Poverty Persistence in Transitional Russia

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ABSTRACT

In this work different poverty lines based on equalized income and expenditures of households are used to analyze which demographic and socio-economic characteristics of household members cause it to be persistently poor (stay below the poverty line for more than 4 out of 9 periods under consideration), and main determinants of entry and exit into and from poverty. Analysis is based on ordered logit models and uses data from Russian Longitudinal Monitoring Survey covering 1994-2004. Obtained results suggest that the most vulnerable categories during the eleven years of Russian transition were families with children and households with heads of older age and without higher education, as well as families with more than one unemployed member, while pensioners' households were relatively better off, compared to households headed by prime-age persons.

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INTRODUCTION

Poverty remains a matter of primary concern even for developed economies. The break up of the Soviet Union made this problem even more severe for the former Soviet Republics. Significant income redistribution and following it increase in income inequality made a large part of the whole population fall below the poverty line in almost all the republics of the former USSR and particularly in Russia. According to some estimations up to 43% of Russian population lived below the poverty line in 1993-1995 (Branco Milanovich, 1998).

Transition from a command economy has been associated with a significant worsening of household and individual well-being. In addition to increased number of people living below the poverty line there was also a significant change in the demographic and social characteristics of poor people. In transitional Russia unlike in developed countries high incidence of poverty was observed among working population who just could not support their families due to substantial decrease in real income and widespread wage arrears.

Central to the current poverty debate is the issue of an existence of a "poverty trap", that is, whether poverty is a condition that affects relatively few households, but those affected remains in poverty for a large portion of their lifetimes (Jorgen Hansen and Roger Wahlberg, 2004). Analysis of persistent poverty is very important from a policy perspective as different poverty reducing policies appear to be affective depending on the nature of poverty and composition of target groups.

In order to effectively model the strategy of poverty reduction it is necessary to understand the structure of poverty: who constitute the groups of temporarily and persistently poor and which events make them fall in one of these two groups. In case of Russia, the impact of

household composition on poverty persistence is not fully explored and needs further examination.

In the presence of high incidence of poverty the main question that can arise is how that can influence the well-being of the most unprotected groups of population: children and elderly persons. Works conducted in the sample of developed countries showed that family composition, as well as number of elderly persons and younger children in household, has a significant impact on household poverty profile (Signe-Mary McKernan and Caroline Ratcliffe (2002). At the same time, some works analyzing poverty in transition countries argued that old age pensioner households have been protected during the transition process, at least in relative terms. In contrast, living standards of households with young children are believed to have fallen substantially over the reform period (Peter Lanjouw et al, 1998). In case of Russia, Klugman and Braithwaite (1998) note that while the publicly financed system of pensions has kept the rate of poverty among the elderly consistently below the national average, for those outside the formal payroll-based system of social insurance, in particular families with children, social assistance is ad hoc and limited (Jeni Klugman and Jeanine Braithwaite, 1998).

At the same time, while most of the researches discussing poverty in Russia examine factors that influence the probability of getting into poverty, not much work is done on analyzing persistent poverty in Russia. Few works in this field conducted by Jeanine Braithwaite (1998) and Dmitri Spryskov (2003) showed that different characteristics of household have different impact on the probability of entering persistent and temporary poverty that should be taken into account when analyzing poverty transitions.

The goal of this analysis is to investigate the long-term (persistent) poverty in transitional Russia and to determine the main factors that influence the length of the period spent in

poverty. Second part of the work analyzes the events that increase the likelihood of entering and exiting poverty. The main focus of my analysis is the impact of demographic composition and events on probability of getting into poverty and staying there for long.

Being able to distinguish between temporarily and persistently poor allows me to identify the factors and events that have different impact on the probability of getting into one of these two states, as well as to potentially advise on different social assistance programs targeting these groups.

Data used in this analysis are obtained from Russian Longitudinal Monitoring Survey and cover rounds 5-13 (1994-2004) that gives me the largest time period that was ever used in such kind of research for Russia. I define two poverty lines - based on equalized income and equalized expenditures - that allow me to compare two widely used approaches and analyze how the results differ depending on the poverty line used. A household is called “non-poor” if it never fell below the poverty line during 9 rounds under consideration; “temporarily poor” and “persistently poor” households are those which fell below the poverty line less or exactly 4 times or more than 4 times respectively. The econometric methods used in this work are based on binary and multiple choice models.

This work is organized as follows. Section two is a literature review. Section three discusses the construction of poverty line, including data description, construction of equivalence scale and choice of poverty line. Section four presents simple model of poverty, while section five is dedicated to analysis of poverty persistence. Section six analyses reasons for poverty entry and exit. In section seven, main conclusions are given.

LITERATURE REVIEW

All the existing literature on poverty dynamics can be divided into several groups based on their methodology and research question. Based on the research question I can separate works aiming to explain the duration of poverty and those dealing with events that influence the probability of getting into poverty and exiting it. I start with works analyzing poverty duration and factors influencing the length of the period spent below the poverty line.

There can be identified three main groups of empirical methodologies in analyzing poverty duration. The first one – so called Hazard rate models – is based on the classical paper of Bane and Ellwood (1983) where spell of poverty was defined and used to model poverty dynamics. The authors investigated persistent poverty in America, based on data of the Panel Study of Income Dynamics (PSID) during 1970-1982 by looking at exit probabilities for individuals. The authors concluded that the longer a person has been poor the less likely he or she will escape poverty in the future. They also investigated the mean poverty duration depending on the cause of poverty. The authors found that the shortest spells of poverty are those that begin when the child becomes a head of another household and the longest spells of poverty are those caused by the birth of a child in a household. In addition to looking at the determinants of poverty, the authors also look at the main events ("trigger events") that can lead to moving in or out of poverty. They found that change in the household disposal income accounts for 50% of all beginnings and 75% of all exits from poverty (Bane and Ellwood, 1983, p.31-32). Among the other events they paid special attention to changes in family structure – so called demographic events.

This method was followed by Ann Stevens (1995) and Francesco Devicienti (2000), who introduced in it some modifications. In particular, Stevens (1995) argues that proposed by Bane and Ellwood (1983) single spell analysis does not take into account that "in the years

just after an exit from poverty, individuals are likely to fall back below the poverty line" (Stevens, 1995, p.5). To account for that she used multiple spell approach to analyze poverty persistence in the same PSID data set which allowed her to compare the results with those obtained using single spell approach. Based on that, she concluded that single-spell measures of poverty persistence significantly overstate the degree of mobility out of poverty. Among the other results it worth noticing a significant impact of household head gender and education on the number of months spent below the poverty line. Very similar model was implemented by Devicienti (2000) who investigated longer-term poverty using duration-data analysis in Britain in 1990s. He concluded, that the most vulnerable groups are families with three and more children, families with heads older then 54, and families where head has low education. At the same time, the least vulnerable categories are families without children and where heads are younger than 54.

There are, however, a number of problems with this approach. As it was argued by Arnstein Aassve et al (2006) hazard rate models are not capable to separately identify the effects of income events and demographic events that occur simultaneously. Another problem was raised by Stephen Jenkins (2000) who argued that there are econometric problems of simultaneity and endogeneity introduced when event variables are used to explain poverty transitions as the underlying processes are likely to be jointly determined. The author also notices that effects of some events persist over time, for instance effect of job loss can influence the individual long after the end of the period this event occurred, that cannot be taken into account by the model.

The second group of methods is so called Components of variance models. This method was originally used by Lee Lillard and Robert Willis (1978) and later employed by Devicienti (2000). This method allows to decompose income changes into permanent and transitory

components that gives more accurate picture of individual's long term position. At the same time, as it was noted in Aasve et al (2006) there is a notable disadvantage in these models – they can explain the poverty dynamics of one homogenous set of individuals at a time. It means that these models cannot be used in analyzing household poverty and influence of changes in household composition.

And finally, the third group of models is Markov models which complement both exit/entry hazard rate approach and the components of variance model, by using an extension of a first-order Markov model for low income transitions (Cappellari and Jenkins (2004). The model provides estimates for poverty transitions by considering poverty measures (wages, earnings, low income transitions, low pay transitions) under panel attrition, non-response and initial conditions.

All the methods discussed above have advantages and limitations and choice of any of them depends on the data available and working sample.

Events associated with entries into and exits from poverty are also widely discussed in empirical literature. All the methods used in such kind of analysis can be divided into two groups. The first one was used by Harrell Rodgers (1988) and Rebecca Blank (1991), who used descriptive analyses that count the proportion of individuals who experience an event that can lead to entry/exit into poverty and whether or not they enter/exit poverty. Their analysis showed that changes in employment and earnings are more commonly associated with poverty entries than changes in composition of household. For example, Blank (1991) finds that a large share of poverty entries (42.8 percent) occur with a fall in heads' earnings (Blank, 1991, p. 26). Among other events significantly influencing the probability of entering poverty are transitions to female headship, young adults set up their own household, and child

born into the household. At the same time, among events associated with poverty exit changes in labor supply were the most influential.

While being very simple this method has one serious drawback: it allows to control for only one household characteristic at a time, while probability of getting into poverty and exit from it can depend on more than one event at a time. In order to take into account multiple factors that can influence changes in the family's poverty situation a multivariate analysis was introduced. This approach was used by John Iceland (1997) and later employed by many authors.

Though many papers have been written on the subject of poverty in transition and developing countries there exist not many papers analyzing poverty persistence and entry/exit events associated with poverty transition in Russia. One of the first works was done by Lanjouw et al (1998) who investigated poverty in transition economies. That was the first work that raised a question of using the economies of size in consumption when work with transition economies. The work also showed that household composition had a significant effect on probability of getting into poverty.

An attempt to investigate persistent poverty in Russia was carried out by Braithwaite (1998). She analyzed poverty using the Russian Longitudinal Monitoring Survey (RLMS) data, for the rounds corresponding to 1994-1996, and found that the most vulnerable categories were single mothers with children and other households with children. On the other hand, households with pensioners were found to be more likely to be temporarily poor. Longer-term poverty was also found to be highly correlated with the location of a household. At the same time, unemployment rate and wage arrears were found to be highly correlated with poverty.

The most recent work on poverty incidence in Russia was done by Spryskov (2003). He used RLMS data for 5 years (rounds 5-9) to analyze poverty duration in Russia. Different household characteristics were analyzed to investigate the probability of getting into poverty and staying there for longer period of time. Analysis is based on relative poverty line based on household expenditures and pays special attention to labor market events like wage arrears and change in employment status influencing probability of getting into poverty. The main limitation of the work is that it is based on rather short time period of five years that hampers the analysis of persistent poverty and its determinants.

CONSTRUCTION OF POVERTY LINE

Data Description

Data used in this paper come from the Russian Longitudinal Monitoring Survey (RLMS) that is an annual household panel survey, based on the first national probability sample drawn in the Russian Federation. This data was created and assembled by the Russian Institute of Nutrition, the University of North Caroline (UNC), Chapel Hill North Carolina, the Institute of Sociology (Moscow) and the Russian Academy of Sciences (Moscow). The purpose of this survey was to investigate changes in the life of the people of Russia caused by transition from Soviet style economy to new market foundations. All rounds of the data set were publicly available through official internet site of the University of North Carolina till January 2006.

I work with rounds 5-13 that cover 1994-1996, 1998, and 2000-2004. Two years – 1997 and 1999 are not covered by survey that is one of the limitations of the data set. Though RLMS also provides data for earlier period of 1992-1993 its sample and list of available variables is not comparable with later rounds and does not allow making a meaningful comparison. Another limitation of the RLMS data is that the data set is not representative regionally (Swafford, 1997), but it still can be used for investigation of poverty in Russia as a whole. Every round contains data about up to 4718 households, but due to attrition and including new households in survey the number of households which took part in all rounds of survey from 1994 till 2004 is much smaller. In my work I use only households that were present in all 9 rounds under investigation and that gave information on both expenditures and income (1948 households).

Definition of poverty line

To construct a "poverty profile" showing how a measure of poverty changes with variations in household characteristics I need to define a poverty line that will serve as a threshold separating non-poor households from poor ones.

There are two main indicators of welfare that are usually used in the literature on poverty. The first one is household equivalent disposal income that is calculated as market income and transfers from government less direct taxes and social security payments of all household members divided by the equivalence scale (for example, in OECD methodology the equivalence scale is equal to the square root of the number of individuals in the household, that allows to take into account household economies of scale (Antolin, 1999). In this case the poverty threshold is usually established at 50 (in some cases 60) percent of the median equivalent disposable income (Fouarge, 2005; Antolin, 1999). While being very appropriate for developed countries where due to not mobile wages and absence of wage and pensions arrears the information about monthly personal incomes is very reliable, this indicator is not widely used in estimation of poverty profiles in developing or transition countries. There are several reasons for that. On the one hand, widespread wage, pensions, and family allowance arrears substantially decrease reported income. On the other hand, the existence of the shadow economy, that is very developed in some transition countries and accounts to up to 25% of household income (Spryskov, 2003), also leads to underestimation of the disposal household income. Another problem is that usually respondents unconsciously or consciously believe that any information about their income will be automatically transmitted to the tax or other governmental authorities that will lead to some kind of punishment. In addition to that, large transitory components in annual income make this measure even more unattractive (Jacques van der Gaag and Eugene Smolensky, 1982) These specific features of Russia's

transition economy suggest that expenditure rather than income should be used to determine the poverty status of household. Indeed, there is little reason to believe that respondents will for some reason underreport their level of expenditures. This measure will allow to solve the problem of wage arrears and intentionally or non-intentionally hidden income, and, what is also very important to account for subsistent agriculture that is widespread in Russia (Aivazian, 2001).

At the same time, while this method seems to be more appropriate in case of Russia, some distortions can also occur. First of all, data on household expenditures are given on the basis of expenditures during the month preceding the survey. On the one hand, it is easier for respondent to remember about purchases that were done no later than 30 days before the survey, which makes the answers more reliable. On the other hand, I need to assume that these one-month expenditures can serve as a proxy for monthly expenditures during the other part of the year that is not always true. Another problem arises when I try to account for durable goods purchased during the months prior to survey such as purchase of TV-set or car. Although in the RLMS these purchases are dispersed over a three-month period, the expenditures will be overestimated to the extent that such kind of goods does not fully depreciate in three months. In reality, families have to put money by sometimes for years to purchase, for example, a car or refrigerator, and after the purchase such things are used several times longer than in Western countries (Spryskov, 2003). To account for that, I use only one third of the amount spent on the durable goods to include in the household expenditures, though I should admit that it is also not the best way of correction, although the only available.

Taking into consideration that expenditures-based method as well as income-based have advantages and disadvantages I use both of them to obtain a better picture of poverty in Russia.

Construction of Equivalence Scale

To be able to compare households of different size and composition I need to account for economies of scale present in any household. Equivalence scales are economic index numbers, which discount household income/expenditures according to some household characteristics (Gianni Betti, 2000). The existence of economies of size in consumption is linked to the extent to which there are public goods included among the household's consumption basket. Research done in the developing country context has illustrated that "while it may remain difficult to fully establish the extent of economies of size in consumption, it seems far less realistic to assume zero economies of size than to allow for some" (Lanjouw, 1998). At the same time, though equivalence scales are used in almost all works dealing with household income and expenditures there is no one way of measuring it.

In my work I follow van der Gaag (1982) and Spryskov (2003) using the Engel model in calculating equivalence scales.

The main assumption that is made in this model is that "households with equal welfare levels have equal shares of expenditures on food in aggregate household expenditures" van der Gaag (1982). This model is one of the group of *scale based on demand* models which allow to compare the consumption of public goods which can be shared among all the members of household and consumption of private goods, which are consumed by each household member individually.

In practice, the model requires estimation of Engel curves for food. Adopting the Working-Leser function suggested by Deaton and Muellbauer (1986) and used in many empirical studies, food share can be estimated according to the following equation:

$$w_f = \alpha + \beta \ln(\frac{x}{n}) + \gamma \ln n + \sum_{k=1}^{K-1} \eta_k \frac{n_k}{n} + \varsigma V + \varepsilon \quad (1)$$

Where $\frac{x}{n}$ is per-capita expenditures, n is household size, $\frac{n_k}{n}$ is the ration of household members who fall in one of the K groups defined by age and sex to household size, and V is a vector of control variables (van der Gaag, 1982)

Following Spryskov (2003) I define 4 demographic variables:

Child_01 – share of children younger than 6 years old in household

Child_02 – share of children from 6 till 18 years old in household

Adults – share of adults in household

Pensioners – share of pensioners in household

When testing such models, the estimate of the economies of scale effect θ is defined as

$$\theta = 1 - \frac{\gamma}{\beta} \quad (2)$$

This model can be estimated using OLS. However, as is shown in van der Gaag (1982) because the expenditure level is measured with errors and the main contributor to these errors is home production, the estimate of β will be biased toward zero. To avoid that, I use an

instrumental variables approach, where the logarithm of per-capita income is used as an instrument for the logarithm of per-capita expenditures. On the one hand, household income is highly correlated with household expenditures, on the other, I used different methods to calculate household expenditures and household income, so I can assume that measurement errors for these parameters are not correlated.

I estimated the model for each of the 9 rounds separately and for a pooled data for all 9 rounds. The results of the estimation are given in table 1 (all the monetary variables are expressed in 2000 prices and are adjusted for regional prices and denomination of 1998).

Table 1. Equivalent scale calculation

Variable	**Rounds**									
	5	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**Pooled**
$Ln(x_i/n_i)$	-0.25 (0.06)	-0.16 (0.03)	-0.15 (0.03)	-0.16 (0.009)	-0.16 (0.006)	-0.17 (0.005)	-0.16 (0.005)	-0.17 (0.004)	-0.18 (0.005)	-0.15 (0.008)
$Ln(n_i)$	-0.06 (0.02)	-0.05 (0.02)	-0.09 (0.03)	-0.09 (0.01)	-0.08 (0.009)	-0.07 (0.008)	-0.08 (0.008)	-0.08 (0.007)	-0.07 (0.007)	-0.06 (0.008)
θ	0.76	0.68	0.4	0.44	0.5	0.59	0.5	0.53	0.61	0.61
# obs	3449	2747	2562	2686	3208	3419	3906	3910	3949	37970

I implemented Wild test to check if θ was equal to 1 in some rounds. The results showed that at five percent significance level the null hypothesis θ=1 can be rejected, which means that there exist a strong household economy of scale in Russia. I should notice that calculated θ – economy of scale coefficient is very big in Russia. For example, two adults leaving together in one household will spend $(2^{0.61}) \approx 1.53$ of what they would spend if they lived separately, that is very significant. At the same time, my result does not fall out of the range of the results obtained by other authors who calculated the economy of scale coefficient for Russia. For instance, Spryskov (2003) found θ =0.827 working with data on 1994-1998 household expenditures, while he cites Ravallion and Lokshin (1998) who found a much lower estimate of the equivalence scale coefficient of 0.4.

In addition to that, the results obtained in the pooled regression allow me to compare differences in needs for different categories.

Table 2. Difference in needs for different categories

Children 0-6	Children 6-18	Adults	Pensioners
0.62	0.74	1	0.77

The results show that needs of children below 6 are approximately 60% of needs of adults, while needs of older children and pensioners are close to ¾ of those of adults.

I use value of θ calculated for the pooled regression in order to adjust for this economy of scale. For that I use slightly modified formula given in van der Gaag (1982):

(3) $$\lambda = (\beta A + \delta_1 C_1 + \delta_2 C_2 + \gamma P)^{\theta}$$

Where λ - household equivalence scale

β - adjustment factor for needs of adult (I put it equal to one)

δ - adjustment factor for needs of children (δ_1 - for younger children and δ_2 - for older children)

γ - adjustment factor for needs of pensioners

θ – economy of scale coefficient

A, C_1, C_2, and P stand for the proportion of adults, younger children, older children, and pensioners in household.

Finally, to be able to compare income and expenditures of households with different sizes and composition I adjust the reported level of expenditures and income using the following formula:

(4) $$E_{equiv} = \frac{E}{\lambda}$$

Where E stands for reported expenditure level and E_{equiv} for level of equivalent expenditures. λ is as before household equivalence scale van der Gaag (1982).

As the last step in setting the poverty line with which I will work, I must decide on the definition of threshold that will separate "poor" households from "non-poor" ones. In literature poverty line is defined as "the money needed by some specific group of people within a population to achieve the minimum level of "well-being" that is required to not be deemed "poor" (Martin Ravallion and Michael Lokshin, 1998). In practice, there are two main groups of research on household poverty, first of which is based on so called "consumer basket" – some a priori given level of income or expenditures that is available or not available to household. The other group deals with relative definition of poverty line, and treat as poor those who belong to the lower part of the income or expenditure distribution. I will use the latter method as it seems to be more flexible and more appropriate in the view of very unstable economic situation in Russia. Based on that, I define household as poor if its per-capita equivalent income (and expenditures) is lower than 60% of the median of the given year.

SIMPLE MODEL OF POVERTY

Determinants of poverty profile

There are three main groups of factors that are usually discussed as factors influencing the probability for a family to be poor or not. The first group contains so called labor market events [3]. It includes increase or decrease in the number of employed adults in the household or in the number of hours worked by household members.

The second group of factors includes personal and household characteristics such as age and sex of all the members of household and of the household head particularly, marital status of the head of household, household composition, number of children, number of elderly persons, etc.

The third group includes such socio-economic characteristics as education level of the head of household, labor market participation at the household level, and health situation. The complete list of variables used in my analysis along with their definitions is given in appendix A.

Estimation methodology

I start my examination of the factors that influence membership in different profiles of poverty with simple logit model that is widely used in analyzing the probability of getting into some state (in my case that is probability of getting into poverty) conditional on observed characteristics.

The functional form of the logistic function ensures that the estimates are constrained to lie within a range between 0 and 1. The logit model is based on the cumulative logistic probability function (F) and is specified as:

(5) $$p_i = F(Z_i) = F(\alpha + \beta X_i) = \frac{1}{1+e^{-(\alpha+\beta X_i)}}$$

Where e denotes the exponential function, p_i is the probability that an individual will get into the given state, given the information contained in the variables contained in the vector of X_i. The variables in X_i are the factors affecting the probability of getting into certain state (Wooldridge, 2003).

As it was stated above, the binary dependant variable takes value 1 when equalized household per-capita expenditures (or income) fall below the 60% of the median household expenditures (or income) of the same year. As I work with pooled data for 9 years I set the value of dependant variable equal to 1 if the household was poor at least once during 9 years and equal to 0 if the household was never poor.

The problem arises with definitions of independent variables that should be used in estimation. As I pooled 9 years of observations on every household I have 9 sets of characteristics for each household that can vary with time. For example, employment status of the household head can change several times during nine years, as well as number of children in each age group, not even mentioning age and income. Taking that into consideration, I need to choose which of the time-varying characteristics of household to use in analysis. Some authors (Fouarge and Muffels, 2000) suggest considering time varying variables at the beginning of the period of observation (in my case that is 1994). While being very simple this method is not applicable for Russia, where non-stable economic environment during the transition period influenced not only household characteristics which relied on, for example, labor market situation, such as hours worked and unemployment status, but also some personal decisions about household size and number of children. Another possibility is to take only those households whose characteristics did not change during the whole period

of observation. The problem is that number of such households is very small that will make my investigation useless. Trying to overcome this limitations, I divide all the household characteristics into two groups: characteristics of household that didn't change over time (such as region of residence and education of the head) and characteristics of household that vary over time (type of family, family composition, number of unemployed in household, household size and gender of the head). In order to be able to account for them I follow Fouarge (2005) and use those values of variables that were measured just before the beginning of the poverty spell. I estimate 2 models: one using poverty line based on equalized per-capita expenditures and another based on equalized per-capita income.

Estimation results

Results given in table 3 allow me to compare the influence of household characteristics on probability of getting below the poverty line separately for poverty line based on equalized expenditures and equalized income. The first column gives estimates for expenditure based approach. Compared to couples without children, single parents have significantly greater probability of experiencing poverty. That can be explained by the fact that single parents very often have to decrease the number of hours worked to be able to take care of children that influence both the income earned and level of expenditures affordable for the family. There is also positive and significant effect for the proportion of children of the age 6-18 in the total size of household. The reason for that can be the fact that expenditures on older children and teenagers in households are usually very high due to additional expenditures on education and clothing. At the same time, higher probability of getting into poverty have households where proportion of adults is higher. This result is somewhat surprising as usually households with at least two adults are assumed to be less prone to getting into poverty due to additional income that is added to the family budget. At the same time, this can be partly explained by

design of the equivalence scale I used. Adult members were given there the highest weight that substantially decreases the amount of equalized income for households where proportion of adults is very high. Another explanation that can be given is that usually several adults live together because that is not affordable for them to have separate flats or to pay for utilities separately, so that the highest proportion of adults living together can be observed at very poor families. The same explanation can be given to the fact that probability of being poor is higher for families where proportion of pensioners is higher. On the one hand, while income of elderly people is smaller than that of working adults, level of expenditures for pensioners is almost 25% lower. On the other hand, pensioners usually live with their grown-up children when that is not affordable for them to live separately or when they have to take care of their grand-children, for example in case of single-parent family or family with big number of children which are usually more likely to be poor.

Education of head of household has also very significant effect on probability of experiencing poverty. Compared to households where head has lower level of education, households where heads studied at least in technical school have much lower risk of getting into poverty. This probability is even lower for households where head has university degree and is the least for households where head has graduate degree, which clearly demonstrates the private returns of investments in human capital in terms of reduced poverty risk.

Age of household head also significantly influences the probability of experiencing poverty. Other things being equal, living in household where head belongs to any of age groups of 40-55 and 55-older substantially increases the probability of being poor. One explanation to that is change in required knowledge and skills that took part after the break up of the Soviet Union. People older than 40 acquired experience and skills that were sometimes not useful in new economic conditions that made them not competitive with younger generation.

Table 3. Results of logit model for poverty profiles

Household characteristics	Poverty line based on equalized expenditures	Poverty line based on equalized income
Family type		
(reference group: family without children)		
Family with children	0.02	0.23
Pensioners family	-0.12	-0.79**
Single parent	0.78**	0.37
Family composition		
Proportion of adults in HH	0.79**	1.92**
Proportion of kids older than 6 years in HH	0.80**	1.99**
Proportion of pensioners	2.80**	2.7**
HH size	-0.06	0.02
Education of the head of HH		
High school	-0.19	-0.48**
PTU (prof. school)	0.3	-0.01
Techschool	-0.62**	-1.15**
University	-1.31**	-1.76**
Graduate level	-1.83**	-2.26**
Head of HH characteristics		
(reference group: head younger than 40)		
Head aged 40-55	0.66**	-0.11
Head aged 55 and older	0.62**	-0.09
Gender of head (0 – male)	0.07	0.4**
Labor market status		
(reference group: no unemployed)		
One unemployed member in household	0.43**	0.63**
More than one unemployed	0.71**	0.63**
Residence regions		
(reference group: North Caucasian)		
Central and Central Black-Earth	-0.45**	-0.6**
Eastern Siberian and Far Eastern	-0.15	-0.39
Metropolitan areas: Moscow and St. Petersburg	-1.81**	-1.47**
Northern and North Western	-0.65**	-0.71**
Ural	-0.28	-0.89**
Number of observations	1748	1456

* 10% significance level
** 5% significance level

Not surprisingly unemployment status has also significant influence on household poverty profile. According to estimated results households with one unemployed member have higher probability than those where all the members are employed. This probability even increases if the number of unemployed members grows.

And finally, region of residence also influences the probability of experiencing poverty. Rather predictable that living in metropolitan areas such as Moscow and St. Petersburg as well as in Northern and North Western region substantially decreases the probability of poverty incidence due to higher employment opportunity and higher level of wages.

Results obtained using poverty line based on equalized income are very similar to results discussed above. Interestingly, the latter estimation suggests that family consisting of pensioners with no other adults has lower probability of experiencing poverty. On the first sight, it contradicts to my previous observation that families with higher proportion of pensioners are more likely to experience poverty, but that is not so. As it was mentioned above that is more affordable for richer families to live separately not trying to use economy of scale. In addition to that, pension arrears in Russia were less frequent than wage arrears that allowed such families to have stable income, while when pensioners live in big families presence of wage arrears make elderly members to divide their income among all the members of household.

Another difference between two models is significance of the coefficient on household head gender. It predicts that probability of experiencing poverty is much higher for female headed households, which can be due to the lower wage rates for women as they usually must take time out of the labor market to rare children and if they also constitute a single parent family they bear all the costs of raring children.

POVERTY PERSISTENCE

Estimation methodology

Analyses in the previous section did not take into account the fact that many different household characteristics can also influence the number of years household spend in poverty (in other words the probability of being persistently poor). As it was already discussed in the literature review, most of the studies that deal with persistent poverty follow the methodology given in the classical article of Bane and Ellwood (1986), which first developed and exploited the notion of poverty spells, using exit probabilities to examine the length of time that people are poor, as well as beginning and ending events to understand why people move into and out of poverty. The multivariate hazard model that they offered allowed the probability of experiencing an event at time t (e.g. experiencing poverty) to depend on a set of explanatory variables, which included among other characteristics, age, race, gender, educational attainment, and trigger events. This hazard rate or spells approach was further intensively used by Stevens (1995), Devicienti (2000) and many other authors.

Though the above mentioned duration and survival analysis is considered to be very effective in analyzing persistent poverty as it allows investigating how the number of months of being in poverty increases or decreases the probability of staying there or exit, these methods are not applicable in case of Russia. The reason for that is widely discussed in Spryskov (2003) and follows from the fact that the main assumption behind any survival analysis is the requirement of continuity of the dependent variable (in my case that is the duration of time in poverty). The problem with RLMS data set is that data on household expenditures and income are based on expenditure/income levels for the month preceding the survey time, not for the whole year. Because of that, I basically have 9 distinct observations on household expenditures, income, and other characteristics, which are not connected in time. While other

researchers sometimes use annualized data in their duration analyzes they just aggregate data throughout the whole year. In my case, I need to assume that household that is considered a poor on the basis of its expenditures or income in one given month when the research was conducted remains poor for other 11 months that is very difficult to justify. But in my case I need to make one much stronger assumption about household poverty profile in those two years (1997 and 1999) when survey was not conducted. To be able to use duration analysis in this case I must assume that households that were poor in 1996 remain poor in 1997, and those which were poor in 1998 were still below the poverty line in 1999 that will lead to highly overestimated poverty duration (Spryskov, 2003).

At the same time, I cannot use any specification of Components of variance models (Income decomposition models) as they are not intended to explain poverty on household level and usually are used to analyze poverty dynamics of one homogeneous set of individuals at a time (Aassve et al, 2006).

Based on these limitations of the models that are traditionally used for poverty duration analysis and following methodology offered by Spryskov (2003) I use multiple choice models as an alternative to poverty duration analysis, which allows me to investigate discrete data and does not need any assumption about continuity of dependent variable.

Unlike in simple logit models in ordered dependent variable models (I use ordered logit specification) the observed dependent variable denotes outcomes representing ordered or ranked categories. In my case I can calculate the number of times the household was below the constructed poverty lines. That certainly does not allow me to identify which of the households were poor in several subsequent rounds (classic definition of persistently poor) and which of them fell into poverty with interval of several years that makes me make an assumption on the definition of persistently poor households, temporarily poor and non-poor.

In my analysis I call household non-poor if it never experienced poverty during 9 years under investigation. Household is considered to be temporarily poor if its income/expenditures fell below the poverty line less or exactly 4 times, and household is persistently poor if its level of expenditures/income was more than 4 times below the poverty line for the period of 9 years. Descriptive statistics on the number of households belonging to any of these groups based on their characteristics is given in table 4.

Table 4. Characteristics of the non-poor, shorter-term poor and longer-term poor

		Non-poor		Temporarily poor		Permanently poor	
		Expenditure based	**Income based**	**Expenditure based**	**Income based**	**Expenditure based**	**Income based**
Number of HH		479	329	1004	918	465	373
Head gender							
Head male	71.4	78.7	73.3	69.0	74.1	68.4	68.4
Head female	28.6	21.3	26.7	31.0	25.9	31.6	31.6
Work attachment							
No unemployed	60.8	64.1	75.41	60.6	64	57.8	43.9
One unemployed	27.2	26.5	17.9	33.3	26.6	25.4	35.1
More unemployed	12.0	9.4	6.69	6.1	9.4	16.8	21.0
Family type							
Single with children	4.0	3.4	5.65	5.3	5.6	6.9	7.6
Family with children	50.0	61.3	40.78	45.1	42.6	44.1	58.62
Family without children	20.7	25.9	23.67	19.5	20.3	16.5	20.2
Pensioners family	25.3	9.4	29.9	30.1	31.5	32.5	13.58
Age of household head							
Younger aged head	33.0	42.2	27.6	32.4	31.6	35.1	24.5
Prime aged head	32.7	38.8	36.2	32.9	29.6	35.4	26
Older-working age head	34.3	19.0	36.2	34.7	38.8	29.5	49.5
Education level of head							
Low education	36.1	13.7	16.1	41.9	43.1	56.9	48.0
Middle education	40.1	47.0	43.0	41.0	39.8	29.2	37.4
Higher education	23.8	39.3	40.9	17.1	17.1	13.9	14.6

* calculated as a percent share of persons with a specified characteristic in each group

As it is clear from the results given in the table there exists a substantial variation in family and labor-market characteristics between groups of longer-term poor, shorter-term poor and non-poor. Though that does not imply that these differences have caused longer or shorter stays in poverty several broad patterns can be seen:

- First of all, the following groups tend to be over-represented among the longer-term poor: families with more that one unemployed member, female headed households, pensioner's families, families where head is older than 55. The concentration of the longer-term poor among these groups probably reflects the fact that many of this conditions, when occur, tend to last for a long time, making probability of exiting from poverty in short run very small.
- Second, such families as those with one unemployed member, head of the younger age and head with at least middle level of education, have higher weight in the group of the shorter term poor. Explanation to that may be that members of households with such characteristics are usually rather competitive on the labor market, so that getting into poverty in one period does not make them stay there for long.

The following table gives more information on how household composition influences belonging to different poverty profiles.

Table 5. Relationship between poverty and household composition.

		Non-poor	Temporarily poor	Permanently poor
Average HH size	Expenditure based	3.4	2.88	2.67
	Income based	2.85	2.78	3.19
Number of adults	Expenditure based	2.07	1.61	1.37
	Income based	1.63	1.52	1.78
Proportion of children 0-6 (% of HH size)	Expenditure based	0.27	0.18	0.17
	Income based	0.15	0.17	0.26
Proportion of children 6-18 (% of HH size)	Expenditure based	0.78	0.55	0.45
	Income based	0.53	0.51	0.75
Proportion of pensioners (% of HH size)	Expenditure based	0.27	0.55	0.69
	Income based	0.54	0.59	0.4

When poverty line is calculated on the basis of reported income the largest households are observed in the group of permanently poor. It can be explained as before that usually big families contain members of different age like children and elderly people, whose contribution to the family budget is very small, though level of expenditures is rather high. Interestingly, if looking at the family size in different poverty groups based on reported expenditures the situation is completely different. Here size of household decreases with the degree of poverty. That can partly be explained by the significantly high equivalence scale I used in my calculations. Among the other household characteristics households with higher number of adults and lower proportion of pensioners are more represented in non-poor profile based on reported expenditures, while proportion of younger and older children is higher in persistently poor households identified using reported income.

Talking about years spent in poverty, higher number of times spent below the poverty line experienced households composed of single adult with children and pensioners families if consider expenditures approach (table 6). Taking reported income as a baseline shows that pensioners' family quite the contrary spend the least number of years in poverty. The reason for that can be already discussed incidence of wage arrears that substantially decreases the reported income of households with adult members, while pension arrears were not so widespread, so that pensioners' family could count on more stable monthly income. Another interesting thing is that number of rounds spent below the poverty line is almost equal for male-headed households and female headed both with reported income and reported expenditures method of poverty line calculation. Age of household head seems to also influence the number of years spent in poverty, as well as his level of education and work experience. For example, households where head has more than 20 years of work experience tend to spend longer time in poverty compared to those with work experience lower than 20 years. That can be explained by the fact that after the change of economic system many skills

that were obtained before became useless that made older workers less competitive than new generation. In addition to that, region of residency also influences the time spent in poverty, with least time spent in it for households living in metropolitan areas.

Table 6. Mean poverty duration by categories

	Expenditures based approach	Income based approach
Family composition		
Single adult family	3.12	3.27
Single adult with children	4	3.67
Family without children	2.38	2.55
Family with children	2.04	2.84
Pensioners family	3.7	1.84
Male-headed family	2.57	2.57
Female-headed family	2.58	2.77
Head age 40	2.33	2.41
Head age 55	3.44	2.78
Education		
Highschool	2.42	2.98
PTU	2.38	3.21
Techschool	2.04	2.21
University	1.35	1.49
Graduate level	0.77	0.57
Experience		
Less than 10 years	1.02	1.88
10-20 years	1.64	2.79
More than 20 years	2.9	2.6
Regions		
North Caucasian	2.88	3.72
Central and Central Black-Earth	2.57	2.44
Eastern Siberian and Far Eastern	2.43	2.7
Metropolitan areas: Moscow and St. Petersburg	0.44	0.73
Northern and North Western	1.66	1.69
Ural	3.13	2.92
West Siberian	3.28	3.64

Having in mind the results discussed above I can estimate the model controlling for all available household characteristics using the ordered logit model. As it was stated before, dependent variable takes 3 values with 0 standing for “non-poor families” (which were never poor during 9 years), 1 – for “temporarily poor families” (which were below the poverty line

not more than 4 out of 9 periods under consideration), and 2 – for "persistently poor families" (which were poor for more than 4 times). I use standard ordered logit procedure to obtain the coefficients of interest, for example as the one described in Greene (2000).

As in the binary dependent variable model, I can model the observed response by considering a latent variable y_i^* that depends linearly on the explanatory variables x_i:

$$y_i^* = x_i'\beta + \varepsilon_i \tag{6}$$

Where ε_i are independent and identically distributed random variables. The observed y_i is determined from y_i^* using the rule:

$$y_i = \begin{cases} 0 \text{ if } y_i^* \le \gamma_1 \\ 1 \text{ if } \gamma_1 < y_i^* \le \gamma_2 \\ 2 \text{ if } \gamma_2 < y_i^* \le \gamma_3 \\ \vdots \\ M \text{ if } \gamma_M < y_i^* \end{cases} \tag{7}$$

It is worth noting that the actual values chosen to represent the categories in y_i are completely arbitrary. All the ordered specification requires is for ordering to be preserved so that $y_i^* < y_j^*$ implies that $y_i < y_j$.

It follows that the probabilities of observing each value of y are given by

$$\begin{aligned} &\Pr(y_i = 0 \mid x_i, \beta_i, \gamma) = F(\gamma_1 - x_i'\beta) \\ &\Pr(y_i = 1 \mid x_i, \beta_i, \gamma) = F(\gamma_2 - x_i'\beta) - F(\gamma_1 - x_i'\beta) \\ &\Pr(y_i = 2 \mid x_i, \beta_i, \gamma) = F(\gamma_3 - x_i'\beta) - F(\gamma_2 - x_i'\beta) \\ &\vdots \\ &\Pr(y_i = M \mid x_i, \beta_i, \gamma) = 1 - F(\gamma_M - x_i'\beta) \end{aligned} \tag{8}$$

Where F is the cumulative distribution function of ε (Greene (2000).

Coefficients can be estimated using any statistical package (E-Views, Stata, etc.). But as in case of simple logit models the estimated coefficients of the ordered model must be interpreted with care (Greene (2000). The sign of β_j shows the direction of the change in the probability of falling in the endpoint rankings (y=0 or y=1) when x_{ij} changes. Pr(y=0) changes in the opposite direction of the sign of $\hat{\beta}_j$ and Pr(y=M) changes in the same direction as the sign of $\hat{\beta}_j$. The effects on the probability of falling in any of the middle rankings are given by:

(9) $$\frac{\partial \Pr(y=k)}{\partial \beta_j} = \frac{\partial F(\gamma_{k+1} - x_i'\beta)}{\partial \beta_j} - \frac{\partial F(\gamma_k - x_i'\beta)}{\partial \beta_j}$$

For k=1, 2, …, M-1. It is impossible to determine the signs of these terms, a priori (Greene (2000).

One more problem should be discussed before starting the estimation – the problem of 'right' and 'left' censoring that arises from the nature of the data. In my analysis I put all households into different groups based on the number of years they spent in poverty during the nine years under consideration. The problem is that I have no data on household poverty profile before 1994 and after 2004, so that what is considered in my work as a short-term poverty can be in fact the end of long lasting poverty spell or beginning of a new long poverty spell. Researchers that work with duration models usually deal with problems of such kind of censoring by leaving out the spells that started before the beginning of the analysis. In my case, this measure has no sense as I deal with number of years spend in poverty without taking into consideration if there was a break between several years in poverty or not. At the

same time, there is no way for me to deal with the censoring problem, so that must be kept in mind when interpreting the results.

Estimation results

The results of ordered logit model estimation are presented in table below.

Table 7. Results of ordered logit model for poverty persistence

Household characteristics	Poverty line based on equalized expenditures	Poverty line based on equalized income
Family type		
(reference group: family without children)		
Family with children	0.31*	0.33
Pensioners family	-0.7*	-1.6**
Single adult with children	0.81*	0.7*
Family composition		
Proportion of adults in HH	-1.22*	-3.55**
Proportion of kids older than 6 years in HH	-0.43	-1.43*
Proportion of pensioners	0.47	-2.3**
HH size	-0.12*	-0.15*
Education of the head of HH		
High school	-0.52	-0.44
PTU (prof. school)	-0.23	-0.24
Techschool	-0.8**	-1.03 **
University	-1.57**	-1.86**
Graduate level	-2*	-2.22**
Head of HH characteristics		
(reference group: head younger than 40)		
Head aged 40-55	0.62**	0.26
Head aged 55 and older	0.67**	0.10
Labor market status		
(reference group: no unemployed)		
One unemployed member in household	0.43**	0.61**
More than one unemployed	0.95**	1.01**
Residence regions		
(reference group: North Caucasian)		
Central and Central Black-Earth	-0.42*	-0.64*
Eastern Siberian and Far Eastern	-0.51	0.55*
Metropolitan areas: Moscow and St. Petersburg	-1.86**	-1.67**
Northern and North Western	-0.84**	-1.19**
Ural	-0.33*	-1.11*
Number of observations	1248	516

* 5% significance level
** 1% significance level

Estimation results given in the table above show that families with children as well as single adults with children are more likely to be persistently poor. Higher probability of getting into long-run poverty have households where heads belong to the middle- and oldest age group. In line with decreasing probability of getting into poverty for household where head has at least secondary technical education it can be a sign of less favorable employment conditions for these groups. Household size also seems to have a negative effect on probability of being persistently poor that can be explained by the economy of scale for large households. Moving to employment situation of household members, number of unemployed members significantly influences the probability of getting into persistent poverty. At the same time, gender of household head does not play any significant role in falling into long-run poverty. As before, region of residence significantly influences the probability of being persistently poor.

REASONS FOR POVERTY ENTRY AND EXIT

Up to this point I discussed effects of demographic and regional factors on the chances of being in different poverty profiles, using static values of variables of interest. That means that the observed dynamics of unemployment status and household composition – the factors of my prime interest – were incorporated into several dummy variables, after which I analyzed the influence of these dummy variables on the probability of being in one out of three poverty statuses. At the same time, poverty is not a static concept and all the changes in poverty profile of households are caused by changes in main household characteristics. To be able to determine the main reasons for falling into poverty and exiting from it I first define events that are likely to cause a transition from one state to the other.

Usually poverty transitions result from changes in income/expenditure level of household and changes in household demography, and very often such events occur at the same time[1]. For example, changes in household size (such as arrival of a child) affect individual equivalent incomes because total household income is spread among more household members. Alternatively, in the case of separations, economies of scale are lost as two new households are set up even if two adults do not change their labor market status. Descriptive analysis by Bane and Ellwood (1986) and Rodgers (1988) find similar results concerning events associated with transitions into poverty. These analysis found that changes in labor supply and earnings were more commonly associated with poverty entries than changes in household structure and composition, while Blank (1991) finds significant impact of proportion of younger children born in household on the probability of poverty entry. Similar to events associated with poverty entry changes in labor supply and earnings are more commonly

[1] This is basically determined by the way I constructed equivalent income and expenditures: I have total household expenditures or income divided by the equivalence scale coefficient that contains information on proportion of different demographic groups in the household. Consequently, equivalent income and expenditures can be affected by changes in the numerator as well as in denominator.

associated with poverty exits than household structure and composition. Ruggles and Williams (1987) found that almost 47 percent of those leaving poverty had a family member gain a job, while the various household structure changes were experienced by less than one percent of those households leaving poverty.

For the purposes of my analysis, the total number of transitions is divided into two broad categories:

- Transitions associated with employment/earnings-related events, which include changes in employment status of household members and household head wage.
- Transitions associated with family-structure-related events, which include change in the household composition.

I start the analysis of the dynamics of changes in the poverty rate over time with simple count method that is usually used to examine both the absolute number of individuals entering and exiting poverty, as well as the probability of entering and exiting poverty at a point in time McKernan and Ratcliffe (2002). The number of people entering and exiting poverty is obtained by calculating changes in individual's poverty statuses across two years. The number of people who enter poverty in year t is defined as the number of persons not poor last year, at t-1, who are poor this year, at t. Similarly, the number of people who exit poverty in year t is defined as the number of persons poor last year, at t-1, who are not poor this year, at t. For my notation, let EN_t represent the number of individuals who enter poverty in year t and EX_t represent the number of persons who exit poverty in year t. The number of entries and exits are used to calculate the probability of entering or exiting poverty at a point in time. The probability of entering poverty is defined as the ratio of the number of people who enter poverty in year t (EN_t) and the number of people not poor in year t-1 ($N_{np,t-1}$), or:

(10) $$\Pr(\text{entering poverty at t}) = \frac{EN_t}{N_{np,t-1}}$$

Similarly, the probability of exiting poverty is defined as the ratio of the number of people who exit poverty in year t (EX_t) and the number of people poor in year t-1 ($N_{p,t-1}$), or:

(11) $$\Pr(\text{exiting poverty at t}) = \frac{EX_t}{N_{p,t-1}}$$

I employ this method to calculate the probability of getting into and out of poverty for different kinds of households grouped on the basis of their demographic and labor market characteristics. To be as precise as possible and to keep sufficient number of observations I use as a base for my analysis the period of 2000-2002. That means that in formulas given above number of people not poor in year t-1 ($N_{np,t-1}$) will be equal to the number of people that were not poor during 2000, 2001 and 2002 and number of people who enter poverty in year t (EN_t) will be equal to the number of people who became poor in 2003 given that they were not poor during three preceding years. Probability of exiting poverty is calculated in a similar way. The choice of base period is very subjective. I took these years as they come after the break in the survey so that information can be obtained on 4 years in a raw. Results are given in table 8[2].

As I have already stated, this descriptive statistics cannot be sufficient in analyzing the relationship between events and transitions, as it allows to control for a change in only one household characteristic, while probability of getting into poverty and exit from it can depend on more than one event at a time. At the same time, I can clearly identify some patterns that can be very important.

[2] I give results only on probability of falling below the poverty line calculated using expenditure based approach. Income appeared to be more volatile, than expenditures so when I are leaving only those households which were poor (or non-poor) during three years, the number of observations left is not enough to get meaningful results.

Table 8. Probability of entering and exiting poverty for different changes in household composition.

Transition trigger events		Probability of entering poverty (%)	Probability of exiting poverty (%)
Number of unemployed in HH	decreases	13.8	31
	goes up	18.9	22.2
Number of children of age 0-6	decreases	13.1	66.7
	goes up	14.9	36
Number of children of age 6-18	decreases	16.2	14.3
	goes up	12	33.3
Number of adults	decreases	12.2	36.2
	goes up	13	18.3
Number of pensioners	decreases	13.3	12.5
	goes up	15.6	14.3

First of all, probability of getting into poverty is very high for households where number of unemployed members increases. At the same time, decrease in number of older children can lead to higher probability of getting into poverty, probably due to the fact that in poor families teenagers usually have some kind of income that is shared among all the members of household while they live with parents. When older children separate household lose this income that can lead to its transition from relatively non-poor to the group of poor. Households with increased number of pensioners also seem to have higher probability of experiencing poverty due to decrease in disposal income if this event was caused by retirement of a household member or due to increase in household size without proportional increase in disposal income in case of arriving of additional member of household. Rather predictable is increase in probability of exiting poverty for households with less unemployed members comparing with base period. Decrease in number of younger children and increase in number of older children sufficiently influences the probability of escaping poverty, as well as decrease in number of adults, while change in number of pensioners does not seem to have large impact.

As a next step I should choose a model that will allow me to determine the main reasons for falling into poverty and exiting it depending on a set of explanatory variables, which includes among other characteristics, age, gender, educational attainment, family size, and regional

characteristics, in addition to trigger events. This multivariate framework allows me to determine the relative importance of multiple events in poverty transitions, something that cannot be learned from a descriptive analysis. A discrete-time multivariate hazard model is used to analyze events that trigger individuals' entries into and exits from poverty. My model assumes that the probability of entering (or exiting) poverty in a given period is represented by a logit specification. Such kind of specification was used in several studies of poverty dynamics (Stevens (1994), Iceland (1997), and Spryskov (2003). With this assumption, probability of entering (or exiting) poverty for person i at time t can be written as:

(12) $$P_{it} = \frac{1}{1+e^{-y_{it}}}$$

where

(13) $$y_{it} = \beta_t + \delta' T_{it} + \Gamma' X_{it}$$

In this model, the vector T represents transition events, the primary focus of this analysis, and the vector X represents control variables. The transition and control variables are based on my conceptual model.

The poverty entry events include: a child is born in a household, teenager separates from household, number of adults in household decreases (household splits into several households), member of household retires, and number of unemployed members increases.

The model of poverty exits includes similar, although slightly different transition events: gain in employment (of head, spouse, or other household members), decrease in number of pensioners and in number of younger children in household, and increase in number of older children and adults. The estimation results are given in table 9.

Table 9. Results of logit models on poverty entry and exit.

Trigger events	Poverty entry	Poverty exit
A child is born in a household	0.38 (0.44)	
Teenager separates from household	0.12* (0.052)	
Household splits into several households	-0.35 (0.51)	
Member of household retires	-0.32 (0.57)	
Number of unemployed members increases	0.78** (0.3)	
Decrease in household head income	0.21 (0.22)	
Number of younger children decreases		0.14* (0.064)
Number of older children increases		0.88 (0.98)
One adult household becomes two adult		0.19 (0.21)
Number of pensioners decrease		1.32* (0.62)
Employment gain of household member		0.42* (0.19)
Increase in household head income		0.78 (0.64)

As this table shows from demographic characteristics significant impact on probability of getting into poverty has the change in the number of older children in the family that is comparable with results obtained from descriptive statistics. At the same time, higher probability of exiting poverty have families where number of younger children and pensioners decreased. Change of employment status of household members also has a predictable effect on entering or exiting poverty.

CONCLUSION

This study analyzes determinants of poverty persistence in transitional Russia using data from Russian Longitudinal Monitoring Survey for the years 1994-2004. The final sample includes 1948 households that took part in all nine rounds and gave information on both household expenditures and income. I use two approaches – based on equalized income and equalized expenditures – to construct a poverty line, that is equal to 60% of the median equivalent income/expenditures of given year. In order to compare households of different size and composition I need to account for economies of scale present in any household. Engel's curve for food is used to construct an economy of scale coefficient on the basis of pooled data on the whole period under consideration. Economy of scale appears to be rather significant in Russian households suggesting that it should be much easier for larger households to escape poverty.

My analysis suggests that poverty in Russia remains one of the main problems. Out of the whole sample, only 24.5 percent of households had never been poor, while almost 52 percent of households found themselves below the poverty line at least once, and 23.8 percent are considered persistently poor.

According to the obtained results longer-term poverty is highly correlated with family size and household composition. The most exposed categories are single parents raring children and families with children, especially with children of younger age. That can be explained by elimination of the social safety net that used to provide extensive free child care, maternal and infant health care for the single-parent households and households with big number of children. After the start of transition from command economy households with children faced much severe budget constraints that led significant part of them to persistent poverty. That means that, in order to reduce poverty in Russia, special attention should be paid to

recovering of the system of social transfers to such kind of families. Interesting, that starting from 2005 Russia implemented a new program offering 250000 rubles (approximately 9650 dollars) for giving birth to the second child in the family. That was intended to increase the fertility via support of poor households. Further works in the field of poverty analysis will have an opportunity to analyze what effect had this measure on the change in the demographic profile of persistently poor.

Estimates for another group of households – pensioners' families that are usually considered to be very vulnerable in transition economies – are also very predictable though not clearly interpretable. According to the results I obtained, families that contain only elderly people are less prone to persistent poverty. One explanation to that is that such household could rely on governmental support during all the years of transition, which, in addition to not widely spread pension arrears, allowed them to count on stable monthly income, while families headed by adults suffered from wage arrears and significant decline in income due to overall economic stagnation.

Persistent poverty is also found to be highly correlated with head of household characteristics. First of all, rather predictable education of the household head has significant effect on probability for a household to get below the poverty line. Households headed by the person with at least secondary technical education are less likely to get into persistent poverty compared to households with less educated head. At the same time, even after controlling for education, age of the household head appears to be very significant. It can be explained by the change in the required knowledge and skills that took part after the break up of the Soviet Union. People older than 40 acquired experience and skills that were sometimes not useful in new economic conditions that made them not competitive with younger generation. This positive correlation between age of the household head and probability of getting into long-

term poverty stays significant even after controlling for employment status, suggesting that there is a need for government support for such kind of households, for example via some privileges, tax indulgences, or some kind of trainings that will allow older people to get skills necessary in new economic environment.

Not surprisingly, unemployment status has also significant influence on household poverty profile. According to estimated results households with one unemployed member have higher probability of getting into temporarily and persistent poverty that those where all the members are employed. This probability even increases if the number of unemployed members grows. The latter result suggests that one of the most effective ways to reduce poverty is to recover the system of unemployment benefits in addition to creation of new working places, for example in the form of public jobs.

Region of residence also influences the probability of experiencing poverty. Rather predictable that living in metropolitan areas such as Moscow and St.Petersburg substantially decreases the probability of poverty incidence due to higher employment opportunity and higher level of wages.

Finally, I analyzed the events that can lead to change in household poverty profile. All the events were divided into those connected to change in demographic composition and those that show the change in income/employment status of household head and other members. The results suggest that higher probability of poverty entry have households where number of unemployed members increase as well as those with decreased number of older children. Probability of poverty exit is higher for households with less kids of the youngest age group and for households where one or more members gain a job.

All of the results discussed above allow me to conclude that the most vulnerable categories during the eleven years of Russian transition were families with children and households with heads of older age and without higher education, as well as families with more than one unemployed member, while pensioners' households were relatively better off, compared to households headed by prime-age persons.

At the same time, this analysis has certain limitations. Firs of all, as I have already mentioned RLMS data set is not representative regionally. While that is not a problem for analyzing poverty in Russia as a whole, we cannot make any conclusions about regional differences in poverty profiles. Another problem with the data source is that RLMS is likely to overestimate the level of poverty for two reasons: uneven panel attrition and under-sampling of high-paid workers that can also significantly influence the results. In addition to that, available data didn't allow me to control for sector of economy where head of household was employed, as data on that was given only in five rounds out of nine. It can potentially lead to bias in my estimators as that is less likely that household with head working for example, in oil industry will get below the poverty line compared to household with head employed in agriculture.

Another limitation of my analysis also stems from the nature of the data available. As I have already discussed, data used in my investigation do not allow implementing duration analysis. That limits our study to use of ordered dependent variable models which do not let to deal with left- and right-censoring problem. In addition to that, my results heavily rely on the definition of equivalence scale and poverty line that I used, and that was rather subjective.

APPENDIX

Variables description

Variable	Description
Variables used in Engel's equation	
Child_01	Share of children younger than 6 years old in household
Child_02	Share of children from 6 to 18 in household
Adults	Share of adults in household
Pensioners	Share of pensioners in household
Per-capita expenditures (x/n)	Total expenditures of household divided by the household size
Household size	Number of persons in household
Per-capita income	Total income of household divided by household size
Definition of poverty line	
Equivalence scale:	
- *for income approach*	Modified OECD equivalence scale: Scale rate for first adult in household=1. Each additional adult is given a value of 0.7, each pensioner a value 0.6, and each child a value of 0.3.
- *for expenditures approach*	Calculated on the basis of Engel's food demand equation. Estimation results are give in text.
Poverty line based on expenditures	60% of the median equivalent per-capita expenditures
Poverty line based on income	60% of the median equivalent per-capita income
Variables used in logit equations	
Family without children	1 if family is composed of 1 or more adult with no children 0 otherwise
Family with children	1 if family is composed of 2 adults with 1 or more children 0 otherwise
Pensioners family	1 if family is composed of 1 or more person older than 60 years old 0 otherwise
Single parent	1 if family is composed of 1 adult with 1or more children 0 otherwise
Education of head:	
- *high school*	1 if head of household finished high school, 0 otherwise
- *PTU*	1 if head of household finished PTU, 0 otherwise
- *Techschool*	1 if head of household finished technical school, 0 otherwise
- *University*	1 if head of household finished university, 0 otherwise
- *Graduate level*	1 if head of household has graduate level, 0 otherwise
Head aged 40-55	1 if head of household is older than 40 and younger than 55 0 otherwise
Head aged 55-older	1 if head of household is older than 55 0 otherwise
Gender of head	1 if household head is female 0 otherwise
One unemployed member in household	1 if there is only 1 unemployed member in household 0 otherwise
More than one unemployed	1 if there is more than 1 unemployed member in household 0 otherwise

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