Mental Accounting, Remittances and Celebrations

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Contents

Motivation

- Is 1$ of remittance income=1$ of any other source of income?
  - Economic principle of **fungibility**: YES!
    - $\Rightarrow$ Any discussion of the effect of migrant remittances on consumption choices of individuals is irrelevant.
  - **Mental accounting**: NO!
    - $\Rightarrow$ Migrant remittances may cause behavioral changes at the household level, and their development impact can be huge.
    - Remittances may increase investments in human and physical capital, or, in contrast,
    - Remittances *"may leave investment decisions unchanged if they are spent on status-oriented, conspicuous consumption, and as such they may have little impact on local economies"* (Demurger & Wang, 2016).

Motivation

- Kyrgyzstan is the number **two** country in the world after Tonga by its share of personal remittances in GDP (33.2% in 2018) (the World Bank).
  - $\Rightarrow$ economy highly dependent on the money transfers by labor migrants.
- Frequent claims in Kyrgyz media that remittances sent by migrants are often used to finance celebratory events, which are numerous and expensive.
  - Kyrgyz citizens spend around 2 billion USD on weddings, funerals and other ceremonies per year (Namatbaeva, 2012), while the GDP of the country was 6.87 billion USD in 2018 (the World Bank).

Motivation

- Frequent claims in Kyrgyz media that remittances sent by migrants are often used to finance celebratory events, which are numerous and expensive.
  - Most of the households reported spending remittance money on:
    1. "current expenditures (food, electricity, rent)" (60.52%),
    2. "savings" (34.75%),
    3. "wedding" (24.36%)
  - 10.47% of the households reported using money transfers from their family members for funding their largest festive event in the past 12 months.
    (author's calculations based on "Life in Kyrgyzstan" survey).

Research Questions

1. Are remittance income and other income fungible for Kyrgyz households?
2. How is remittance income and income from other sources spent, and are there significant differences in their patterns of spending?
3. What type of goods the different expenditure categories represent (normal, luxury, necessity, or inferior) in response to the increase in remittance income versus other income of Kyrgyz families?

Why is This Study Unique?

1. The first attempt in the literature to formally test the fungibility assumption using non-experimental data;
   - The Working-Leser expenditure model is extended to incorporate a **constant elasticity of substitution** function;
   - To address endogeneity due to selection bias, **control function approach** in the context of non-linear estimation is employed.
2. System of **demand equations** that is used allows for both accounting for different patterns of spending by households, as well as differentiating between various types of goods according to the income source used;

Why is This Study Unique?

3. Analysis is extended to study distributional effects;
4. One of the first attempts in the field to empirically study the relationship between sources of income and spending on celebratory events;
5. Contribution to literature on Central Asia and Kyrgyzstan in particular, which are often overlooked by the scholarly community in the world.

Review of the Literature

Fields of study:

1. Mental Accounting:
   - Individuals have multiple "mental accounts" where activities are assigned;
   - *"expenditures are grouped into categories (housing, food, etc.) and spending is sometimes constrained by implicit or explicit budgets"* (R.H.Thaler, 1999, p.183).
     $\Rightarrow$
   - Households engage in spending in terms of groups of expenditures rather than individually;
   - There may be separate "remittance income" budget and "other income" budget;
   - $\Rightarrow$ remittance income and other income are not fungible.

Review of the Literature

Fields of study:

2. Demand Systems:
   - the Rotterdam model (Barten, 1969; Theil, 1965, 1976);
   - the translog model (Christensen, Jorgenson & Lau, 1975);
   - an Almost Ideal Demand System (AIDS) (Deaton & Muellbauer, 1980);
   - the Working-Leser expenditure model (Parida, Mohanty & Raman, 2015; Randazzo & Piracha, 2019; Wang, 2010).

Review of the Literature

Fields of study:

3. Remittances and Its Uses:

   3 views in the literature:

   1. *Optimistic:* Compared to other sources of income, remittances are mostly spent on productive uses (investment in human and physical capital) $\Rightarrow$ positive long-term development impact on livelihoods.
   2. *Pessimistic:* Unlike other sources of income, money transfers from migrants are spent on consumption goods mostly $\Rightarrow$ no long-term benefits for the receiving communities.
   3. *Fungibility:* Remittance income is like any other source of income $\Rightarrow$ no significant differences between patterns of spending of remittance versus other income.

Kyrgyzstan: Country Profile

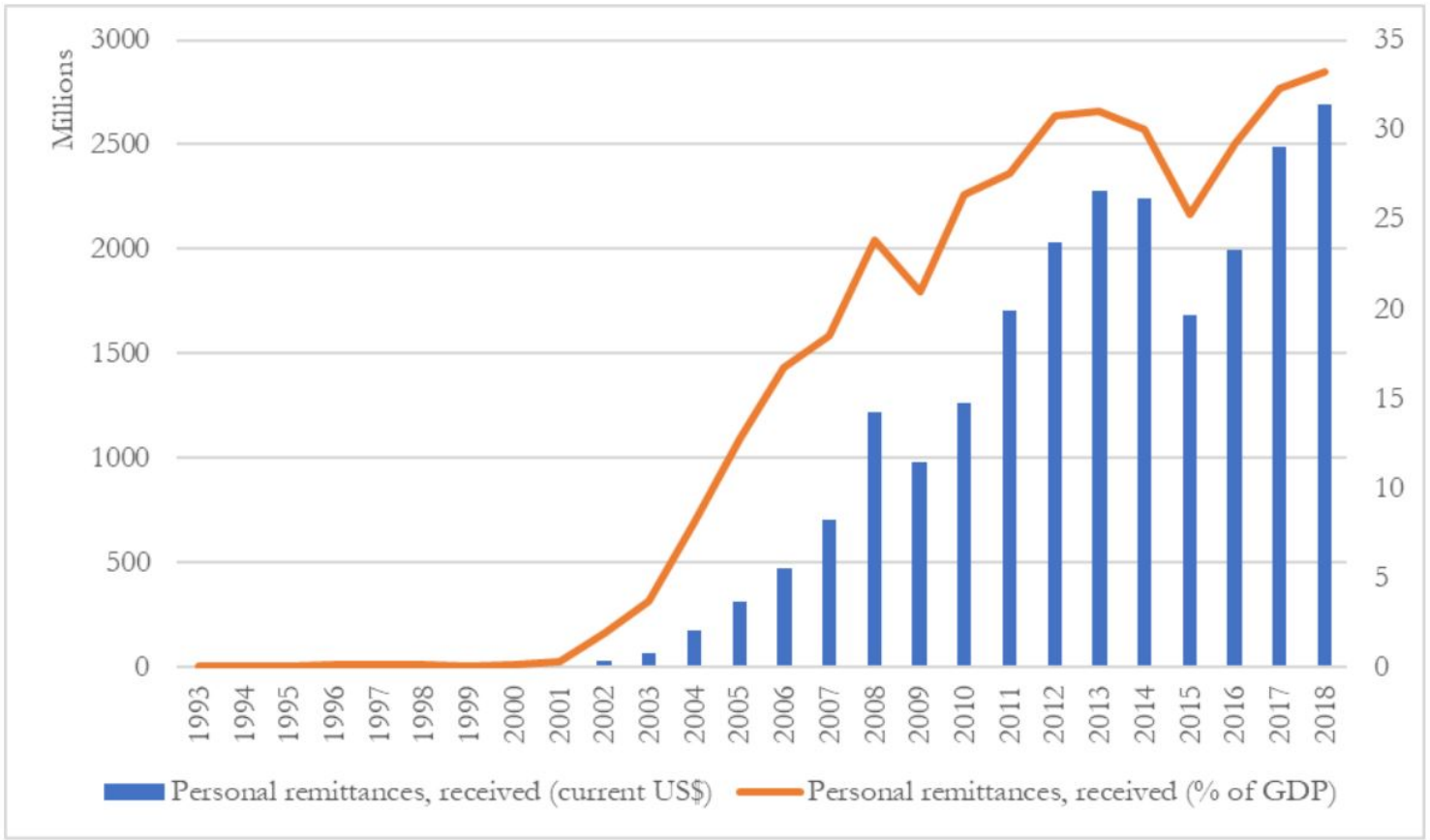
Migration Profile

1. Emigration of non-Kyrgyz ethnic groups to their origin countries, following the collapse of the Soviet Union;
2. After 2005, migration entirely motivated by economic reasons.
   - Russia and Kazakhstan became the most popular destination countries.

Kyrgyzstan: Country Profile

Migration Profile

Figure. Personal Remittances Received by Kyrgyzstan (1993-2018)



Source: National Statistics Committee of the Kyrgyz Republic

Kyrgyzstan: Country Profile

Migration Profile

- 86.82% of households left behind reported receiving money transfers;
- The average yearly amount of remittances was 166,754 KGS (3,534 USD);
- The average monthly amount of remittances was 13,896 KGS (294 USD);
- Average monthly income of a household was 17,123 KGS (363 USD); (author's calculations based on "Life in Kyrgyzstan" survey)

  $\Rightarrow$ potential for money transfers to significantly improve households' wellbeing.

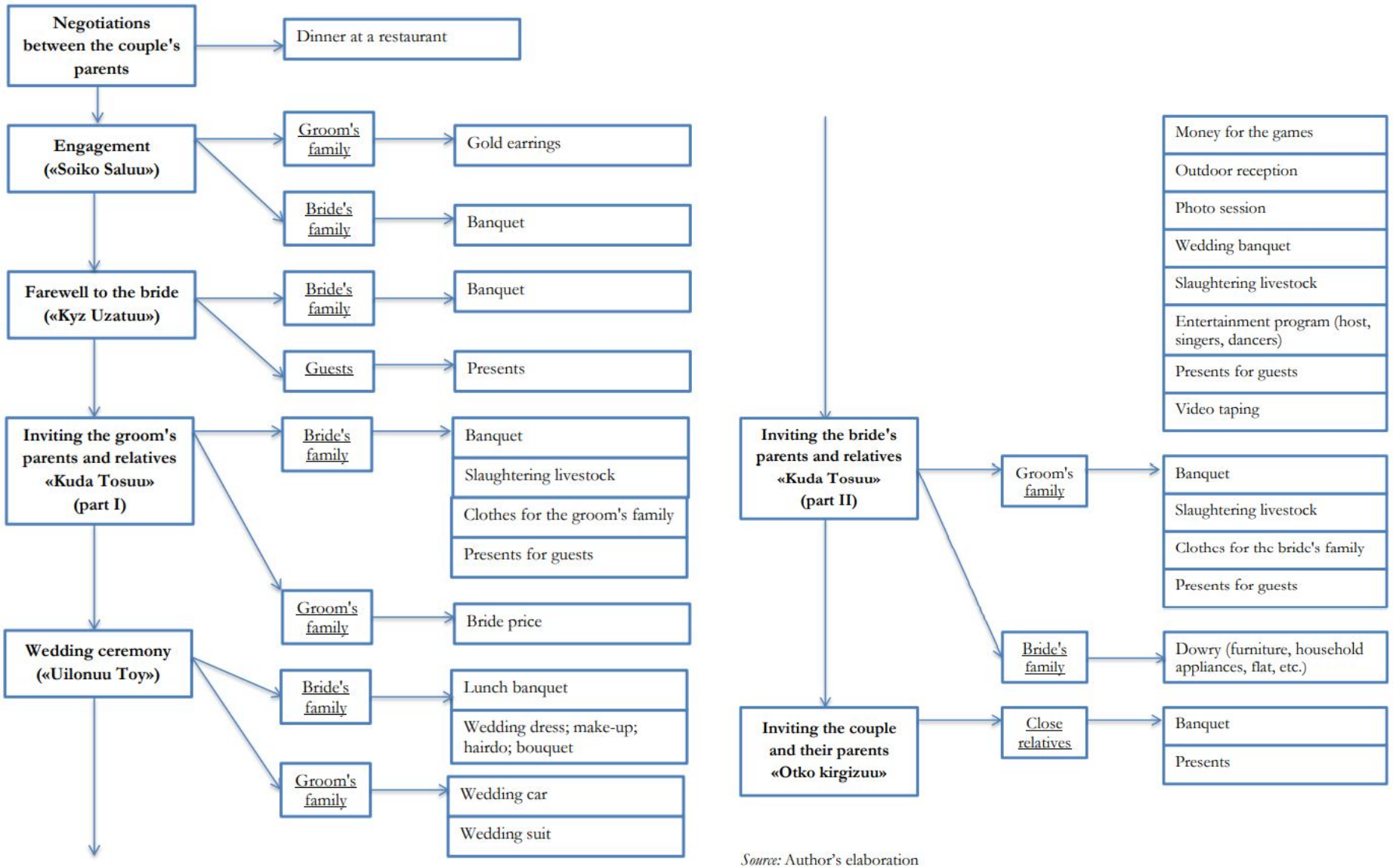
Kyrgyzstan: Country Profile

Celebrations in Kyrgyzstan

Celebrations in Kyrgyzstan are numerous and expensive:

- The average number of guests served at a "Funeral/Remembrance day" attended by a household was 227;
- The average size of "kalym" (bride price) was 68,329 KGS (1,448 USD);
- The average spending for the "Son's (any male household member's) wedding/marriage" was 103,776 KGS (2,199 USD).
  (author's calculations based on "Life in Kyrgyzstan" survey)

Kyrgyzstan: Country Profile (Marriage Process)



Source: Author's elaboration

Kyrgyzstan: Country Profile

Celebrations in Kyrgyzstan

- Such massive amounts of spending on celebrations pose a serious threat to households' welfare;
- The Kyrgyz Parliament has made numerous unsuccessful attempts to pass a law (Namatbaeva, 2012) similar to the one that is already in place in Tajikistan since 2007 (Oliphant, 2015);
  - Restrictions on the number guests, number of slaughtered animal, etc.
- Expenditures on festivities may divert the valuable resources away from more productive uses, which could otherwise help households in their fight against poverty;
- If remittances are spent on short-term consumption purposes like celebratory events $\Rightarrow$ no development impact from migrant money transfers.

Empirical Analysis

Model Specification

The basic Working-Leser expenditure model:

$$w_j = \alpha_j + \beta_j log(x) + \epsilon_j$$

where:

$w_j = \frac{C_j}{Exp}$=expenditure share of consumption category j in total;
x=total expenditure on all consumption categories;
ϵ_j=error term.

I rewrite it:

$$\boldsymbol{w_j = \alpha_j + \beta_j log(\gamma r^{\theta} + (1-\gamma) y^{\theta})^{\frac{1}{\theta}} + \epsilon_j}$$

where:

γ and $(1-\gamma)$=distribution parameters;
θ=substitution parameter

Empirical Analysis

Model Specification

This is a system of j demand equations, which needs to be solved simultaneously, with the following restrictions:

$\sum_{j=1}^{n} \alpha_j = 1$: adding up restriction;

$\sum_{j=1}^{n} \beta_j = 0$: homogeneity restriction.

It is estimated using the **feasible generalized nonlinear least squares (FGNLS)** method.

Model Specification

I can calculate the elasticity of substitution:

$$\sigma = \frac{1}{1+\theta}$$

$\sigma < 1$: remittance income, r, and other income, y are **complements** to each other;

$\sigma > 1$: remittance income, r, and other income, y are **substitutes** to each other;

Model Specification

After rearranging, I get:

$$MBS_r = \frac{\partial C_j}{\partial r} = \alpha_j + \beta_j \frac{1}{\theta} log(\gamma r^\theta + (1-\gamma) y^\theta) + \frac{\beta_j \gamma r^{\theta+1} + \beta_j y r^\theta}{(\gamma r^\theta + (1-\gamma) y^\theta) r}$$

$$MBS_y = \frac{\partial C_j}{\partial y} = \alpha_j + \frac{\beta_j (1-\gamma) y^{\theta-1} (r+y)}{\gamma r^\theta + (1-\gamma) y^\theta} + \beta_j \frac{1}{\theta} log(\gamma r^\theta + (1-\gamma) y^\theta)$$

and

$$ABS_r = \frac{C_j}{r} = \alpha_j + \frac{\alpha_j y}{r} + \beta_j \frac{1}{\theta} log(\gamma r^\theta + (1-\gamma) y^\theta) + \frac{\beta_j y log(\gamma r^\theta + (1-\gamma) y^\theta)}{\theta r}$$

$$ABS_y = \frac{C_j}{y} = \frac{\alpha_j r}{y} + \alpha_j + \frac{\beta_j r log(\gamma r^\theta + (1-\gamma) y^\theta)}{\theta y} + \beta_j \frac{1}{\theta} log(\gamma r^\theta + (1-\gamma) y^\theta)$$

Empirical Analysis

Model Specification

I can calculate respective expenditure elasticities for each consumption category and from each source of income:

$$\xi_r = \frac{MBS_r}{ABS_r}$$

$$\xi_y = \frac{MBS_y}{ABS_y}$$

Marginal budget shares, average budget shares and expenditure elasticities are evaluated at mean of remittance income and other income.

$\xi < 0$: **inferior good**;
$\xi < 1$: **necessity good**;
$\xi > 0$: **normal good**;
$\xi > 1$: **luxury good**;

Empirical Analysis

Model Specification

There may be **endogeneity** due to selection bias:

- Households that have migrants abroad (and/or receive remittances) may be different from households that do not have migrants abroad (and/or do not receive remittances).

  $\Rightarrow$ I use a **control function approach**.
- *Instrumental variables*:
  1. Whether the household head can read, write and speak Russian;
  2. Whether the household head and his/her spouse can read, write and speak Russian;
  3. Percentage of household members who can read, write and speak Russian;
  4. Proportion of households in the community who have migrants abroad.

To calculate standard errors, I use **bootstrapping** using 400 replications.
I use **inverse hyperbolic sine transformation** to deal with zero values for remittance income.

Empirical Analysis

Data

- "Life in Kyrgyzstan" data for 2011-2013;
- Five consumption categories:
  1. Food items;
  2. Education and health;
  3. Celebrations, funerals, rituals;
  4. Consumer goods;
  5. Other goods.
- *Remittance income:* amount of money transfers from persons living abroad in the last 12 months, per month (in KGS);
- *Income from other sources:* all non-remittance income per month (in KGS).

Empirical Analysis

Data

Variables of control:

- Number of household members with primary, secondary and university education;
- Age of the household head;
- Household size;
- Number of males over age 15;
- Number of children under age 5;
- Gender of the household head;
- Marital status of the household head;
- Time dummy variables;
- Dummy variables for oblasts.

Empirical Analysis: Results

Table 1. FGNLS Results of the Working-Leser Expenditure Model System of Equations Using Control Function Approach

	Instrument: Knowledge of Russian (Whether the household head can read, write and speak Russian)		Instrument: Knowledge of Russian (Whether the household head and his/her spouse can read, write and speak Russian)		Instrument: Knowledge of Russian (Percentage of HH members who can read, write and speak Russian)		Instrument: Migration Networks (Proportion of households in the community who have migrants abroad)	
	No variables of control	With variables of control	No variables of control	With variables of control	No variables of control	With variables of control	No variables of control	With variables of control
				Food				
α_1	0.781*** (0.080)	0.784*** (0.059)	0.768*** (0.080)	0.784*** (0.059)	0.777*** (0.077)	0.787*** (0.059)	0.639*** (0.123)	0.578*** (0.083)
β_1	-0.027*** (0.008)	-0.029*** (0.006)	-0.024*** (0.008)	-0.029*** (0.006)	-0.026*** (0.008)	-0.028*** (0.006)	-0.008 (0.014)	-0.011 (0.009)
θ_1	2.890*** (0.657)	1.337 (1.182)	2.903*** (0.677)	1.368 (1.172)	2.648*** (0.634)	1.479 (1.182)	1.747*** (0.305)	1.458*** (0.475)
γ_1	0.929*** (0.168)	0.738*** (0.210)	0.715*** (0.173)	0.759*** (0.205)	0.889*** (0.161)	0.621*** (0.219)	0.955*** (0.095)	0.329** (0.158)
ζ_1	-0.000 (0.000)	0.000* (0.000)	-0.000 (0.000)	0.000* (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000*** (0.000)	-0.000* (0.000)
Hh members (primary)		0.005 (0.003)		0.005 (0.004)		0.006* (0.004)		0.000 (0.004)
Hh members		-0.000		0.000		-0.000		0.005

Empirical Analysis: Results

(secondary)	(0.003)	(0.003)	(0.003)	(0.004)
Hh members (university)	-0.007*** (0.002)	-0.007*** (0.002)	-0.007*** (0.002)	-0.006*** (0.002)
Household head age	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Household size	-0.005*** (0.001)	-0.005*** (0.001)	-0.005*** (0.001)	-0.003* (0.002)
Males older than 16	-0.003 (0.003)	-0.003 (0.003)	-0.004 (0.003)	-0.005 (0.003)
Children under 5	0.019*** (0.002)	0.019*** (0.002)	0.019*** (0.002)	0.017*** (0.003)
Household head male	-0.014** (0.006)	-0.014** (0.006)	-0.013** (0.006)	-0.011* (0.007)
Household head married	-0.001 (0.006)	-0.001 (0.006)	-0.002 (0.006)	0.003 (0.007)
Year 2011	0.114*** (0.006)	0.114*** (0.006)	0.115*** (0.006)	0.124*** (0.006)
Year 2012	-0.029*** (0.006)	-0.029*** (0.006)	-0.029*** (0.006)	
Issyk-Kul	-0.011 (0.011)	-0.011 (0.011)	-0.010 (0.011)	0.046*** (0.015)
Jalal-Abad	0.018*	0.018*	0.017	0.045***

Empirical Analysis: Results

		(0.010)		(0.010)		(0.010)		(0.014)
Naryn		-0.060***		-0.060***		-0.058***		-0.020
		(0.011)		(0.012)		(0.012)		(0.016)
Batken		-0.002		-0.002		-0.002		0.035**
		(0.011)		(0.011)		(0.011)		(0.014)
Osh		0.009		0.009		0.009		0.026*
		(0.010)		(0.010)		(0.010)		(0.013)
Talas		-0.112***		-0.112***		-0.111***		-0.083***
		(0.011)		(0.011)		(0.011)		(0.015)
Chuy		-0.034***		-0.034***		0.033***		-0.015
		(0.010)		(0.010)		(0.010)		(0.014)
Bishkek		-0.018*		-0.018*		-0.016*		-0.005
		(0.010)		(0.010)		(0.010)		(0.014)
				Education and Health				
α_2	0.096***	0.066***	0.108***	0.067***	0.096***	0.068***	0.131***	0.095***
	(0.016)	(0.016)	(0.016)	(0.016)	(0.015)	(0.016)	(0.049)	(0.018)
β_2	-0.004**	-0.002	-0.004**	-0.002	-0.004**	-0.002	-0.008	-0.004**
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.005)	(0.002)
θ_2	1***	1***	1***	1***	1***	1***	1	1
	(0.050)	(0.202)	(0.049)	(0.200)	(0.062)	(0.202)		
γ_2	0.975***	0.985***	0.331	0.985***	0.964***	0.980***	0.5***	0.5***
	(0.263)	(0.231)	(0.267)	(0.224)	(0.255)	(0.227)	(0.001)	(0.152)

Empirical Analysis: Results

ζ_2	0.000	-0.000	-0.000	-0.000	0.000	-0.000	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Hh members (primary)		-0.010***		-0.010***		-0.010***		-0.009***
		(0.002)		(0.001)		(0.002)		(0.002)
Hh members (secondary)		-0.001		-0.001		-0.001		-0.001
		(0.001)		(0.001)		(0.001)		(0.001)
Hh members (university)		0.001		0.001		0.001		0.001
		(0.001)		(0.001)		(0.001)		(0.001)
Household head age		0.000***		0.000***		0.000***		0.000*
		(0.000)		(0.000)		(0.000)		(0.000)
Household size		0.011***		0.011***		0.011***		0.011***
		(0.001)		(0.001)		(0.001)		(0.001)
Males older than 16		-0.007***		-0.007***		-0.007***		-0.007***
		(0.001)		(0.001)		(0.001)		(0.001)
Children under 5		-0.020***		-0.020***		-0.020***		-0.021***
		(0.001)		(0.001)		(0.001)		(0.001)
Household head male		0.000		0.000		0.000		-0.000
		(0.003)		(0.003)		(0.003)		(0.003)
Household head married		0.006*		0.006**		0.006**		0.007**
		(0.003)		(0.003)		(0.003)		(0.003)
Year 2011		-0.003		-0.003		-0.003		-0.002
		(0.003)		(0.003)		(0.003)		(0.003)

Empirical Analysis: Results

Year 2012		0.002 (0.003)		0.002 (0.003)		0.002 (0.003)		
Issyk-Kul		-0.008 (0.005)		-0.008 (0.005)		-0.008 (0.005)		-0.018*** (0.006)
Jalal-Abad		-0.019*** (0.005)		-0.019*** (0.005)		-0.019*** (0.005)		-0.019*** (0.006)
Naryn		-0.013** (0.006)		-0.013** (0.005)		-0.013** (0.006)		-0.013* (0.007)
Batken		-0.019*** (0.005)		-0.019*** (0.005)		-0.019*** (0.005)		-0.024*** (0.007)
Osh		-0.012** (0.005)		-0.012** (0.005)		-0.012** (0.005)		-0.015** (0.006)
Talas		-0.003 (0.006)		-0.003 (0.006)		-0.003 (0.006)		-0.001 (0.007)
Chuy		0.001 (0.005)		0.001 (0.005)		0.001 (0.005)		-0.003 (0.006)
Bishkek		0.013** (0.005)		0.013** (0.005)		0.013** (0.005)		0.004 (0.007)
				Celebrations, Funerals, Rituals				
α_3	0.045 (0.035)	0.021 (0.025)	0.060* (0.036)	0.021 (0.025)	0.049 (0.033)	0.022 (0.025)	0.073 (0.062)	0.053 (0.033)
β_3	0.002 (0.004)	0.007** (0.003)	-0.001 (0.004)	0.007** (0.003)	0.001 (0.004)	0.007** (0.003)	-0.001 (0.007)	0.003 (0.004)

Empirical Analysis: Results

θ_3	0.583*	0.684	0.705**	0.708	0.484*	0.720	1	1***
	(0.299)	(0.443)	(0.325)	(0.440)	(0.263)	(0.444)		(0.193)
γ_3	0.944***	0.773***	0.484**	0.791***	0.929***	0.772***	0.699***	0.524***
	(0.217)	(0.207)	(0.221)	(0.204)	(0.213)	(0.206)	(0.105)	(0.169)
ζ_3	0.000	-0.000	0.000**	-0.000	0.000	-0.000	0.000***	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Hh members (primary)		0.004**		0.004**		0.004**		0.005*
		(0.002)		(0.002)		(0.002)		(0.002)
Hh members (secondary)		-0.001		-0.001		-0.001		-0.001
		(0.002)		(0.002)		(0.002)		(0.002)
Hh members (university)		0.002		0.002		0.002		0.001
		(0.001)		(0.001)		(0.001)		(0.001)
Household head age		-0.000*		-0.000*		-0.000*		-0.000
		(0.000)		(0.000)		(0.000)		(0.000)
Household size		-0.003***		-0.003***		-0.003***		-0.004***
		(0.001)		(0.001)		(0.001)		(0.001)
Males older than 16		0.003*		0.003*		0.003**		0.006***
		(0.001)		(0.001)		(0.001)		(0.002)
Children under 5		0.001		0.001		0.001		0.002
		(0.002)		(0.002)		(0.002)		(0.002)
Household head male		0.009**		0.009**		0.008**		0.006
		(0.004)		(0.004)		(0.004)		(0.004)

Empirical Analysis: Results

Household head married	-0.011***	-0.011***	-0.011***	-0.007
	(0.004)	(0.004)	(0.004)	(0.005)
Year 2011	-0.025***	-0.025***	-0.025***	-0.027***
	(0.004)	(0.004)	(0.004)	(0.004)
Year 2012	-0.017***	-0.017***	-0.017***	
	(0.004)	(0.004)	(0.004)	
Issyk-Kul	0.004	0.004	0.004	-0.001
	(0.006)	(0.006)	(0.006)	(0.008)
Jalal-Abad	-0.002	-0.002	-0.002	-0.002
	(0.006)	(0.006)	(0.006)	(0.008)
Naryn	0.016**	0.016**	0.016**	0.020**
	(0.007)	(0.007)	(0.007)	(0.009)
Batken	0.009	0.009	0.009	-0.000
	(0.007)	(0.007)	(0.007)	(0.009)
Osh	0.003	0.003	0.003	-0.002
	(0.006)	(0.006)	(0.006)	(0.008)
Talas	0.095***	0.095***	0.094***	0.091***
	(0.007)	(0.007)	(0.007)	(0.009)
Chuy	-0.004	-0.004	-0.004	-0.009
	(0.006)	(0.006)	(0.006)	(0.008)
Bishkek	-0.022***	-0.022***	-0.022***	-0.027***
	(0.006)	(0.006)	(0.006)	(0.007)

Empirical Analysis: Results

	Consumer Goods							
α_4	0.012	0.083***	0.020	0.083***	0.017	0.080**	0.007	0.128***
	(0.028)	(0.031)	(0.027)	(0.030)	(0.027)	(0.031)	(0.066)	(0.040)
β_4	0.020***	0.016***	0.018***	0.016***	0.019***	0.016***	0.018**	0.012***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.007)	(0.004)
θ_4	2.212***	1.518**	2.053***	1.525**	1.988***	1.516**	1***	1.190***
	(0.295)	(0.709)	(0.344)	(0.685)	(0.291)	(0.726)	(0.002)	(0.294)
γ_4	0.902***	0.856***	0.686***	0.862***	0.873***	0.685***	0.698***	0.369***
	(0.137)	(0.168)	(0.140)	(0.157)	(0.124)	(0.174)	(0.065)	(0.131)
ζ_4	-0.000	-0.000	0.000	-0.000	-0.000	0.000	-0.000	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Hh members (primary)		0.001		0.001		-0.000		0.003
		(0.002)		(0.002)		(0.002)		(0.002)
Hh members (secondary)		0.001		0.001		0.002		-0.001
		(0.002)		(0.002)		(0.002)		(0.002)
Hh members (university)		0.003*		0.003*		0.003*		0.002
		(0.002)		(0.002)		(0.002)		(0.002)
Household head age		-0.001***		-0.001***		-0.001***		-0.001***
		(0.000)		(0.000)		(0.000)		(0.000)
Household size		-0.001		-0.001		-0.001		-0.003**
		(0.001)		(0.001)		(0.001)		(0.001)
Males older		-0.000		-0.000		0.001		0.001

Empirical Analysis: Results

than 16	(0.002)	(0.002)	(0.002)	(0.002)
Children under 5	-0.003 (0.002)	-0.003 (0.002)	-0.003 (0.002)	-0.001 (0.002)
Household head male	-0.004 (0.005)	-0.004 (0.005)	-0.004 (0.005)	0.001 (0.005)
Household head married	-0.002 (0.005)	-0.002 (0.005)	-0.001 (0.005)	-0.004 (0.005)
Year 2011	-0.041*** (0.004)	-0.041*** (0.004)	-0.042*** (0.004)	-0.049*** (0.005)
Year 2012	0.047*** (0.004)	0.047*** (0.004)	0.047*** (0.004)	
Issyk-Kul	0.001 (0.008)	0.001 (0.008)	-0.000 (0.008)	-0.018* (0.010)
Jalal-Abad	0.003 (0.008)	0.003 (0.008)	0.003 (0.008)	-0.003 (0.010)
Naryn	0.028*** (0.010)	0.028*** (0.010)	0.026*** (0.010)	0.012 (0.011)
Batken	0.001 (0.008)	0.001 (0.008)	0.001 (0.008)	-0.004 (0.010)
Osh	-0.002 (0.008)	-0.001 (0.008)	-0.002 (0.008)	0.006 (0.009)
Talas	0.022***	0.022***	0.021**	0.020*

Empirical Analysis: Results

		(0.008)		(0.008)		(0.008)		(0.010)
Chuy		-0.005 (0.007)		-0.005 (0.008)		-0.006 (0.008)		-0.002 (0.009)
Bishkek		0.007 (0.008)		0.007 (0.008)		0.006 (0.008)		0.012 (0.009)
				Other goods				
α_5	0.066	0.046	0.044	0.045	0.061	0.043	0.015	0.146
β_5	0.009	0.008	0.011	0.008	0.01	0.007	-0.001	0
θ_5	1.699*** (0.348)	2.072*** (0.435)	2.184*** (0.346)	2.045*** (0.439)	1.692*** (0.338)	2.111*** (0.428)	1	1*** (0.030)
γ_5	0.857*** (0.239)	0.537* (0.283)	0.387* (0.230)	0.593** (0.281)	0.803*** (0.247)	0.480* (0.278)	0.554*** (0.093)	0.258 (0.159)
ζ_5	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000*** (0.000)	0.000 (0.000)
Hh members (primary)		-0.000 (0.002)		0.000 (0.002)		-0.000 (0.002)		0.001 (0.003)
Hh members (secondary)		0.000 (0.002)		0.000 (0.002)		0.000 (0.002)		-0.001 (0.002)
Hh members (university)		0.001 (0.001)		0.001 (0.001)		0.001 (0.001)		0.001 (0.001)

Empirical Analysis: Results

Household head age	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000** (0.000)
Household size	-0.002*** (0.001)	-0.002*** (0.001)	-0.002*** (0.001)	-0.002** (0.001)
Males older than 16	0.007*** (0.002)	0.007*** (0.002)	0.007*** (0.002)	0.004*** (0.002)
Children under 5	0.003* (0.002)	0.003* (0.002)	0.003* (0.002)	0.003* (0.002)
Household head male	0.009** (0.004)	0.009** (0.004)	0.009** (0.004)	0.005 (0.004)
Household head married	0.009** (0.004)	0.009** (0.004)	0.009** (0.004)	0.001 (0.004)
Year 2011	-0.045*** (0.004)	-0.045*** (0.004)	-0.045*** (0.004)	-0.047*** (0.004)
Year 2012	-0.003 (0.004)	-0.003 (0.004)	-0.003 (0.004)	
Issyk-Kul	0.014* (0.008)	0.014* (0.008)	0.014* (0.008)	-0.007 (0.007)
Jalal-Abad	0.000 (0.007)	0.000 (0.007)	0.000 (0.007)	-0.021*** (0.007)
Naryn	0.029*** (0.008)	0.029*** (0.008)	0.029*** (0.008)	0.001 (0.007)

Empirical Analysis: Results

Batken		0.011		0.011		0.011		-0.006
		(0.007)		(0.007)		(0.007)		(0.007)
Osh		0.002		0.002		0.002		-0.014**
		(0.007)		(0.007)		(0.007)		(0.006)
Talas		-0.001		-0.001		-0.001		-0.028***
		(0.009)		(0.009)		(0.009)		(0.007)
Chuy		0.043***		0.043***		0.042***		0.029***
		(0.007)		(0.007)		(0.007)		(0.007)
Bishkek		0.019***		0.019***		0.019***		0.016**
		(0.007)		(0.007)		(0.007)		(0.007)
Number of observations	7,617	7,612	7,617	7,612	7,617	7,612	4,925	4,920

Bootstrapped standard errors in parentheses (400 replications)
*** p<0.01, ** p<0.05, * p<0.1

Empirical Analysis: Results

Table 2. Elasticities of Substitution between Remittance Income and Other Income

	Instrument: Knowledge of Russian (Whether the household head can read, write and speak Russian)		**Instrument: Knowledge of Russian (Whether the household head and his/her spouse can read, write and speak Russian)**		**Instrument: Knowledge of Russian (Percentage of household members who can read, write and speak Russian)**		**Instrument: Migration Networks (Proportion of households in the community who have migrants abroad)**	
	No variables of control	With variables of control	No variables of control	With variables of control	No variables of control	With variables of control	No variables of control	With variables of control
Food	0.257*** (0.043)	0.428** (0.217)	0.256*** (0.044)	0.422** (0.209)	0.274*** (0.048)	0.403** (0.192)	0.364*** (0.040)	0.407*** (0.079)
Education and health	0.5*** (0.012)	0.5*** (0.051)	0.5*** (0.012)	0.5*** (0.050)	0.5*** (0.015)	0.5*** (0.050)	0.5	0.5
Celebrations, funerals, rituals	0.632*** (0.119)	0.594*** (0.156)	0.586*** (0.112)	0.585*** (0.151)	0.674*** (0.119)	0.581*** (0.150)	0.5	0.5*** (0.048)
Consumer goods	0.311*** (0.029)	0.397*** (0.112)	0.328*** (0.037)	0.396*** (0.108)	0.335*** (0.033)	0.397*** (0.115)	0.5*** (0.000)	0.457*** (0.061)
Other	0.370*** (0.048)	0.326*** (0.046)	0.314*** (0.034)	0.328*** (0.047)	0.371*** (0.047)	0.321*** (0.044)	0.5	0.5*** (0.007)

Bootstrapped standard errors in parentheses (400 replications)
*** p<0.01, ** p<0.05, * p<0.1

Empirical Analysis

Results

- For all expenditure categories, in all cases, the elasticities of substitution are less than 1.
  $\Rightarrow$ remittance income and other income are **not perfect substitutes**, i.e. they are *not fungible.*
- Kyrgyz households view these two sources of income differently and have separate mental accounts for them, or separate "remittance income" budget and "other income" budget.
  $\Rightarrow$ mental accounting matters;
  $\Rightarrow$ there may be significant differences in the patterns of spending the two types of income.

Empirical Analysis: Results

Table 3. Marginal Budget Shares for Remittance Expenditure (Income)

	Instrument: Knowledge of Russian (Whether the household head can read, write and speak Russian)		Instrument: Knowledge of Russian (Whether the household head and his/her spouse can read, write and speak Russian)		Instrument: Knowledge of Russian (Percentage of household members who can read, write and speak Russian)		Instrument: Migration Networks (Proportion of households in the community who have migrants abroad)	
	No variables of control	With variables of control	No variables of control	With variables of control	No variables of control	With variables of control	No variables of control	With variables of control
Food	0.543*** (0.007)	0.494*** (0.068)	0.544*** (0.005)	0.493*** (0.069)	0.542*** (0.007)	0.515*** (0.035)	0.554*** (0.030)	0.474*** (0.020)
Education and health	0.027 (0.077)	0.029 (0.044)	0.066*** (0.006)	0.029 (0.044)	0.031 (0.065)	0.028 (0.044)	0.056*** (0.004)	0.051*** (0.009)
Celebrations, funerals, rituals	0.074** (0.032)	0.106*** (0.028)	0.055*** (0.007)	0.107*** 0.028)	0.068** (0.030)	0.104*** (0.027)	0.061*** (0.012)	0.078*** (0.012)
Consumer goods	0.194*** (0.013)	0.248*** (0.038)	0.188*** (0.006)	0.249*** (0.037)	0.197*** (0.014)	0.232*** (0.019)	0.198*** (0.014)	0.243*** (0.014)
Other	0.158*** (0.014)	0.123*** (0.009)	0.147*** (0.003)	0.123*** (0.009)	0.155*** (0.009)	0.123*** (0.009)	0.134*** (0.006)	0.155*** (0.008)

Bootstrapped standard errors in parentheses (400 replications)
*** p<0.01, ** p<0.05, * p<0.1

Empirical Analysis

Results

- For 1 KGS increase in the remittance income budget, expenditure on:
  - food rises by about 0.5 KGS;
  - education and health by about 0.04 KGS;
  - celebrations, funerals, rituals by about 0.08 KGS;
  - consumer goods by about 0.22 KGS;
  - other goods by about 0.14 KGS.

$\Rightarrow$ at the margin, money transfers from migrants are spent on consumption goods mostly, which have no long-term benefits for the receiving communities.

Empirical Analysis: Results

Table 5. Remittance Expenditure (Income) Elasticities

	Instrument: Knowledge of Russian (Whether the household head can read, write and speak Russian)		Instrument: Knowledge of Russian (Whether the household head and his/her spouse can read, write and speak Russian)		Instrument: Knowledge of Russian (Percentage of household members who can read, write and speak Russian)		Instrument: Migration Networks (Proportion of households in the community who have migrants abroad)	
	No variables of control	With variables of control	No variables of control	With variables of control	No variables of control	With variables of control	No variables of control	With variables of control
Food	0.093*** (0.002)	0.087*** (0.013)	0.093*** (0.000)	0.087*** (0.013)	0.093*** (0.001)	0.091*** (0.006)	0.090*** (0.006)	0.093*** (0.000)
Education and health	0.040 (0.117)	0.055 (0.084)	0.090*** (0.004)	0.054 (0.084)	0.046 (0.096)	0.053 (0.085)	0.082*** (0.007)	0.086*** (0.006)
Celebrations, funerals, rituals	0.118** (0.059)	0.130*** (0.033)	0.092*** (0.012)	0.131*** (0.034)	0.110** (0.055)	0.128*** (0.032)	0.090*** (0.021)	0.097*** (0.006)
Consumer goods	0.100*** (0.010)	0.105*** (0.017)	0.095*** (0.002)	0.106*** (0.016)	0.101*** (0.009)	0.098*** (0.007)	0.115*** (0.010)	0.095*** (0.001)
Other	0.101*** (0.015)	0.094*** (0.001)	0.094*** (0.000)	0.094*** (0.002)	0.099*** (0.010)	0.094*** (0.001)	0.092*** (0.005)	0.094*** (0.001)

Bootstrapped standard errors in parentheses (400 replications)
*** p<0.01, ** p<0.05, * p<0.10

Empirical Analysis

Results

- All consumption categories are **normal goods**, in particular, *necessity goods*:
  - An increase in remittance income will lead to a higher demand for all of these expenditure categories but to a lesser extent than an increase in income.

Empirical Analysis: Results

Table 6. Marginal Budget Shares for Other Expenditure (Income)

	Instrument: Knowledge of Russian (Whether the household head can read, write and speak Russian)		Instrument: Knowledge of Russian (Whether the household head and his/her spouse can read, write and speak Russian)		Instrument: Knowledge of Russian (Percentage of household members who can read, write and speak Russian)		Instrument: Migration Networks (Proportion of households in the community who have migrants abroad)	
	No variables of control	With variables of control	No variables of control	With variables of control	No variables of control	With variables of control	No variables of control	With variables of control
Food	0.519*** (0.016)	0.503*** (0.018)	0.519*** (0.008)	0.503*** (0.018)	0.519*** (0.009)	0.502*** (0.014)	0.571*** (0.008)	0.464*** (0.022)
Education and health	0.063*** (0.012)	0.049*** (0.009)	0.063*** (0.004)	0.049*** (0.009)	0.063*** (0.010)	0.049*** (0.009)	0.056*** (0.004)	0.051*** (0.008)
Celebrations, funerals, rituals	0.059*** (0.005)	0.081*** (0.009)	0.055*** (0.005)	0.080*** (0.010)	0.058*** (0.005)	0.080*** (0.009)	0.063*** (0.005)	0.078*** (0.011)
Consumer goods	0.203*** (0.009)	0.236*** (0.013)	0.203*** (0.004)	0.236*** (0.012)	0.202*** (0.006)	0.237*** (0.012)	0.177*** (0.004)	0.251*** (0.014)
Other	0.156*** (0.009)	0.131*** (0.009)	0.159*** (0.004)	0.131*** (0.009)	0.157*** (0.006)	0.131*** (0.009)	0.134*** (0.004)	0.156*** (0.009)

Bootstrapped standard errors in parentheses (400 replications)
*** p<0.01, ** p<0.05, * p<0.10

Empirical Analysis

Results

- For 1 KGS increase in the other income budget, expenditure on:
  - food rises by about 0.51 KGS;
  - education and health by about 0.06 KGS;
  - celebrations, funerals, rituals by about 0.07 KGS;
  - consumer goods by about 0.22 KGS;
  - other goods by about 0.14 KGS.

$\Rightarrow$ Kyrgyz households spend on education and health more of their other income budget than from their remittance income budget.

$\Rightarrow$ Kyrgyz households spend on celebrations, funerals and rituals more of their remittance income budget than from their other income budget.

Empirical Analysis: Results

Table 8. Other Expenditure (Income) Elasticities

	Instrument: Knowledge of Russian (Whether the household head can read, write and speak Russian)		Instrument: Knowledge of Russian (Whether the household head and his/her spouse can read, write and speak Russian)		Instrument: Knowledge of Russian (Percentage of household members who can read, write and speak Russian)		Instrument: Migration Networks (Proportion of households in the community who have migrants abroad)	
	No variables of control	With variables of control	No variables of control	With variables of control	No variables of control	With variables of control	No variables of control	With variables of control
Food	0.858*** (0.015)	0.858*** (0.009)	0.862*** (0.015)	0.858*** (0.009)	0.860*** (0.014)	0.856*** (0.008)	0.897*** (0.020)	0.884*** (0.019)
Education and health	0.893*** (0.116)	0.901*** (0.077)	0.846*** (0.026)	0.901*** (0.076)	0.889*** (0.093)	0.898*** (0.077)	0.798*** (0.071)	0.835*** (0.031)
Celebrations, funerals, rituals	0.912*** (0.023)	0.958*** (0.042)	0.899*** (0.059)	0.957*** (0.043)	0.910*** (0.016)	0.959*** (0.042)	0.892*** (0.086)	0.936*** (0.043)
Consumer goods	1.009*** (0.018)	0.969*** (0.022)	1.003*** (0.016)	0.969*** (0.021)	1.005*** (0.018)	0.974*** (0.017)	0.996*** (0.039)	0.954*** (0.017)
Other	0.964*** (0.035)	0.974*** (0.032)	0.981*** (0.037)	0.974*** (0.033)	0.969*** (0.038)	0.975*** (0.032)	0.896*** (0.041)	0.912*** (0.020)

Bootstrapped standard errors in parentheses (400 replications)
*** p<0.01, ** p<0.05, * p<0.10

Empirical Analysis

Results

- All consumption categories, apart from consumer goods, are **normal goods**, in particular, *necessity goods*:
  - An increase in other income will lead to a higher demand for all of these expenditure categories but to a lesser extent than an increase in income.
- Consumer goods are **luxury goods**:
  - An increase in other income will lead to a bigger percentage increase in demand for this category of goods.

Conclusion

1. Are remittance income and other income fungible for Kyrgyz households?
   - Remittance income and income from other sources are in fact not perfect substitutes in the eyes of Kyrgyz households;
   - The assumption of fungibility fails and therefore, mental accounting matters;
   - Migrant money transfers may cause behavioral changes at the household level, and their development impact can be huge.

Conclusion

2. How is remittance income and income from other sources spent, and are there significant differences in their patterns of spending?
   - In line with the pessimistic view, transfers from migrants are spent on consumption goods mostly, which have no long-term benefits for the receiving communities;
   - Kyrgyz households spend on education and health more of their other income budget than remittance income budget;
   - Families in Kyrgyzstan spend on celebrations, funerals and rituals more of their remittance income budget than their other income budget;
   - Massive remittance inflows into the country do not have a positive development impact that they potentially could.

Conclusion

3. What type of goods the different expenditure categories represent (normal, luxury, necessity, or inferior) in response to the increase in remittance income versus other income of Kyrgyz families?
    - All consumption categories are normal goods, in particular, necessity goods, when they are financed from remittance income budget;
    - Kyrgyz households view consumer goods as luxury items, when they are financed from other income budget.