

Estimation of the consumption function of Russian households using RLMS microdata

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Outline

- Goal:

Estimate MPC out of Permanent Income using household micro-data

- Approach:

Consumption function based on PIH, Koyck Transformation, MPC as a function of social characteristics, GMM-IV

- Key results

We obtained MPC levels for different social groups

Literature review

- According to PIH (Friedman, 1957; Hall, 1978) a household consumes a fixed share of its Permanent Income (Marginal Propensity to Consume)
- MPC depends on social characteristics (Tullio Jappelli and Luigi Pistaferri, 2014)
- MPC is a crucial determinant of an efficient social policy (Ampudia et al., 2018)

Model

- Consumption function:

$$C_{i,t} = MPC_{i,t} Y_{i,t}^p \exp(\xi_{i,t}^c)$$
$$\log(C_{i,t}) = \log(MPC_{i,t}) + \log(Y_{i,t}^p) + \xi_{i,t}^c$$

- PI change is based on adaptive expectations:

$$\Delta \log(Y_{i,t}^p) = \lambda (\log(Y_{i,t}) - \log(Y_{i,t-1}^p))$$
$$\log(Y_{i,t}^p) = \lambda \log(Y_{i,t}) + (1 - \lambda) \log(Y_{i,t-1}^p)$$

Model

- After the Koyck transformation the model becomes as follows:

$$\log(C_{i,t}) = \lambda \log(MPC_{i,t}) + \lambda \log(Y_{i,t}) + (1 - \lambda) \log(C_{i,t-1}) + \omega_{i,t}$$
$$\omega_{i,t} = \xi_{i,t}^c - (1 - \lambda) \xi_{i,t-1}^c$$

- After terms rearranging:

$$\Delta \log(C_{i,t}) = \lambda \log(MPC_{i,t}) + \lambda (\log(Y_{i,t}) - \log(C_{i,t-1})) + \omega_{i,t}$$

Marginal propensity to consume

- MPC depends on income level, number of people and children, education level(Tullio Jappelli and Luigi Pistaferri, 2014; Ampudia et al., 2018; Dimitris Christelis et al., 2019).
- $\lambda \log(MPC_{i,t}) = \beta^D Decile_{i,t} + \beta^P People_{i,t} + \beta^C Child_{i,t} + \beta^S School_{i,t} + \beta^H HighEduc_{i,t} + \beta^Y Year_t$
- The final model:
- $\Delta \log(C_{i,t}) = \beta^D Decile_{i,t} + \beta^P People_{i,t} + \beta^C Child_{i,t} + \beta^S School_{i,t} + \beta^H HighEduc_{i,t} + \beta^Y Year_t + \lambda (\log(Y_{i,t}) - \log(C_{i,t-1})) + \xi_{i,t}^c - (1 - \lambda) \xi_{i,t-1}^c$

Endogeneity problem

- Possible inconsistency problem due to endogeneity:
- $\text{cov}(\log(Y_{i,t}) - \log(C_{i,t-1}), \xi_{i,t}^c - (1 - \lambda)\xi_{i,t-1}^c) \neq 0$
- Endogenous variable $\log(Y_{i,t}) - \log(C_{i,t-1})$ is instrumented by $\log(Y_{i,t}) - \log(Y_{i,t-1})$ (Abowd and Card, 1989; Blundell, 2008)

GMM estimation

	GMM-IV	
Variable	Coefficient	SD
$\log(Y_{i,t}) - \log(C_{i,t-1})$	0,54***	0,01
Income deciles	Yes	
Number of people	Yes	
Number of children	Yes	
Education	Yes	
Years dummies	Yes	
Others	Yes	

MPC estimations for different social groups

- $\lambda \log(MPC_{i,t}) = \sum_j \beta_l^j$
- We take households from the year 2016, in the 5th income decile, consisting of 3 people, with one child, whose heads have higher education
- $MPC_{i,t} = e^{\frac{\sum_j \beta_l^j}{\lambda}}$
- $j = \{D, P, C, S, H\}$ – index of belonging to one of the dummy variables group $\{Decile_{i,t}, People_{i,t}, Child_{i,t}, School_{i,t}, HighEduc_{i,t}, Year_t\}$.
- l – index of the element from group j . For instance, for the group $Decile_{i,t}$ it is a decile number, which a household belongs to.

Number people	of	people 1	people 2	people 3	people 4	people 5	people 6	people 7	Number of children	child0	child1	child2	child3	child4
MPC		0,33	0,38	0,41	0,44	0,45	0,46	0,48	MPC	0,38	0,45	0,47	0,50	0,52

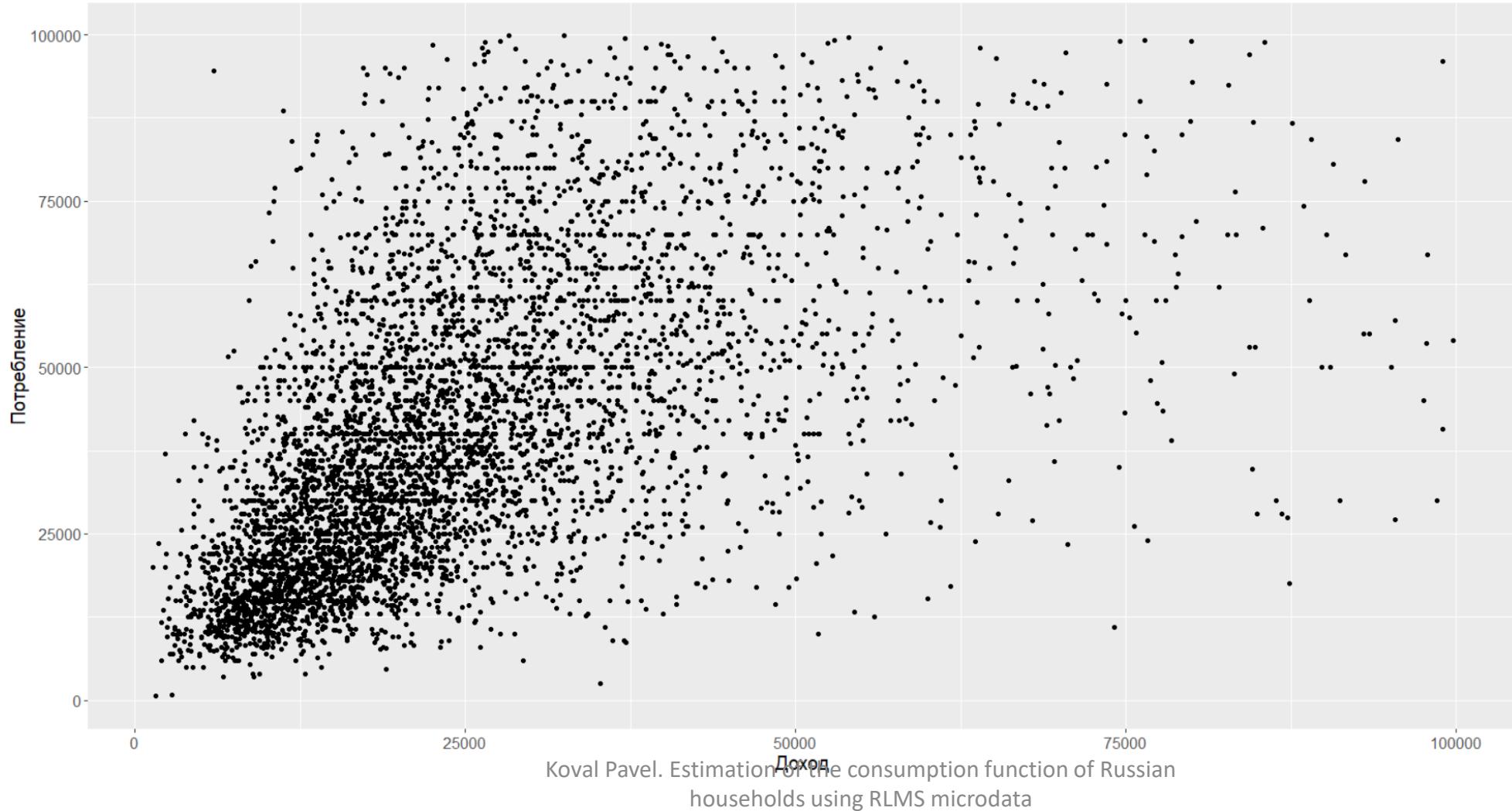
Decile number	decile 1	decile 2	decile 3	decile 4	decile 5	decile 6	decile 7	decile 8	decile 9	decile 10
MPC	0,73	0,57	0,52	0,47	0,45	0,44	0,41	0,39	0,35	0,3

Observation period		year2001		year2002		year2003		year2004		year2005		year2006	
MPC		0,8		0,75		0,68		0,64		0,63		0,57	
Observation period		year2007		year2008		year2009		year2010		year2011		year2012	
MPC		0,55		0,51		0,48		0,51		0,49		0,49	
Observation period		year2013		year2014		year2015		year2016					
MPC		0,48		0,46		0,44		0,45					

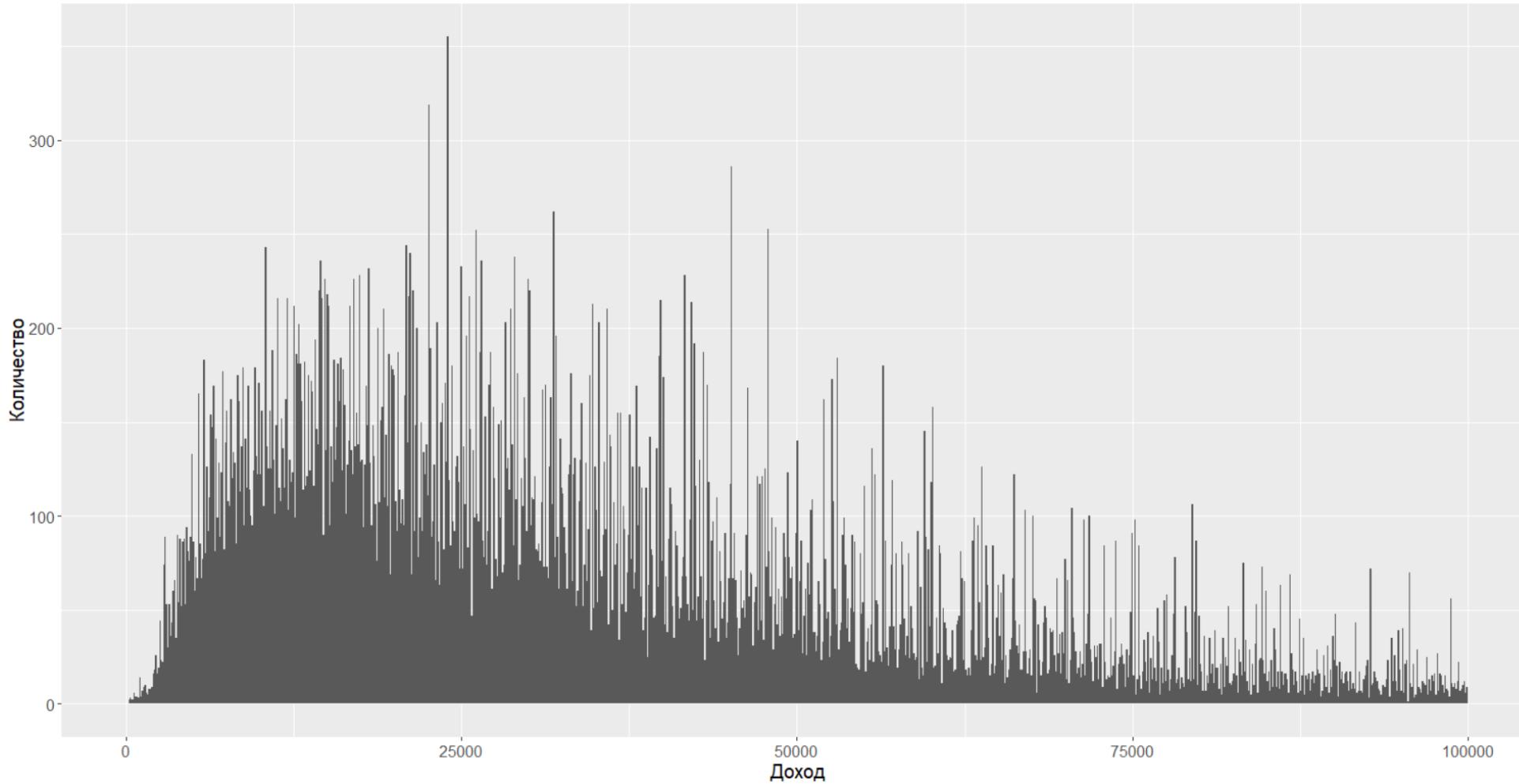
Conclusion

- MPC levels are a crucial parameter of a targeted social policy
- MPC level decreases with income growth
- MPC level increases as numbers of people and children increase
- Households spend a smaller share of the PI on current consumption as times goes by

Облако рассеяния для 2016 года



Гистограмма дохода



Koval Pavel. Estimation of the consumption function of Russian
households using RLMS microdata

Гистограмма потребления

