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The impact of the 2022 sanction crisis on household consumption in Russia: A quantitative analysis

This paper analyses how the 2022 sanction crisis affected household consumption in Russia. Using data from the Russian Longitudinal Monitoring Survey (RLMS-HSE), we group households into five clusters by the employment sector of the household head. In terms of the methodological framework, we apply mean comparison and Kolmogorov–Smirnov tests, as well as panel data models. Our principal finding is that the crisis led to a stronger quantitative reallocation of expenditures than qualitative changes in behaviour. Russian households are reluctant to significantly alter their consumption structure. Furthermore, households headed by employees in sub-sanctioned business companies suffered more, while those in sanctioned sectors, such as real estate, agriculture, public, and defence, saw income and consumption benefits.

Keywords: sanctions; household-level; consumption structure; consumer behavior; RLMS; occupation; income.

JEL classification: D12; H12; C21; R29.

1. Introduction

Households are the economic agents most sensitive to external shocks. Numerous studies have estimated the effect of crises on households' living standards, inequality, and aggregate consumption (Blundell et al., 2022; Skoufias, Suryahadi, 2000). The natural response to economic uncertainty and political crises is a decline in aggregate consumption, which has been the subject of numerous papers (Gautier et al., 2020; Kamakura, Du, 2012). Zubarevich, Safronov (2020) argue that since the late 2000s the Russian economy has experienced two global crises (2008–2009 global financial crisis, 2020 COVID-19 pandemic crisis) and a local crisis in 2014. Figure 1 depicts the proportion of consumption expenditures in the Russian GDP over a period covering these crises.

We observe a significant decline in the share of household expenditure in GDP during the global financial crisis (2009), increased sanctions pressure (2015–2016), and the onset of the COVID-19 pandemic (Q2 2020). However, during the 2022 crisis, there was no further decline in household spending in GDP, despite the largest economic crisis caused by significantly increased sanctions pressure. Despite the widest range of sanctions imposed, recovery from the acute phase of the crisis and some 'normalisation' of market conditions was observed in many sectors of the economy.

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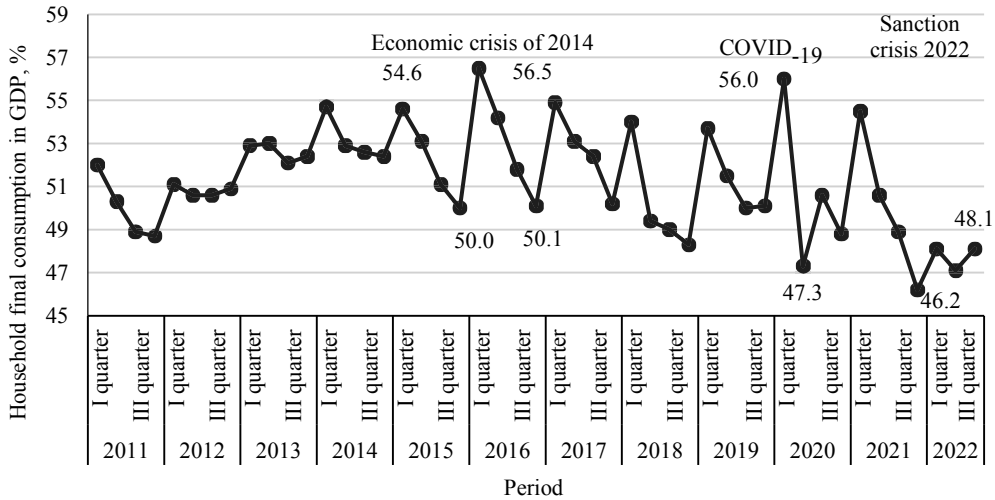


Fig. 1. Household expenditure in Russia's GDP

Source: Federal State Statistics Service.

Policymakers, public speakers and the academic community have identified the pivotal role of private enterprise in overcoming the current crisis (Glenn, 2023).

The demand for goods and services provided by private businesses is formed by households. The withdrawal of companies from the market, in conjunction with the rise in the price of imports due to the weakening of the national currency, may result in a change in the structure of household expenditures. Given the significantly increased sanction pressure, households' responses may vary across categories of consumer expenditures. Household heterogeneity in consumption habits and living standards affects analysis accuracy (Misra, Surico, 2014). The issue is further complicated by the lack of a widely accepted method for grouping households. Given this background, this paper undertakes an intergroup analysis of Russian households' consumer spending under the impact sanction crisis of 2022.

The motivation for this paper is threefold.

First, in 2022, the pressure exerted by sanctions increased significantly. Sanctions were imposed in an unprecedentedly wide range, according to Castellum.AI², with 2695 sanctions imposed on Russian individuals and entities before February 2022 and 13263 afterwards. Although sanctions are imposed on specific individuals and entities, their impact affects households. For instance, the experience of Iranian households demonstrates that sanctions pressure leads to elevated price levels (Hejazi, Emamgholipour, 2022), a reduction in disposable income (Khabbazan, Farzanegan, 2016), a transformation in consumer behaviour (Ezzati, Salmani, 2017).

Second, the consumer price index (CPI) calculation uses the shares of consumer expenditure over the last eight quarters. Identifying the determinants of the structure of consumer spending provides more accurate estimates of inflation. Natalini et al. (2020) argue that the discrepancy between official estimates of consumer price index and the inflation rate observed by households can lead to social tensions and dissatisfaction among the population.

² Russia Sanctions Dashboard. <https://www.castellum.ai/russia-sanctions-dashboard>.

Third, the reaction to external shocks varies across diverse social and demographic clusters (Abebe et al., 2022). In the context of the sanction crisis of 2022, occupation is an important determinant of household exposure to crises. There has been a significant increase in wages in the military industrial complex³ due to the large government defence order in this complex and the skills shortage. Wage growth did not elude the IT sector, although it was relatively modest in absolute terms⁴. The primary causes of wage growth in this sector are the outflow of highly skilled personnel, the shift towards locally developed software alternatives, and rising inflation. In this context, two sectors that can be considered particularly lucrative for an employee in 2022 are the military sector and the information technology sector. The *objective* of the study is to examine the impact of the sanction crisis of 2022 on the consumer spending patterns in various social groups of households.

This study is organized as follows. Section 2 presents a synthesis of empirical and theoretical works on the impact of crises on the structure of household consumption, as well as a systematic analysis of shifts in the structure of consumption. Section 3 outlines the data employed for analysis and the econometric tools utilised in the paper. Section 4 describes the approach used in this paper to categorise households into groups and to profile them. Section 5 presents the results of statistical tests and econometric modelling. Finally, Section 6 provides the hypothesis testing results and the conclusions of the study.

2. Literature review and main hypotheses

2.1. Impact of sanctions: experience of Iranian and Russian households

In examining the impact of sanctions pressure on the financial situation of households at the micro level, we consider foreign studies that have analysed the experience of Iranian households. Hejazi, Emamgholipour (2022) note that there were dramatic price increases for all groups of goods in the year following the imposition of sanctions. In the face of significant price increases, households lose between 4 to 35% of their wealth, with losses increasing as income rises (Khabbazan, Farzanegan, 2016). Similarly, the results of Farzanegan et al. (2015) showed that households with higher incomes lose more under the impact of oil sanctions. Conversely, Salehi-Isfahani (2022) argues that households with elderly members and women as heads of household are the most vulnerable to the effects of sanctions. A similar conclusion is reached by Ghomi (2022), who posits that poor, young, and rural households are affected by sanctions, while educated households are not.

Studies on the impact of sanctions on Russian households deserve special attention. Hinz, Monastyrenko (2022) argue that sanctions pressure reduces the welfare of Russian households by 1.88%. A number of studies (Berdysheva, Romanova, 2017; Zubarevich, Safronov, 2019) have noted that the sanctions pressure had a significant impact not only on incomes and consumption volumes, but also on the structure of consumer spending. A distinguishing feature of these studies is the utilisation of statistical analysis at the macro level, whereas the current study considers the heterogeneity of Russian households and employs advanced quantitative methods at the micro level.

³ Labour turnover in Russia reached the highest level in the last 10 years. <https://tass.ru/ekonomika/19253805>.

⁴ Salaries of IT specialists in Russia have grown by 15% since the beginning of the year. <https://www.forbes.ru/svoi-biznes/499692-zarplaty-it-specialistov-v-rossii-s-nacala-goda-vyrosli-na-15>.

Berendeeva, Ratnikova (2018) investigate the impact of the food embargo in Russia as a counter-measure to sanctions pressure. The authors conclude that the import ban led to a change in spending within the group of food products and a more frugal consumption style of Russian families. They suggest that demand characteristics recovered after the acute phase of sanctions pressure.

The experience of Iranian and Russian households demonstrates that sanctions pressure has a significant impact on the price level, which has a negative effect on both household incomes and aggregate consumption. Consequently, a considerable number of Iranian studies indicate a reduction in household wealth and income (Hejazi, Emamgholipour, 2022; Khabbazan, Farzanegan, 2016). This, in turn, suggests potential shifts in household consumption patterns, with a preference for cheaper alternatives and an augmentation in expenditure on less elastic categories (e. g. food at home), which is explored in detail in Section 2.2. Against this background, we would like to test the impact of sanctions on Russian households, and develop the first hypothesis.

Hypothesis 1. *Sanction-affected households have low income compared to households that are not affected by sanctions.*

2.2. What are the implications of shifts in household consumption patterns?

The existing literature notes that a reduction in aggregate household consumption is a perfectly natural response to external shocks and has been extensively studied in theoretical models (Kydland, Prescott, 1982) and empirical works (Abebe et al., 2022). Gautier et al. (2020) argue that during crises, households not only reduce aggregate consumption but also change their consumption expenditure patterns. A similar conclusion is reached by Duflo, Udry (2004), who argue that households' expenditure patterns depend on their individual characteristics as well as the type of shock. Ezzati, Salmani (2017) observe that external shocks result in a shift in consumer behaviour, namely a reallocation of consumer expenditure shares. Using the example of the local crisis of 2014, Berdysheva and Romanova (2017) demonstrate that the consumer behaviour of Russians changed towards greater frugality. However, these changes in consumer behaviour are not a result of conscious decision-making, but rather a consequence of external forces.

In addition to the stylised fact that changes in consumption patterns are forced rather than desired, it is necessary to consider *how* consumption patterns change. There are significant differences if consumption patterns change in favour of highly elastic components (non-food goods and services) or in favour of necessities (Kemp, 1998). Interestingly, that in a number of countries (for instance, Italy), households are evaluated on the basis of their consumption patterns to determine whether they are below the poverty line (Cutillo et al., 2022). Haq et al. (2008) present evidence that even within household food expenditure, there is a significant difference in household food expenditure between the poor and the rich. The rich consume more protein foods, while the less affluent mainly eat carbohydrates. That said, a high share of expenditure on food at home is more likely for poor households, making them particularly vulnerable to external shocks (Jacobs, 2009). Hence, changes in household consumption patterns in favour of the least elastic categories, such as food expenditure at home, can be considered a proxy for a decline in the welfare of household members. Given this background, we propose hypothesis 2.

Hypothesis 2. *Sanction-affected households have less diversified consumption patterns with a shift towards spending on food at home compared to households that are not affected by sanctions.*

2.3. Heterogeneity in the impact of crises on households

Anecdotal evidence suggests that different household groups exhibit varying responses to external shocks. For instance, an identical decline in income may cause different shifts in the consumption behaviour of the rich and the poor. Kumhof et al. (2015) indicate that external shocks exacerbate inequality within households regarding income and consumption patterns. Pasinetti (1983) finds significant heterogeneity among households based on their socioeconomic status and observed price levels. Accounting for the socio-economic characteristics of the households is particularly challenging due to their composite structure. Following Jinkins (2016), who estimates the influence of household head attributes on consumption, we apply certain characteristics of the household head to the entire household. The characteristics include employment status, educational attainment, etc. These data is obtained from the individual questionnaire of the household head. This approach significantly enhances the accuracy of our estimates by allowing for the clustering of households by employment sector.

Households are clustered based on the employment industry of the household head. The RLMS sample contains hundreds of occupational titles, in accordance with the international standard ISCO-08. All the occupational titles cannot be accommodated by the present analysis. Consequently, five aggregated sectors of employment within the Russian economy are selected for examination: the public sector, finance, agriculture, security and the real sector. These sectors have been delineated by Bartolucci et al. (2017).

Therefore, various categories of households respond differently to crises. The 2022 crisis has revealed that occupation plays a pivotal role in influencing the household's vulnerability to the crisis. These observations have led us to formulate hypothesis 3.

Hypothesis 3. *In the context of the sanctions pressure in 2022, the most affected groups of households are those who have been integrated into the global economy and engaged in interactions with Western companies⁵.*

This paper addresses the gaps in the current literature as follows. *First*, this paper fills a gap in existing literature by estimating the impact of the sanction crisis of 2022 on the structure of consumer spending at the micro level. *Second*, in order to capture household heterogeneity, we consider inter-group differentiation of households by identifying social groups based on the employment sector of the head of the household. The present study compares the impact of sanctions on households that are directly affected by them with the impact on households that are not directly affected. *Third*, to the best of our knowledge, this paper represents the inaugural attempt to produce estimates of income elasticities (and their change during the acute phase of the sanctions) based on aggregated categories of consumer expenditures. The results may be useful for private businesses to forecast demand in crises and for policy makers.

⁵ Global integration can be defined as the process of integrating into the global world. This can range from an interest in the cultures of other countries, which cannot be traced at the household level, to direct communication on personal and work matters with foreigners, which we capture through the employment sector of household chief (for further details, refer to Section 4).

3. Data and empirical setup

3.1. Data

In order to test the hypotheses, data from the Russian Longitudinal Monitoring Survey⁶, conducted annually by HSE University is used. The sample comprises household data from waves 27 to 31 (2018–2022), derived from 32 Russian regions. The sample is an unbalanced panel data set, with the unit of observation being the household. The RLMS survey format comprises two types of questionnaire: one at the household level and one at the individual level. Some of the variables deemed crucial for modelling household consumption patterns are collected at the level of the household head (for further details, refer to Table 1). The total number of observations is 18464, taking into account those excluded from the sample. This includes households with negative income, as well as households with income per household member less than 1000 and more than 50000 roubles (in 2003 prices), which represents approximately 1% of the sample. Table 1 provides a detailed description of the variables used in the analysis⁷.

Table 1. Variables description

Variable	Description	Unit of measurement / interpretation
<i>Variables, capturing the impact of sanction crisis</i>		
$D_{(sanction)}$	Binary variable which reflects the presence of direct impact of the sanctions on household. If in region j and year t , and industry k there are at least one company under sanctions, and if in year t the chief of household leaving in region j is employed in industry k , then we assume that his household is directly affected by the sanctions.	1 — household is directly affected by the sanctions; 0 — otherwise
$D_{(sanction)} \times explanatory\ variable$	Interaction term, for additional capturing the impact of the sanction crisis	Depends on the unit of measurement of explanatory variable
snm_total	Total number of sanctions imposed on enterprises in the region by different countries ⁷ . This variable is used to account for the indirect effect of sanctions and their magnitude since 2014.	Number of sanctions
<i>Dependent variables (household level)</i>		
<i>Food at home</i>	Absolute value of expenditure on food at home	Roubles
<i>Out-of-home food</i>	Absolute value of expenditure on out-of-home food	Roubles
<i>Alcohol</i>	Absolute value of expenditure on alcohol	Roubles
<i>Non-food</i>	Absolute value of expenditure on non-food	Roubles
<i>Services</i>	Absolute value of expenditure on service	Roubles
<i>Food at home (share)</i>	Food at home expenditure in total consumer spending	%

⁶ <https://www.hse.ru/en/rlms/>.
⁷ This paper has considered the sanctions imposed by European Union, United States, United Kingdom, Canada, Switzerland, Australia, Japan and Netherlands.

End of Table 1

Variable	Description	Unit of measurement / interpretation
<i>Out-of-home food (share)</i>	Out-of-home food expenditure in total consumer spending	%
<i>Alcohol (share)</i>	Alcoholic beverages expenditures in total consumer spending	%
<i>Non-food (share)</i>	Non-food expenditure in total consumer spending	%
<i>Services (share)</i>	Service expenditure in total consumer spending	%
<i>Explanatory variables (household level)</i>		
<i>Log income</i>	Logarithm of PPP adjusted income at 2003 prices	Roubles
<i>log_members</i>	Logarithm of the number of household members	Persons
<i>hhtype</i>	Household type	1 — household headed by a man of working age; 2 — household headed by a woman of working age; 3 — household headed by a man of incapable age; 4 — household headed by a woman of incapable age;
<i>own_auto</i>	Presence of a car in the household	1 — household own a car; 0 — otherwise
<i>own_comp</i>	Presence of a personal computer in the household	1 — household own a personal computer; 0 — otherwise
<i>debt_dummy</i>	Has your family lent money in the last 30 days?	1 — yes; 0 — otherwise
<i>child_7_18</i>	Number of children aged 7 to 18	Persons
<i>child_7</i>	Number of children under 7 years of age	Persons
<i>Explanatory variables (characteristics of head of the household)</i>		
<i>higher</i>	Availability of tertiary education for the head of household	1 — head of household has higher education; 0 — otherwise
<i>optimistic</i>	Is the household head an optimist?	1 — yes; 0 — otherwise
<i>pessimistic</i>	Is the household head a pessimist?	1 — yes; 0 — otherwise
<i>subordinates</i>	Are there other people subordinate to the head of household?	1 — yes; 0 — otherwise
<i>age_chief</i>	Age of household head	Years
<i>Regional and time effects</i>		
<i>dummy_years</i>	Dummy variable for the respective year (2019, 2020, 2021, 2022), <i>id_w</i> , capturing time effects	1 — values for the certain year; 0 — otherwise
<i>region</i>	Dummy variable for the respective region	1 — values for the certain region; 0 — otherwise

Note. Econometric modelling uses aggregate household income in 2003 prices, in roubles; the model also includes all the explanatory variables stated in the table. Absolute values of expenditures are presented at 2003 prices, PPP adjusted, per household. Optimists are defined as those who, when asked how their family will live in 12 months, respond “much better” or “a little better”. Conversely, pessimists respond with “a little worse” or “much worse”.

Household income and social characteristics predetermine its consumption patterns. Xiong et al. (2021) argue that age, family size and household income are factors determining household consumption patterns. A number of studies argue for the importance of educational attainment in determining household consumption patterns (Yen, Jensen, 1996). Furthermore, the consumption pattern of a household is contingent upon the employment status and the position held by its members.

The role of expectations in determining the structure of household consumption is worthy of particular attention. In general, the consideration of economic agents' expectations is employed in DSGE modelling, as well as in general macroeconomic models. In terms of the impact on household consumption, two distinct mechanisms can be identified: expectations regarding price changes (Carroll et al., 2020) and expectations regarding changes in living standards (Coibion et al., 2024). The mechanism by which expectations influence household expenditure is determined by the expenditure category. However, the general pattern is that in anticipation of higher inflation, households purchase services in anticipation of higher inflation, thereby stimulating demand and provoking price increases. Interestingly, Stephens (2004) shows that expectations of job loss (and thus source of income) have no effect on household consumption patterns. With similar expectations of job loss, Hurd, Rohwedder (2013) demonstrate that households tend to reduce their expenditure on the most elastic categories, including luxury items, eating out, and entertainment.

3.2. Methodological framework

To model the impact of sanction crisis of 2022 on household consumption structure, we employ the Engel function. Specifically, the Engel curve corresponds to the connection between household income and its expenditures on food, out-of-home food, alcohol, non-food goods and services. The basic form of the model (Leser, 1963) suggests the incorporation of income as the main predictor of household expenditure. Additionally, several empirical studies demonstrate the influence of household socioeconomic characteristics on household consumption (Edelstein, Kilian, 2009). Given this evidence, we extend the basic model by including household social characteristics, (i.e., age of household chief, number of children, education level, expectations) and household financial characteristics, (i.e., income, presence of debts to household, cars in household and etc.). The econometric specification applied in this paper is:

$$Y_{ijr} = \alpha_{ij} + (\beta_{0j} + \delta_{0j}D_{(sanction)}) + (\beta_{1j} + \delta_{1j}D_{(sanction)})X_{1it} + \dots + (\beta_{kj} + \delta_{kj}D_{(sanction)})X_{kit} + \sum_{t=2}^5 \gamma_{tj}w_t + \theta_{rj}D_{trj} + \varepsilon_{ijr}, \quad (1)$$

where $j=1,2,3$ corresponds to the type of expenditures (food, non-food goods and services), $i=1,\dots,N$ is the number of household, $t=1,\dots,5$, where 1 corresponds to 2018, ..., 5 corresponds to 2022, $r=1,\dots,32$ is the number of the region. Y_{ijr} is representative of the dependent variable, which is defined as the consumer expenditure of the i household for the designated time period t , in the region r and by the specified expenditure category j . α_{ij} is an individual effects, $X_1 - X_k$ are the number of predictors (explanatory variables, for further details, see Table 1),

D_{irj} is the i household in r region and takes value 1 and 0 otherwise⁸, w_t are dummy variable for the respective wave of RLMS survey. To capture the direct impact of the sanction crisis we use $D_{(sanction)}$, which indicates whether household is directly affected by the sanction crisis, and interaction coefficients of each explanatory variable $\delta_{kj} D_{(sanction)} X_k$. To capture the magnitude effect of sanctions, we use additional control for the number of sanctions imposed on the companies of the certain region. For expenditure on food at home, non-food goods and services, random and fixed effects models are employed. For each household group, we estimate both FE and RE models and based on the Hausman test choose the best model. In light of the considerable number of zeros in expenditure on food outside the home and alcohol, Tobit model with random effects⁹ is utilised. The functional form of this equation is analogous to equation (1), with the adjustment to utilise a latent dependent variable Y_{itjr}^* reflecting expenditure on food outside the home and alcohol $j = 1, 2$ in household i for period t in region r :

$$Y_{itjr}^* = \alpha_{ij} + (\beta_{0j} + \delta_{0j} D_{(sanction)}) + (\beta_{1j} + \delta_{1j} D_{(sanction)}) X_{1it} + \dots + (\beta_{kj} + \delta_{kj} D_{(sanction)}) X_{kit} + \sum_{t=2}^5 \gamma_{tj} w_t + \theta_{rj} D_{irj} + \varepsilon_{itj}. \quad (2)$$

4. Clustering and profiles of Russian households

Given the importance of occupation on household exposure to the sanction crisis, the division of households (following Section 2.3), according to employment sector of household head is chosen for the analysis. This approach is designed to capture the differences between clusters of households that occurred as a result of the sanction crisis of 2022. The existing approaches for categorising households into sectors can be roughly divided into single-level and multi-level approaches. In the single-level approach, occupations are aggregated at one level, and allocated groups are not aggregated (Bartolucci et al., 2017). This is in contrast to multi-level approaches, in which occupations are aggregated into groups, groups are nested in sectors, and sectors are nested in industries (Barrett et al., 2001).

In order to assess the changes in consumption patterns under the impact of the sanction crisis of 2022, this paper modifies the approach proposed in Bartolucci et al. (2017). The main motivation for using this approach is that the Bartolucci et al. (2017) study was conducted on data from the Russian Longitudinal Monitoring Survey (RLMS-HSE, waves 15–19), so it is feasible to identify similar sectors in our sample. The authors identify five sectors on the basis of which individual level analyses are conducted: assigning value to each sector from 1 to 5. Additional names were not assigned to the sectors, but they can be generalised to ‘Real sector’, ‘Agriculture’, ‘Public sector’, ‘Security and military’, ‘Business sector, IT’.

This paper utilises consumption structure data collected at the household level. The employment sector, along with a number of other important determinants of consumption patterns, are contained in the individual questionnaire. An approach from Jenkins (2016), was employed to assign individual characteristics to the household, whereby the household is assigned the characteristics of the household head (employment sector, education level, expectations). Within the main RLMS questionnaires,

⁸ The aforementioned coefficients are estimated in random-effects models (including Tobit) and are excluded from fixed-effects models on the grounds that dummy is time invariant.

⁹ To estimate Tobit model with RE we apply *xttobit* package in Stata.

there is no separate variable to identify the head of household. However, the supplementary RLMS questionnaires indicate that the head of household is the oldest member of the household from the labour force (if there is none, from the non-labour force). In accordance with the methodology proposed by RLMS experts, the head of household in this article is defined as the oldest member of the household of working age. In the absence of members of working age within the household, the designation of head of household is attributed to the oldest member of the household who is unable to work. This paper distinguishes four types of households, depending on who is the head of the household: a man of working age; a woman of working age; a man of incapable age; a woman of incapable age.

The expansion of the list of households interviewed and the expansion of sectors since 2018 has led to a significant expansion of Sector 5 (also known as the Business sector and the IT sector). This now includes other business services, including legal services and the IT sector. Given the context of the crisis, the latter is the most interesting. A detailed sectoral distribution of households is presented in Table 2.

Table 2. Sectoral distribution of households

Sector	Industries that are included in the enlarged sector
Sector 1. Real sector	Light industry, food industry; civil engineering; oil and gas industry; other heavy industry; construction; transport, communications; energy industry; chemical industry; wood processing industry, forestry; catering organisation
Sector 2. Agriculture	Agriculture
Sector 3. Public sector	Administration; education; science, culture; health care; trade, consumer services; housing and communal services; real estate operations; social services; church; sports, tourism, entertainment; public services; ecology, environmental protection; public organisations, veteran councils
Sector 4. Security and military	Military-industrial complex; army; Ministry of Internal Affairs; security agencies
Sector 5. Business sector, IT	Finance; law; information technology; mass media, publishing, printing, telecommunications; advertising, marketing

Source: Following (Bartolucci et al., 2017).

Table 2 illustrates that the largest sectors, in terms of both the number of industries included and total employment, are the real sector and the public sector. In contrast, the smallest sectors are agriculture, security, and the business sector. To ensure the representativeness of the sectoral distribution, we compare the representativeness of each sector with Russian statistics (Table 3).

Table 3. Representativeness by sector, comparison with Russian statistics

Sectors	Share of the sector (Russian statistics), %	Share of the sector (RLMS sample), %	Number of observations in RLMS sample
Sector 1. Real sector	36.4	35.4	6498
Sector 2. Agriculture	5.8	3.8	700
Sector 3. Public sector	45.9	49.4	9070
Sector 4. Security and military	6.8	7.7	1422
Sector 5. Business sector, IT	5.1	3.7	684

Source: Federal State Statistics Service; RLMS-HSE.

The results indicate that the distribution obtained is comparable. Indeed, the real and public sectors employ the majority of the population, while agriculture, business services and security account for approximately 17–18%. These stylised facts indicate the representativeness of the chosen approach to dividing households into groups, which will ensure the robustness of the findings. Table 4 reflects descriptive statistics by household group.

The descriptive analysis yielded several intriguing findings. *First*, we note significant heterogeneity amongst Russian households in terms of their consumer expenditures. Specifically, the analysis reveals that the households with the highest average expenditure on food outside the home are those whose heads are employed in the business sector, which can be explained

Table 4. Summary statistics by sectors and variables

Variables	Unit of measurement	Sample characteristics	Real sector	Agriculture	Public sector	Security and military	Business sector, IT
<i>Food at home</i>	Roubles ^a	Mean	3694.37	3052.79	3331.55	3612.15	3761.92
		Median	3210.23	2616.35	2873.44	3206.25	3282.57
		Standard deviation	2386.06	2034.47	2320.16	2077.20	2518.27
<i>Out-of-home food</i>	Roubles ^a	Mean	701.42	457.88	644.62	613.52	843.95
		Median	0	0	0	0	239.10
		Standard deviation	1200.63	918.36	1136.92	1215.13	1362.73
<i>Alcohol</i>	Roubles ^a	Mean	139.68	84.68	107.61	125.17	124.98
		Median	0	0	0	0	0
		Standard deviation	306.61	207.56	272.16	295.10	296.63
<i>Non-food</i>	Roubles ^a	Mean	3661.38	3435.65	3308.31	3665.25	3811.93
		Median	2892.85	2701.29	2489.33	2955.59	2727.66
		Standard deviation	3334.27	2725.16	3331.98	3274.59	4647.14
<i>Services</i>	Roubles ^a	Mean	2416.26	1540.93	2334.11	2569.87	3696.09
		Median	1303.96	636.21	1187.11	1318.70	1824.31
		Standard deviation	4170.99	7975.34	4248.60	4368.37	8293.29
<i>Income</i>	Roubles	Mean	5937.68	4698.52	5948.69	6170.04	6742.22
		Median	5214.24	4049.99	5307.88	5452.03	5914.37
		Standard deviation	3278.45	2987.12	3209.30	3350.47	4084.15
<i>Children (under 7)</i>	Persons	Mean	0.319	0.281	0.232	0.317	0.315
		Median	0	0	0	0	0
		Standard deviation	0.585	0.555	0.511	0.599	0.582
<i>Children (7–18)</i>	Persons	Mean	0.572	0.754	0.472	0.546	0.511
		Median	0	0	0	0	0
		Standard deviation	0.767	1.089	0.699	0.757	0.723
<i>Higher education</i>	Proportion	Mean	0.285	0.157	0.391	0.425	0.686
		Median	0	0	0	0	1
		Standard deviation	0.451	0.364	0.488	0.494	0.694

Note. ^a — monthly expenditure on food at home, out of home, alcohol, non-food goods and services are PPP-adjusted and presented in 2003 prices.

Income is measured per household member and is also PPP-adjusted and presented in 2003 prices. The higher education variable indicates the proportion of household heads that have attained tertiary education among all households in a specific sector.

by the availability of public catering in large cities, where the commercial activity is concentrated. Conversely, the lowest expenditure on this category is observed among households whose head is employed in agriculture. The median alcohol expenditure is found to be higher among households whose heads are employed in the real sector, which may be related to coping strategies to deal with stress. The median value of alcohol expenditure is zero, indicating polarisation: most households do not spend on alcohol, but some households have positive expenditure. *Second*, the highest average income is observed among households whose head is employed in the business sector, and the lowest among households whose head is employed in agriculture. This finding aligns with prevailing trends¹⁰, suggesting disparities in labour remuneration across sectors, particularly between the IT sector and other sectors in Russia. *Third*, the demographic characteristics (education and number of children) of the households are heterogeneous. Households whose heads are employed in agriculture have a higher average number of children, which is consistent with the low share of heads of households with higher education in this sector (only 15.7%). Conversely, the highest proportion of household heads with higher education (68.6 and 42.5%) is observed in the business sector and the security and military sector, aligning with the qualification requirements prevalent in these industries.

A further crucial aspect is the measurement of the impact of sanctions, given that the 2022 crisis was directly associated with unprecedented sanctions pressure on the Russian economy. Hart et al. (2024) document that the isolation of the net effect of sanctions appears to be a complex task requiring a substantial data set and robustness checks. A relatively accurate approach to measuring the impact of sanctions is to match microdata at the firm and household levels. In this case, one distinguishes between groups of sanctioned firms and groups of non-sanctioned firms. Both groups include members of households for whom data are available in existing questionnaires. However, it is not feasible to apply this approach as the data on specific companies employing household members are not available.

In order to analyse the impact of sanctions, we utilised a database comprising microdata from companies that had been sanctioned by various countries (Voytenkov et al., 2024). The firm-level data were aggregated to the regional level, resulting in panel data for Russian regions, with a time delta of one year. These data are comparable to household microdata as each household is assigned to a different region, thus integrating higher-level variables into the household database.

In order to ascertain the impact of sanctions, the most accurate approach is employed: the inference is made as to whether a household is directly affected by sanctions, based on the industry in which the head of household is employed and the presence of sanctions on that industry in a particular region. To illustrate, if in 2018 the head of a household in the Chelyabinsk region is employed by a military-industrial complex enterprise and at least one enterprise in the Chelyabinsk region was sanctioned in 2018, we posit that the household is subject to sanctions. Otherwise, there is no direct impact of the sanctions, but the indirect effect of the sanctions can be observed. In order to account for the scale effect of sanctions, it is necessary to control for the total number of sanctions imposed on businesses in the region by different countries¹¹.

¹⁰ Salaries of IT specialists in Russia have grown by 15% since the beginning of the year. <https://www.forbes.ru/svoi-biznes/499692-zarplaty-it-specialistov-v-rossii-s-nacala-goda-vyrosli-na-15>.

¹¹ This paper has considered the sanctions imposed by European Union, United States, United Kingdom, Canada, Switzerland, Australia, Japan and Netherlands.

The principal disadvantage of this approach is its crude measurement, while more accurate alternatives are not available due to the specificity of the data. With appropriate control for the accumulated impact of the sanctions, which commenced in 2014, the resulting econometric estimates should be highly accurate. The advantage of this approach is the possibility of separating the control group and the treatment group, which allows for comparative analyses between them in both income and consumption patterns. Table 5 presents the results of an average value comparison that was conducted to assess whether there were any differences in income levels between the sanctions-affected and non-affected households, and comparison of 2022 year and the years preceding the acute phase of the sanctions crisis.

Table 5. Income winners and losers — difference in mean values of household incomes

Period	Real sector	Agriculture	Public sector	Security and military	Business sector, IT
2022 vs 2018	263.37	1802.10**	316.12	884.55	1011.45
2022 vs 2019	−316.92	212.92	−234.90	1110.97*	−212.65
2022 vs 2020	−60.48	78.17	−54.81	1248.61*	273.24
2022 vs 2021	−609.11*	−1319.87	−463.19	−6.192	−915.45
Sanctions-affected vs non-affected	1280.99***	1178.97	1798.09***	1647.14***	−798.80

Note. The differences between two means are presented. Incomes are presented per household member in 2003 prices, in roubles.

Significance levels: *** — 1%, ** — 5%, * — 10%.

Table 5 illustrates that in 2022, in comparison to 2018, income growth was observed solely in the agricultural sector. Furthermore, income growth in 2022 in comparison to 2019 and 2020 was observed in the defence sector, with an increase of 1110 and 1250 roubles, respectively. Conversely, when comparing 2022 with 2021, every sector experienced a decline in income, with a statistically significant decrease by approximately 610 rubles in households whose heads are employed in the real sector. The differences between households affected and not affected by sanctions in terms of income are striking. The results indicate that households affected by sanctions whose heads are employed in the real sector, public sector and defence sector have significantly higher incomes (from 1280 to 1800 roubles) than those not affected by sanctions, while in other household groups the changes are not statistically significant. Conversely, among households whose heads are employed in the commercial services sector, the difference in income is reversed, although this is not statistically significant, as economist N. Zubarevich noted when analysing regions. She stated that the most globally integrated regions have been hit hardest¹². Thus, we cannot confirm Hypothesis 1 about the negative impact of sanctions on households working in sanctioned enterprises.

¹² <https://trends.rbc.ru/trends/innovation/637b27059a79477ea7e6a4a1>.

5. Empirical results

5.1. Statistical modelling

The objective of this paper is to evaluate the impact of the 2022 sanction crisis on consumption patterns. We can quantify changes in consumption structure through the examination of absolute and relative changes in expenditure. This is achieved through the application of statistical tests, including the mean comparison and Kolmogorov–Smirnov tests. Furthermore, qualitative changes, namely alterations in consumption habits¹³, can be evaluated through regression analysis.

To analyse the effect of the sanctions' impact, we distinguish two groups: households that are affected and those that are not directly affected by the sanctions. The null hypothesis of the mean comparison test allows us to test the presence of a statistically significant difference between the average values of consumer expenditures. We assess the quantitative changes that have occurred in the structure of household consumption between two groups of households (affected vs non-affected ones). The null hypothesis of the Kolmogorov–Smirnov test is that the distributions of the variable are equal at both points in time. We compare the absolute and relative values (shares) of expenditures on food at home, food outside the home, alcohol, non-food goods and services for households affected by sanctions and those not affected. The negative sign indicates a lower expenditure in households affected by sanctions compared to those not affected, and a positive sign indicates the opposite. The results of the statistical tests are presented in Table 6.

Table 6. Kolmogorov–Smirnov (KS) test and difference in mean values for sanctions-affected and non-affected households

	Real sector	Agriculture	Public sector	Security and military	Business sector, IT
<i>Food (shares)</i>					
Mean difference	–2.930***	2.311	–4.894***	–0.521	–0.001
KS test	0.000	0.754	0.000	0.878	0.179
<i>Food (absolute values)</i>					
Mean difference	100.22	344.18	–34.39	324.20*	–214.30
KS test	0.493	0.193	0.243	0.138	0.024
<i>Out-of-home food (shares)</i>					
Mean difference	1.307***	4.771**	0.903	–0.047	–0.572
KS test	0.002	0.004	0.042	0.816	0.684
<i>Out-of-home food (absolute values)</i>					
Mean difference	183.28**	445.11**	122.64**	72.25	–124.49
KS test	0.000	0.002	0.001	0.530	0.834
<i>Alcohol (shares)</i>					
Mean difference	0.060	0.848***	0.207	0.269	0.481
KS test	0.446	0.729	0.021	0.043	0.997

¹³ The change in consumer habits is measured using the slope coefficient value of the interaction term ($D_{(sanction)} \times explanatory\ variable$).

End of Table 6

	Real sector	Agriculture	Public sector	Security and military	Business sector, IT
<i>Alcohol (absolute values)</i>					
Mean difference	10.09	63.06	36.30***	54.66**	22.72
KS test	0.433	0.830	0.020	0.049	0.998
<i>Non-food (shares)</i>					
Mean difference	-2.177***	-7.647**	-1.684***	-3.239**	-1.836
KS test	0.000	0.080	0.006	0.043	0.464
<i>Non-food (absolute values)</i>					
Mean difference	231.54	-79.79	262.51*	-44.46	499.27
KS test	0.871	0.695	0.309	0.422	0.633
<i>Services (shares)</i>					
Mean difference	3.740***	-0.282	5.469***	3.537***	1.929
KS test	0.000	0.321	0.000	0.010	0.513
<i>Services (absolute values)</i>					
Mean difference	843.54***	-256.99	958.39***	960.78***	293.48
KS test	0.000	0.397	0.000	0.009	0.537

Note. The differences between two means are presented.

Significance levels for mean comparison test: *** — 1%, ** — 5%, * — 10%.

For the Kolmogorov–Smirnov test (H_0 : distributions are homogeneous in two groups of households, namely, sanctions-affected vs non-affected), p -values are presented.

Table 6 indicates a decrease in the share of food expenditures in households affected by sanctions compared to non-affected ones in sectors whose heads are employed in the real sector and public sector. This result is confirmed by a statistically significant difference in income between households whose heads are employed in sanctioned and non-sanctioned companies (see Table 5). At the same time, an increase in expenditures on food at home in sanction-affected households compared to non-affected ones in sectors whose heads are employed in the defence sector is more likely due to the transition to a better-quality food basket. It is not possible to either confirm or refute Hypothesis 2, as households from the real sector and the public sector decrease the share of expenditures on food at home, while households from the security sector increase absolute expenditures on this category.

In sanctions affected households, compared to non-affected ones, there is an increase in alcohol expenditure in households whose heads are employed in agriculture (in relative terms) and in the public and defence sectors (in absolute terms), while in the other sectors the changes are not statistically significant. This stylised fact confirms the general breakdown in the decline in alcohol consumption that began in 2010¹⁴. The results shed light on those household groups that increased their alcohol consumption under the impact of sanctions.

Interestingly, the response of households whose heads are employed in the real sector and public sector to the sanctions pressure is strikingly similar. Both groups of households reduce non-food expenditure and increase expenditure on out-of-home food and services. It is likely that this effect is related to belonging to the ‘working class’ highlighted in (Morris, 2016). The author notes that

¹⁴ The number of alcoholics in Russia has increased for the first time in 12 years.
<https://www.rbc.ru/society/15/01/2024/65a4cfd79a794712c6e42179>.

this class suffered the greatest losses during the crises of the 1990s, due to job losses and mass closures. Furthermore, they continue to lose during the crises of 2008 and 2014. For example, the most significant impact of the 2008 crisis on households was the sharp rise in unemployment, particularly among younger individuals and blue-collar workers (Demidova, Signorelli, 2012). However, in terms of sanction pressure, sanction-affected households have much higher per capita income, and shifts in favor of highly elastic expenditures. This indicates that, for the first time in the history of modern Russia, those who had previously suffered the most were able to earn more and change their consumption behaviour during the sanctions crisis. As with income, no quantitative differences in consumption patterns were found between sanctions-affected households and non-affected individuals from the business sector.

5.2. Econometric estimation

Regression analysis enables the capture of both quantitative and qualitative changes in the structure of household consumption. For instance, modelling allows for the analysis of whether households' consumption habits have undergone alterations in the wake of external shocks. Technically, this effect can be captured by including the interaction term (*dummy_sanction* × *explanatory variable*) in the regression model. The slope coefficient of the interaction term demonstrates the changes resulting from the sanction crisis of 2022. The approach of including interaction terms is a common approach for studying crises and has been particularly developed after the global financial crisis (Dell'Araccia et al., 2008).

One of the key issues with including interaction terms for each explanatory variable is the potential for multicollinearity. This occurs when the values of interaction terms for different households overlap, increasing the linear dependence between the explanatory variables. The results indicated a high linear relationship between the two coefficients: $\text{Log income} \times D_{(\text{sanction})}$ and $D_{(\text{sanction})}$, as shown by an extremely high paired correlation coefficient of 0.998. Given the high importance of both slope coefficients for modelling, it was decided to split the overall specification into two. The first one includes a dummy variable for sanctions $D_{(\text{sanction})}$ but does not include the income elasticity multiplied by a dummy variable for sanctions $\text{Log income} \times D_{(\text{sanction})}$. This specification is the main specification. In contrast, the alternative specification does not include a dummy variable for sanctions $D_{(\text{sanction})}$ but does include an income elasticity for the group of households under the direct impact of sanctions $\text{Log income} \times D_{(\text{sanction})}$. For the robustness check, we estimate the main model specification with an alternative dependent variable — share of expenditure of the category. With regard to the absolute value of consumer expenditures, the interpretation of marginal effects is made in the context of elasticities (change in income in % to change in expenditures in %), whereas for shares the interpretation is made in the context of change in income in % to change in expenditure shares in percentage points (pp).

Hausman test was conducted for each of the models to determine the most appropriate model for expenditure on food at home, non-food and services. Furthermore, a metric of model quality, the coefficient of determination R^2 overall, was incorporated into the fixed and random effects models (Tables 7, 9). In addition to the coefficient of determination, the quality of the model fit can be evaluated by the p -value for the F -test. This is used to test the significance of the regression as a whole. The findings indicate that for all models presented in Tables 7 and 9, the p -value is equivalent to zero. This indicates that the overall significance of each regression is deemed

to be high. An LR test was conducted for expenditure on food outside the home and alcohol to determine the most appropriate model for pooled Tobit and Tobit with random effects (H_0 : no individual-level effects). The results of the LR test (Table 8) demonstrate that panel-level variance plays a significant role in enhancing the explanatory power of the model. We also conducted the Wald test for joint significance (H_0 : joint insignificance of regression coefficients). The results of the Wald test demonstrate that the regression equations are statistically significant.

Leser (1963) suggests the incorporation of income as the main predictor of household expenditure. Changes in income can be interpreted in terms of income elasticity, a robust microeconomic concept. In this context, two variables are employed to assess the impact of the sanction crisis of 2022: a dummy variable for sanctions $D_{(sanction)}$ and the income elasticity during for the group of households under the direct impact of sanction $\text{Log income} \times D_{(sanction)}$. Each regression equation includes the comprehensive set of control variables, which are explicitly described in Section 3. For the sake of simplicity, the following Tables 7–9 present only the estimates of the slope coefficients of logarithm of income (*Log income*) as the primary predictor of consumer spending. Additionally, we tabulate the slope coefficients for $D_{(sanction)}$ and $\text{Log income} \times D_{(sanction)}$. The marginal effects of income elasticity and the sanctions for expenditure on food at home and non-food items are presented in Table 7. Table 8 presents the results for spending on out-of-home food and alcohol, and Table 9 for services.

Table 7 depicts that the least elastic expenditure is that on food at home. This follows from the relatively high share of expenditure on this category is also confirmed in several papers (De Agostini, 2014). The value of the coefficient on the logarithm of income is between 0 and 1, indicating that these expenditure categories are normal¹⁵ (De Agostini, 2014). The expenditure on food at home are least elastic in households whose heads are employed in the public sector, agriculture and real sector. This is associated with the high importance of these expenditures in the family budget. Conversely, income elasticity among households whose heads are employed in the business and defence sectors is slightly higher. This is associated with the purchase of higher quality food items and greater interest in protein foods, as evidenced by Huang, Gale (2009). A similar conclusion was reached by Abdulai (2002), who found that food behaves as an essential commodity for all household groups, with income elasticities varying across groups. The proportion of expenditure on food at home declines as income increases, in accordance with Engel's law and the findings of Kotelnikova, Radaev (2017). There is no statistically significant change in income elasticity during the sanctions crisis in 2022. The dummy variable for sanctions is statistically significant for households, whose heads are employed in the business sector, indicating an increase in food expenditure in relative terms by 11.2 pp in sanctions-affected households compared to non-affected ones. For the whole sample the effect is opposite — in sanctions-affected households compared to non-affected ones a decrease by 1.8 pp of the share of food expenditure is observed. This is consistent with the findings of Zubarevich, who documents the greater impact of sanctions on the most developed and high-tech industries¹⁶.

The elasticity of expenditure on non-food items varies slightly but decreases with the importance of this category for the household group. At the same time, the share of non-food expenditure increases with income growth only in those households whose heads are employed in the public sector, as well as in the whole sample. The impact of sanctions can be observed in households

¹⁵ There are a number of exceptions, particularly in the significance of the income elasticity during sanctions ($\text{Log income} \times \text{dummy_sanction}$).

¹⁶ Economist N. Zubarevich: "This crisis is crushing the more developed".
<https://trends.rbc.ru/trends/innovation/637b27059a79477ea7e6a4a1>.

Table 7. Econometric assessment of the impact of sanction crisis — food and non-food expenditures

	Sector 1. Real sector	Sector 2. Agriculture	Sector 3. Public sector	Sector 4. Security and military	Sector 5. Business sector, IT	Whole sample
<i>Food (absolute values, roubles)</i>						
<i>Log income</i>	FE: R^2 overall 0.182 0.121*** (0.030)	RE: R^2 overall 0.395 0.123* (0.066)	FE: R^2 overall 0.210 0.094*** (0.028)	RE: R^2 overall 0.283 0.199*** (0.050)	RE: R^2 overall 0.323 0.211*** (0.064)	FE: R^2 overall 0.202 0.114*** (0.017)
$D_{(sanction)}$	0.091* (0.054)	0.005 (0.168)	-0.064 (0.048)	0.028 (0.066)	0.089 (0.130)	-0.015 (0.029)
<i>Log income</i>	FE: R^2 overall 0.182 0.120*** (0.030)	RE: R^2 overall 0.395 0.123* (0.066)	FE: R^2 overall 0.210 0.095*** (0.028)	RE: R^2 overall 0.283 0.199*** (0.051)	RE: R^2 overall 0.323 0.209*** (0.063)	FE: R^2 overall 0.202 0.114*** (0.017)
$Log\ income \times D_{(sanction)}$	0.001 (0.006)	-0.001 (0.019)	-0.007 (0.005)	0.003 (0.007)	0.008 (0.014)	-0.002 (0.003)
<i>Share of food in total expenditures</i>						
<i>Log income</i>	RE: R^2 overall 0.164 -5.065*** (0.585)	RE: R^2 overall 0.243 -3.114* (1.824)	FE: R^2 overall 0.118 -4.078*** (0.696)	RE: R^2 overall 0.233 -6.181*** (1.480)	RE: R^2 overall 0.234 -4.292** (1.837)	FE: R^2 overall 0.113 -4.230*** (0.473)
$D_{(sanction)}$	-2.097 (1.389)	-1.026 (5.905)	-2.119 (1.544)	-1.690 (2.383)	11.26** (4.375)	-1.827* (0.941)
<i>Non-food (absolute values, roubles)</i>						
<i>Log income</i>	FE: R^2 overall 0.269 0.267*** (0.044)	RE: R^2 overall 0.410 0.378*** (0.108)	FE: R^2 overall 0.305 0.328*** (0.040)	RE: R^2 overall 0.375 0.497*** (0.078)	FE: R^2 overall 0.222 0.099 (0.140)	FE: R^2 overall 0.306 0.304*** (0.026)
$D_{(sanction)}$	-0.007 (0.089)	-1.308 (1.045)	0.091 (0.088)	-0.017 (0.144)	-0.701* (0.281)	-0.011 (0.058)
<i>Log income</i>	FE: R^2 overall 0.269 0.267*** (0.044)	RE: R^2 overall 0.410 0.378*** (0.108)	FE: R^2 overall 0.305 0.327*** (0.040)	RE: R^2 overall 0.375 0.497*** (0.079)	FE: R^2 overall 0.219 0.109 (0.139)	FE: R^2 overall 0.306 0.304*** (0.026)
$Log\ income \times D_{(sanction)}$	-0.0002 (0.0010)	-0.150 (0.112)	0.010 (0.009)	-0.0003 (0.0150)	-0.085* (0.034)	-0.001 (0.006)
<i>Share of non-food in total expenditures</i>						
<i>Log income</i>	FE: R^2 overall 0.052 1.423* (0.791)	RE: R^2 overall 0.269 0.496 (1.715)	FE: R^2 overall 0.102 2.071*** (0.623)	RE: R^2 overall 0.237 1.078 (1.134)	RE: R^2 overall 0.255 2.232 (1.420)	FE: R^2 overall 0.087 1.493*** (0.436)
$D_{(sanction)}$	-3.766*** (1.432)	-4.097 (8.073)	1.562 (1.415)	1.213 (2.366)	-2.758 (3.147)	-0.391 (0.842)

Note. To estimate the change in the income elasticity during sanction crisis we use $Log\ income \times D_{(sanction)}$ in alternative model specification that does not include $D_{(sanction)}$ due to high multicollinearity. Clustered standard errors are given in parentheses (). Significance levels: * — 1%, ** — 5%, *** — 10%. For each model, an F -test was conducted, and the null hypothesis (joint insignificance of regression coefficients) was rejected.

Table 8. Econometric assessment of the impact of sanction crisis — out-of-home food and alcohol expenditures

	Sector 1. Real sector	Sector 2. Agriculture	Sector 3. Public sector	Sector 4. Security and military	Sector 5. Business sector, IT	Whole sample
	<i>Out-of-home food (absolute values, roubles)</i>					
<i>Log income</i>	Tobit RE 0.930*** (0.127)	Tobit RE 0.281 (0.314)	Tobit RE 0.916*** (0.099)	Tobit RE 0.844*** (0.291)	Tobit RE 0.426 (0.358)	Tobit RE 0.838*** (0.072)
<i>D_(sanction)</i>	-0.030 (0.300)	2.066* (1.114)	-0.351 (0.268)	0.744 (0.526)	-0.246 (0.849)	-0.027 (0.173)
<i>Log income</i>	Tobit RE 0.930*** (0.127)	Tobit RE 0.279 (0.314)	Tobit RE 0.919*** (0.099)	Tobit RE 0.826*** (0.291)	Tobit RE 0.431 (0.357)	Tobit RE 0.838*** (0.072)
<i>Log income</i> × <i>D_(sanction)</i>	-0.004 (0.031)	0.231* (0.122)	-0.042 (0.029)	0.087 (0.055)	-0.020 (0.090)	-0.004 (0.018)
	<i>Share of out-of-home food in total expenditures</i>					
<i>Log income</i>	Tobit RE 1.548*** (0.302)	Tobit RE 0.774 (0.736)	Tobit RE 1.622*** (0.247)	Tobit RE 1.357** (0.679)	Tobit RE 0.999 (0.850)	Tobit RE 1.454*** (0.174)
<i>D_(sanction)</i>	0.447 (0.707)	5.757* (2.614)	-0.914 (0.669)	1.370 (1.228)	-0.597 (2.022)	-0.050 (0.419)
	<i>Alcohol (absolute values, roubles)</i>					
<i>Log income</i>	Tobit RE 0.488*** (0.097)	Tobit RE -0.004 (0.239)	Tobit RE 0.431*** (0.073)	Tobit RE 0.487** (0.223)	Tobit RE -0.126 (0.272)	Tobit RE 0.407*** (0.054)
<i>D_(sanction)</i>	0.334 (0.217)	1.525** (0.767)	0.215 (0.190)	0.253 (0.388)	-0.861 (0.654)	0.214* (0.123)
<i>Log income</i>	Tobit RE 0.485 (0.097)	Tobit RE -0.005 (0.239)	Tobit RE 0.429*** (0.073)	Tobit RE 0.480** (0.223)	Tobit RE -0.109 (0.271)	Tobit RE 0.405*** (0.054)
<i>Log income</i> × <i>D_(sanction)</i>	0.039* (0.023)	0.168** (0.086)	0.026 (0.020)	0.031 (0.041)	-0.095 (0.070)	0.025* (0.013)
	<i>Share of alcohol in total expenditures</i>					
<i>Log income</i>	Tobit RE 0.295*** (0.098)	Tobit RE 0.003 (0.251)	Tobit RE 0.277*** (0.075)	Tobit RE 0.060 (0.201)	Tobit RE -0.380* (0.228)	Tobit RE 0.234*** (0.055)
<i>D_(sanction)</i>	0.148 (0.221)	1.980** (0.774)	0.157 (0.195)	0.005 (0.356)	-0.308 (0.541)	0.154 (0.126)

Note. To estimate the change in the income elasticity during sanction crisis we use $Log\ income \times D_{(sanction)}$ in alternative model specification that does not include $D_{(sanction)}$ due to high multicollinearity. Clustered standard errors are given in parentheses (). Significance levels: *** — 1%, ** — 5%, * — 10%. For each model, an LR test was conducted, and the null hypothesis (no individual effects) was rejected.

Table 9. Econometric assessment of the impact of sanction crisis — services expenditures

	Sector 1. Real sector		Sector 2. Agriculture		Sector 3. Public sector		Sector 4. Security and military		Sector 5. Business sector, IT		Whole sample
Dependent variable:	FE	RE	FE	RE	FE	RE	FE	RE	FE	RE	FE
Services (absolute values, roubles)	R^2 overall 0.127	R^2 overall 0.333	R^2 overall 0.126	R^2 overall 0.232	R^2 overall 0.114	R^2 overall 0.144					
<i>Log income</i>	0.280*** (0.077)	0.647** (0.212)	0.326*** (0.065)	0.594*** (0.125)	0.046 (0.279)	0.341*** (0.044)					
$D_{(sanction)}$	0.365** (0.161)	-1.166 (1.038)	0.181* (0.106)	0.118 (0.191)	-0.922* (0.469)	0.175** (0.079)					
Dependent variable:	FE	RE	FE	RE	FE	RE	FE	RE	FE	RE	FE
Services (absolute values, roubles)	R^2 overall 0.127	R^2 overall 0.333	R^2 overall 0.125	R^2 overall 0.232	R^2 overall 0.113	R^2 overall 0.144					
<i>Log income</i>	0.277*** (0.077)	0.648** (0.212)	0.325*** (0.065)	0.590*** (0.125)	0.062 (0.276)	0.340*** (0.044)					
$Log\ income \times D_{(sanction)}$	0.041** (0.017)	-0.135 (0.109)	0.019* (0.011)	0.016 (0.020)	-0.095* (0.049)	0.020** (0.008)					
Dependent variable:	FE	RE	FE	RE	FE	RE	FE	RE	FE	RE	FE
Services (share of services in total expenditures)	R^2 overall 0.127	R^2 overall 0.001	R^2 overall 0.006	R^2 overall 0.156	R^2 overall 0.185	R^2 overall 0.042					
<i>Log income</i>	2.851*** (0.513)	0.023 (1.725)	0.825 (0.647)	4.561*** (1.368)	2.548 (1.732)	1.530*** (0.433)					
$D_{(sanction)}$	2.978** (1.374)	-4.808 (2.953)	2.367* (1.270)	0.212 (2.551)	-7.062 (4.352)	1.986** (0.896)					

Note. To estimate the change in the income elasticity during sanction crisis we use $Log\ income \times D_{(sanction)}$ in alternative model specification that does not include $D_{(sanction)}$ due to high multicollinearity. Clustered standard errors are given in parentheses (). Significance levels: *** — 1%, ** — 5%, * — 10%. For each model, an *F*-test was conducted, and the null hypothesis (joint insignificance of regression coefficients) was rejected.

whose heads are employed in the real sector and the business sector. Thus, in the real sector, households affected by sanctions spend 3.7 pp less on non-food items than non-affected ones, as evidenced by the results of statistical tests. A similar pattern emerges in the business sector, where sanctions-affected households experience a 70% reduction in expenditure compared to non-affected ones. This corroborates the findings of Farzanegan et al. (2015), who suggest that sanctions have a greater impact on the most developed segments of the population. Notably, among the sanctions-affected group of households, whose heads are employed in the business sector, the income elasticity of this category is negative, indicating the lower income elasticity in the sanctions-affected group of households compared to non-affected ones.

The results from Table 8 indicate that the most elastic expenditure category is expenditure on food outside the home (elasticity ranging from 0.84 to 0.94), findings that are corroborated by the price elasticity estimates in Andreyeva et al. (2010). It can be observed that households whose heads are employed in agriculture and are subject to sanctions spend significantly more on food and alcohol than those not subject to sanctions. In absolute terms, the difference in expenditure on food outside the home is almost twofold, while in relative terms it is 5.76 pp. Similarly, expenditure on alcohol is 1.5 times higher in absolute terms and 1.98 pp higher in relative terms. These results are supported by both quantitative changes in consumption patterns and the existence of income differences between households that are employed in sub-sanctioned and non-sanctioned firms. Of interest is the fact that across the whole sample, alcohol expenditure in absolute terms increased by 21.3% in sanctions-affected households compared to those not affected by sanctions. Interestingly, that these findings are at odds with those of Pu et al. (2008) who have documented that low-income households tend to allocate the majority of their expenditure to tobacco and alcohol. The findings are consistent with changes in the expectations of household heads. Those groups in which expectations have deteriorated have been observed to increase spending on eating out and alcohol, which is in line with prior findings of Nash et al. (2005).

As previously noted, one of the most elastic categories of expenditures is services (Table 9). Interestingly, as income rises, expenditure on services in every household group increases, with the business sector being an exception, while the share of expenditure rises only among those employed in the defence sector, real sector and for the whole sample. The direct impact of sanctions is pronounced among households whose heads are employed in the real sector, public sector and for the whole sample. For instance, we observe an increase in services expenditures in absolute and relative terms among sanctions-affected households compared to non-affected ones. This, in turn, is rather a positive shift in consumption habits, as spending on services is not a proxy for poverty like rising food expenditure at home (Cutillo et al., 2022; Jacobs, 2009), nor is it an indicator of social disadvantage like rising alcohol expenditure. At the same time, the elasticity of expenditure on services for sanctions-affected households is higher than for those who are not directly affected by the sanctions.

The results of both statistical and econometric modelling indicate a paradoxical situation. Those social groups (in our case, Sector 5, consisting mainly of representatives of intellectual labour) which, in the periods before the sanctions, were considered to be the most affluent, were involved in the global world and Western-oriented professions are more adversely affected by Western sanctions than other professions (in our case, these are representatives of sectors 1–4), who often had no interest in import consumption and the global world. Similarly, Parviainen, Pyle (2025) utilised RLMS-HSE data to ascertain that the implementation of sanctions was associated with a disproportionate increase in life satisfaction and enhanced financial security among households. The authors

ascribed this phenomenon to the altered labour market and augmented government expenditure. It was found that the greatest increase in well-being occurred in regions where the industrial military-industrial complex was most prominent. The results confirm Hypothesis 3 about the most affluent and socially active segments of the population suffering the most from Western sanctions.

5.3. Robustness check

In order to ascertain the robustness of the estimates obtained in Sections 5.1 and 5.2, we utilize an alternative method for estimating the impact of sanctions on household expenditure, namely the Augmented Inverse-Probability Weighting (AIPW)¹⁷. The present method has been developed to estimate two separate models. Firstly, a propensity score model is used to predict the probability of receiving treatment (by Inverse Probability Weighting). Secondly, an outcome model is used to predict the outcome taking into account the influence of covariates. The combination of these approaches results in a property of double robustness, since the estimate remains consistent provided that at least one of the models is correct. This, in turn, reduces the sensitivity of the results to possible specification errors. In the context of measuring the impact of sanctions, it is particularly important to capture other covariates that determine consumption patterns (income, educational level of the head of the household, number of children), which also allows for the inclusion of AIPW in the outcome model. Furthermore, AIPW is increasingly utilised in the assessment of household welfare and food security (Kangmennaang et al., 2018). Table 10 presents Average Treatment Effects (ATE), comparing consumption expenditure in absolute and relative terms among sanction-affected and non-affected households.

The results of the AIPW assessment corroborate the primary conclusions of the study. Specifically, the analysis reveals a significant disparity in the expenditure patterns of sanction-affected and non-affected households. The former exhibits a reduced allocation of financial resources towards food expenditure at home compared to non-affected households whose heads are employed in the real and public sectors. Consistent with prior findings (see Table 7), the absolute expenditure on food at home is higher among sanctions-affected households than among those not affected, suggesting a shift towards a higher quality food basket.

A similar effect is observed in both absolute and relative expenditure on out-of-home food. Consequently, households whose heads are employed in the real, public and agricultural sectors and are under sanctions pressure have higher out-of-home food expenditures than households not directly affected by sanctions. The presence of higher out-of-home food expenditure (as the category with the highest income elasticity) indicates a more favourable position for sanctioned households from these groups. As previously observed, alcohol expenditures demonstrate minimal differences between sanctioned and non-sanctioned households, which also confirms the results of statistical analysis and the econometric models.

In accordance with the findings of preceding sections (Tables 7, 9), we observe higher expenditure on services among sanctioned households from the real and public sectors, and a lower share of non-food expenditure among sanctioned households from these groups compared to non-affected ones. Furthermore, the impact of sanctions on expenditure on services is evident in the same groups of households as in the linear modelling (Table 9), which lends the robustness of the modelling results.

¹⁷ To obtain the estimates of AIPW we apply *teffects aipw* package in Stata.

Table 10. AIPW estimates for sanctions-affected and non-affected households

Sector 1. Real sector	Sector 2. Agriculture	Sector 3. Public sector	Sector 4. Security and military	Sector 5. Business sector, IT	Whole sample
<i>Food (shares)</i>					
−2.583*** (0.773)	−4.292 (3.492)	−3.297*** (0.812)	2.031* (1.202)	0.671 (2.955)	−0.987 (1.170)
<i>Food (absolute values)</i>					
0.055** (0.028)	0.130 (0.197)	0.029 (0.028)	0.221*** (0.041)	0.112 (0.119)	0.110*** (0.041)
<i>Out-of-home food (shares)</i>					
1.413*** (0.524)	3.944** (1.942)	1.063** (0.510)	0.009 (0.833)	−1.126 (1.114)	0.858* (0.439)
<i>Out-of-home food (absolute values)</i>					
0.591*** (0.180)	1.902* (1.082)	0.379** (0.167)	−0.131 (0.296)	0.344 (0.578)	0.258 (0.190)
<i>Alcohol (shares)</i>					
−0.106 (0.138)	0.418 (0.610)	−0.036 (0.156)	−0.080 (0.190)	0.634 (0.459)	−0.412 (0.370)
<i>Alcohol (absolute values)</i>					
−0.016 (0.135)	0.755 (0.750)	0.102 (0.127)	0.164 (0.233)	0.422 (0.549)	−0.137 (0.243)
<i>Non-food (shares)</i>					
−0.939 (0.770)	0.216 (5.793)	−1.515** (0.685)	−2.489** (1.163)	1.178 (2.274)	−0.664 (1.041)
<i>Non-food (absolute values)</i>					
0.103** (0.040)	0.045 (0.325)	0.075 (0.052)	0.033 (0.070)	0.178 (0.110)	0.105** (0.050)
<i>Services (shares)</i>					
2.216*** (0.807)	−0.285 (2.373)	3.786*** (0.766)	0.529 (1.190)	−1.357 (2.093)	1.205 (1.499)
<i>Services (absolute values)</i>					
0.263*** (0.073)	0.314 (0.537)	0.341*** (0.073)	0.089 (0.152)	0.006 (0.259)	0.181* (0.099)

Note. Significance levels: *** — 1%, ** — 5%, * — 10%.

Statistically significant differences were not identified for the group of households whose heads are employed in the business sector and IT. This finding is somewhat at odds with the results of statistical analysis and linear models. The underlying reasons for this discrepancy are as follows. *First*, the relatively small number of observations within this group of households (around 700 in the linear models, around 650 in the AIPW), which reduces the power of the AIPW on small samples. *Second*, the correction for selection bias inherent in the AIPW (through propensity score estimation), which makes the results more robust, may have weakened the estimate of the impact of sanctions. *Third*, in most of the linear models (Tables 7–9), the statistical significance of the coefficient estimate for sanctions in this group of households was at the 10% level, which can be considered

borderline to statistically insignificant. Given the loss of statistical significance of the sanctions effect only for this group of households, it can be assumed that such differences are primarily caused by the specifics of the group rather than a problem in the approach used.

6. Conclusion

This study examines the impact of the sanction crisis on the structure of household consumption in Russia. The structure of household consumption encompasses five categories — expenditures on food at home, outside the home, alcohol, non-food products and services. For the quantitative analysis, data from the Russian Longitudinal Monitoring Survey was employed, with households divided into five clusters based on the employment sector of the household head. The study employed a range of statistical techniques, including the mean comparison and Kolmogorov–Smirnov tests, as well as regression models with fixed effects, random effects, Tobit random effects.

The principal conclusion of this paper is that the quantitative impact of the sanction crisis (redistribution of consumer expenditures and their shares) is considerably more pronounced than the qualitative change in consumer habits. This indicates a certain inertia of Russian households in consumer behaviour, as well as reluctance to significantly alter the consumption structure. Furthermore, households whose heads are employed in sub-sanctioned enterprises in the business services sector are more adversely affected than those employed in non-sanctioned enterprises in this sector. Among other groups of households whose heads are employed in the real sector, agriculture, public and defence sectors, the situation is the opposite: those whose heads are employed in sanctioned companies are more likely to benefit both in terms of income and consumption structure.

This paper tests three hypotheses that extensively (both quantitatively and qualitatively) reveal the impact of the sanction crisis of 2022. The results indicate that sanctions-affected households whose heads are employed in the real sector, public sector and defence sector have significantly higher incomes than those households not affected by the sanctions, while in other household groups the changes are not statistically significant. Hypothesis 2 on a shift towards food expenditure at home under the influence of sanctions could neither be confirmed nor refuted. The reason for this is that households in the real sector and the public sector decrease the share of expenditure on food at home, while households in the security sector increase the absolute expenditures in this category. Hypothesis 3 on the most affected household groups is confirmed. The results indicate that the group of households most affected by the impact of sanctions is the group of households from the business sector, which in turn is the most integrated in the global world.

This paper is subject to two main limitations. *First*, the relatively small number of observations in the business and defence sectors may affect the quality of the resulting estimates. Alternatively, data from the Household Budget Survey, which contains data on employment status, could be used instead, although this contains less information than the employment sector breakdown presented. Furthermore, the sample can be expanded as new data become available. *Second*, a rather rough estimation of falling into the group of sanctioned households. At the same time, due to the specificity of the research data, more precise alternatives (matching firms with household heads and sanctioned firms) are not possible. Given the presence of controls for the effect of the cumulative impact of sanctions, the econometric estimates obtained are sufficiently accurate.

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