Remittances and Labour Supply In Kyrgyzstan

Simone Angioloni (presenting author)
Glenn C. W. Ames
Zarylbek Kudabaev

afbi — Agri-Food and Biosciences Institute ®

The University of Georgia — 1785

American University of Central Asia

Outline of The Presentation

- Introduction and Objectives

- Global and National Trends in Remittances

- Microeconomic background

- Model Specification and Estimation

- Results

- Conclusions and Implications

Introduction and Objectives

▶ Economic theories that describe the effect of remittances on economic growth can be classified into two extremes (Taylor 1999; 2003):

    a) Developmentalist approach (NELM) → Production Possibility Frontier Effect.

    b) "Dutch disease" or "migrant syndrome" perspective → from raw materials for subsidies to labour for remittances.

    c) Between the two extremes, economic environments → institutional, infrastructural, and resources constraints.

Introduction and Objectives

▶ The primary objective of this study is to analyze the effect of remittances on the household labour supply in Kyrgyzstan.

▶ In particular, this study provides a theoretical and empirical background to show that the relationship depends on the living standards:

1. Low living standards → Subsistence Effect (SE): an increase of remittances can reduce the labour supply → $\partial h / \partial R < 0$.

2. Intermediate living standards → PPF effect (PPFE): an increase of remittances can increase the labour supply → $\partial h / \partial R > 0$.

3. High living standards → Income Effect(IE): an increase of remittances can reduce the labour supply → $\partial h / \partial R < 0$.

➤ In addition, this study provides evidence that the actual amount of remittances is underreported in Kyrgyzstan.

Global and National Trends in Remittances

▶ At the global level, the worldwide remittances are estimated to have exceeded $601 billion in 2015 (World Bank, 2016).

▶ Comparison: $0.4 billion in 1970, $49 billion in 1995 (Taylor, 1999).

▶ Developing and transition countries are estimated to receive more than 73% of remittances, worldwide.

▶ The growth of remittances received by developing and transition countries is expected to slow down in 2015 with respect to 2014, but it is still positive.

▶ The top recipient countries of recorded remittances were India, China, the Philippines, Mexico, and France.

▶ However, as a share of GDP, Tajikistan is first (42%) followed by Kyrgyzstan (30%), Nepal (29%), Tonga (28%), and Moldova (26%).

Figure 1. Remittances From and To Kyrgyzstan, 2002-2014
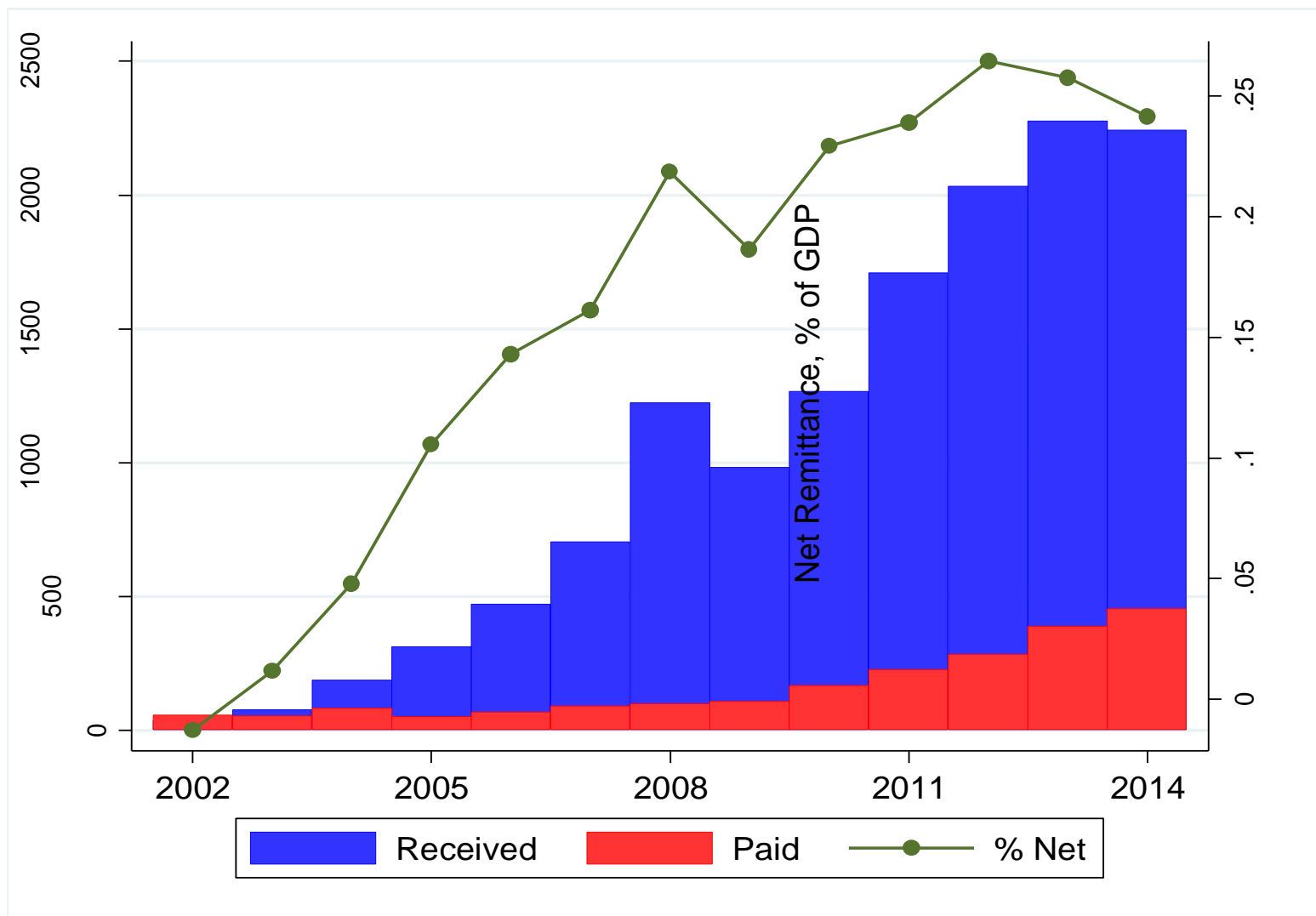
Source: World Development Indicators, World Bank (2016)

Migration and Remittances in Kyrgyzstan

▶ Internal and external migration in post Soviet Period:

- Loosening of controls on the movement of people in post 1991 period.

- Unemployment in rural and urban areas jumped.

- Increase in poverty and extreme poverty in Kyrgyzstan.

- Migration to near abroad – primarily Russia - in search of employment.

- Flows of remittances to communities in Kyrgyzstan.

Table 1. Labour Migration in Kyrgyzstan.

Percentage of Migrant Population	5%
Percentage of Labour Migration	96%
Principal Country of Migrant's Destination: Russia	91%
Migrant's Main Activity: Unskilled-Construction	43%
Annual Remittances per Household (USD$)	1643
Annual Expenditure per Household (USD$)	3460
Principal Channel to Send Remittances in Kyrgyzstan: Money Transfer	60%
Main Use of Remittances: Current Expenditures	34%

Source: Life in Kyrgyzstan Panel Study (LIK), 2010.

Microeconomic background: Issues

▶ Do remittances change the labour supply of the receiving households according to their living standards?

▶ *Ceteris paribus*: constant prices, preferences, one technology, no uncertainty, unitary household, and zero agricultural production (Singh et al., 1986).

▶ Backward pending labour supply curve = maximization of the total utility over consumption and leisure subject to the income and time constraints where leisure is normal good.

▶ Apparent paradox = is it possible that the income effect is operating at the very low living standards?

▶ Inverted S-shaped labour supply curve = subsistence constraint (Kruger, 1962; Dessing, 2002; Gartner and Gartner, 2011).

▶ $w \cdot h + NL = \overline{\overline{Subb}}$ → $w = (\overline{\overline{Subb}} - NL)/h$

Figure 2. Labour Supply Schedule

Hours of Work

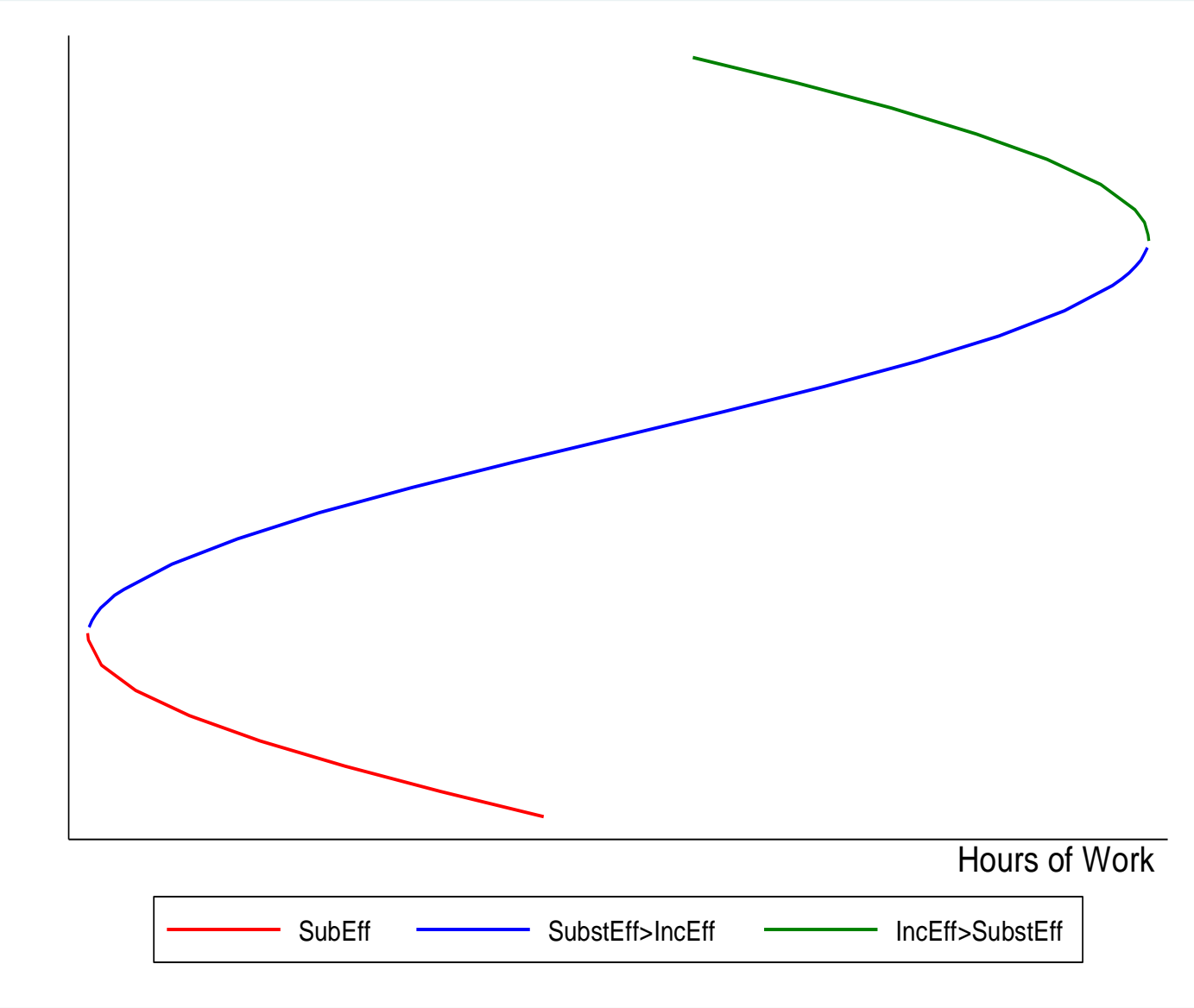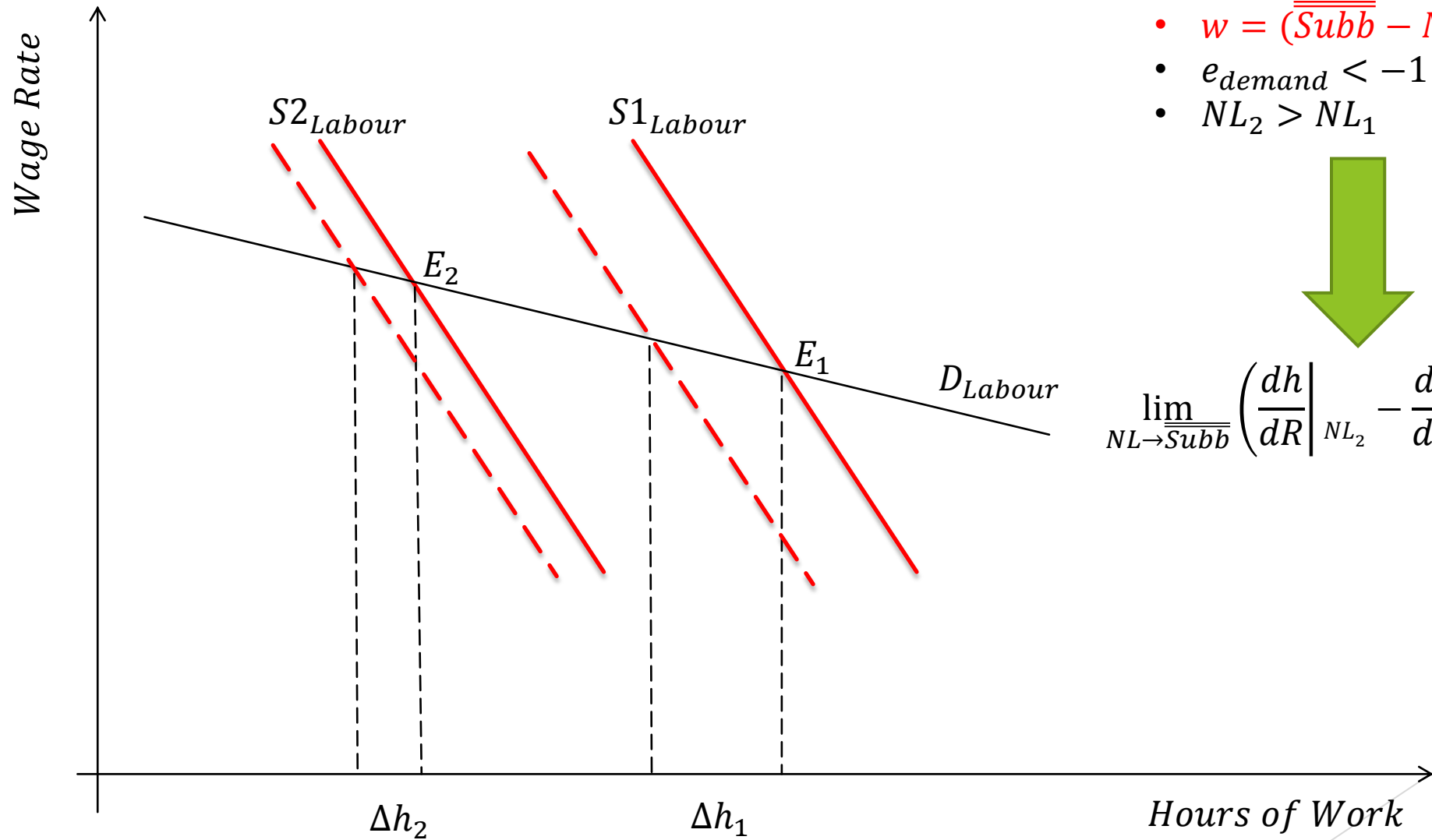|		
—— SubEff	—— SubstEff>IncEff	—— IncEff>SubstEff

Figure 3. Labour Market Equilibrium Along the Subsistence Frontier

- $w = (\overline{\overline{Subb}} - NL)/h$
- $e_{demand} < -1$
- $NL_2 > NL_1$

$$\lim_{NL \to \overline{\overline{Subb}}} \left(\frac{dh}{dR}\bigg|_{NL_2} - \frac{dh}{dR}\bigg|_{NL_1} \right) = 0$$

Labour Market Equilibrium Along the Subsistence Frontier

▶ Example → quasi-linear production function:

- $\dfrac{1-r_1}{1-r_0} \geq \dfrac{MP_0}{MP_1}$ (1)
- $MP = \dfrac{\partial y}{\partial h} = y'$
- $r = -\dfrac{y''}{y'}h$

▶ Practical interpretation: Conditional to the living standards, $\partial h / \partial R = parabola.$

▶ Policy implications →If the purpose of the policy maker is to foster the economic growth through an increase of the labour supply:

a) At the subsistence level = policies to support the households' living standards so that the reduction of labour supply is minimized, i. e., minimum wage, foreign aids, fair trade agreement (Gartner and Gartner, 2011).

b) At the higher living standards = polices to affect the effective marginal tax rate on the labour income (Prescott et al., 2004).

Model Specification and Estimation

▶ From a parametric standpoint, a straightforward model specification is the following:

$$\frac{\partial h}{\partial R} = \beta_1 + \beta_2 \cdot LS + \beta_3 \cdot LS^2 + \dots \qquad (2)$$

▶ Where h represents the worked hours in a day averaged over the household members, LS indicates the living standards, and R is the received remittances.

▶ If the previous argumentation is true, β_1 and β_3 are expected to be negative, subsistence and income effect, respectively, while the sign of β_2 should be positive (PPF effect).

▶ Thus, the model can be estimated by the following equation:

$$h = \beta_1 \cdot R + \beta_2 \cdot LS \cdot R + \beta_3 \cdot LS^2 \cdot R + \dots \qquad (3)$$

▶ There are three main econometric issues to estimate equation (3).

Estimation: First Stage

▶ First, the reported worked hours are observed to be censored at zero → censored model (Tobit) for the labour equation (Justino and Shemyakina, 2012).

▶ Second, the reported remittances are censored at zero as well → censored model for the remittances equation. However, the *actual* remittances could be also *underreported* (Freund and Spatafora, 2008).

▶ Reasons for underreporting and estimation consequences.

▶ Thus, we follow Shonkwiler et al. (2011) that developed this approach to study the effect of remittances on the household labour supply.

▶ The model consists on developing a further equation to control for underreporting → the model has the nice property that if there is no underreporting, it collapses in the traditional censored model.

▶ a) first stage estimation and b) expected value of the true remittances.

14

Estimation: Second Stage

▶ Another issue is related to the living standards.

▶ To estimate the household living standards, we use the per capita expenditure:

   a) The household expenditure is the sum of all the purchases plus the monetary values of the food items produced and consumed by the household in a year.

   b) Since remittances cover a consistent share of the household expenditure, to disentangle this interaction, LS has be calculated as the household expenditure minus the expected values of the true remittances divided by the household members (reasons + assumption) → $NPEX$.

▶ Even in this case, there is simultaneity between worked hours and living standards. We employ the rooms per person (RPP) as instrument for $NPEX$.

Estimation: Second Stage

- RPP (or PPR) is generally accepted as an indicator of the living standards (EUROSTAT, 2015; UK Office of Labour Market Statistics, 2011; US PD&R, 2007).

- The Newly Independent States suffered from a severe housing shortage (Struyk and Romanik, 1995; Alymbaeva, 2013).

- In Kyrgyzstan, the overcrowding rate has been proved directly related to poverty (Chzhen, 2010).

- For the estimation, we follow Wooldridge and we use RPP as instrument for $NPEX$. Three further auxiliary equations with relative assumptions and advantages:

$$NPEX \qquad\qquad NPEX \cdot R \qquad\qquad NPEX^2 \cdot R$$
$$\downarrow \qquad\qquad\qquad \downarrow \qquad\qquad\qquad \downarrow$$
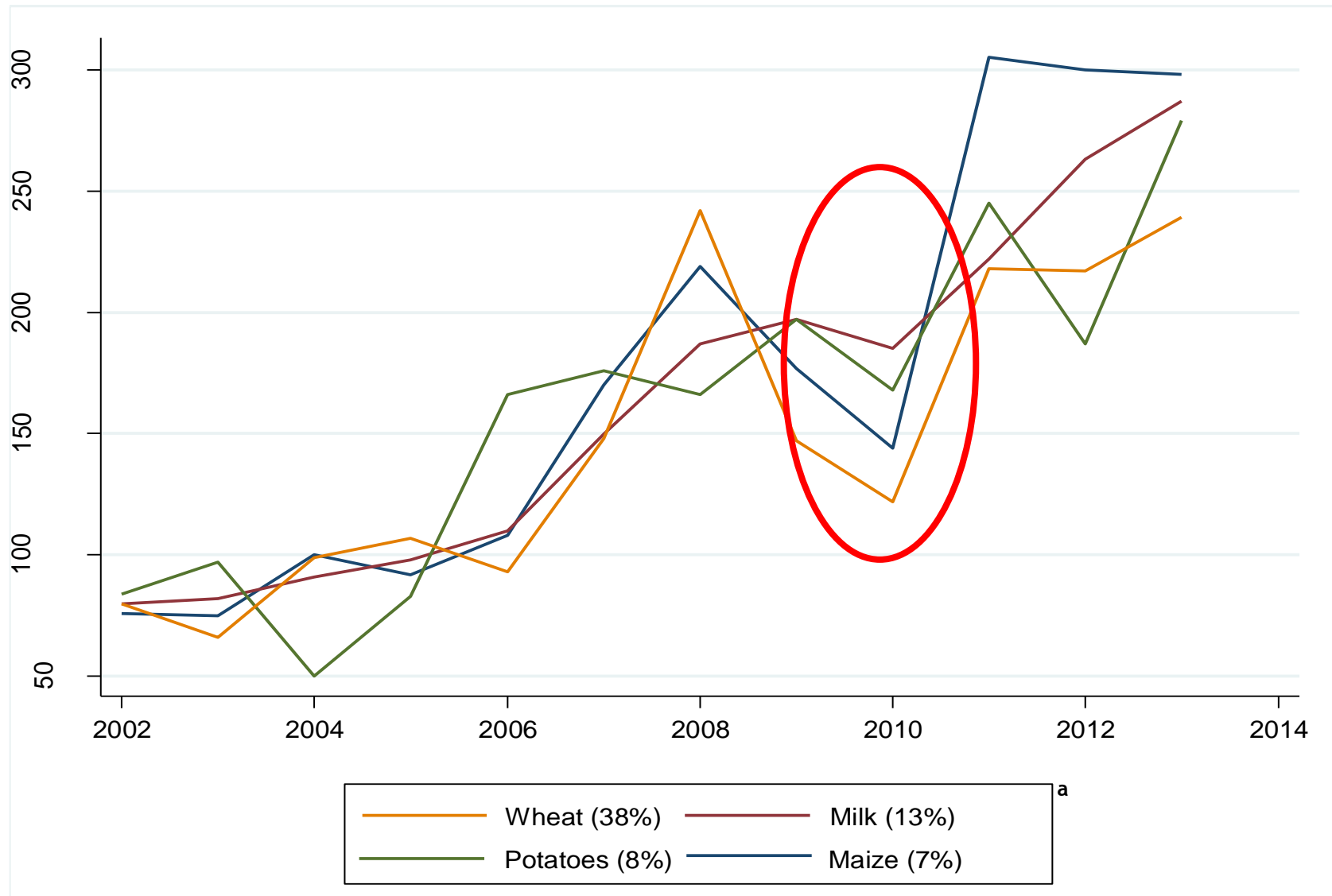$$RPP \qquad\qquad\quad RPP \cdot R \qquad\qquad\quad RPP^2 \cdot R$$

- In summary, we estimate through MLE a system of six equations in two stages.

Figure 4. Producer Price Index in Kyrgyzstan

ª: Food Consumption Share in Caloric Contribution (%).
Source: FAOSTAT, 2016.

Table 2. First Stage Results: Estimation of the Remittances Equation

Dependent Variable	Remittances (1000 USD $)		
	Coefficient	Standard Error	
Constant	0.063	(2.225)	⎫
%Corruption	0.621**	(0.303)	
Bad House (=1 if low quality of house)	0.647**	(0.301)	Underreporting
Log(AvWorkAge)	-0.081	(0.609)	
Bank No Trust (=1 if no trust in banks)	-0.475*	(0.268)	⎭
Constant	-2.745***	(0.567)	⎫
Number of Migrants per household	3.519***	(0.341)	
HH size (number of members)	-0.040	(0.040)	
Share of Kids in the household (≤6 years)	0.024	(0.519)	
Share of Elderly in the household (≥65 years)	-0.331	(0.536)	Remittances
Share of Women in the household	-0.698*	(0.387)	
Urban (=1 if household in urban area)	0.415**	(0.186)	
%Network-Remit	2.914***	(0.869)	
Excellent House(=1 if high quality of house)	-0.021	(0.168)	⎭

Maximum likelihood results. Robust Huber-White standard errors in parentheses.
*, **, and *** denotes significance at 10, 5, and 1%, respectively.

## Table 3. Second Stage Results: Estimation of the Labour Supply Equation

Dependent Variable	Per capita worked hours in a day[a]	
	Coefficient	Standard Error
Constant	0.608	(1.432)
NPEX	0.491	(0.321)
$E[R^*]$	-1.748**	(0.731)
$NPEX \cdot E[R^*]$	3.625**	(1.446)
$NPEX^2 \cdot E[R^*]$	-1.608***	(0.600)
Share of Kids in the household ($\leq$6 years)	-1.938***	(0.390)
Share of Elderly in the household ($\geq$65 years)	-1.837***	(0.652)
Share of Women in the household	-0.203	(0.783)
Urban (=1 if household in urban area)	0.368***	(0.115)
Household Male (=1 if household head male)	0.166	(0.134)
Male Unemployment Rate	-5.344***	(0.265)
Age of the Household Head	-0.050	(0.038)
Squared Age of the Household Head	0.001***	(2.56E-04)
Years of Education of the Household Head	0.393***	(0.057)
Average Worked Age	0.312***	(0.071)
Squared Averaged Worked Age	-0.003***	(0.001)

[a]: Averaged over all the household members in working age (18-64).
Maximum likelihood results. Robust Huber-White standard errors in parentheses.
*, **, and *** denotes significance at 10, 5, and 1%, respectively.

Figure 5. Marginal Effects of Remittances and Predicted Worked Hours in a Day[a]
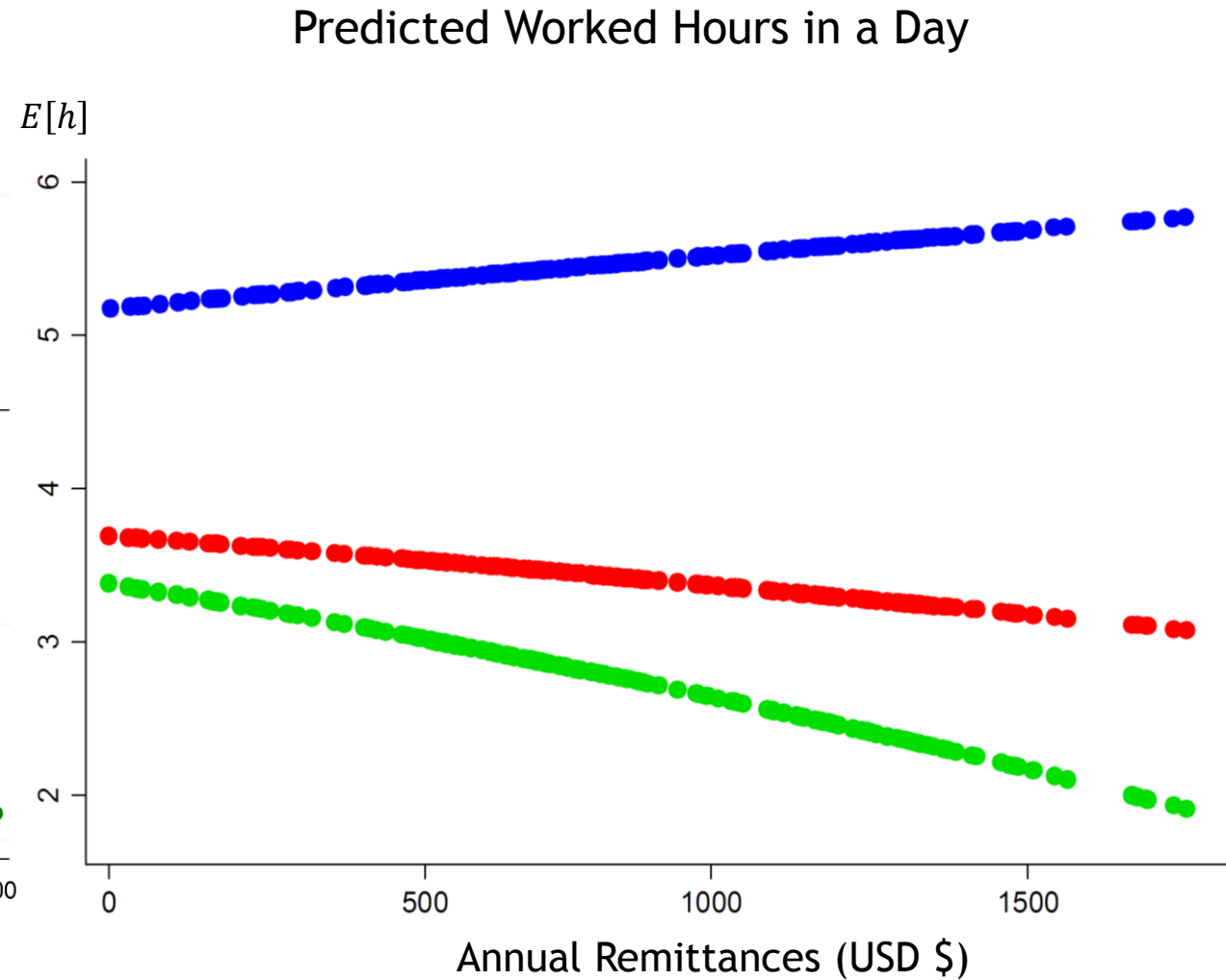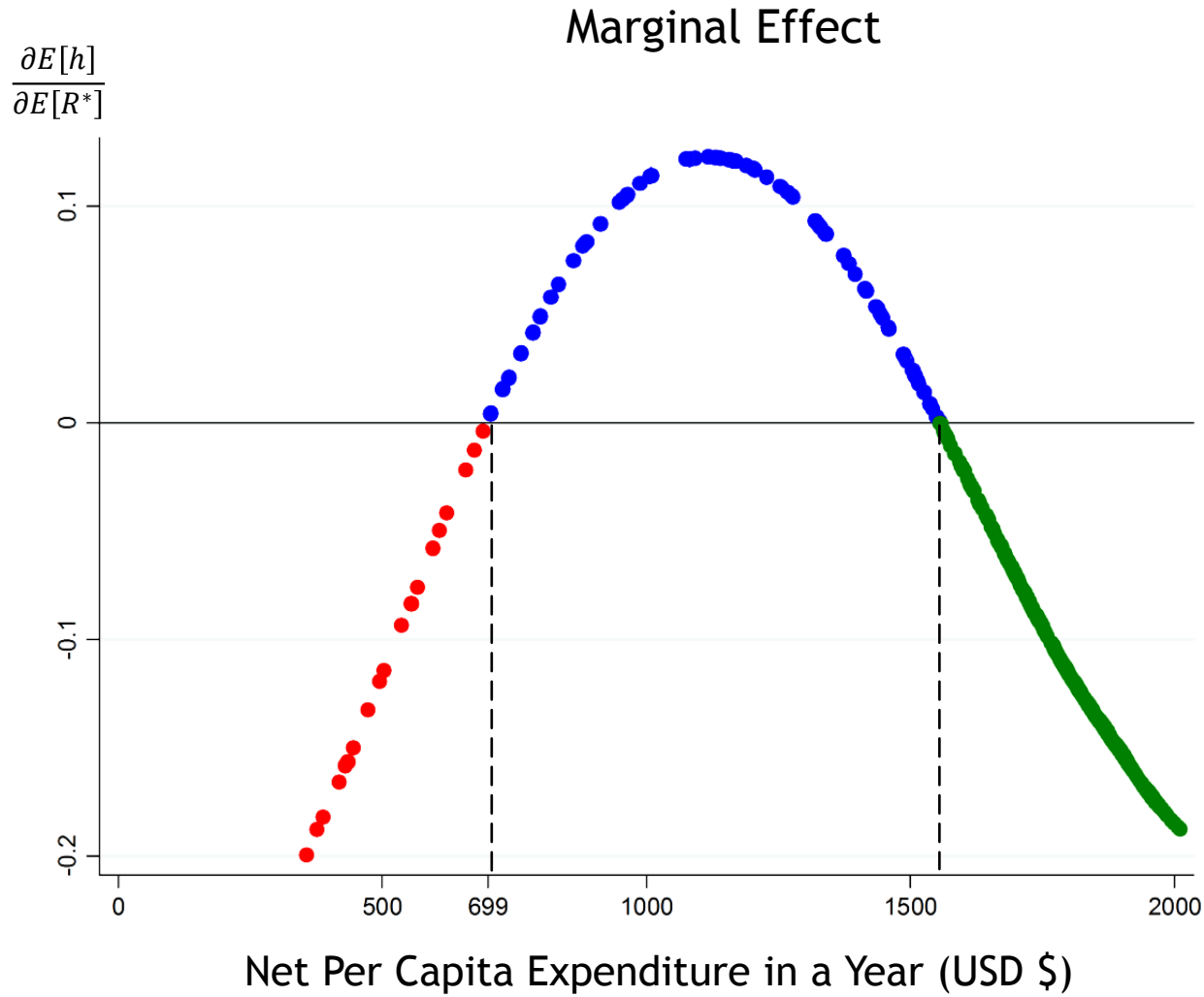
a: All the other covariates at the mean value.

Conclusions and Implications

▶ This study investigates the relationship between remittances and household's worked hours in Kyrgyzstan.

▶ Results indicate that

  a) The observed remittances are underreported (31%).

  b) The relationship between remittances and worked hours depends on the household's living standards.

  c) In particular, the negative effect between remittances and worked hours is mostly present at the highest living standards (92%).

▶ Policy implications

  a) Strategies that affect the marginal tax rate on the labour income can be effective, especially because they involve a large number of households.

  b) However, strategies that support the households' living standards can reduce the poverty gap and remove financial constraints that obstruct labour migration in Kyrgyzstan.

21

THANK YOU

QUESTIONS?

Email: Simone.Angioloni@afbini.gov.uk

References

Alymbaeva, A. A. 2013. "Internal Migration in Kyrgyzstan: A Geographical and Sociological Study in Rural Migration," in Marlene Laruelle (ed), Migration and Social Upheaval as the Face of Globalization in Central Asia, Leiden, The Netherlands: Koninklijke Brill, NV, 117-148.

Chzhen, D. 2010. Child Poverty in Kyrgyzstan: Analysis of 2008 Household Budget Survey. The University of York, Social Policy Research Unit. Working Paper EC2410.

Dessing, M. 2002. "Labor Supply, the Family and Poverty: the S-shaped Labor Supply Curve," *Journal of Economic Behavior and Organization*, 49(4): 433-458.

EUROSTAT, 2015. EU Statistics on Income and Living Conditions. Methodology – Housing Conditions. Available at: http://ec.europa.eu/eurostat/statistics-explained/index.php/EU_statistics_on_income_and_living_conditions_(EU-SILC)_methodology_-_housing_conditions.

FAOSTAT. 2010. Download Data. Available at: http://faostat3.fao.org/download/P/PI/E.

Freund, C. and N. Spatafora. 2008. "Remittances Transaction Costs and Informality," *Journal of Development Economics*, Vol. 86: 356-366.

Gartner, D. and M. Gartner. 2011. "Wage Traps as a Cause of Illiteracy, Child Labor, and Extreme Poverty. " *Research in Economics*, 65(3): 232-242.

Krueger, Anne O. 1962 'The implications of a backward bending labor supply curve.' Review of Economic Studies 29(4), 327–328.

Life in Kyrgyzstan Panel Study. 2010. International Data Service Center. Institute for the Study of Labor. Available at: https://idsc.iza.org/datasets/dataset/124/life-in-kyrgyzstan-panel-study-2013.

Prescott, E. C. et al. 2004. "Why Do Americans Work So Much More Than Europeans?" *Federal Reserve Bank of Minneapolis Quarterly Review,* 28(1): 2–13.

Shonkwiler, J. S., D. A. Grigorianb, and T. A. Melkonyan. 2011. "Controlling for Underreporting of Remittances." *Applied Economics*, 43: 4817-4826.

Struyk, R. J., and C. Romanik. 1995. "Brief Communications: Background and News Analysis" subtitled "Residential Mobility in Selected Russian Cities: An Assessment of Survey Results." *Post-Soviet Geography*, 6(1):58-66.

Taylor, J. E. 1999. "The New Economics of Labour Migration and the Role of remittances in the Migration Process." *International Migration*, 37(1):63-88.

Taylor, J. E. 2003. "Migration and Incomes in Source Communities: A New Economics of Migration Perspective from China." *Economic Development and Cultural Change*, 52(1): 75-101.

UK Office of Labour Market Statistics, 2011.Persons per Room. Available at: https://www.nomisweb.co.uk/census/2011/qs410ew.

US Office of Policy Development and Research. 2007. Measuring Overcrowding in Housing. Department of Housing and Urban Development, Washington D. C.

World Bank.2016. DataBank. Available at: http://databank.worldbank.org/data/home.aspx.

Appendix Table 1. Definitions of Variables

Hours worked	Per capita hours worked by the working-age household members (18-64) in a day.
Remittances	Annual remittances received from outside the country in USD $.
%Corruption	Share of respondents in every region who were extremely worried about corruption. The scale ranges from 0 (no worry) to 10 (extremely worried).
BadHouse	Dummy variable based on the household's assessment of their housing conditions. The scale ranges from 0 (completely unsatisfied) to 10 (completely satisfied). BadHouse=1 if household is completely unsatisfied, 0 otherwise.
ExcellentHouse	Dummy variable based on the household members' assessment of their housing conditions. ExcellentHouse=1 if household is completely satisfied, 0 otherwise.
AvWorkAge	Average age of the working-age household members.
BankNoTrust	Dummy variable based on the household members' assessment of the bank and financial system. The scale ranges from 1 (no trust at all) to 4 (a lot of trust). BankNotrust=1 if there is no trust at all, 0 otherwise.
Migrants	Number of household members living outside the country who remit.
HHsize	Number of household members.
%Kids	Percent of household members under 6 years.
%Elderly	Percent of household members above 65 years.
%Women	Percent of women in the household.
Urban	Dummy variable equal to 1 if the household dwells in a urban region and 0 if it dwells in a rural region.
%Network-Remit	Share of respondents in every region who migrate.
HouseholdMale	Dummy variable for male household head, male 1, female 0.
Unemployment	Region-wide unemployment rate in percent among men.
Age	Age of the household head.
Education	Average number of years of schooling of the working-age household members. The following years of schooling were assumed and averaged across the household members: illiterate (0), primary (4), basic secondary (9), secondary technical (12), university (15), PhD candidate and above (18).
CapitaExpend	Household expenditure in USD $ divided by the household size.
RPP	Number of rooms in the household house divided by the household size.

Appendix Table 2. Descriptive Statistics

	Average	Standard Deviation	Minimum	Maximum
Remittances (USD $)[a]	1643	1520	63	12000
Per Capita Hours worked in a day	3.16	2.31	0	16
%Corruption	0.58	0.32	0	1
BadHouse	0.09	0.29	0	1
ExcellentHouse	0.18	0.39	0	1
AvWorkAge	37.46	8.02	18	64
BankNoTrust	0.20	0.40	0	1
Migrants[a]	1.33	0.51	1	3
HHsize	4.72	2.13	1	15
%Kids	0.11	0.15	0	0.67
%Elderly	0.04	0.11	0	0.67
%Women	0.51	0.21	0	1
Urban	0.41	0.49	0	1
%Network	0.10	0.12	0	0.42
HouseholdMale	0.73	0.44	0	1
%Unemployment	0.35	0.20	0	0.98
Age	49.54	13.57	18	98
Education (years)	11.12	1.51	0	18
CapitaExpend (USD $)	970	987	116	34573
RPP	0.98	0.56	0.17	6

[a] Statistics are calculated on the sample of households with positive remittances.

Appendix Table 3. Auxiliary Equations of the Second Stage Equation

Dependent Variable	Net Per Capita Expenditure		Net Per Capita Expenditure·$E[R^*]$		Net Per Capita Expenditure^2·$E[R^*]$	
	Coefficient	Standard Error	Coefficient	Standard Error	Coefficient	Standard Error
Constant	0.267	(0.360)	0.089	(0.109)	0.133	(0.209)
$E[R^*]$	-0.153*	(0.082)	0.070	(0.197)	0.044	(0.170)
RPP	0.320***	(0.041)	-0.019*	(0.011)	0.026	(0.017)
RPP· $E[R^*]$	0.000	(0.092)	0.291***	(0.110)	0.543*	(0.317)
RPP^2· $E[R^*]$	-0.135	(0.095)	-0.683*	(0.355)	0.186**	(0.066)
%Kids	-0.092	(0.202)	-0.059	(0.045)	-0.002	(0.133)
%Elderly	0.001	(0.162)	-0.045	(0.061)	0.112	(0.114)
%Women	-0.071**	(0.028)	-0.082**	(0.040)	-0.120***	(0.044)
Urban	0.289***	(0.040)	0.081***	(0.020)	0.101***	(0.030)
HouseholdMale	0.020	(0.044)	0.004	(0.025)	0.014	(0.033)
Unemployment	-0.167***	(0.057)	-0.058	(0.045)	-0.083*	(0.049)
Age	-0.029***	(0.008)	0.007**	(0.003)	-1.11E-04	(0.005)
Age^2	2.34E-04**	(7.55E-05)	-5.57E-05	(3.11E-05)	-2.25E-05	(4.99E-05)
Education	0.067***	(0.015)	0.001	(0.005)	0.012	(0.009)
AvWorkAge	0.014	(0.019)	-0.004	(0.006)	-0.010	(0.011)
AvWorkAge^2	-1.16E-04	(2.18E-04)	9.02E-06	(5.95E-05)	1.01E-04	(1.22E-04)

Maximum likelihood results. Robust Huber-White standard errors in parentheses.
*, **, and *** denotes significance at 10, 5, and 1%, respectively.

Equation	Variance-Covariance Matrix			
	Labour Supply	Net Per Capita Expenditure	Net Per Capita Expenditure$\cdot E[R^*]$	Net Per Capita Expenditure$^2\cdot E[R^*]$
Labour Supply	5.360			
NetCapitaExpend	0.323	0.879		
NetCapitaExpend$\cdot E[R^*]$	0.517	0.049	0.239	
NetCapitaExpend$^2\cdot E[R^*]$	1.001	0.368	0.038	0.507
LR Test	Chi2(6)		p-value	
H_0: zero correlation	1075.25		0.00	