

Family provision of long-term care for the elderly in Russia

Daria Tsyplakova

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Motivation

- Literature on intergenerational transfers is substantial, but not much is known about decision making regarding parental care-giving
- Necessity to provide parental care impacts economic decisions over lifetime and over generations
- Private long-term care insurance is rarely purchased (Pauly, 1990)
- Public long-term care expenditures accounts for over 1% of GDP across OECD countries (OECD Health Data, 2008), and it rises with the share of the population aged over 80
- But population is aging and demand for long-term care is expected to increase over the next decades

Structure of the paper and research question

- ① Motivation and basic facts about long-term care
- ② Literature review
- ③ The basic model of elderly care-giving
- ④ Discussion of GE model
- ⑤ Data and variables description
- ⑥ Testing main predictions of the model

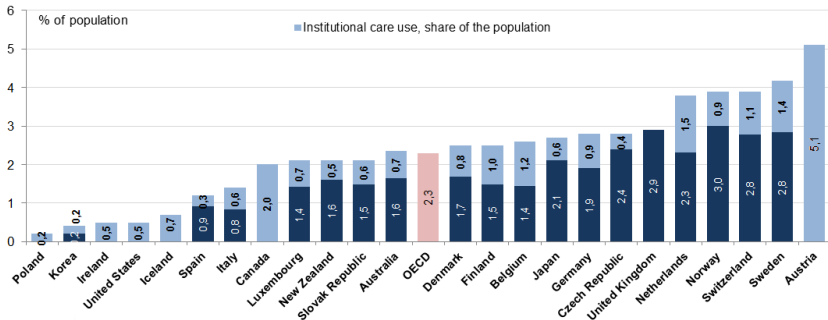
How individuals take decisions about provision of elderly care?

Basic facts about long-term care

- a care for chronic illness or disability and help with activities of daily living (it differs from health care)
- usually lasts for a prolonged period of time (as long as a person is alive)
- often provided by unpaid unprofessional caregivers, and this influences many crucial economic decisions of care-givers (labor supply, health decisions, etc.)
 - more than 1 in 10 adults aged over 50 provides informal unpaid help in OECD countries; about 2/3 of family carers are women (WHO, 2013)
 - most LTC users are women aged over 80 years
- basic types of LTC: paid help, unpaid family care, nursing home care

Family vs. institutional care

Share of population receiving family care is larger than that of receiving institutional care



Brief review of literature on informal elderly care

Empirical papers

- negative correlation with the labor force participation of caregivers (Heitmueller, 2007)
- evidences of income impact on the utilization of long-term care are mixed (Goda et al., 2011)
- the substitution between informal and market care (Bonsang, 2009)

Theoretical papers

- The model with parent providing strategic gift and altruistic child taking care of a parent (Pestieau, Sato, 2008)
- The OLG model with endogenous life expectancy and intergenerational time transfers investigating a level of the capital stock (Mizushima, 2009)
- OLG model with endogenous growth and altruistic young agents who take care of the health of their parents facing risk of own illness. (Tabata, 2005)

Individual care-giving (basics)

Agent enjoys consumption and cares of parental health

$$u(c, H) = \log(c) + \delta \log(H)$$

- c is consumption
- H is parental health status
- δ is the parameter of preference towards parental health relative to consumption.

Elderly care production function is $H = [m^\rho + t^\rho]^{\frac{1}{\rho}}$,

- m is a market care purchased by an agent,
- t is time devoted to taking care of parents.

Budget constraint is $c + m = w(1 - t)$, where w is labor income.

Individual care-giving (basics)

Maximization problem

$$\begin{aligned}
 \max_{c,m,t} \quad & \log(c) + \delta \log(H) \\
 \text{s.t.} \quad & c + m = w(1 - t) \\
 & H = [m^\rho + t^\rho]^{\frac{1}{\rho}}
 \end{aligned} \tag{1}$$

gives optimal time of care t^* and market care purchase m^* .

$$t^* = \frac{\delta}{1 + \delta} \cdot \frac{1}{w^{\frac{\rho}{1-\rho}} + 1}; \quad m^* = \frac{\delta}{1 + \delta} \cdot \frac{w^{\frac{1}{1-\rho}}}{w^{\frac{\rho}{1-\rho}} + 1}. \tag{2}$$

As $\rho \rightarrow 1$, increase in w leads to decrease in informal care provided via time transfers relative to monetary transfers, i.e. wealthier agents provide their parents with more monetary help relative to time transfers.

General equilibrium model - set-up

Preferences and labor supply

- Adults has preferences towards own consumption $c_{i,t}^t$ and parental health which is normal good $H_{i,t}^{t-1}$.
- Agents are warm-glow altruistic to their parents, i.e. they receive utility from time and cash transfers.
- Each individual face probability π of surviving through adulthood and old age. Every agent rakes care of parent, and every agent is disabled in old age.
- Adults have an endowment of one unit of time. They supply fraction $(1 - t)$ of time endowment to firms for wage w_t per unit of time, and fraction $0 \leq t \leq 1$ is spend to parental care-giving
- Agents may save but they are not allowed to borrow due to capital market imperfections.

General equilibrium model - set-up

Health production

Parental health is produced according to

$$H_{i,t}^{t-1} = \theta \log t_{i,t}^t + (1 - \theta) \log(m_{i,t}^t + bh_{i,t}^{t-1} - \bar{m}),$$

- where $t_{i,t}^t$ and $m_{i,t}^t$ are time and cash transfers from child,
- $h_{i,t}^{t-1}$ is own health investment,
- \bar{m} is subsistence level of monetary inputs
- θ is parameter of health production function.
- Parameter ψ reflects the agents preference towards own health level relatively to consumption
- β is discount factor.

Reasonable to assume that time in old age is not productive, but agents can invest money in their health.

General equilibrium model - set-up

UM Problem

$$\begin{aligned}
 & \max_{c_t, c_{t+1}, m_t, t_t, h_t} & u_i^t &= \log(c_{i,t}^t - \bar{c}) + \psi H_{i,t}^{t-1} + \beta \pi (\log(c_{i,t+1}^t - \bar{c}) + \psi H_{i,t+1}^t) \\
 & \text{s.t.} & c_{i,t}^t + m_{i,t}^t + s_{i,t}^t &\leq w_t(1 - at_{i,t+1}^t) \\
 & & H_{i,t+1}^t &= \theta \log t_{i,t+1}^{t+1} + (1 - \theta) \log(m_{i,t+1}^{t+1} + h_{i,t+1}^t - \bar{m}) \\
 & & c_{i,t+1}^t + ph_{i,t+1}^t &\leq r_{t+1} s_{i,t}^t
 \end{aligned} \tag{3}$$

Also assume that care-giving responsibilities worsen the labor productivity of care-giver, and wage is an increasing function of labor time $[1 - t_t]$.

General equilibrium model - set-up

Firms

- Firms produce consumption good and healthcare services.
 - Consumption good is produced according to a constant returns to scale Cobb-Douglas technology $Y_t^{goods} = AK_t^\alpha L_t^c{}^{1-\alpha}$, where L_t^c are employed in a good production sector.
 - Service production is labour intensive and it doesn't require capital inputs $Y_t^{services} = L_t^s$, where L_t^s are employed in a service production sector.

How elderly care works in Russia?

Rosstat, 2012: 1,662,472 are the oldest old (>85), 80% are women
SAGE: 21.4% of people older 60 is in need of care, and 14% of them cannot be left for more than 1 hour.

In-patient care for the elderly

- The most part is provided by hospitals and GPs.
- 233 special houses with 12,272 living here (Rosstat, 2013)

Out-patient care for the elderly

- 11,230 departments of social services for elderly
- 1,090,105 of elderly and disabled receive services (Rosstat, 2013)

⇒ Significant burden of elderly care rests with family in Russia

Data and summary statistics

- Empirical task: To test predictions of the theoretical model of elderly care
- Gender and Generations Study dataset (2004) "Parents and children, men and women in family and society", cross-sectional data (first wave)
- Respondents are older than 22 and have mother alive

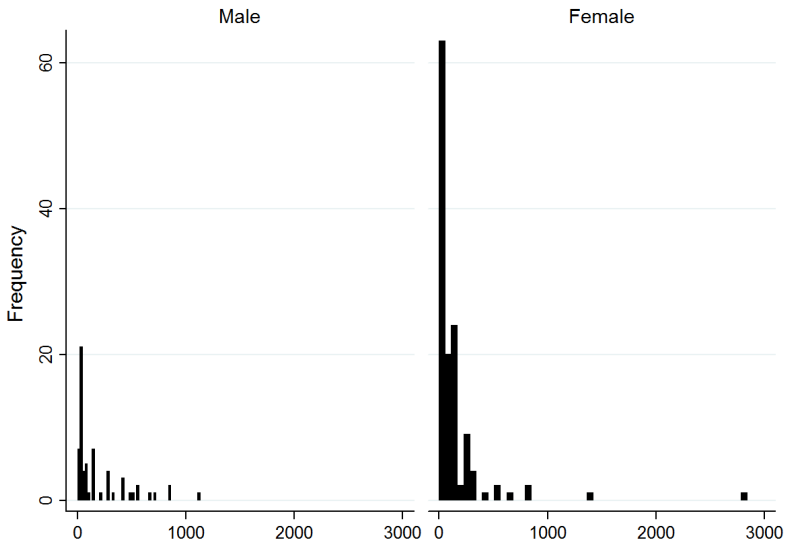
Variable	Mean	Std. Dev.	Min.	Max.	N
dummy for monetary transfer	0.037	0.190	0	1	5355
monetary transfer	5.789	62.382	0	2844.6	5344
time transfer	0.042	0.201	0	1	5355
income	2.271	0.914	-1.386	6.033	4834
female	0.594	0.491	0	1	5355
mother is disabled	0.114	0.318	0	1	5355
age of mother	63.841	11.783	37	105	5317
mother lives alone	0.449	0.497	0	1	5355
father is alive	0.499	0.500	0	1	5355
bad health	0.473	0.499	0	1	5355
age	38.156	10.596	22	78	5355
married	0.588	0.492	0	1	5355
unemployed	0.093	0.290	0	1	5355
distance	0.072	0.188	0	1.92	4,114

Some relevant questions in dataset

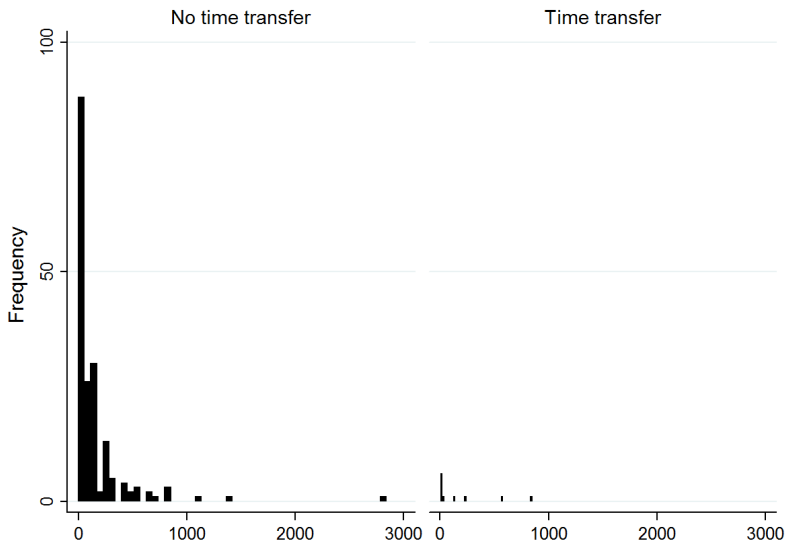
Section 5. "Parents and parental home"

Section 10. "Household possessions, income and transfers"

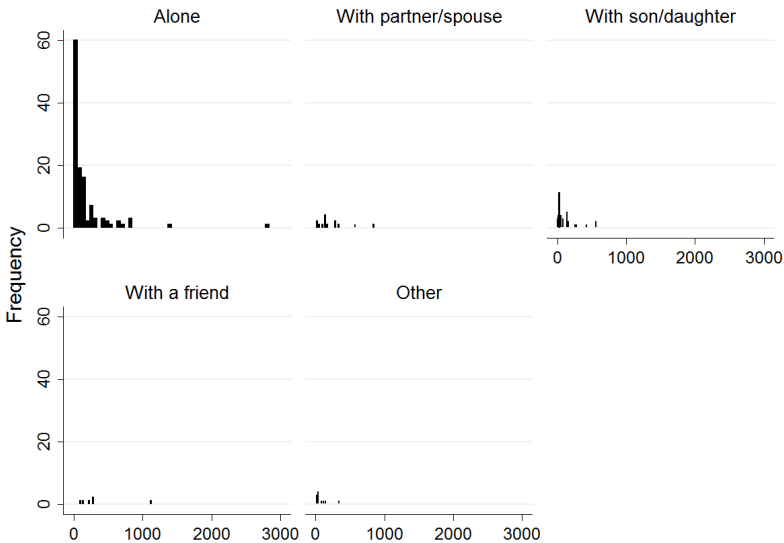
- 1 Does your mother have any physical or mental limitations that hinder her everyday activities or make her disable?
- 2 In the last 12 months, have you provided regular assistance to anyone with eating, getting up, getting dressed, bathing, using the bathroom, etc.? Do not include childcare here. Whom of the people did you help?
- 3 In the last 12 months, have you or (has your resident partner/spouse) at least once, from time to time, or regularly gave money, valuable things or expensive gifts to a person not belonging to your household?
- 4 How much would the items that your or (your partner/spouse) have/has have/has given to this person in the last 12 months cost in rubles?



Summary statistics



Summary statistics



Probit estimates for dependent variable monetary transfer

	(1)	(2)	(3)	(4)	(5)	(6)
	Probit	Probit	Probit	Probit	Probit	Probit
female	0.177** (0.0885)	0.206** (0.0928)	0.148 (0.0929)	0.185* (0.0979)	0.189* (0.0980)	0.164* (0.0984)
higher education	0.192** (0.0843)	0.154* (0.0905)	0.169* (0.0891)	0.133 (0.0967)	0.130 (0.0969)	0.118 (0.0975)
income		0.271*** (0.0605)		0.317*** (0.0678)	0.317*** (0.0686)	0.315*** (0.0690)
inheritance			1.149*** (0.123)	1.238*** (0.130)	1.230*** (0.131)	1.227*** (0.131)
mother lives alone					0.228** (0.102)	0.211** (0.103)
time transfer						0.628*** (0.223)
Constant	-2.178 (1.367)	-2.877* (1.480)	-2.900** (1.460)	-3.407** (1.555)	-2.968* (1.589)	-3.247** (1.636)
Observations	3,222	2,963	3,222	2,963	2,963	2,963

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Endogeneity problem

Monetary Transfer_i = Time transfer_i + X_i + ε_i

- Empirical fact: **distance to mother's residence** is closely and negatively related to provision of time transfer (IV relevance)
- As good as randomly assigned? (IV exogeneity)

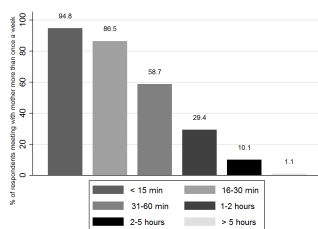


Figure: Percentage of respondents living separately from mother and meeting with their mother more than once a week by time distance to mother's residence

Endogeneity problem

- The distance between respondents and their mother's residence strongly influences the probability to receive care in form of time transfer.
- However, proximity of respondents and their mothers's residence might be related to children's opinion on responsibility for parental care, family values or mother's health status.

I use information in the data set to construct variables representing family values of respondents (questions "Care for older persons in need of care at their home is more a task for the family than for society / mainly a task for the family", "Children should take responsibility for parental care if parents are in need").

Endogeneity problem

- There is no evidence that values, opinions on parental care-giving responsibilities or mother's health status are associated with preferences towards particular location of residence.
- Although, it doesn't rule out the case when children or parents choose their residence according to their expectations of future need of care and care-giving.

Table: First-stage regression of time transfer on distance

Variables	time transfer
Distance	-0.050*** (0.013)
Constant	0.032*** (0.003)
Observations	4,114
R-squared	0.003

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

OLS and IV estimates of monetary transfer on covariates

VARIABLES	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) OLS	(6) OLS	(7) IV
time transfer	0.279* (0.148)	0.272* (0.147)	0.353** (0.163)	0.272* (0.148)	0.341** (0.162)	0.329** (0.163)	-2.755 (8.727)
female	0.030 (0.03)	0.03 (0.032)	0.035 (0.033)	0.030 (0.033)	0.030 (0.032)	0.030 (0.032)	0.097 (0.193)
higher education	0.086** (0.035)	0.075** (0.034)	0.058 (0.036)	0.086** (0.035)	0.044 (0.035)	0.045 (0.035)	0.091 (0.134)
mother is disabled	-0.036 (0.052)	-0.043 (0.050)	-0.043 (0.051)	-0.034 (0.051)	-0.048 (0.050)	-0.044 (0.050)	0.346 (1.105)
inheritance		0.609*** (0.111)			0.607*** (0.108)	0.605*** (0.108)	0.628*** (0.100)
income			0.095*** (0.022)		0.106*** (0.022)	0.105*** (0.022)	0.110*** (0.025)
mother lives alone				0.058* (0.034)		0.073** (0.033)	0.126 (0.153)
Constant	-0.079 (0.489)	-0.251 (0.482)	-0.351 (0.477)	0.050 (0.499)	-0.504 (0.470)	-0.331 (0.485)	0.356 (2.019)
Observations	3,220	3,220	2,961	3,220	2,961	2,961	2,961
R-squared	0.108	0.132	0.118	0.109	0.144	0.146	

Robust standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Multinomial logit for 4 types of transfer outcomes

Variables	None	Monetary	Time	Both
income	-0,023*** (0,005)	0,021*** (0,004)	-0,001 (0,003)	0,003* (0,001)
higher education	-0,022** (0,009)	0,010 (0,007)	0,014*** (0,005)	-0,002 (0,002)
number of children	0,009 (0,006)	-0,010** (0,005)	0,001 (0,003)	0,001 (0,001)
mother is disabled	-0,044*** (0,013)	-0,006 (0,012)	0,045*** (0,006)	0,004* (0,002)
good relation	0,015* (0,008)	-0,004 (0,007)	-0,011** (0,005)	0,0001 (0,002)
oblast's center	-0,014 (0,010)	-0,001 (0,008)	0,008 (0,006)	0,008* (0,004)
inheritance	-0,088*** (0,015)	0,076*** (0,009)	0,004 (0,012)	0,007** (0,004)
mother lives alone	-0,030*** (0,009)	0,016** (0,007)	0,013** (0,006)	0,001 (0,002)
Observations	2,964	2,964	2,964	2,964

Standard errors in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Theoretical part

If the market and informal care are substitutes, high-wage adults choose to purchase market services and manage to provide more care-giving to their parents relative to low-wage earners who are forced to provide time transfers.

Results: Empirical part

I test basic predictions of this model: impact of income and substitutability of time and monetary transfers

- 1 Income has economically large and statistically significant positive effect on the provision of monetary transfer, and so has inter-vivo transfer from mother
- 2 Income and inter-vivo transfer from mother have no statistically significant effect on probability of provision of time transfer
- 3 Provision of time transfer has no statistically significant effect on the amount of provision of monetary transfer

I welcome your questions
and feedback!