Economic Education and Research Consortium

Russian Economic Research Program

Working Paper No **99/11**

Income Mobility in Russia in the mid-1990s

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Program Area: Micro 2 (Household Behavior)

CONTENTS

INTRODUCTION

The objective of this project is to uncover the determinants of wage and household income mobility in present day Russia. Russia's transition to a market economy has brought about an increase in economic inequality and the emergence of distinct social strata and groups – the "new rich", the "new poor", and the "new" middle class.

Income mobility research is a new field in the domestic science. Although this phenomenon has been widely recognized, there have been no attempts to measure directly the income mobility of households in Russia . Only two interesting studies have touched on this issue, (Commander S. et al., 1997; Mroz T.A., Popkin B.M. 1995), this paper marks the first effort to deal with the income mobility issue directly.

Previous theoretical and empirical work has helped establish a link between income mobility and other socio–economic characteristics. Factors such as social class, occupation, education, power–administrative status, gender, age, race and ethnic background affect both one's relative economic status and the likelihood of it being changed (Schiller B.R., Gottschalk P., Johnson P. & Reed H., Sloane P.J. & Theodossiou I., Dearden L., Machin S. & Reed H., Commander S. et al., Anurin V., Bogomolova T., Tapilina V. and Titma M.). It can be assumed, therefore, that changes in social and demographic characteristics can themselves influence income mobility.

Household income mobility might also be a function of macro–economic factors. Certainly, Russia has experienced serious macro–economic shocks in recent years. State assets have been privatized, the sectoral structure of the economy has been rapidly transformed, open unemployment has increased, wage arrears have ballooned and the state's social safety net has been badly damaged. All this could not but be reflected on household income mobility. These macro–economic variables should certainly be considered as possible

Literature review. As mentioned above, income mobility in Russia is a relatively unexplored field. In part, this was a function of how the Soviet economy was organized. The level of wages for the bulk of the population was stable over decades and there was little social–economic differentiation within the population. Sampling studies of household budgets conducted by the Russian *Goskomstat* did not produce the relevant data. And the well–known studies of Rimashevskaya N.M. *et al.* – ("Taganrog–I" and "Taganrog–II") tracked income dynamics and differentiation but not income mobility. Studies of mobility were limited to social and occupational groupings. The works on mobility in material well–being that are the most relevant to this project are those by Bogomolova T. and Tapilina V. (1992), and Tapilina V. (1998).

Internationally, income mobility studies have been carried out for several decades. Substantively and methodologically, their progenitors were studies of social mobility (Duncan O., Blumen I., Boudon R., Davis J.A., Goodman L.A. and others). In the present day, income mobility studies are divided between the sociological and the economic. Sociology has focused on the transmission mechanisms of material well–being from generation to generation and the re–production of socioeconomic groups and classes (Duncan G., Smeeding T., Rodgers W., Newman K., and Smith P.K.). Economics has concentrated more on the relationship between mobility and income distribution inequalities.

The economic literature on income mobility can be divided into two branches. The first includes theoretical and substantive analyses of the matrix of transitions between income groups (Atkinson A.B., Bourguignon F. & Morrison C., McCall J.J., Schiller B.R., Lillard L.A. & Willis R.J., Hart P.E., *et al.*). Another develops econometric methods and approaches to mobility measurements (Shorrocks A., Hart P.E., King M.A., Maasoumi & Zandvakili, Fields G.S. & Ok E.K., *et al.*).

Fields Gary S. reviews these approaches and income mobility estimation techniques (1998). He points to four methodological features of mobility studies: 1) the observation of one and the same economic object over time; 2) the set of observed objects (e.g., individuals, households, groups, generations); 3) the variety of economic indicators (e.g., wage, household income, and outlay per unit); and 4) the comparison of economic conditions in an initial and a subsequent time period. Specifying the meaning of income mobility, he points out, can be difficult. He points to five potential meanings or ways of measuring income mobility. The first measures how the economic situation of an observed object in the past pre–determines its economic situation in the present. The second defines mobility as the change in an object's economic situation on the scale of ranks e.g., centiles, decilies, quintiles, etc. The third focuses on the change in the income earned by an observed object as a share of total income. The fourth concept takes into consideration only the scale of changes irrespective of their direction. The fifth concept studies losses and benefits under income changes. Choosing among the concepts requires researchers to consider the availability of different types of information and take into account the tasks of the study.

1. METHODOLOGY

In this study, we draw on the methodological contributions of both economics and sociology to explain the transformations in contemporary Russia. So far income mobility has been, as a rule, associated not with the changing values of particular independent variables (determinants) over a period of time from t_0 to t_1 but with their values at some starting (t_0) or subsequent (t_1) point of time. We, however, will explore how changes in certain social–economic variables over time affect income mobility. Income mobility is defined in this study as a change of income over a period from t_0 to t_1 which alters the individual's or household's relative position on an income distribution scale.

Relative income mobility is measured on a mobility matrix, which delineates transitions between two income distributions – at t_0 and t_1 time; the matrix is divided into n equally sized income classes (quantiles). Let P be a matrix of n x n transitions, the ij–th element of which, P_{ij}, is the percentage in the income class i at t_0 time of those who at t_1 time crossed over to class j. X_i and Y_j are the number of units in the whole population who belonged to i and j income classes at t_0 and t_1 times, respectively. By definition, in matrix terms

$$Y = P^*X \text{ or } Y_j = \sum_i P_{ij} X_i \ , (i, j = 1, \ldots, n). \qquad (1)$$

The units (individuals or households) which have transitioned from one income class to another ($i \neq j$) over the considered period, are defined as "mobiles", and those which remained in their original income class ($i = j$) as immobile. The number of individuals or households that have changed their place on the income distribution scale over the period of observation indicates the volume of mobility. Mobiles, of course, may differ in the direction of their mobility and are thus divided into "ascendants" ($i < j$) and "descendants" ($i > j$). The number of income classes passed over by an individual or household in the income distribution scale over a certain period of time is a measure of "mobility intensity."

The data used in this study come from the Russian Longitudinal Monitoring Survey (RLMS). The RLMS is the first panel survey of households based on a national sample. A multi–stage stratified territorial sampling with random selection at the last stage was employed to draw the sample of dwelling units. In the first stage, administrative–geographical units (*oblast, krai, republic*) were grouped into 38 strata based largely on geographical factors, level of urbanization, and (where there was salient variability) ethnicity. One *raion* (similar to a county) was then selected from each stratum, with the probability of its selection being directly proportional to its population size. In the next

stage, in each of the selected raions a district (census, election, or postal) was determined, in which 100 dwelling–houses were selected by random sampling. As a result, all the adult household members living in these houses were surveyed. The description of the sample formation procedure can be found in M. Swafford (1997).

The analysis presented here is based on the data collected in the second stage of the RLMS study – i.e., the fifth, sixth and seventh waves (December 1994, October 1995, October 1996) – where about eleven thousand respondents in four thousand households were surveyed.

The RLMS asks for information about household incomes, as well as each household members' business, and employment activity. Each wave of the survey is presented in two files: "household" and "individual". We employ both in our study. This is done mostly because a household is presented in the "household" file as socially anonymous. Thus, in order to reveal its social profile, it is necessary to refer to the social characteristics of the household members. As wages are more sensitive than the specific household's income to the changes in social–economic characteristics of its employed, it makes sense to consider first the effect of such changes on wage and then on the specific household income.

We limit this study to those objects (individuals and households) which were observed in each of the three waves (or for some tasks, to those that were observed in at least the first and the last of the three waves). Moreover, we limit the study to objects that receive income and possess the associated set of basic variables to be examined. These criteria leave us with a sample of 2409 households with 2605 employed, adult family members. Basic distributional information of this sample are provided in Tables A1 and A2.

In the analysis of the consolidated "individual" data file, the unit of observation will be an employed adult member of the household, and the variable to be observed will be wages in cash on the primary job over the last 30 days before the interview.

In any wage data analysis in Russia, special attention must be paid to arrears. In 1994, when the fifth wave of the RLMS was administered, enterprises were in arrears to 42% of their workers. By 1996, this number had increased to 58%. As a rule, the average period of wage arrears accounts for 2–3 months. On the moment of observation 21% of the workers in our sample in 1994 and 31% in 1996 reported not having been paid for the thirty days. These levels of arrears pose major problems for measuring wage mobility. To include workers who in one wave of the survey have not been paid during the previous month may produce an exaggerated view of income mobility. But not to include in the analysis employees who did not receive their wages in time would be to ignore

a significant element of wage dynamics in Russia and risk producing a distorted picture of mobility.

In the analysis of the consolidated "household" data file, the unit of observation is a household – i.e. a group of persons living under the same roof and having a common budget; the *observed variable* is the current money income of the household obtained from all sources over the 30 days prior to the interview.

This study considers neither the non–monetary incomes of household members nor a monetary estimation of household production. Rather it relies exclusively upon money income as the observable variable. There are several reasons for this. First, according to Commander S. *et al.* (1997), in contemporary Russia, variation in cash income alone determines the level of inequality in total incomes obtained in different forms and from different sources. Second, transition to the market economy has considerably increased the role of money income as a factor determining the individual's place in the socio–economic hierarchy. A final reason is that evaluating the monetary value of household production is quite complex and time consuming and is therefore deserving of a separate study altogether.

In the analysis of household incomes, we use the consumption unit concept in order to account for households of varying composition (Kapteyn A. & van Praage B.; Buchman B. et al.; Buss J.A.). We employ the Organization for Economic Cooperation and Development (OECD) scale, which weights the income per consumption unit of the first adult in the household at 1, with each additional adult at 0.7 and each child at 0.5.

In order to eliminate the effect of inflation that occurred in the period under observation, we do not measure monetary units (rubles) directly but rather normalize incomes to the median income of variation series. This thus produces a measure of relative but not absolute mobility.

The analytical data presented in this report consist of two parts. In the first part, we consider both general characteristics of relative household income mobility (volume, direction, and intensity), and the relationship of income mobility to income inequality. In order to establish the role of initial income class as a determinant of income mobility, we employ the Kaplan–Meier survival function, and define the probabilities of a household transitioning between income classes. The second part of our analysis employs logit and probit models to explore the relationship between an wage and household income mobility and changes in those individuals' and households' socio–economic characteristics.

2. THE RELATIONSHIP BETWEEN INCOME CLASS AND HOUSEHOLD INCOME MOBILITY

2.1. General characteristics of relative household income mobility

Using a mobility matrix, we can measure the "immobility rate," which is the share of households in all households that remain in their original income class at the final moment of observation. All the others (i.e., those that have transferred to another class) are considered to be mobile.

Our transition matrix is divided into quintile groups by income per consumption unit on the OECD equivalence scale (see Tables 1, 2 and A3). For one, these matrices show that there were rather significant movements of households along the income rank scale over the observation period. The middle income quintiles show the highest degree of relative mobility. For another, the matrices highlight the effect of initial conditions. That is one's subsequent income class depends upon one's starting point. The presence of the relation between the original and achieved classes is supported by the value of the Spearman rank correlation. For the periods of 1994–1995 and 1995–1996, they were 0.504 and 0.488, respectively.

2.2. Scales of household income mobility

In1994–1995 and 1995–1996, about 40% of households remained in their original income quintile, while roughly 30% moved downward, and about 30% moved upward.

Among the mobiles, over half of all transitions were to the neighboring class, that is, the mode frequency of transition was one (+1 or –1). Higher intensities of transition were less common. Looking at the data from 1995–1996, we see that 36.8% of all households had a transition intensity of one (+1 or –1), 15.3% had an intensity of two, and 7.1% and 2.7% had intensities of three and four, respectively.

The intensity and directions of transitions to another income class are determined by the percentage change in the household's income over the period of observation.

The intensity and directions of transitions to another income class are determined by the proportion to which the initial income has changed. Thus, downward transition per one class is caused by income decline down to 62–64% of the initial; per two classes downward by income decline down to 40%; per three, down to the fourth; per four, down to 12–13% of the initial income.

Upward transitions are determined by several times rise of income[1]: transition per one class upward is determined by 1.5–2 times rise; per two classes – 2.5–3 times; per three classes – 5–5.4 times; per four classes – 11–12 times (see Tables A4 – A6).

Table 1. Transition matrix for households between income quintiles N = 2 408

1994 Quintiles	1995 Quintiles				
	1	2	3	4	5
1	0.505	0.206	0.124	0.106	0.057
2	0.228	0.372	0.173	0.126	0.101
3	0.121	0.228	0.341	0.201	0.109
4	0.084	0.108	0.235	0.325	0.248
5	0.062	0.085	0.127	0.241	0.485

Table 2. Transition matrix for households between income quintiles N = 2 408

1995 Quintiles	1996 Quintiles				
	1	2	3	4	5
1	0.441	0.253	0.138	0.104	0.064
2	0.236	0.336	0.237	0.122	0.069
3	0.156	0.197	0.301	0.231	0.115
4	0.099	0.129	0.213	0.315	0.244
5	0.068	0.085	0.111	0.228	0.508

[1] In this case we talk about promedian income change. Undoubtedly, it would be interesting to estimate income changes expressed in real monetary units – rubles, as it is common practice in the study of absolute mobility: what the number of households which increased or decreased their money income on 25%, 50%, 100%, 200%, etc. is. Over the period of 1994–1996, nominal money income was observed gradually rising, with the significant fall of real income. To be more exact, the analysis of absolute income mobility under these conditions requires the use of deflators differentiated with respect of the regions of the country. Calculations, which were done without deflators indicated that 82% of households in Russia over the period of 1994–1996 experienced upward absolute income mobility. Basically, it could have happened to 100% of households; however, hardly does it reflect the real increase in standards of living. We suppose to devote our next work to this problem, since absolute income mobility is seen as a separate field of study with particular measurement techniques.

Table 3. Intensity of household income mobility (%)

Intensity of Income Mobility	Period		
	1994–1995	1995–1996	1994–1996
– 4	1.2	1.4	1.3
– 3	3.3	3.7	3.7
– 2	7.1	7.9	8.6
– 1	18.6	17.5	18.3
0	40.5	38.1	35.0
1	16.7	19.3	20.4
2	7.2	7.4	7.8
3	4.2	3.4	3.7
4	1.2	1.3	1.2
All Households	100.0	100.0	100.0

The extent of household income mobility and ratio between volumes of upward and downward mobility has a clear geographic character. In general, the households located in the borderlands (e.g., the Far East and the European North) may be said to be more income mobile than those located in the middle latitudes (e.g., the Central region and Western Siberia). Decomposing mobility into upward and downward trends, can give us a sense of the relative performance of the various regions over the observed time periods. According to the 1994–1996 data, the volume of upwardly mobile households was higher than the volume of the downwardly mobilie in the Northern, Northwestern, Central–Black Earth, Povolzsky (Volga basin region), North–Caucasus and Western Siberian economic regions. The Central, Volgo–Viatsky, Ural, Eastern Siberian and Far–West regions all had a greater volume of the downwardly mobile.

2.3. "Reproduction" of household income classes

In addition to the various aspects of relative income mobility, we are also interested in immobility, or the "reproduction," of different income classes. To evaluate the reproduction of different income classes, the Kaplan–Meier (KM) survival function calculation was used. The cumulative probability of KM survival calculates the share of those who remain in their initial class among the members of a certain quintile in each subsequent moment of observation. The results of the calculation of the KM survival functions for different quintile groups by income per consumption unit are given in Table 4. These values show that those households initially in one of the middle quintiles exited to a new quintile at a higher rate. For instance, in the 1995–1996 span, over 30% of the households in both the first and fifth quintiles remained in the same one,

whereas only roughly one–fifth of those in the second, third and forth quintiles remained in their initial group.

Table 4. Kaplan–Meier table for household income quintile factor survival analysis for time

Income Quintiles	Cumulative Survival	
	1994–1995	1995–1996
1 (the lowest)	0.7521	0.3074
2	0.6852	0.2087
3	0.6712	0.1892
4	0.6635	0.1935
5 (the highest)	0.7424	0.3452

A Log Rank Test showed that for $p < 0.00005$ significance, there was no statistically significant difference between the survival functions of the lowest and highest quintiles, nor was there any such difference between those for the middle quintiles (see Figure 1).

These results, therefore, show the high degree of relative mobility along the income distribution scale in the mid–1990s. The overwhelming majority of Russian households have changed their place in the income hierarchy.

Knowing to which income quintile a household belonged in each observation time, it is possible to track the trajectory of its movements in income space. Denote the household trajectory as a vector (*a, b, c*) where *a* is the income quintile of the household in 1994; *b* in 1995, *c* in 1996 ($a = 1,,5; b = 1,,5; c = 1,,5$).

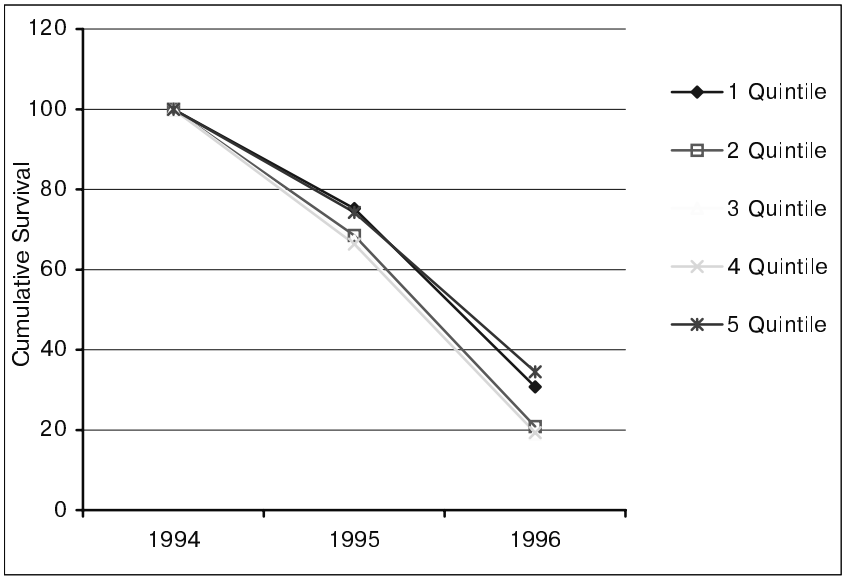
The analysis of households' mobility among different income classes has shown that 20% of households remained in the same income class over all three periods.

$(a = b \text{ AND } b = c)$.One–direction transitions from a lower to a higher class $(a < c \text{ AND } b \geq a)$ were made by 25% of households; 23% transitioned in one direction $(a > c \text{ AND } b \geq c)$ from a higher to a lower class. The remaining mobile households, 32% of the total, had transition trajectories characterized by both "ups and downs" $(a \neq b \text{ AND } b \neq c)$. Roughly half of these households returned at the end of the observation period to their initial class $(a = c \text{ AND } b \neq a \text{ AND } b \neq c)$.

Thus, the different methods of estimating income class "reproduction" – the Kaplan–Meier survival function, the analysis of transition trajectories, and transitions in the mobility matrix at the beginning and the end of the 1994–1996 observation period – have produced different results. The first two methods took into account all intermediate movements and yielded higher

measures of mobility; the latter did not account for “return ” mobility and, therefore, produced a lower value.

Figure 1. Survival functions for household income quintiles



2.4. Social direction of household income mobility

We also can analyze these data in terms of the mobility of households into and out of the two extremes. Let us define as "poor” the households in the first (bottom) quintile and as "rich” those in the fifth (top) quintile. The specific character of mobility into and out of these two groups are shown in Table 5.

The majority of households never found themselves in either of these extremes during the period of observation. Although 42% of households were, according to our definition, poor at some point during the observation period, only 5% of households could be referred to as chronically poor (i.e., a=b=c=1). Most households, therefore, only remained in the bottom quintile temporarily.

Large households, households in rural areas and households headed by an adult over 60 years in age are disproportionately represented in this group of “chronically poor.” The “chronically rich" households are most often small households, with no children, and headed by adults between the ages of 35

and 60. The profiles of these groups are presented graphically in Figures B1, B2, B3.

Table 5. Trajectories of transitions on the scales "Poor – Non–Poor", "Rich – Non–Rich" in 1994 – 1996 (% of Households)

Trajectories	«Poor»	«Rich»
Chronically Poor (Rich) – (1, 1, 1), (5, 5, 5)	5	6
Poor (Rich) at Start and Finish – (1, *, 1), (5, *, 5)	3	3
Moved out of Group at Finish – (1, **, *), (5,** , *)	22	17
Dropped into Group at Finish – (*, **, 1), (*,**, 5)	12	11
Never Poor (Rich) – (*, *, *)	58	63
All Households	100	100
Asterisk (*) denotes any other than the first and fifth income class; two asterisks (**) denote all classes, including the first and the fifth.		

2.5. Household odds to ascend to "Rich" and descend to "Poor"

The probability of moving into a particular quintile depends on a household's initial income class. We can see this most clearly by looking at the probabilities of entering the first or fifth quintiles.

Table 6. Odds ratio of household income quintiles to enter into the highest quintile

Quintiles	1994–1995	1995–1996	1994–1996
1	67.693	51.012	47.449
2	21.490	29.154	20.464
3	12.025	12.187	7.885
4	2.39	2.888	2.007

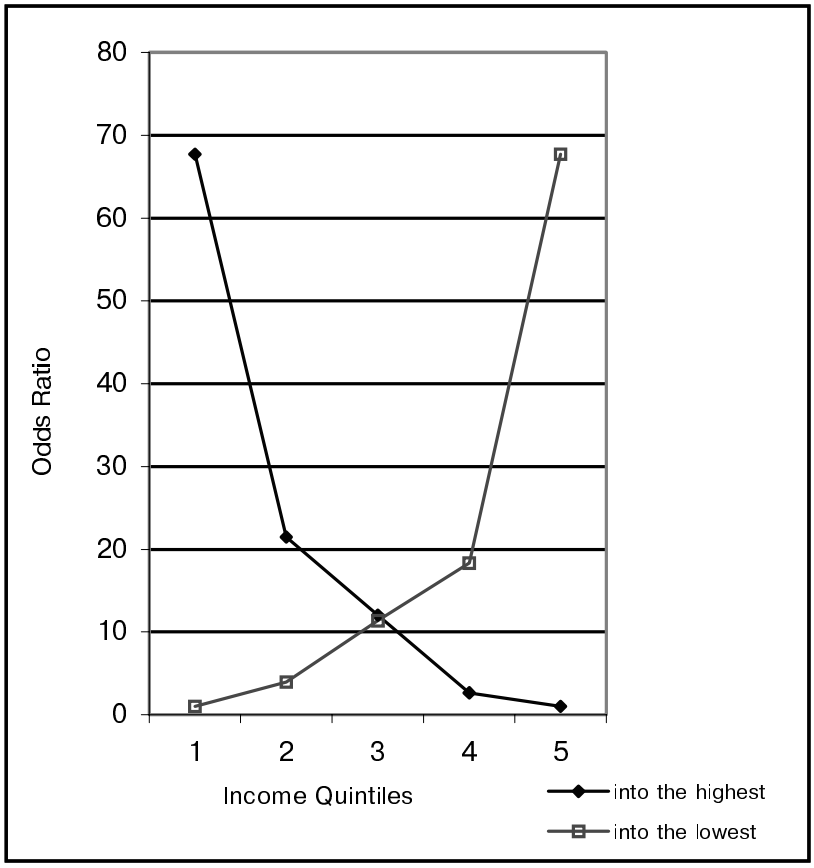
Table 7. Odds ratio of household income quintiles to drop into the lowest quintile

Quintiles	1994–1995	1995–1996	1994–1996
2	3.980	2.488	1.683
3	11.382	6.239	4.879
4	18.342	13.579	11.827
5	67.693	51.012	47.449

Below, in Tables 6 and 7, we present the odds ratio for households of an initially given quintile of transitioning into the rich and poor quintiles, respectively. The *odds ratio* in the two Tables show how much greater is the probability that a household already in one of the two extreme groups have of remaining in that group than a household in the listed quintile has of entering

it. For example, in the 1994–1995 period, a household initially in the fifth quintile was 67 times more likely to remain in that quintile than a household initially in the first quintile was to transition into the fifth quintile.

Figure 2. Odds ratio of income quintiles to enter into the hifhest and drop into the lowest quintiles in 1994–1996



The odds were not stacked quite as high against households from the middle three quintiles; a household in the fifth quintile was 21.49, 12.025 and 2.39 times more likely than a household in the second, third and fourth quintiles, respectively, to remain in that quintile than a household from one of those middle quintiles was to transition into the fifth quintile. The closer a household is to the high quintile, the greater the chance that it transitions into it in the

subsequent period. Likewise, with regard to the lowest–income extreme, the probability of becoming poor in a year is gets lower the farther from the poverty extreme a household is initially. Figure 2, in fact, shows a certain asymmetry in the odds ratio of moving into the fifth and first quintiles.

The 1995–1996 period produces a different pattern of odds ratios. The chances of transitioning into the fifth quintile declined by more than a third. The chances of members of the third and fourth quintiles of jumping into the top quintile also declined, but by a much smaller amount. . However, members of the first quintile transitioned with greater frequency into the rich quintile in 1995–1996 than in the previous observation period. In 1995–1996, all income quintiles displayed increased chances of moving downward into the first first quintile (Table 7). For example, while in 1994–1995 the chances of the members of the third income quintile to fall down to the first quintile were 11.382 times less than for the members of the first quintile to remain there, in 1995–1996, the odds ratio fell to 6.239. That is, the chances to become poor increased for the members of the third class more than 1.5 times.

Unlike in 1994–1995, the odds ratios for transitioning into the extreme income classes was asymmetric and the borders of the first and fifth quintiles became equally "permeable" for the members of the adjacent quintiles. The observed dynamics suggest that the "reproducibility" of extreme quintiles (i.e., households remaining consistently in the poor or rich quintile) is decreasing due to the higher probability of a more intensive transition from "rich" to "poor" and *vice versa*. The odds of getting into the high–income quintile for the members of other quintiles are similar for the two periods, but the probability of transitioning into the lowest income class appears to be increasing for the members of these quintiles.

2.6. Household income differentiation dynamic as the background for relative mobility

Greater income differentiation may be one of the by–products of greater relative income mobility. And over the considered period, we actually do see a greater polarization of household incomes.

The quintile differentiation coefficient, equaling the ratio of the average income of the fifth quintile to the average of income of the first[2], increased from 9.63 in 1994 to 12.47 in 1996 (Table 8).

[2] Quintile differentiation coefficient equals the ratio of average income of the fifth (high–income) quintile to the average income of the first (low–income) quintile.

Table 8. Ratio between quintile mean income and mean income of the first quintile in 1994–1996

Quintiles	1994	1995	1996
1	1	1	1
2	1.87	1.92	2.22
3	2.62	2.69	3.18
4	3.89	3.97	4.75
5	9.63	10.26	12.47
All Households	3.80	3.97	4.72

We may consider the dynamic of pro–median income quintiles[3] in order to draw further conclusions about the dynamics of income differentiation. The data in Table 9 testify to household income polarization. In the first and the second quintiles, pro–median household income progressively decreases, whereas in the fourth and the fifth quintiles, it increases.

Table 9. Promedian household income (per consumption unit) in quintiles in 1994–1996

Quintiles	1994	1995	1996
1	38.93	37.28	31.95
2	72.69	71.61	70.87
3	101.89	100.44	101.59
4	151.28	147.87	151.89
5	374.76	382.79	398.27
All Households	147.76	148.14	150.93

These trends are especially evident in the first and fifth quintiles. The pro–median income of the “rich” by +8.03 from 1994 to 1995 and by +15.48 from 1995 to 1996. The pro–median income of the first quintile fell –1.65 and –5.33, respectively, over the same two periods.

An increase in income concentration is illustrated by the dynamics of the Gini coefficient , which was 0.444 in 1994, 0.458 in 1995; and 0.472 in 1996. The concentration of income which these figures represent can be seen in Table 10 in the decreasing share of the first through the fourth quintiles in total income and the increasing share of the fifth.

The share of the first quintile in total income shows the greatest drop, 1.03 percentage points (to nearly a fifth of the original value).

[3] Note that the pro–median income is determined as the ratio between household specific income and median income in variation raw at each year of the considered period.

Thus, such special characteristics of household income mobility as the increase in "price" for transition to a higher income class; the increase in "loss" for downward mobility; and the fact that the odds to become 'poor' tend to grow, in comparison with the odds to become 'rich', were reflected in the revealed characteristics of household income mobility differentiation over the considered period.

Table10. Household income quintile shares (%)

Quintiles	1994	1995	1996
1	5.27	5.04	4.24
2	9.92	9.60	9.39
3	13.72	13.54	13.44
4	20.40	20.10	20.13
5	50.69	51.72	52.80
All Households	100.00	100.00	100.00

3. CHANGES IN EMPLOYEE'S SOCIAL–ECONOMIC CHARACTERISTICS AS DETERMINANTS OF WAGE AND HOUSEHOLD INCOME MOBILITY

3.1. Description of input determinants

We now turn to studying the relationship between income mobility and variables representing changes in other social–economic characteristics of individuals and households. In the most general form, this relationship can be expressed as: $M_{inc} = f(M_1, M_2, \ldots, M_g)$, where M_{inc} – is income mobility an indicator; M_k – is mobility indicator for the k–th social–economic characteristic ($k=1,, g$).

We first model the dependence of wage mobility on changes in employees' social–economic characteristics. For this purpose, logistic regression analysis is applied. We then use probit analysis to evaluate the dependence of household income mobility on changes in the social–economic characteristics of their employed members. Variables that characterize changes in professional career and the workplace / firm of the employed adults were used as determinants.

In the set of determinants such variables were included as:

STATEOWN – transition between state enterprises /organizations/ and private ;

CITIZOWN – transition between the Russian enterprises /organizations/ and enterprises with the share of foreign capital ;

RESPOWN – transition from hired labor to the ownership of enterprises and v.v.;

POWSTATUS – power–hierarchical transfers (transition between positions "chief" – "subordinated" and v.v.);

WAGARREAR – dynamics of wage arrears existence;

EMPLSTATUS – transition between factual and nominal employment and v.v.– a type of disguised unemployment, when employees are not dismissed but given administrative and other unpaid leaves;

OCCUPMOB – dynamics of occupational group mobility in the hierarchy of wage payments due to changes in social–economic situation.

Each of the variables could assume one of three states depending upon their effect on wages: 1) *dropping* (transitioning downward); 2) *stable,* or 3) *rising* (transitioning upward). The direction of transitions from one state to another (up – down) was determined on the basis of possibilities of rise (loss) in wages (see table11). Table 11 shows in particularly that over the period of 1994–1996 11% of employee's in the considered totality moved from state enterprises to non–state ones; and 79,7% of employee's remained at the enterprises of the same form of property although they could move from one enterprise to another.

Table 11. Descriptive statistics of determinants

Determinant	Values			Total
	Dropping	Stable	Rising	
STATEOWN	9.3	79.7	11.0	100
CITIZOWN	6.7	76.7	16.6	100
RESPOWN	11.4	82.0	6.6	100
POWSTATUS	7.6	84.5	7.9	100
WAGARREAR	28.4	62.0	9.6	100
EMPLSTATUS	15.2	72.4	12.4	100
OCCUPMOB	20.2	58.9	20.9	100

Previous research has shown that, *ceteris paribus*, wages are higher (1) in the private than in the public sector, (2) at enterprises that have attracted foreign capital than those that are wholly Russian–owned, (3) among worker–owners than among wage laborers, (4) among chief than among "subordinated ", (5) in professional groups that take part in the company's regulation and state their own salary (lawyers, composers, workers of financial–credit sphere and trade, etc.), rather than in the case of employees whose salary depends on the budget. A respondent transitioning from a state–owned enterprise to one in the private sector is, therefore, treated, *ceteris paribus*, as having made a transition that produces to a wage increase – i.e., as having made an upward transition. Conversely, the transition from a private to a state–owned enterprise was treated as a downward transition.

The variables *STATEOWN, CITIZOWN, RESPOWN, POWSTATUS* reflect transitions connected with the efforts of employees. They reflect conscious and purposeful action. On the other hand, the variables *WAGARREAR* and *EMPLSTATUS* likely reflect changes that are beyond the control of workers[4]. In this case they can be viewed as reflective of macroeconomic factors.

The variable *OCCUPMOB* can also be regarded as an indirect indicator of macroeconomic factors. Characterizing the relative position of industrial and professional groups within the wage hierarchy, it is designed to capture the effect of how industries have varied in their abilities to adapt to new market conditions. The data presented in Table A7 confirms that the structural transformation of the economy during the transition from socialism has not had a uniform affect on the wage growth of employees in different sectors. . For example, if in 1990 the average monthly wage of an employee engaged in agriculture was 1.9 times lower than in that of an employee engaged in the gas industry, by 1995 this gap had increased to 8.5 times.

The demand for professional services of lawyers, bankers, managers sharply increased in the 1990s and, as a consequence, these groups' wage and income also tended to grow. By and large, those professional groups, which were able to respond to these economic changes that found themselves in the most favorable position. It was this sort of development that we tried to take into consideration when forming the *OCCUPMOB* variable.

In the RLMS, professions are coded according to the four digit International Standard Classification of Occupations (ISCO–88). We may also apply three, two and one digit codes. We chose to use the two digit code, which allowed us to divide our sample into 28 professional groups, distinguishing among managers, clerks, highly skilled experts, and workers, and by industrial groups and specialties.

Professional groups were divided according to those that had a above average wage increases from 1994 to 1996, those that had below average wage increases and those whose wage increases were, more or less, average.

In sum, the value ascribed to a certain individual across each of the considered variables has been determined –only by their change in status. Variation across individuals and households in the way in which these socio–economic variables change, we believe, is shown below to explain a good deal about upward and downward income mobility.

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[4] When choosing input variables, it is necessary to take into account their interdependence. In particular, in practice, enterprises' (organizations') long–term wage arrears sometimes coexist or lead to mass unpaid leaves under the initiative of administration. With this regard, the question about independence between *WAGARREAR* and *EMPLSTATUS* variables arises.

3.2. Modeling the dependence of wage mobility

To determine the effect that the independent variables produce on relative wage mobility, we apply the logistic regression model. It allows us to estimate the probability of upward or downward wage mobility. This probability can be expressed as:

$$Prob\ (wage\ mobility) = 1 / (1 + EXP(-Z)), \quad (2)$$

in which Z is the linear combination

$$Z = B_0 + B_1*X_1 + B_2*X_2 + \ldots + B_p*X_p, \quad (3)$$

and B_0 and B_i ... are coefficients; and X_i independent variables.

We will first estimate the effect of downward transitions on downward wage mobility, and will then turn to the effect of upward transitions on the upward wage mobility.

Table 12. Parameter estimates for logistic regression model of downward wage mobility

Variable	B – Regression Coefficients	Wald–statiatic	Significance
Constant (B_0)	–0.8265	144.5466	0.0000
STATEOWN (Dropping)	0.0471	0.0772	0.7811
CITIZOWN (Dropping)	–0.1411	0.4739	0.4912
RESPOWN (Dropping)	0.1393	0.7299	0.3929
POWSTATUS (Dropping)	–0.0284	0.0245	0.8757
WAGARREAR (Dropping)	*1.4278*	*178.0186*	*0.0000*
EMPLSTATUS (Dropping)	0.1775	0.4429	0.5057
OCCUPMOB (Dropping)	*0.3024*	*6.5163*	*0.0107*
–2LL = 2474.462 Chi–Square (7) = 197.765 Significance = 0.0000			

Table 13. Parameter estimates for the logistic regression model of upward wage mobility

Variable	B – Regression Coefficients	Wald–statiatic	Significance
Constant (B_0)	–1.2466	313.3358	0.0000
STATEOWN (Rising)	–0.2283	1.8952	0.1686
CITIZOWN (Rising)	*0.3163*	*4.7922*	*0.0286*
RESPOWN (Rising)	0.1706	0.6715	0.4125
POWSTATUS (Rising)	*0.5626*	*11.0445*	*0.0009*
WAGARREAR (Rising)	*1.0696*	*44.0292*	*0.0000*
EMPLSTATUS (Rising)	*0.9983*	*16.0252*	*0.0001*
OCCUPMOB (Rising)	0.1559	1.6043	0.2053
–2LL = 2238.229 Chi–Square (7) = 81.564 Significance = 0.0000			

For this purpose, the dependent and independent variables were transformed to dummy variables. In this case, the dependent variable, "downward wage mobility," takes the value of 1 if downward wage mobility was observed, and 0 if not. For each of the independent variables, there are two types. For example, the *STATEOWN* variable can be presented as either *STATEOWN* (Dropping) or *STATEOWN* (Rising). *STATEOWN* (Dropping) takes the value 1 if a downward transition was exercised, and 0 if not. Likewise, *STATEOWN* (Rising) takes the value 1 if an upward transition is exercised, and 0 if not. Having transformed the given initial variables to dummy variables, we estimate regression equations parameters. For downward wage mobility they are illustrated in Table 12, and for upward wage mobility in Table 13.

Using the formula to estimate the probability of an event occurring under the obtained regression coefficients, the probability of downward and upward wage mobility, under different determinants patterns, can be estimated.

In cases in which for each set of independent variables downward transitions are observed, the probability of downward mobility is as follows:

Prob (downward wage mobility) = 0.75.

In cases in which for each set of independent variables upward transitions are observed, the probability of upward mobility is:

Prob (upward wage mobility) = 0.86.

These results suggest that under the given sets of independent variables the event (downward, or upward wage mobility) is more likely to occur than not to occur. That is, the set of independent variables have a satisfactory predictive power.

The estimation analysis of the significant variables of the regression models gives an opportunity to compare the effect of separate determinants. The logistic regression coefficient *(B)* in the equation can be interpreted as the change in log odds of downward wage mobility with a one–unit change in the independent variable if the values of the other independent variables were to remain the same. If the independent variables included in this model have different units of measurement, the value *exp (B)* allows us to compare the impact of these variables. In our case, all the variables are of the same dimension, 0 or 1. Consequently, the value of coefficient B , itself, can be treated as a measure of the influence that variable on a dependent variable B_i is positive, the probability of the event occurring increase. If B_i is negative, the odds of the event occurring decrease.

In the model of downward wage mobility (Table 12), the level of significance for Wald statistics indicates that under the level of significance 0, 0.5 in the model, only coefficients for such variables as *WAGARREAR (Dropping)* significantly

differ from zero. The change in value of *WAGARREAR (Dropping)* variable from 0 to 1 causes the increase of log odds by 1.4278; the change of *OCCUPMOB (Dropping)* variable leads to the increase of log odds by 0.3024. This comparison thus shows that the influence of *WAGARREAR (Dropping)* on downward wage mobility is greater than that of *OCCUPMOB (Dropping)*.

Table 14. Parameter estimates for the logistic regression model of downward wage mobility

Variable	B – Regression Coefficients	Wald–statiatic	Significance
STATEOWN		3.5463	0.1698
STATEOWN (Dropping)	0.0706	0.1687	0.6813
STATEOWN (Rising)	0.3003	3.5118	0.0610
CITIZOWN		0.8349	0.6587
CITIZOWN (Dropping)	−0.1436	0.4768	0.4899
CITIZOWN (Rising)	−0.0965	0.4562	0.4994
RESPOWN		2.3325	0.3115
RESPOWN (Dropping)	0.1281	0.6038	0.4371
RESPOWN (Rising)	−0.2577	1.5250	0.2169
POWSTATUS		1.9197	0.3830
POWSTATUS (Dropping)	−0.0182	0.0097	0.9214
POWSTATUS (Rising)	−0.2460	1.9192	0.1659
WAGARREAR		187.1942	0.0000
WAGARREAR (Dropping)	*1.3651*	*155.3914*	*0.0000*
WAGARREAR (Rising)	*−0.6677*	*11.6260*	*0.0007*
EMPLSTATUS		5.0168	0.0814
EMPLSTATUS (Dropping)	0.1377	0.2630	0.6080
EMPLSTATUS (Rising)	*−0.6139*	*4.6806*	*0.0305*
OCCUPMOB		5.9830	0.0502
OCCUPMOB (Dropping)	*0.3017*	*5.9496*	*0.0147*
OCCUPMOB (Rising)	−0.1027	0.7013	0.4023
C o n s t a n t	−0.6386	11.3897	0.0007
−2 Log Likelihood = 2448.891 ch2 (14) = 223.335 Significance = 0.0000 Contrast variables: *STATEOWN* (Stability), *CITIZOWN* (Stability), *RESPOWN* (Stability), *POWSTATUS* (Stability), *WAGARREAR* (Stability), *EMPLSTATUS* (Stability), *OCCUPMOB*(Stability)			

As far as the model for upward wage mobility is concerned, the coefficients of the following variables, listed in order of their influence on the dependent variable, significantly differ from 0 (Table 13): *WAGARREAR (Rising)* (i.e., a transition from not being paid to being paid); *EMPLSTATUS (Rising)* (i.e., a

transition from nominal to factual employment); *POWSTATUS(Rising)* (i.e., a transition up the power hierarchy); and *CITIZOWN(Rising)* (i.e., a transition from a wholly owned Russian enterprises /organizations to one with the participation of foreign capital). Similar results have been achieved with the help of logistic regression analysis, in which the independent variables have transformed into indicator variables. Each initial variable has been decoded into three variables, which correspond to it's the three values *Dropping*, *Stable*, and *Rising*. The value *Stable* is supposed to be a contrast variable. The value of its logistic coefficient equals 0 and so it is not included in the parameter estimates table. The coefficients for variables with the values *Dropping* and *Rising* can be compared with the value of the contrast variable coefficient. In particular, if the variable coefficient with the value *Dropping* is greater than 0, that variable can be said to affect the dependent variable more than the contrast variable. And if the variable coefficient with the value *Dropping* is less than 0, that variable can be said to affect the dependent variable less than the contrast variable.

The regression estimates for the logistic models are given in Tables 14 and 15.

Table 14 demonstrates that the following are significant factors for downward mobility: one, both the improvement and the deterioration of the situation with wage arrears; two, the transition from nominal to factual employment. Moreover, compared to immobility, a deterioration in the situation with wage arrears increases the possibility of downward mobility; and conversely, an improvement of the situation decreases the chances for downward mobility. The transition from nominal to factual employment also decreases the chances for downward mobility as compared to immobility.

The probability of upward mobility (Table 14) are shown to increase with the transition from nominal to factual employment, an improvement in the situation with wage arrears, an upward transition along the power hierarchy and the participation of foreign capital in the workplace. The probability of upward mobility is decreased by a worsening situation with wage arrears.

We next explore the question of whether there are any differences in the relative wage mobility of large social groups: between men and women, urban and rural populations, and people living in the western and eastern parts of the country. The wage mobility matrix suggested that females with a low wage level are less mobile than males starting at a similar wage level. Moreover, males with a high wage level were shown to be far less likely to exercise downward mobility than females.

Compared to urban populations, those in rural areas appear to have a higher level of wage stability among the low–paid groups of the employed but, to a certain extent, greater downward and upward mobility among those paid an "average" wage. Little distinguishes the wage mobility of the least–paid groups in the western and eastern regions of the country. But in the eastern regions, we observe a higher level of mobility of average–paid groups and a high rate of reproduction (66%) of the high–paid groups. Applying logistic regression models on the same social–demographic and location groups of the employed turns up similar influences of the independent variables. They show the

relationship between the direction of the transitions across independent variables and the direction of the dependent variable changes. We observe some variability in the significance of the separate independent variables as factors of wage mobility for males and females, as well as for rural and urban employees. The transitions from working as a wage laborer to a worker–owner and from nominal employment to factual appeared to be statistically significant factors of downward and upward mobility for females, but insignificant for males. On the other hand, the transition between working at a state and a private enterprise is shown to be a significant factor of downward mobility for males and insignificant for females (see Tables 16 and 17). These findings may be connected with the specific nature of males' and females' professional careers as well as with the nature of urban and rural labor markets.

Table 15. Parameter estimates for the logistic regression model of upward wage mobility

Variable	B – Regression Coefficients	Wald–statiatic	Significance
STATEOWN		2.2996	0.3167
STATEOWN (Dropping)	0.0402	0.0468	0.8287
STATEOWN (Rising)	–0.2584	2.0520	0.1424
CITIZOWN		5.4263	0.0663
CITIZOWN (Dropping)	–0.1546	0.4536	0.5006
CITIZOWN (Rising)	*0.3139*	*4.5498*	*0.0329*
RESPOWN		1.9263	0.3817
RESPOWN (Dropping)	–0.2286	1.5386	0.2148
RESPOWN (Rising)	0.1050	0.2477	0.6167
POWSTATUS		10.1681	0.0062
POWSTATUS (Dropping)	–2.2534	1.4786	0.2240
POWSTATUS (Rising)	*0.4881*	*7.9737*	*0.0047*
WAGARREAR		77.2588	0.0000
WAGARREAR (Dropping)	*–0.7995*	*35.8419*	*0.0000*
WAGARREAR (Rising)	*0.8642*	*27.3796*	*0.0000*
EMPLSTATUS		20.6779	0.0000
EMPLSTATUS (Dropping)	–0.4833	1.9909	0.1582
EMPLSTATUS (Rising)	*1.0935*	*18.3004*	*0.0000*
OCCUPMOB		2.2379	0.3266
OCCUPMOB (Dropping)	–0.1226	0.7882	0.3746
OCCUPMOB (Rising)	0.1200	0.8633	0.3528
C o n s t a n t	–0.7005	12.4488	0.0000
–2 Log Likelihood = 2191.962 ch2 (14) = 127.812 Significance = 0.0000 Contrast variables: *STATEOWN* (Stability), *CITIZOWN* (Stability), *RESPOWN* (Stability), *POWSTATUS* (Stability), *WAGARREAR* (Stability), *EMPLSTATUS* (Stability), *OCCUPMOB*(Stability)			

Table 16. Parameter estimates for the logistic regression of downward wage mobility for male and female

Variable	Male		Female	
	B– Regression Coefficients	Significance	B– Regression Coefficients	Significance
STATEOWN		0.0780		0.9027
STATEOWN (Dropping)	0.1277	0.5866	0.0478	0.8527
STATEOWN (Rising)	0.5016	0.0248	0.1012	0.6670
CITIZOWN		0.9978		0.5869
CITIZOWN (Dropping)	0.0164	0.9522	–0.2535	0.4362
CITIZOWN (Rising)	0.0073	0.9710	–0.1587	0.4464
RESPOWN		0.6394		0.0770
RESPOWN (Dropping)	0.1902	0.3741	0.1263	0.6359
RESPOWN (Rising)	*0.1210*	*0.6704*	*–0.6964*	*0.0296*
POWSTATUS		0.9165		0.2213
POWSTATUS (Dropping)	0.1200	0.6824	–0.0973	0.6850
POWSTATUS (Rising)	–0.0142	0.9579	–0.4126	0.0855
WAGARREAR		0.0000		0.0000
WAGARREAR (Dropping)	*1.3042*	*0.0000*	*1.4481*	*0.0000*
WAGARREAR (Rising)	–0.9342	0.0012	–0.4237	0.1201
EMPLSTATUS		0.4340		0.0089
EMPLSTATUS (Dropping)	–0.5287	0.3449	0.3123	0.3286
EMPLSTATUS (Rising)	0.4627	0.3875	*–1.0036*	*0.0041*
OCCUPMOB		0.3457		0.1663
OCCUPMOB (Dropping)	0.2480	0.1466	0.3505	0.0582
OCCUPMOB (Rising)	0.1028	0.6194	0.0779	0.6187
Constant	–0.3191	0.3097	–0.8299	0.0010
Contrast variables: *STATEOWN* (Stability), *CITIZOWN* (Stability), *RESPOWN* (Stability), *POWSTATUS* (Stability), *WAGARREAR* (Stability), *EMPLSTATUS* (Stability), *OCCUPMOB*(Stability)				

Table 17. Parameter estimates for the logistic regression models of upward wage mobility for male and female

Variable	Male		Female	
	B – Regression Coefficients	Significance	B – Regression Coefficients	Significance
STATEOWN		0.4968		0.3785
STATEOWN (Dropping)	−0.1610	0.5370	0.2468	0.3594
STATEOWN (Rising)	−0.2664	0.2812	−0.2420	0.3443
CITIZOWN		0.6456		0.0430
CITIZOWN (Dropping)	−0.2312	0.4550	−0.1109	0.7487
CITIZOWN (Rising)	0.1002	0.6394	*0.5046*	*0.0152*
RESPOWN		0.5548		0.4646
RESPOWN (Dropping)	−0.2645	0.2785	−0.1861	0.5169
RESPOWN (Rising)	−0.0551	0.8562	0.2991	0.3189
POWSTATUS		0.1353		0.0080
POWSTATUS (Dropping)	−0.6820	0.0648	0.0304	0.9063
POWSTATUS (Rising)	0.1808	0.5134	*0.7007*	*0.0021*
WAGARREAR		0.0000		0.0000
WAGARREAR (Dropping)	*−0.5788*	*0.0033*	*−0.9828*	*0.0000*
WAGARREAR (Rising)	*1.0729*	*0.0000*	*0.6846*	*0.0046*
EMPLSTATUS		0.8363		0.0000
EMPLSTATUS (Dropping)	0.1997	0.7178	0.8204	0.0707
EMPLSTATUS (Rising)	0.2620	0.6286	*1.3415*	*0.0000*
OCCUPMOB		0.6733		0.7458
OCCUPMOB (Dropping)	−0.0974	0.6050	−0.0868	0.6774
OCCUPMOB (Rising)	0.1439	0.5041	0.0847	0.6092
Constant	−1.0145	0.0019	−0.4991	0.0611
Contrast variables: *STATEOWN* (Stability), *CITIZOWN* (Stability), *RESPOWN* (Stability), *POWSTATUS* (Stability), *WAGARREAR* (Stability), *EMPLSTATUS* (Stability), *OCCUPMOB*(Stability)				

Rural and urban populations are shown to differ in that the transitions (1) to working at an enterprise that has attracted foreign capital and (2) upward along the power hierarchy are shown to be significant factors of upward wage mobility for the urban but insignificant for the rural employed (see Tables A8 and A9).

Summing to this point, the analysis of logistic regression models has lead us to make the following conclusions:

On the whole, the set of independent variables do display a satisfactory degree of predictive power. The greater the change in an employee's social–economic characteristics, the higher the probability of shifting into another wage quintile.

The impact on downward and upward wage mobility varies across the set of independent variables. Some better explain the chances for downward mobility, whereas others better explain upward mobility and immobility.

The analysis of regression models confirmed our hypotheses that the direction of relative wage mobility coincides with the direction of transitions from one state to another across independent variables.

The same determinants of wage mobility may differ, with respect to statistical significance, for large social groups.

3.3 Modeling the dependence of household income mobility

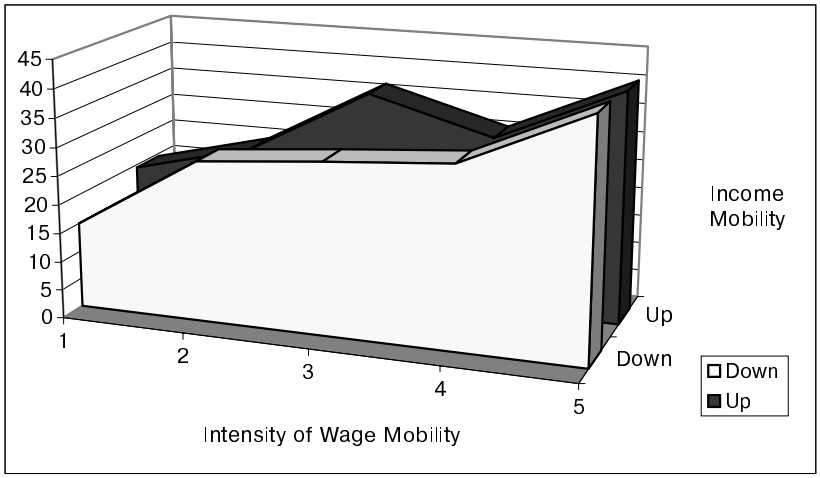
Since a household is defined as a combination of individuals living together and having common incomes and outlays, it follows that the determinants of the wage mobility of individual household members will affect household income mobility. Although it is true that wages are only a part of household income, they are the most significant part.

This inter–relationship is shown by Figure 3. From 1994 to –1996, the higher the intensity of an individual's upward wage mobility, the more frequently upward income mobility is observed. A similar finding correlation is true for the intensity of downward mobility.

This relationship provides us with good reason to assume that the determinants of employee wage mobility are household income mobility determinants as well. But since monetary household income contains not only the wages of employed members but also other monetary receipts (e.g., social transfers, proceeds from the sale of private property, alimony, and deposit interest), the influence of the same determinants on household income mobility should be less. The value of these non–wage sources of income, after all, may not be related directly to the career of the employed household members.

This turned out to be supported by the parameter estimates from the logistic regression model. Again, downward and upward household income mobility were made the dependent variables with input determinants characterizing separate household employees being independent variables. At the significance level of 0.05, in the downward mobility model, the regression coefficients were shown to be significantly different from 0 for *POWSTATUS* and *WAGARREAR;* and in the upward mobility model, *WAGARREAR* variable was statistically significant (see Table 18).

Figure 3. Relationship between intensity of wage mobility and household income mobility



One way of obtaining more acceptable modeling results would be to improve the set of independent variables and to search for a more adequate model. But the database did not allow for alternative sampling of other independent variables, so the given variables were transformed and the relevant model was found.

The main objective of the transformation was to measure the contribution to income mobility made by the variable that simultaneously "accumulates" the influence of all employees in a distinct household on its income mobility, rather than simply characterizing each member of the household separately.

In general terms, the regression model for the transformed response at a particular dose can be written as

$$Transformed\ P_i = A + B^*X_i\ , \qquad (4)$$

where P_I is the observed proportion of those responding at dose X_i.

Table 18. Parameter estimates for the logistic regression models of downward and upward household income mobility

Variable	Downward		Upward	
	B − Regression Coefficients	Significance	B − Regression Coefficients	Significance
STATEOWN (Dropping)	0.2149	0.3108		
(Rising)			−0.0613	0.7859
CITIZOWN (Dropping)	0.2245	0.3724		
(Rising)			−0.0241	0.9029
RESPOWN (Dropping)	−0.0770	0.7313		
(Rising)			0.6177	0.0722
POWSTATUS(Dropping)	*−0.5875*	*0.0424*		
(Rising)			0.0166	0.9438
WAGARREAR (Dropping)	*0.5497*	*0.0000*		
(Rising)			*0.6544*	*0.0007*
EMPLSTATUS (Dropping)	0.1378	0.6737		
(Rising)			0.1002	0.7677
OCCUPMOB (Dropping)	0.2404	0.1135		
(Rising)			0.2612	0.0909
Constant	−1.9967	0.0000	−1.9961	0.0000
	−2LL = 1626.478 Chi−Square (7) = 28.715 Significance = 0.0004		−2LL = 1525.489 Chi−Square (7) = 17.471 Significance = 0.0128	

We used as a guide a probit model suggested by D. J. Finney[5]

[5] Finney D.J. applied this model to determine the dose of insecticide to kill a particular proportion of pollinated insects. In the model, the independent variable, the stimulus dose or concentration of insecticide, was a continuous numerical variable. A probit model presupposes a linear relationship between the independent and dependent variables and determines the extent to which a change of concentration or stimulus dose influences the probability of an expected event to occur − in this case, the death of an insect (SPSS Advanced Statistics 6.1. (1994)).[0]

In our case, in terms of this model, "stimulus" would be analogous to the set of input independent variables; "dose" is the number of downward and upward transitions (of all employed household members) across all input independent variables; the dependent variable (i.e., the expected event) is downward or upward household income mobility.

This probit model does not give us the ability to estimate the contribution of each input variable to household income mobility. However, this model does have advantages. For one, it allows us to estimate the influence of a change in the intensity of employees' social–economic characteristics on household income mobility. It thus allows us to check whether or not more movements made by a household's employed members does lead to a higher probability that household income mobility follows the same direction.

In solving this problem with the help of a probit model, we used the same set of independent variables that were used in the logistic regression analysis. Probit models were built for separate regions of stimulus values: upward transitions of all employed household members across the whole set of considered independent variables – *Up_Shifts*; downward transitions made by all employed household members across the set of considered independent variables – *Down_Shifts*.

The parameter estimates for the upward and downward mobility models built for separate regions of stimulus values – *Up_Shifts* and *Down_Shifts* – are given in Tables 19, 20.

To understand whether these models are acceptable, we should consider the main parameter estimates and also the predicted probabilities for household income mobility relative to the "dose," the number of *Up_Shifts* and *Down_Shifts* across the set of independent variables of all employed household members. The goodness–of–fit of the constructed models is characterized by the *P* – significance level for the chi–square statistics for a goodness–of–fit test of the model (*Goodness–of–fit Chi square*). The larger is *P*, the better the model fits the data. Both models are acceptable with regard to the value criterion for Chi–square statistics. The value of observed significance for upward mobility equals 0.299, and for downward mobility is 0.301. The values of probits *(Prob)* given in the tables indicate that the proportion of income mobile households changes according to the number of shifts made by all employed household members. The greater the number of shifts, the higher the proportion of households moved to another income quintile. Thus, in the case of one down shift, the Probit for a household which exercised downward mobility was equal to 0.13051; in the case of seven shifts, comparable number was equal to 0.36853 (see Table 19).

A similar phenomenon is observed for upward mobility: Probit increases from 0.12653 in the case of one shift to 0.24029 in case of seven shifts (see Table 20).

Table 19. Probit analysis of downward income mobility

Parameter Estimates for PROBIT Model					
	Intercept	Regression Coefficient	Standart Error	Coefficient /S.E.	P Goodness –of–Fit
Down_Shifts	–1.25535	0.13137	0.02454	5.35352	0.301
Observed and Expected Frequencies					
Doses – Number of Down_Shifts per Household	Number of Subjects	Observed Responses	Expected Responses	Residual	Probit
0	1141	106	119.4	–13.435	0.10468
1	690	108	90.0	17.947	0.13051
2	429	69	68.8	0.166	0.16045
3	187	34	36.4	–2.382	0.19456
4	74	18	17.2	0.777	0.23274
5	30	6	8.2	–2.243	0.27476
6	4	1	1.3	–0.281	0.32021
7	4	1	1.4	–0.474	0.36853

Theoretically, Probit analysis allows us to estimate the number of shifts, which are necessary for household income mobility to achieve a certain level. In particular, our calculations show that for 25% of households to exercise upward mobility of more than one income quintile shift, it is necessary for the employed members of these households to experience 7–8 up shifts across the independent variables considered. For 25% of households in the considered totality to undergo a down shift by more than one income quintile, their employed members should experience approximately 4–5 down shifts across independent variables.

Parameter estimates from the probit models show that there exists a direct dependence between the direction of income mobility and social–economic changes of individuals. Apart from this, probit models illustrate that the relationship between the number of "doses" (i.e., the number of *Up_Shifts* and *Down_Shifts*) and the dependent variable is linear.

Table 20. Probit analysis of upward income mobility

Parameter Estimates for PROBIT Model					
	Intercept	Regression Coefficient	Standart Error	Coefficient /S.E.	P Goodness–of–Fit
Up_Shifts	–1.21588	–0.07293	0.02557	2.85184	0.299
Observed and Expected Frequencies					
Doses – Number of Up_Shifts per Household	Number of Subjects	Observed Responses	Expected Responses	Residual	Probit
0	1357	141	152.0	–11.004	0.11201
1	605	91	76.5	14.450	0.12653
2	331	49	47.1	1.897	0.14230
3	157	20	25.0	–5.020	0.15936
4	74	15	13.2	1.850	0.17770
5	25	3	4.9	–1.933	0.19732
6	8	2	1.7	0.254	0.21820
7	2	0	0.5	–0.481	0.24029

Thus, the results obtained above from probit modeling have shown that social–economic changes of household members are not only determinants of wage mobility but of income mobility of households with employed members as well.

CONCLUSION

We have provided evidence here that in Russia, during the mid–1990s, changes in the social–economic position of people –– brought about either by their own efforts or by macroeconomic factors –– affected their income mobility. Logistic regression analysis and probit analysis revealed a consistency between the direction in household wage and income mobility and the direction in the changes of the independent social–economic variables. Specifically, our empirical analysis has shown Russian households have been quite mobile in relative income terms. Over 60% of households demonstrated a "highly unstable situation" in terms of their position on the relative income scale, whereas only

20% of households remained consistently in the same income quintile for all three observation periods. Households in the middle three quintiles were particularly mobile.

Over the period of observation, 42% of households were at least momentarily poor, and although only 5% were "chronically poor" in the sense of remaining in that lowest quintile. We further found a strong relationship between the possibility of transitioning into any income class and a household's initial income class, with a lower probability of entering into the high income quintile than the low.

The dependence of income mobility on the initial income class shown is quite predictable. Income class as an indicator of individual's or household's position in the inequality hierarchy is the projection of economic, social and cultural capital they have accumulated by the given time point and of the potential possibilities given by this capital. In other words, income class rank is the transformed estimate of people's position in the labor market, investments made in the human capital, place in the administration structure etc. which predetermines not only the achieved level of incomes but also the possibility and probability of further movement in the income inequality system. In this sense, the rank of income class plays the role of mobility determinant.

In exploring causality for wage mobility, we found that it can be explained by important changes at the individual's place of employment as well as macro–economic factors. In particular, we have shown that the chances of an individual displaying downward mobility are increased both when his place of work experiences greater problems with wage arrears and when there is a decline in the wages of his occupational group to which he belongs relative to other professions. Upward mobility is associated with improvement of the situation with wage arrears, a transition from nominal to factual employment, promotions up the power ladder, and the transition to enterprises with the share of foreign capital.

Wage arrears dynamics appeared to be the most significant determinant both for downward and upward wage relative mobility.

We also uncovered significant differences in the determinants of wage mobility between males and females and the urban and rural employed. And although we did not carefully explore the reasons for these differences, we feel that they probably lie with the specific character of male and female career tracks as well as labor markets differences between urban and rural areas.

As a rule, the fact of income mobility in the society and the increase of the volumes of upward mobility over the volumes of downward mobility is estimated as positive, the first being the reflection of openness of the society and functioning of the mechanism of relation between the contribution and the reward of each member of the society. The second is regarded as the increase

in the number of attractive social–economic positions and possibilities to increase rewards over the considered period as well as the existence of chances of social–economic promotion. Apart from this, the social meaning of income mobility quantitative indicators in a certain society can be viewed only in the context of the causes and mechanisms which define this mobility. It is especially topical for the transitive societies, such as Russia in the mid 90–s. Our research has fixed a wide scale of mobility and nearly the same volumes of upward and downward mobility. However, judging the most significant determinant (the change in the situation with wage arrears) these indicators appeared to be defined by the violations of normal functioning of the mechanisms of the relation between the contribution and reward, rather than by normal functioning of these mechanisms.

Societies with high degrees of income mobility often are characterized positively as places of great opportunity, where people achieve a better life as the fruit of their labors. Our research presents a somewhat more complex view of the situation in Russia. We have actually shown that macro–economic influences, particularly the ups and downs of wage arrears and the flows between factual and nominal employment, seem to have a greater impact on income mobility than micro–economic factors. This leads us to the uncomfortable conclusion that Russians may not be able to directly control, through their own skills and efforts, what they can earn.

Furthermore, Russia's high decree of economic instability, confirmed by the mobility indices presented here, make us doubt that the government will be able to implement effective and consistent policies to reduce poverty. In these conditions, perhaps government anti–poverty policies should be focused on building and regulating labor markets.

BIBLIOGRAPHY

Adelman I., Morley S., Schenzler C., Warning M., 1994, Estimating Income Mobility from Census Data, *Journal of Policy Modeling ,* V. 16, N 2, 187–213.

Behrman J., Taubman P., 1985, Intergenerational Earning Mobility in the Unitad States: Some Estimates and a Test of Beckers Intergenerational Endowments Model, *The Review of Economics and Statistics,* V.67, 144–151.

Bogomolova T., Tapilina V., Mikheeva A., 1992, Sotsial'naia struktura: neravenstvo v material'nom blagososto ianii. Novosibirsk: Institute of the Economics and Industrial Engineering, Siberian Branch, Russian Academy of Sciences, 192 P.

Commander S., Tolstopiatenko A., Yemtsov R., 1997, Channels of Redistribution: Inequality and Poverty in the Russian Transition, *Paper prepared for the Conference on "Inequality and Poverty in Transition Economies,* EBRD, London.

Coulter F.A.E., Cowell F.A., Jenckins S.P., 1992, Equivalence Scale Relativities and the Extent of Inequality and Poverty, *The Economic Journal,* V. 102, 1067-1082.

Dearden L., Machin S., Reed H., 1997, Intergenerational Mobility in Britain, *The Economic Journal*, V.107, 47-66.

Duncan G.J., Boisjoly J., Smeeding T., 1996, Economic Mobility of Young Workers in the 1970s and 1980s, *Demography,* V. 33, N 4, 497-509.

Fields G.S., 1998, Income mobility: Meaning, Measurement, and Some Evidence for the Developing World, *Paper prepared for the Workshop on Social Mobility*, Brookings Institution, Washington, D.C.

Finney D.J. Probit Analysis. Cambridge: Cambridge University Press, 1971.

Gottschalk P., 1997, Inequality, Income Growth, and Mobility: the Basic Facts, *Journal of Economic Perspectives,* V. 11, N 2, 21-40.

Johnson P., Reed H., 1996, Intergenerational Mobility Among the Rich and Poor: Results from the National Child Development Survey, *Oxford Review of Economic Policy,* V.12, N 1, 127-142.

Hungerford T., 1993, U.S. Income Mobility in the Seventies and Eighties, *The Review of Income and Wealth,* V. 39, N 4, 403-417.

Lillard L.A., Willis R.J., 1978, Dynamic Aspects of Earning Mobility, *Econometrica,* V. 6, 985-1012.

Schiller B.R., 1977, Relative Earning Mobility in the U.S., *The American Economic Review,* V. 67, N 5, 926-941.

Sloane P.J., Theodossiou I., 1996, Earning Mobility, Family Income and Low Pay, *The Economic Journal,* V. 106, N 436, 657-666.

Smith P.K., 1994, Downward Mobility: Is a Growing Problem? *The American Journal of Economics and Sociology,* V. 53, N 1, 57-72.

Solon G.R., 1992, Intergenerational Income Mobility in the United States, *The American Economic Review,* V. 82, 393-408.

Swafford M., 1997, Sample of the Russian Federation. Rounds V, VI and VII of the Russian Longitudinal Monitoring Survey, *Technical Report,* Paragon Research International.

SPSS Advanced Statistics 6.1. Chicago: SPSS Inc.,1994, pp.250-257.

Tapilina V., 1998, The Rich in Postsocialist Russia. *Sociological Research. A Journal of Translations from Russian*, Vol. 37, № 1, 32-47.

Uusitalo H., 1989, Income Distribution in Finland, Central Statistical Office of Finland, Helsinki.

LIST OF FIGURES AND TABLES

APPENDIX A

Table A1. Demographic characteristics of individuals in RLMS and working sample.

			RLMS	Working Sample
Cities	Men	Age: 18 – 29	7.3	6.1
		30 – 44	10.3	9.9
		45 – 59	7.4	7.6
		60 +	5.3	5.1
	Women	Age: 18 – 29	8.6	7.7
		30 – 44	11.9	12.8
		45 – 59	9.5	10.5
		60 +	10.0	10.9
Villages of the City Type	Men	Age: 18 – 29	0.5	0.5
		30 – 44	1.0	1.0
		45 – 59	0.5	0.6
		60 +	0.3	0.4
	Women	Age: 18 – 29	0.6	0.6
		30 – 44	1.1	1.2
		45 – 59	0.7	0.8
		60 +	0.6	0.5
Rural (Villages)	Men	Age: 18 – 29	2.1	1.7
		30 – 44	3.7	3.7
		45 – 59	2.3	2.3
		60 +	2.5	2.4
	Women	Age: 18 – 29	2,3	1.9
		30 – 44	3.6	4.0
		45 – 59	3.1	3.2
		60 +	4.7	4.4
Total			100.0	100.0

Table A2. Distribution of population across regions in RLMS and working sample

№	Name of Region	RLMS	Working Sample
1	St. Petersburg City	3.7	2.1
2	Moscow City	6.6	6.3
3	Moscow Oblast	5.0	5.6
4	Komi ASSR: Syktyvkar	2.5	2.8
5	Komi ASSR: Usinsk & Usinsk Raion	2.4	2.7
6	Lrningrad Oblast: Volosovskii Raion	2.3	2.7
7	Smolensk City and Raion	2.7	2.7
8	Kalinin Oblast: Rzhev and Rzhev Raion	2.5	3.4
9	Tul'skaya Oblast: Tula	2.5	2.4
10	Kaluzhskaya Oblast: Kuibyshev Raion	2.4	2.6
11	Gor'kovskaya Oblast: Nizhnii Novgorod	2.6	3.0
12	Chuvashskaya ASSR: Shumerlya City and Raion	2.5	3.0
13	Penzenskaya Oblast: Zemetchinskii Raion	2.4	1.2
14	Lipetskaya Oblast: Lipetsk City and Raion	2.4	2.7
15	Tambov Oblast: Uvarovo City and Raion	2.3	1.8
16	Tatarskaya ASSR: Kazan'	2.4	3.4
17	Saratov City and Raion	2.5	2.9
18	Saratov Oblast: Volskii Gorsovet and Raion	2.3	2.1
19	Volgograd Oblast: Rudnianskii Raion	2.5	2.8
20	Kabardino-Balkariya, Zol'skii Raion	2.3	1.3
21	Rostov Oblast: Bataisk	2.5	2.1
22	Krasnodar City and Raion	2.3	2.4
23	Stavropol'skii Krai: Georgievskii City Raion	2.4	2.3
24	Krasnodarskii Krai: Kushchevskii Raion	2.3	2.7
25	Cheliabinsk	2.4	3.3
26	Kurgan	2.3	2.6
27	Udmurt ASSR: Glasov City Raion	2.2	2.4
28	Orenburg Oblast: Orsk	2.4	2.7
29	Perm Oblast: Solikamsk City and Raion	2.4	3.3
30	Cheliabinsk Oblast: Krasnoarmeiskii Raion	2.4	2.4
31	Tomsk City and Raion	2.2	2.2
32	Khanty-Mansiiskii AO: Surgut City and Raion	2.5	2.1
33	Altaiskii Krai: Biisk City and Raion	2.6	2.4
34	Altaiskii Krai: Kur'inskii Raion	2.4	1.4
35	Krasnoyarskii Krai: Krasnoyarsk	2.5	1.7
36	Vladivostok	2.6	1.3
37	Krasnoyarskii Krai: Nazarovo City and Raion	2.4	2.7
38	Amurskaya Oblast: Arkharinskii Raion	2.3	2.6
	Total	100.0	100.0

Table A3. Transition matrix for households between income quintiles N = 2 408

1994 Quintiles	1996 Quintiles				
	1	2	3	4	5
1	0.409	0.295	0.144	0.090	0.062
2	0.251	0.305	0.230	0.121	0.093
3	0.165	0.194	0.283	0.236	0.122
4	0.111	0.131	0.208	0.292	0.258
5	0.064	0.075	0.135	0.261	0.465

Table A4. The value of household income change in transitions of different direction and intensity in 1994–1995 (number of times comparing to its income in 1994)

Quintile (1994)	Mobility Intensity in 1994–1995								
	– 4	– 3	– 2	– 1	0	1	2	3	4
1					1.15	2.10	3.20	5.38	10.63
2				0.56	0.99	1.32	1.98	4.57	
3			0.38	0.74	0.97	1.39	2.85		
4		0.27	0.50	0.72	0.97	2.21			
5	0.13	0.25	0.37	0.54	1.25				
All Households	0.13	0.26	0.41	0.64	1.09	1.79	2.66	4.99	10.63

Table A5. The value household income change in transitions of different direction and intensity in 1995–1996 (number of times comparing to income in 1995)

Quintile (1995)	Mobility Intensity in 1995–1996								
	– 4	– 3	– 2	– 1	0	1	2	3	4
1					1.17	2.20	3.51	5.84	12.53
2				0.46	1.02	1.34	2.10	4.90	
3			0.35	0.73	1.04	1.45	4.43		
4		0.25	0.50	0.71	1.06	2.27			
5	0.12	0.27	0.39	0.61	1.31				
All Households	0.12	0.26	0.41	0.62	1.14	1.83	3.34	5.46	12.53

Table A6. The value of household income change in transitions of different direction and intensity in 1994–1996 (number of times comparing to its income in 1994)

Quintile (1996)	Mobility Intensity in 1994–96								
	– 4	– 3	– 2	– 1	0	1	2	3	4
1					1.10	2.04	3.09	5.39	16.67
2				0.47	0.99	1.39	2.08	5.08	
3			0.35	0.73	1.00	1.47	3.34		
4		0.24	0.50	0.69	1.02	2.38			
5	0.11	0.25	0.36	0.53	1.39				
All Households	0.11	0.24	0.40	0.59	1.13	1.85	2.85	5.24	16.67

Table A7. Average monthly wage indicators at enterprises and organizations of different industries in Russia in 1990 and 1995 (rubles)

	1990	1995	1995 to 1990 (number)
1	2	3	4
Total	303	483629	1596.1
Industrial Production	311	553737	1780.5
Energy	366	123120	2795.4
Fuel	447	1199324	2683.1
Oil Extracting	502	1395874	2780.6
Oil Processing	295	170654	3629.3
Gas (extraction and processing of natural and associated gas)	555	1924645	3467.8
Coal-Mining	478	1125546	4026.5
Ferrous Metallurgy	353	647774	3188.5
Non-Ferrous Metallurgy	440	1077426	2448.7
Chemical and Petrochemical	292	509966	1746.5
Mechanical Engineering and Metal-Working Industry	305	405640	1329.9
Timber, Pulp and Paper	308	492461	1598.9
Building Materials	316	525084	1661.7
Light Industry	249	259664	1042.8
Food Industry	313	598609	1912.5
Agriculture	289	225743	781.1
Forestry	227	317139	1397.1
Construction	376	660129	1755.7
Transport	349	760662	2179.6
Communication	257	580094	2257.2
Trade, Commerce, Fast food	258	416038	1612.6
Information Service	289	504758	1746.6
Housing Services, Non-productive Public Services	224	519504	2319.3
Health, Physical Culture	203	343745	1693.3
Education	203	306810	1511.4
Culture, Arts	188	282308	1501.6
Science	352	364881	1306.6
Banking, Finance, Insurance	410	791860	1591.4
Government, Legislation Management	364	532679	1463.4

Source: Uroven' Jizni Naseleniya Rossii . Stat. Sbornik. M: Goskomstat,1996, S.40. Notes: Column 4 is calculated by the authors.

Table A8. Parameter estimates for the logistic regression models of downward wage mobility for urban and rural population

Variables	Urban Population		Rural Population	
	B– Regression Coefficients	Significance	B– Regression Coefficients	Significance
STATEOWN		0.3145		0.1956
STATEOWN (Dropping)	0.0856	0.6859	0.1010	0.7761
STATEOWN (Rising)	0.2844	0.1336	0.6400	0.0709
CITIZOWN		0.1800		0.1237
CITIZOWN (Dropping)	–0.4587	0.0688	*0.9191*	*0.0452*
CITIZOWN (Rising)	–0.0907	0.5791	–0.0535	0.8808
RESPOWN		0.4103		0.1097
RESPOWN (Dropping)	0.2568	0.1932	–0.1921	0.5887
RESPOWN (Rising)	–0.0393	0.8716	*–0.9632*	*0.0383*
POWSTATUS		0.2750		0.9293
POWSTATUS (Dropping)	0.0105	0.9593	–0.1507	0.7659
POWSTATUS (Rising)	–0.3337	0.1109	–0.1039	0.7964
WAGARREAR		0.0000		0.0000
WAGARREAR (Dropping)	*1.4121*	*0.0000*	*1.0298*	*0.0001*
WAGARREAR (Rising)	–0.6056	0.0074	–0.7433	0.1134
EMPLSTATUS		0.0226		0.7436
EMPLSTATUS (Dropping)	0.3902	0.2402	–0.3377	0.5620
EMPLSTATUS (Rising)	*–0.9157*	*0.0138*	0.2494	0.6304
OCCUPMOB		0.0867		0.1083
OCCUPMOB (Dropping)	*0.3223*	*0.0344*	*0.5099*	*0.0354*
OCCUPMOB (Rising)	0.1708	0.2297	0.2199	0.4741
Constant	–0.6655	0.0028	–0.3608	0.3660
Contrast variables: *STATEOWN* (Stability), *CITIZOWN* (Stability), *RESPOWN* (Stability), *POWSTATUS* (Stability), *WAGARREAR* (Stability), *EMPLSTATUS* (Stability), *OCCUPMOB*(Stability)				

Table A9. Parameter estimates for the logistic regression models of upward wage mobility for urban and rural population

Variables	Urban Population		Rural Population	
	B – Regression Coefficients	Significance	B – Regression Coefficients	Significance
STATEOWN		0.5561		0.3091
STATEOWN (Dropping)	0.0795	0.7212	−0.2595	0.5275
STATEOWN (Rising)	−0.1991	0.3261	−0.6192	0.1407
CITIZOWN		0.0973		0.2760
CITIZOWN (Dropping)	0.0628	0.8061	−0.8655	0.1914
CITIZOWN (Rising)	*0.3597*	*0.0309*	0.2825	0.4354
RESPOWN		0.4089		0.1762
RESPOWN (Dropping)	−0.2899	0.1833	−0.1873	0.6503
RESPOWN (Rising)	−0.0667	0.7911	0.7169	0.0812
POWSTATUS		0.0176		0.3086
POWSTATUS (Dropping)	−0.2291	0.3105	−0.4719	0.4370
POWSTATUS (Rising)	*0.5028*	*0.0111*	0.5258	0.2011
WAGARREAR		0.0000		0.0005
WAGARREAR (Dropping)	*−0.8005*	*0.0000*	*−0.6429*	*0.0449*
WAGARREAR (Rising)	*0.7246*	*0.0001*	*1.2528*	*0.0025*
EMPLSTATUS		0.0000		0.6022
EMPLSTATUS (Dropping)	−0.6082	0.1547	−0.4980	0.4678
EMPLSTATUS (Rising)	*1.3722*	*0.0000*	0.3860	0.5020
OCCUPMOB		0.2215		0.1934
OCCUPMOB (Dropping)	−0.2908	0.0857	0.1602	0.5537
OCCUPMOB (Rising)	−0.0985	0.5066	0.5909	0.0700
C o n s t a n t	−0.6323	0.0067	−1.0113	0.0245
Contrast variables: *STATEOWN* (Stability), *CITIZOWN* (Stability), *RESPOWN* (Stability), *POWSTATUS* (Stability), *WAGARREAR* (Stability), *EMPLSTATUS* (Stability), *OCCUPMOB* (Stability)				

APPENDIX B

Figure B1. Profiles of chronically poor and rich households by location

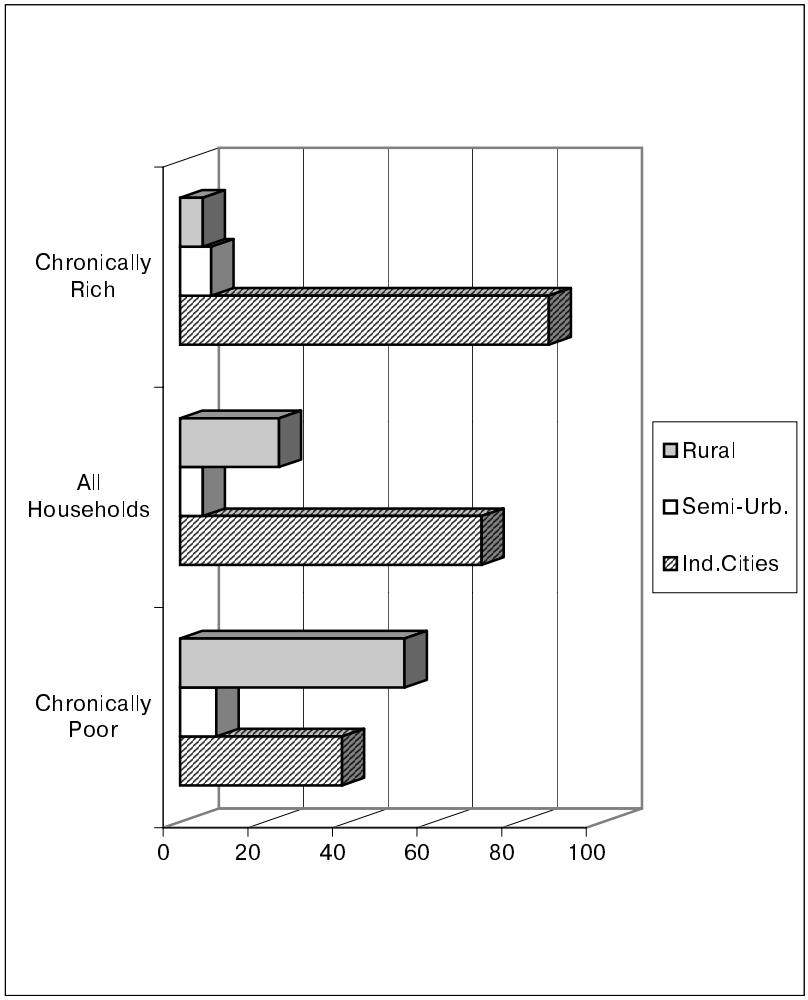


Figure B2. Profiles of chronically poor and rich households by demographic load

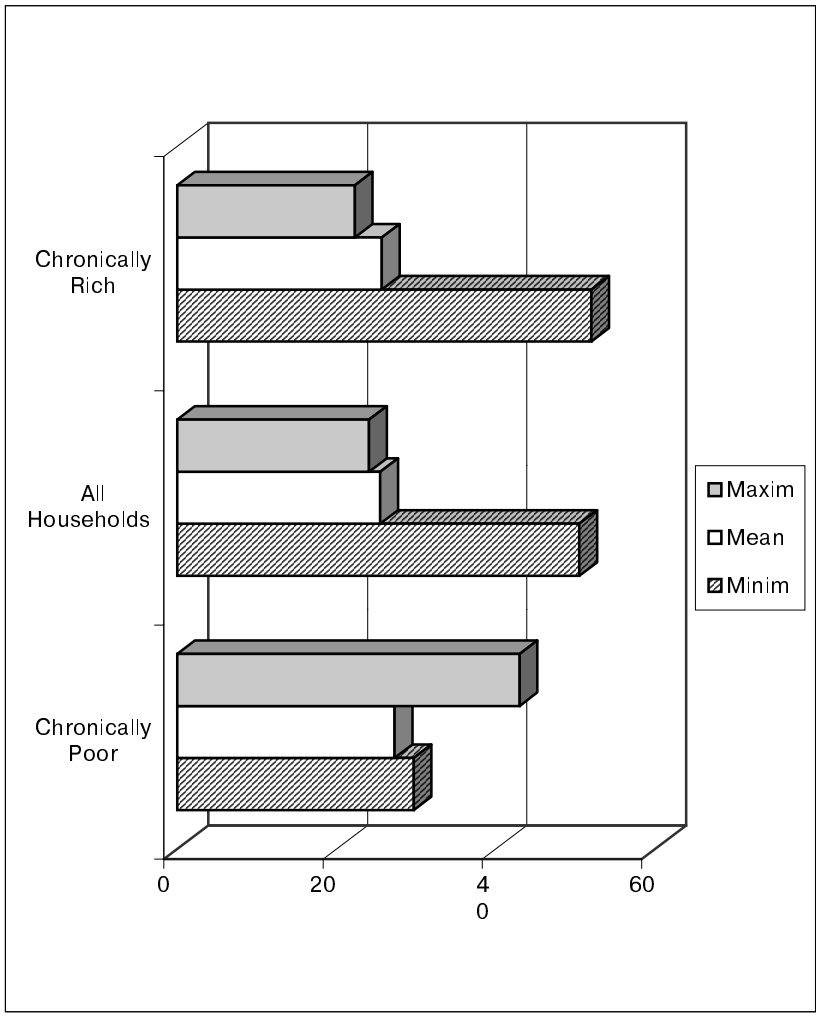


Figure B3. Profiles of Chronically Poor and Rich by Age of Household Head