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DISCUSSION PAPER

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ANALYSING RUSSIAN FOOD EXPENDITURE USING MICRO-DATA

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ABSTRACT

Since the beginning of transition, the level and structure of average food consumption and expenditure of Russian households has changed substantially. This development has gone together with a steep increase in the share of food in total expenditure. Notable differences with respect to food expenditure are observed between distinct household strata. In this paper, food demand of Russian households is investigated. For this purpose, households are classified by sociodemographic characteristics, and differences between food demand patterns of various household types are described using data of a Russian household survey of 1996. Russian food demand is econometrically estimated for seventeen food commodities belonging to five groups using a two-stage linear approximation of the Almost Ideal Demand System (LA/AIDS). Total expenditure allocation on food and non-food is analysed using Working's Engel model. The basic models are extended by sociodemographic factors. In a first step, unit values of food commodities are adjusted for quality differences and Probit analyses are carried out to analyse the decision to purchase food commodities. In a second step, the Engel model and the LA/AIDS are estimated applying the Generalised Heckman procedure in order to account for estimation bias introduced from zero expenditures. The estimates are used to calculate total expenditure and own price elasticities for different household groups. The results indicate that sociodemographic characteristics exert an important influence on the level and composition of food expenditure and on food demand elasticities. Therefore, if demand analysis shall contribute to the design of comprehensive food and social policies, not only average estimates for the population as a whole, but estimates for specific population groups should be considered.

ZUSAMENFASSUNG

Seit Beginn der Transformation haben sich das Niveau und die Struktur des durchschnittlichen Nahrungsmittelverbrauchs und der Ausgaben für Nahrungsmittel russischer Haushalte stark verändert. Gleichzeitig ist der Anteil des Nahrungsmittel- am Gesamtbudget der Haushalte deutlich angestiegen. Es sind wesentliche Unterschiede in den Ausgaben für Nahrungsmittel unterschiedlicher Haushaltsgruppen festzustellen. In diesem Papier wird die die Nahrungsmittelnachfrage russischer Haushalte untersucht. Diese werden nach soziodemographischen Charakteristika gruppiert und bestehende Unterschiede in Niveau und Struktur ihrer Nahrungsmittelausgaben heraus gearbeitet. Die Evidenz basiert auf Haushaltsbudgetdaten des Jahres 1996. Die Nahrungsmittelnachfrage wird mittels eines zweistufigen linearisierten Almost Ideal Demand Systems für siebzehn Nahrungsmittel ökonometrisch geschätzt. Die Analyse der Allokation der Gesamtausgaben auf Nahrungsmittel und Nicht-Nahrungsmittel geschieht unter Verwendung eines Engel Modells. Die Modelle werden um soziodemographische Faktoren erweitert. In einem ersten Schritt erfolgt eine Anpassung der als Preisproxy verwendeten Einheitswerte der Nahrungsmittel im Hinblick auf Qualitätsunterschiede zwischen den Aggregaten, und die Kaufentscheidung wird mit Probit Modellen untersucht. In einem zweiten Schritt werden die Engel und die AIDS Gleichungen unter Anwendung der Generalised Heckman Procedure geschätzt. Aus den geschätzten Parametern werden Ausgaben- und Preiselastizitäten für unterschiedliche Haushaltsgruppen berechnet. Die Ergebnisse zeigen, daß soziodemographische Faktoren das Niveau und die Struktur der Nahrungsmittelausgaben sowie der Nachfrageelastizitäten beeinflussen. Für die Gestaltung von Ernährungs- und Sozialpolitiken wäre es mithin wünschenswert, nicht nur durchschnittliche Schätzergebnisse zugrunde zu legen, sondern auch haushaltsspezifische Charakteristika zu berücksichtigen.

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LIST OF ABBREVIATIONS

LA/AIDS	Linear Approximation of the Almost Ideal Demand System
BMWi	German Federal Ministry of Economics
CIS	Commonwealth of Independent States
FAO	Food and Agriculture Organization
GDP	gross domestic product
OECD	Organization for Economic Co-operation and Development
OLS	ordinary least squares
RLMS	Russia Longitudinal Monitoring Survey
UNICEF	United Nations Children's Fund
USDA	United States Department of Agriculture

LIST OF SYMBOLS

Bold letters are used for vectors and matrices.

i	index for goods
j	index for goods
k	index for goods
h	index for households
n	number of goods
w_i	budget share of good i
x	expenditure
p_i	price of good i
q_i	quantity of good i
α_i	functional parameter of the AIDS demand function
β_i	functional parameter of the AIDS demand function
γ_{ij}	functional parameter of the AIDS demand function
P^S	Stone's price index
u	specific utility level
$\mathbf{p}$	vector of prices
$c(u,\mathbf{p})$	cost function
$\mathbf{z}$	vector of household characteristics
t	the superscript denotes a translated demand function, direct or indirect utility or cost function
d_i	translating parameter for good i depending on sociodemographic variables
$D_i(\mathbf{z})$	translating function for good i
R	number of household characteristics
r	index for household characteristics
ρ_{ir}	coefficient of the sociodemographic characteristic z_r in the demand equation of good i
uv_i	unit value of good i
b_{i0}	intercept of the quality-adjustment equation of good i
b_{ir}	coefficient in the unit value and the quality-adjustment equations of good i
ε_i	disturbance term
qe_i	quality effect in the unit value of good i
$uv_i^{adj.}$	quality-adjusted unit value of good i
MR_{hi}	inverse Mill's Ratio for household h and commodity i

E_{hi}	dependent variable in the Probit analysis of the decision of household *h* to purchase good *i*
$\mathbf{W_{hi}}$	vector of the regressors in the Probit analysis of the decision of household *h* to purchase good *i*
$\boldsymbol{\delta_i}$	parameter vector in the Probit equation analysing the decision to purchase
Φ	cumulated distribution function of the standard normal distribution
ϕ	standard normal distribution density function
$\boldsymbol{\beta_i}$	parameter vector in the Engel model
e_i	income elasticity of demand for good *i*

1 INTRODUCTION

The political and economic changes since the beginning of transition have strongly altered the living conditions of Russian households. The changes in the level and structure of their food consumption and expenditure reflect these developments. With the end of the socialist era, prices and income have become major determinants of food consumption. The price level has generally risen, price relations have changed heavily, and real incomes have declined while income inequality has increased. At the same time, the average share of food expenditure in total expenditures of private households has grown, reflecting households' budgetary restrictions. The overall decline in living standards in Russia has gone hand in hand with a substantial increase of income inequality and a higher incidence and severity of poverty. One feature that cannot be seen from aggregate data is that food consumption and expenditure vary considerably between different population groups. Not all Russian households are guaranteed food security. Another characteristic feature in Russia is that home-produced food products play a decisive role in the nutrition of many Russian households, and to a large extent supplement diets, at least of some population groups. In this context, an assessment of the impact of agricultural, food and social policies should rely not only on aggregate food demand data but consider specific sociodemographic characteristics of different households, and take into account households' home-production of food.

The aim of this paper is, firstly, to give an overview on food demand patterns of Russian households; secondly, it presents econometric estimates of expenditure and price elasticities of food demand for different sociodemographic household groups. In addition, some implications of the results are discussed.[1]

The paper starts with setting out the patterns of food demand in Russia, focusing on differences between various household types (Section 2). For this purpose, evidence is used from the Russia Longitudinal Monitoring Survey (RLMS), a cross-section data base of Russian households that was collected in 1996. In Section 3 the methodological framework is outlined. The fourth section is dedicated to the presentation of selected estimation results, and in Section 5 some implications of the results are discussed. The final section summarises the main issues of this study and identifies further areas of research.

2 PATTERNS OF RUSSIAN HOUSEHOLDS' FOOD DEMAND

2.1 Development of Average Food Demand in Russia Since the Beginning of Transition

The transition process from a centrally planned to a market economy required a radical change in the agricultural and food sector. Its key elements were the abolition of consumer subsidies, price and trade liberalisation and privatisation. In January 1992, at the beginning of the economic reform process, a far-reaching policy of price liberalisation was pursued and high consumer price subsidies have been abolished. As a consequence, food prices as well as prices for other consumer goods have risen sharply, leading to a fall in real income. Price relations between different food products have altered notably, because the extent of price increases has varied from product to product. Furthermore, it can be expected that at least for some

[1] This discussion paper is the revised version of a paper presented at a contributed session of the IX Congress of European Agricultural Economists in Warsaw, Poland, August 24 – 28, 1999.

household strata, changes of preferences are likely to have occurred.[2] As a result, the level and structure of per capita food consumption have changed heavily (see Table 1). In socialist times, Russian per capita food consumption was relatively high as compared to Western countries, especially considering the relatively low per capita GDP. Highly subsidised food prices led to an increased demand for food products, particularly for meat and milk products. During transition, per capita consumption of food products that are assumed to exhibit high income elasticities like meat and dairy products has decreased, while demand for staple foods such as potatoes and cereal products has increased. In 1996, as compared to the level in 1990, consumption of meat and dairy products has decreased by 32 % and almost 40 % respectively, whereas per capita consumption of potatoes and cereal products has risen by 19 % and 8 %, respectively. Consumption of fruits and vegetables, vegetable oil and sugar declined at the beginning of transition, but appears to have stabilised since 1993. Consumption of potatoes and cereal products rose during the first years after the reforms and then stabilised at 1993 levels.

Table 1: Food Consumption in Russia, 1985-1997 (kg per Capita and Year)

Products	**1985**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997[p]**	**Change[1)]**
Cereal products	119	119	120	125	124	124	124	127	128	7.56
Potatoes	109	106	112	118	127	122	124	124	126	18.87
Vegetables and melons	98	89	86	77	71	68	76	75	74	-16.85
Fruits and berries	46	35	35	32	29	28	29	28	28	-20.00
Meat and meat products	67	75	69	60	59	57	55	52	51	-32.00
Milk and dairy products	344	386	347	281	294	278	253	240	235	-39.12
Eggs (pieces)	299	297	288	263	250	236	214	200	200	-32.66
Sugar	45	47	38	30	31	31	32	34	32	-31.91
Vegetable oil	10	10	8	7	7	7	7	8	n.a.	-20.00

Notes: n.a.: not available. p.: provisional. 1) Percentage change from 1990 to 1997. Vegetable oil: percentage change from 1990 to 1996.

Source: OECD (1998, p. 57).

The described changes in food consumption have gone hand in hand with an overall decline in the intake of calories and other nutrients. The negative impact on nutrition has, however, been less pronounced than one would have expected, given the large decline in income (cf. UNICEF 1994, p. 75). The reason for this observation is that households have adopted different coping strategies to attenuate the impact of worsening economic conditions on nutrition. Nevertheless, diets are not adequate for a growing number of very poor households. For about 10 % of them, nutrient intake has fallen below dietary recommendations, and due to the drastically reduced consumption of milk, fresh fruits and vegetables, micro-nutrient deficiencies have worsened (cf. WILDNER 1997, p. 19; cf. UNICEF 1994, pp. 75-76, 79-81).

[2] See ELSNER and HARTMANN (1998) for a discussion of factors leading to changes in preferences.

Patterns of food purchases vary heavily between different population groups, a feature that cannot be seen from average data. In the following, evidence on existing differences between Russian households' food expenditure are presented using RLMS VII data.[3]

2.2 Disparities Between Russian Households

The structure of food demand largely reflects the living standard of households, and systematic differences between various household types with respect to the level and structure of food demand are obvious. In this chapter, the RLMS data base is shortly described (Section 2.2.1), and sociodemographic characteristics by which Russian households can be classified are introduced (Section 2.2.2), before outlining in more detail the existing differences in food purchases and expenditure between these household strata (Section 2.2.3).

2.2.1 Data Base

The empirical analysis of this paper is based on the Russia Longitudinal Monitoring Survey Round VII of 1996 (in the following denoted as RLMS VII).[4] This monitoring survey system was established as a collaboration between the Russian Federation, the University of North Carolina at Chapel Hill, and the World Bank.[5] The RLMS survey collected repeated cross-sectional household data to systematically monitor the effects of the Russian reforms on the economic welfare of households and individuals.

The RLMS survey had two phases. The first four surveys were conducted between August 1992 and January 1994, they are termed Rounds I to IV. In a second phase, data of an independent sample was collected in 1994, 1995, 1996, and 1998.[6] These are the Rounds V to VIII which represent the first nationally representative sample of the Russian Federation. Since entirely different samples were used and the survey designs differed slightly, the data sets from the first and second phase must not be merged and results from analyses of these two phases cannot be directly compared making an analysis over time using all rounds available not viable. The prior aim of this study is a comparative analysis of food demand of different household groups. This object justifies concentrating on the most recent round that has been available when the work on this project started in 1997, this is Round VII. An assessment of developments over time is not intended.

The sample used for the analyses comprises 2874 households. The structure of this sample is presented in Table 2. The structure of the data set satisfactorily corresponds to Russian reference data (cf. GOSKOMSTAT 1996, p. 16-19, 38-43, 49; 1997, p. 66, 117; 1998, p. 12).

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[3] There are several shortcomings in using RLMS expenditure data. It is beyond the scope of this paper to discuss them in more detail.

[4] For a closer description of the RLMS with respect to survey design, sampling, and sample evaluation, consult the documentation provided by the University of North Carolina at Chapel Hill on the World Wide Web and POPKIN ET AL. (1997, pp. 23-27).

[5] The World Bank was only involved in funding the first year of the RLMS and in partially funding the second year. Subsequent funding has come from the U.S. National Science Foundation, the National Institute of Health, and the Agency of International Development in separate grants to the University of North Carolina at Chapel Hill.

[6] Due to lack of funding, no survey has been carried out in 1997. It would have been desirable to use the data that have been collected in 1998, all the more because they reflect the changes that resulted from the Russian economic crises of summer 1998. However, the data have been made available not until August 1999, when the bulk of the work on this study already has been completed. Due to the immense work connected to the cleaning of household survey data, these more actual data could not have been employed.

Table 2: Structure of RLMS VII Data

Variable	Realisation	RLMS VII data in %
Settlement type	Urban	73.84
	Rural	26.16
Region	Moscow/St. Petersburg	7.72
	North/Northwest	6.61
	Central/Central Black-Earth	21.40
	Volga-Vaytski/Volga Basin	18.72
	North Caucasus	11.20
	Ural	15.21
	Western Siberia	9.57
	Eastern Siberia and Far East	9.57
Household size	1-2	42.87
	3-4	46.20
	5 and more	10.93
Employment status	Household head employed	94.68
	Household head not employed	5.32
Household production	Household uses land	66.67
	Household does not use land	33.33
	Average area of land used	0.12 ha

Source: RLMS VII data. Own calculations.

2.2.2 Sociodemographic Characteristics of Russian Households

Many sociodemographic variables are likely to influence households' food demand. Economic theory does not give many hints for selecting the factors to be introduced in a demand system. Literature with a background of social science and dealing with marketing seem to be more helpful in this respect.[7] However, empirical studies[8] on the influence of sociodemographic factors on demand can serve as a useful guide and have been considered for selecting sociodemographic factors for the purpose of this study. Table 3 presents the chosen household characteristics and introduces the respective variable labels.

For selecting sociodemographic variables, different considerations play an important role. One is that the sociodemographic variables introduced into the model should not be strongly correlated. In addition, there exists a considerable trade-off between accuracy and saving parameters. The higher the number of variables included, the more complex becomes the model. This does not only render the estimation procedure more complicated, but it causes comprehensive and meaningful examinations of the results to be increasingly difficult. Therefore, it seems justifiable to include only a limited number of sociodemographic characteristics and to restrict the number of distinct realisations considered. Originally, it was intended to include home-production of food by accounting for consumed quantities that have been produced by the households themselves. Unfortunately, data density is very low for most home-produced products, amounting for many food items to only about 20 % of all observations. Hence, due to data restrictions, only a dummy variable indicating whether the household produced plant or animal products is included as a proxy in the case of plant or animal products, respectively.

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[7] See for example SENAUER ET AL. (1991) for a comprehensive description of the changes in demographic factors, lifestyles and market segmentations and their implications on food markets and the food industry.

[8] See RAUNIKAR and HUANG (1987, pp. 186-215) for an overview of empirical analyses.

Table 3: Sociodemographic Characteristics for the Definition of Household Groups in Russia

Sociodemographic factor	Operational sociodemographic variable	Name of the variable	Type
Household size	Number of household members	*HHSIZ*	Discrete
Gender	Variable indicating whether the household is headed by a woman (reference household: no)	*FEMHH*	Dummy 0 no 1 yes
Social position of the household	Variable indicating whether the head of the household is unemployed (reference household: no)	*UNEMP*	Dummy 0 no 1 yes
	Variable indicating whether the head of the household has a higher education (reference household: no)	*HEDU*	Dummy 0 no 1 yes
Household production	Variable indicating whether the household used land for production of plant products or kept livestock for production of animal products (reference household: no)	*PROD*	Dummy 0 no 1 yes
Location	Settlement type (reference household: urban)	*RUR*	Dummy 0 urban 1 rural
	Region (reference household: metropolitan areas Moscow and St. Petersburg, *METROP*)	*NORTH* *CENTRAL* *VOLGA* *CAUCAS* *URAL* *WSIB* *FEAST*	Dummy North/Northwest Central/Central Black-Earth Volga-Vaytski/Volga Basin North Caucasus Ural Western Siberia Eastern Siberia and Far East
Relative economic status	Quartiles of total per capita expenditure (reference household: highest quartile, *TEXP4*)	*TEXP1* *TEXP2* *TEXP3*	Dummy quartile 1 (lowest) quartile 2 quartile 3

Source: Own table.

In the estimated empirical models, the dummy coefficients are differential coefficients which can only be interpreted with respect to the reference or base category. Consequently, it is very critical for the interpretation of empirical results to know how the values of the categories are assigned. The choice of the base category is dictated by a priori considerations and rather arbitrary.

The following hypotheses are at the base of the choice of the sociodemographic variables. It should be kept in mind that a priori expectations can not be formulated for all sociodemographic variables. In some cases, it is likely for plausibility reasons that the respective sociodemographic variables affect expenditure, but the concrete direction of this influence rests rather an empirical question whose answer is left to the empirical part of this study. Presumably, economies of scale do exist in household food expenditures because for many food products buying food in bulk is cheaper than purchasing smaller quantities. Therefore, it is expected that food budget shares decrease with household size but at a diminishing rate. In addition, the gender of the household head responsible for food purchases might differentially influence food provision decisions. The social position of the household is captured by two variables. The first one represents an educational effect. It is expected that the nutrition of an educated household is more equilibrated than that of a less educated one.

Therefore, it is supposed that food expenditures significantly differ between these households, and this feature is controlled for by the education variable. The second variable, the employment status, is thought to identify vulnerable groups. It is assumed that food expenditures are lower for unemployed than for employed households. Despite its possible correlation with total expenditure and household food production, the employment status might contain additional information. Food production is likely to lower food expenditure for all relevant food items, and it is expected that food purchases of producing households react more sensitive to price or income, i.e. expenditure changes because they are capable of substituting home-produced for purchased food. The location factor controls for differences in culture and lifestyle of the households that might occur between households living in urban or rural areas or in different regions, respectively. Another factor that is likely to explain differences in food purchases is the relative economic status of a household that can be represented by its classification to a certain total expenditure quartile. This variable can be seen as a shift factor accounting for differences in food purchase behaviour beyond the mere income effect captured by the expenditure variable.

Possible correlation between the sociodemographic variables has been investigated using Spearman's Rank Order Correlation Coefficients (see Annex 1). The highest mutual correlation exists between total expenditure and the total expenditure quartile dummies *TEXP1* and *TEXP4*, where the coefficient amounts to -0.75 and 0.75, respectively. Despite this correlation, the coefficients of these variables prove to be jointly statistically significant in almost all econometric estimations thus containing additional explanatory power.

2.2.3 Differences in Food Demand Between Sociodemographic Groups

Annex 2 shows the expenditure shares of the Food and Non-Food aggregates of the households in the RLMS VII sample. In addition to the overall average numbers, the figures are differentiated by household characteristics as outlined in the previous section. On average the respective shares of Food and of Non-Food amount to 50 % of total expenditure. This average number is roughly in line with figures reported in other studies or official statistical data. However, if home-produced food quantities are considered as imputed income and as additional food purchases, this results in a much higher average food expenditure share of about 70 % (cf. QAIM ET AL. 1997, p. 14, footnote 11).[9] The disaggregated numbers show that at least with regard to some household characteristics, substantial differences exist between various household strata. The food expenditure share is significantly higher for urban households (52 %) as compared with rural ones (46 %), similarly for households that cannot rely on home-produced food (53 %) in comparison with those households that produce food themselves (49 %). Also between the eight regions considerable differences in budget shares are obvious. The food budget share varies between 45 % and 55 % in the Volga-Vaytski / Volga Basin Region and in the North / North Western Region, respectively. Food expenditure shares by expenditure quartile decrease with rising total expenditure, and the difference between the lowest and the richest expenditure quartile, realising food expenditure shares of respectively 56 % and 36 %, is rather high.

[9] Due to data problems a similar concise analysis is not feasible using RLMS VII data. For a more qualitative assessment of the importance of food production by Russian households based on RLMS VII data see ELSNER (1999). Analyses focusing on household production of food in Russia are CLARKE ET AL. (1999) and SEETH (1997).

Table 4 introduces the variable labels for the commodities that are introduced in this study. Thy are necessary to read Annex 3. It shows average per capita food purchases in kg of different food commodities for the whole sample and differentiated by household type.

Table 4: Variable Labels of Products Considered in this Study

Stage 1	**Stage 2**	**Stage 3**
Aggregates	**Sub-Aggregates**	**Commodities**
Food – *FOOD*	Plant Products – *PLA* (I)	Bread – *BRD* (1)
		Rice and Grain - *GRN* (2)
		Flour and Pasta Products – *PAS* (3)
		Potatoes – *POT* (4)
		Vegetables – *VGE* (5)
		Fruits – *FRU* (6)
	Meat and Fish – *MEA* (II)	Beef and Veal – *CBF* (7)
		Pork – *POR* (8)
		Poultry – *POU* (9)
		Processed Meat and Sausages – *PRM* (10)
		Other Meat and Fish - *OMF* (11)
	Dairy Products and Eggs – *MLK* (III)	Fresh Milk - *MIL* (12)
		Milk Products (except Cheese) – *MIP* (13)
		Cheese – *CHE* (14)
		Eggs – *EGG* (15)
	Candies – *CAS* (IV)	Sugar – *SUG* (16)
		Sweets – *SWE* (17)
	Fats and Oils - *FAT* (V)	-
Non-Food – *NFO*	-	-

Source: Own table.

Important for the diet of Russian households are Plant Products and Milk Products.[10] Within the Plant Products Aggregate, especially Bread, but also Flour and Pasta Products and Vegetables have a high weight. With regard to Potatoes, it becomes evident that the RLMS VII purchase data heavily understate their annual per capita consumption. Only about 30 kg are purchased per year and capita, this is much less than indicated by other data sources that quantify per capita consumption of potatoes in the range of 120 to 140 kg.[11] This high difference mainly results from the high home-production of this food product. As the data collection was carried out in November, only shortly after the harvest of potatoes, presumably many are in stock and 88 % of all households in the sample report not having purchased this product in the respective week. For the interpretation of the results, one has to keep in mind this particularity. It is also of relevance for other commodities like for example vegetables, pork and poultry, although to a much lesser extent.[12] Notable differences in per capita food purchases exist between different household types and hint to the need of relying not only on average data when assessing food supply for households. Details can be seen in Annex 3, only one interesting feature should be pointed out here: Per capita food purchases of all aggregates and commodities increase with rising per capita total expenditure, demonstrating the high importance of all products also for those households that are better off.

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[10] Whenever the text refers to the specific food groups defined within this study, the respective names are written in capital letters to distinguish it from other sources.

[11] The higher number refers to a regional household survey (cf. QUAIM ET AL. 1997, p. 16, Table 4). Consumption data are published by FAO (1998) and OECD (1998, p. 57). Annex 4 illustrates this point by confronting quantities purchased and consumed of different data sources.

[12] See also Section 3.3.

Annex 5 shows the average expenditure share of the individual food commodities in the total food budget of different household strata. On average, Plant Products make up for the largest share of food expenditure (41 %), followed by Meat and Fish Products (27 %), Milk products and Eggs (13 %), Candies (9%), and Fats and Oils (9 %). The product exhibiting the smallest food expenditure share is Cheese (apart from Potatoes with the already mentioned shortcoming). One sees that for all food aggregates but Fats and Oils and for some disaggregated food commodities, notably Bread and Processed Meat, substantial disparities exist between household strata, albeit the spread is much less pronounced than for per capita purchases of food in physical quantities. Interestingly, for most commodities at the disaggregated level, there are only small differences in budget shares between household types. Given the large variation in per capita purchases in physical quantities, this reflects variations in absolute expenditures on food as well as in quality choices. Focusing only on the differences between the expenditure quartiles, it can be seen that for Plant Products taken as an aggregate and especially for the Bread component, the expenditure share sinks with increasing total expenditures. For the Meat and Fish Products aggregate and all its components, higher food expenditure shares are observed for the better off households. Similarly, the expenditure shares of the Milk Products and Eggs and of the Candies aggregate rise with increasing total per capita food expenditure, although not for all of the commodities in the respective group.

3 ECONOMETRIC ANALYSIS OF RUSSIAN HOUSEHOLDS' FOOD EXPENDITURE

After the description of food demand patterns of Russian households, an econometric analysis is undertaken in this chapter. A complete demand system allocating total expenditure of Russian households will be econometrically estimated. The first section of this chapter develops the model considering sociodemographic variables, the Sections 3.2 and 3.3 focus on special problems related to the use of cross-sectional data for demand analysis, and the last section shortly specifies the estimation procedure.

3.1 Specification of the Demand Model

3.1.1 Basic Model

The demand model used for the analysis is based on the linear approximation of the Almost Ideal Demand Sytem (LA/AIDS) introduced by DEATON and MUELLBAUER (1980a; 1980b, pp. 75-78). The LA/AIDS Marshallian demand functions of a household are derived from a PIGLOG cost function and have the form

$$(1) \qquad w_i = \alpha_i + \sum_{j=1}^{n} \gamma_{ij} \log p_j + \beta_i \log\left(x / P^S\right),$$

with the linear Stone price index P^S

$$(2) \qquad \log P^S = \sum_{k=1}^{n} w_k \log p_k \ .$$

w_i denotes the budget share of product *i*. Total expenditure is denominated as *x*, and p_i stands for the commodity prices.[13] The γ_{ij} and β_i parameters represent the changes in the budget

[13] The index *i* is used to denote one specific product, whereas *j* or *k* are counting indices.

shares caused by changes in prices and real expenditure. $\beta_i > 0$ implies a luxury good, $\beta_i < 0$ a necessity.

In order to assure the properties adding-up, homogeneity and symmetry of demand functions according to microeconomic demand theory (cf. DEATON and MUELLBAUER 1980b, pp. 43-44), the parameters have to be restricted as follows:

$$(3) \qquad \sum_j \alpha_j = 1, \qquad \sum_j \beta_j = 0, \qquad \sum_j \gamma_{ji} = 0, \qquad \gamma_{ij} = \gamma_{ji}.$$

Negativity, i.e. the concavity of the underlying cost function, is not automatically guaranteed by these parameter restrictions, but it can be imposed locally.[14] Economic interpretation of the parameters of the LA/AIDS function are only to some extent meaningful and they are not given here as the resulting elasticities are of superior interest for policy implications of the empirical analysis.

For the econometric application in this study, weak separability is assumed allowing to model a three-stage budgeting process. Food demand is estimated by applying a two-stage LA/AIDS on stages 2 and 3. At the upper stage, an Engel model is used to analyse the allocation of total expenditure on the aggregates Food and Non-Food (see Section 3.4.1).

that defined the variable labels of the commodities serves also to illustrate the three-stage budgeting process of allocation of total household expenditure.

3.1.2 Introducing Sociodemographic Characteristics

As the present study focuses on sociodemographic factors, the basic LA/AIDS has to be extended. This extension allows separating sociodemographic effects on demand from own- and cross-price as well as income, i.e. expenditure effects. Different ways of accounting for sociodemographic variables in complete demand systems have been proposed in the economic literature. The approach used in this study is demographic translation, which was employed first by POLLAK and WALES (1978; 1980). It modifies the original cost function $c(u,\mathbf{p})$ for a household by

$$(4) \qquad c^t(u,\mathbf{p},\mathbf{z}) = \sum_{j=1}^{n} p_j d_j + c(u,\mathbf{p}),$$

with $d_i = D_i(\mathbf{z})$ for each specific good i, the superscript t denoting the procedure of translating, the translating parameters d_i depending on the vector of demographic variables $\mathbf{z}$ in a functional form that has to be specified.[15] Translation assumes that the other parameters of the demand system do not depend upon the sociodemographic variables. It corresponds to adding a fix cost term $\sum_{j=1}^{n} p_j d_j$ to the original cost function. Thus, one can interpret the single d_i's for one specific product i as necessary or subsistence parameters depending on

[14] See GRINGS (1993) for an application.

[15] If the translating procedure is applied to a demand system that already has a translating parameter in the form of an intercept, then the translation approach assumes that this parameter of the original demand system depends on sociodemographic variables, and it does not introduce a separate translating parameter (cf. POLLAK and WALES 1978, p. 354).

sociodemographic variables.[16] They equal zero in the case of the reference household. When translating is used to introduce demographic characteristics into complete demand systems, changes in demographic variables are closely related to changes in total expenditure. A change in household characteristics leads to changes in d_i. Through changes in the fixed cost element, this will imply a reallocation of expenditure among the goods leaving total expenditure unchanged. Expenditures on some goods increase whereas expenditures on other goods decrease. Therefore, the sign of the effect on expenditure on a specific good cannot be inferred from the sign of its effect on d_i. Additionally, there is no presumption whether the change in a sociodemographic variable increases or decreases the values of the d_i's.

In order to completely specify the demand system, the translating function has to be formulated. Linear demographic translation is a convenient specification that has for each good i the form $D_i(\mathbf{z}) = \sum_{r=1}^{R} \rho_{ir} z_r$. It adds at most $n \times R$ parameters to the original demand system, i.e. one for each sociodemographic variable in each demand equation. In the present application, translating results in 16 additional parameters in each demand equation. The corresponding demand function for good i to be estimated is

$$(5) \qquad w_i = d_i + \alpha_i + \sum_{j=1}^{n} \gamma_{ij} \log p_j + \beta_i \log\left(x / P^S\right), \text{ with}$$

$$(6) \qquad \begin{aligned} d_i = {} & \rho_{i1} HHSIZ + \rho_{i2} FEMHH + \rho_{i3} UNEMP + \rho_{i4} HEDU + \rho_{i5} PROD + \rho_{i6} RUR \\ & + \rho_{i7} NORTH + \rho_{i8} CENTRAL + \rho_{i9} VOLGA + \rho_{i10} CAUCAS + \rho_{i11} URAL \\ & + \rho_{i12} WSIB + \rho_{i13} FEAST + \rho_{i14} TEXP1 + \rho_{i15} TEXP2 + \rho_{i16} TEXP3 \end{aligned}$$

and P^S is the original Stone price index introduced to avoid inherent non-linearities of the translated AIDS price index.[17]

3.2 Analysis of Unit Values and Adjustment for Household Related Factors

As prices at the household level have not been collected, unit values for all food commodities were imputed as proxies for prices by dividing expenditure on a commodity by the corresponding quantity purchased. According to neoclassical demand theory, only one price exists for a particular good at a specific point in time, and cross-sectional data would show no price variation at all. But in reality and especially in transition countries, large price variations are observed. A number of factors can cause these disparities. PRAIS and HOUTHAKKER (1955, p. 110) argue that the causes of cross-sectional price variations have to be identified in order to interpret correctly the effects of prices on demand. They identify price variation due to region, seasonal effects, price discrimination and quality effects such as services purchased with the commodity and quality differences caused by heterogeneous commodity aggregates. When the structure of demand is relatively constant, price variation can be attributed to different supply conditions and be used to identify commodity demand curves. In order to

[16] However, POLLAK and WALES (1978, p. 354, footnote 21) point out that this interpretation can be misleading. Firstly, because the estimated d_i's may be negative. Secondly, in some demand systems regularity conditions require the d_i's to be larger than the q_i's.

[17] Note that the price index resulting from translating the AIDS cost function is not only a mere price deflator, but it incorporates as well sociodemographic variables, thus implying a kind of 'sociodemographic deflation.' The use of this deflator would introduce additional nonlinearities.

correctly interpret the effects of prices in cross-sectional demand analyses, the causes of cross-sectional price variations have to be identified and only supply related price variations should be used to estimate the demand functions.

To assess the size of the demand related price effect, the unit value of the composite commodities is regressed on per capita food expenditure and selected sociodemographic characteristics. This assumes that household specific unit values are a function of sociodemographic, i.e. demand related, factors in addition to a price basis characterised by the intercept of the price function. The following price equations were estimated for the unit values of each commodity and sub-aggregate by linear regression including only data of purchasing households:

$$(7) \quad uv_i = b_{i0} + b_{i1}\,PCFEXP + b_{i2}\,HHSIZ + b_{i3}\,FEMHH + b_{i4}\,UNEMP + b_{i5}\,HEDU + b_{i6}\,PROD + b_{i7}\,RUR + b_{i8}\,NORTH + b_{i9}\,CENTRAL + b_{i10}\,VOLGA + b_{i11}\,CAUCAS + b_{i12}\,URAL + b_{i13}\,WSIB + b_{i14}\,FEAST + \varepsilon_i,$$

with uv_i indicating the unit value of commodity *i*, and *PCFEXP* standing for the weekly per capita monetary expenditure on food, both measured in thousand Roubles. The other characteristics were also originally included into the model, but as they exhibited no explanatory power they have been dropped. The reference household refers to an urban household headed by an employed male without higher education residing in the metropolitan areas Moscow or St. Petersburg. One obvious shortcoming of this specifications is that the regional dummy variables and the dummies indicating the settlement type, which have been introduced in order to account for systematic demand related influences on the unit values, do not only incorporate demand related factors but also those related to supply. The differential influence of demand and supply cannot be distinguished in this model.

The results of the estimated commodity unit value functions are given in Annex 6. 59.09 % of all estimated coefficients are significant at the 10 % level. With respect to the signs of the coefficients, per capita food expenditure exerts a positive influence on the unit value for all commodity aggregates but Flour and Pasta Products, where it is significantly negative. The results confirm the hypothesis that the unit value of the aggregate commodity, which can be interpreted as an indicator of quality of the composite good, rises with increasing per capita food expenditure of the household. Surprisingly and contrary to the expected sign, household size positively affects unit values in all but three cases, but the coefficients are not significant. As expected, a higher educational status of the household head has a positive effect on unit values in 15 of 22 cases, and when the household head is unemployed this reduces in all but 4 cases the unit values. When the household is headed by a female this increases the unit values in all but one case. Also as expected, the regional variables exhibit explanatory power for the variation of unit values in distinctly more than half of all cases. Not for all regions a unique direction of the influence on unit values can be detected for all commodities. Considering only statistically significant coefficients, the unit values in the Central, the Volga, the Caucasian and the Ural Regions are for most commodities lower than in the cities Moscow and St. Petersburg. In the Northern / Northwestern and Eastern / Far Eastern Regions and in Western Siberia, unit values are for most commodities higher than in the big cities. The household's location in an urban or rural area has no unequivocal influence on unit values and in most cases it is not statistically significant. Concentrating only on statistically significant variables, the unit value for Bread is significantly lower in rural areas, which might be contributed to the better availability of required agricultural raw products in rural areas and

comparatively easy processing, which can be done locally.[18] For the same reason, one would expect as well a lower unit value of Milk in rural areas, that is however not proven by the data. For Sugar, the unit values are as well significantly higher in rural areas than in urban ones. This might reflect that production of sugar requires special processing plants not widespread in most rural areas leading to higher prices due to the poor infrastructure and associated larger transportation costs. For other commodities, no uniform direction of differences in urban and rural unit values can be observed. This very likely results from the degree of aggregation that has been chosen due to data restrictions. The adjusted R^2s of the commodity unit value equations vary between 0.06 (Candies) and 0.85 (Sweets). The generally rather low values indicate that a substantial share of price variations is not explained by the model. Following the interpretation of COX and WOHLGENANT (1986, p. 914) this residual variations reflect non-systematic factors related to supply. Nevertheless, a non-negligible amount of price variation can be attributed to demand related factors. This should be taken into account by adjusting prices in order to properly identify the demand functions.

Following COX and WOHLGENANT (1986) adjusted prices, i.e. unit values $uv_i^{adj.}$ that do not contain demand related effects, can be derived from the above price equation (7) as

$$(8) \qquad uv_i^{adj.} = uv_i - \sum_{r=1}^{R} b_{ir} z_r = b_{i0} + \varepsilon_i$$

with $\sum_{r=1}^{R} b_{ir} z_r$ representing the estimated total influence of household related characteristics including the expenditure variable as introduced in equation (7). Adjusted unit values for each commodity can thus be generated using equation (8) by adding the estimated constant b_{i0} to the residuals derived from each commodity regression (cf. COX and WOHLGENANT 1986, p. 913). This means that adjusted prices are composed of two components: non-systematic supply related factors, represented by the residuals, and the price base, i.e. systematic supply related factors, that are represented by the intercept. Inversely taken, adjusted prices are obtained by subtracting from the observed unit values the household specific influences on unit values. This is done for each household, so that one accounts for the differential impact of influences of the different households in the survey. This procedure is common in the relevant literature.[19] The described approach to generate adjusted unit values admits that some of the adjusted unit values become negative. This could be interpreted in such a way that net of household specific influences, one would have to pay a certain sum to a particular household to incite it to purchase the good in question.

3.3 Treatment of Zero Expenditures

In the diary records of the RLMS zero expenditures are reported. Principally, different reasons are conceivable for zero expenditures on some product groups. Firstly, the survey period only covered one week and it can be argued that if the interview period had been longer, more items would have been purchased. This is particularly likely for storable food commodities where purchase infrequency is due to household inventory keeping. Secondly, and relevant in transition economies as Russia, the products in question might have been consumed but not purchased because they have been received as payment in kind or as a donation or because the

[18] This interpretation and the following, however, relate to factors linked to supply and not to demand.

[19] See for example PARK ET AL. (1996, p. 292) for a relative recent application of this methodology.

household has produced them itself. Thirdly, some items might not have been available during the reporting period due to seasonality or due to short supply in remote areas. This is relevant for a country as Russia, where international trade and national distribution channels do not function very well so that shortages of certain food commodities might occurr. Fourthly, households may decide for economic reasons not to purchase specific products because its price is perceived being too high or their incomes are too low, these are so called corner solutions. Lastly, some households might generally refuse to purchase specific product because they do not like to consume it. This is the case of non-preference.

In econometric estimations one has to explicitly deal with the problem of zero expenditures. If one includes the zero observations into econometric estimation without a special treatment, the dependent variable would exhibit a concentration of zero values and the estimation would lead to biased and inconsistent estimators (cf. INTRILIGATOR ET AL. 1996, p. 165), this means that the econometric model is misspecified. Likewise, only including the observations with dependent variables larger than zero would not lead to consistent estimators because the expected value of the residuals would not equal zero (cf. MADDALA 1977, p. 162). Furthermore, the problem of selection bias can arise if non-purchasing households behave systematically differently from purchasing households. As Annex 7 shows, low data density indeed is a problem when dealing with expenditure data of RLMS VII and has to be considered in the estimation procedure.

Econometric literature proposes different approaches to deal with the problem of zero observations. In the following, only the 'Generalised Heckman procedure' that is applied in this study is presented.[20] This approach goes back to HECKMAN (1979). It is a two-step estimation procedure that provides consistent and asymptotically efficient parameter estimates.[21] In this model the decision to purchase is separated from the decision on the quantity to buy. In the first step the probability that a given household will purchase a specific good is determined from a Probit regression using all available observations. This probability is used to compute inverse Mill's Ratios (MR_{hi}) for each household *h* and each commodity *i*. In the second step the inverse Mill's Ratios are used as an instrument that incorporates the censoring latent variables in the demand equations. The process can be mathematically characterised as follows (cf. HEIEN and DURHAM 1991, p. 292; cf. HEIEN and WESSELS 1990, p. 369-370).

In the Probit regression the dependent variable E_{hi} equals one if the expenditure is nonzero and the household *h* purchases the good *i*, and zero otherwise. The decision to purchase is modelled as a dichotomous choice problem, with $\mathbf{W_{hi}}$ a vector of regressors related to the purchase decision E_{hi}

$$(9) \qquad E_{hi} = f(\mathbf{W_{hi}}).$$

Only few theoretical work has been done so far regarding the concrete specification of the function determining this purchase decision. It can be assumed, however, that prices, expenditures as a proxy for income as well as sociodemographic variables play roles in the decision to buy similar to those in traditional demand analysis (cf. HEIEN and DURHAM 1991, p. 192), so that the purchase decision can be written as

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[20] More recent studies applying this approach within complete demand systems include HEIEN and DURHAM (1991), HEIEN and WESSELS (1990) and PARK ET AL. (1996).

[21] For an overview of studies dealing with the problem of censored dependent variables and further references see HEIEN and WESSELS (1990, pp. 366, 368-369, 371).

(10) $E_{hi} = f(\mathbf{p}, x, \mathbf{z})$

The model specification chosen for the Probit analysis for each food commodity includes as regressors total per capita food expenditure, a vector of selected sociodemographic characteristics including a variable indicating whether the household has used land or kept livestock for food production. In earlier model specifications the complete vector of sociodemographic variables has been incorporated as has been the vector of the adjusted unit value of the commodity in question and of the commodities that are members of the same food group. However, unit values never proved to be statistically significant, suggesting that the probability to purchase the commodity in question does not depend on the product prices, or more precisely on the adjusted unit values but on other factors, such as availability for example. Similarly, dummies indicating unemployment, a female or a higher educated household head have been dropped because they only proved to be statistically significant in the minority of cases. So, the final model specification for the Probit analysis is given by

(11) $E_{hi} = \delta_{i0} + \delta_{i1}\, PCFEXP + \delta_{i2}\, HHSIZ + \delta_{i3}\, PROD + \delta_{i4}\, RUR + \delta_{i5}\, NORTH + \delta_{i6}\, CENTRAL + \delta_{i7}\, VOLGA + \delta_{i8}\, CAUCAS + \delta_{i9}\, URAL + \delta_{i10}\, WSIB + \delta_{i11}\, FEAST + \varepsilon_i$

The equations were estimated by Probit regression including data of purchasing and non purchasing households for the expenditure on each commodity (Stage 3) and sub-aggregate (Stage 2). The results of the estimated functions are given in Annex 8. 71.59 % of all estimated coefficients are significant at the 10 % level. In general, the impact of most household characteristics on the probability to purchase is rather low. With respect to the signs of the coefficients, per capita food expenditure exerts a positive influence on the probability to purchase for all commodity aggregates but Other Meat and Fish. Household size positively affects the probability to purchase in all cases but one. As expected, the regional variables exhibit explanatory power for the probability to purchase in distinctly more than half of all cases. For most regions a unique direction of the influence on the probability to purchase can be detected for all commodities. Considering only statistically significant coefficients, the probabilities to purchase a commodity are in all regions but the Central Region for most commodities lower than in the cities Moscow and St. Petersburg. Interestingly, the probability to purchase the commodities included in this analysis is lower for rural than for urban households. This can be due to differences in preferences but as well to the fact that goods are less available in remote areas and that rural households keep larger inventories. Home-production of food, that is more frequent in rural areas, cannot be used to explain urban and rural differences, because the significant coefficients of the dummies indicating home-production are positive for all commodities. This implies that - contrary to intuition - the probability to purchase is higher for households that produced food themselves as compared to non-producing households.

From the Probit regressions the probability that a given household will purchase the good in question is determined for each household and each good.

(12) $pr(E_{hi} = 1) = \Phi(\mathbf{W_{hi}}\ddot{\mathbf{a}}_\mathbf{i})$

(13) $pr(E_{hi} = 0) = 1 - \Phi(\mathbf{W_{hi}}\ddot{\mathbf{a}}_\mathbf{i}),$

where $\mathbf{W_{hi}}$ represents the vector of the explaining exogenous variables included in the Probit model, and $\boldsymbol{\delta}_\mathbf{i}$ is the parameter vector related to these regressors. Φ denotes the cumulated

density function of the standard normal distribution. It is evaluated at the value of the Probit function using the estimated coefficients (cf. GRIFFITHS ET AL. 1993, p. 741).

Estimates of the inverse Mill's Ratio MR_{hi} are derived as follows:

(14) $$MR_{hi} = \frac{\phi(\mathbf{W_{hi}}\ddot{\mathbf{a}}_i)}{\Phi(\mathbf{W_{hi}}\ddot{\mathbf{a}}_i)} \qquad \text{for } E_{hi} = 1$$

(15) $$MR_{hi} = \frac{\phi(\mathbf{W_{hi}}\ddot{\mathbf{a}}_i)}{1-\Phi(\mathbf{W_{hi}}\ddot{\mathbf{a}}_i)} \qquad \text{for } E_{hi} = 0,$$

where ϕ represents the standard normal distribution density function evaluated at the value of the Probit function.

In the next stage, the inverse Mill's Ratio is included in the estimation of each demand function of the complete demand system as an exogenous variable, that means it is added to the model specified by equations (5) and (6). In this stage, all available observations are used for the analysis, i.e. zero and non-zero observations are included. Including the inverse Mill's Ratio combines the decision to buy with the decision on the quantity to purchase and permits accounting for any bias resulting from zero values in the dependent variable.

Including zero observations into the demand system to be estimated on the second stage requires price variables for these observations. As unit value observations are missing for the households that do not purchase a specific good, they have to be imputed. Since this study uses adjusted unit values, the procedure proposed by COX and WOHLGENANT (1986, p. 913) is followed. They set the adjusted price for non-purchasing households equal to the intercept term of the estimated equation (7) assuming that non-purchasing households face prices equal to the average price base for all households. The major disadvantage of this approach is that the imputed unit values would be identical for all non-purchasing households thus limiting unit value variability. It implies that supply-related price conditions are identical and that there are no unsystematic deviations from this price base for non-purchasing households. This is critical considering that the high amount of unexplained variance hints at substantial price variations not being demand related.

3.4 Model Estimation

3.4.1 Engel Model at Stage 1

At Stage 1, no LA/AIDS can be estimated, because RLMS VII data contain only expenditures on Non-Food items and no quantity, so that no unit values can be calculated. Therefore, expenditure and price elasticities for the Food and the Non-Food aggregates were estimated using an Engel relationship. Many different functional forms have been proposed in the literature. The one used here is based on WORKING (1943). It assumes a linear relationship between the budget share of each good and the logarithm of total expenditure. The theoretical advantage of this relationship is its consistency with a utility function and with the adding-up property of demand functions. As adding-up results from the linearity of the budget constraint, it is satisfied automatically if the model is estimated equation by equation using ordinary least squares. The model allows for luxuries, necessities, and inferior goods (cf. DEATON and MUELLBAUER 1980b, pp. 19, 75). One shortcoming is that observations exhibiting zero expenditures cannot be included into the analysis because the logarithm of zero is not defined. The elimination of these observations results in an increased estimate for

the expenditure elasticity. For that reason, the Generalised Heckman procedure as described in Section 3.3. was applied for the Engel curve estimation as well. The underlying Probit model corresponds to equation (11) used in Section 3.3 with the only difference that total per capita expenditure in thousand Roubles (*PCTEXP*) instead of food expenditure is used.

The results of the Probit analysis are shown in Annex 8. Also here, the coefficients have to be interpreted as differential coefficients with respect to the base category. Regarding the equation for the Food aggregate, only the variables total per capita expenditure, household size and the rural dummy show a statistically significant influence on the probability to purchase. The larger per capita total expenditure of the household, and the bigger the household, the higher is the probability to spend money on food products. Interestingly, the regional dummies exert no statistically significant influence on the purchase of food commodities taken as an aggregate. The dummy variable indicating whether the household produced food itself is not significant. This might be due to the high level of aggregation. Another explanation that might be brought forward is that home-producing households need to purchase at least some food commodities, in general they are not completely self supporting. For that reason, the respective variable has no explaining impact at this fairly high level of aggregation.

Based on the Probit analysis, the inverse Mill's Ratios were calculated as described in Section 3.3. After that, the Engel model was estimated including the inverse Mill's Ratios. As already said, a modified model based on WORKING (1943) is used for this purpose. Its basic form is extended to include households' demographic characteristics. Analogous to the demand equations to be estimated at Stages 2 and 3, the final model is formulated as follows:

$$
\begin{aligned}
(16) \quad w_i = {} & \beta_{i0} + \beta_{i1} \ln PCTEXP + \beta_{i2} HHSIZ + \beta_{i3} FEMHH + \beta_{i4} UNEMP + \beta_{i5} HEDU \\
& + \beta_{i6} PROD + \beta_{i7} RUR + \beta_{i8} NORTH + \beta_{i9} CENTRAL + \beta_{i10} VOLGA + \beta_{i11} CAUCAS \\
& + \beta_{i12} URAL + \beta_{i13} WSIB + \beta_{i14} FEAST + \beta_{i15} TEXP1 + \beta_{i16} TEXP2 + \beta_{i17} TEXP3 \\
& + \beta_{i18} MR_i + \varepsilon_i ,
\end{aligned}
$$

the household index h is ommitted here for convenience. The sign of β_{i1} determines whether the commodities are necessities or luxuries. When $\beta_{i1} > 0$, the commodities are luxuries, for $\beta_{i1} < 0$, they are necessities or even inferior. The coefficients allow assessing the impact of household characteristics on the budget share. They enter in a convenient linear specification like proposed for example by DEATON (1997, p. 231). For the extended model adding-up is not automatically satisfied, and unrestricted estimation of equation (16) for Food and Non-Food confirmed that adding-up is actually not fulfilled. As the focus of this study is on food demand and demand on the remaining aggregate is not analysed in more detail, the Engel curve for Food is estimated, and the coefficients of Non-Food are calculated residually using adding-up parameter restrictions, requiring that the β_{i0} and the β_{i1} sum up to unity and zero, respectively. Annex 9 shows the results of OLS estimation on the data of Russian households. As expected, Food is a necessity. Increases in household size decrease the budget share of food hinting at economies of scale of living together. It reduces food's budget share, if the household is headed by a female and/or if the household head is higher educated. The same holds when the household resides in a rural area or in the Northern and Northwestern Region. The coefficients of the other regions are not statistically significant at the 10 % level. If the household produces food itself, this goes hand in hand with a higher expenditure share of

food. This might reflect that producing households face tighter budgetary restrictions. The coefficients of the per capita total expenditure quartiles prove conforming with Engel's law that the food expenditure shares are higher for lower expenditure quartiles than for the reference category of households in the highest quartile. The expenditure share of the lowest quartile is, however, not significantly different from that of the highest one. In addition it is puzzling, that the augmenting effect of the quartile affiliation is more pronounced for higher quartiles (*TEXP3*) than for lower ones (*TEXP2* or *TEXP1*). Interestingly, the impact of the inverse Mill's Ratios is highly significant supporting the decision to include them despite the that the share of zero observations is small.

The price index of the Food aggregate has not been included in the Engel analysis. In order to derive the respective elasticity of demand, it is assumed that the compensated price, i.e. price index, elasticities for the aggregates Food and Non-Food equal zero. This implies that there is no substitution between the two aggregates once the expenditure effect is accounted for. From the Slutsky equation directly follows that the elasticity of demand for the Food aggregate with respect to its price index equals $-w_{FOOD}*e_{FOOD}$, that means the negative value of the product of its budget share in total expenditure and its expenditure elasticity.

3.4.2 Estimation of the LA/AIDS at Stages 2 and 3

A stochastic form of the LA/AIDS including sociodemographic variables is obtained by adding a disturbance term to the share form of each demand equation specified by equations (5) and (6) and augmented with the inverse Mill's Ratio. The vector of disturbances corresponding to the *h*th household is denoted $\varepsilon_h=(\varepsilon_{h1},..., \varepsilon_{hn})$ and it is assumed that $E(\varepsilon_h)=0$, that $E(\varepsilon_h\varepsilon_h')=\sigma^2$ for all *h* and that the ε_h are independently normally distributed. Because of the adding-up constraint, the dependent variables and the non-stochastic terms in the equations add up to unity for each household, therefore the covariance matrix of the residuals is singular. To avoid singularity of the variance-covariance matrix of the disturbance terms, one equation has to be dropped and the parameters of this equation can then be calculated using the parameter restrictions of the system. The last equation of every sub-system (see Table 3) is dropped. The parameter restrictions given in equation **(3)** are imposed, and in order to assure adding up, the translating parameters and the coefficients of the inverse Mill's Ratios are restricted to $\sum_{i=1}^{n} \rho_{ir} = 0$ for all *r* and $\sum_{i=1}^{n} \delta_i = 0$, respectively.[22]

The parameter estimates for each group are obtained using a multivariate non-linear least squares routine of RATS Version 4.[23] The estimates are given in Annex 9. One shortcoming in the estimation process is that observations exhibiting zero group expenditures or quality-adjusted prices that are negative or zero are not included because the logarithm of zero or negative values is not defined. This reduces the number of usable observations for the estimations.

As the elasticities are more easily interpreted and relevant for policy implications, the parameter estimates will not be presented in more detail but more space is dedicated to the discussion of resulting elasticities. In a multi-stage demand system the price change of a

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[22] Note that the negativity property is neither locally imposed nor checked for.

[23] The routine is also suitable for estimating complex linear models including a huge number of restrictions. These can be set up much easier than within the SUR routine of RATS (cf. DOAN 1995, p. 5-28).

commodity affects the group price index and thus the allocation of expenditures between groups. This change of group expenditures has to be taken into account when calculating price elasticities for a multi-stage demand system. These integrated elasticities have been calculated as described by DEATON (1975, p. 184).

4 ESTIMATION RESULTS

In this chapter, the average elasticity estimates and the household group specific estimates are presented and commented (Sections 4.1 and 4.2).

4.1 Average Elasticity Estimates and Comparison with Other Relevant Results

The **integrated expenditure elasticities** with respect to total expenditure are relatively high, ranging between 0.44 (Grain) and 1.45 (Milk Products) (see Annex 10). They are all positive implying that all commodities are normal goods. At the third, most disaggregated stage, Flour and Pasta Products, Potatoes, Vegetables, Fruits, Beef and Veal, Other Meat and Fish, Fresh Milk, Milk Products, and Cheese exhibit elasticities larger than 1 and are identified as luxuries. If real income of households will further decrease, in relative terms less expenditure will be allocated on these food commodities. The demand for Milk Products (1.45) and Vegetables (1.40) is most expenditure elastic, the demand for Grain (0.44) and Processed Meat (0.48) is the least elastic. Especially for Potatoes, the high expenditure elasticity is puzzling. It can be explained by the fact that the annual per capita purchases of potatoes reported by RLMS VII data are very low, on average only about 30 kg, and even lower for rural households and for home-producing households. Thus, the low purchased quantities very likely reflect the influence of household production on food demand. At this modest per capita demand level, a small increase of expenditure might result in a more than proportional rise in purchases of potatoes, but in absolute terms, this rise is not so large. The household group specific expenditure elasticities support that interpretation (see Section 4.2). Regarding Potatoes, Vegetables, Fruits, Fresh Milk, and Dairy Products that are frequently produced at the household level (cf. ELSNER 1999, p. 11), they are much higher for food producing households than for non producing ones. The relative order of magnitude of the expenditure elasticities seems reasonable.

The **integrated uncompensated own price elasticities** are negative for all commodities and for many of them demand reacts very elastic to price changes (see Annex 11). They range between -0.69 (Bread) and -1.80 (Flour and Pasta Products). Demand is generally more responsive to price changes than to changes in total expenditure. The largest uncompensated own price elasticities are calculated for Flour and Pasta Products (-1.80) and Potatoes (-1.61). The Food aggregate as a whole exhibits the lowest uncompensated own price elasticity(-0.41), followed by Bread (-0.69).

As required by demand theory, the **compensated own price elasticities** are negative for all commodities (see). For all commodities they are lower than the uncompensated ones (and also than the uncompensated within groups elasticities not given in this paper), suggesting that a rise or a fall in the price of the respective commodity would have considerable expenditure effects.

A comparison with other relevant econometric analyses on food demand of Russian households (QAIM ET AL. 1997, SHENG 1997) shows that the expenditure and own price elasticities that were estimated within this study are for almost all food items higher than the comparative values. However, this comparison is only of limited scope because the studies

differ distinctly with respect to the data base, demand models used and estimation techniques applied. QAIM ET AL. (1997) and SHENG (1997) use regional data instead of national data for overall Russia. In addition, they estimate no demand model in its proper sense but a kind of 'mixed model' because self produced food products are introduced into demand equations. In addition, QAIM ET AL. (1997, p. 33, Table 11) also present average market demand expenditure elasticities revealing that they are slightly larger than what they call consumption elasticities. Morreover, QAIM ET AL. (1997) use single demand equations and SHENG (1997) estimates a one-stage Linear Expenditure System, and neither incorporates sociodemographic variables. An additional difference is that quality-adjustment of prices leading to increased elasticities is not carried out within these studies because it proves unnecessary (cf. QAIM ET AL. 1997, p. 20-22). QAIM ET AL. (1997) account for estimation bias due to zero expenditures by introducing Mill's Ratio into their econometric model, this is omitted by SHENG (1997), who however choose a higher commodity aggregation thus to a certain extent circumventing the problem. Hence, as the various studies differ with respect to their aim and contribution to the analysis of Russian food demand, they should be seen as useful complementary investigations, focusing on the same subject from somewhat different perspectives.

A look at results of other studies on food demand in Central and Eastern European countries (for example BROSIG 1998a, 1998b) shows that the magnitude and the range of elasticities is roughly comparable. But similar differences to those mentioned in the previous paragraph exist between the different studies and since they do cover other countries, so that the comparability is limited.

4.2 Household Group Specific Elasticity Estimates

The elasticities for various household groups only partly reveal substantial differences in their reactions with respect to variations in the economic variables prices and income.

The group specific **integrated expenditure elasticities** are all positive implying that the commodities are normal goods for all household strata (see Annex 10). For single or couple households, expenditure elasticities are smaller than for larger households. The differential effect of female headed household as compared to those headed by males is negligible. Apart from the Non-Food aggregate, the expenditure elasticities for almost all commodities are lower for households with employed households heads than for those whose household head is not employed.With respect to the educational status of the household head it is observed that a higher education goes hand in hand with lower expenditure elasticities for Plant Products (Stage 3), Milk Products and Eggs, and with higher elasticities for Sugar, Sweets, Meat, Other Meat Products and Fish (all at Stage 3) as compared to households whose household heads are not higher educated. This might point at that higher educated households pay attention to a more equilibrated diet thus not easily adjusting consumption of nutritionally valuable products as vegetables, fruits and milk products. Interestingly, the expenditure elasticities show similar patterns for rural households and for households that report producing food themselves. For all food products expenditure elasticities are higher for rural households and for households producing their own food than for urban households and non-producing households, respectively, and in most cases considerably higher than the average elasticities. A possible explanation for this already has been brought forward in Section 4.1. Regarding the different regions it is noticeable that Western Siberia exhibits for almost all food commodities the highest expenditure elasticities, whereas they are lowest for many items in the big cities Moscow and St. Petersburg. The classification of expenditure elasticities by total expenditure quartiles shows a somewhat puzzling pattern. For the highest expenditure

quartile they are highest for the Food aggregate, for all product groups at the second stage, and for all commodities in the Meat and Fish group and in the Candies group at the third stage. For households in the second highest total expenditure quartile, the expenditure elasticities are lowest for almost all food items at whichever stage they are looked at. The households in the lowest expenditure quartile exhibit the highest total expenditure elasticities for nearly all products of the Plant Products and the Milk products and Eggs groups. The former are very important for the diet of this expenditure group and the respective households spend most of their food budget on them. For the other products they are in the middle of the range.

The **integrated uncompensated own price elasticities** are negative for all commodities and all household groups, meaning that changes in own prices have inverse impacts on quantities demanded (see Annex 11). The elasticities reflect differences between different household strata, although these differences are much less pronounced than for expenditure elasticities and furthermore lack obvious patterns. For the Food and the Non-Food aggregates household group specific uncompensated own price elasticities differ only negligibly, for the Food aggregate it is about –0.40, for the Non-Food aggregate about –0.60. The classification of own price elasticities by total expenditure quartiles exhibits a kind of uniform structure. For almost all food commodities but Fresh Milk, Bread, Fats and Oils (Stage 2) and Plant Products (Stage 2), the price elasticities of households belonging to the lowest total expenditure quartile are distinctly higher than for the other quartiles, showing that their purchase behaviour heavily reacts to price changes of the respective food commodities.

As demand theory requires, the **compensated own price elasticities** are negative for all commodities and all household classes (see Annex 12). In general, they are for all commodities and household types lower than the uncompensated elasticities, suggesting that a rise or a fall in the price of the respective commodity would have considerable expenditure effects.

5 IMPLICATIONS OF THE RESULTS

Food demand estimates do not only provide information to characterise food demand structure but offer a framework for assessing impacts of changes in determinants of food demand. A change in the price of a particular food will lead to adjustment in the food basket of households depending on the budget share of the relative food item and the relative price responses. Similarly, economic developments with respect to changes in the income, i.e. expenditure, level or in expenditure distribution can be evaluated. During this decade, extensive economic changes have occurred in Russia and have strongly deteriorated the living conditions of many Russian households. In this context it is desirable to assess the impact on households of the changed economic environment and of possible policy options suitable to mitigate unacceptable adverse effects on vulnerable groups. This is not only important for humanitarian reasons but also for strengthening the support of the transition process on the part of the population. This is a prerequisite for successful transition and political stability lying in the interest of Russia and the international community.

The transition process has entailed an enormous loss of real incomes for the Russian households. As a result, average food purchases and consumption declined, and for some household strata, especially the poorest, this contraction has been much more pronounced than average numbers indicate. The evidence presented here supports that substantial disparities exist between the quantities of food that different household groups purchase, and that

primarily poor households apparently do not dispose of an adequate market access to food. Even accounting for the supplementing role of households' home-produced food for nutrition, it is expected that diets are no longer adequate for all Russian households, and existing investigations[24] have confirmed this view. In this situation, regional governments try to administratively lower consumer prices through direct intervention in the food chain at the processing and trading level or by subsidising consumer prices (cf. OECD 1998, pp. 113-121, 137, 271-275) and these efforts are expected to grow in the medium term as the prospects for economic development in Russia show in the direction of further depression. Even if general price depressing policies immediately benefit consumers who depend on market provision of their food and who react very price sensitive, some shortcomings are connected with them. Firstly and as the results of this study have shown, not only the poorest households strongly react to price changes, but price elasticities are also fairly high for the wealthier households. As they spend an absolute larger amount of money on food, they would benefit more from general price subsidies. Therefore, it would be preferable to restrict price subsidies to poorer households with limited market access to food. This could be achieved by appropriate schemes, like food stamp programs, with a special emphasis on targeting the measure to those most in need of it. The estimated effects of sociodemographic variables on food purchases are helpful in determining whether such variables should be included in identifying target groups within the population and the appropriate instruments for improving their nutrition.[25] Targeting can contribute to lower the budgetary costs of such a measure, although administrative costs of such programs increase with the number of factors considered for determining eligible households. Secondly and more generally, price subsidies that depress the price level for agricultural products by artificially fixing prices below market levels, contribute to entailing or maintaining inefficiencies in various stages of food production, processing and distribution and thus hamper restructuring of the domestic agricultural and food sector.

Higher incomes would enable households to increase their expenditure. Given the quiet high total expenditure elasticities for food products this would enlarge households' market provision of food. This emphasises the need for sustained economic growth in improving the economic situation of households. Prerequisites for an economic upswing are the adoption of reform measures and a growth oriented policy together with overall economic stability. The positive impacts of such policies will not show up before the medium or long term. Already today, there are many losers of the reform process and many people are not and will not be in the position to participate sufficiently in economic growth. Where this is not possible, supplementing social policies are necessary that provide the neediest with basic means for life by income transfers. Due to budgetary and administrative restrictions, the leeway for application of such social policies is limited. Against this background, it is necessary to develop policy options that take into account the restrictions set by budgetary constraints and the administrative system in Russia.

The results strongly support that it is very important to consider the consumers' position in the design of agricultural and food policies. Those are frequently introduced with the aim to support domestic suppliers at the same time neglecting the effects on the demand side. The relatively high price elasticity of demand for many food items emphasises the importance of

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[24] See for example WILDNER (1997).

[25] Applied studies in this line have been presented for example by HEIEN ET AL. (1989) and LARAKI (1990).

food price changes for Russian households, and their reaction should be taken into account in the development of comprehensive agricultural and food policies.

Besides the social implications, the calculated elasticities also allow some conclusions on the food market development in Russia. In case income growth will be realised in the medium or longer term, food demand in Russia can be expected to increase largely. At the given state of the agricultural and food sector in Russia it is unlikely, that the domestic supply will prosper sufficiently to be able to satisfy an expanded demand. For this reason, imports will have to rise in order to cover domestic demand, particularly of the food items exhibiting high expenditure elasticities.

6 SUMMARY AND CONCLUSIONS

This paper has investigated food demand of Russian households. A two-stage LA/AIDS model has been econometrically estimated for seventeen food commodities in five groups, and total expenditure allocation has been analysed using Working's Engel model. The basic model was augmented by eight sociodemographic factors, corresponding to seventeen sociodemographic variables. In a first step, an adjustment of unit values of food products has been carried out in order to avoid biased estimates due to demand related factors reflected in unit values. In addition, a Generalised Heckman procedure was employed to account for biases introduced from zero expenditures on commodities. In the second step, the Engel Model and the LA/AIDS were estimated and the results were used to calculate own price and total expenditure elasticities for different household groups.

The figures indicate that sociodemographic characteristics have an influence on the level and composition of food expenditure and on demand elasticities, although this influence is not very strong for some variables. If demand analysis shall contribute to the design of comprehensive food and social policies, not only average estimates for the population as a whole, but estimates for specific population groups are of additional interest. If essential for adequate policy design, a larger amount of sociodemographic characteristics could be included. At any rate it would be desirable to more satisfactorily account for households' home-produced food, substantially contributing to nutrition of some Russian household strata. This would require more detailed and higher quality data at the micro-level and an extension of demand models in the direction of complete household models. In order to use demand models for assessing policies from the consumers' point of view, more than mere estimates of elasticities of demand are needed. It would be desirable to simulate the effects of applicable policies on nutrition and household welfare of different population strata.

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ANNEX

Annex 1: Spearman's Rank Order Correlation Coefficients Between the Sociodemographic Variables of Russian Households Used in the Empirical Model, 1996

	HHSIZ	FEMHH	UNEMP	HEDU	PROD	RUR	METROP	NORTH	CENTRAL	VOLGA	CAUCAS	URAL	WSIB	FEAST	TEXP1	TEXP2	TEXP3	TEXP4	PCFEXP	PCTEXP
HHSIZ	1.000	-0.118**	0.036	0.031	-0.149**	0.004	-0.010	-0.011	-0.066**	-0.034	0.108**	0.007	0.007	0.024	0.054**	0.022	0.004	-0.079**	-0.125**	-0.084**
FEMHH		1.000	0.034	0.098**	0.109**	-0.061**	0.031	0.028	-0.012	-0.017	-0.035	0.036	-0.017	-0.003	0.019	-0.064**	0.004	.041**	0.027	0.034
UNEMP			1.000	-0.010	0.023	-0.035	-0.011	0.024	0.001	-0.018	-0.025	0.025	-0.003	0.012	0.078**	-0.037**	-0.005	-0.037**	-0.028	-0.060**
HEDU				1.000	0.089**	-0.199**	0.168**	-0.049**	0.001	-0.016	-0.020	-0.061**	-0.024	0.030	-0.180**	-0.049**	0.063**	0.166**	0.180**	0.229**
PROD					1.000	-0.342**	0.141**	0.002	-0.004	-0.020	-0.076**	0.023	-0.057**	0.011	-0.099**	-0.015	-0.001	0.115**	0.163**	0.124**
RUR						1.000	-0.172**	0.039**	-0.023	-0.030	0.178**	-0.087**	0.059**	0.051**	0.242**	0.005	-0.072**	-0.175**	-0.330**	-0.273**
METROP							1.000	-0.077**	-0.151**	-0.139**	-0.103**	-0.123**	-0.094**	-0.094**	-0.149**	-0.056**	0.065**	0.140**	0.207**	0.203**
NORTH								1.000	-0.139**	-0.128**	-0.094**	-0.113**	-0.087**	-0.087**	-0.021	-0.024	-0.018	0.063**	0.038**	0.064**
CENTRAL									1.000	-0.250**	-0.185**	-0.221**	-0.170**	-0.170**	-0.011	0.004	0.041**	-0.035	0.041**	-0.001
VOLGA										1.000	-0.170**	-0.203**	-0.156**	-0.156**	0.113**	0.026	-0.028	-0.110**	-0.129**	-0.156**
CAUCAS											1.000	-0.150**	-0.116**	-0.116**	0.001	0.047**	-0.019	-0.029	-0.046**	-0.034
URAL												1.000	-0.138**	-0.138**	0.011	0.031	0.022	-0.063**	-0.037**	-0.043**
WSIB													1.000	-0.106**	0.039**	-0.038**	-0.062**	0.061**	-0.036	0.005
FEAST														1.000	-0.035	-0.019	-0.008	0.061**	0.024	0.053**
TEXP1															1.000	-0.333**	-0.333**	-0.333**	-0.626**	-0.750**
TEXP2																1.000	-0.334**	-0.333**	-0.134**	-0.250**
TEXP3																	1.000	-0.333**	0.255**	0.250**
TEXP4																		1.000	0.505**	0.750**
PCFEXP																			1.000	0.764**
PCTEXP																				1.000

Note: For the variable labels of the sociodemographic characteristics, see Table 3.
Source: RLMS VII data, own calculations.

Annex 2: Share of the Food Aggregate in Total Expenditure of Russian Households, 1996 (%)

	FOOD
Sample Average	0.50
HHSIZ 1-2	0.53
HHSIZ 3-4	0.48
HHSIZ 5-10	0.50
FEMHH - N	0.50
FEMHH - Y	0.50
UNEMP - N	0.50
UNEMP - Y	0.56
HEDU - N	0.51
HEDU - Y	0.46
PROD - N	0.53
PROD - Y	0.49
RUR - N	0.52
RUR - Y	0.46
METROP	0.48
NORTH	0.45
CENTRAL	0.54
VOLGA	0.55
CAUCAS	0.49
URAL	0.50
WSIB	0.43
FEAST	0.47
TEXP1	0.56
TEXP2	0.56
TEXP3	0.53
TEXP4	0.36

Note: For the variable labels of the sociodemographic characteristics, see Table 3.

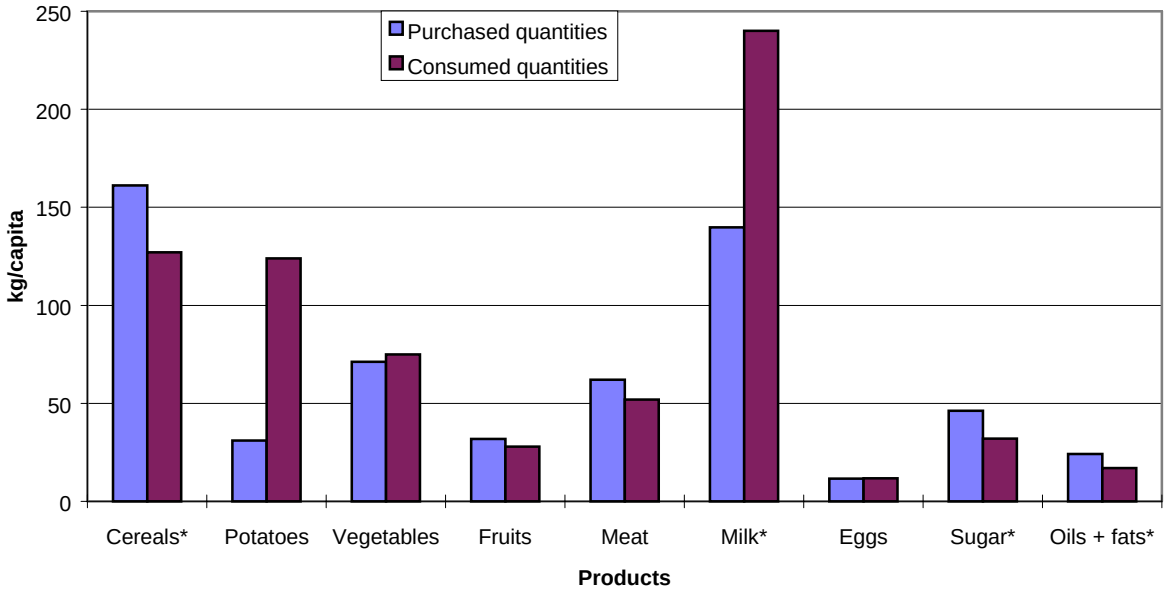
Source: RLMS VII data, own calculations.

Annex 3: Annual Per Capita Food Purchases of Russian Households, 1996 (kg)

		Stage 2					Stage 3						Stage 3					Stage 3				Stage 3	
		PLA	MEA	MLK	CAS	FAT	BRD	GRN	PAS	POT	VGE	FRU	CBF	POR	POU	PRM	OMF	MIL	MIP	CHE	EGG	SUG	SWE
		I	II	III	IV	V	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Sample Average		288.8	60.6	145.6	40.4	22.2	106.1	9.4	45.8	29.2	67.7	30.5	13.0	8.7	11.1	14.7	13.1	43.3	58.7	32.7	11.0	30.2	10.2
HHSIZ	HHSIZ 1-2	328.1	68.6	173.3	43.0	30.0	118.6	10.4	47.6	40.1	79.4	32.1	12.9	9.8	13.3	16.5	16.1	55.2	68.7	36.2	13.0	31.9	11.1
	HHSIZ 3-4	258.3	57.2	131.2	38.1	16.7	98.4	8.6	41.3	19.8	60.0	30.1	12.8	8.5	9.9	14.3	11.7	35.2	54.3	31.7	10.1	27.7	10.4
	HHSIZ 5-10	263.5	43.7	98.5	40.4	14.8	89.4	9.3	57.6	26.1	54.9	26.2	13.6	5.4	7.4	9.3	8.0	30.4	38.0	23.2	6.9	33.9	6.5
FEMHH	FEMHH - N	291.8	60.5	144.2	40.5	22.5	107.9	9.6	46.3	29.6	68.9	29.6	13.2	9.0	10.9	14.2	13.2	43.7	58.2	31.4	10.8	30.7	9.8
	FEMHH - Y	267.3	61.5	155.9	40.0	19.9	93.6	8.2	42.3	26.6	59.5	37.1	11.1	6.9	12.2	18.4	12.9	39.8	62.2	41.6	12.3	26.8	13.2
UNEMP	UNEMP - N	287.9	60.9	147.0	41.1	22.3	106.0	9.5	45.5	29.1	67.2	30.6	13.0	8.8	11.1	14.8	13.2	43.8	58.7	33.5	11.0	30.8	10.3
	UNEMP - Y	305.8	55.2	121.7	28.6	21.3	107.9	8.9	51.0	30.9	77.3	29.8	11.7	7.6	10.6	13.1	12.2	33.1	59.0	17.8	11.7	20.1	8.5
HEDU	HEDU - N	285.5	56.8	129.3	40.8	22.7	108.1	9.5	49.6	28.0	64.6	25.6	11.8	8.8	10.6	13.1	12.5	42.7	50.4	26.2	10.0	31.4	9.4
	HEDU - Y	301.2	74.7	206.2	39.2	20.4	98.6	9.1	31.6	33.7	79.4	48.7	17.2	8.5	12.8	20.6	15.6	45.4	89.3	56.8	14.7	25.8	13.4
PROD	PROD - N	346.8	69.0	167.8	34.9	22.2	99.5	9.3	34.7	55.0	105.6	42.7	13.7	8.0	15.3	17.4	14.6	45.5	68.4	39.5	14.3	23.7	11.3
	PROD - Y	259.9	56.4	134.6	43.2	22.2	109.4	9.5	51.4	16.3	48.8	24.5	12.6	9.1	9.0	13.3	12.4	42.1	53.8	29.3	9.4	33.5	9.7
RUR	RUR - N	310.0	71.2	176.0	38.6	22.8	106.2	9.5	38.5	36.4	82.0	37.4	15.2	10.0	13.4	17.3	15.2	48.9	72.9	40.0	14.1	27.8	10.8
	RUR - Y	229.2	30.6	60.1	45.7	20.5	105.9	9.2	66.4	8.9	27.4	11.3	6.6	4.9	4.4	7.3	7.4	27.2	18.5	11.9	2.4	36.9	8.8
REGION	METROP	389.1	89.0	260.2	44.9	24.7	93.1	11.8	28.3	88.8	108.3	58.9	16.2	4.7	17.5	26.9	23.7	47.5	118.1	77.6	17.0	30.0	14.9
	NORTH	300.0	62.3	123.2	41.6	20.7	117.8	6.2	36.3	20.0	93.1	26.6	7.0	3.1	16.2	19.1	16.9	36.3	50.7	25.8	10.5	32.6	9.0
	CENTRAL	264.3	66.8	164.9	38.5	26.8	120.3	11.5	33.6	21.6	49.0	28.2	11.9	8.3	12.2	20.7	13.7	55.6	56.1	40.7	12.5	28.6	9.9
	VOLGA	236.0	52.7	130.1	35.1	21.7	101.8	8.0	43.8	14.0	47.6	20.7	14.8	10.6	7.1	10.1	10.2	48.2	44.5	27.1	10.3	25.8	9.3
	CAUCAS	385.3	51.5	115.4	70.3	27.8	113.2	12.5	85.6	54.3	87.9	31.8	14.2	11.6	6.5	8.3	10.8	40.2	47.6	20.6	7.0	61.5	8.8
	URAL	266.0	58.5	127.1	36.3	18.3	96.8	8.0	47.5	21.9	67.0	24.8	14.1	8.7	9.9	12.9	12.8	36.5	54.1	24.5	12.0	24.9	11.4
	WSIB	294.5	54.8	142.0	28.1	15.9	95.1	8.0	46.8	19.2	89.4	35.9	15.1	9.0	11.9	10.0	8.8	40.6	62.3	28.4	10.7	19.1	9.1
	FEAST	276.1	57.8	124.4	34.8	17.8	102.6	8.2	47.2	26.3	54.9	36.9	7.8	9.3	14.0	12.3	14.3	24.4	66.3	25.7	8.1	23.8	11.0
TEXP	TEXP1	135.2	14.7	40.7	10.1	8.2	91.3	4.0	12.4	6.9	15.4	5.1	3.0	2.7	2.4	3.2	3.4	23.4	9.8	4.7	2.7	7.7	2.4
	TEXP2	246.4	44.4	108.4	25.0	21.1	111.2	10.0	33.6	25.4	47.1	19.2	9.2	6.5	7.9	10.1	10.7	41.7	39.8	17.6	9.4	18.8	6.1
	TEXP3	336.7	74.8	182.6	39.4	27.9	112.1	11.9	64.1	33.7	79.9	35.0	16.5	10.4	12.9	18.0	16.9	53.6	73.9	41.0	14.0	27.5	11.9
	TEXP4	437.0	108.5	250.9	87.3	31.6	109.8	11.8	73.1	50.8	128.6	62.8	23.1	15.2	21.1	27.5	21.6	54.3	111.2	67.5	17.9	66.7	20.5

Note: The variable labels of the sociodemographic characteristics and the products are explained in Table 3 and Table 4, respectively.
Source: RLMS VII data, own calculations.

Annex 4: Comparison of Russian Food Purchases and Food Consumption of Different Data Sources, 1996



Note: * Different composition of product aggregates.
Source: RLMS VII data, FAOStat (1998), OECD (1998, p. 57), own calculations.

Annex 5: Average Composition of Russian Households' Food Expenditure, 1996 (%)

		Stage 2					Stage 3						Stage 3					Stage 3				Stage 3	
		PLA	MEA	MLK	CAS	FAT	BRD	GRN	PAS	POT	VGE	FRU	CBF	POR	POU	PRM	OMF	MIL	MIP	CHE	EGG	SUG	SWE
		I	II	III	IV	V	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Sample Average		0.41	0.27	0.13	0.09	0.09	0.24	0.02	0.06	0.01	0.04	0.04	0.05	0.04	0.04	0.09	0.05	0.04	0.04	0.02	0.03	0.03	0.06
HHSIZ	**HHSIZ 1-2**	0.42	0.26	0.13	0.08	0.10	0.25	0.02	0.06	0.02	0.04	0.04	0.04	0.04	0.04	0.09	0.05	0.05	0.04	0.02	0.03	0.03	0.05
	HHSIZ 3-4	0.40	0.29	0.13	0.10	0.08	0.23	0.02	0.06	0.01	0.04	0.05	0.05	0.04	0.04	0.10	0.05	0.04	0.04	0.02	0.03	0.03	0.07
	HHSIZ 5-10	0.43	0.26	0.11	0.11	0.09	0.22	0.03	0.09	0.01	0.04	0.04	0.08	0.04	0.04	0.08	0.03	0.04	0.03	0.02	0.02	0.05	0.06
FEMHH	**FEMHH - N**	0.42	0.27	0.13	0.09	0.09	0.24	0.02	0.06	0.01	0.04	0.04	0.05	0.04	0.04	0.09	0.05	0.04	0.04	0.02	0.03	0.03	0.06
	FEMHH - Y	0.40	0.27	0.14	0.10	0.08	0.22	0.02	0.06	0.01	0.04	0.06	0.04	0.03	0.04	0.11	0.05	0.04	0.04	0.02	0.03	0.03	0.07
UNEMP	**UNEMP - N**	0.41	0.28	0.13	0.09	0.09	0.23	0.02	0.06	0.01	0.04	0.04	0.05	0.04	0.04	0.09	0.05	0.04	0.04	0.02	0.03	0.03	0.06
	UNEMP - Y	0.48	0.24	0.11	0.08	0.09	0.28	0.02	0.08	0.02	0.05	0.03	0.04	0.04	0.04	0.08	0.04	0.03	0.04	0.01	0.03	0.03	0.05
HEDU	**HEDU - N**	0.43	0.26	0.12	0.09	0.09	0.25	0.02	0.07	0.01	0.04	0.04	0.05	0.04	0.04	0.09	0.05	0.04	0.03	0.01	0.03	0.03	0.06
	HEDU - Y	0.35	0.31	0.16	0.09	0.08	0.17	0.01	0.04	0.01	0.05	0.06	0.07	0.03	0.04	0.12	0.05	0.04	0.06	0.03	0.04	0.02	0.07
PROD	**PROD - N**	0.40	0.29	0.15	0.08	0.08	0.19	0.02	0.05	0.02	0.06	0.06	0.05	0.03	0.05	0.11	0.05	0.04	0.05	0.02	0.04	0.02	0.06
	PROD - Y	0.42	0.26	0.12	0.10	0.10	0.26	0.02	0.07	0.01	0.03	0.04	0.05	0.04	0.03	0.09	0.05	0.04	0.04	0.02	0.03	0.03	0.06
RUR	**RUR - N**	0.38	0.30	0.15	0.08	0.09	0.20	0.02	0.05	0.02	0.05	0.05	0.06	0.04	0.05	0.10	0.05	0.05	0.05	0.02	0.04	0.02	0.06
	RUR - Y	0.52	0.18	0.06	0.13	0.11	0.35	0.03	0.10	0.00	0.02	0.02	0.03	0.03	0.02	0.06	0.04	0.03	0.01	0.01	0.01	0.05	0.08
REGION	**METROP**	0.34	0.31	0.19	0.09	0.07	0.12	0.01	0.03	0.03	0.07	0.07	0.06	0.02	0.05	0.13	0.06	0.04	0.07	0.03	0.03	0.02	0.07
	NORTH	0.44	0.26	0.12	0.08	0.09	0.27	0.01	0.05	0.01	0.06	0.04	0.02	0.01	0.06	0.11	0.06	0.04	0.04	0.02	0.03	0.03	0.05
	CENTRAL	0.39	0.30	0.14	0.08	0.10	0.25	0.02	0.06	0.01	0.03	0.03	0.05	0.04	0.04	0.12	0.05	0.05	0.03	0.02	0.03	0.03	0.05
	VOLGA	0.41	0.27	0.12	0.09	0.10	0.28	0.02	0.07	0.01	0.02	0.02	0.07	0.05	0.03	0.07	0.05	0.05	0.03	0.02	0.03	0.03	0.07
	CAUCAS	0.44	0.26	0.10	0.12	0.09	0.21	0.03	0.09	0.03	0.05	0.03	0.07	0.06	0.03	0.07	0.04	0.03	0.03	0.01	0.02	0.06	0.06
	URAL	0.39	0.29	0.13	0.10	0.09	0.21	0.02	0.06	0.01	0.05	0.05	0.06	0.04	0.04	0.10	0.05	0.05	0.04	0.02	0.03	0.02	0.07
	WSIB	0.46	0.24	0.13	0.10	0.08	0.24	0.02	0.07	0.01	0.06	0.06	0.05	0.04	0.04	0.07	0.04	0.04	0.05	0.01	0.03	0.03	0.07
	FEAST	0.48	0.22	0.12	0.09	0.09	0.27	0.02	0.07	0.01	0.04	0.07	0.02	0.03	0.04	0.08	0.05	0.03	0.05	0.01	0.02	0.02	0.06
TEXP	**TEXP1**	0.59	0.16	0.09	0.07	0.09	0.46	0.02	0.06	0.01	0.02	0.02	0.03	0.03	0.02	0.05	0.03	0.05	0.02	0.01	0.02	0.03	0.04
	TEXP2	0.41	0.27	0.13	0.08	0.10	0.24	0.03	0.07	0.02	0.03	0.03	0.05	0.04	0.04	0.09	0.05	0.04	0.04	0.01	0.04	0.03	0.06
	TEXP3	0.35	0.31	0.14	0.09	0.10	0.16	0.02	0.07	0.01	0.05	0.05	0.07	0.04	0.04	0.11	0.05	0.04	0.05	0.02	0.04	0.02	0.07
	TEXP4	0.32	0.34	0.15	0.12	0.08	0.12	0.01	0.05	0.01	0.06	0.06	0.06	0.05	0.05	0.13	0.05	0.03	0.06	0.02	0.03	0.04	0.08

Note: The variable labels of the sociodemographic characteristics and the products are explained in Table 3 and Table 4, respectively.
Source: RLMS VII data, own calculations.

Annex 6: Parameter Estimates of the Analysis of Unit Values of Russian Households' Food Purchases, 1996 I

Dependent variables:	Stage 2										Stage 3											
Unit values of food products	PLA		MEA		MLK		CAS		FAT		BRD		GRN		PAS		POT		VGE		FRU	
	I		II		III		IV		V		1		2		3		4		5		6	
Explaining variables	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
CONSTANT	3.32	28.00	12.64	14.19	1.21	3.67	10.83	9.20	10.07	11.03	3.83	37.04	4.11	21.13	5.08	18.91	1.24	11.33	2.45	8.34	4.55	10.71
PCFEXP	0.00	6.48	0.02	7.04	0.00	0.84	0.02	3.28	0.01	1.81	0.01	9.30	0.00	3.96	0.00	-2.35	0.00	3.76	0.01	5.89	0.01	2.75
HHSIZ	0.04	2.07	0.28	3.32	0.05	1.59	0.47	2.63	0.10	1.16	0.02	1.55	0.07	2.58	-0.05	-1.14	0.00	0.08	0.03	0.64	-0.02	-0.26
FEMHH	0.20	2.73	0.96	2.83	0.21	1.73	1.60	2.29	0.38	1.04	0.07	1.13	0.10	0.76	-0.08	-0.49	0.06	0.76	0.57	3.04	0.27	1.04
UNEMP	-0.19	-1.82	-1.78	-3.56	0.12	0.69	-1.36	-1.34	-0.93	-1.77	-0.07	-0.82	-0.31	-1.82	-0.16	-0.73	0.02	0.17	0.11	0.41	-0.08	-0.18
HEDU	0.24	4.21	1.24	4.74	-0.12	-1.31	2.23	4.07	0.82	2.85	0.16	3.21	-0.15	-1.67	0.34	2.66	-0.01	-0.10	0.26	1.82	0.38	1.91
HEDU	0.24	4.21	1.24	4.74	-0.12	-1.31	2.23	4.07	0.82	2.85	0.16	3.21	-0.15	-1.67	0.34	2.66	-0.01	-0.10	0.26	1.82	0.38	1.91
RUR	-0.13	-2.48	-0.25	-0.70	0.90	6.51	0.18	0.34	0.31	0.86	0.12	2.50	-0.01	-0.11	0.34	2.88	0.04	0.59	-0.27	-1.90	0.03	0.17
NORTH	0.32	2.63	-0.20	-0.35	1.10	5.42	0.97	0.86	2.53	4.43	-0.03	-0.30	0.19	0.96	0.53	1.95	0.54	4.10	0.24	0.86	0.82	2.00
CENTRAL	-0.35	-3.58	-0.58	-1.38	-0.35	-2.29	-1.25	-1.41	0.22	0.49	-0.85	-10.00	-0.26	-1.73	0.16	0.80	-0.26	-3.16	-0.96	-4.25	-0.34	-1.08
VOLGA	-0.35	-3.47	-0.96	-2.14	-0.47	-2.93	-2.05	-2.20	0.09	0.18	-0.90	-10.26	-0.27	-1.69	-0.02	-0.07	-0.16	-1.76	-1.33	-5.47	-0.23	-0.68
CAUCAS	-1.14	-10.22	-1.47	-2.93	-0.33	-1.78	-2.52	-2.40	0.24	0.45	-1.61	-16.49	-0.20	-1.25	-0.47	-1.97	0.26	3.13	-1.12	-4.40	-1.77	-4.36
URAL	-0.13	-1.29	-0.48	-1.07	-0.11	-0.66	-0.05	-0.05	1.35	2.77	-0.72	-8.02	0.17	1.05	0.12	0.54	-0.12	-1.40	-0.29	-1.22	0.83	2.53
WSIB	-0.08	-0.67	1.04	1.99	0.18	0.98	2.58	2.39	3.36	5.87	-0.92	-9.22	0.83	4.53	0.76	2.98	0.41	3.68	0.04	0.15	0.67	1.83
FEAST	0.56	4.96	1.04	2.02	0.66	3.54	1.90	1.81	3.03	5.51	-0.13	-1.30	0.45	2.54	1.74	7.26	0.46	4.97	0.00	0.00	1.43	4.07
R^2	0.1435		0.0696		0.0853		0.0616		0.0719		0.2343		0.1198		0.0896		0.2659		0.1272		0.0706	
Number of HH included	2731		2142		2007		1667		1776		2631		749		1341		335		983		1208	

Note: The variable labels of the sociodemographic characteristics and the products are explained in Table 3 and Table 4, respectively.
The critical value of the t-statistics lies around 2 or -2, respectively.

Source: RLMS VII data, own calculations.

Annex 6: Parameter Estimates of the Analysis of Unit Values of Russian Households' Food Purchases, 1996 II

Dependent variables:	Stage 3										Stage 3								Stage 3			
Unit values of food products	CBF 7		POR 8		POU 9		PRM 10		OMF 11		MIL 12		MIP 13		CHE 14		EGG 15		SUG 16		SWE 17	
Explaining variables	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
CONSTANT	9.87	8.03	10.15	6.91	10.24	13.78	16.14	11.35	10.50	7.56	1.79	9.24	1.63	3.55	1.40	9.05	6.42	14.11	3.15	26.13	16.46	13.94
PCFEXP	0.03	9.20	0.03	6.78	0.01	6.15	0.04	8.90	0.02	4.11	0.01	11.25	0.00	3.18	0.00	5.58	0.01	7.60	0.00	0.66	0.02	4.16
HHSIZ	0.53	5.00	0.33	2.25	0.14	2.26	0.38	2.71	0.37	2.63	0.12	6.68	0.05	1.21	0.00	0.26	0.13	4.09	-0.01	-0.36	0.55	3.03
FEMHH	0.56	1.19	0.72	1.19	0.35	1.48	0.11	0.21	1.30	2.42	0.04	0.51	0.21	1.30	0.04	0.79	0.31	2.44	0.04	0.48	1.20	1.76
UNEMP	-1.50	-2.37	-1.27	-1.62	-0.36	-1.08	-1.88	-2.34	-1.97	-2.58	-0.13	-1.14	0.10	0.42	-0.17	-1.86	-0.35	-1.97	-0.04	-0.41	-0.12	-0.12
HEDU	0.79	2.51	1.58	3.70	0.21	1.18	1.12	2.89	1.46	3.60	0.18	3.25	0.01	0.10	0.06	1.62	-0.03	-0.36	0.05	0.82	1.31	2.49
HEDU	0.79	2.51	1.58	3.70	0.21	1.18	1.12	2.89	1.46	3.60	0.18	3.25	0.01	0.10	0.06	1.62	-0.03	-0.36	0.05	0.82	1.31	2.49
RUR	0.60	1.17	1.79	1.40	0.02	0.05	-0.31	-0.53	-0.44	-0.75	0.30	3.66	0.42	2.14	0.10	1.46	0.26	1.29	0.05	0.83	1.16	2.29
NORTH	-0.97	-1.16	-1.28	-1.70	-0.81	-2.95	0.41	0.50	-0.23	-0.29	-0.02	-0.18	0.55	2.23	0.12	1.43	1.12	5.52	0.33	2.94	1.64	1.46
CENTRAL	-0.59	-1.16	-2.47	-3.21	-0.05	-0.16	-0.87	-1.45	-1.05	-1.76	-0.88	-9.84	-0.36	-1.99	-0.21	-3.93	-0.15	-1.03	-0.03	-0.28	-2.44	-2.82
VOLGA	-2.16	-4.15	-1.27	-1.54	0.09	0.22	0.15	0.23	-1.01	-1.53	-1.26	-13.26	-0.90	-4.55	-0.27	-4.53	-0.36	-2.26	-0.23	-2.34	-4.09	-4.53
CAUCAS	-2.90	-4.54	-1.85	-2.33	-0.49	-1.65	0.14	0.18	-3.24	-4.16	-1.08	-9.81	-0.92	-3.79	-0.14	-1.78	0.81	4.20	-0.16	-1.48	-3.69	-3.53
URAL	-2.58	-4.58	0.70	0.78	-0.12	-0.34	1.38	2.08	-1.17	-1.76	-0.73	-7.34	-0.64	-3.22	-0.03	-0.39	-0.67	-4.15	0.13	1.18	-3.17	-3.49
WSIB	-0.61	-0.96	0.11	0.12	-0.34	-1.03	3.27	4.06	0.57	0.69	-0.37	-3.25	0.06	0.25	0.15	2.00	0.33	1.78	0.46	3.67	0.33	0.32
FEAST	1.84	2.50	1.03	1.86	0.03	0.09	6.04	7.83	-1.88	-2.47	0.03	0.25	0.31	1.40	0.27	3.61	1.40	7.13	1.13	9.91	0.09	0.09
R^2	0.2525		0.2151		0.0685		0.1548		0.0585		0.3327		0.0764		0.1909		0.2260		0.2468		0.8458	
Number of HH included	740		542		822		1454		1115		1440		1250		646		1097		661		1350	

Note: The variable labels of the sociodemographic characteristics and the products are explained in Table 3 and Table 4, respectively.
The critical value of the t-statistics lies around 2 or -2, respectively.

Source: RLMS VII data, own calculations.

Annex 7: Density of RLMS VII Expenditure Data, 1996

			Number of zero observations	Data density
	PCTEXP		28	99.03
Stage 1	**PCFEXP**		98	96.59
	PCNFEXP		102	96.45
Stage 2	**PLA**	**I**	143	95.02
	MEA	**II**	732	74.53
	MLK	**III**	867	69.83
	CAS	**IV**	1207	58.00
	FAT	**V**	1098	61.80
Stage 3	**BRD**	**1**	243	91.54
	GRN	**2**	2125	26.06
	PAS	**3**	1533	46.66
	POT	**4**	2539	11.66
	VGE	**5**	1891	34.20
	FRU	**6**	1666	42.03
Stage 3	**CBF**	**7**	2143	25.43
	POR	**8**	2332	18.86
	POU	**9**	2052	28.60
	PRM	**10**	1419	50.63
	OMF	**11**	1759	38.80
Stage 3	**MIL**	**12**	1434	50.10
	MIP	**13**	1624	43.49
	CHE	**14**	2228	22.48
	EGG	**15**	1777	38.17
Stage 3	**SUG**	**16**	2213	23.00
	SWE	**17**	1524	46.97

Note: The variable labels of the sociodemographic characteristics and the products are explained in Table 3 and Table 4, respectively.

Source: RLMS VII data, own calculations.

Annex 8: Parameter Estimates of the Probit Analysis of Russian Households' Food Purchases, 1996 I

Dependent variables:	Stage 1				Stage 2										Stage 3											
Decision to purchase	FOOD		NFO		PLA		MEA		MLK		CAS		FAT		BRD		GRN		PAS		POT		VGE		FRU	
					I		II		III		IV		V		1		2		3		4		5		6	
Explaining variables	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
CONSTANT	6.56	0.00	5.68	20.11	6.09	0.00	-1.40	-5.09	-1.47	-5.95	-1.20	-8.69	-0.95	-4.73	1.87	4.92	-1.49	-11.5	-1.26	-10.1	-1.45	-9.43	-1.18	-8.50	-0.91	-6.70
PCFEXP [1)]	0.01	7.42	0.03	10.14	0.05	11.03	0.04	22.60	0.02	17.86	0.02	20.28	0.02	18.49	0.01	6.96	0.01	10.57	0.01	15.64	0.01	8.55	0.01	18.15	0.01	17.28
HHSIZ	0.12	2.89	0.40	7.43	0.15	3.83	0.23	9.68	0.13	5.94	0.26	13.27	0.15	7.79	0.02	0.65	0.16	8.67	0.19	10.54	0.05	2.09	0.13	6.51	0.21	10.42
PROD	0.13	0.67	-0.16	-1.01	0.57	2.88	0.33	3.78	0.77	9.56	0.06	1.01	0.16	2.07	0.20	1.82	-0.03	-0.51	0.16	2.92	0.86	11.30	0.78	12.75	0.37	6.20
RUR	-1.19	-8.00	-0.45	-3.13	-0.83	-6.35	-0.58	-6.76	-0.82	-10.3	0.11	1.69	-0.11	-1.47	-0.87	-9.96	-0.04	-0.56	-0.03	-0.45	-0.64	-4.74	-0.61	-7.55	-0.67	-9.39
NORTH	1.53	0.00	-5.32	-13.16	-4.43	0.00	-0.14	-0.61	-0.35	-1.82	-0.09	-0.59	0.09	0.62	-0.46	-1.17	-0.11	-0.78	-0.11	-0.81	-0.96	-5.44	-0.36	-2.54	-0.48	-3.38
CENTRAL	-4.67	0.00	-5.73	-24.53	-5.14	0.00	-0.07	-0.37	-0.12	-0.72	-0.16	-1.41	0.07	0.64	-0.05	-0.12	0.14	1.31	0.20	1.89	-0.84	-6.94	-0.80	-7.02	-0.72	-6.31
VOLGA	-5.37	0.00	-6.22	-29.21	-5.90	0.00	-0.25	-1.28	-0.32	-1.91	-0.21	-1.76	-0.14	-1.19	-0.79	-2.15	-0.09	-0.79	0.00	0.00	-0.96	-7.31	-0.85	-7.18	-0.80	-6.73
CAUCAS	-4.71	0.00	-5.85	-21.98	-5.46	0.00	-0.07	-0.36	-0.10	-0.57	-0.32	-2.47	-0.14	-1.10	-0.64	-1.71	0.26	2.17	0.16	1.36	-0.02	-0.18	-0.13	-1.03	-0.73	-5.57
URAL	-5.41	0.00	-5.74	-22.85	-5.89	0.00	-0.13	-0.66	-0.31	-1.81	-0.08	-0.68	-0.06	-0.54	-0.84	-2.26	-0.10	-0.84	-0.04	-0.40	-0.80	-6.15	-0.57	-4.78	-0.38	-3.18
WSIB	-5.52	0.00	-5.42	-19.20	-5.75	0.00	-0.51	-2.42	-0.23	-1.22	-0.41	-3.05	-0.57	-4.27	-0.83	-2.19	-0.19	-1.53	-0.22	-1.83	-1.00	-6.17	-0.52	-3.79	-0.45	-3.30
FEAST	-4.66	0.00	-6.08	0.00	-5.29	0.00	-0.65	-3.16	-0.63	-3.45	-0.35	-2.66	-0.32	-2.46	-0.36	-0.93	-0.04	-0.35	0.04	0.35	-0.73	-5.06	-0.53	-3.95	-0.28	-2.08

Notes: 1) PCTEXP for Food and Non-Food. The variable labels of the sociodemographic characteristics and the products are explained in Table 3 and Table 4, respectively. The critical value of the t-statistics lies around 2 or -2, respectively.

Source: RLMS VII data, own calculations.

Annex 8: Parameter Estimates of the Probit Analysis of Russian Households' Food Purchases, 1996 II

Dependent variables:	Stage 3										Stage 3								Stage 3			
Decision to purchase	CBF 7		POR 8		POU 9		PRM 10		OMF 11		MIL 12		MIP 13		CHE 14		EGG 15		SUG 16		SWE 17	
Explaining variables	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
CONSTANT	-2.60	-11.3	-2.49	-10.7	-3.00	-12.9	-1.30	-6.30	-0.81	-4.10	-1.29	-6.64	-1.89	-8.70	-1.81	-7.79	-3.38	-14.3	-1.41	-10.8	-1.36	-10.5
PCFEXP	0.01	17.96	0.01	13.30	0.01	16.20	0.02	19.25	0.01	15.97	0.01	10.76	0.02	18.96	0.01	16.12	0.01	15.86	0.01	10.84	0.01	19.10
HHSIZ	0.25	11.91	0.14	6.60	0.17	8.29	0.21	10.97	0.13	6.76	0.10	5.37	0.20	9.77	0.19	8.93	0.20	9.94	0.12	6.18	0.25	13.16
PROD	0.30	3.22	0.19	2.04	0.74	7.87	0.24	3.00	0.03	0.44	0.47	6.23	0.51	6.10	0.22	2.32	1.12	11.85	0.16	2.54	0.00	0.06
RUR	-0.54	-5.54	-0.36	-3.75	-0.23	-2.46	-0.45	-5.65	-0.35	-4.47	-0.68	-8.91	-0.77	-8.89	-0.46	-4.50	-0.64	-6.93	0.24	3.40	0.00	-0.03
NORTH	-0.52	-3.37	-0.28	-1.57	0.29	2.20	-0.30	-2.09	-0.22	-1.66	-0.46	-3.45	-0.46	-3.15	-0.71	-4.91	-0.06	-0.44	0.06	0.46	-0.23	-1.73
CENTRAL	0.10	0.96	0.43	3.54	0.18	1.71	0.02	0.19	-0.24	-2.23	0.31	2.92	-0.34	-2.96	-0.37	-3.40	0.09	0.87	-0.04	-0.38	-0.17	-1.54
VOLGA	0.27	2.40	0.63	5.07	-0.12	-1.10	-0.55	-4.62	-0.45	-4.14	0.02	0.19	-0.56	-4.71	-0.51	-4.49	-0.01	-0.10	-0.18	-1.65	-0.15	-1.38
CAUCAS	0.18	1.41	0.78	5.72	-0.31	-2.36	-0.48	-3.71	-0.50	-4.10	0.22	1.82	-0.30	-2.27	-0.69	-5.20	-0.01	-0.07	-0.16	-1.28	-0.37	-3.01
URAL	0.03	0.29	0.44	3.48	0.05	0.41	-0.29	-2.42	-0.40	-3.58	-0.12	-1.08	-0.41	-3.41	-0.57	-4.96	-0.08	-0.73	-0.34	-2.97	0.05	0.42
WSIB	-0.16	-1.21	0.19	1.30	-0.14	-1.05	-0.77	-5.69	-0.80	-6.30	-0.28	-2.24	-0.36	-2.59	-0.72	-5.38	-0.25	-1.89	-0.57	-4.32	-0.27	-2.13
FEAST	-0.62	-4.40	0.06	0.43	-0.04	-0.32	-0.63	-4.68	-0.55	-4.47	-0.45	-3.64	-0.49	-3.61	-0.84	-6.22	-0.49	-3.80	-0.37	-2.92	-0.19	-1.55

Notes: 1) PCTEXP for Food and Non-Food. The variable labels of the sociodemographic characteristics and the products are explained in Table 3 and Table 4, respectively. The critical value of the t-statistics lies around 2 or -2, respectively.

Source: RLMS VII data, own calculations.

Annex 9: Estimated Parameters of the Working Model and the LA/AIDS Model Allocating Russian Households' Expenditure, 1996 I

Explained variable:	Stage 1			Stage 2										Stage 3											
	FOOD		NFO	PLA		MEA		MLK		CAS		FAT		BRD		GRN		PAS		POT		VGE		FRU	
Budget share of				I		II		III		IV		V		1		2		3		4		5		6	
Explaining variables	Coeff	t-stat	Coeff	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
CONSTANT	1.03	17.80	-0.03	0.40	12.36	0.34	12.75	0.04	2.76	0.15	8.02	0.07	1.73	0.80	30.32	-0.02	-1.47	0.02	0.76	-0.08	-6.74	-0.04	-2.55	0.32	6.78
HHSIZ	-0.02	-7.01	0.02	-0.02	-4.40	0.02	5.04	0.00	-0.42	0.01	3.58	-0.01	-11.17	-0.03	-9.38	-0.01	-6.39	0.01	3.84	0.00	-2.13	0.00	1.34	0.03	1.59
FEMHH	-0.01	-1.06	0.01	-0.01	-0.90	0.01	0.85	0.00	0.16	0.01	0.86	-0.01	-0.59	-0.06	-4.27	0.00	0.09	0.02	1.67	-0.01	-1.35	0.01	0.94	0.04	1.85
UNEMP	0.04	1.87	-0.04	0.05	2.49	-0.04	-2.33	-0.02	-1.69	0.00	-0.27	0.01	1.31	-0.01	-0.53	0.00	-0.28	0.04	2.24	0.00	-0.61	0.00	-0.01	-0.02	-0.55
HEDU	-0.03	-2.69	0.03	-0.02	-1.53	0.01	0.90	0.02	4.01	0.00	-0.30	-0.01	-1.65	-0.01	-1.36	-0.01	-2.62	-0.04	-3.80	0.00	-1.37	0.00	0.22	0.06	5.14
PROD	0.02	2.55	-0.02	0.02	1.62	0.00	-0.31	0.00	-0.63	-0.01	-0.90	-0.01	-2.41	-0.08	-8.41	-0.01	-1.49	-0.02	-1.78	-0.02	-6.18	0.05	7.63	0.07	2.93
RUR	-0.04	-3.38	0.04	0.09	7.16	-0.09	-8.52	-0.07	12.26	0.07	8.89	0.00	3.09	0.05	4.09	0.01	3.31	0.06	6.59	0.01	1.90	-0.02	-2.24	-0.12	-0.85
NORTH	-0.06	-2.52	0.06	0.05	1.87	0.00	0.00	-0.03	-2.31	-0.03	-2.02	0.01	0.06	0.11	4.85	0.00	-0.51	-0.01	-0.49	0.02	2.08	-0.02	-1.42	-0.09	-0.96
CENTRAL	0.00	0.02	0.00	-0.04	-1.80	0.04	2.11	-0.01	-0.83	-0.01	-1.05	0.02	1.88	0.06	3.05	0.00	-0.20	0.06	3.56	0.00	0.79	-0.05	-4.28	-0.06	-0.50
VOLGA	0.01	0.34	-0.01	-0.02	-0.91	0.02	1.21	-0.02	-1.69	0.01	0.67	0.01	2.07	0.08	4.00	0.00	-0.19	0.07	4.47	0.01	1.35	-0.04	-3.46	-0.11	-1.50
CAUCAS	-0.02	-0.82	0.02	0.00	0.14	0.02	0.85	-0.01	-1.12	-0.01	-0.39	0.00	1.13	-0.03	-1.59	0.01	1.74	0.06	3.42	0.01	2.05	-0.01	-0.65	-0.04	-0.20
URAL	-0.03	-1.46	0.03	-0.02	-1.12	0.03	1.50	-0.02	-1.64	0.01	0.42	0.01	0.97	0.04	1.96	0.00	0.37	0.03	2.03	0.01	1.25	-0.03	-2.20	-0.05	-0.18
WSIB	-0.02	-1.16	0.02	0.06	2.26	-0.04	-1.83	-0.02	-1.97	0.01	0.42	0.00	2.88	0.03	1.43	0.01	1.38	0.02	1.32	0.01	1.27	0.00	0.00	-0.07	-0.10
FEAST	-0.03	-1.51	0.03	0.10	3.93	-0.06	-2.86	-0.04	-3.41	-0.02	-1.10	0.01	2.90	0.05	2.51	0.00	0.19	0.02	0.97	0.01	1.26	-0.05	-3.82	-0.03	-2.21
TEXP1	0.02	0.91	-0.02	0.23	13.62	-0.17	12.45	0.03	4.26	-0.08	-8.04	-0.01	-1.33	0.16	10.79	0.01	2.81	-0.03	-2.13	0.03	6.23	0.00	0.13	-0.17	-7.17
TEXP2	0.07	3.92	-0.07	0.09	5.85	-0.07	-6.24	0.03	4.36	-0.05	-6.12	0.01	1.97	0.07	5.21	0.01	2.79	0.02	1.68	0.03	6.59	-0.02	-2.62	-0.10	-7.26
TEXP3	0.09	5.84	-0.09	0.02	1.78	-0.02	-1.81	0.02	2.70	-0.03	-4.10	0.01	1.31	0.03	2.83	0.00	0.27	0.02	2.11	0.01	2.81	-0.01	-1.84	-0.05	-6.04
ln(PCFEXP-P)[1)]	-0.10	-11.03	0.10	-0.03	-4.34	-0.02	-2.91	0.04	15.44	-0.01	-2.87	0.01	9.19	-0.18	-33.25	-0.02	-10.42	0.06	12.17	0.02	8.12	0.09	23.73	0.05	4.94
p1				-0.02	-1.18	-0.01	-1.26	0.01	1.17	0.01	1.76	0.01	29.56	0.02	1.59	0.00	-0.54	0.03	3.36	-0.02	-1.96	-0.02	-2.57	-0.02	-24.72
p2				-0.01	-1.26	0.00	0.00	0.00	-0.41	0.01	2.16	0.00	1.90	0.00	-0.54	0.00	0.00	0.00	-0.31	0.02	2.28	0.00	-1.27	-0.01	-0.29
p3				0.01	1.17	0.00	-0.41	-0.01	-4.62	0.00	1.81	0.00	-6.03	0.03	3.36	0.00	-0.31	-0.11	-10.05	0.02	3.88	0.04	5.68	0.03	12.98
p4				0.01	1.76	0.01	2.16	0.00	1.81	-0.02	-6.64	0.00	0.64	-0.02	-1.96	0.02	2.28	0.02	3.88	-0.02	-2.64	0.00	-0.72	0.00	0.64
p5				0.01	29.56	0.00	1.90	0.00	-6.03	0.00	0.64	-0.02	-19.61	-0.02	-2.57	0.00	-1.27	0.04	5.68	0.00	-0.72	-0.01	-2.20	0.00	-9.46
p6														-0.02	-24.72	-0.01	-0.29	0.03	12.98	0.00	0.64	0.00	-9.46	-0.01	-43.31
MR	-0.31	-17.12	0.31	-0.05	-4.94	-0.03	-5.80	-0.03	-6.87	0.00	-0.82	0.12	17.97	-0.15	-13.95	0.20	51.22	0.04	3.96	0.15	41.57	0.05	8.26	-0.30	-1.50

Notes: 1) PCTEXP for Food and Non-Food. The variable labels of the sociodemographic characteristics and the products are explained in Table 3 and Table 4, respectively. The critical value of the t-statistics lies around 2 or -2, respectively.

Source: RLMS VII data, own calculations.

Annex 9: Estimated Parameters of the Working Model and the LA/AIDS Model Allocating Russian Households' Expenditure, 1996 II

Explained variable:	Stage 3										Stage 3								Stage 3			
	CBF		POR		POU		PRM		OMF		MIL		MIP		CHE		EGG		SUG		SWE	
Budget share of	7		8		9		10		11		12		13		14		15		16		17	
Explaining variables	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
CONSTANT	-0.19	-8.46	-0.09	-5.94	-0.09	-3.74	0.55	15.35	0.82	33.02	0.27	4.69	0.18	3.44	-0.02	-0.76	0.57	8.28	-0.42	-6.92	1.42	4.33
HHSIZ	0.02	5.03	-0.02	-6.78	-0.02	-4.40	-0.01	-1.28	0.02	2.01	-0.02	-3.79	0.02	3.50	0.00	-0.90	0.01	2.76	0.00	0.78	0.00	3.16
FEMHH	-0.01	-0.71	0.00	-0.18	-0.01	-0.89	0.06	2.74	-0.04	-0.80	-0.03	-1.50	-0.02	-1.21	0.01	1.11	0.04	2.08	-0.04	-2.17	0.04	0.31
UNEMP	-0.01	-0.62	0.02	1.09	0.02	0.88	-0.04	-1.18	0.02	2.21	-0.05	-1.46	0.04	1.47	-0.03	-1.94	0.04	0.90	0.03	1.15	-0.03	-1.46
HEDU	0.01	0.88	-0.01	-1.91	-0.03	-2.66	0.06	3.31	-0.02	-0.44	-0.05	-2.84	0.03	1.77	0.01	1.09	0.01	0.69	-0.01	-1.12	0.01	0.93
PROD	0.01	0.74	-0.02	-2.43	0.04	3.66	0.00	-0.18	-0.02	-1.21	-0.01	-0.62	0.01	0.64	0.00	-0.11	0.00	-1.88	0.00	-0.18	0.00	0.60
RUR	0.05	3.42	0.03	3.08	0.02	1.77	0.01	0.47	-0.11	-0.41	0.09	3.41	-0.02	-0.71	0.05	4.32	-0.13	-1.73	-0.01	-0.90	0.01	0.99
NORTH	-0.02	-1.02	0.03	2.03	0.10	4.38	-0.06	-1.56	-0.05	-0.52	-0.03	-0.83	0.02	0.61	-0.04	-1.86	0.05	1.24	0.08	3.03	-0.08	-1.24
CENTRAL	-0.01	-0.40	0.00	0.09	0.00	0.00	0.02	0.86	-0.02	-1.94	0.08	2.94	-0.08	-3.11	-0.03	-2.30	0.03	2.82	0.02	1.08	-0.02	-0.65
VOLGA	0.06	3.42	0.03	2.20	-0.01	-0.29	-0.12	-4.00	0.03	2.92	0.08	2.73	-0.08	-3.10	-0.03	-1.76	0.03	2.79	0.01	0.42	-0.01	-0.17
CAUCAS	0.06	3.05	0.06	3.76	0.03	1.38	-0.14	-4.37	-0.01	-1.69	0.07	2.04	-0.01	-0.40	-0.04	-2.30	-0.02	-1.27	0.06	2.26	-0.06	-0.26
URAL	0.02	1.18	0.01	0.86	0.00	0.12	-0.03	-1.16	0.00	-1.95	0.02	0.58	-0.01	-0.29	-0.03	-2.09	0.02	1.09	0.00	-0.17	0.00	1.65
WSIB	0.03	1.61	0.02	0.98	0.07	3.22	-0.09	-2.75	-0.03	-1.16	0.02	0.67	0.00	-0.09	-0.03	-1.59	0.01	0.65	0.00	0.12	0.00	-1.11
FEAST	-0.01	-0.63	0.06	4.03	0.08	3.73	-0.06	-1.88	-0.06	-1.16	0.00	-0.01	0.05	1.67	-0.04	-2.26	-0.01	-0.22	-0.01	-0.24	0.01	0.37
TEXP1	0.10	5.89	0.06	5.09	0.05	2.82	-0.22	-8.25	0.01	8.65	0.25	9.47	-0.05	-2.24	0.00	0.36	-0.20	-1.07	0.19	9.34	-0.19	-1.31
TEXP2	0.05	3.98	0.03	2.85	0.04	2.66	-0.14	-6.66	0.02	6.88	0.09	4.48	-0.02	-0.93	-0.01	-1.34	-0.06	-0.59	0.12	7.55	-0.12	-1.81
TEXP3	0.04	3.39	0.01	1.34	0.01	0.59	-0.09	-4.69	0.03	4.21	0.03	1.68	-0.01	-0.71	-0.01	-1.25	-0.01	-0.30	0.07	4.64	-0.07	-0.10
ln(PCFEXP-P)	0.06	10.86	-0.01	-1.74	-0.02	-3.40	-0.14	-15.52	0.10	46.24	-0.01	-0.93	0.09	14.00	0.02	3.94	-0.10	-13.90	0.09	15.63	-0.09	-8.12
p1	-0.03	-1.53	-0.02	-1.50	-0.02	-1.02	0.03	2.91	0.03	3.60	-0.09	-3.38	0.06	4.10	0.02	0.74	0.01	34.52	0.02	0.39	-0.02	-64.50
p2	-0.02	-1.50	0.00	0.00	0.01	0.71	0.01	0.76	0.00	0.49	0.06	4.10	0.00	0.00	-0.01	-0.45	-0.05	-0.98	0.10	2.37	-0.10	-11.01
p3	-0.02	-1.02	0.01	0.71	0.01	0.40	0.02	1.85	-0.02	-12.14	0.02	0.74	-0.01	-0.45	0.00	-0.23	0.00	0.47				
p4	0.03	2.91	0.01	0.76	0.02	1.85	-0.10	-5.83	0.04	13.27	0.01	34.52	-0.05	-0.98	0.00	0.47	0.04	22.80				
p5	0.03	3.60	0.00	0.49	-0.02	-12.14	0.04	13.27	-0.05	-14.93												
p6																						
MR	0.32	0.42	0.39	3.24	0.35	3.83	0.07	4.05	-1.12	-12.36	0.04	1.73	0.07	4.76	0.27	32.67	-0.38	9.04	0.57	38.31	-0.57	-0.51

Notes: The variable labels of the sociodemographic characteristics and the products are explained in Table 3 and Table 4, respectively. The critical value of the t-statistics lies around 2 or -2, respectively.

Source: RLMS VII data, own calculations.

Annex 10: Russian Households' Integrated Total Expenditure Elasticities of Demand, 1996

		Stage 1		Stage 2					Stage 3						Stage 3					Stage 3				Stage 3	
		FOOD	NFO	PLA	MEA	MLK	CAS	FAT	BRD	GRN	PAS	POT	VGE	FRU	CBF	POR	POU	PRM	OMF	MIL	MIP	CHE	EGG	SUG	SWE
				I	II	III	IV	IV	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Sample Average		0.81	1.19	0.76	0.77	1.10	0.72	0.91	0.51	0.44	1.07	1.16	1.40	1.05	1.06	0.72	0.67	0.48	1.16	1.07	1.45	1.23	0.64	0.96	0.63
HHSIZ	HHSIZ 1-2	0.76	1.27	0.71	0.72	1.02	0.66	0.84	0.48	0.38	1.02	1.03	1.26	1.02	1.03	0.67	0.64	0.44	1.07	1.00	1.37	1.16	0.57	0.84	0.57
	HHSIZ 3-4	0.86	1.13	0.80	0.81	1.15	0.76	0.97	0.53	0.45	1.12	1.30	1.50	1.06	1.12	0.76	0.70	0.51	1.23	1.12	1.51	1.29	0.69	1.08	0.67
	HHSIZ 5-10	0.85	1.15	0.79	0.80	1.20	0.76	0.95	0.51	0.57	1.05	1.21	1.59	1.12	1.00	0.75	0.70	0.46	1.34	1.17	1.59	1.34	0.68	0.97	0.66
FEMHH	FEMHH - N	0.81	1.19	0.76	0.77	1.10	0.72	0.91	0.51	0.45	1.06	1.16	1.41	1.06	1.05	0.72	0.67	0.47	1.17	1.07	1.45	1.24	0.63	0.95	0.63
	FEMHH - Y	0.82	1.18	0.76	0.77	1.09	0.73	0.92	0.49	0.38	1.09	1.20	1.31	0.98	1.14	0.71	0.67	0.52	1.16	1.06	1.45	1.20	0.65	1.02	0.65
UNEMP	UNEMP - N	0.82	1.18	0.76	0.77	1.10	0.72	0.91	0.51	0.44	1.07	1.17	1.41	1.05	1.06	0.72	0.67	0.48	1.17	1.07	1.46	1.24	0.63	0.96	0.63
	UNEMP - Y	0.75	1.32	0.70	0.70	1.05	0.64	0.83	0.47	0.35	0.94	1.03	1.23	1.07	0.97	0.66	0.62	0.40	1.06	1.03	1.37	1.28	0.69	0.82	0.55
HEDU	HEDU - N	0.81	1.20	0.75	0.76	1.11	0.71	0.90	0.51	0.45	1.04	1.17	1.44	1.10	1.06	0.71	0.67	0.46	1.15	1.09	1.49	1.27	0.65	0.93	0.62
	HEDU - Y	0.84	1.14	0.77	0.80	1.07	0.74	0.96	0.48	0.38	1.18	1.14	1.30	0.96	1.07	0.73	0.68	0.53	1.23	1.04	1.37	1.17	0.59	1.06	0.66
PROD	PROD - N	0.78	1.25	0.72	0.74	1.02	0.68	0.88	0.44	0.33	1.06	0.93	1.12	0.94	1.02	0.68	0.66	0.47	1.16	0.99	1.34	1.15	0.62	0.89	0.59
	PROD - Y	0.82	1.17	0.77	0.77	1.12	0.73	0.91	0.53	0.48	1.05	1.50	1.67	1.10	1.06	0.73	0.66	0.47	1.15	1.10	1.50	1.27	0.63	0.97	0.64
RUR	RUR - N	0.78	1.24	0.72	0.74	1.01	0.67	0.87	0.47	0.39	1.04	1.03	1.24	0.95	1.00	0.69	0.65	0.46	1.14	0.98	1.33	1.13	0.60	0.91	0.59
	RUR - Y	0.94	1.05	0.88	0.86	1.65	0.86	1.03	0.63	0.60	1.15	2.44	2.64	1.58	1.27	0.81	0.72	0.54	1.21	1.62	2.28	1.84	0.57	1.08	0.74
REGION	METROP	0.79	1.20	0.72	0.75	0.98	0.69	0.90	0.37	0.34	1.15	0.87	1.04	0.89	1.04	0.63	0.65	0.50	1.10	0.95	1.23	1.06	0.47	0.93	0.61
	NORTH	0.87	1.10	0.82	0.82	1.19	0.76	0.97	0.55	0.34	1.23	1.35	1.35	1.13	1.53	0.64	0.76	0.52	1.16	1.16	1.55	1.35	0.76	0.95	0.65
	CENTRAL	0.76	1.28	0.70	0.72	1.01	0.66	0.84	0.49	0.44	0.97	1.32	1.58	1.06	1.02	0.67	0.63	0.48	1.14	0.99	1.41	1.14	0.59	0.85	0.57
	VOLGA	0.78	1.27	0.72	0.73	1.06	0.69	0.86	0.52	0.36	1.00	1.48	1.75	1.12	0.94	0.70	0.61	0.38	1.10	1.04	1.52	1.20	0.65	0.90	0.60
	CAUCAS	0.84	1.15	0.79	0.79	1.21	0.76	0.94	0.48	0.59	1.03	0.99	1.39	1.23	1.02	0.76	0.64	0.43	1.25	1.19	1.62	1.41	0.64	0.96	0.65
	URAL	0.82	1.18	0.76	0.78	1.09	0.73	0.91	0.50	0.40	1.10	1.26	1.38	1.00	1.06	0.72	0.67	0.49	1.19	1.07	1.46	1.25	0.68	1.08	0.65
	WSIB	0.94	1.04	0.89	0.88	1.28	0.84	1.06	0.56	0.49	1.25	1.66	1.42	1.16	1.20	0.83	0.80	0.51	1.39	1.25	1.63	1.44	0.70	1.21	0.75
	FEAST	0.86	1.13	0.80	0.80	1.17	0.75	0.95	0.52	0.39	1.13	1.27	1.55	1.01	1.31	0.74	0.72	0.49	1.14	1.14	1.45	1.35	0.63	1.05	0.66
TEXP	TEXP1	0.83	1.21	0.79	0.75	1.24	0.71	0.93	0.60	0.41	1.26	1.63	2.38	1.62	1.05	0.71	0.65	0.44	1.10	1.22	1.90	1.56	0.67	0.86	0.60
	TEXP2	0.75	1.31	0.70	0.71	1.01	0.66	0.83	0.48	0.47	0.96	1.04	1.52	1.06	1.00	0.66	0.63	0.44	1.05	0.99	1.38	1.19	0.64	0.84	0.57
	TEXP3	0.75	1.29	0.68	0.71	0.98	0.66	0.83	0.43	0.40	0.92	1.02	1.19	0.92	0.96	0.66	0.62	0.44	1.07	0.95	1.28	1.09	0.58	0.89	0.58
	TEXP4	0.98	1.01	0.90	0.94	1.28	0.89	1.12	0.49	0.44	1.26	1.28	1.36	1.10	1.28	0.88	0.82	0.60	1.49	1.25	1.63	1.41	0.70	1.29	0.79

Notes: The variable labels of the sociodemographic characteristics and the products are explained in Table 3 and Table 4, respectively.
Source: RLMS VII data, own calculations.

Annex 11: Russian Households' Integrated Uncompensated Own Price Elasticities of Demand, 1996

		Stage 1		Stage 2					Stage 3						Stage 3					Stage 3				Stage 3	
		FOOD	NFO	PLA	MEA	MLK	CAS	FAT	BRD	GRN	PAS	POT	VGE	FRU	CBF	POR	POU	PRM	OMF	MIL	MIP	CHE	EGG	SUG	SWE
				I	II	III	IV	IV	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Sample Average		-0.41	-0.59	-0.79	-0.83	-1.02	-1.17	-1.15	-0.69	-0.97	-1.80	-1.61	-1.19	-1.05	-1.21	-0.97	-0.91	-1.12	-1.30	-1.27	-1.10	-1.05	-0.73	-1.10	-1.15
HHSIZ	**HHSIZ 1-2**	-0.41	-0.59	-0.79	-0.84	-1.01	-1.21	-1.12	-0.69	-0.97	-1.86	-1.51	-1.17	-1.06	-1.24	-0.98	-0.91	-1.13	-1.29	-1.24	-1.10	-1.05	-0.72	-1.14	-1.18
	HHSIZ 3-4	-0.41	-0.59	-0.80	-0.82	-1.02	-1.16	-1.19	-0.70	-0.97	-1.81	-1.73	-1.20	-1.05	-1.21	-0.97	-0.90	-1.10	-1.30	-1.29	-1.10	-1.05	-0.74	-1.07	-1.14
	HHSIZ 5-10	-0.42	-0.58	-0.78	-0.84	-1.05	-1.14	-1.16	-0.70	-0.97	-1.62	-1.60	-1.22	-1.06	-1.14	-0.98	-0.91	-1.15	-1.39	-1.28	-1.11	-1.05	-0.73	-1.11	-1.14
FEMHH	**FEMHH - N**	-0.41	-0.59	-0.79	-0.83	-1.02	-1.18	-1.15	-0.69	-0.97	-1.80	-1.60	-1.19	-1.06	-1.20	-0.97	-0.91	-1.12	-1.30	-1.26	-1.10	-1.05	-0.73	-1.11	-1.16
	FEMHH - Y	-0.41	-0.59	-0.80	-0.83	-1.01	-1.15	-1.17	-0.70	-0.97	-1.85	-1.66	-1.16	-1.04	-1.26	-0.98	-0.90	-1.06	-1.29	-1.29	-1.10	-1.04	-0.74	-1.07	-1.14
UNEMP	**UNEMP - N**	-0.41	-0.59	-0.79	-0.83	-1.02	-1.17	-1.15	-0.69	-0.97	-1.81	-1.62	-1.19	-1.05	-1.21	-0.97	-0.91	-1.11	-1.30	-1.26	-1.10	-1.05	-0.73	-1.10	-1.15
	UNEMP - Y	-0.42	-0.58	-0.75	-0.86	-1.04	-1.24	-1.15	-0.68	-0.97	-1.65	-1.52	-1.16	-1.07	-1.22	-0.97	-0.91	-1.16	-1.31	-1.30	-1.11	-1.07	-0.77	-1.15	-1.19
HEDU	**HEDU - N**	-0.41	-0.59	-0.78	-0.84	-1.03	-1.17	-1.14	-0.69	-0.97	-1.75	-1.63	-1.20	-1.06	-1.22	-0.97	-0.91	-1.13	-1.30	-1.25	-1.11	-1.05	-0.74	-1.11	-1.15
	HEDU - Y	-0.39	-0.61	-0.83	-0.80	-0.98	-1.18	-1.20	-0.71	-0.98	-2.04	-1.54	-1.16	-1.03	-1.18	-0.98	-0.90	-1.07	-1.31	-1.33	-1.09	-1.03	-0.72	-1.07	-1.16
PROD	**PROD - N**	-0.41	-0.59	-0.80	-0.82	-1.00	-1.21	-1.18	-0.71	-0.98	-1.94	-1.33	-1.13	-1.04	-1.21	-0.98	-0.91	-1.10	-1.33	-1.28	-1.09	-1.04	-0.74	-1.12	-1.18
	PROD - Y	-0.40	-0.60	-0.78	-0.84	-1.03	-1.16	-1.14	-0.68	-0.97	-1.75	-2.10	-1.25	-1.06	-1.21	-0.97	-0.90	-1.12	-1.29	-1.26	-1.11	-1.05	-0.73	-1.09	-1.14
RUR	**RUR - N**	-0.40	-0.60	-0.81	-0.81	-0.99	-1.21	-1.17	-0.70	-0.97	-1.90	-1.50	-1.17	-1.05	-1.20	-0.97	-0.90	-1.11	-1.31	-1.27	-1.09	-1.04	-0.74	-1.11	-1.18
	RUR - Y	-0.43	-0.57	-0.73	-0.89	-1.15	-1.09	-1.11	-0.65	-0.97	-1.58	-3.00	-1.38	-1.10	-1.28	-0.98	-0.91	-1.12	-1.26	-1.26	-1.15	-1.07	-0.65	-1.09	-1.11
REGION	**METROP**	-0.38	-0.62	-0.83	-0.80	-0.95	-1.19	-1.22	-0.72	-0.98	-2.18	-1.23	-1.11	-1.03	-1.21	-0.98	-0.90	-1.05	-1.26	-1.37	-1.07	-1.02	-0.68	-1.10	-1.16
	NORTH	-0.40	-0.60	-0.77	-0.84	-1.02	-1.21	-1.15	-0.68	-0.98	-2.01	-1.74	-1.14	-1.05	-1.47	-0.99	-0.91	-1.10	-1.25	-1.33	-1.10	-1.05	-0.76	-1.15	-1.18
	CENTRAL	-0.41	-0.59	-0.81	-0.82	-1.01	-1.22	-1.13	-0.69	-0.97	-1.76	-2.01	-1.26	-1.07	-1.23	-0.98	-0.90	-1.06	-1.33	-1.23	-1.10	-1.05	-0.73	-1.13	-1.18
	VOLGA	-0.42	-0.58	-0.80	-0.84	-1.03	-1.17	-1.14	-0.68	-0.97	-1.76	-2.20	-1.29	-1.08	-1.16	-0.97	-0.90	-1.20	-1.30	-1.23	-1.10	-1.05	-0.75	-1.11	-1.15
	CAUCAS	-0.41	-0.59	-0.78	-0.84	-1.06	-1.12	-1.17	-0.70	-0.97	-1.61	-1.28	-1.17	-1.08	-1.16	-0.96	-0.89	-1.19	-1.34	-1.24	-1.12	-1.06	-0.72	-1.10	-1.12
	URAL	-0.41	-0.59	-0.81	-0.83	-1.01	-1.16	-1.15	-0.70	-0.97	-1.90	-1.75	-1.19	-1.04	-1.20	-0.97	-0.90	-1.10	-1.31	-1.27	-1.10	-1.05	-0.75	-1.06	-1.14
	WSIB	-0.41	-0.59	-0.76	-0.85	-1.02	-1.15	-1.18	-0.69	-0.97	-1.82	-2.01	-1.13	-1.03	-1.21	-0.98	-0.91	-1.16	-1.34	-1.30	-1.10	-1.05	-0.72	-1.06	-1.14
	FEAST	-0.40	-0.60	-0.74	-0.86	-1.03	-1.19	-1.15	-0.68	-0.97	-1.80	-1.66	-1.19	-1.02	-1.36	-0.98	-0.92	-1.12	-1.27	-1.34	-1.11	-1.05	-0.72	-1.09	-1.16
TEXP	**TEXP1**	-0.47	-0.53	-0.71	-0.91	-1.08	-1.25	-1.17	-0.62	-0.97	-2.16	-2.21	-1.38	-1.13	-1.24	-0.98	-0.92	-1.16	-1.30	-1.20	-1.12	-1.08	-0.72	-1.19	-1.20
	TEXP2	-0.42	-0.58	-0.80	-0.84	-1.02	-1.20	-1.12	-0.69	-0.97	-1.74	-1.56	-1.25	-1.07	-1.23	-0.98	-0.91	-1.12	-1.29	-1.24	-1.10	-1.06	-0.75	-1.13	-1.17
	TEXP3	-0.40	-0.60	-0.83	-0.80	-1.00	-1.17	-1.14	-0.71	-0.97	-1.69	-1.56	-1.18	-1.05	-1.19	-0.97	-0.90	-1.11	-1.29	-1.30	-1.09	-1.04	-0.73	-1.09	-1.15
	TEXP4	-0.36	-0.64	-0.84	-0.78	-0.99	-1.11	-1.19	-0.72	-0.98	-1.81	-1.50	-1.13	-1.03	-1.19	-0.97	-0.90	-1.08	-1.33	-1.34	-1.09	-1.03	-0.71	-1.05	-1.11

Notes: The variable labels of the sociodemographic characteristics and the products are explained in Table 3 and Table 4, respectively.
Source: RLMS VII data, own calculations.

Annex 12: Russian Households' Compensated Own Price Elasticities of Demand, 1996

		Stage 1		Stage 2					Stage 3						Stage 3					Stage 3				Stage 3	
		FOOD	NFO	PLA	MEA	MLK	CAS	FAT	BRD	GRN	PAS	POT	VGE	FRU	CBF	POR	POU	PRM	OMF	MIL	MIP	CHE	EGG	SUG	SWE
				I	II	III	IV	IV	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Sample Average		0.00	0.00	-0.63	-0.73	-0.95	-1.14	-1.11	-0.40	-0.95	-1.65	-1.57	-1.04	-0.91	-1.02	-0.88	-0.79	-0.93	-1.06	-0.93	-0.71	-0.90	-0.59	-0.67	-0.41
HHSIZ	HHSIZ 1-2	0.00	0.00	-0.63	-0.74	-0.94	-1.18	-1.07	-0.39	-0.95	-1.71	-1.48	-1.02	-0.94	-1.06	-0.88	-0.78	-0.95	-1.03	-0.87	-0.72	-0.91	-0.59	-0.61	-0.49
	HHSIZ 3-4	0.00	0.00	-0.64	-0.71	-0.95	-1.12	-1.15	-0.41	-0.95	-1.66	-1.70	-1.05	-0.89	-1.02	-0.88	-0.80	-0.90	-1.06	-0.98	-0.70	-0.90	-0.58	-0.71	-0.34
	HHSIZ 5-10	0.00	0.00	-0.61	-0.74	-0.98	-1.10	-1.12	-0.44	-0.93	-1.43	-1.57	-1.08	-0.93	-0.88	-0.89	-0.79	-0.99	-1.18	-0.94	-0.71	-0.89	-0.59	-0.61	-0.49
FEMHH	FEMHH - N	0.00	0.00	-0.63	-0.73	-0.95	-1.14	-1.11	-0.40	-0.95	-1.64	-1.57	-1.05	-0.92	-1.01	-0.88	-0.79	-0.95	-1.06	-0.92	-0.71	-0.91	-0.59	-0.66	-0.42
	FEMHH - Y	0.00	0.00	-0.65	-0.73	-0.93	-1.11	-1.13	-0.44	-0.96	-1.69	-1.63	-1.00	-0.86	-1.10	-0.91	-0.80	-0.82	-1.04	-0.99	-0.72	-0.87	-0.58	-0.70	-0.36
UNEMP	UNEMP - N	0.00	0.00	-0.64	-0.72	-0.94	-1.14	-1.11	-0.40	-0.95	-1.66	-1.58	-1.04	-0.91	-1.02	-0.88	-0.79	-0.93	-1.05	-0.93	-0.71	-0.90	-0.59	-0.67	-0.41
	UNEMP - Y	0.00	0.00	-0.56	-0.76	-0.98	-1.21	-1.10	-0.41	-0.96	-1.48	-1.49	-1.01	-0.96	-1.03	-0.85	-0.78	-1.00	-1.06	-0.99	-0.68	-0.97	-0.56	-0.62	-0.48
HEDU	HEDU - N	0.00	0.00	-0.61	-0.74	-0.96	-1.14	-1.10	-0.39	-0.95	-1.59	-1.60	-1.06	-0.94	-1.03	-0.87	-0.79	-0.95	-1.05	-0.89	-0.73	-0.92	-0.58	-0.65	-0.44
	HEDU - Y	0.00	0.00	-0.70	-0.69	-0.90	-1.15	-1.16	-0.46	-0.96	-1.90	-1.50	-0.99	-0.82	-0.98	-0.91	-0.81	-0.86	-1.08	-1.09	-0.66	-0.85	-0.59	-0.72	-0.34
PROD	PROD - N	0.00	0.00	-0.65	-0.71	-0.92	-1.19	-1.14	-0.48	-0.96	-1.80	-1.27	-0.94	-0.87	-1.03	-0.91	-0.77	-0.91	-1.11	-0.97	-0.70	-0.90	-0.58	-0.66	-0.42
	PROD - Y	0.00	0.00	-0.63	-0.74	-0.96	-1.12	-1.10	-0.36	-0.94	-1.58	-2.08	-1.13	-0.94	-1.01	-0.87	-0.81	-0.94	-1.03	-0.91	-0.71	-0.90	-0.59	-0.67	-0.41
RUR	RUR - N	0.00	0.00	-0.67	-0.70	-0.91	-1.19	-1.13	-0.42	-0.95	-1.75	-1.46	-1.00	-0.89	-1.00	-0.88	-0.79	-0.93	-1.08	-0.96	-0.70	-0.90	-0.58	-0.68	-0.39
	RUR - Y	0.00	0.00	-0.52	-0.82	-1.11	-1.04	-1.06	-0.33	-0.93	-1.40	-2.99	-1.29	-1.02	-1.11	-0.88	-0.81	-0.92	-0.95	-0.73	-0.76	-0.89	-0.58	-0.61	-0.50
REGION	METROP	0.00	0.00	-0.72	-0.69	-0.87	-1.16	-1.19	-0.55	-0.96	-2.05	-1.15	-0.88	-0.82	-1.02	-0.95	-0.80	-0.83	-1.01	-1.15	-0.62	-0.82	-0.59	-0.67	-0.41
	NORTH	0.00	0.00	-0.60	-0.74	-0.96	-1.18	-1.10	-0.39	-0.96	-1.88	-1.71	-0.98	-0.92	-1.36	-0.97	-0.70	-0.91	-0.96	-1.06	-0.68	-0.91	-0.57	-0.59	-0.53
	CENTRAL	0.00	0.00	-0.66	-0.70	-0.94	-1.19	-1.09	-0.35	-0.94	-1.60	-1.98	-1.14	-0.96	-1.06	-0.90	-0.79	-0.83	-1.10	-0.86	-0.76	-0.90	-0.59	-0.64	-0.46
	VOLGA	0.00	0.00	-0.63	-0.73	-0.96	-1.14	-1.09	-0.31	-0.96	-1.60	-2.18	-1.18	-0.97	-0.92	-0.83	-0.82	-1.08	-1.04	-0.84	-0.78	-0.90	-0.58	-0.66	-0.43
	CAUCAS	0.00	0.00	-0.61	-0.74	-0.99	-1.07	-1.13	-0.47	-0.92	-1.42	-1.23	-1.02	-0.98	-0.92	-0.80	-0.82	-1.05	-1.11	-0.83	-0.72	-0.94	-0.59	-0.60	-0.52
	URAL	0.00	0.00	-0.66	-0.71	-0.94	-1.12	-1.11	-0.41	-0.95	-1.75	-1.72	-1.03	-0.88	-1.00	-0.89	-0.80	-0.90	-1.07	-0.95	-0.71	-0.92	-0.57	-0.73	-0.31
	WSIB	0.00	0.00	-0.59	-0.76	-0.95	-1.12	-1.15	-0.45	-0.95	-1.67	-1.98	-0.96	-0.88	-1.00	-0.88	-0.76	-1.00	-1.10	-1.00	-0.66	-0.90	-0.59	-0.72	-0.33
	FEAST	0.00	0.00	-0.56	-0.78	-0.96	-1.16	-1.11	-0.44	-0.96	-1.65	-1.63	-1.06	-0.84	-1.22	-0.89	-0.76	-0.93	-0.98	-1.08	-0.60	-0.92	-0.59	-0.70	-0.36
TEXP	TEXP1	0.00	0.00	-0.45	-0.84	-1.02	-1.22	-1.13	-0.21	-0.96	-2.05	-2.19	-1.29	-1.07	-1.04	-0.86	-0.80	-0.99	-1.00	-0.63	-0.82	-1.00	-0.59	-0.53	-0.61
	TEXP2	0.00	0.00	-0.63	-0.73	-0.94	-1.17	-1.07	-0.37	-0.94	-1.58	-1.52	-1.12	-0.96	-1.05	-0.89	-0.78	-0.93	-1.02	-0.86	-0.74	-0.95	-0.57	-0.63	-0.47
	TEXP3	0.00	0.00	-0.71	-0.69	-0.92	-1.13	-1.09	-0.46	-0.95	-1.50	-1.52	-1.01	-0.89	-0.99	-0.88	-0.80	-0.94	-1.05	-1.01	-0.69	-0.88	-0.58	-0.68	-0.39
	TEXP4	0.00	0.00	-0.74	-0.66	-0.92	-1.07	-1.16	-0.53	-0.96	-1.65	-1.45	-0.92	-0.81	-1.01	-0.88	-0.80	-0.89	-1.11	-1.10	-0.65	-0.85	-0.59	-0.72	-0.33

Notes: The variable labels of the sociodemographic characteristics and the products are explained in Table 3 and Table 4, respectively.
Source: RLMS VII data, own calculations.

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