

THE ROLE OF THE SAFETY NET AND THE LABOR MARKET  
ON FALLING CASH CONSUMPTION IN RUSSIA: 1994–96  
A QUINTILE-BASED DECOMPOSITION ANALYSIS

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This paper investigates the relative importance of changes in social safety net support and labor market in explaining the decline in the purchasing power of Russian households that occurred during the period 1994–96. Drawing on three cross-sections of the Russian Longitudinal Monitoring Survey, we find that labor market changes have been the main cause of the observed decline in cash consumption. Among these changes, reductions in the impact of the time spent in employment and increasing frequency of wage arrears are most important, more so than increases in open unemployment or the fall in real wages among workers who were fully paid. The contribution of falling state transfers to cash consumption is nonetheless substantial. We also find that the sources of the decline in household welfare vary substantially across quintiles in the distribution.

1. INTRODUCTION

The transition from a planned to market economy in Russia in the early 1990s has been accompanied by severe macroeconomic and structural shocks that resulted in a collapse in economic activity and a sharp decline in living standards. Real GDP fell by more than 40 percent between 1991 and 1996, which places Russia among the worst affected of the formerly planned economies, where reported GDP declines during the same period range from 11 percent in Poland to 57 percent in Lithuania (World Bank, 2000a).

The economic shocks led to various coping mechanisms, in particular subsistence farming and the rise in barter transactions between households (Rose, 1996). These only partially compensated for the decline in real monetary income however. In fact, many benefits and services, previously available through enterprises or the state either in-kind or at below market prices, were monetized and charged at higher prices. This was typically the case for housing and utilities, but also for essential services like health and education, for which formal and informal payments in cash became common (UNICEF, 1996). In this context, cash incomes became an increasingly important determinant of people's capacity to access goods and services, and thus of household well-being.

The collapse of economic activity and difficulties in collecting tax revenues, together with the government's objective of reducing high rates of inflation, imposed serious constraints on public spending, including on social welfare. Expenditure on pensions, according to IMF estimates, fell from about 7 percent

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of GDP in 1992, to 4.5 percent in 1996, while the resources directed to child allowances fell from 2 percent to 0.7 percent of GDP over the same period (World Bank, 2000a).

The Russian transition thus raises several important policy-related questions for analysts interested in distribution, which are addressed in this paper. How did the overall economic decline affect the welfare of households at different points in the income distribution? What are the major sources of this decline and have these differed across the income distribution? Did the relatively extensive system of public transfers serve to protect the relatively worse off? Has the slow pace of economic liberalization and continuation of soft budget constraints in the enterprise sector (World Bank, 2000b) protected workers, or at least those at the bottom of the distribution? And how has the relative importance of these factors varied over time?

This paper investigates the transmission of macro and structural shocks to the Russian economy onto households, through the labor market and the payment of social benefits which had previously guaranteed them a minimum standard of living. The novelty of this paper is twofold: first, it provides an empirical evaluation of the relative contributions of reduced public transfer payments and labor market events to overall declines in the well-being of Russian households in a period of enormous economic change; second, a quintile decomposition method is used which enables us to examine variations in these effects at different points in the expenditure distribution.

In section 2, we present the data set and the measure of economic well-being used in the analysis. Some summary statistics on indicators of household economic well-being used in the econometric analysis are presented in section 3. The statistical procedure employed to decompose changes in the chosen measure of household well-being is explained in section 4. Section 5 presents the main results and section 6 concludes.

## 2. DATA AND CONCEPTS

### 2.1. *The Russian Longitudinal Monitoring Survey*

The data source is the Russian Longitudinal Monitoring Survey (RLMS), rounds V–VII. The relevant dates were November 1994 to January 1995 (round V), October to December 1995 (round VI), and October to December 1996 (round VII). While the RLMS can also be used as a panel, it is used here as repeated cross-sections because, as discussed below, there is a structural break in the data between 1994 and 1995, and hence a model that allows for time varying parameters (coefficients) is needed.<sup>1</sup> The RLMS data are intended to be representative of the whole population, but very high income groups and marginalized people (e.g. the homeless) are not represented.<sup>2</sup> We utilize information collected at the

<sup>1</sup>Although it is possible to use more complex panel data models with varying coefficients, to do so, we have to impose some strong restrictions regarding the way the coefficients are changing (Greene, 1993). This is very constraining in the absence of an economic justification.

<sup>2</sup>This is inevitable with surveys of this kind. Some estimates suggest that up to 1 percent of people in major Russian cities are homeless (World Bank, 2000b).

household and individual level. After data cleaning, the sample size is 3743 household-level observations for round V, 3574 for round VI, and 3525 for round VII.

## 2.2. *Indicator of Household Welfare*

Most earlier studies on living standards in Russia have recognized the importance of non-cash activities as a coping mechanism (see, e.g. Popkin *et al.*, 1996; Doyle, 1996; Klugman, 1997). Typically, the values of non-monetary sources of income are imputed. However, this approach risks underplaying the impact of reduced real cash balances on household capacity to purchase goods and services. Thus, if most earlier studies consistently point to a lower incidence of poverty once non-monetary sources of income are included, none of these studies give a fair treatment of the decline in household purchasing power, nor have they attempted to see how the determinants of the decline in household welfare may have differed across expenditure groups.

By way of contrast, family cash consumption allows examination of the impact of an exogenous shock—i.e. falling cash income from wage earnings and transfers—on the capacity of a family to purchase goods and services in the economy. This is the measure of household welfare used here.

The imputed value of home food production is excluded since it is a coping mechanism to offset declines in purchasing power, and its inclusion would tend to underestimate the real fall in the purchasing power. Consumer durables and savings were excluded since they make household comparisons difficult. Even though purchase of these items may be a useful signal, expenditures on durables are lumpy and possibly misleading given that the reference period is the preceding month.

Empirically the RLMS suggests that cash consumption is the major component of total “expenditures” and that its share increased between 1994 and 1996 from 66 to 72 percent for the bottom quintile. The imputed value of home-produced food is important, although its relative significance for households in the bottom quintile decreased over the period, from 29.3 to 25.6 percent. Expenditures on durables and savings represent only a small fraction of the consumption aggregate (both around 2 percent).

## 2.3. *Poverty Line and Adjustment for Household Needs*

This paper adopts a welfare ratio approach in which household consumption aggregates are adjusted for household needs and assessed relative to a regional poverty line. The welfare ratio measures well-being on a continuous scale, contrary to the traditional binary (poor–non-poor) measure. This facilitates and enriches distributional analysis of household welfare (Ravallion, 1996; Deaton and Zaidi, 1999).

Household needs are set relative to the regional poverty line, and taking household size and composition into account. Regional poverty lines enable variation in the level of regional prices and rates of inflation across the vast expanse of the Russian Federation to be taken into account. The composition of the food basket underlying the poverty line varies according to the observed regional consumption patterns. The different needs of families of varying composition and

size are met through the inclusion of both equivalence scales and economies of scale using the Rothbarth approach.<sup>3</sup>

### 3. SUMMARY STATISTICS

#### 3.1. *The Expenditure-to-Needs Ratio*

The average expenditure-to-needs ratio fell by 20 percent between 1994 and 1996, from 3.31 in 1994 to 2.71 in 1995 and 2.64 in 1996. The fall during this period obviously represents only part of the decline in living standards that has occurred since the beginning of the transition<sup>4</sup> (see e.g. Klugman and Braithwaite, 1998; World Bank, 2000a).

The decline in the welfare ratio was not spread equally across the expenditure distribution. At the bottom quintile, the ratio fell by more than 25 percent, compared to about 19 percent at the top. The deterioration in household welfare was concentrated in 1994 and 1995, but continued through to 1996 for the bottom three quintiles. Among families at the top quintile of the distribution, however, the decline was reversed after 1995.

The scale and the timing of this deterioration is partly explicable by a slow-down in the rate of inflation and the rate of decline in aggregate demand and employment in 1995 and 1996, compared with 1994. The quarterly CPI inflation rates were still high at 37 percent in November 1994 to January 1995 (round V) but then dropped sharply, to 3 percent by the end of 1996 (Russian Economic Trends, 1997.2). The decline in recorded GDP was about 13 percent in 1994, but around 4 percent in 1995, and 5 percent in 1996.

#### 3.2 *Possible Factors Associated with Falling Cash Consumption*

Changes in household cash consumption during this period have two likely sources: changes in transfers received and labor market trends. It is possible to isolate the respective contributions of each. Because reliable monthly regional price indices for the period 1994–96 were not available at the time of writing, all the income variables are adjusted to June 1992 prices using a national index. The mean values of all the explanatory variables are presented in the Appendix, Table A-1 (as defined in Table A-2). The overall decline in average income, broken down by income source, is depicted in Figure 1. The rest of this section describes these trends, overall and at different points in the distribution.

The economic transition in Russia has been associated with severe labor demand shocks, with dramatic erosion in real wage receipts due to inflation and

<sup>3</sup>See Popkin *et al.* (1996). The economies of scale adjustments incorporated in the RLMS data set are such that the poverty line for a family of two adults is only 0.89 that of an unadjusted threshold obtained as the sum of the subsistence needs of two adults. This falls with additional family members, so that the fifth to eighth members of the household “count” for only about 0.7 of the first member. The choice of equivalence scales and economies of scale are inevitably subject to debate. For example, under the RLMS approach, the needs of a three-person household comprising a mother and two children would be subject to the same economies of scale adjustment as a two-parent, one-child household. Whether or not this is the most appropriate treatment is a question that we do not investigate here.

<sup>4</sup>Comparison for the whole period based on the RLMS is inhibited by lack of data, because the questionnaires were different in the first and second wave.

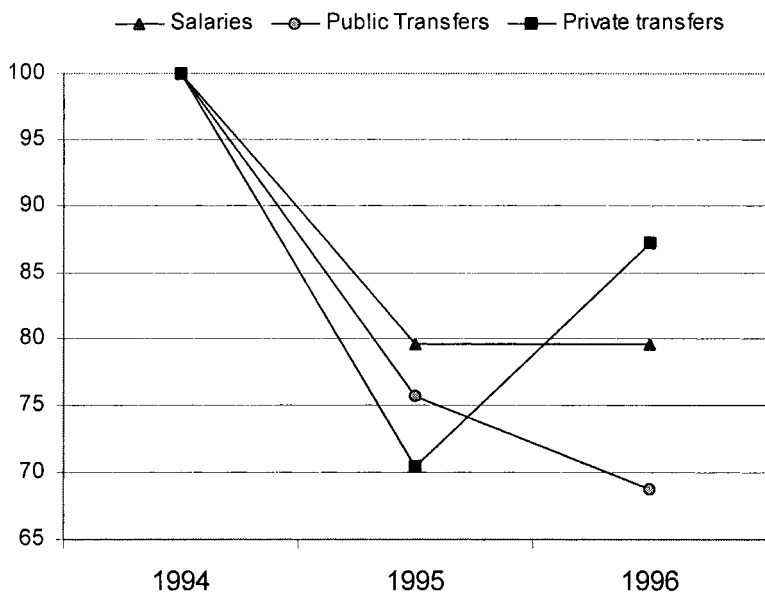


Figure 1. Decline in Real Income, by Source (1994 = 100)  
Source: RLMS rounds V, VI and VII.

wage arrears among those who were employed, rather than outright retrenchment (World Bank, 2000a). Hence the sharp decline in labor income depicted in Figure 1 could reflect a combination of factors, such as shorter work hours, increases in open and hidden unemployment, wage arrears, and/or falling hourly wages even among those individuals who were fully paid. Trends with respect to each factor are examined below.

In late 1996, real labor income represented only about 80 percent of its 1994 value for all workers, even with a partial recovery in late 1996. Table 1 presents the composition of income for each quintile of the log welfare ratio in 1994 and 1996. It shows that labor income represented a higher share of total income for those families with high cash expenditures. However the relative share of income from labor did increase at the bottom of the expenditure distribution.

TABLE 1  
INCOME SOURCES BY QUINTILES OF THE LOG WELFARE RATIO (IN PERCENT)

Items	Q20		Q40		Q60		Q80		Q100	
	1994	1996	1994	1996	1994	1996	1994	1996	1994	1996
Labor income	36.2	41.7	43.2	46.1	47.2	49.7	48.7	46.5	51.5	49.4
Public transfers	47.2	30.5	40.5	32.2	38.8	31.9	36.2	36.1	31.6	29.6
Private transfers	10.3	15.6	9.5	13.3	7.4	10.0	7.2	10.9	7.4	9.4
Capital income	4.5	8.6	6.1	7.2	5.8	7.5	7.5	5.9	8.3	9.3
Sales in cash of home production	1.8	3.6	0.7	1.2	0.8	0.9	0.4	0.6	1.2	2.3
Total	100	100	100	100	100	100	100	100	100	100

Source: RLMS rounds V, VI and VII.

Among better-off households (situated above the 80th percentile), the real wage rate tended to increase, while at the bottom of the distribution, the wage rate has declined (Table 2). Interestingly, the time spent in primary and secondary employment each month by household members supplying positive hours shows an increase of the order of 6 percent for all quintiles. This suggests that the overall decline in labor income was not primarily due to reduced hours of the family members in work. At the same time, unemployment has been shown to be a significant explanatory factor in the profile of Russian poverty (Commander and Yemtsov, 1997). Open unemployment in the sample increased from 7.7 percent of the labor force in 1994 to 9.1 percent in 1996. At the household level, the share of unemployed members among working age adults increased from 7.4 percent in 1994 to 8.6 percent in 1996. But this hides substantial differences across quintiles, with the incidence of unemployment being much higher at the bottom of the expenditure distribution. While the share of household members on compulsory unpaid leave, which is a form of hidden unemployment (Standing, 1996), remained quite low on average, it was more common at the bottom of the expenditure distribution.

TABLE 2  
MEAN OF LABOR MARKET VARIABLES BY QUINTILES OF THE WELFARE RATIO

Explanatory Variables	1994					1995				
	Q20	Q40	Q60	Q80	Q100	Q20	Q40	Q60	Q80	Q100
Hourly wages fully paid (>0)	16.9	25.9	28.4	30.3	41.3	14.1	18.9	27.0	30.5	42.5
Av. monthly hours (>0)	175	167	167	165	178	209	193	186	177	184
Av. members unemployed	0.129	0.082	0.068	0.046	0.050	0.124	0.086	0.083	0.074	0.065
Av. members with wage arrears	0.240	0.173	0.162	0.114	0.117	0.398	0.245	0.195	0.209	0.176
Av. members on unpaid leave	0.007	0.008	0.007	0.002	0.001	0.005	0.010	0.004	0.002	0.001

Source: RLMS rounds V and VII.

Payment arrears have become a widespread problem in a number of former Soviet countries. In the RLMS, the share of workers in the household reporting non-payment of their wage in the preceding month increased from 16 percent in 1994 to more than 24 percent in 1996. The incidence of wage arrears was much higher for the bottom quintiles, suggesting that arrears worsen the distribution of family cash consumption. It is however difficult to measure the real extent of wage arrears and its associated impact on welfare, because the RLMS survey instrument does not ask for how long the amount had been owing, and we are therefore unable to determine the real value of the arrears.<sup>5</sup>

An extensive system of benefits was inherited from the Soviet period and most Russian families in the 1990s continued to receive some public income support. In late 1996, public transfers (including pension, unemployment, and child benefits) represented about 30 percent of the income of the poorest (Table 1). However, the average real value (in June 1992 prices) of public social transfers per household dropped by more than 30 percent between 1994 and 1996. This

<sup>5</sup>A number of researchers have nonetheless carried out fruitful analysis of wage arrears using the RLMS including Lehman, Wadsworth, and Acquisti (1998) and Desai and Idson (1997).

decline can be attributed to non-indexation of, coupled with arrears in, benefit payments, which became widespread. The share of eligible households not receiving government transfers increased sharply over the period, from 3.6 percent to 34 percent for pensions and from 33 percent to 62 percent for child benefits (Richter, 1998).

Assistance from the extended family and friends has always been an important part of the safety net for households in Russia (Cox, Eser, and Jimenez, 1997). Over the period 1994–96, the contribution of private transfers to household income averaged about 8 percent, with substantial differences by welfare quintiles, and a higher share of private transfers among the worse-off (Table 1). In contrast to public support, the *share* of private transfers in total income increased between 1994 and 1996. At the same time, the real value of these transfers fell sharply between 1994 and 1995, and then recovered slightly, albeit to levels below their 1994 values (Figure 1).

Among other income sources, capital income declined substantially over the period while the revenues from the sales of home produced food increased (Table 1). The latter can be interpreted as a household reaction to falling income. Both types of other income were equally distributed across households, as a share of cash income.

#### 4. METHODOLOGY

To investigate the relative importance of different income sources and their variation over time, we specify a model where the parameters can vary according to the segment of the expenditure distribution under consideration. We first estimate the determinants of the welfare ratio using quintile regression models. Then this is applied to a Blinder/Oaxaca decomposition in order to separate at different points in the distribution, the overall welfare decline into mean changes in the characteristics of the population, and changes in the impact of these characteristics.

##### 4.1. *Quintile Regression Analysis*

The first step is to isolate the main correlates of family cash welfare as measured by the cash expenditure-to-needs ratio. We specify a set of regressions of the logarithm welfare ratio against sets of variables related to social transfers and labor market activity, with additional controls for other family income, family composition and region. In order to allow different factors to matter in different parts of the welfare ratio distribution, we estimate four quintiles of the expenditure-to-needs ratio, conditional on the values of the independent variables.<sup>6</sup> Quintile regression models use more information from the dependent variable, and allow the estimated parameter to vary by groupings of the dependent variable.

<sup>6</sup>Quintile regression models are very similar to ordinary regression, but instead of minimizing the sum of the squares of the residuals as in OLS, quintile regression models minimize the sum of the absolute residuals. Statistical properties of minimum absolute deviation estimators are reviewed by Koenker and Bassett (1978).

In such models, the  $q$ th regression quintile,  $0 < q < 1$ , is defined as the solution to the minimization problem:

$$\min_{\beta_j} \left[ \sum_j q |y_i - \beta_j x_{ij}| + \left[ \sum_j (1 - q) |y_i - \beta_j x_{ij}| \right] \right].$$

This is set up and solved via linear programming techniques.

Formally, separate adjusted expenditure functions are estimated at the 20th, 40th, 60th and 80th percentile for a given year and for all households  $i = 1, \dots, N$ :

$$(1) \quad LnW_i^q = a_q X_i + u_i$$

where  $LnW^q$  is the  $q$  quintile of the natural logarithm of the welfare ratio for the entire sample,  $X$  is the vector of explanatory variables,  $a_q$  is the vector of coefficients, and  $u$  is a random error term with  $E(u) = 0$  and  $Var(u) = \sigma^2$ .

The results of equation (1) may be interpreted as linear regression output, except that instead of the mean of the dependent variable, we predict the chosen quintile of the log ratio for the entire sample in a given year using the estimated coefficients and the mean characteristics across all households:

$$(2) \quad \overline{LnW^q} = \hat{a}^q \bar{X}$$

where for each year  $\hat{a}^q$  is the quintile or *minimum-absolute* estimate of  $a^q$ ,  $\bar{X}$  are the means across all households of the explanatory variables, and  $\overline{LnW^q}$  is the fitted value for the  $q$  quintile of the log ratio estimated at the mean of the sample characteristics.

The vector of  $X$  variables includes social transfers and labor income variables. The former includes public benefits and private transfers. The latter includes the average hourly wage in the family from first and secondary jobs for those members reporting no wage arrears, the monthly hours spent in employment (from first and second jobs) for those individuals receiving some positive wages, the share of working family members affected by wage arrears, the share of unemployed members in the family and the share of employed family members on compulsory unpaid leave.

#### 4.2. The Decomposition Technique

The linear nature of equation (2) allows straightforward decomposition of changes in  $\overline{LnW^q}$  into changes in the  $\bar{X}$  and  $\hat{a}^q$  for several percentiles by applying a Blinder/Oaxaca decomposition technique. Following Gomulka and Stern (1989) we adapt this in order to assess how much of the fall in household adjusted cash expenditures was due to changes in the observable characteristics of the sample population, and how much to changes in the “treatment” of those characteristics.

For each percentile of the expenditure-to-needs ratio under investigation, changes in the predicted welfare ratio between periods  $t$  and  $t + 1$  are decomposed into changes in the vector of coefficients, including the constant, and changes in the mean values of the explanatory variables weighted by their impact at the chosen percentile in period  $t$ :

$$(3) \quad \overline{LnW_{t+1}^q} - \overline{LnW_t^q} = (\hat{a}_{t+1}^q - \hat{a}_t^q) \bar{X}_{t+1} - (\bar{X}_{t+1} - \bar{X}_t) \hat{a}_t^q.$$



The first term on the RHS represents the changes in the welfare ratio (in log points) at the  $q$ th percentile explained by changes in the coefficients between periods  $t$  and  $t + 1$ , evaluated at the means of the sample for  $t + 1$ . The second term measures the changes in the ratio explained by changes in the mean values of the explanatory variables holding the coefficients constant at the values estimated for period  $t$  and for the chosen percentile  $q$ . Hence, this analysis reveals whether changes are due to structural changes in the model coefficients or changes in underlying explanatory variables due to idiosyncratic shocks.

We can also look at the impact of changes in an individual variable or coefficient of interest. The vector of the explanatory variables  $X$  are separated into distinct social transfer ( $SOC$ ) and labor market ( $LAB$ ) components, with the associated coefficients  $\alpha$  and  $\beta$  respectively. The changes in the predicted log ratio for a given percentile  $q$  between the periods  $t$  and  $t + 1$  can then be rewritten as:

$$(4) \quad \Delta \overline{LnW^q} = \Delta \hat{\alpha}^q \overline{SOC}_{t+1} + \hat{\alpha}_t^q \Delta \overline{SOC} + \Delta \hat{\beta}^q \overline{LAB}_{t+1} + \hat{\beta}_t^q \Delta \overline{LAB}$$

where  $\Delta$  indicates the difference between periods. On the RHS, the first and third terms measure the effect of a partial change in the coefficient of the social and labor market income variables respectively. The second and fourth terms, in turn, represent the effect of a partial change in the mean value of these variables.

This methodology is implemented in three steps. First, we predicted the 20th, 40th, 60th and 80th percentiles of the log ratio using the actual coefficients found for the years 1994, 1995 and 1996, but held the values of each household's regressors ( $X$  variables) constant at 1996 levels. The difference in the predicted values shows how much of the aggregate change can be attributed to changes in the coefficients of the model holding the values of the explanatory variables constant (first term RHS in equation (3)). Then, we hold the coefficients constant at their 1994 levels, and predict the log ratio using the actual value of the sample regressors for each year. The differences in the predictions reveal how much of the changes can be attributed to changes in the explanatory variables, holding the coefficients constant at 1994 levels (second term on RHS in equation (3)).

As a separate exercise, the above two steps are repeated for the social transfers and labor market variables, utilizing equation (4). This reveals the partial change in the log welfare ratio due to changes in transfer payments and income from labor market earnings.<sup>7</sup> The results are presented in the next section.

## 5. RESULTS

### 5.1. *Multivariate Analysis*

In the quintile regressions, the “labor market activity” variables are the average hourly wage in the family for those employed family members who were fully paid, the monthly hours of work for those with non-zero wages, wage arrears, and

<sup>7</sup>Note that this technique is merely accounting, in that, by definition the aggregate change in the log ratio evaluated at a chosen percentile is equal to the sum of the marginal changes of the characteristics and the marginal changes of the coefficients. However, some of the changes may not be statistically significant.

a binary indicator of the presence of an unemployed person in the household.<sup>8</sup> In order to capture the extent of support provided by the social safety net, all sources of public transfers and transfers from private sources are included. We also include income received from capital, and from the sale of home produced food. Other control variables include demographic characteristics (specifically, age of the household head, the number of children, the number of working-age adults and the number of above working-age adults), and region of residence. In the discussion below, changes in the household's expenditure ratio adjusted for needs is taken as equivalent to changes in household welfare.

Before proceeding, we test for statistical differences between coefficient estimates among different quintiles, and for changes in these coefficients over time. Using Wald tests, the hypothesis that the coefficients were jointly equal at the 20th and 80th percentile in 1994, 1995 and 1996 can be rejected at the 95 percent confidence level, indicating that the model coefficients are different for different expenditure quintiles, and justifying the quintile regression approach. We were also able to reject at the 95 percent confidence level the hypothesis that the coefficients were jointly equal between 1994 and 1995, and 1994 and 1996. However, we could not reject the hypothesis that the coefficients of the models were equal between 1995 and 1996. This indicates that a structural break in the data occurred between 1994 and 1995.<sup>9</sup>

The quintile regressions reveal some interesting patterns. Results for the top and bottom quintiles are presented in Tables 3 and 4.<sup>10</sup> (Results for the other quintiles are available from the authors on request.) Public transfers are associated with a positive and significant impact on household welfare. A one thousand rouble (about 7 dollars in June 1992 prices) increase in these transfers raises expenditure ratios by an estimated 5–6 percent at the top quintile, 7–9 percent at the third quintile, 10 percent at the second quintile, and 10–15 percent at the bottom quintile.<sup>11</sup> This suggests that despite the erosion of benefit levels, the safety net still plays an important role in protecting household cash consumption. Moreover, the impact is progressive: the marginal effects of benefit payments on the welfare ratio are much higher at the bottom of the expenditure distribution.

Likewise, the effect of private transfers on household welfare is positive and significant, though the marginal impact is relatively less for those at the bottom of the distribution. This result contrasts with the earlier descriptive statistics where private transfers represent a larger share of income among the poorest. Across all quintiles, the size of the coefficients on private transfers are also small

<sup>8</sup>Note that unemployment includes both open (using the ILO definition) and hidden (the share of officially employed family members on compulsory unpaid leave).

<sup>9</sup>As noted above, this also precludes a fixed-effect or random-effect model using the panel dimension of the RLMS, given that these models assume that the coefficients are constant over time.

<sup>10</sup>When the sensitivity of these results was tested by re-estimating the same regressions using two alternative measures of family welfare (first, using a national poverty line without economies of scale or regional price adjustments; and second, using total cash consumption without any adjustment for household size), the results proved to be robust.

<sup>11</sup>Note that a common mistake is to interpret the coefficient of dummy variables in semi-logarithmic equations as corresponding to percentage effects. As illustrated in an article by Halvorsen and Palmquist (1980), if  $c$  is the coefficient of a dummy variable in an equation where the dependent variable is  $\log Y$ , then the impact of this variable on  $Y$  is  $\exp(c) - 1$ , not  $c$ . The approximation is good only when  $c$  is "small".

TABLE 3  
 QUINTILE REGRESSION ESTIMATES OF THE LOGARITHM OF THE EXPENDITURE-TO-NEEDS  
 RATIO: BOTTOM QUINTILE (Q20)

Explanatory Variables	1994		1995		1996	
	Coef.	t-ratio	Coef.	t-ratio	Coef.	t-ratio
<i>Labour market factors</i>						
Wage fully paid	0.005	4.4	0.006	4.5	0.005	4.6
Hours/100	0.113	4.2	0.075	3.0	0.075	3.9
Unemployment	-0.609	-4.7	-0.411	-3.3	-0.388	-4.1
Wage arrears	-0.308	-3.6	-0.407	-5.2	-0.377	-7.2
Unpaid leave	-1.130	-3.0	-0.655	-1.7	-0.377	-1.6
<i>Social safety net</i>						
Public transfers/1000	0.098	4.0	0.150	5.5	0.128	7.6
Private transfers/1000	0.015	2.7	0.047	4.0	0.012	2.7
<i>Other income</i>						
Sales of home produced food/1000	0.015	0.44	0.032	1.0	0.080	5.4
Capital income/1000	0.012	2.4	0.017	3.0	0.017	2.5
<i>Family structure variables</i>						
Head's age	-0.001	-0.7	-0.000	-0.3	0.000	0.5
Number of children	-0.116	-3.9	-0.100	-3.5	-0.131	-5.7
Number of working age adults	-0.061	-1.9	-0.071	-2.4	-0.063	-2.6
Number of pensioners	-0.162	-2.7	-0.149	-2.8	-0.134	-3.7
<i>Location variables</i>						
Rural household	-0.596	-9.5	-0.543	-9.6	-0.602	-13.1
Region dummies	Yes (7)		Yes (7)		Yes (7)	
Constant	0.310	2.0	0.327	2.2	0.272	2.2
Pseudo R-squared		0.104		0.111		0.135
Number of observations		3743		3574		3525

relative to those for public transfers, although this could reflect their smaller overall importance. Private transfers represented in late 1996 about 10 to 15 percent of total income, compared with 30 to 36 percent for public transfers on average.

The labor market variables generally have the expected sign. Wages that were fully paid and reported hours of work contributed significantly to increase the expenditure-to-needs ratio. In late 1996, a one hundred rouble increase (0.7 dollar) in the average hourly wage is estimated to raise the expenditure ratio by around 50 to 60 percent. The returns to the wages that were fully paid also tend to have increased slightly after 1994. However, the sensitivity of cash consumption to the time spent in employment for those receiving positive wages (but not necessarily fully paid), as captured by the coefficient on the number of work hours, decreased sharply at all points in the distribution. An increase in monthly hours by 100 increases the expenditure ratio by an estimated 10 to 15 percent in 1994, but by only 5 to 7 percent in 1996. Given that the family hourly wage received by workers who were fully paid is included in the equation (and that the coefficient on this variable tended to increase), the decline in the impact of the time spent in employment probably reflects the effect of workers not being fully paid. But beyond the incidence of wage arrears in the survey period, which is controlled for in the model, this could pick up the cumulative negative impact of past arrears in wages or an increase in the size of arrears.

TABLE 4  
QUINTILE REGRESSION ESTIMATES OF THE LOGARITHM OF THE EXPENDITURE-TO-NEEDS  
RATIO: TOP QUINTILE (Q80)

Explanatory Variables	1994		1995		1996	
	Coef.	t-ratio	Coef.	t-ratio	Coef.	t-ratio
<i>Labour market factors</i>						
Wage fully paid	0.005	9.8	0.009	12.2	0.008	12.5
Hours/100	0.149	8.2	0.074	3.8	0.050	2.8
Unemployment	-0.212	-2.3	-0.115	-1.1	-0.084	-0.9
Wage arrears	-0.239	-1.4	-0.091	-1.2	-0.130	-2.1
Unpaid leave	-0.395	-1.4	-0.249	-0.5	-0.442	-2.2
<i>Social safety net</i>						
Public transfers/1000	0.059	3.6	0.054	2.3	0.054	3.3
Private transfers/1000	0.040	9.3	0.033	3.0	0.029	5.7
<i>Other income</i>						
Sales of home produced food/1000	0.073	2.9	0.020	0.7	0.039	2.4
Capital income/1000	0.032	16.0	0.038	18.6	0.052	16.4
<i>Family structure variables</i>						
Head's age	-0.000	-0.3	-0.003	-2.1	0.003	2.0
Number of children	-0.106	-5.0	-0.145	-6.1	-0.145	-6.0
Number of working age adults	-0.147	-6.1	-0.159	-6.7	-0.145	-5.8
Number of pensioners	-0.134	-3.2	-0.120	-2.6	-0.099	-2.6
<i>Location variables</i>						
Rural household	-0.194	-4.6	-0.180	-3.6	-0.237	-5.1
Region dummies	Yes (7)		Yes (7)		Yes (7)	
Constant	1.460	13.8	1.380	11.2	1.416	11.9
Pseudo R-squared		0.088		0.104		0.104
Number of observations		3743		3574		3525

As expected, the dummy coefficients on wage arrears and unemployment variables are negative, but there are substantial differences across quintiles. Both have a larger negative and significant impact at the bottom of the expenditure distribution, but they are rarely significant at the top of the distribution. At the top quintile, the unemployment variable was not significant in 1995 and 1996, and the wage arrears variable was significant only in late 1996. In other words, unemployment and wage arrears did not affect the adjusted cash consumption of the richest, but these factors had a strong negative impact at the bottom of the distribution. Somewhat surprisingly, the sensitivity to unemployment has decreased over the period: across all quintiles, a 1 percent increase in the share of unemployed family members among working age adults was estimated to decrease adjusted cash consumption by 21 to 60 percent in 1994, compared with 8 to 38 percent in 1996. This could mean that a growing share of the unemployed had informal sector earnings, something that we do not control for in the model.<sup>12</sup>

The unpaid leave variable has the expected negative sign but is only significant for the bottom quintile. This is not surprising given that unpaid leave affects relatively few households, and those who are affected are more likely to be at the bottom of the expenditure distribution. The sensitivity of cash consumption to

<sup>12</sup>We do include earnings from second jobs in the model, but other informal wages reported by those who are not employed are not included due to large measurement errors (Kolev, 1998).

unpaid leave has decreased over time, probably due to the fact that those affected are augmenting their income by informal sector employment.

Capital income has a positive and significant impact on the welfare ratio across all expenditure quintiles, but more so at the top. A one thousand rouble increase in capital income was estimated to raise the welfare ratio by 1 percent at the bottom quintile, and 3 to 5 percent at the top quintile. Similarly the effect of cash income from the sale of home produced food on the welfare ratio tends to be positive and stronger among households situated in the middle two quintiles.

The household size variables have a negative impact on the welfare ratio. Since the ratio is adjusted for family needs, this points to a lower level of cash welfare among large families. This result is consistent with previous studies showing that larger families are at greater risk of poverty in Russia (Klugman, 1997).<sup>13</sup> There are significant differences in the magnitude of demographic coefficients across the quintiles however (as shown by t-tests). Whilst the presence of dependants has a strong negative impact on the welfare ratio for all quintiles, the negative impact associated with the number of pensioners living in the household is particularly high among the worse-off, and exceeds that associated with the number of children. Conversely, the negative impact associated with the elderly in the household tends to be smaller among the richest. The results also indicate that the coefficient associated with the presence of an elderly person in the household has tended to decrease over time.

Spatial variables are statistically significant. This was expected given the large rural–urban and regional differences that characterize the Russian Federation (World Bank, 2000b). The negative association between household welfare and the rural dummy is also much higher among the poorest. Compared with urban households, rural residence decreased the welfare ratio by nearly 80 percent at the bottom quintile, compared with about 20 percent at the top quintile. Note that the inclusion of home production in the measure of household cash expenditure would likely reduce the size of the rural dummy coefficient.<sup>14</sup>

Lastly, the coefficients of the constant, which captures unobserved characteristics in the model, are significant but declined substantially during the period. The changes in the coefficients of the constant were also statistically significant at conventional levels.

## 5.2. *Decomposition Analysis*

This section examines the extent to which changes in Russian households' welfare between 1994 and 1996 can be explained by changes in household characteristics (in terms of receipt of safety net transfers and labor market variables) versus changes in the structural coefficients which govern the importance of (or returns to) different characteristics. This is done using the Oaxaca decomposition framework described in section 4.2.

<sup>13</sup>If we use cash consumption without any adjustment for family needs, as one would expect, additional adults and children in the household would increase household welfare.

<sup>14</sup>As expected, the impact of the regional dummies differed, albeit only slightly, with the use of a national poverty line that does not incorporate any economies of scale or regional price adjustments.

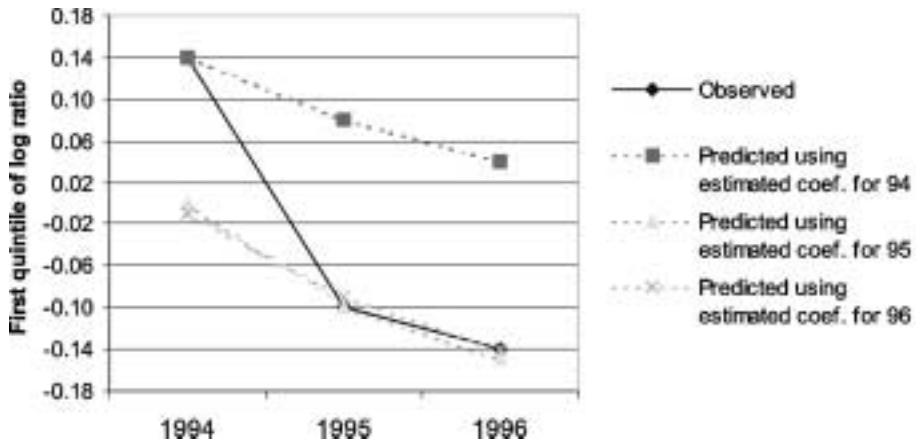


Figure 2. Actual and Predicted First (Bottom) Quintile of the Log Welfare Ratio

### 5.2.1. Components of the Decline in the Welfare Ratio

The results of the decomposition analysis for the top and bottom quintiles are shown in Figures 2 and 3. These show the actual and the fitted values of the natural logarithm of the expenditure-to-needs. The dotted lines represent declines in the log ratio due to changes in characteristics (like employment status), whilst the difference between each curve shows the decline in the log ratio due to changes in the coefficients. Changes in the sensitivity of cash consumption to characteristics (as measured by the regression coefficients), including unobserved characteristics reflected in the coefficient on the constant, account for the major part of the decline in the predicted ratio (Table 5): about 63 percent of the overall decline at the bottom quintile. Changes in the model coefficients dominate changes in the explanatory variables themselves. Hence any attempts to forecast the welfare ratio for either 1995 or 1996 using the 1994 set of coefficients would have performed very poorly since much of the decline in the ratio between 1994 and 1996 is associated with changing coefficients.

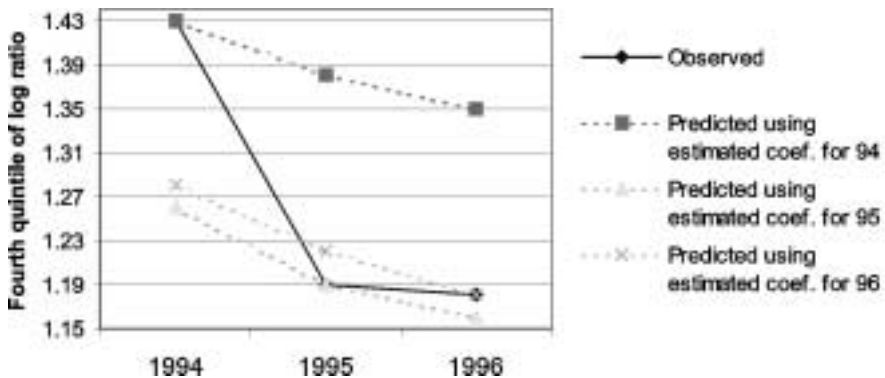


Figure 3. Actual and Predicted Fourth Quintile of the Log Welfare Ratio

TABLE 5  
DECOMPOSITION IN THE PREDICTED LOG RATIO BETWEEN 1994 AND 1996  
BY QUINTILES

Quintile	Difference in Log Adjusted Consumption	Percentage due to Changes in Characteristics	Percentage due to Changes in Coefficients
First quintile	0.2916	37.2	62.8
Second quintile	0.2742	34.3	65.7
Third quintile	0.2722	26.8	73.2
Fourth quintile	0.2446	31.5	68.5

*Source:* RLMS rounds V, VI and VII.

*Note:* Changes in characteristics are evaluated using the coefficients estimated for 1994. Changes in coefficients are evaluated holding the sample characteristics constant at their values in 1996.

The results also show that the welfare declines due to the changing coefficients of the model were less in the latter part of the period, 1995–96. This could be explained by the improved macroeconomic environment noted above, so that labor market conditions and income sources were less volatile relative to the earlier year.

As noted above, the decline in the log welfare ratio was largest at the bottom quintile. Interestingly, changing characteristics of the sample explain a larger share of the decline in the log ratio for the bottom quintile (37 percent, compared to 31 percent at the top quintile). This is investigated further in the next section.

### 5.2.2. Accounting for the Role of the Safety Net and the Labor Market

Quantifying the relative contributions of the weakening of the safety net and changes in labor market outcomes on the fall in family cash welfare sheds light on transmission mechanisms of macroeconomic shocks to household well-being. The marginal impact of changes in the mean values and changes in the coefficients of these variables are presented in Table 6.

While labor market related factors have played a more important role than those associated with the social safety net, there are substantial differences across quintiles so that the driving forces contributing to these outcomes are also very different across quintiles. Among labor market changes, increasing incidence of wage arrears tend to have played a major role, especially for the bottom and second quintile (–6.6 and 4.3 percent respectively). This is consistent with findings elsewhere in the former Soviet Union (Klugman, 1998). Rising unemployment seems to have played a smaller role in part because the change in unemployment evaluated at the mean was not statistically significant (Appendix, Table A-1). However, the poor still tend to have suffered relatively more from increases in unemployment: –1.9 percent at the first quintile is twice that for the top quintile.

There are also substantial differences across quintiles in the returns to labor market characteristics. The marginal impact of the decline in the welfare ratio due to a decrease in the coefficients on “hours”, which might pick up a decline in the wage among workers who were paid but not fully, was much higher among the better-off (–91.4 percent) than at the bottom (–26.2 percent). The increase in

TABLE 6  
CONTRIBUTION OF SOCIAL SAFETY NET AND LABOUR MARKET EVENTS ON THE CHANGES IN  
LOG ADJUSTED CASH CONSUMPTION BETWEEN 1994 AND 1996 AS A PERCENTAGE OF THE  
OVERALL DECLINE

	First Quintile	Second Quintile	Third Quintile	Fourth Quintile
<i>Labour market events</i>	-26.5	-25.6	-7.1	-34.5
<i>Changes in characteristics</i>	-2.0	2.1	6.7	8.4
Full wage	-1.2	-1.8	-1.7	-1.7
Wage arrears	-6.6	-4.3	-2.2	-2.8
Unemployment	-1.9	-1.8	-1.2	-0.9
Hours	7.7	10.0	11.8	13.8
Unpaid leave	0.0	0.0	0.0	0.0
<i>Changes in coefficients</i>	-24.5*	-27.7**	-13.8**	-42.9**
Full wage	3.3	21.8*	62.0**	47.8**
Wage arrears	-7.7	-10.2	-9.7*	-3.1
Unemployment	5.4	2.2	1.9	4.1
Hours	-26.2	-39.9**	-67.4**	-91.4**
Unpaid leave	0.7*	-0.6	0.0	-0.3
<i>Social safety net</i>	-6.1	-13.8	-17.9	-20.0
<i>Changes in characteristics</i>	-16.5	-21.2	-17.5	-14.6
Public transfers	-16.1	-20.3	-16.6	-13.0
Private transfers	-0.4	-0.9	-0.9	-1.6
<i>Changes in coefficients</i>	10.4	7.4	-0.4	-5.4
Public transfers	10.7	7.6	-0.3	-2.4
Private transfers	-0.3	-0.2	-0.1	-3.0
Changes in the constant	16.5	82.7	103.0	21.9

*Source:* RLMS rounds V, VI and VII.

*Note:* (\*\*\*) Changes in the coefficient or the set of coefficients are significantly different from zero at the 90 (95) percent level respectively.

the impact of wages for those who were fully paid, which was statistically significant among the three top quintiles, also contributed more to protecting the welfare position of the better-off, relative to the effect for the worse-off households.

While the contribution of the factors related to public social transfers were smaller overall, the marginal impact of falling state transfers was nonetheless substantial: accounting for between 13 to 20 percent of the overall decline in the log ratio. Private transfers played a smaller role in explaining charges; although these transfers dropped by nearly 13 percent, between 1994 and 1996, this accounts for 0.4 to 1.6 percent of the total decline in the welfare ratio.

Unobserved changes not captured in the RLMS instrument also substantially affect the welfare ratio. Changes in the constant's coefficient play an important role in explaining the decline in cash welfare, especially for the middle two quintiles.

## 6. CONCLUSIONS

This paper explored the welfare impact of the erosion of the social safety net and labor market shocks in an overall context of declining living standards and rising inequality. Using a decomposition technique to explain changes in the log welfare ratio of Russian households over time, we were able to isolate the sources of the decline for the sub-period 1994–96. Despite the acknowledged limitations



of the methodology adopted and available data, the results provide some interesting insights into the transmission mechanisms of macroeconomic and structural shocks to household well-being.

The empirical results suggest that between 1994 and 1996, about two thirds of the overall decline in the log welfare ratio can be explained by changes in the returns to observed household and individual characteristics. This was especially true in 1994–95, when the macroeconomy was still very unstable. The finding that the explanatory power of observed household characteristics (such as demographic variables, employment status and wage earnings) in the adjusted cash consumption regressions varies significantly over time highlights the potential inadequacy of policy recommendations and actions that are based on “dated” profiles of poverty risk factors. This warning is likely to be true throughout the post-crisis period when changes in employment status, aggregate demand and the macro-economy amount to structural breaks in model parameters and determinants of poverty.

Labor market events were the most important independent variables in explaining the decline in the cash-based welfare ratio, despite the fact that open unemployment remains low relative to the size of decline in output. In particular, falling returns to time spent in employment and the increase in the share of workers affected by wage arrears have been most damaging for household welfare. There are nonetheless important differences in the nature of labor market impacts across the distribution. Interestingly, the rise in unemployment and increase in wage arrears were much more important in explaining the decline in adjusted cash consumption at the bottom than at the top of the distribution.

Another conclusion is that weakening of the state welfare programs accounted for a substantial part of the decline in the predicted expenditures-to-needs ratio. This effect was large in all parts of the distribution, and suggests that the government’s failure to maintain real benefit levels and ensure the timely payment of most transfers in the context of a deep economic crisis had a strong negative impact on family welfare. However, public transfers still played an important role in protecting household cash consumption, especially for the poorest.

Finally, the decline in private transfers contributed little to the overall decline in the welfare ratio over the period. Private transfers, which represented about 8 percent of family income in 1996, declined to a lesser extent than public transfers. It is possible that private transfers have acted as a substitute or cushion for household welfare in the face of declining labor income and public support. In this sense, private transfers could be endogenous (responsive) to household welfare, though this point was not empirically tested here.

## APPENDIX

TABLE A-1

MEAN (STANDARD DEVIATIONS) OF THE EXPLANATORY VARIABLES: 1994–96

	1994	1995	1996
<i>Labour market factors</i>			
Total monthly labour income	3881 (6344)	3089 (4959)	3094* (5659)
Hourly wages fully paid (> 0)	29.8 (36.3)	25.1 (31.3)	29.2 (38.6)
Av. monthly hours of family members (> 0)	158 (86)	163 (94)	168 (99)
Av. family members unemployed	0.057 (0.213)	0.056 (0.212)	0.066 (0.230)
Av. family members reporting wage arrears	0.159 (0.313)	0.181 (0.326)	0.244* (0.369)
Av. family members sent on compulsory unpaid leave	0.005 (0.063)	0.003 (0.050)	0.004 (0.063)
<i>Social safety net income</i>			
Public transfers	1410 (1567)	1068 (1210)	969* (1414)
Private transfers	637 (3095)	449 (1980)	556 (2899)
<i>Other income</i>			
Sales of home produced food	72 (656)	80 (754)	109 (973)
Capital income	921 (5997)	874 (6077)	540* (3877)
<i>Family structure variables</i>			
Head's age	46.5 (15.7)	47.1 (15.8)	46.7 (16.1)
Number of children	0.75 (0.94)	0.74 (0.94)	0.72 (0.92)
Number of working age adults	1.48 (1.08)	1.47 (1.10)	1.48 (1.10)
Number of pensioners	0.61 (0.75)	0.62 (0.75)	0.62 (0.75)
<i>Location and regional variables</i>			
Rural household	0.24 (0.42)	0.25 (0.43)	0.26 (0.43)
Moscow and St Petersburg	0.10 (0.29)	0.09 (0.28)	0.08 (0.26)
North and North West	0.07 (0.25)	0.07 (0.25)	0.07 (0.25)
Central and Central Black Earth	0.20 (0.39)	0.19 (0.39)	0.20 (0.40)
Volga–Vaytski and Volga Basin	0.18 (0.38)	0.18 (0.38)	0.18 (0.38)
North Caucasian	0.11 (0.32)	0.12 (0.32)	0.12 (0.32)
Ural	0.14 (0.35)	0.15 (0.35)	0.15 (0.35)
Western Siberia	0.10 (0.29)	0.10 (0.29)	0.10 (0.29)
East Siberia and Far East	0.10 (0.29)	0.10 (0.30)	0.10 (0.29)

Source: RLMS rounds V, VI and VII.

Notes: Wages and social incomes are in June 1992 roubles.

\*Mean value in 1994 is significantly different than mean value in 1994 at the 95 percent confidence level.

TABLE A-2

DEFINITIONS OF THE VARIABLES

<i>Labour market factors</i>	
Wage fully paid	Sum of all monthly wages in June 1992 prices from main and second jobs received by all household members that do not report wage arrears divided by the respective monthly hours of work performed in main and second jobs
Hours	Sum of all hours of work performed in main and second jobs by all household members divided by the number of wage recipients in the family
Unemployment	Number of unemployed members in the household (ILO definition) divided by the number of members participating in the labor force
Wage arrears	Number of employed household members reporting no wages in the last month but providing positive hours of work divided by the number of employed members with positive hours of work who were paid in the last month
Unpaid leave	Number of household members officially employed but sent on compulsory unpaid leave divided by the number of officially employed family members

TABLE A-2—continued

<i>Social safety net</i>	
Public transfers	Sum of all government transfers received in the household: includes pensions, child benefits, unemployment benefits and other public benefits
Private transfers	Sum of all transfers received in the household from relatives, friends, and non-governmental organizations
<i>Other income</i>	
Sales of home produced goods	Sum of all cash revenues from the sale of home produced goods in the household
Capital income	Household income from rents, property and capital investments
<i>Family structure variables</i>	
Head's age	Head of age in years
Number of children	Number of children of age 17 or below living in the same household
Number of working age adults	Number of males of age 18–59 and females of age 18–54 living in the same household
Number of pensioners	Number of males of age 60 and above and females of age 55 and above living in the same household
<i>Location and regional variables</i>	
Rural household	= 1 if the family lives in a rural settlement
Moscow and St Petersburg	= 1 if the family lives in Moscow or St Petersburg
North and North West	= 1 if the family lives in North or North West
Central and Central Black Earth	= 1 if the family lives in Central or Central Black Earth
Volga–Vaytski and Volga Basin	= 1 if the family lives in Volga–Vaytski or Volga Basin
North Caucasian	= 1 if the family lives in North Caucasian
Ural	= 1 if the family lives in Ural
Western Siberia	= 1 if the family lives in Western Siberia
East Siberia and Far East	= 1 if the family lives in East Siberia or Far East

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