Банк России

HETEROGENEITY OF CONSUMPTION RATIO ELASTICITY BY THE INTEREST RATE

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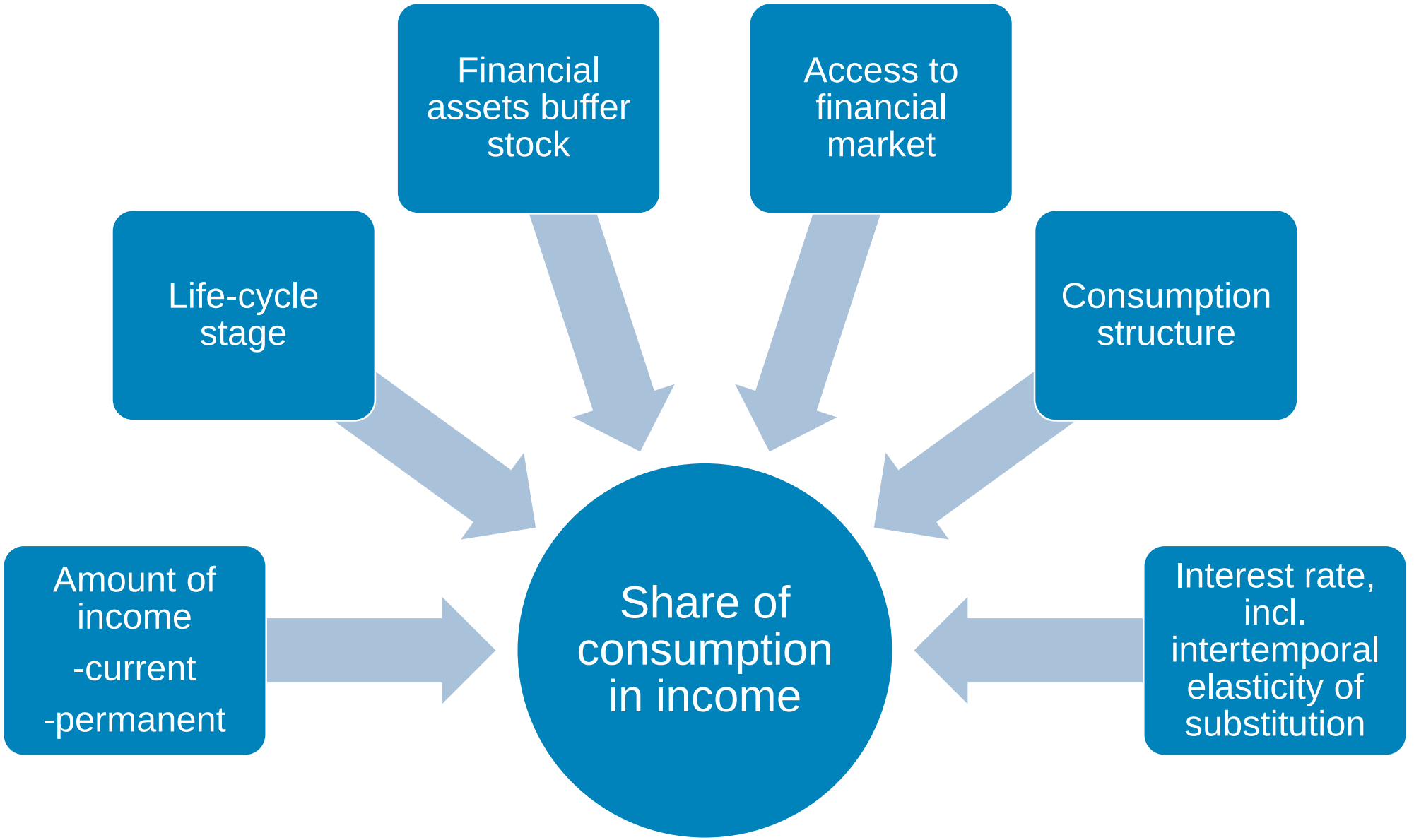
2022

- Literature review
- Information base of research
- Research methodology
- Impact of deposit rates on household consumption ratio
- Impact of loan rates on household consumption ratio
- Impact of interest spread on household consumption ratio
- Impact of real interest rates on household consumption ratio
- Conclusions and discussion


Financial assets buffer stock
Access to financial market
Life-cycle stage
Consumption structure
Amount of income
-current
-permanent
Share of consumption in income
Interest rate, incl. intertemporal elasticity of substitution

Different responses of consumption ratio to interest rates changes

nHtM/wHtM/pHtM	• Non Hand-to-Mouth – strong, Wealthy Hand-to-Mouth и Poor Hand-to-Mouth – no response (Kaplan&Violante,2021; Ampudia et al, 2018; Cantore et al, 2022)
Saver/ debtor	• No difference (Attanasio&Weber, 2010; Tullio&Scognamiglio,2018) • Debtor's response is stronger (Di Maggio et al, 2017; Georgarakos&Tatsiramos, 2018, Sukheeet al, 2020)
Amount of financial assets	• Wealthy people's response is stronger (Havranek et al, 2015) • Poor people's response is stronger (Hohberger et al, 2020)
Access to financial market	• People without access and housing have a stronger response (Georgarakos&Tatsiramos, 2018) • People with access have a stronger response (Attanasio et al., 2002; Vissing-Jørgensen, 2002)
Level of financial literacy	• Financially literate people's response is stronger (Dräger&Nghiem, 2021)
Amount of current income	• Wealthy people's response is stronger (Coibion et al, 2012; Havranek et al, 2015; Sukheeet al, 2020; Andreoll&Surico, 2021; Andersen et al, 2021) • Both the wealthy and the poor have no response (BIS, 2021)

Algorithm for calculating dependent variables (based on Household Budget Survey quarterly data conducted by the Federal State Statistics Service of Russia)

Identification of average gross equivalent income for each household according to the Oxford scale (OECD scale)

Grouping households in each region into ten groups with equal number of people, ranked in ascending order according to average gross equivalent income level

Summation of final consumption expenditure (excluding expenditure on maintaining a household plot, purchase of jewelry, real estate, constructing materials and payment of services for construction and renovation of real estate) for each household group

Summation of monetary income for each household group

Calculation of the ratio of final consumption expenditure* to monetary income for each household group in each region

Consumer expenditure ≠ consumption

Variable designation	Variable description (regressors)	Source
R_d	Quarterly average interest rates on short-term individuals' deposits, except for call accounts, annual %	Based on data of the Bank of Russia
R_c	Quarterly average interest rates on individuals' loans (maturity exceeding a year), annual %	
Sp_r	Loan and deposit rates difference, p.p.	
Rr_d	Difference between deposit rate and median value of expected inflation, annual %	Based on data of the Bank of Russia and InFOM's survey
ChEx_r	Dynamics of exchange rate, ruble/US dollar	Based on data of the Bank of Russia
Un	Unemployment rate under ILO methodology, %	Federal State Statistics Service of Russia
In_av	Per capita income of the population, rub./month	
Inf	Consumer price index	
In_rl	Dynamics of real monetary incomes of the population	
Cr_pc	Bank debts for individuals' loans per working-age person in the region, thousands rubles	Based on data of the Bank of Russia and the Federal State Statistics Service
Dep_pc	Balance on individuals' deposits per working-age person in the region, thousands rubles	

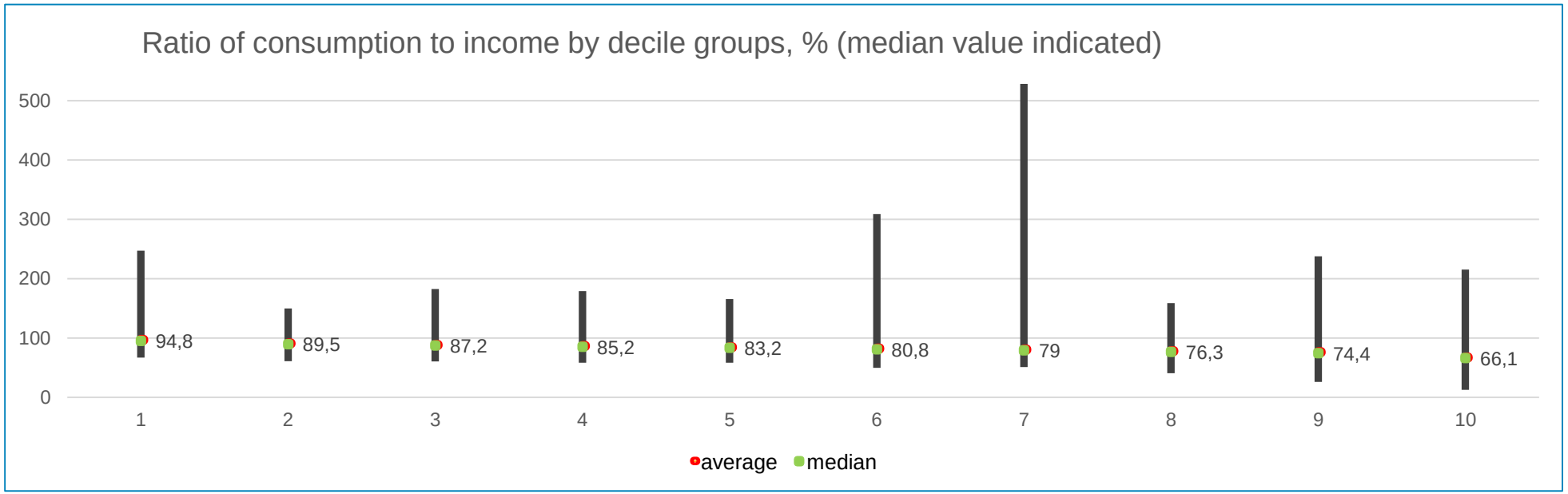
Descriptive statistics

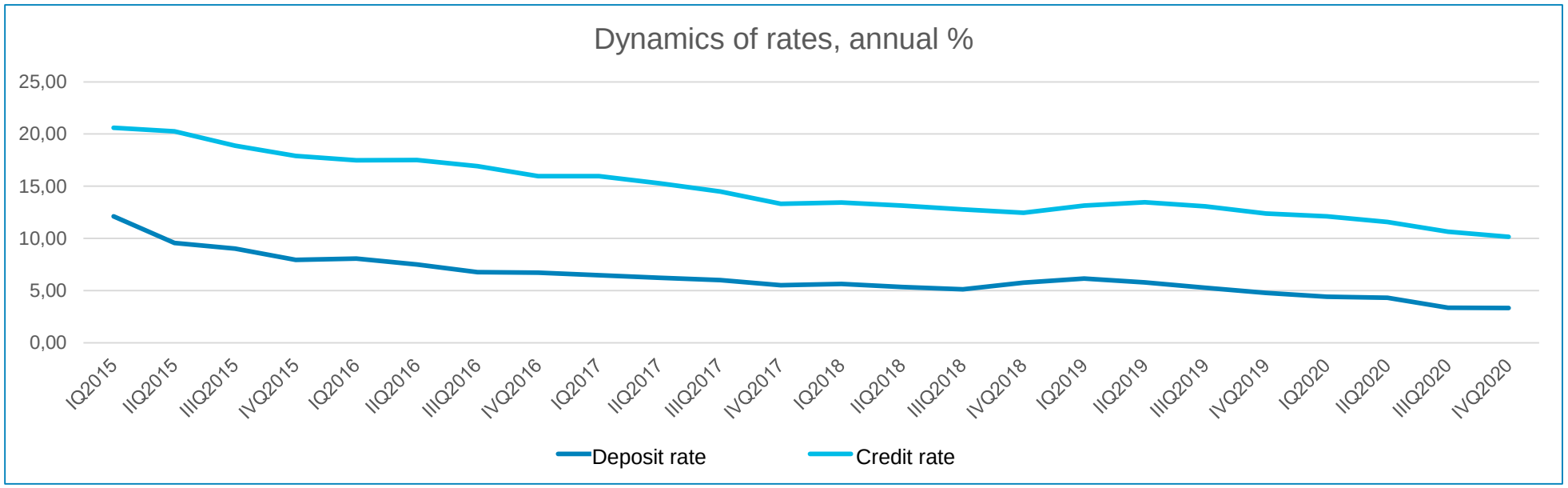
Quarterly data for 82 subjects of the Russian Federation for the period from the 1st quarter of 2015 till the 4th quarter of 2020

Variable	Minimum	Maximum	Average	Median	Standard deviation
Sp_r	6,7	10,7	8,4	7,6	1,2
Rr_d	-7,9	-3,0	-5,0	-4,7	1,4
ChEx_r	90,0	125,6	101,5	98,8	8,8
Un	1,2	31,6	6,5	5,5	3,8
In_av	12037	99135	28850	26171	11127
Inf	0,0	155,3	101,4	101,1	3,1
In_rl	79,3	158,6	98,6	98,8	5,5
Cr_pc	3,0	469,8	167,7	161,6	68,5
Dep_pc	14,6	1710,0	236,4	214,0	164,9

Correlation matrix of regressors

	R_d	R_c	Sp_r	Rr_d	ChEx_r	Un	In_av	Inf	In_rl	Cr_pc	Dep_pc
R_d	1,00	0,95	0,68	-0,27	-0,01	0,02	-0,19	0,38	-0,12	-0,45	-0,18
R_c	0,95	1,00	0,86	-0,41	-0,03	0,03	-0,19	0,30	-0,18	-0,50	-0,19
Sp_r	0,68	0,86	1,00	-0,56	-0,04	0,04	-0,16	0,11	-0,24	-0,48	-0,17
Rr_d	-0,27	-0,41	-0,56	1,00	0,16	-0,10	0,01	-0,11	0,34	0,19	0,08
ChEx_r	-0,01	-0,03	-0,04	0,16	1,00	-0,03	-0,01	-0,01	0,12	0,05	0,04
Un	0,02	0,03	0,04	-0,10	-0,03	1,00	-0,36	-0,06	-0,06	0,29	-0,46
In_av	-0,19	-0,19	-0,18	0,01	-0,01	-0,36	1,00	-0,07	0,16	0,52	0,73
Inf	0,38	0,30	0,11	-0,11	-0,01	-0,06	-0,07	1,00	-0,04	-0,08	0,01
In_rl	-0,12	-0,18	-0,24	0,34	0,12	-0,06	0,16	-0,04	1,00	0,11	0,08
Cr_pc	-0,45	-0,50	-0,48	0,19	0,05	0,29	0,52	-0,08	0,11	1,00	0,49
Dep_pc	-0,18	-0,19	-0,17	0,08	0,04	-0,46	0,73	0,01	0,08	0,49	1,00

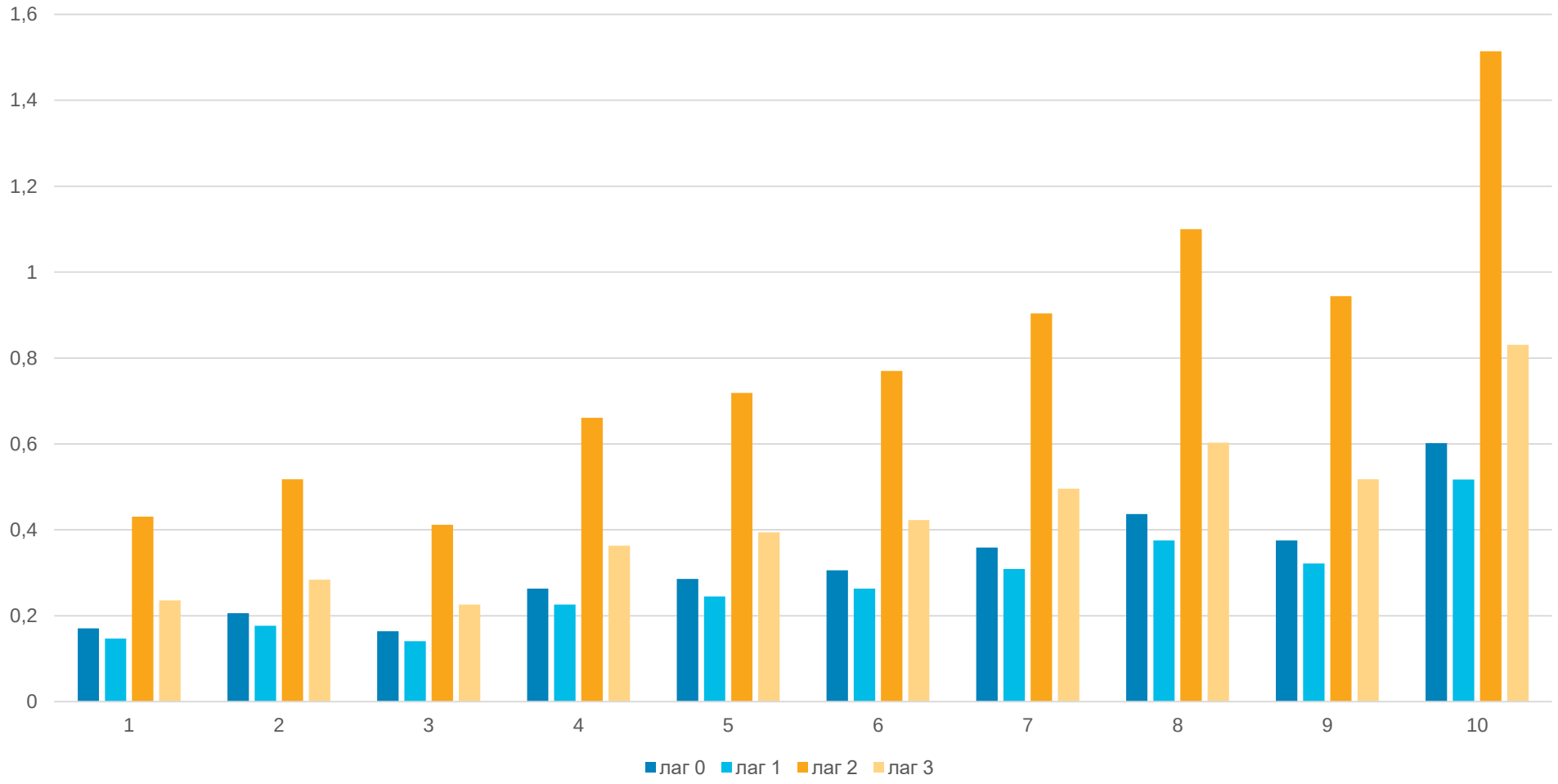

Ratio of consumption to income by decile groups, % (median value indicated)
500
400
300
200
100
0
94,8
89,5
87,2
85,2
83,2
80,8
79
76,3
74,4
66,1
1
2
3
4
5
6
7
8
9
10
average
median


Dynamics of rates, annual %
25,00
20,00
15,00
10,00
5,00
0,00
IQ2015
IIQ2015
IIIQ2015
IVQ2015
IQ2016
IIQ2016
IIIQ2016
IVQ2016
IQ2017
IIQ2017
IIIQ2017
IVQ2017
IQ2018
IIQ2018
IIIQ2018
IVQ2018
IQ2019
IIQ2019
IIIQ2019
IVQ2019
IQ2020
IIQ2020
IIIQ2020
IVQ2020
Deposit rate
Credit rate

Methodology

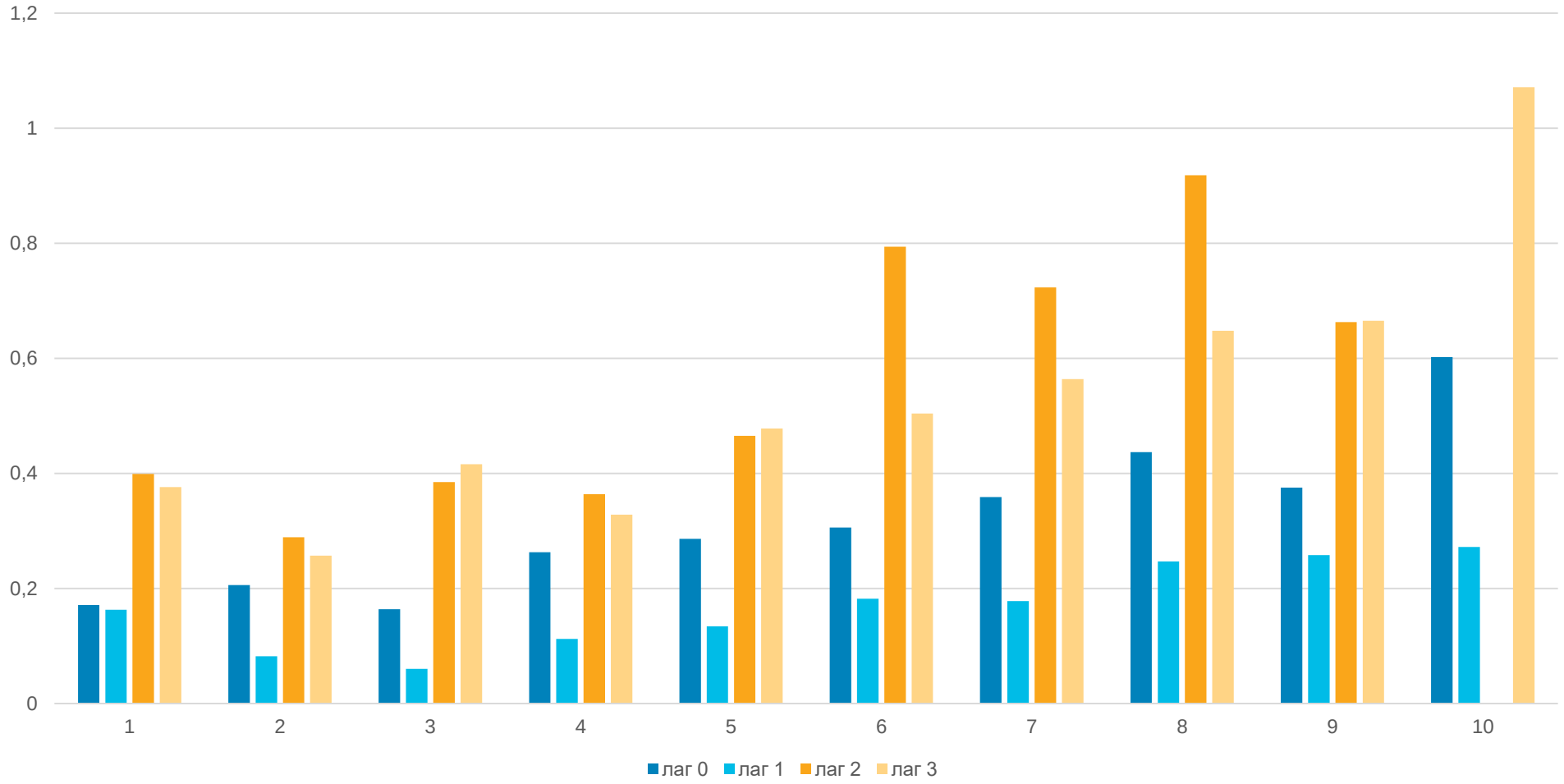
- ✓ Specification comprising the regressor we are interested in and control variables has been assessed for each decile group.
- ✓ Fixed or random effects models, weighted OLS method have been used according to the Hausman and Breusch-Pagan tests, tests for the normal distribution of residues and autocorrelation.
- ✓ Time effects have been considered in all estimated equations.
- ✓ Logarithms of all variables, except for real interest rates equations, have been included in specifications.
- ✓ Coefficients estimation has been performed in the absence of a time lag, with a lagged the regressor we are interested in, with a lagged dependent variable for all kinds of specifications.
- ✓ The first decile group corresponds to households with the lowest level of welfare, the tenth group corresponds to households with the highest level of welfare.

Elasticity* consumption ratio with respect to the deposit rate (rate lag)



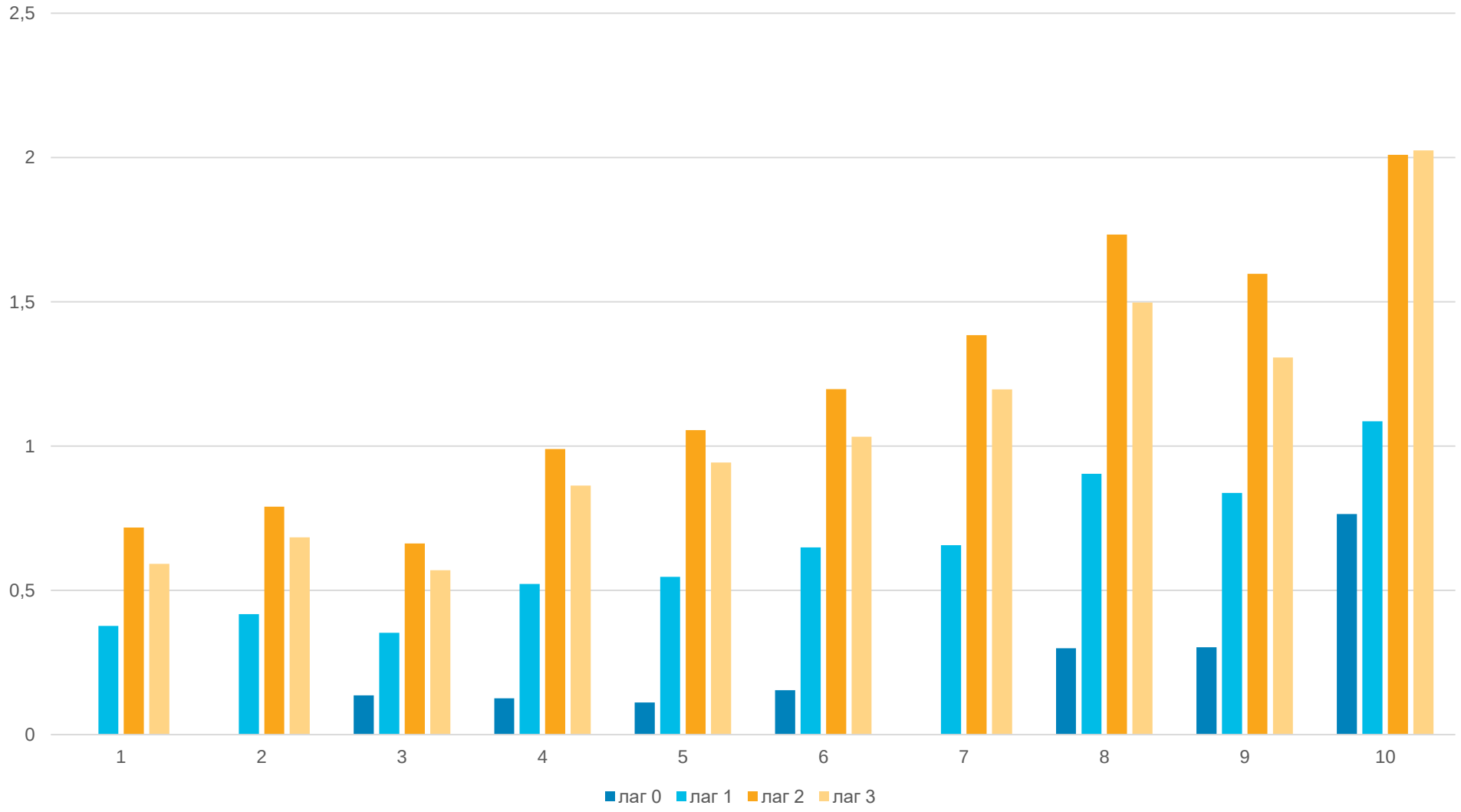
* - negative sign for all numbers, values with module, $p < 1\%$

Elasticity* consumption ratio with respect to the deposit rate (dependent variable lag)



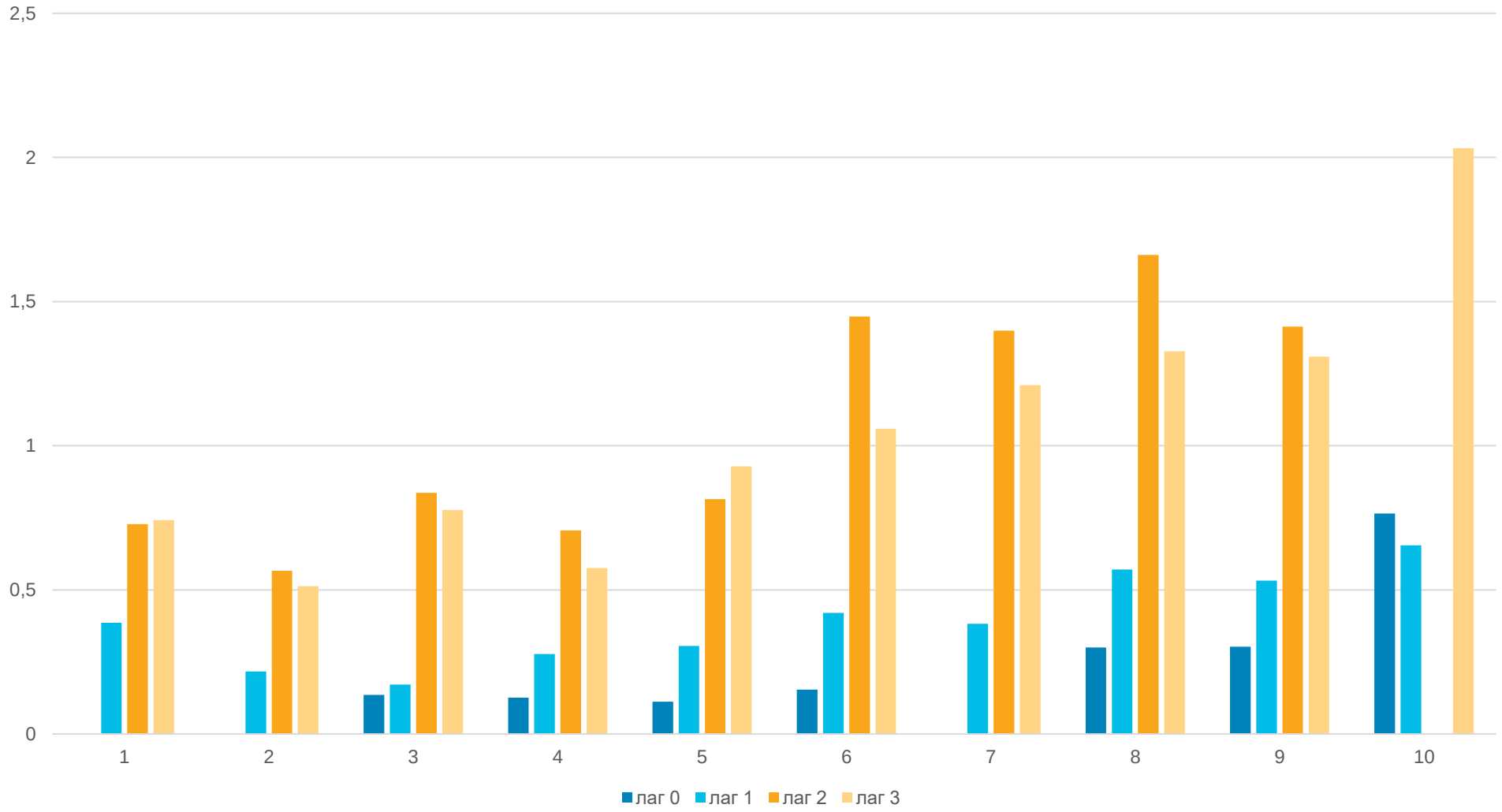
* - negative sign for all numbers, values with module, p < 10%, statistically non-significant coefficients estimates were not indicated

Elasticity* consumption ratio with respect to the loan rate (rate lag)



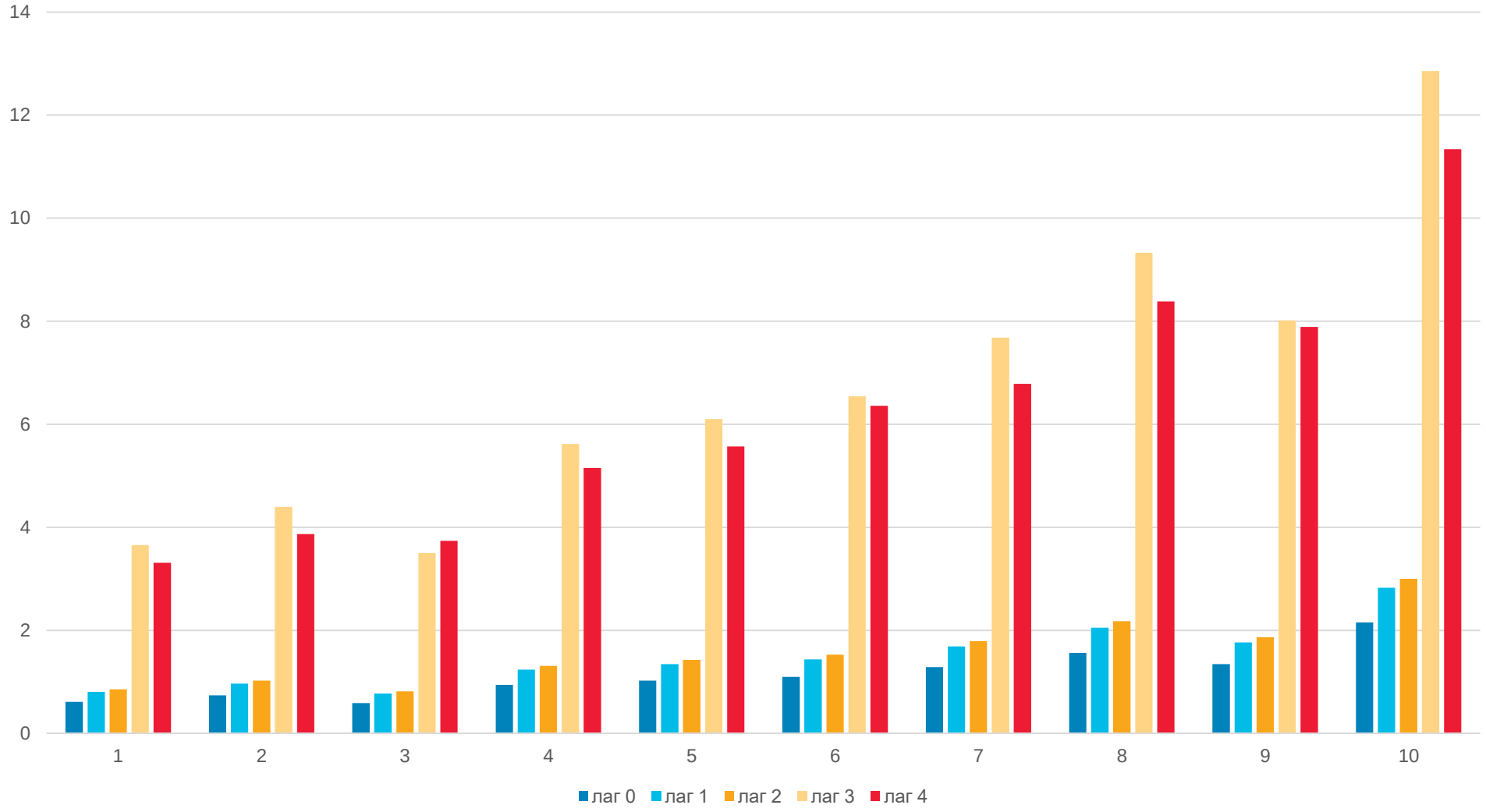
* - negative sign for all numbers, values with module, p<5%, statistically non-significant coefficients estimates were not indicated

Elasticity* consumption ratio with respect to the loan rate (dependent variable lag)



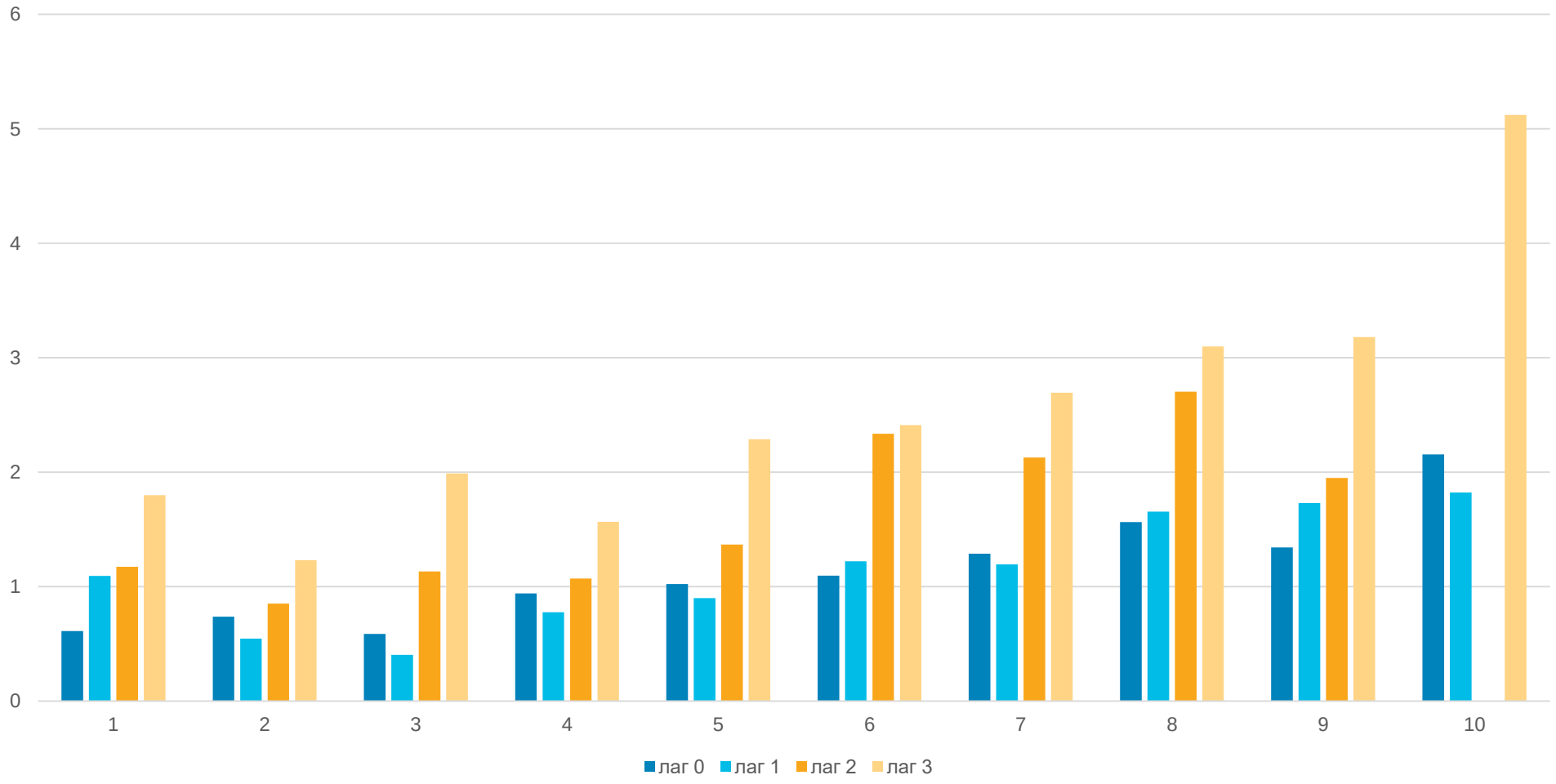
* - negative sign for all numbers, values with module, p < 5%, statistically non-significant coefficients estimates were not indicated

Elasticity* consumption ratio with respect to the interest spread (spread lag)



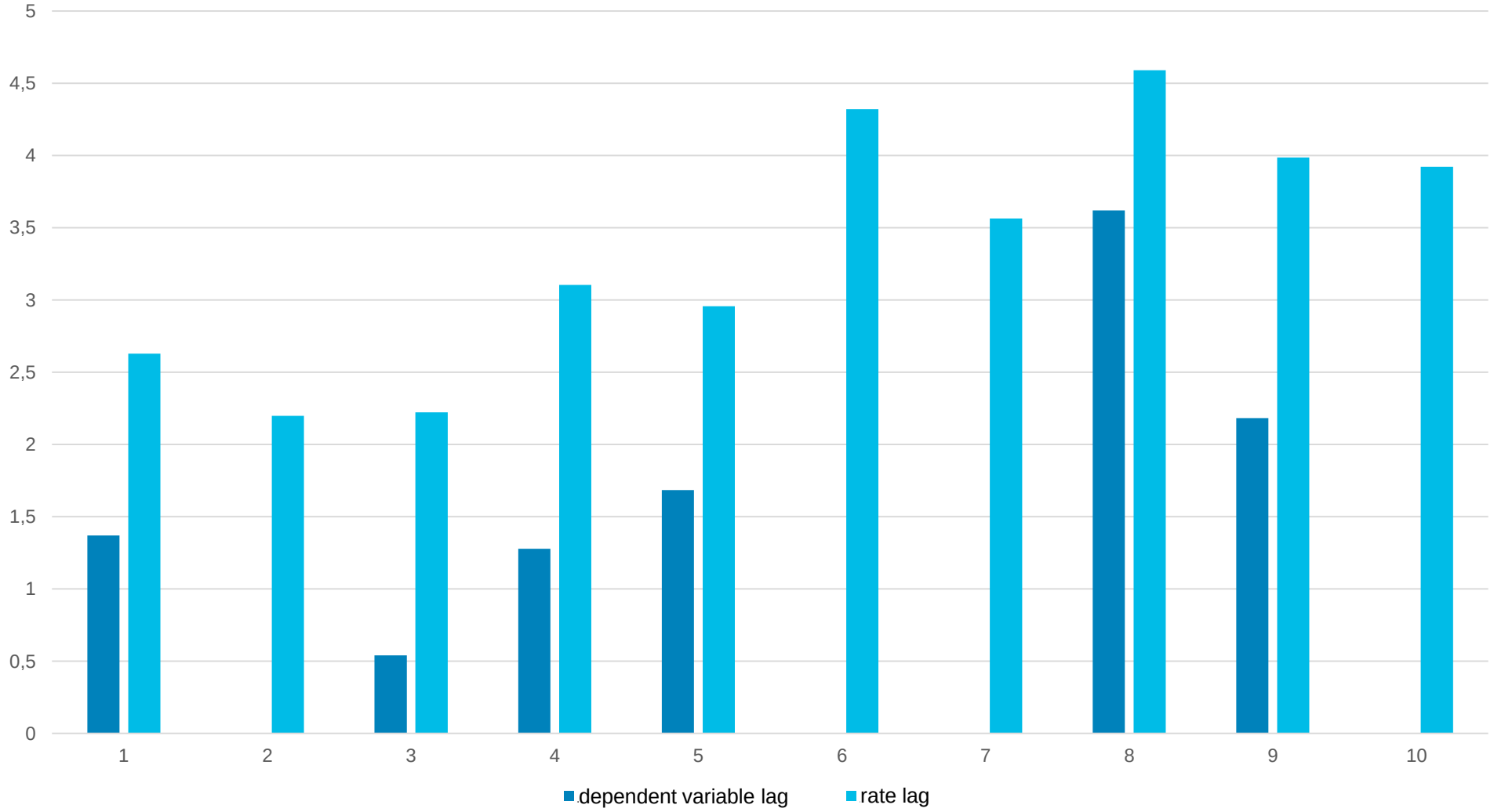
* - negative sign for all numbers, values with module, $p < 5\%$

Elasticity* consumption ratio with respect to the interest spread (dependent variable lag)



* - negative sign for all numbers, values with module, p< 10%, statistically non-significant coefficients estimates were not indicated

Response* of consumption ratio to real (given expected inflation) deposit interest rate change with lag 1



* - negative sign for all numbers, values with module, p <10%, statistically non-significant coefficients estimates were not indicated

Conclusions

- ✓ Deposit and loan interest rates have a significant adverse effect on the consumption ratio. The inverse correlation between interest rate and households' propensity to consumption aligns with theoretical concepts and economic logic.
- ✓ High-income groups of population have twice as high susceptibility of the consumption ratio with respect to the interest rate levels as middle- and lower-income groups.
- ✓ Spread of loan and debit rates is negatively related to the consumption ratio. Approximation of bank rates for raising and placing funds is regarded as an argument in favour of consumer behaviour model.
- ✓ Household consumption all over the distribution scale is more responsive to loan rates level rather than deposit rates level which is consistent with economic logic.
- ✓ Maximum effect from rates is reached in 2-3 quarters, while the biggest impact of spread is reached in 3-4 quarters.
- ✓ Consumption dependence on interest rates discounted on consumer price index, as well as loan rates adjusted for inflation expectations, has not been discovered. Deposit rates adjusted for the magnitude of expected inflation with a quarterly lag have a significant adverse effect on the consumption ratio, susceptibility of consumption of the upper decile of income distribution being higher than the one of the lower decile.
- ✓ Instability of significance and value of control variables coefficients indicates differences in factors that affect consumption behaviour of households with different levels of welfare.
- ✓ Inequality reduction by decreasing the proportion of wealthy groups will reduce the effectiveness of monetary policy, whereas a decline in the proportion of the poor will have a reverse effect.

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THANK YOU FOR YOUR ATTENTION