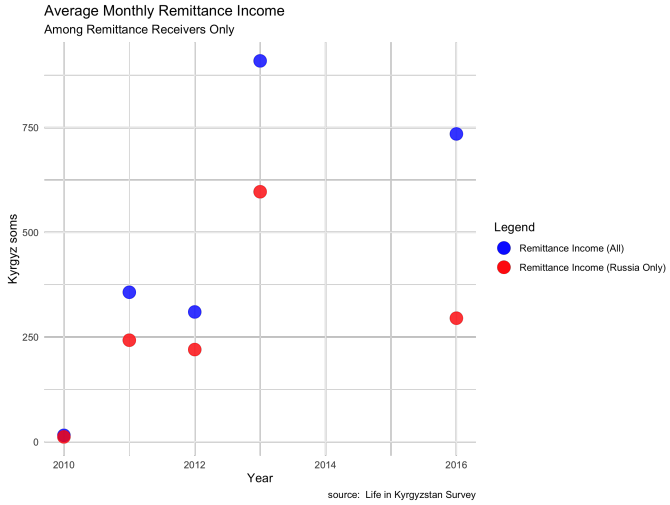


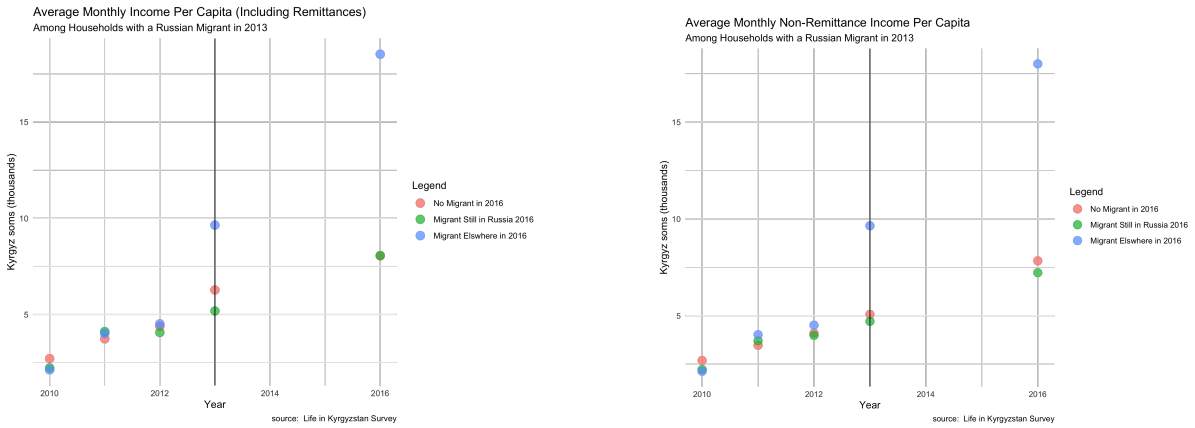
Figure 4: Average Monthly Remittance Income for Remittance Receivers

This drop in the overall volume of remittances is matched by an over 50% drop in monthly remittances on the intensive margin for those households that receive remittances from Russia. Given the 44.32% depreciation in the Kyrgyz som between 2013 and 2016, this is a 65.76% real decrease in remittance income in terms of USD (Figure 4).

We can now safely conclude that the drop in remittances from three key sources: households whose migrants returned home or stopped sending remittances, households who would have sent a family member abroad and decided not to, and households who receive a lower level of remittances.

In terms of percentage decrease, the decrease for Russian remittances is larger than that for other migrants. But we should notice from the parallel drop that that the Russian Financial Crisis seems to have a large effect on neighboring Kazakhstan as well.

With regards to non-remittance income (Figure 5b), we see that families whose migrants return home have a slightly higher non-remittance whose migrants are still abroad, which makes sense given the desire to replace lost remittance income. Average total nominal income per capita increases in 2016 among



(a) Total Income Per Capita

(b) Non-Remittance Income Per Capita

Figure 5: Income Trends Among Households with 2013 Russian Migrant

all groups (Figure 22b). Taking into account depreciation, average Russian migrant household income increases 41% in nominal terms; average income for non-migrant families increases 55% in nominal terms; average Kazakh migrant family income increases by 62%. Given a depreciation of 44% between 2013 and 2016, this implies that real per capita incomes decreased for migrant families and increased for non-migrant families, though this decrease could be due to the returning family member. Given the trajectory of wage growth implied by the pre-trends, this result implies income per capita stagnation due to the crisis.

5.2.3 Summary

To summarize, between 2013 and 2016, total remittances to Kyrgyzstan from Russia shrank by 28% due to drops on both the extensive and intensive margins. There was an over 30% decrease in the number of households with a Russian migrant abroad and the number of households receiving remittances from Russia. Most migrants who were abroad in Russia in 2013 returned home, where their households earned around the same per capita income in 2016 as those households whose migrants remained abroad. Considering the trajectory of income per capita pre-crisis, this is evidence of stagnation.

Now that we have established the real and significant drop in migration and remittance income, we turn to our main research question. Did the Russian Financial Crisis and the associated loss in remittance income lead to a medium term impact in consumption patterns, credit and savings? Or by 2016 were most families with a Russian migrant able to recover?

6 Methodology

6.1 Difference-in-Difference Approach

6.1.1 Regression Specification

In order to isolate the impact of the Russian Financial Crisis on migration, remittances, consumption, and credit, we implement a simple difference-in-difference (DiD) specification with two time periods, 2013 and 2016. In our model, the "treatment" is direct exposure to the Russian Financial Crisis, while our control group is only indirectly exposed.

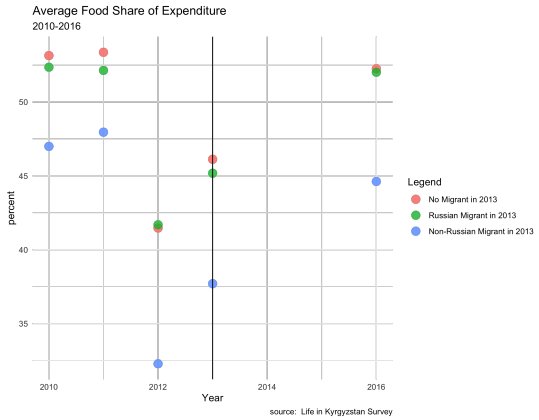
$$y_{jt} = \alpha + \beta Post_t \times MigrantStatusR_j + \mu MigrantStatusR_j + \gamma Post_t + x'_{jt}\Omega + \epsilon_{jt} \quad (1)$$

In (1), we restrict our sample to only households with a migrant abroad in 2013. The variable $MigrantStatusR$ (Migrant Status Restricted) equals 1 if the household had a migrant in Russia in 2013, before the Russian Financial Crisis. Group 1 is the "treatment" group. $MigrantStatusR$ equals 0 if the household had a migrant abroad but not in Russia. This is our "control" group. Since 88.8% of these migrants were listed as residing in Kazakhstan, we will also refer to this group as the Kazakh migrant households. The dummy $Post$ equals 0 in 2013 and equals 1 in the year 2016, the period after the Russian Financial Crisis. x_{jt} is a vector of control variables, including per-capita non-remittance

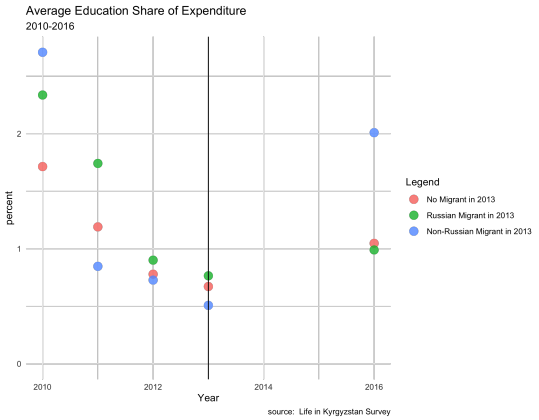
income, gender of household head, highest education of family members, number of adults and children, and rural vs. urban residence. The outcome variables of interest y_{jt} are divided in three categories following our data description structure in Section 4: 1) migration, remittances and income ($Hasmigrant$, $ReceivesRemit$, $RemitInc$, $Ttlinc$). 2) consumption shares and food variety ($FoodShare$, $EduShare$, $MedShare$, $CelebShare$). 3) savings and loan patterns ($Dsaving$, $Dloan$, $LoanAmt$). Note that standard errors are clustered at the community level.

6.1.2 Parallel Trends Assumption

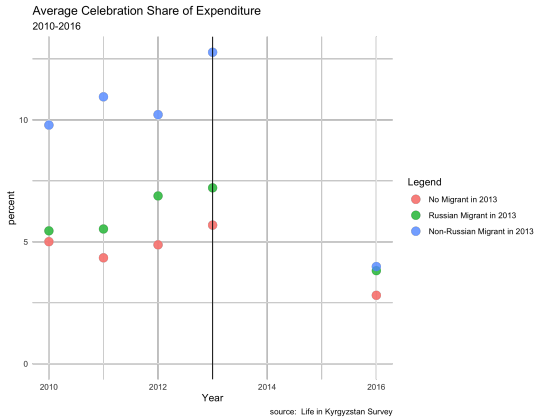
Our approach relies on the assumption that the treatment group and control group followed parallel trends before the impact of an exogenous shock, the Russian Financial Crisis. Figure 6 suggests that trends can be considered as parallel for consumption shares of food, medical supplies, and traditional celebrations between the Russian migrant (green dots) and Kazakh migrant households (blue dots). A parallel trend in education share is less clear, though there seems to be a parallel trend between the the non-migrant and Russian migrant groups. Figure 23 does not show clear parallel trends in the three groups for food variety outcomes. For these outcomes, DID may not be valid.



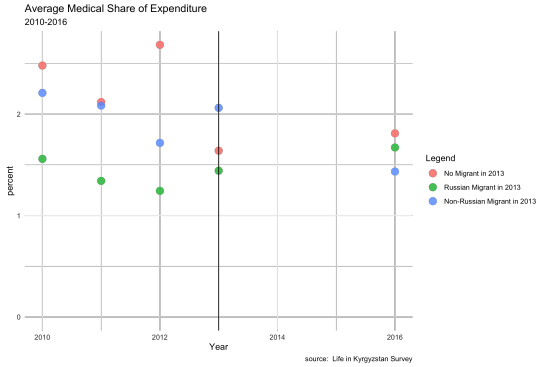
(a) Food Share



(b) Education Share



(c) Celebrations Share



(d) Medical Share

Figure 6: Parallel Trends in Consumption Shares

7 Results

In this section, we present and explain our main results. First, we present our main difference-in-difference regression. Then, we show the results of several robustness checks.

7.1 Baseline Difference-in-Difference Results

We hypothesize that the Russian Financial Crisis led to a drop in real income for households of Russian migrants, and that this drop in income may have led to changes in consumption patterns including an increased food share expenditure and a decreased expenditure share in all other categories. It might also have led to a decrease in dietary variety as households focus their consumption on calorie-dense foods. We also hypothesize an increase in credit applications and decrease in savings as households attempt to smooth consumption after an income loss.

In what follows, we show that while both Russian and Kazakh migrant households experienced a remittance income loss, increase in poverty, increase in food share, and decrease in celebration share after the crisis, the difference between these two groups was not significant. We do observe a higher rate of loan applications from households with a Russian migrant.

7.1.1 Migration, Remittances, and Income

In our first DiD regression (Table 7), we look at the impact of the Russian Financial Crisis on migration, remittances, and income. Recall that the sample is restricted to only families with a migrant abroad in 2013. $MigrantStatusR$ equals 1 when the household had a Russian migrant. As expected, we note that the *Post* term shows a significant drop in the probability the family has a migrant abroad and the probability that the family receives remittances. The sign on total remittance income is negative, though not significant. [16] Though they are not significant, the coefficient on *Post* for income per capita, non-remittance income per capita, and income quantile make intuitive sense. They suggest that after the Russian Financial Crisis, families with migrants had increased nominal total income per capita and non-remittance income (due to depreciation and increase in home production or labor force participation). Because migrant families do not increase their income as much as the rest of the population, they drop in income quantile.

As for the interaction terms, none are significant. This implies that there is no statistical difference in impact between families with Russian and non-Russian migrants after the crisis. Because the "control group" of Kazakh migrants is only 28 families, this is not surprising. The negative coefficient on $ReceivesRemit$ implies that Russian migrant families are even less likely to receive remittances after the crisis. The signs of the other coefficients imply that Russian migrant families are faring worse than their Kazakh counterparts, with lower remittance income per capita, non-remittance income, and total income per capita. Russian migrant families seem less likely to drop below the poverty line or by income quantile than Kazakh migrant families, though these coefficients are not significant.

7.1.2 Consumption Shares

Table 8 presents results from the same specification on all consumption shares, as well as dietary variety. The first important result is the significant increase in food share and significant decrease in celebration share in both groups after the Russian Financial Crisis (Post coefficient). This is consistent with the expected reaction to an economic downturn, especially given the depreciation of the Kyrgyz som and rise in food prices mentioned in the introduction. Migrant families also have less money to spend on leisure activities, which is why celebration share decreases. Medical and education shares remain constant, though it must be admitted that these shares were already very small to begin with. The interaction terms show no significance. The results on food groups and food variety are hard to interpret, since there were no clear parallel trends.

7.1.3 Expenses, Savings, and Loans

The final table (Table 9) shows results for total expenditures, savings, and loans. We first note a positive coefficient on *Post* for total food expenditure per capita, which should not be surprising given the depreciation of the Kyrgyz som and food price increases. Unsurprisingly, other expenditure per capita decreases as food share increases. More importantly, there is a positive and significant coefficient on the *Loan* interaction term, indicating that families with a Russian migrant in 2013 are 23.3% more likely to apply for credit after the crisis compared to their Kazakh counterparts. Savings behavior does not appear to change.

[16] This term should only be interpreted as an average among the group, as it includes a drop on the extensive and intensive margins.

7.2 Robustness Checks

In order to confirm the main results and insights provided by our baseline DiD model, we run four different robustness checks. First, we extend our model to a generalized difference-in-difference (GDiD) including all the years available before the Russian Financial Crisis [17]. Second, we implement a panel data fixed effects regression using an interaction between our main treatment variable and each year available to validate the parallel trends assumptions. Third, we run a DiD specification with both migrant groups and the group of non-migrants to compare *Post* outcomes. Finally, to strengthen our results specifically for post-shock credit demand patterns, we use a discrete choice approach, namely logit, probit, and linear probability models.

7.2.1 Generalized Difference-in-Difference for All Years

This GDiD specification, unlike our baseline model, uses four time periods, 2011 2012 2013 and 2016. The objective is to compare the coefficients estimated by the GDiD having an extended pre-treatment period to the ones estimated by our simple DiD and see whether they are consistent.

$$y_{jt} = \alpha + \beta \times MigrantStatusR_j \times Post_t + \mu_j + \gamma_t + \epsilon_{jt} \tag{2}$$

The treatment and control groups remain the same as before (1 if the household has a Russian migrant, 0 if it has a Kazakh migrant). Because the Life in Kyrgyztan survey does not ask about savings and credit patterns before 2013, these variables are not included in this regression. All the other outcome variables of interest used before are nevertheless still considered. We introduce μ_j household and γ_t time fixed effects. The results these GDiD regressions are presented in Tables 10 11, and 12. After capture the long run trend, Russian migrant household are 10.2% less likely to receive remittance comparing to Non-Russian migrant households, which is same sign and similar size to the coefficient in the simple DID regression. As for poverty levels, all migrant households experience an increase in poverty after the Financial Crisis, although the increase in the poverty level of Russian migrant households is smaller, which confirms our results in simple DiD7.

7.2.2 Time-Coefficient Interaction for All Years

For this second robustness check, we run a regression interacting our main regressor $MigrantStatusR$ with the years considered in our data. The goal is to look at the difference between the pre-treatment period coefficients and the one for the post-treatment year 2016.

$$y_{jt} = \alpha + \sum_{t=2011}^{2016} \beta_t \times MigrantStatusR_j \times Time_t + \mu_j + \gamma_t + \epsilon_{jt} \tag{3}$$

Our two groups remain the same. Again the savings and loan binary variables are not considered because we do not have any data for these before 2013. Both household and time fixed effects are again included. The results of this robustness check are presented in Tables 13, 14, and 15, with coefficient plots in Figure 26 and 27. We can see from Figure 26a that time-coefficients before the treatment is stable while the time-coefficient in 2016 drop largely for receive remittance outcome variable. There is also a significant increase for the time-coefficient in year 2016 for celebration share26a.

7.2.3 DiD with Full Sample

The Russian Financial crisis affected Kyrgyzstan and Kazakhstan both through direct (remittances) and indirect (depreciation, trade) channels. To compare outcomes with households without a migrant, we run (4).

$$y_{jt} = \alpha + \beta_{1,2} Post_t \times MigrantStatus_j + \mu_{1,2} MigrantStatus_j + \gamma Post_t + x'_{jt}\Omega + \epsilon_{jt} \tag{4}$$

The dummy $MigrantStatus_j$ (Migrant Status Unrestricted) equals 0 if a household has no migrant abroad in 2013, equals 1 if the household has a migrant abroad in Russia in 2013, and equals 2 if the household has a migrant abroad in another country in 2013. The results of these regressions are presented in Tables 16, 17, and 18. This table confirms our conclusion that all the Migrant households are less likely to receive remittance in 2016, with a more sizable magnitude for Russian Migrant Households.

[17] We include the years 2011, 2012. 2010 is excluded because of the irregularities displayed by the data.

Both Migrant households increase poverty rate but Russian Migrant households increase less. For all the households, including Non-Migrant and Migrant households, the food expenditure per capita increases in 2016, given the depreciation of som and the increasing price of food in 2016, this make sense. Most importantly, this full sample DiD regression confirms our previous conclusion that Russian migrant households are more likely to apply for loans in 2016, comparing to the non migrant household and non-Russian migrant households.

7.2.4 Discrete Choice Approach

To assess the impact of the Russian Financial Crisis on the household's binary decision to apply for credit, we employ a discrete choice model.

In this specification, the outcome variable y_j equals 1 if household j applies for credit or saves money in year t.

$$Pr(y_{jt} = 1|x_{jt}) = F(x'_{jt}\beta) \tag{5}$$

$$x_{jt} = \alpha + \beta MigrantStatusR_j + z'_{jt}\Omega + \varepsilon_{it} \tag{6}$$

The dummy $MigrantStatusR_j$ is the same as before, and z_{jt} is a vector of explanatory variables. We test three different options for the function F: probit, logit, and linear probability.

We run our discrete choice model for the loan application for both years 2013 and 2016 separately. [18] In 2013, all three models suggest households with Russian migrants are less likely to take out loans than households with Kazakh migrants. However, in 2016 all three report a positive coefficient, although not statistically significant (see Table 19).

8 Discussion

8.1 Results Interpretation

8.1.1 Poverty

Our results reveal an increase in poverty among all migrant families in 2016, a year when the poverty rate decreased for the overall population relative to 2013 (Figure 7). Proportionally, Kazakh migrants are even more directly affected. Since all families experience an increase in nominal non-remittance income in 2016 (Figure 5b), this increase in poverty comes from two sources: depreciation and a drop in nominal remittance income. The effects are most severe for families whose migrant is still abroad in Russia but does not send remittances (Table 5). These households' migrants also report being abroad for a longer period of time, suggesting that these households rely on remittances as a long-term source of income. They are the most dependent and worst-affected of the group.

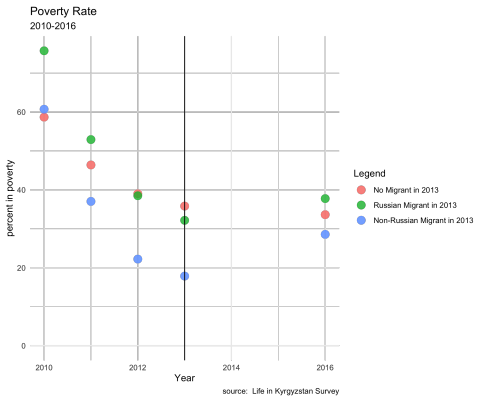


Figure 7: Poverty Rate

In fact, the pattern shown in Figure 8 suggest that remittances can be a source of poverty alleviation. Recall that our treatment group refers specifically to the households who had a migrant abroad in Russia

[18] LiK only asks respondents about loan applications in 2013 and 2016, so unfortunately there are no pre-trends.

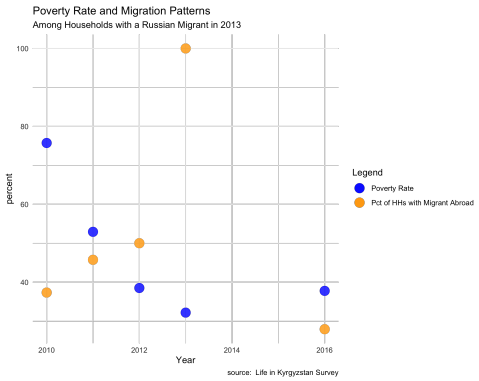


Figure 8: Poverty and Migration Patterns

in 2013. We see quite clearly that as the percentage of households with a migrant abroad increases, the level of poverty among the same group decreases. Of course it could be argued that a decrease in poverty enables households to fund migration abroad, thereby reducing poverty further. However the results discussed in this paper strongly suggest that a loss of remittance income contributed to pushing some of these families back into poverty.

	% in Poverty	% Savers	% Loan	Loan (thousands)
Migrant Abroad; Doesn't Send Remittances	58.33	16.67	41.67	52.5
Migrant Abroad; Sends Remittances	34.48	33.30	20.00	14.22
Migrant No Longer Abroad	37.75	34.33	11.59	5.49
Non-Migrant Families	33.63	21.84	11.20	10.09

Table 5: Poverty, Savings and Credit Among 2013 Russian Migrant Households, 2016

8.1.2 Consumption Shares

Our results demonstrate that Russian migrant households as a whole experienced a stagnation or real decrease in income following the crisis.[19] However, there does not seem to be an outsized impact on any consumption share relative to all other groups. The parallel trends from before the crisis continue afterward (Figure 6). This suggests that within the time span considered, migrant families are as resilient to shocks as all other groups.

However, we need to keep in mind both the bigger and smaller picture. The bigger picture is that the Russian Financial Crisis did have a noticeable impact on all households. Namely, we see a very clear increase in food share and a decrease in celebration share of expenditure across all groups, consistent with a re-balancing of the consumption basket during an economic downturn. In the entire sample, the *Post* dummy indicates a significant 6.76% increase in food share and significant 2.89% decrease in celebration share.

How did the Russian financial crisis impact the entire Kyrgyz economy? The depreciation of the Kyrgyz som would have made imports much more expensive. Because trade partners like Russia (19.3% of trade in 2015) and Kazakhstan (8.55%) experienced higher depreciation, these imports prices may have remained more stable in real terms. However, over half (53.3%) of imports to Kyrgyzstan in 2015 were from China, which did not experience a similar level of depreciation.[20] These items, mostly clothes and electronics, would have become more expensive.

Kyrgyzstan also suffered in terms of export trade. Its exports dropped from $2 billion in 2014 to $1.44 billion in 2015. In fact, Kyrgyz exports to Russia remained more or less stable between these years. But exports to other Central Asian countries including Kazakhstan, Uzbekistan, and Tajikistan decreased, with Kazakhstan alone dropping more than $200 million. [21] Taken together, these facts suggest that the Russian Financial Crisis impacted households in Kyrgyzstan both directly and indirectly through a currency crisis and a slowdown of trade across the entire former Soviet Central Asian region.

[19] The average Russian migrant family income increased 41%, but the som depreciated 44%.
[20] https://oec.world/en/profile/country/kgz?yearSelector1=exportGrowthYear21yearlyTradeFlowSelector=flow1
[21] https://comtrade.un.org/data/

What of the smaller picture? A data-driven narrative of the impact of the Russian Financial Crisis on remittance-receiving families has already been elaborated in detail in Section 5.2. The results of our regressions show that the "treatment" group of Russian migrants as a whole kept pace with other groups in terms of consumption shares. However, *within* this group, the impact varied greatly depending on whether the family's migrant remained in Russia in 2016 or not. Among households whose migrant returned to Kyrgyzstan, average income per capita is much lower in 2016 (8.18 thousand KGZ to 20.79 thousand KGZ). Food share is higher (52.20% to 50.49%) and celebration share is lower (2.79% to 6.61%). Of course, we cannot claim that these differences are only due to the crisis, because the likelihood of migrants losing their job in Russia or returning home is endogenous to other factors. But even so, the loss of remittance income from Russia represents a very large decrease in income and a rebalancing of the consumption basket, whether this change is exogenous or not.

8.1.3 Credit

Our results indicate that households with a Russian migrant abroad in 2013 are more likely to apply for credit in 2016 than both the control group and the group of households with no migrants in 2013. This is striking, given that households with a Russian migrant are less likely than both groups to apply for credit in 2013 (see Figure 9).

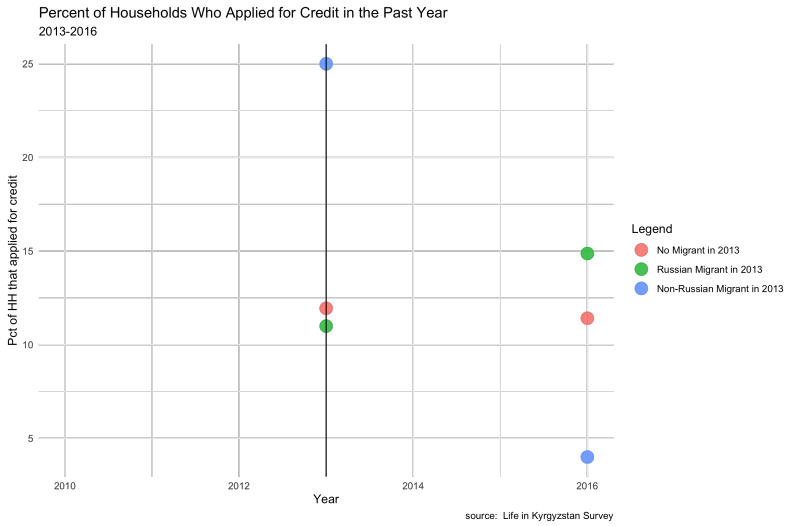


Figure 9: Applications for Credit

By contrast, the percentage of control households seeking credit decreases dramatically, while the percentage of non-migrant households seeking credit remains more or less stable. The large drop in credit applications in the control group is hard to interpret because of the small sample size. [22]

It seems natural that Russian migrant households might seek credit given that a loss of all remittance income means, on average, a loss of half of total household income. A closer inspection of the data shows that 53.70% of these households seeking credit no longer have a migrant abroad in Russia. 40.74% still have a migrant in Russia. Only three households still have a migrant abroad but in a different country. Out of the whole group, 50.98% obtained the loan from a microcredit agency, with private persons (17.65%) and credit unions (15.69%) being other important sources of credit.

Of these credit-seeking households, the most common reasons for applying were to purchase agricultural equipment and seeds (60.78%), cover current household expenses (23.23%), or start a business (23.23%). By contrast in 2013, only 14.62% of credit-seeking households from the same group used the loan for agricultural purposes, and only 4.88% used the loan to start a business. The percentage using a loan to cover current expenses was about the same (21.95%). [23]

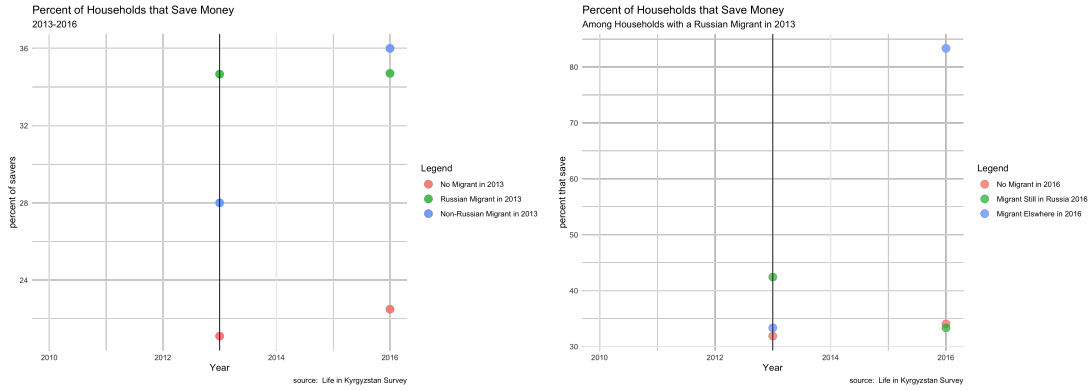
[22] The control group has only 28 households, of which only 7 applied for a loan in 2013 (2 to build a house, 2 to cover current living expenses, 2 to purchase agricultural equipment, and 1 for other purposes). In 2016, only one of those households applied for a loan (other purposes).

[23] It should be noted that in 2013 Life in Kyrgyzstan only asks the respondent for the primary purpose of the loan, whereas in 2016 respondents are able to select multiple reasons. Therefore, it is possible that the 2013 data omits other uses for the loan.

As mentioned in Section 5.2, the vast majority of returning migrants do not work outside the home after returning from abroad. The large increase in loans for agricultural equipment and business indicates that Russian migrant families reacted to a drop in labor income by investing in home production and entrepreneurship, perhaps as a buffer against labor market conditions. Indeed, Figures 24 and 25 demonstrate a more than double increase in income from crop farming enterprises among families with a migrant abroad in Russia in 2013. [24] Given that families with a migrant overwhelmingly live in rural areas, the shift into agricultural production rather than wage work makes intuitive sense.

8.1.4 Savings

Our results indicate that households with a Russian migrant in 2013 do not change in their average propensity to save after the crisis. This may be due to an unobserved personal propensity to save that is endogenous to migration. As shown in Figure 10a, migrant families and Russian migrant families in particular have a much higher propensity (34.67%) to save than the rest of the population (21.10%). This could be for two interrelated reasons. As noted previously, remittance-receiving families have a significantly higher household income than other households, and thus they are in a position to put aside funds for a rainy day. Another explanation may be that families with a migrant have a preference for future consumption and hence save more; this characteristic could be a motivation for labor migration. Because we do not have data before 2013, we cannot elaborate on whether Russian migrant families saved at the same level before a family member sent remittances from abroad.



(a) Saving Patterns - All Groups

(b) Saving Patterns - Russian Migrant Group

Figure 10: Saving Patterns

However, within the Russian migrant group we do observe differences in saving behavior based on whether the Russian is home in 2016 or not, and whether that migrant sends remittances. For families whose migrant returned home by 2016, the savings rate is about the same and still much higher than the general population (Table 5). The group with the lowest percentage of savers (16.67%) and highest rate of credit applications (41.67%) is households whose migrant was still abroad in Russia but did not send remittances. These long-term migrant families are exactly the families with a higher poverty rate after the crisis, who were most dependent on remittance income. Their savings and credit behavior is consistent with a need to spend more in the present and find alternative source of income in response to higher food prices as a result of the Russian Financial Crisis.

8.2 Methodological Concerns

8.2.1 Control Group

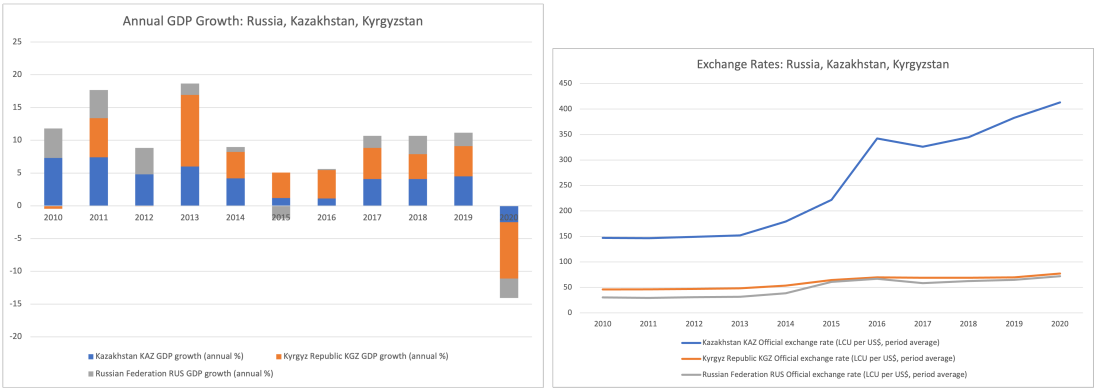
The size of the control group is a legitimate concern. Out of 2,494 households surveyed in 2013, 2,090 have no migrant abroad; 376 have a migrant in Russia; and 28 have a migrant elsewhere. These 28 households have 45 migrant family members abroad in 2013. 40 of these migrants are in Kazakhstan, while 5 are elsewhere.[25] Because the overwhelming majority of Kyrgyz migrants go to Russia, the Life in

[24] We note that this chart uses remittance income from Form 5, which is much lower than Form 6. In our calculations and regressions, we use remittance income from Form 6.

[25] While the occupations of Russian migrants are more varied (see Figure 19), 97.5% of migrants to Kazakhstan work in construction, trade, and repair. 80% are unskilled workers, as opposed to 65.9% of Russian migrants. On average,

Kyrgyzstan sample naturally interviews far fewer non-Russian migrant households, and thus the averages of this group may not be representative of the population.

Also of concern is the fact that neighboring countries, including Kazakhstan, were indirectly exposed to the shock of the Russian Financial Crisis. Outflows of remittances from Kazakhstan dropped from $3.46 billion to $2.4 billion from 2014 to 2016.[26] The Kazakstani tenge (KZT) depreciated from 179.19 KZT to USD in 2014 to 342.16 KZT to USD in 2016. [27]. Kazakhstan, like Kyrgyzstan, experienced slowed economic growth but did not enter recession like the Russian Federation (Figure 11a). [28]. Though it is reasonable to assume the effect on Kazakh migrants was in some way different than the impact on Russian migrants, it is also possible that it was more severe.



(a) GDP Growth

(b) Exchange Rates to USD

Figure 11: Macro Variables 2010-2020: Russia, Kazakhstan, Kyrgyzstan

Though it cannot offer identification in the sense that migrant and non-migrant families differ in unobservable ways, it may be helpful to think of non-migrant families as the "control" group that was affected by the Russian Financial Crisis in an indirect way only (depreciation and trade). Our two groups of migrant families – Russian and Kazakh – are a "treatment" group that are affected in heterogeneous ways.

8.2.2 Duration of Migration

It must be acknowledged that the scope of our analysis is limited given that we are missing data from crucial years 2014 and 2015 and therefore we are unable to observe the effect of the crisis throughout its full duration. As a result, it is reasonable to question whether the drop in migrants and remittances is capturing the effect of the Russian Financial Crisis, or rather of the normal rate of attrition as migrants return home. While it may be impossible to fully untangle these two effects, we believe the 2016 drop in migrants cannot be fully due to normal attrition, for three reasons.

As Figure 12 demonstrates, 50% households with a migrant abroad in 2010 reported a migrant abroad in 2013. By contrast, only a little over 25% of households with a migrant abroad in 2013 reported a migrant abroad in 2016. This implies a premature return date for about half of Russian migrants who were abroad in 2013.

Second, the natural return of migrants does not automatically imply a drop in the extensive margin of remittances, because in every year there will be new families that send migrants abroad. Figure 12 shows that of households who did *not* have a migrant abroad in 2010, nearly 12.5% had one abroad in 2013. By comparison, slightly over 7% had a migrant abroad in 2016.

Third, there are a non-negligible amount of migrants who spend more than two years abroad. When asked for how long they have received remittances, the majority of remittance-receiving households

these migrants abroad elsewhere send back fewer remittances per capita than Russian migrants, though they had a higher income per capita than households with Russian migrants. This could be true for one of three reasons: 1) non-Russian migrant households have fewer migrants per family. 2) Russian migrants receive higher wages than non-Russian migrants. 3) these families do not need as many remittances, because they already have a higher income. 4) the sample is too small or distorted in some way. Explanation 1 could contribute to this result, because Russian migrant families are more likely to have 2 migrants abroad rather than 1 (39.63% versus 32.14 %). Explanation 2 is likely, since Kazakhstan has a generally weaker economy than Russia. Explanation 3 is supported by the income data. Explanation 4 is also certainly possible.

[26] https://data.worldbank.org/indicator/BM.TRF.PWKR.CD.DT?locations=KZ

[27] https://data.worldbank.org/indicator/PA.NUS.FCRF?locations=KZ

[28] https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=KZ-RU-KG

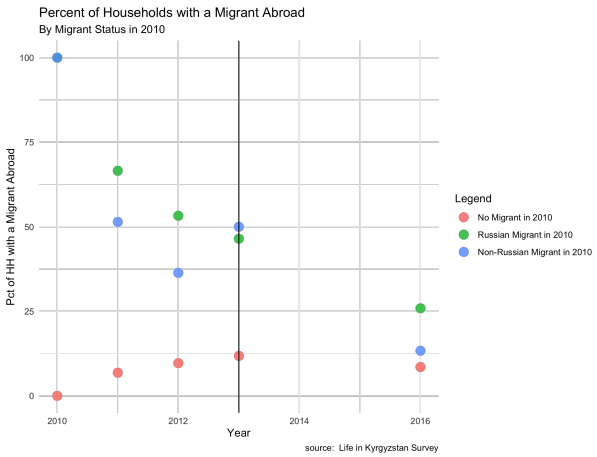


Figure 12: Migration Patterns from 2010

reported having received them from 0-5 years, with some receiving remittances for even longer. This data implies that migrants who arrived in Russia in 2013 may have returned much earlier than planned, given previous expectations.

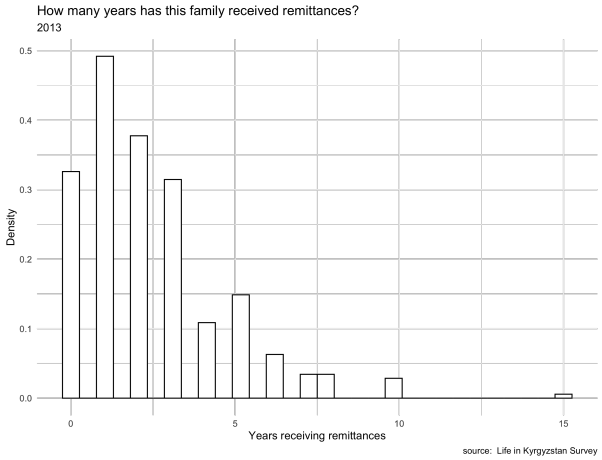


Figure 13: Years Receiving Remittances

Taken together, the data suggests that the Russian Financial Crisis prematurely cut short Kyrgyz migrants' stay in Russia and discouraged Kyrgyz families from sending migrants to Russia.

8.2.3 Data Specific Limitations and Recommendations For Further Research

As previously discussed, many Kyrgyz remittance-receiving households are able to find coping strategies to aid their recovery by 2016, however due to the 2014-2015 gap in the data we are unable to capture the effect of any transition period in which income from Russia has ceased and has not yet been replaced from employment elsewhere. That is to say, while our theory that the Russian financial crisis had a negative impact on remittances to Kyrgyzstan is upheld by the fact that those that still have a migrant in Russia are worse-off in 2016 than those without such explicit ties to the Russian economy, we are perhaps underestimating the worst effects of the crisis if those effects occur in 2014 or 2015.

Similarly, a sixth round of the Life in Kyrgyzstan survey was conducted in 2019, however it is not yet accessible for academic research. By 2019, Russian GDP was at its highest level since the crisis began in 2014; the economy had somewhat recovered and therefore the sixth round would have been useful for observing the extent to which the recovery of remittances to Kyrgyzstan is conditional on Russian economic recovery. Further research into Kyrgyzstan's reliance on remittances should strive to make use of this data.

As discussed in section 8.2.1, a big problem with this particular data set is the very small control

group it offers, given that the vast majority of Kyrgyz migrants go to Russia, along with the fact that the control group is also indirectly affected by the same financial crisis. Migrants from other countries in the same region, such as Georgia and Armenia are spread much more diversely across the globe, With Russia hosting only 50% (approximately) of both countries' respective diasporas.[29] Therefore, for future researchers looking to examine the relationship between the Russian and post-Soviet economies, it would be more desirable to have longitudinal survey data on remittances and consumption from countries like Georgia and Armenia as opposed o Kyrgyzstan.[30]

Moreover, as with any survey data, there is potential for misreporting, and especially so when the subject matter concerns migration, due to social desirability bias. In other words, some households, particularly in the 2013 sample, may be receiving remittances from a migrant that is abroad *illegally* in Russia or elsewhere, and may opt to withhold this information for fear of judgment or implicating themselves in legal trouble, which in turn may limit the precision of our findings.[31] More specifically, the 67% return rate of migrants that we observe between 2013 and 2016 may be even higher in reality and therefore the actual drop in remittances may also be greater in magnitude. Similarly, social desirability bias may also elicit inaccurate responses from households on the topic of whether or not they applied for loans, or the nature of their spending habits, which again may produce underestimates of any negative impact of the Russian financial crisis on affected households.

Lastly, there is also the issue of unintentional reporting inaccuracies in the survey, as we found many discrepancies and outliers in the food consumption and remittance data. The household member responding to questions about consumption and remittances may not have had firsthand or recent knowledge of the relevant frequency, amount, and currency used in foods purchased or remittances received.

9 Conclusion

In this paper we considered the medium-term impact of the Russian Financial Crisis on Kyrgyz families with migrants abroad in Russia. We determined that households with a Russian migrant experienced an average loss in total real income per capita after the crisis, while households without a migrant on average increased real income per capita slightly between 2013 and 2016. Given the trajectory that incomes were on before the crisis, this represents a stagnation in development for both groups. While the poverty rate in Kyrgyzstan fell overall in 2016 compared to 2013, the poverty rate for migrant families actually increased to 37.76% for Russian migrant families – when it had been lower than the population average in 2013.

As for consumption shares, food share increased and celebration share decreased for all families following the crisis, with no significant difference in migrant families regardless of migrant destination. This respective increase and decrease, which are consistent with a re-balancing of the consumption basket during an economic downturn, are more severe for families whose migrant returned home. Russian migrant families with a non-remitting migrant abroad distinguished themselves in being less likely to save and more likely to apply for a loan after the crisis in order to purchase agricultural equipment or start a business. These results suggest that families with migrants in Kyrgyzstan are resilient and resourceful in finding ways to smooth consumption and replace lost income after a transitory shock.

On the whole, our results reinforce the fact that Central Asia and former Soviet countries in particular remain closely economically connected. The macroeconomic shock in Russia had direct and indirect impact on Kyrgyz families through multiple channels: depreciation of the Kyrgyz som, inflation, drop in exports, and sharp decrease in remittances. Notably, these same shocks also affected Kazakhstan, which then affected Kyrgyzstan as well through trade and remittance channels.

The present-day implications of these findings are relevant due to the ongoing conflict in Ukraine and the associated shock to the Russian economy and financial system. An ongoing squeeze on the Russian economy will negatively affect underdeveloped post-Soviet states. As of right now, it is too early to tell if the World Bank's projected 33% drop in remittances will be realized, or to assess impacts on bilateral trade in the region. What we can say is that following the invasion of Ukraine, the Kyrgyz som depreciated along with the Russian rouble, from approximately 85 KGZ to USD to a high of around 105 KGZ to USD, though the currency has since stabilized. [32] Unlike the previous Russian Financial Crisis,

[29] https://migration.commission.ge/files/eng.pdf

[30] The Integrated Household Survey in Georgia and the Integrated Living Conditions Survey in Armenia are very similar to the Life in Kyrgyzstan in content but are cross-sectional which is less suitable for this research subject.

[31] This type of bias is less likely to affect the 2016 round since Kyrgyzstan had been admitted into the Eurasian Economic Union (EAEU) on January 1st 2015. See background section for further detail on the EAEU.

[32] https://www.xe.com/currencycharts/?from=USDto=KGS

which was precipitated by a negative shock to the oil price, the conflict in Ukraine has led to a spike in oil prices. Given that Kyrgyzstan is a country that imports 90% of its oil from Russia and Kazakhstan, this channel is likely to have a damaging effect on consumer prices too.[33]

Based on the evidence presented in this paper, we conclude that the crisis in Ukraine and the associated Russian economic downturn is likely to affect all Kyrgyz families through several different channels, with migrant families suffering a larger income loss and increase in poverty due to loss of labor market opportunities in Russia. We hope these results will inform policy-makers as they consider the need for aid to ameliorate negative tertiary impacts of the conflict on outcomes for developing nations in Central Asia.

[33] https://www.iea.org/reports/kyrgyzstan-energy-profile

10 References

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11 Figures

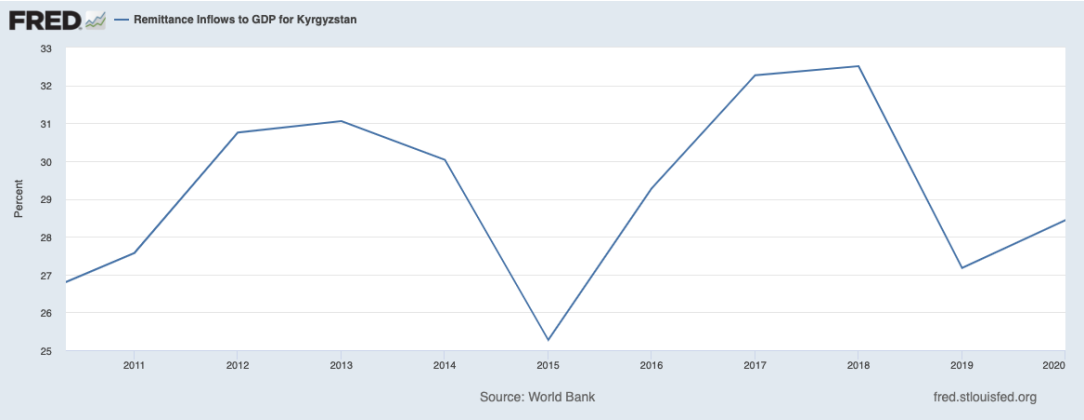


Figure 14: Remittances to GDP, Kyrgyzstan

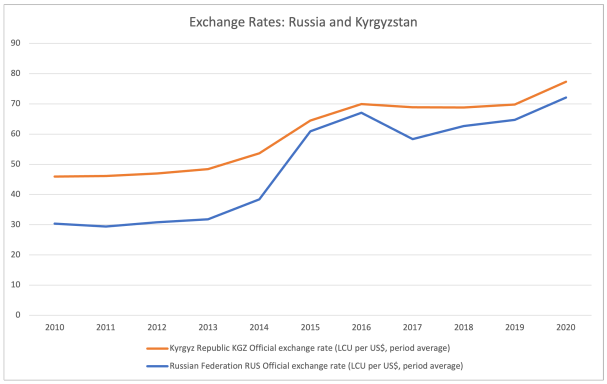


Figure 15: Exchange Rate to USD, Russia and Kyrgyzstan

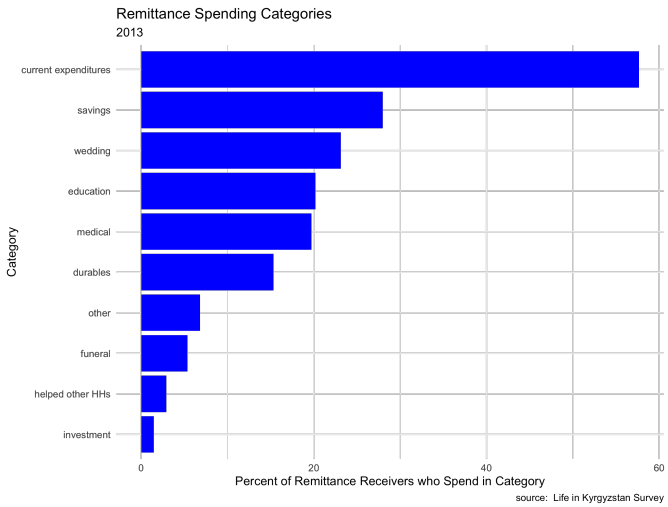


Figure 16: Remittance Spending Patterns

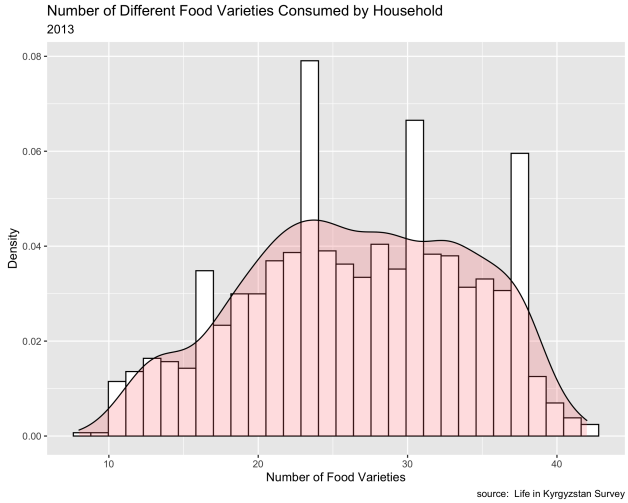


Figure 17: Total Dietary Variety

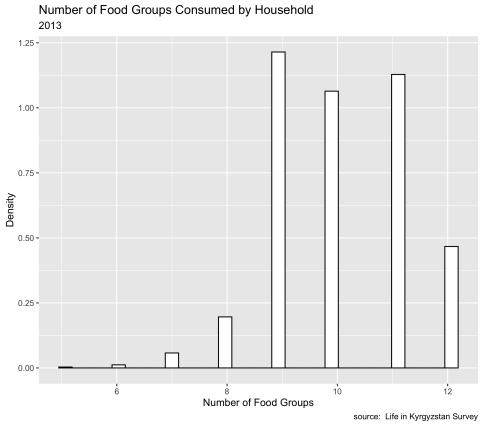


Figure 18: Food Groups

Food Group	Varieties
Bread and grains	Bread, Flour, Noodles, Rice, Buckwheat
Other cereals, legumes, and tubers	Other cereals and beans, Potatoes
Vegetables	Tomatoes, Pepper, Carrot, Cabbage, Onion, Other vegetables
Fruits	Apples,Bananas, Citrus Products, Other fruits, berries
Milk and Dairy	Fresh milk, Kefir, Airan, Butter, Cheese, Eggs
Fish	Fish
Meat	Chicken, Beef, Lamb, Pork, Sausages
Sauces	Cooking oil
Sugar and sweets	Sugar, Sweets and cookies
Tea & Coffee	Tea, Coffee
Beverages	Non-alcoholic beverages, Beer, Vodka
Tobacco	Cigarettes and tobacco

Table 6: Food Group Categories

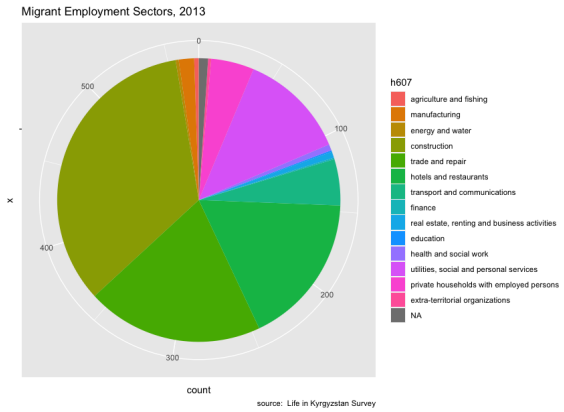


Figure 19: Migrant Employment Sectors

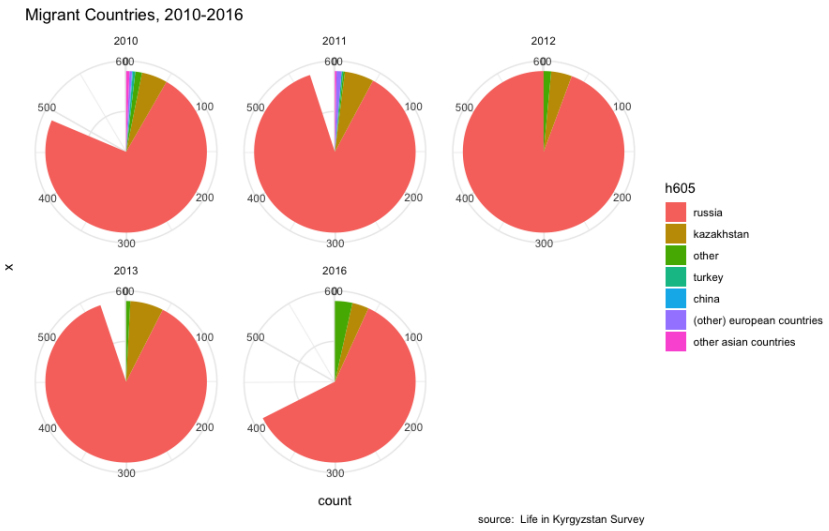


Figure 20: Migration Destinations

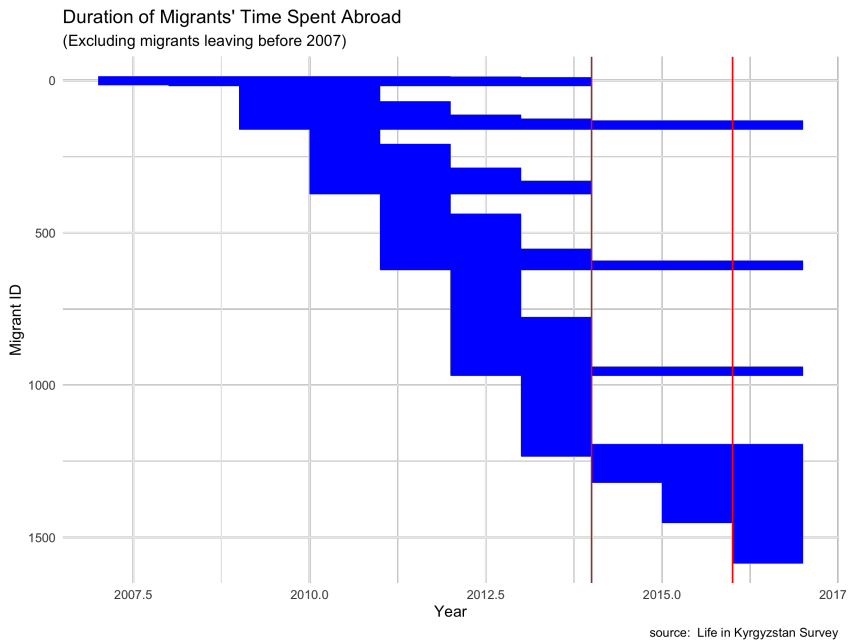
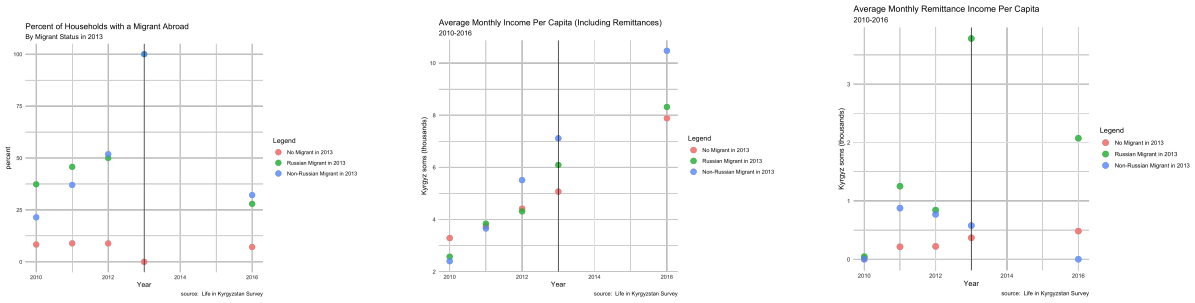
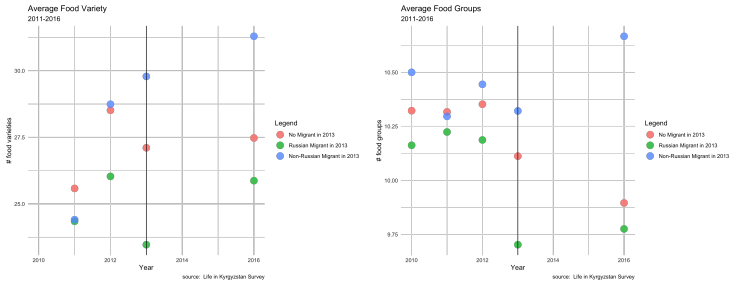


Figure 21: Migration Patterns According to LiK Data



(a) Migration (b) Total Income (c) Remittances

Figure 22: Parallel Trends in Migration and Income



(a) Total Food Variety (b) Food Groups

Figure 23: Parallel Trends in Consumption Shares

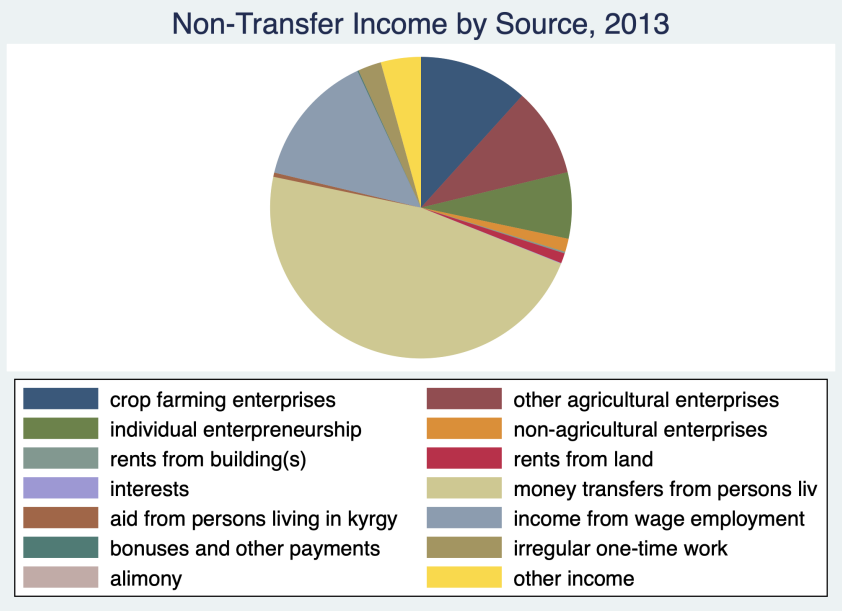


Figure 24: Income Sources Among Russian Migrant Families, 2013

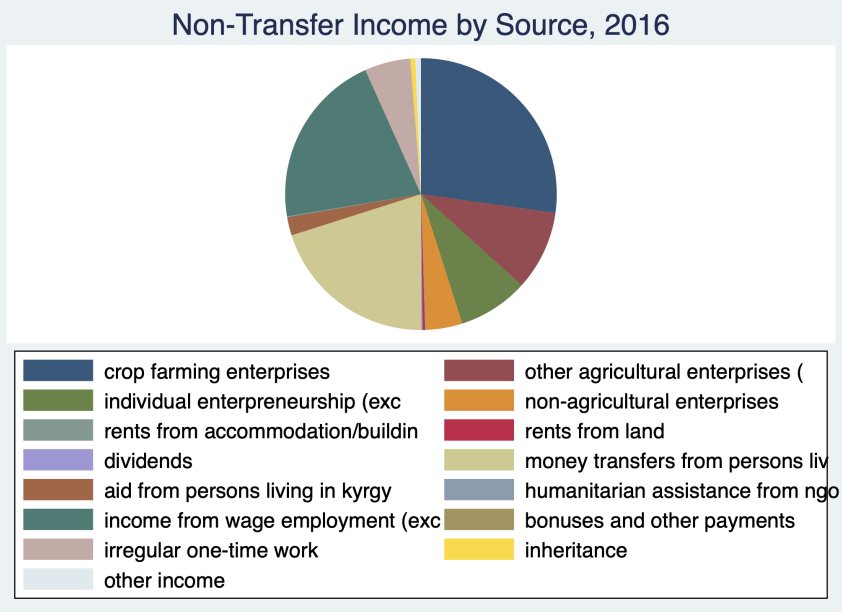


Figure 25: Income Sources Among Russian Migrant Families, 2016

12 Regressions

12.1 Difference-in-Difference on Migrant Households - Years 2013 and 2016

Table 7: DID Regression of Migrant-Households on Migrant and Remittance

	(1) HasMigrant	(2) ReceivesRemit	(3) RemitInc	(4) TtlInc_pc	(5) NonRemitInc_pc	(6) Poverty	(7) IncQ
1.MigrantStatusR	-0.044**	0.122	2.166*	0.147	-0.368	0.096	-0.265
	(0.016)	(0.113)	(0.950)	(1.283)	(1.173)	(0.087)	(0.250)
1.Post	-0.694***	-0.435**	-0.646	2.926	3.389	0.158	-0.451
	(0.111)	(0.127)	(0.552)	(4.049)	(4.031)	(0.102)	(0.417)
1.MigrantStatusR1.Post	0.005	-0.163	-0.866	-0.478	-0.407	-0.018	0.239
	(0.107)	(0.127)	(1.170)	(4.237)	(4.207)	(0.118)	(0.446)
NonRemitInc_pc	0.001	0.003	-0.036			-0.015***	0.064***
	(0.002)	(0.002)	(0.035)			(0.004)	(0.012)
Fhead	0.022	0.018	-0.889	1.658	1.768	0.031	-0.318**
	(0.029)	(0.041)	(0.723)	(1.371)	(1.374)	(0.038)	(0.103)
Nadult	0.051***	0.065***	-0.194	-0.494*	-0.332	-0.014	0.229***
	(0.009)	(0.010)	(0.197)	(0.202)	(0.201)	(0.011)	(0.030)
Nchild	-0.001	0.004	0.320	-1.459***	-1.425***	0.065***	0.136***
	(0.010)	(0.013)	(0.210)	(0.366)	(0.366)	(0.011)	(0.033)
HighestEd	-0.006	-0.015	0.285	0.145	0.042	-0.013	0.082
	(0.009)	(0.014)	(0.286)	(0.319)	(0.324)	(0.015)	(0.043)
Residence	0.013	0.065	-4.379*	1.398	2.297*	0.077	-0.257
	(0.036)	(0.041)	(1.767)	(1.032)	(1.075)	(0.051)	(0.137)
Cons	0.816***	0.436**	4.177	8.782***	7.284**	0.251*	1.781***
	(0.068)	(0.149)	(2.668)	(2.125)	(2.155)	(0.121)	(0.349)
N	733	733	733	733	733	733	733
adj. R^2	0.557	0.380	0.035	0.067	0.073	0.165	0.289

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 8: DID Regression of Migrant Households on Expenditure Patterns

	(1) FoodShare	(2) MedShare	(3) CelebShare	(4) EduShare	(5) NFoodGroup	(6) FoodVariety
1.MigrantStatusR	0.053*	-0.005	-0.036*	0.002	-0.779**	-6.456***
	(0.022)	(0.007)	(0.017)	(0.005)	(0.245)	(1.510)
1.Post	0.064**	-0.001	-0.067**	0.020	0.371	2.215
	(0.023)	(0.008)	(0.020)	(0.010)	(0.198)	(1.310)
1.MigrantStatusR1.Post	-0.000	0.007	0.036	-0.016	-0.246	0.211
	(0.029)	(0.008)	(0.020)	(0.011)	(0.216)	(1.502)
NonRemitInc_pc	0.000	-0.000**	0.000	-0.000	-0.007	0.008
	(0.001)	(0.000)	(0.000)	(0.000)	(0.006)	(0.040)
Fhead	-0.002	-0.004	-0.006	0.001	-0.513***	-1.897**
	(0.013)	(0.002)	(0.006)	(0.004)	(0.143)	(0.660)
Nadult	0.001	-0.000	0.001	0.000	-0.014	0.035
	(0.004)	(0.001)	(0.002)	(0.001)	(0.042)	(0.182)
Nchild	0.003	-0.000	-0.002	-0.001*	-0.013	0.070
	(0.004)	(0.001)	(0.002)	(0.001)	(0.043)	(0.187)
HighestEd	-0.006	0.000	0.002	-0.001	0.055	0.520*
	(0.004)	(0.001)	(0.002)	(0.001)	(0.042)	(0.197)
Residence	-0.078***	0.005	0.014	-0.000	-0.480	-2.676
	(0.022)	(0.003)	(0.009)	(0.003)	(0.259)	(1.382)
Cons	0.486***	0.017*	0.087***	0.013	10.842***	29.418***
	(0.037)	(0.008)	(0.023)	(0.008)	(0.432)	(2.256)
N	722	733	733	733	724	724
adj. R^2	0.106	0.008	0.044	0.006	0.070	0.120

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 9: DID Regression of Migrant Households on Expenditures, Savings, Loan and Loan Size

	(1) FoodExp_pc	(2) OtherExp_pc	(3) Dsavings	(4) Dloan	(5) LoanAmt
1.MigrantStatusR	1.644	-4.398	0.095	-0.141	-7.734
	(2.435)	(3.568)	(0.088)	(0.103)	(7.553)
1.Post	3.639	-3.390	0.084	-0.200	2.896
	(1.970)	(4.038)	(0.092)	(0.105)	(17.573)
1.MigrantStatusR1.Post	-2.447	-2.432	-0.122	0.233*	-3.088
	(2.485)	(4.434)	(0.114)	(0.111)	(19.158)
NonRemitInc_pc	0.177***	0.250	0.008**	0.001	0.055
	(0.051)	(0.135)	(0.003)	(0.001)	(0.134)
Fhead	0.811	-0.503	-0.126**	0.030	3.069
	(1.134)	(1.501)	(0.037)	(0.032)	(3.222)
Nadult	-0.401	-0.578	0.014	0.019	0.645
	(0.417)	(0.348)	(0.013)	(0.012)	(0.804)
Nchild	-2.116***	-2.422***	0.003	0.008	1.897
	(0.441)	(0.645)	(0.014)	(0.010)	(1.425)
HighestEd	0.524	0.919	0.008	-0.001	-0.236
	(0.374)	(0.486)	(0.018)	(0.010)	(1.258)
Residence	-9.939	-1.442	0.050	-0.059	-0.381
	(5.003)	(2.857)	(0.100)	(0.067)	(3.692)
Cons	29.037***	33.343***	0.090	0.191	9.559
	(4.348)	(5.219)	(0.189)	(0.124)	(9.594)
N	724	729	729	731	731
adj. R^2	0.190	0.103	0.035	0.012	-0.001

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

12.2 Robustness Check - Generalized Difference-in-Difference

Table 10: DID Regression of Migrant Households on Migration and Remittances

	(1) HasMigrant	(2) ReceivesRemit	(3) RemitInc	(4) TtlInc_pc	(5) NonRemitInc_pc	(6) Poverty	(7) IncQ
1.MigrantStatusR1.Post	-0.046	-0.102	0.838	-1.163	-1.395	-0.070	0.318
	(0.108)	(0.107)	(0.760)	(3.901)	(3.895)	(0.095)	(0.383)
$FE(HH)$	YES	YES	YES	YES	YES	YES	YES
$FE(YEAR)$	YES	YES	YES	YES	YES	YES	YES
N	1925	1925	1925	1925	1925	1925	1925
adj. R^2	0.332	0.392	0.043	0.110	0.096	0.105	0.210

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 11: DID Regression of Migrant Households on Expenditure Patterns

	(1) FoodShare	(2) MedShare	(3) CelebShare	(4) EduShare	(5) NFoodGroup	(6) FoodVariety
1.MigrantStatusR1.Post	-0.009	0.009	0.050**	-0.016	-0.446	-1.926
	(0.032)	(0.007)	(0.017)	(0.011)	(0.257)	(1.249)
$FE(HH)$	YES	YES	YES	YES	YES	YES
$FE(YEAR)$	YES	YES	YES	YES	YES	YES
N	1912	1925	1925	1925	1915	1519
adj. R^2	0.111	0.010	0.022	0.021	0.043	0.061

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

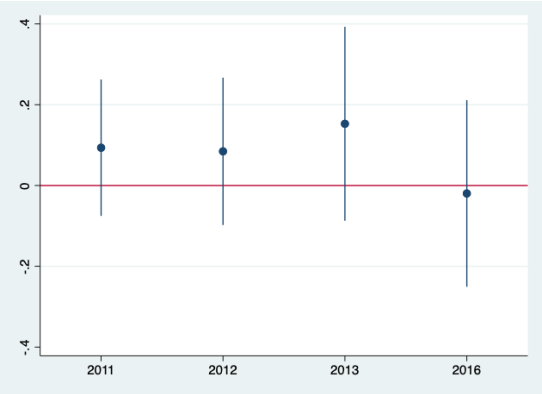
Table 12: DID Regression of Migrant Households on Expenditures, Savings, Loan, and Loan Size

	(1) FoodExp_pc	(2) OtherExp_pc	(3) Dsavings	(4) Dloan	(5) LoanAmt
1.MigrantStatusR1.Post	-2.560	-4.775	-0.125	0.258*	-2.625
	(2.356)	(4.203)	(0.114)	(0.119)	(20.538)
$FE(HH)$	YES	YES	YES	YES	YES
$FE(YEAR)$	YES	YES	YES	YES	YES
N	1915	1920	729	731	731
adj. R^2	0.169	0.079	0.038	0.038	-0.002

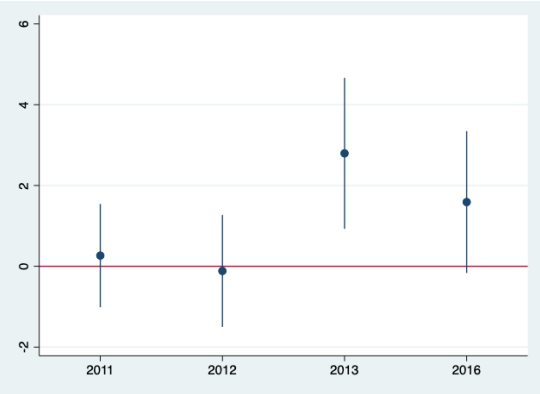
Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

12.3 Robustness Check - Interaction with Years

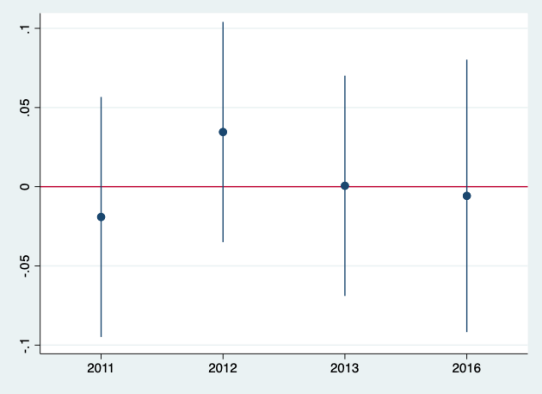


(a) *ReceiveRemit*

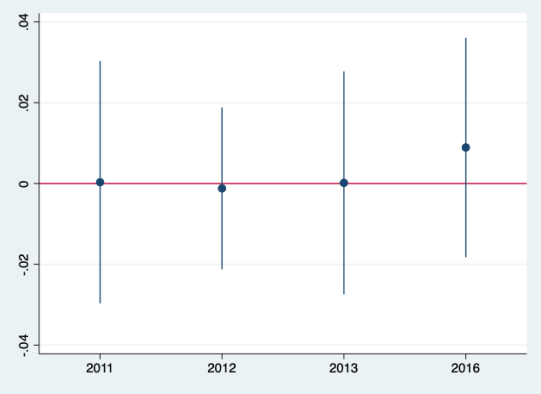


(b) *RemitInc*

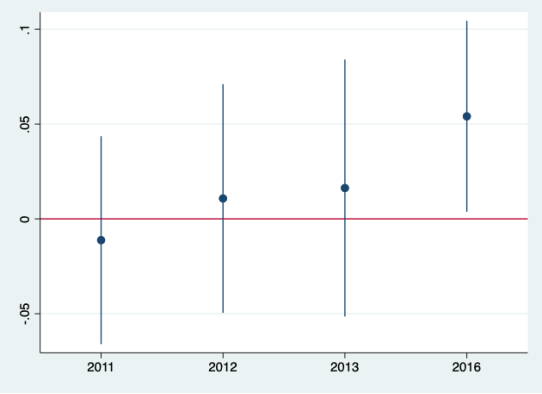
Figure 26: Time-interacted Coefficients for *ReceiveRemit* and *RemitInc*



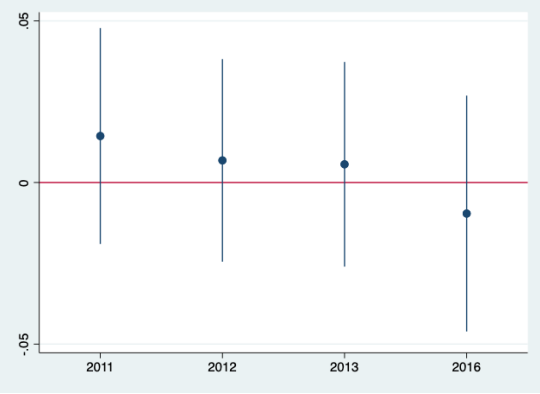
(a) *FoodShare*



(b) *MedShare*



(c) *CelebShare*



(d) *EduShare*

Figure 27: Time-interacted Coefficients for Expenditure Shares

Table 13: DID Regression of Migrant Households on Migration and Remittances

	(1) HasMigrant	(2) ReceivesRemit	(3) RemitInc	(4) TtlInc_pc	(5) NonRemitInc_pc	(6) Poverty	(7) IncQ
1.MigrantStatusR2011.year	-0.060	0.094	0.265	0.011	-0.042	0.016	-0.080
	(0.089)	(0.085)	(0.640)	(0.355)	(0.365)	(0.081)	(0.204)
1.MigrantStatusR2012.year	-0.181	0.085	-0.116	-1.567*	-1.601*	0.018	-0.093
	(0.092)	(0.091)	(0.694)	(0.682)	(0.714)	(0.120)	(0.245)
1.MigrantStatusR2013.year	-0.147	0.153	2.796**	-1.536	-2.044*	-0.061	0.039
	(0.079)	(0.120)	(0.935)	(1.179)	(0.993)	(0.113)	(0.293)
1.MigrantStatusR2016.year	-0.142	-0.020	1.590	-1.924	-2.307	-0.082	0.285
	(0.121)	(0.116)	(0.880)	(3.681)	(3.668)	(0.110)	(0.418)
$FE(HH)$	YES	YES	YES	YES	YES	YES	YES
$FE(YEAR)$	YES	YES	YES	YES	YES	YES	YES
N	1925	1925	1925	1925	1925	1925	1925
adj. R^2	0.333	0.392	0.044	0.110	0.096	0.208	0.209

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 14: DID Regression of Migrant Households on Expenditure Patterns

	(1) FoodShare	(2) MedShare	(3) CelebShare	(4) EduShare	(5) NFoodGroup	(6) FoodVariety
1.MigrantStatusR2011.year	-0.019	0.000	-0.011	0.014	0.244	
	(0.038)	(0.015)	(0.027)	(0.017)	(0.239)	
1.MigrantStatusR2012.year	0.035	-0.001	0.011	0.007	0.042	-2.493
	(0.035)	(0.010)	(0.030)	(0.016)	(0.227)	(1.468)
1.MigrantStatusR2013.year	0.001	0.000	0.016	0.006	-0.327	-5.419*
	(0.035)	(0.014)	(0.034)	(0.016)	(0.335)	(2.066)
1.MigrantStatusR2016.year	-0.006	0.009	0.054*	-0.010	-0.458	-4.579*
	(0.043)	(0.014)	(0.025)	(0.018)	(0.344)	(1.806)
$FE(HH)$	YES	YES	YES	YES	YES	YES
$FE(YEAR)$	YES	YES	YES	YES	YES	YES
N	1912	1925	1925	1925	1915	1519
adj. R^2	0.110	0.008	0.021	0.021	0.044	0.070

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 15: DID Regression of Migrant Households on Expenditures, Savings, Loan and Loan Size

	(1) FoodExp_pc	(2) OtherExp_pc	(3) Dsavings	(4) Dloan	(5) LoanAmt
1.MigrantStatusR2011.year	-3.510*	-1.875			
	(1.607)	(2.326)			
1.MigrantStatusR2012.year	-3.487	-9.060*			
	(2.491)	(4.375)			
1.MigrantStatusR2013.year	-2.072	-7.150			
	(3.071)	(3.951)			
1.MigrantStatusR2016.year	-4.803	-9.230*	-0.125	0.258*	-2.625
	(2.717)	(4.404)	(0.114)	(0.119)	(20.538)
$FE(HH)$	YES	YES	YES	YES	YES
$FE(YEAR)$	YES	YES	YES	YES	YES
N	1915	1920	729	731	731
adj. R^2	0.169	0.079	0.038	0.038	-0.002

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

12.4 Difference-in-Difference on ALL Households - Years 2013 and 2016

Table 16: DID Regression on ALL Households on Migration and Remittances

	(1) HasMigrant	(2) ReceivesRemit	(3) RemitInc	(4) TtlInc_pc	(5) NonRemitInc_pc	(6) Poverty	(7) IncQ
1.MigrantStatus	0.952***	0.809***	3.420***	1.255**	0.299	-0.079*	-0.011
	(0.008)	(0.022)	(0.705)	(0.449)	(0.419)	(0.039)	(0.128)
2.MigrantStatus	0.976***	0.664***	0.799	1.736	1.310	-0.178*	0.364
	(0.008)	(0.108)	(0.583)	(1.170)	(1.002)	(0.076)	(0.202)
1.Post	0.073***	0.063***	0.170	2.894***	2.853***	0.070***	-0.248***
	(0.012)	(0.011)	(0.109)	(0.585)	(0.583)	(0.021)	(0.064)
1.MigrantStatus1.Post	-0.759***	-0.653***	-1.704	-0.528	0.060	0.076	0.012
	(0.037)	(0.044)	(1.060)	(1.214)	(1.199)	(0.060)	(0.167)
2.MigrantStatus1.Post	-0.761***	-0.486***	-1.031	0.107	0.648	0.103	-0.257
	(0.108)	(0.126)	(0.530)	(3.818)	(3.799)	(0.095)	(0.400)
NonRemitInc_pc	0.000	0.001	-0.027**			-0.018***	0.069***
	(0.001)	(0.001)	(0.010)			(0.003)	(0.010)
Fhead	0.002	0.001	-0.127	0.486	0.487	-0.007	-0.206***
	(0.008)	(0.009)	(0.143)	(0.336)	(0.333)	(0.020)	(0.046)
Nadult	0.029***	0.031***	0.050	-0.051	-0.022	-0.011	0.330***
	(0.004)	(0.005)	(0.054)	(0.095)	(0.095)	(0.006)	(0.022)
Nchild	-0.001	0.000	-0.010	-1.189***	-1.147***	0.078***	0.098***
	(0.003)	(0.003)	(0.056)	(0.140)	(0.141)	(0.007)	(0.020)
HighestEd	-0.002	-0.004	0.030	0.094	0.088	-0.039***	0.141***
	(0.003)	(0.003)	(0.067)	(0.196)	(0.199)	(0.007)	(0.020)
Residence	0.018	0.019	-0.573	0.451	0.520	0.126***	-0.364***
	(0.012)	(0.011)	(0.339)	(0.531)	(0.536)	(0.032)	(0.088)
Cons	-0.094***	-0.092***	0.566	6.360***	6.078***	0.513***	0.829***
	(0.025)	(0.026)	(0.488)	(1.073)	(1.095)	(0.053)	(0.157)
N	4268	4268	4268	4268	4268	4268	4268
adj. R^2	0.650	0.539	0.041	0.065	0.063	0.249	0.364

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 17: DID Regression on All Households on Expenditure Patterns

	(1) FoodShare	(2) MedShare	(3) CelebShare	(4) EduShare	(5) NFoodGroup	(6) FoodVariety
1.MigrantStatus	0.011	-0.004	0.004	0.000	-0.380***	-3.067***
	(0.011)	(0.002)	(0.007)	(0.002)	(0.102)	(0.781)
2.MigrantStatus	-0.054*	0.003	0.040**	-0.001	0.362	3.135*
	(0.021)	(0.007)	(0.015)	(0.004)	(0.245)	(1.481)
1.Post	0.063***	0.005*	-0.029***	0.005***	-0.196	0.474
	(0.010)	(0.002)	(0.004)	(0.001)	(0.101)	(0.737)
1.MigrantStatus1.Post	0.006	0.000	-0.004	-0.002	0.306*	1.999*
	(0.017)	(0.003)	(0.007)	(0.003)	(0.135)	(0.857)
2.MigrantStatus1.Post	0.005	-0.007	-0.041*	0.015	0.522*	1.666
	(0.023)	(0.008)	(0.018)	(0.010)	(0.205)	(1.439)
$\text{NonRemitInc}_p c$	-0.001*	-0.000	0.001	0.000	-0.000	0.008
	(0.000)	(0.000)	(0.000)	(0.000)	(0.004)	(0.024)
Fhead	0.011	0.001	-0.005*	-0.003**	-0.281***	-0.758*
	(0.006)	(0.001)	(0.003)	(0.001)	(0.052)	(0.332)
Nadult	-0.004	0.001	0.003**	0.001	-0.007	-0.162
	(0.002)	(0.000)	(0.001)	(0.000)	(0.025)	(0.146)
Nchild	-0.000	-0.001	-0.002*	0.000	-0.004	-0.017
	(0.002)	(0.000)	(0.001)	(0.000)	(0.020)	(0.118)
HighestEd	-0.013***	0.001	0.002	-0.000	0.072**	0.679***
	(0.002)	(0.000)	(0.001)	(0.000)	(0.027)	(0.171)
Residence	-0.035**	0.000	0.023***	-0.004*	-0.199	-2.215*
	(0.011)	(0.002)	(0.005)	(0.002)	(0.150)	(0.991)
Cons	0.563***	0.013***	0.030***	0.010**	9.986***	25.624***
	(0.016)	(0.003)	(0.008)	(0.004)	(0.176)	(1.340)
N	4203	4268	4268	4268	4221	4221
adj. R^2	0.084	0.006	0.063	0.012	0.026	0.072

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 18: DID Regression on All Households on Expenditures, Savings, Loan and Loan Size

	(1) FoodExp_pc	(2) OtherExp_pc	(3) Dsavings	(4) Dloan	(5) LoanAmt
1.MigrantStatus	6.352***	3.859*	0.097*	-0.022	-5.192
	(1.722)	(1.597)	(0.043)	(0.027)	(3.619)
2.MigrantStatus	2.972	7.783*	-0.001	0.097	2.835
	(2.040)	(3.128)	(0.082)	(0.101)	(7.925)
1.Post	9.279***	1.296	-0.004	-0.016	-2.867
	(0.854)	(1.268)	(0.037)	(0.015)	(2.282)
1.MigrantStatus1.Post	-8.096***	-7.908***	-0.021	0.048	1.922
	(1.523)	(2.129)	(0.060)	(0.035)	(3.646)
2.MigrantStatus1.Post	-5.856**	-5.742	0.093	-0.182	4.928
	(2.158)	(4.021)	(0.096)	(0.102)	(17.358)
NonRemitInc_pc	0.248***	0.560***	0.004*	0.002*	0.345*
	(0.068)	(0.161)	(0.002)	(0.001)	(0.140)
fhhead	1.730**	-0.365	-0.066***	-0.010	-0.460
	(0.568)	(0.940)	(0.018)	(0.013)	(2.922)
Nadult	-1.426***	-1.098***	0.010	0.004	0.673
	(0.247)	(0.266)	(0.006)	(0.005)	(0.423)
Nchild	-2.452***	-2.496***	-0.008	0.008	1.255
	(0.199)	(0.323)	(0.005)	(0.005)	(0.887)
HighestEd	0.423*	2.321***	0.007	0.009	2.163
	(0.204)	(0.401)	(0.009)	(0.005)	(1.162)
Residence	-5.916***	-2.121	0.075	0.010	-1.039
	(1.365)	(1.499)	(0.045)	(0.026)	(3.964)
Cons	26.618***	19.032***	0.122	0.035	-4.923
	(1.875)	(2.260)	(0.072)	(0.040)	(6.193)
N	4221	4261	4226	4234	4234
adj. R^2	0.289	0.141	0.029	0.006	0.003

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

12.5 Robustness Check - Logit and Probit Model on Loan

Table 19: Logit and Probit Model on Loan Applications in Migrant Households - Years 2013 and 2016

	(1) Logit 2013 Dloan	(2) Probit 2013 Dloan	(3) OLS 2013 Dloan	(4) Logit 2016 Dloan	(5) Probit 2016 Dloan	(6) OLS 2016 Dloan
main						
1.MigrantStatusR	-0.909	-0.508	-0.119	0.404	0.231	0.061
	(0.607)	(0.346)	(0.104)	(0.358)	(0.199)	(0.050)
NonRemitInc_pc	0.044	0.023	0.006	0.000	0.000	-0.000
	(0.023)	(0.013)	(0.004)	(0.012)	(0.006)	(0.001)
Fhead	0.128	0.085	0.013	0.501	0.297	0.058
	(0.349)	(0.188)	(0.040)	(0.391)	(0.212)	(0.048)
Nadult	-0.037	-0.016	-0.004	0.338**	0.185**	0.043*
	(0.097)	(0.053)	(0.010)	(0.125)	(0.069)	(0.019)
Nchild	0.228*	0.118*	0.026	-0.077	-0.039	-0.010
	(0.112)	(0.060)	(0.015)	(0.117)	(0.064)	(0.016)
HighestEd	0.057	0.041	0.006	-0.065	-0.032	-0.008
	(0.111)	(0.058)	(0.011)	(0.113)	(0.061)	(0.013)
Residence	-0.540	-0.272	-0.062	-0.485	-0.244	-0.060
	(0.433)	(0.227)	(0.051)	(0.662)	(0.364)	(0.096)
Cons	-1.608	-1.021	0.186	-2.891***	-1.705***	0.022
	(0.989)	(0.545)	(0.129)	(0.803)	(0.449)	(0.101)
N	390.000	390.000	390.000	341.000	341.000	341.000
ll	-140.047	-140.134	-113.220	-132.930	-133.032	-119.654
r2			0.031			0.056
r2_p	0.037	0.037		0.065	0.064	

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$