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# Poverty and Inequality in Russia during the 1990s, an Empirical Investigation

## 1. Introduction

*"Most of the people in the world are poor, so if we knew the economics of being poor we would know much of the economics that really matters."*[1]

Like for many Eastern European countries, the 1990s have been a decade of far-reaching political upheavals, social and personal emancipation, decline and new opportunities for Russia. The transition from a centrally planned economy to a decentralized operating market system was accompanied by deep economic crises in each of these countries. Unlike others, Russia has not overcome the problems until now – at least for wide sections of the population. The net balance of a decade that halved real per capita income in average, that witnessed a decline in GDP of nearly 44%, inflation of more than 60,000%, growing poverty and an enormous concentration of wealth is in fact depressing. But, nevertheless, the 1990s in Russia were far from being a uniform episode of economic decline. Developments diverged regionally and for different sectors of the economy, and between the two deep crises at the beginning and the end of the decade there was growing hope for stabilization, just as right now. This article tries to identify the impact of some economical phenomena typical of transition countries on the development of aggregate poverty and inequality. Four guiding questions form the basis of this paper: how can one reasonably measure poverty in Russia? Which correlations are expected and found between declining income, growing inequality and poverty? How does the structural change inherent in privatization and labor market liberalization affect poverty? Is there an obvious link between inflation and poverty? This paper is basically descriptive and argues on an aggregate level in a classical way in that several indicators of economic well-being were computed and measured on different scales in comparison to certain poverty lines. Nonetheless, the paper distinguishes itself in the colorful concert of empirical literature on poverty in Russia in that it consistently compares poverty estimates from two totally different datasets using different indicators, scales and poverty lines. On the micro level we use the RLMS longitudinal household survey and compare the results to a synthetic sample fitted to grouped data. The paper is organized as follows: After clarifying some concepts used in our analysis in section II we summarize the historical background and the development of inequality and poverty in section III. Section IV discusses some empirical evidence for possible reasons. Section V concludes.

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[1] Quoted from SCHULTZ (1980), *Nobel Lecture: The Economics of Being Poor, Journal of Political Economy*, 88, 639-651.

## 2. A Brief Conceptual Review

*"Poverty is hunger. Poverty is lack of shelter. Poverty is… .*
*Poverty has many faces, changing from place to place and across time… ."*[2]

There is no generally accepted definition of poverty, but there is a need to quantify this term in order to measure, understand and fight poverty. During the last 20 years a remarkable empirical and theoretical body of literature has developed, discussed and applied concepts, measures and indices on an axiomatic background.[3] Each attempt faces at least two basic problems which we want to discuss in the Russian context: identification and aggregation of poverty.

### Identification

Identifying poverty, in turn, raises, at least four questions: *Who* is subject to poverty? *What* is an adequate standard of living indicator? *Where* is the minimum level below which our *who* is seen as poor? *Which* appropriate source of information can be utilized?

*Who?* We are, of course, interested in the well-being of *people*, but lack of information and difficulties in assigning shared resources to individual members force us to consider *households* as the basic micro-unit of our analysis. This non-coincidence of the subject of wealth or poverty (a person) with the economic unit (a household) causes two heterogeneity problems: it does not allow any analysis of intra-household inequality and it makes inter-household comparisons difficult. Obviously, one way out of the comparability problem is to consider per capita measures, another is to take account of economies of scale by treating different household members in different ways. Our empirical findings show that this decision has a significant influence on the magnitude of poverty, although qualitative poverty orderings basically remain unchanged. Economies of scale in household expenditure mean that the marginal increment of total household spending attributable to an additional person decreases with the number of household members. Furthermore this marginal contribution to household spending on investment goods, rent, heating, utility bill or consumption may depend on age, sex, occupation or other characteristics. In order to compare the living standard, consumption ability or income purchasing power across households of different size and composition, we analyzed both

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[2] Quoted from World Bank, *PovertyNet, What is poverty?*, URL: http://www.worldbank.org/poverty/mission/up1.htm

[3] For an excellent comparison of ''classical'' attempts of measuring poverty cf. SEIDL (1988, pp. 71-84).

per capita values of the household specific indicator variables (*Y*) and transformations $Y_{ad}(Y)$ into "per equivalent adult" quantities for (standardized) household members defined by:

$$Y_{ad} = \frac{Y}{(N_{ad} + \alpha N_{ch} + \beta N_{el})^{\theta}} \cdot \qquad (1)$$

The variables $\{N_{ad}, N_{ch}, N_{el}\}$ denote the number of adults, children and elderly (above the official retirement age, 55 for women and 60 for men). The parameters $\{\alpha, \beta\}$ express the relation of the basic-needs requirements between children/adults and elderly/adults, $\theta$ embodies scale effects of household size. The Russian State Committee on Statistics, GOSKOMSTAT, issues empirically estimated subsistence minima for employable people, children and pensioners. Although their methodology changed several times during the 1990s the ratio of these minima remained surprisingly stable. In accordance with WORLD BANK (1999) we, therefore, took the average over the period and assume constant values $\alpha = 0.9$ and $\beta = 0.63$ for the whole decade. The same WORLD BANK study found no significant deviation from $\theta = 1$. In accordance, we also presume that household size has no significant effect on the per capita expenditure on nutrition, clothing or housing.

*What?* To make our poverty measures as objective as possible, we used both reported household income and expenditure as two alternative indicators of economical well-being. The use of expenditure has some advantages. They are often more completely recognized and reported by the respondents in surveys. They may include - in the case of RLMS to a high degree - additional resources not found in any income component. And they often appear relatively smoother and delayed in comparison to income. That may indicate at least a short time validity of the life-cycle hypothesis that people are able to "insure" themselves against income shocks in markets or social nets.

*Where?* The literature discusses two contrary concepts of poverty definitions: absolute and relative poverty. Both concepts throw a highly dichotomous light on the world in that they separate the whole population into poor and non-poor according to the relative position of each single wealth indicator in comparison to a precisely defined upper bound on poverty. Although this poverty line is a fairly easy concept, nearly every cardinal poverty measure depends on it, and the very definition of this point on the cumulative distribution function $\{z, F(z)\}$ is the core of the dispute between the two views on poverty. Absolute poverty is typically associated with the *basic needs approach.* Basic needs may express the biological subsistence minimum only. But it may also include other demands necessary for surviving in a developed society. In any case, the definition of poverty only depends on human needs and is absolute in the sense that it is totally independent of wealth distribution: an entire society may be poor or everybody in a given society may be above the poverty line. By contrast, relative concepts define poverty in terms of wealth distribution only. People are considered as poor whenever they fall short of a certain percentage of mean wealth – totally independent of their specific needs: according to this concept, a

society can never be poor as a whole and can deliver itself from poverty only in the case of identically distributed wealth. One man having one penny more, all others would fall back into poverty again.

A purely *absolute* poverty line fixes a unique amount for the living standard indicator over the entire domain of entities subject to poverty comparison. Two persons will be assigned to the poor or non-poor simply by their relative position with regard to the single poverty line and irrespective of their age, education or place of living, for instance. The poverty line itself may be fixed at a 'subsistence level', defined as a minimal amount of nutrition per day necessary for surviving, at a 'socio-economic minimum', defined as a bundle of goods needed for participating in social life, or at any other level. It may be defined as an entitlement to benefits in terms of a minimal consumption level, or as an entitlement to rights in terms of income, education, etc. Once defined, it remains unchanged and is independent, in particular, of the development of a society. A purely *relative* poverty line fixes certain, possibly domain specific, shares of a central tendency statistic, say the mean, of the living standard indicator (i.e. k = 40% of mean monthly per capita income for adults and 36% for children) as a minimum that divides a population into poor and non-poor. While the absolute concept is independent of distribution, the purely relative poverty line as a constant proportion of the mean is homogenous of degree 1 in the mean: when the mean doubles and distribution remains unchanged, the poverty line also doubles and the amount of poverty, recognized by the measure based on that line, remains unchanged. Poverty comparisons using a purely relative poverty line are comparisons of inequality rather than poverty. There are also *mixed forms* of poverty delimitation such as AMARTYA SEN'S postulation of poverty as 'absolute deprivation'. In several publications he insisted on "an irreducible absolutist core in the idea of poverty" (SEN 1983, p. 159) and thereby rejected the total relativeness of poverty but recognized that a meaningful poverty line will generally vary over time.[4] A simple approach is to fix different absolute poverty lines over different domains. The challenge in this approach is to ensure comparability, i.e. to ensure that the poverty lines of different domains like countries, regions or periods reflect a purchasing power parity in terms of a cost-of-living index representing consumption patterns of the poor.

Literature and practice offer numerous approaches to both concepts and mixed forms. Each concept can be simply applied normatively by politically determining a level of basic needs, a share of the mean social income that should be available to everyone or a combination of both.[5] Absolute poverty lines can also be estimated from consumption patterns. One common approach is to estimate the cost of a bundle of goods that just barely secures physical survival. This amount of money is then inflated to include non-food expenditures. One method, introduced by ORSHANSKY (1965) for measuring poverty in the United

[4] The GOSKOMSTAT poverty line - which is used throughout this investigation - is a practical example of an absolute concept that implies some relative features like adaption over time, regions and age of people.

[5] Examples of such political norms are the subsistence level in the Soviet Union or some items of the German 'Sozialhilfe'.

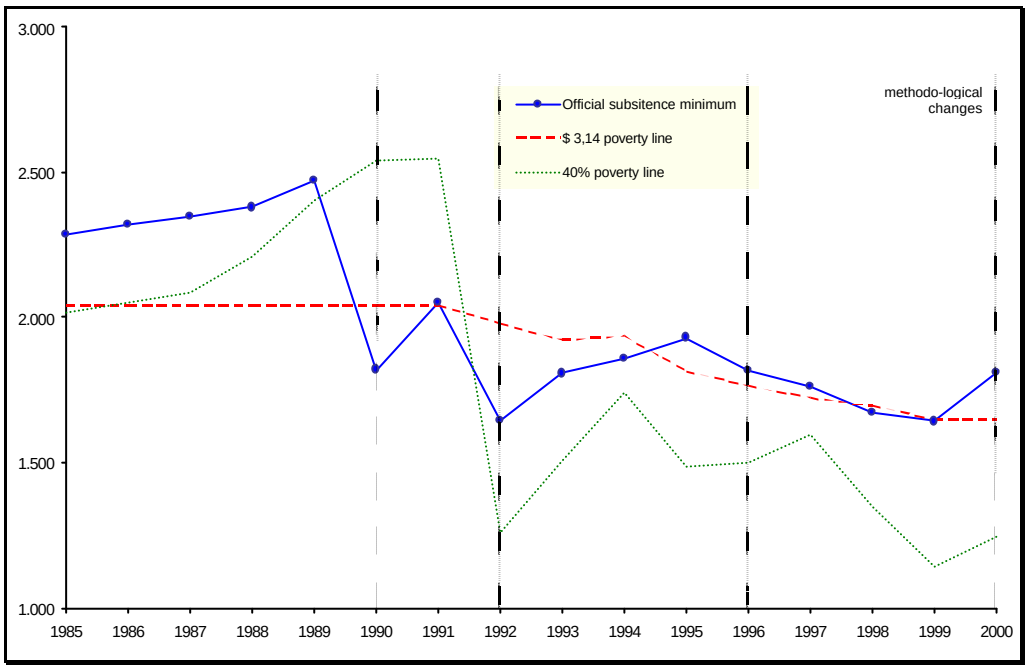
States and used by GOSKOMSTAT for Russia since 1992, is to divide the cost of the basic goods by the share of expenditures for these goods in total expenditure among the poor (the ENGEL coefficient of the poor). As RAVALLION (1992) notes, a problem might arise in applying these methods separately to each sub-domain (region or period) and afterwards comparing poverty measured in terms of these multiple poverty lines. The reason is that consumption patterns and levels will differ over the domains. Regions, for example, with a higher mean consumption will tend to have a lower mean food share which results in a higher poverty line regardless of the actual purchasing power parity. Thus, separately applied to several sub-domains, this method introduces some relativeness through the back door "… in ways which do not make clear whether we are observing changes in absolute poverty or changes in relative poverty" (RAVALLION 1992, p. 28). An alternative for estimating a 'socially accepted' absolute poverty line is to ask people, what they consider as an absolute minimum. Plotted against their actual incomes, answers will typically show patterns that can be summarized by an increasing but concave function with a positive intercept. The intersection of this function expressing the perception of an absolute minimum for each observed level of income with the 45° line is an interesting candidate for a poverty line. All incomes above $z$ are considered as above the minimum level, whereas incomes $y$ below $z$ fall short of the level, that is according to the opinion of all respondents $i$ with an income $y_i \geq y$ required to escape poverty.

In our calculations we generally applied the official monthly GOSKOMSTAT poverty lines for the Russian Federation and checked for robustness using a purchasing power parity poverty line, a relative poverty line and dominance tests that do not depend on a certain poverty line. Just like all sample, model and simulation data the poverty lines are expressed in constant prices with that of June 1992 set to one. We use the all-Russian CPI, for regional computations the regional CPIs, for deflating. Figure 1 shows the development of the all-Russian poverty line over the 1990s in constant prices. Several methodological changes in this time series have been reported. But even between these adjustments the poverty line, expressing the cost of one and the same basket of goods in constant prices, is far from constant. We will examine the effects of this somewhat unpleasant observation in detail in section 4.1. To better understand this phenomenon we estimated another poverty line following the *World Development Report* (WORLD BANK 1990) standard of 1 Dollar purchasing power per day. This standard was introduced for comparing poverty among developing countries but seems to be too low for a transition economy such as Russia. Therefore we first divided the monthly average GOSKOMSTAT subsistence level for the RF by the purchasing power parity (PPP) exchange rate estimation (RET database 2001). This gives an average of US $ 3.14 per day for 1991 - 2000. Converted back into Roubles and deflated with the overall Russian CPI, this produces the $ 3.14 poverty line in Figure 1. The 3rd line in Figure 1 is a purely relative poverty line, set equal to 40% of the per capita mean income.

Both absolute poverty lines - irrespective of methodological changes – show a falling trend over the 1990s in real terms, so that the basket of goods considered

as a subsistence minimum was relatively cheaper in 1999 than in 1991. The reason is that the CPI that we use for deflating is based on a different bundle of goods than the poverty line. The poverty line basket became relatively cheaper from the mid-1990s on. This also means that we tend to underestimate the purchasing power of the poor when deflating their income or expenditure with the overall CPI and that the marginal contribution of the changing poverty line to the changes in estimated poverty over time examined in section 4.1 is partially a reflection of this underestimation.[6] In contrast to the downward curves of the absolute concepts, the sharp decline of the relative poverty delimitation over the 1990s is caused by the collapse of real per capita incomes.

Figure 1: Poverty Lines for Russia 1985 - 2000 in constant prices (Rbl., June, 1992 = 1)




The $ 3,14 poverty line is the p. d. purchasing power equivalent of the average monthly official GOSKOMSTAT subsistence minimum for 1991 – 2000. Note that it is not only flatter than the GOSKOMSTAT line because of averaging out changes in methodology, but also because the Stockholm Institute of Transition Economics – which publishes PPP exchange rate estimations - uses the overall Russian CPI for interpolating their PPP rate estimations in months where no direct price comparison of the underlying food basket between Russia und the US was available. We also used the CPI for extrapolation in 2000.

*Which?* Estimations of depth and developments in poverty and inequality in Russia depend to a large extent on the dataset used. Two extreme positions can

[6] In principle, one could avoid this problem by deflating using the poverty line instead of the CPI. In this case one would not only have to adjust for the methodological changes in the poverty line but would also overestimate inequality (in terms of purchasing power, not in the indicator itself or its GINI, of course) as there are more non-poor than poor that would have an imaginary higher income, provided the CPI describes the cost development of the consumption of the non-poor better than the poverty line. It should be noted that we decided to deflate both income, expenditure and the poverty lines with the CPI, so that a lower indicator is compared with a lower bound, and the effects tend to average out.

be found in officially published statistics on the one hand and RLMS-based data on the other hand (cf. MINTRUD (2001) versus RLMS (2000)). For our comparative analysis we used both sources. Before going into details a few remarks on the datasets should help classify the results.

*RLMS*. The RUSSIA LONGITUDINAL MONITORING SURVEY is a publicly available set of nine survey rounds as yet, conducted between 1992 and 2000, representative for the Russian Federation. Its voluntary face-to-face interviews capture a wide range of household-specific and personal information allowing detailed analysis of the changing economic and social situation of households during the transition period. The first 4 waves in 1992/93 with a total of 6,300 to 5,700 evaluable household (plus the corresponding individual) questionnaires establish one phase; the waves 5-9 for 1994-96, 98, 2000 with a different stratification scheme and a newly redrawn sample of 3,700 to 4,000 datasets a second phase. Expenditures were inquired only on the household level, whereas every individual member and the household as a total were asked for income data. We used both sources with a priority on individual data whenever possible. Unfortunately, there is a large amount of non-responds in single quantities as well as in totals. Even worse, different methods of estimating missing values exploiting horizontal or vertical sample information yield significantly different poverty estimates for the first phase. We therefore finally decided to ignore qualitative information without quantitative specifications and essentially assume a value of zero in these income or expenditure components. While the fraction of households with a missing total is negligible in the first phase, they add up to 5-6% in the second phase. We explicitly dropped them and readjusted weights proportionally in order to sustain a constant sum of weights in each distinct weight class. For most variables households were asked to estimate monthly values. Others were converted assuming identical distribution over the reported period. Each of the RLMS waves spreads over several months with most households typically interviewed in autumn. The results are, therefore, point observations and not necessarily representative for the whole year. Finally, we deflated all monetary variables using regional, monthly GOSKOMSTAT CPI and expressed them in constant prices of June 1992, when the first wave began. Once the variables of interest are computed, deriving poverty and inequality measures is a straightforward task – in principle. We simply treated microeconomic survey observations as discrete realizations of an underlying distribution and estimated measures of this unknown distribution by computing and testing their sample realizations. One only has to take into account the three-stage stratified sample design, because measure and standard error estimations should be corrected for unequal selecting probabilities and finite population effects among households and Primary Sampling Units.

*GOSKOMSTAT Data.* Our second approach is to think of distribution as a continuum rather than a set of discrete values and establish a model by fitting a functional form to the sample realizations. Afterwards measures can directly be obtained from this function. While this seems a rather lengthy approach it has two major advantages: measures depending on a special point within the support of the function – as it is the case for nearly every poverty measure depending on

the poverty line – are unambiguously defined no matter where the next sample realization in the neighborhood of this point is found and, even more importantly, this method can also be applied to grouped data.

Table 1: Some annual economic indicators for Russia 1985-2000. The quintile shares and mean per capita income were used for our LOGNORM and LORENZ model

| year | Population, beginning of the year (Mio) | real GDP growth (% pa) | consumer price Index | real mean per capita income | real poverty line | poverty rate | quintile shares | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | June 92 = 1,0 | Rbl (06.92) / month | Rbl (06.92) / month | % | Lowest 20% | Second 20% | Third 20% | Fourth 20% | Highest 20% |
| 1985 | 142.823 | 2 | 0,0273 | 5.047,72 | 2.287,72 | | 10 | 14,6 | 18,3 | 23,1 | 34 |
| 1986 | 143.835 | 6 | 0,0328 | 5.125,32 | 2.318,23 | | 9,8 | 14,4 | 18,2 | 23,1 | 34,5 |
| 1987 | 145.115 | 1 | 0,0328 | 5.216,50 | 2.348,73 | | 9,5 | 14,3 | 18,2 | 23,1 | 34,9 |
| 1988 | 146.343 | 3 | 0,0328 | 5.528,83 | 2.379,23 | | 9,3 | 14,1 | 18,1 | 23,1 | 35,4 |
| 1989 | 147.401 | 2 | 0,0328 | 6.007,99 | 2.470,74 | 11,5 | 8,9 | 13,7 | 17,9 | 22,9 | 36,6 |
| 1990 | 148.041 | -3 | 0,0336 | 6.356,30 | 1.820,02 | 11,6 | 9,8 | 14,9 | 18,8 | 23,8 | 32,7 |
| 1991 | 148.543 | -5 | 0,0690 | 6.371,28 | 2.049,51 | 11,7 | 11,9 | 15,8 | 18,8 | 22,8 | 30,7 |
| 1992 | 148.704 | -14,5 | 1,0001 | 3.142,60 | 1.642,62 | 31,5 | 6 | 11,6 | 17,6 | 26,5 | 38,3 |
| 1993 | 148.673 | -8,6 | 9,3072 | 3.766,34 | 1.807,06 | 30,9 | 5,8 | 11,1 | 16,7 | 24,8 | 41,6 |
| 1994 | 148.366 | -12,6 | 44,4266 | 4.344,51 | 1.859,29 | 23,1 | 5,3 | 10,2 | 15,2 | 23 | 46,3 |
| 1995 | 148.306 | -4,1 | 134,8810 | 3.714,93 | 1.930,26 | 26,2 | 5,5 | 10,2 | 15 | 22,4 | 46,9 |
| 1996 | 147.976 | -3,4 | 203,3344 | 3.749,73 | 1.819,04 | 21,4 | 6,2 | 10,7 | 15,2 | 21,5 | 46,4 |
| 1997 | 147.502 | 0,9 | 233,4717 | 3.983,78 | 1.761,23 | 21,2 | 6 | 10,2 | 14,8 | 21,6 | 47,4 |
| 1998 | 147.105 | -4,9 | 290,6949 | 3.368,02 | 1.672,21 | 24,6 | 6,1 | 10,4 | 14,8 | 21,1 | 47,6 |
| 1999 | 146.693 | 5,4 | 552,2019 | 2.846,99 | 1.641,68 | 34,1 | 6,1 | 10,5 | 14,8 | 20,8 | 47,8 |
| 2000 | 145.934 | 8,3 | 667,5501 | 3.112,77 | 1.811,67 | 30,6 | 6,1 | 10,6 | 14,9 | 21,2 | 47,2 |

Figures for 1985-89 refer to annual data, those for 1990-2000 are averages of monthly data.
"Real" values are expressed in constant prices with June-92 = 1 and were deflated with the overall Russian CPI.

Surces:
Population at the beginning of the year (annual data):
- Goskomstat, Demograficeskij jezegodnik Rossii 1999, Moskau 1999, p. 19;
- Social'no-ekonomiceskoe polozenie Rossii janvar' 2000 goda, p. 209.

GDP:
- World Bank, World Data '95. CD ROM, URL: http://www.indiana.edu/~unionet/Spero103.gif for 1985 - 1988
- Buiter (2000), p. 8 for 1989 - 1994
- World Bank, The Development Data Group, URL: http://devdata.worldbank.org, for 1995 - 1998
- GOSKOMSTAT, Î ñíîâíûå ïîêàçàòåëè ñèñòåìû íàöèîíàëüíûõ ñ÷åòîâ
  for 1996 - 2000, URL: http://www.gks.ru/scripts/free/1c.exe?XXXX19F.2.1/000330R

CPI:
- World Bank for 1985-1990;
- Russian Economic Trends for 1990-1999.
- GOSKOMSTAT for 2000.

Nominal income per capita:
- Goskomstat for 1985; Milanovic (1998) for 1987-89;
- Russian Economic Trends for 1990-2000.

Nominal poverty line:
- McAuley (1995) for 1985-89 values (MMS methodology);
- Russian Economic Trends for 1990-2000 (average minimum subsistence level).

Poverty rate:
- Popova (2000, S.6) for 1985, 86; Atkinson/Micklewright (1992, Tab. UP2) for 1988, 89; 1987 interpolated.
- Russian Economic Trends and MINTRUD for 1991-2000, 1990 interpolated.

Quintil shares:
- Shorrocks (2000), Tab. 2 for 1985 - 1989;
- MINTRUD (Moskva 2001), p. 34 for 1990-2000.

One often has only limited access to household data but can find tables with aggregated statistical information on the distributions of interest. We fitted two different models to per capita income quintile shares $q_i$ officially reported by the Russian State Statistical Agency GOSKOMSTAT. Tab. 1 summarizes our models' input. Quintile shares, $q_i - q_{i-1}$, denote the proportion of total income in each 20% population percentile $p_i - p_{i-1}$, in relation to total income over the whole

population sorted in ascending order. Cumulated, they mark points on a LORENZ curve $L = L((0;0, (p_1;q_1), \ldots (1;1))$. Together with a location parameter, e.g. mean per capita income, $\mu$, $L$ completely characterizes the cumulated distribution function $F=F(L,z)$. The sources of the income data are GOSKOMSTAT evaluations of the FAMILY BUDGET SURVEY (FBS), a panel survey of nearly 50,000 households that is not publicly available. Literature frequently criticizes that beginning in 1993 GOSKOMSTAT has been correcting in-sample income data reported by respondents on the basis of out-of-sample estimations of informal sector incomes in a very intransparent way and thereby upgraded total household income by about 20% (OVCHAROVA, 1997). In fact, all our poverty estimations are significantly lower than the RLMS evaluations. While we cannot explain the large differences, we find some interesting structural similarities in both datasets. Also, we have annual average point information – and generalized with the two models discussed below entire distributions – over a longer period, which is especially important for considering the two main poverty crises at the beginning and the end of the decade.

Our two models differ from each other in the function that is approximated and in the functions we use for approximating. The reason for modeling is simply that we need an interpolation rule for points not given in the table. We applied two models for an informal check of the sensitivity of our results to model-specific assumptions.

*LOGNORM Model:* The first candidate function type we fitted to the data is a cumulative distribution function, $F$. The basic idea originates in the assumption that one can produce reasonable approximations to per capita income with a lognormal distribution $Y \approx LN(\mu, \sigma^2)$ where $X = ln(Y)$ is normally distributed with mean $\mu$ and variance $\sigma^2$, consistent with reported data. The lognormal is known as a positively skewed distribution providing a reasonable fit in a middle range of income typically supporting poverty rates actually observed in Russia, say 10-40%. This distribution also has some possible shortcomings: it tends to overstate positive skewness, generally fits poorly towards the extreme tails and generates only positive incomes. We will find some of these drawbacks in our results later. The first step in fitting a LOGNORM model to the data is to determine the parameters $\mu$, $\sigma^2$. Say, $\Phi$ is the cumulative normal distribution function for $X \approx N(0;1)$. The distribution $F(Y)$ then follows:

$$F_Y(y \mid \mu,\sigma) = P(Y \le y) = P(\ln Y \le \ln y) = P(X \le x)$$
$$= \Phi\left(\frac{x-\mu}{\sigma}\right) = \int_{-\infty}^{y} \frac{1}{\sigma\sqrt{2\pi}} e^{-(\ln\xi-\mu)^2/2\sigma^2}\, d\xi. \qquad (2)$$

Of course, this expression holds at the upper bounds of each quintile, too. We can write for the cumulated quintile shares:

$$p = F(y) = \Phi\left(\frac{\ln y - \mu}{\sigma}\right). \qquad (3)$$

KAKWANI (1980, p. 35) established a relation between the lognormal cdf and the LORENZ function, mapping cumulated shares of the population into cumulated shares of income over the population, which can be written as

$$\begin{aligned} L(p) &= \int_0^p y \, \mathrm{d}\, LN(y \mid \mu,\sigma) \Big/ \int_0^1 y \, \mathrm{d}\, LN(y \mid \mu,\sigma) \\ &= \int_0^p y \, \mathrm{d}\, LN(y \mid \mu,\sigma) \Big/ \bar{y} \\ &= \int_{-\infty}^p \frac{1}{y\sigma\sqrt{2\pi}} e^{-(\ln y-\mu)^2/2\sigma^2} \, \mathrm{d}y \Big/ e^{\mu+\sigma^2/2} \\ &= \int_{-\infty}^p \frac{1}{y\sigma\sqrt{2\pi}} e^{-\left(\ln y-\mu-\sigma^2\right)^2/2\sigma^2} \, \mathrm{d}y. \end{aligned} \tag{4}$$

In analogy to (3), we can, therefore, express the income shares of the cumulated quintiles as

$$q = L(p) = \Phi\left(\frac{\ln y - \mu - \sigma^2}{\sigma}\right). \tag{5}$$

Using (3) and (5) we can calculate the distribution parameter $\sigma$ as

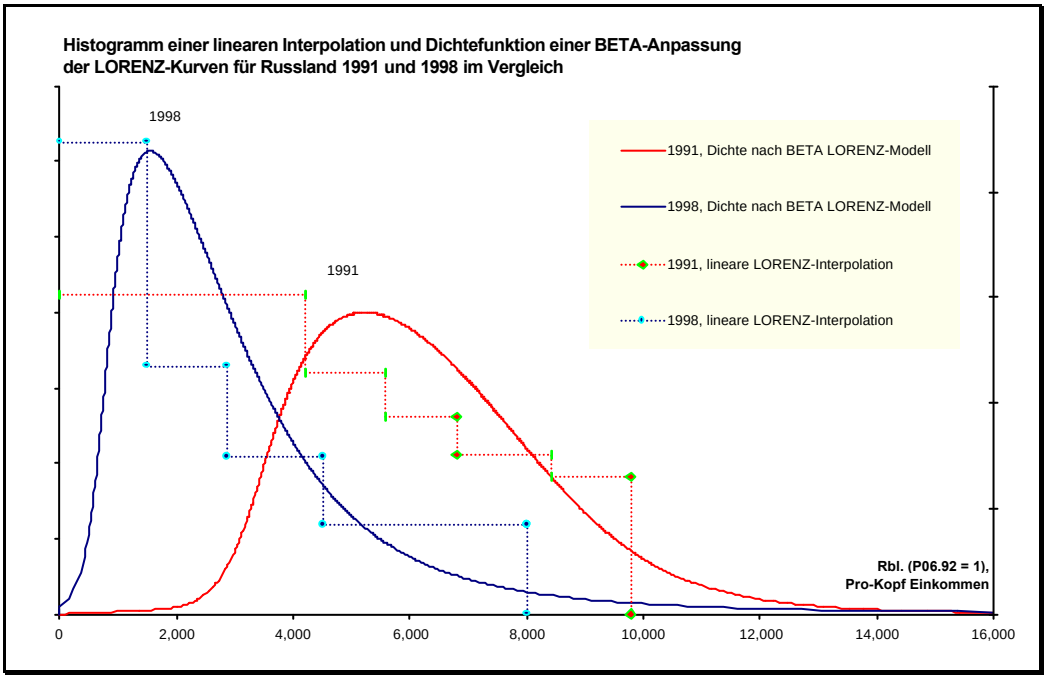
$$\begin{aligned} &\sigma \cdot \Phi^{-1}(p) = \ln y - \mu \quad \text{resp.} \quad \sigma \cdot \Phi^{-1}\left(L(p)\right) + \sigma^2 = \ln y - \mu, \\ &\sigma = \Phi^{-1}(p) - \Phi^{-1}\left(L(p)\right). \end{aligned} \tag{6}$$

Equation (6) allows us to specify a $\sigma_i$ for each of the tabled *p,q* pairs. We follow SHORROCKS, KOLENIKOV (2000, p. 7) in determining $\sigma$ as the mean over the 5 $\sigma_i$ obtained from (6) for each year. Since mean per capita income of the empirical distribution for each year is known from table 1, and the expectation of the lognormal is given by $\bar{y} = \mathrm{E}[Y] = e^{\left(\mu+\sigma^2/2\right)}$, we can compute the location parameter $\mu$ as $\mu = \ln \bar{y} - \sigma^2/2$. Unfortunately, $F_Y^{-1}(p)$ fits only poorly with some of the reported income shares, so we follow a modification procedure proposed by SHORROCKS, KOLENIKOV (2000) in order to replicate the given points exactly. First, we drew a sample of 5,000 values for each year. Then, we scaled the middle quintile ($q_3$) in order to match its average implied by the reported quintiles as $\bar{y}_i = \frac{q_i \bar{y}}{p_i}$ exactly. In a third step we adapted the two upper quintiles to match the average of the 4th quintile. So as to avoid of jumps in the distribution, we adjusted the values proportionally to their difference from the upper bound of $q_3$. In a fourth step we adjusted all differences between values in $q_5$ and the upper bound of $q_4$ in the same manner. In a sixth and seventh step, we applied the same procedure to $q_2$ and $q_1$, scaling the differences to the lower

bounds. In concordance with SHORROCKS, KOLENIKOV we received relatively smooth and plausible pseudo empirical samples exactly replicating the data given in table 1. These samples can now be used for estimating and simulating poverty. A drawback of the adjustments is, of course, that again we work with (synthetic) discrete values instead of functional expressions. To overcome this and to check for methodological artefacts in the results, we fitted a second model to the data for comparison.

*LORENZ Model:* The second candidate function type we fitted to the data is a LORENZ function, $L$. A straightforward idea of mapping the cumulated tabled coordinates $\{p_i, q_i\}$ into a function is piecewise linear interpolation. The resulting constant slope of the LORENZ curve in each quintile implies an equal share in total income for each quintile member. Within the quintiles, per capita income is, therefore, identically distributed, whereas the *cdf* jumps between the quintiles. Irrespective of this undesirable shape, linear interpolation can be used for computing relative frequencies of income classes that give an idea of the distribution. Figure 2 shows histograms of per capita income for 1991 and 1998 in comparison to smooth density functions obtained from a BETA parameterization of $L$.

Figure 2: Histogram of a linear interpolation and density function of a BETA parameterization of the LORENZ curve for Russia, 1991 and 1998




The dotted histograms, scaled at the right axis, show relative frequencies of per capita income classes for Russia in 1991 and 1998. They are obtained by linear interpolation of the cumu lated quintile shares in table 1. The resulting identical intra -quintile distribution implies that the given quintile mean qi*y/pi equals the upper bound of the quintile shown in fig. 2. The solid lines, scaled at the left axis, are density estimations implied by the BETA model of the LORENZ curve.

Following DATT (1998) we generalized the unrealistic assumption of identical innerquintile distributions by fitting smooth parametric functions to the points on the LORENZ curve given in table 1. The first approach we applied to our data for 1985-1991 and 1995-1998 was introduced by KAKWANI (1980) and could be called BETA model because of the approximating function. The second alternative, which we use for 1922-1994, 1999 and 2000, was proposed by VILLASENER, ARNOLD (1984, 1989) and called "general quadratic LORENZ curve" (GQ model). Both models can be applied to grouped and to empirical micro data converted into *p-q* pairs. They are defined by:

$$\begin{aligned} &\text{BETA: } L(P) = P - \alpha P^{\beta}(1-P)^{\gamma} \quad \text{or} \quad \ln\left(P - L(P)\right) = \alpha + \beta \ln P + \gamma \ln(1-P) \\ &\text{GQ: } \quad L(P)\cdot\left(1 - L(P)\right) = \alpha\left(P^2 - L\right) + \beta L(P-1) + \text{a(P-L)} \end{aligned} \tag{7}$$

In both cases the parameters $\alpha$, $\beta$, $\gamma$ can be computed with a simple OLS regression, for the GQ model without intercept. The fit of both 3rd degree polynomials to our four data points between (0;0) and (1;1) is nearly perfect. But the parameters have to satisfy some constraints for a theoretically valid LORENZ curve, which is not automatically guaranteed by the OLS regression. One therefore has to check for validity after estimation (cf. DATT 1998, p. 12). If both regressions provide valid results, one can choose the one with a better fit at the bottom of the income distribution.[7] Fortunately we arrived at valid functions with high accuracy for all years. Only in 1992 the parameter estimates of the valid GQ model are insignificant. To compute poverty and inequality measures, one can use this functions as well as the *cdf* or density function.

**Aggregation**

Once the database has been constructed and a poverty line has been chosen, one can finally aggregate poverty in a measure. There is an enormous literature on point-specific poverty measures and generalized poverty dominance tests, so we will not go into detail here.[8] For this article, we used measures that FOSTER, GREER and THORBECKE introduced in 1984 as a conjoint class. They should be denoted as $FGT(\alpha)$ and are defined as:

$$\begin{aligned} &FGT(\alpha) = A^{\alpha} = \frac{1}{N}\sum_{i=1}^{P(z)}\left(\frac{z - y_i}{z}\right)^{\alpha} \quad \text{for a discrete and} \\ &FGT(\alpha) = A^{\alpha} = \int_0^z \left(\frac{z - y_i}{z}\right)^{\alpha} f(x)\,dx \text{ for a continous distribution.} \end{aligned} \tag{8}$$

[7] CHEN, DATT, RAVALLION developed and provide an excellent computation tool, PovCalc.exe, that can be downloaded from http://www.worldbank.org/html/prdph/lsms/tools/povcalc.

[8] Cf. for example DEATON (1998, p. 140-169) or SEIDL (1988). Laval University offers a very helpful software tool for distributive and poverty analysis that can be downloaded from http://www.mimap.ecn.ulaval.ca/. Cf. ARAAR, DUCLOS, FORTIN (2002).

For $\alpha=0$ the measure simply corresponds to the share of the poor, the so-called *poverty rate*. For $\alpha=1$ it corresponds to the average relative distance of the welfare indicator $y<z$ from the poverty line $z$. One can interpret this so-called *poverty gap* as a lower bound on the average costs of poverty elimination that would match the elimination cost exactly if lump-sum taxes and transfers were available. A $\alpha>1$ gives indicator realizations far below $z$ a higher weight so that $FGT(\alpha>1)$ can be used as a distributionally sensitive measure. As usual in poverty analysis, we will argue with $FGT(0)$, $FGT(1)$, $FGT(2)$ in this article.

## 3. A Brief Historical Review

Before looking at links between the development of poverty, aggregate income, distribution, structural changes and inflation we want to set the stage and briefly describe the historical paths.

### The Macroeconomic Framework

The Russian economy has been experiencing continuous and deep crisis since the beginning of the 1990s. Especially in the first half of the 1990s the drop in GDP took on catastrophic dimensions. The first decline in GDP took place as early as 1990. That year was characterized by strong tendencies toward decentralization in almost all fifteen Soviet republics. Not only production chains began to collapse. The economic and political competition between the union and the republics led to differing economic regulations. So Russia offered privileges in terms of tax and price policy to enterprises, which were willing to come under the jurisdiction of the Russian Federation. This struggle for power inside the Soviet Union worsened the economic situation in the country noticeably. Apart from regional destabilization, structural changes in economic sectors such as conversion of the military-industrial complex had a strong destabilizing effect on the economy. After the collapse of the Soviet Union in December 1991 the situation became critical. The Russian government decided to carry out swift economic reforms towards a free market economy accompanied by stabilization policies. Most economists associate January 1992 with the beginning of transition in Russia. The mass privatization of 1992-1994 also started a – politically motivated – deep change in the structure of property. In 1992 GDP dropped by 15% and continued to fall until 1996, when it accounted for 60% of its 1990 value. The inflation stimulated barter and the shadow economy and implied allokative losses. The slight economic recovery in 1997 and the first half of 1998 with positive GDP growth rates and moderate inflation rates of 130% was ruined by financial crisis in the late summer of 1998. The development of the last two years gives us hope for some stabilization. However, the net result of the 1990s with a 44% GDP decline and about 67,000% inflation remains depressing.

According to GOSKOMSTAT, private per capita income reached its maximum in 1991 (cf. tab. 1). The high inflation implied big losses of private real incomes and savings. By 1992, average real per capita income had already been halved.

Due to improvements of real wages and pensions, it increased by 15% in 1993 and by 29% in 1994. Income from entrepreneurial activity and assets rose as well. Real per capita income remained below its 1994 level until the financial crisis of 1998. During the financial crisis it fell by 15% compared to the preceding year and reached its absolute minimum of the 1990s in 1999. Despite slight improvements in 2000 income barely reached half of its 1990 level. This development was accompanied by a clear progressive redistribution of shrinking volume of income from the poor to the rich.

The situation on the labor market is not as easy to assess. Between 1992 and 1994 the rate of registered unemployed people[9] remained below 3%. Alternative calculations of GOSKOMSTAT based on the ILO methodology stated a rise of the unemployment rate from 5.2% to 7.7% during the same period. But even these numbers appear amazingly low compared to the drastic fall of economic performance. This divergence can partly be explained by non-coverage, the three-month period, short time work and hidden unemployment through subsidies for non-profitable enterprises (cf. DIW, IWH, IfW, 1994, p. 7-8). In the second half of the 1990s the unemployment rate calculated by ILO methodology grew continuously and reached its maximum at 11.9% in 1998. The share of employees in the private sector of the economy amounted to 31% of the working population in 1992 and 62% in 1998.

**Development of the Income Distribution During the 1990s**

Both relative and absolute income distribution experienced great shifts in the 1990s, unequally distributed over the decade with its two deep crises. First we will look at the picture of this development provided by the GOSKOMSTAT data. Afterwards we'll compare it with the results of the RLMS data analysis.

*GOSKOMSTAT data.* The last year of the Soviet Union, 1991, was a "golden year" in terms of real per capita income as well as in terms of the income distribution: both average per capita income and income shares of the lowest quintiles reached their maximum and the GINI coefficient its minimum at only 19% (cf. tab. 1). The first market reforms of 1992 led to a drastic deterioration of the situation: not only was average per capita income halved in 1992 but income inequality also grew remarkably. The shares of the two lower quintiles went down to half or two thirds of their pre-crisis levels. The only (relative) winners of these developments were the two highest quintiles. Interestingly, in contrast to shifts in income distribution in the first half of the decade, relative income losses in the second half were concentrated in the upper two quintiles. Although the financial crisis of 1998 caused once more deep losses in GDP, the distribution remained relatively stable – at the lowest level of the entire period. Compared to the shifts in distribution caused by the changes in 1992, the second crisis barely affected the relative positions of the lowest quintile shares. On the contrary, they did even a little bit better, in relative terms. The fourth quintile

[9] A three-month period of unemployment enables a person to be registered as unemployed.

steadily reported losses with the exception of 2000. The middle quintile also faced losses, but with a decreasing tendency. The highest quintile experienced its first losses in 2000. Looking at the whole period we can see income losses shifting over the distribution. 2000 reported even a moderate regressive redistribution from the highest quintile to the lower, which implied a decrease of the GINI coefficient from 41.3% to 40.6%. At the same time, GDP grew by 9% and ones more reached its level of the first crisis year, 1992.

Figure 3: Parametric LORENZ curves fitted to officially published quintile shares for Russia, 1985-2000.

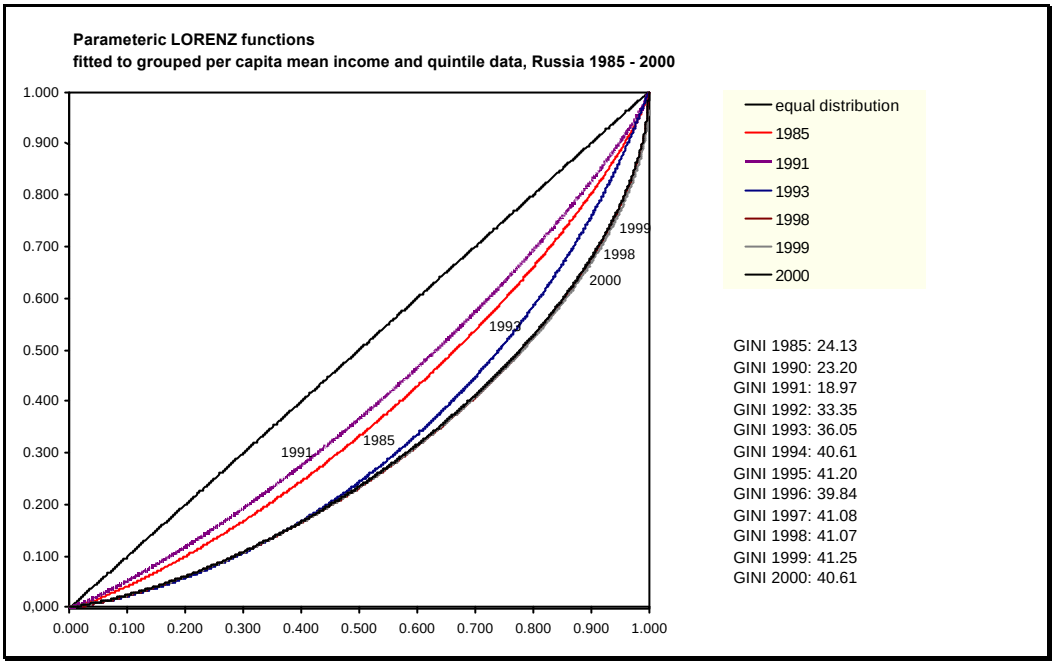
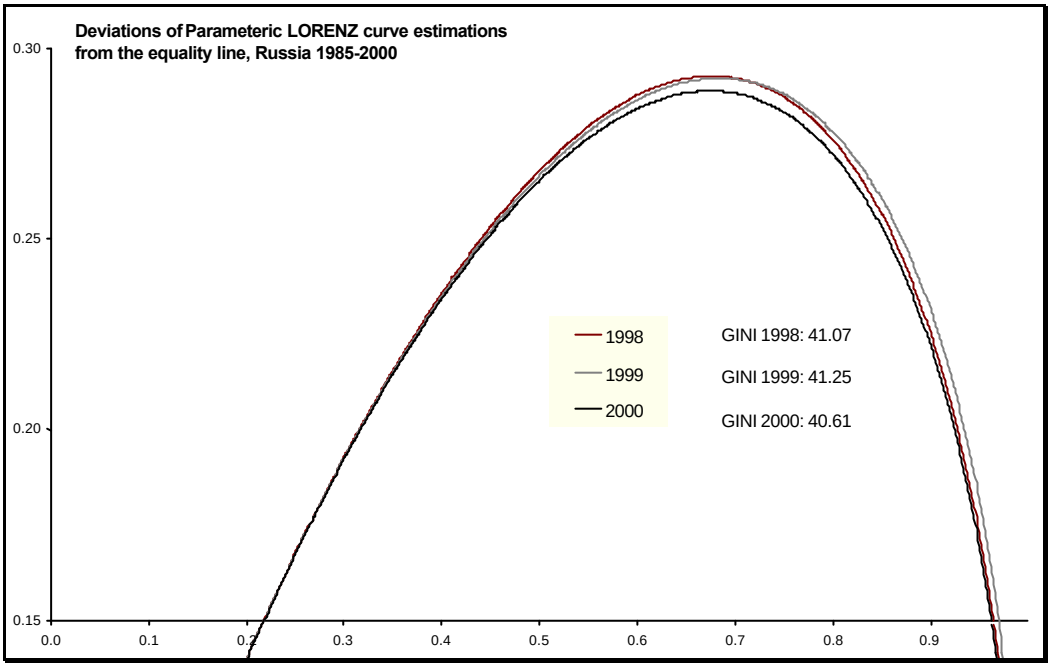



Fig. 3 shows LORENZ curves for 1985 to 2000. One can see that the 1991 income distribution LORENZ-dominates all other distributions over the whole range.[10] Also, the "moving concentration" mentioned is manifest in the plot as well: while the lower parts of the LORENZ curves for 1993 and for 1998-2000 are quite similar, the upper part of the latter is more concentrated than the 1993 one. That means that lower quintiles faced income losses as early as at the beginning of the decade, whereas the upper began to lose their income only at the end. To illustrate the difference between LORENZ curves from 1998 to 2000 we plotted their distances from the 45° line in the relevant area. Fig. 4 shows that the 2000 LORENZ curve dominates the 1998 and the 1999 LORENZ curves over the whole range. Unfortunately the latter cross each other at 73% of the population, so we cannot say anything about LORENZ ranking over the whole domain between 1998 and 1999. But again, we find indicators of a moving concentration: 1999 shows the highest concentration in the upper range, whereas the third quintile still loses while the position of the others remains more or less

[10] This is also valid for omitted years which we didn't illustrate for clarity.

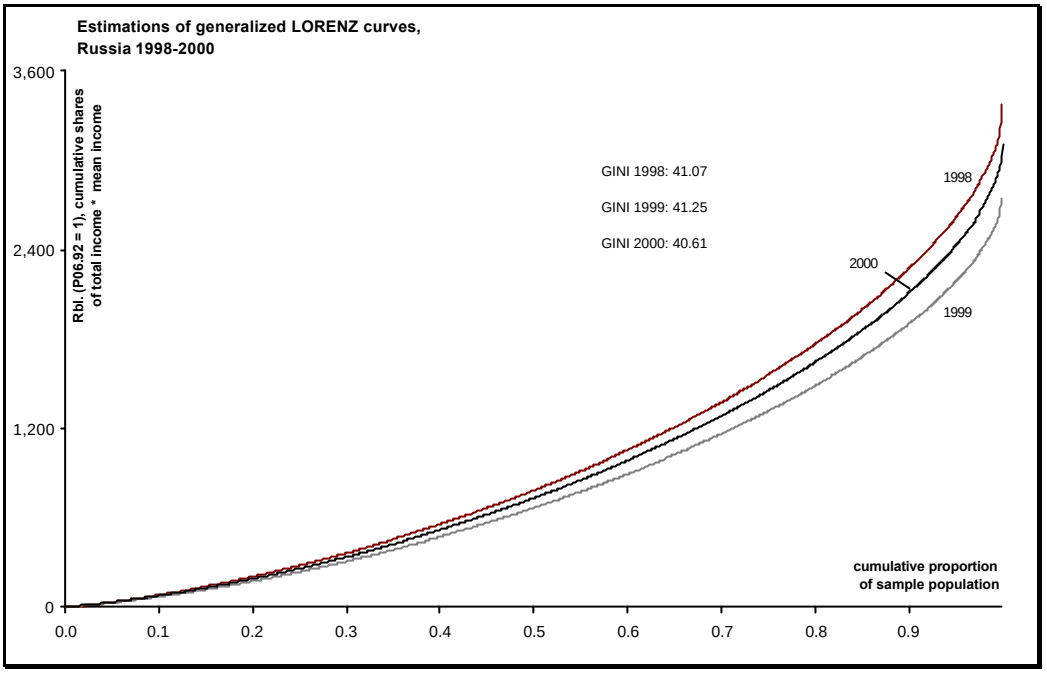
unchanged. Taking into account the corresponding average annual incomes by multiplying them by every point on the LORENZ curves, we derived generalized LORENZ curves as illustrated in Fig. 5. Most interestingly, the additional consideration of average income levels changes the picture dramatically: now the high-income year 1998 dominates the 2000 distribution, which in turn dominates 1999. All in all the 'golden opening' of the decade was followed by a drastic income shock affecting first of all low-income groups. In the following periods, relative income losses 'moved' over the distribution of the incessantly shrinking "cake". The second deep shock, following the financial crisis in August 1998, had a generally weaker effect, concentrated on the upper range of the income distribution. The crisis decade reached its bottom in 1999. In 2000 Russia's average income level was ones more that of the first crisis year, 1992.

Figure 4: Deviations of parametric LORENZ curves from the 45° Line, Russia 1998-2000.




To better distinguish between the LORENZ curves 1998 – 2000 in the upper income range, we plotted their distance from the 45° line. Therefore, lower curves LORENZ–dominate others in this concept.

Figure 5: Estimations of generalized LORENZ curves, Russia 1998-2000.




Each point on the LORENZ curve (cf. fig. 3) is multiplied by the corresponding average income level. It turns out that, if are also considered income levels, the distribution of 1998 dominates 2000 and 1999.

*RLMS.* In comparison to the constructed datasets of last paragraph, RLMS provides a far richer microstructure. Unfortunately, it does not cover the whole period: there are no data for 1991, 1997, and 1999 and we cannot analyze direct effects of the two crises. Another problem of the dataset is the high influence of some extreme values in the upper area of the income distribution. Especially, per capita income in rounds 1-6 and 9 is highly biased by some extreme outliers. The use of equivalence scales relieves the problem only insignificantly (cf. tab. A.1). However, expenditure per equivalent adult seems to be less affected. The development of expenditure-based GINI coefficients shows a roughly similar pattern to that of the income-based GINIS of the synthetic dataset (cf. tab. A.1 and fig.3). In general, and despite outliers, we find much more concentration in the RLMS data than in our synthetic dataset, no matter whether we compute income, expenditure, per capita or equivalent indicators. The upper bounds of RLMS income percentiles weakly support our observation of a moving concentration. The three lower percentiles bottom out in 1996 (at a level of only 10% - 50% of their highest income in the crisis year 1992!) and recover significantly in 1998, whereas the upper percentiles reach their minimum in the financial crisis year 1998.

The expenditure distribution is more stable in general and indicates the existence of resources for consumption smoothing that are not found in any income data, although RLMS explicitly asks for self supply and public and private transfers. These resources were of vital importance especially for low-income groups in 1996. The budget (im-)balance of the following years indicates that this

temporary overdraft was 'paid back' within a readjustment period of 2 to 4 years: while income grew again in 1998, expenditure continued to fall.

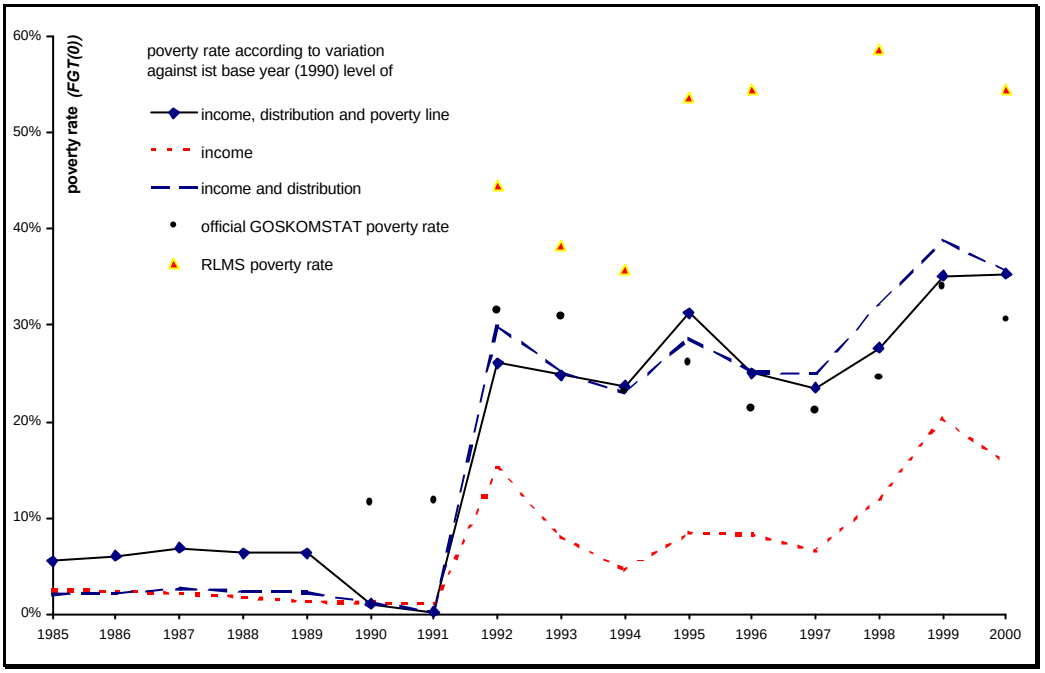
**Development of Poverty**

The evolution of income distribution described above gives the impression that poverty must have increased rapidly at the beginning of the 1990s. And indeed, all poverty measures, welfare indicators, and datasets support this assumption. Within one year only, from 1991 to 1992, the poverty rate increased from nearly zero to ¼ or 1/3 of the population depending on poverty line, indicator, dataset, and model used. Table A.2 summarizes our *FGT(0), FGT(1),* and *FGT(2)* estimations for the LOGNORM and LORENZ model.[11] All indicators show a decreasing tendency of incidence and depth of poverty until the black summer of 1998. The only exception is the fall in income in 1995, which implied a short-term increase in poverty found in both models and the RLMS data. The financial crisis caused a new fall in private incomes and led to a sustained increase in the incidence and depth of poverty. Neither income increases nor the slight regressive redistribution in 2000 were able to change this trend, measured against the official poverty line. Using our $ 3.14 PPP poverty line, let us presume a slight recovery. But, nevertheless, poverty still prevails at the disastrous level of the beginning of the decade, or, in terms of the official line, even exceeds it. Despite the slight redistribute changes in the second half of the 1990s, the depth of poverty still increased following the financial crisis: *FGT(1)* and *FGT(2)* reach a clear, at least local, maximum. Both models and the RLMS expenditure and income data supported these findings, so we assume a real background.

Before turning to possible reasons for the developments described, we should briefly mention three technical findings: first, both the theoretical distribution functions of our models and the empirical RLMS distribution allow unique poverty ordering over the entire range of the absolute poverty lines we considered. Therefore we do not need to employ concepts of stochastic dominance of higher order. Second, although equivalence scales have a significant influence on income distribution they do not change poverty orderings up to the maximum absolute poverty line we considered. Third, RLMS poverty measures are significantly higher than those estimated on the basis of GOSKOMSTAT data. Typically, they show a slightly different pattern, too: in contrast to our synthetic datasets, poverty extent and depth increases from 1995 to 1996 and decreases in 2000 in comparison to 1998. Cf. figure 6.

[11] We did not report the estimations based on the 40% relative poverty line here. Because of the procyclical behavior of the poverty line poverty estimates differ significantly in level and pattern and tend to reach their maximum in the high income years of the decade.

Figure 6: Poverty simulations and RLMS estimations, Russia 1985 – 2000




Poverty rate development according to simulated income distributions gradually taking into account income-, distribution and poverty line effects (GOSKOMSTAT data, base year 1990) are compared to RLMS estimations.

## 4. Causes of Poverty

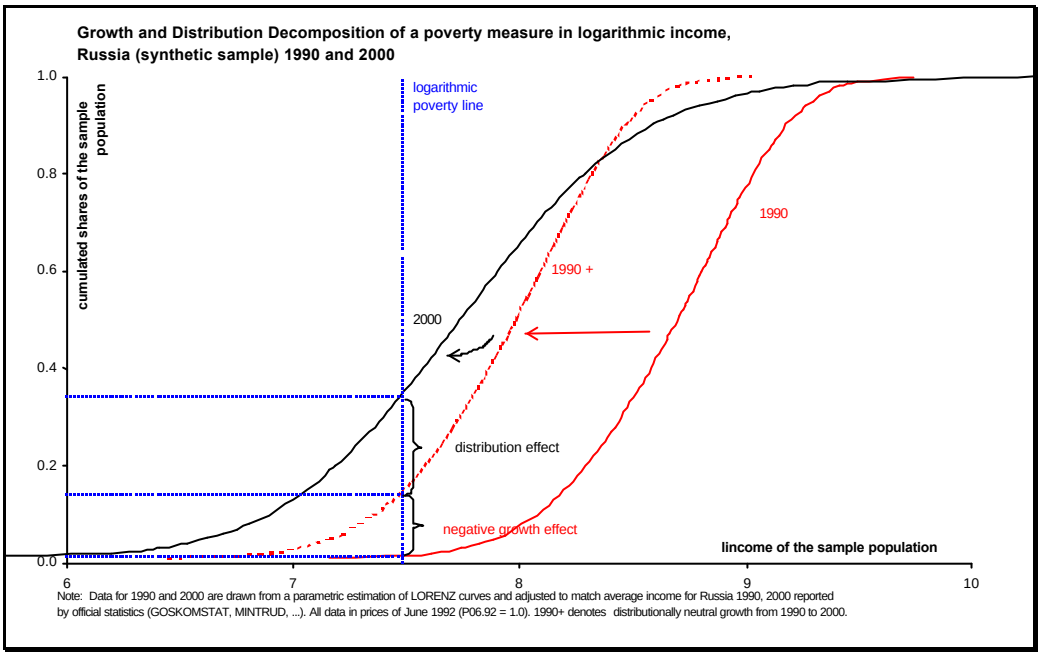
Utilizing the additive decomposability of $FGT(\alpha)$ measures, this section analyzes possible causes of the poverty that Russia experienced in the 1990s to a large extent, such as distributional changes, adverse income shocks, inflation and structural changes due to privatization. Although our analysis argues on a very aggregate level using simple and rough measures, we were able to identify some surprising details and trends.

### Growth and Inequality

*Methodological review:* Section III reported substantial changes in levels as well as in distributions of welfare indicators $y_i$ such as expenditure or income. However, neither their qualitative nor even their quantitative mutual effect on poverty is clear a priori: for example, a lump sum redistribution from one household above the poverty line $z$ to another well below $z$ in such a way that $y_i, y_j < z$ afterwards will, of course, reduce inequality but simultaneously raise the poverty rate $F(z)$, where $F$ is the distribution function. Obviously, measures of concentration, like the GINI, could be misleading in poverty analysis. On the other hand, typical measures of growth, such as the GDP ratio, are totally distributionally invariant, so that observed income growth does not allow any conclusions on poverty without further information. However, we can decompose an observed change in poverty into a growth and a redistribution

step. Figure 7 demonstrates the decomposition of total change in the poverty rate $FGT(0) = P^0$ in Russia from 1990 to 2000, holding the poverty line constant at $z_{1990}$. Therefore, we computed a third distribution, the dotted line 1990+, that simulates $F(y)$ with the distributional pattern, i.e. the LORENZ curve $L_{1990}$ of 1990, but incorporates the lower income level of 2000 in a lump sum fashion: we simply multiplied all incomes by the average income ratio $\mu_{2000}/\mu_{1990}$ and plotted their logarithms so that $F(ln(y))$ shifts to the left in a parallel, linearized proportional way.

Figure 7: Growth Distribution Decomposition of logarithmic income, Russia 1990-2000




This illustrates a decomposition of the poverty rate difference, F(z)00-F(z)90, into a marginal growth and a second marginal distribution effect which add up to the total change, holding z constant. It turns out that in this case the changes in the distribution effect which add up to the total change, holding z constant. It turns out that in this case the changes in the distribution affect poverty nearly twice as much as the average income loss: F(z)00-F(z)90+ > F(z)90+-F(z)90.

In its logarithmic formulation figure 7 visualizes the interesting fact that the steeper the original distribution function, the larger the income effect, i.e. the change in $F(z)$ due to the parallel shift to the left. In other words, we can derive the following hypothesis: if the original distribution is rather equal, distributionally neutral growth will be more important for poverty alleviation; or, the other way round, the greater the inequality observed in the original distribution, the more effective will it be to pursue distribution policies.

For each of the three distributions we can compute poverty measures that add up to the total change in $FGT(\alpha)=P^{\alpha}$ over the period. If the poverty line changes, we'll have to consider an additional poverty line effect. All together we get:

$$
\begin{aligned}
&P^{\alpha}_{t+1}(\mu_{t+1}, L_{t+1}, z_{t+1}) - P^{\alpha}_{t}(\mu_t, L_t, z_t) \\
&= \underbrace{\left(P^{\alpha}_{t(+)}(\mu_{t+1}, L_t, z_t) - P^{\alpha}_{t}(\mu_t, L_t, z_t)\right)}_{\text{marginal income effect}} + \underbrace{\left(P^{\alpha}(\mu_{t+1}, L_{t+1}, z_t) - P^{\alpha}_{t(+)}(\mu_{t+1}, L_t, z_z)\right)}_{\text{marginal distribution effect}} \\
&+ \underbrace{\left(P^{\alpha}_{t+1}(\mu_{t+1}, L_{t+1}, z_{t+1}) - P^{\alpha}(\mu_{t+1}, L_{t+1}, z_t)\right)}_{\text{marginal poverty-line effect}}.
\end{aligned}
\tag{9}
$$

One problem with this gradual introduction of changes in income, distribution and the poverty line is that their marginal contributions depend on the order in which they are considered. The marginal income effect, for example, could be defined in two ways with generally different magnitudes: $P^{\alpha}_{90+}(\mu_{00}, L_{90}, z_{90}) - P^{\alpha}_{90}(\mu_{90}, L_{90}, z_{90}) = 0.15 \neq$ $P^{\alpha}_{00}(\mu_{00}, L_{00}, z_{90}) - P^{\alpha}_{00-}(\mu_{90}, L_{00}, z_{90}) = 0.27$. A second possibility that is often used is to define the growth, redistribution and poverty line contributions as pure instead of marginal effects, where a pure effect is equal to a marginal one incorporated first:

$$
\begin{aligned}
&P^{\alpha}_{t+1}(\mu_{t+1}, L_{t+1}, z_{t+1}) - P^{\alpha}_{t}(\mu_t, L_t, z_t) \\
&= \underbrace{\left(P^{\alpha}(\mu_{t+1}, L_t, z_t) - P^{\alpha}_{t}(\mu_t, L_t, z_t)\right)}_{\text{pure income effect}} + \underbrace{\left(P^{\alpha}(\mu_t, L_{t+1}, z_t) - P^{\alpha}_{t}(\mu_t, L_t, z_t)\right)}_{\text{pure distribution effect}} \\
&+ \underbrace{\left(P^{\alpha}(\mu_t, L_{t+1}, z_{t+1}) - P^{\alpha}_{t}(\mu_t, L_t, z_t)\right)}_{\text{pure poverty-line effect}} + R.
\end{aligned}
\tag{10}
$$

Obviously, the three effects do not add up to the total change, but require an interaction residuum which is hard to interpret: $R = 2P^{\alpha}_{t} + P^{\alpha}_{t+1} - P^{\alpha}_{t+1,t,t} - P^{\alpha}_{t,t+1,t} - P^{\alpha}_{t,t,t+1}$.

*Application:* Although this unfriendly R turns out to be quite large for Russia, table A.3 yields an interesting first impression of the three impacts on the poverty rate $P^0$. The base year of our simulations of distributional neutral growth and lump sum redistribution for the decomposition analysis is 1990. In most cases changes of the poverty line had a negative but comparatively low effect on poverty and can be ignored.[12] The general impression is that the structure of poverty development was determined by the development of income. However, since 1991 the incidence of poverty has been reinforced by progressive redistribution of the shrinking cake by about 1/2 to 2/3. In particular, in years with increasing overall per capita income, 1994 and 1997 redistribution had a large impact. These findings also apply to *FGT(2)*. As expected, the importance of the distribution component appears somewhat stronger. Therefore the models point to progressive redistribution also below the poverty line. Apart from the

[12] That was also the reason for omitting sensitivity calculations with PPP poverty lines.

relatively large *R* our simulations suffer from the fact that the paths depend on the base year chosen. The reason is the above-mentioned dependence of relative contributions of income and distribution effects on the income concentration in the base year. A calculation starting in 1990, a year with a relative equal income distribution, shows a relatively stronger contribution of income changes to poverty than in a year with a less equal income distribution, such as 2000.[13]

Calculating marginal contributions instead of pure ones helps to avoid the unpleasant *R* but introduces the new problem that the incidence of effects now depends on the order of introduction: our three components allow for six possible permutations and six different results. We follow SHORROCKS, KOLENIKOV (2000), who suggested calculating all combinations for every year first and than defining the average as an average marginal effect. This "trick" allows for a complete, sequentially independent and invertible decomposition: absolute average marginal effects of a decomposition $|P_{t+1}-P_t|$ are equal to that of $|P_t-P_{t+1}|$. To reduce the base year dependence, we calculated average marginal effects for all years following one another: 1990-91, 1992-93 and so on. Table A.4 summarizes the results of this year-to-year decomposition.

Comparing the average marginal distribution effects to marginal income effects indicates once more the above-mentioned moving concentration. While the progressive redistribution at the beginning of the 1990s contributed to increases in poverty, the redistribution components at the end of the 1990s are negative, as shown in the two aggregate rows for 1990-93 and 1997-2000. Nonetheless, over the whole period the redistribution components contributed more to poverty measured in *FGT(0)* than the income components. Surprisingly this does not hold for *FGT(2)*, although this measure weights incomes far below *z* more than just below *z* and is, therefore, sensitive to distribution. This indicates that progressive redistribution is greater in income groups close to the poverty line than far below the poverty line: the very poor were more affected by overall income losses than by the redistribution from the poor to the rich. In some years the distribution and the income effects had opposite impacts. Nonetheless, the distribution effects never crowded out the income effect and thus never caused a sign change. Our observation that income determines the pattern but cannot explain the level of poverty development has been confirmed in this decomposition without residuals.

Summarizing this section, we can say that according to our simulations, the structural development of poverty in Russia in the 1990s was mostly subject to income growth. Incidence of poverty appears to have been predominantly determined by progressive income redistribution. The redistribution component had a marked positive effect on poverty rates at the beginning of the 1990s whereas its influence at the end of the period tended to reduce poverty. Theoretical considerations indicated that at present – taking into account the

[13] Because of space limitations we omit our calculations with the base year 2000. They show a remarkably stronger relative contribution of the distribution component.

remarkably high income concentration in Russia – a lump-sum redistribution policy may be an especially important instrument for poverty alleviation.

**Privatization and Structural Change**

*Methodological review:* Privatization and the associated structural change constitute two central aspects of the Russian transition in the 1990s. They had a significant direct effect on private incomes. In this section we analyze the influence of these processes on the development of poverty in Russia between 1992 and 2000, again applying decomposition techniques. Our second, intersectoral decomposition approach also relies upon the additive separability of the *FGT(α)* class, which allows calculating an aggregate poverty measure as a sum of subpopulation measures. Consider, for example, a population of $N$ individuals split into $m$ subgroups. Each subgroup consists of $N_i$ persons, $i = 1, \ldots m$ and $n_i = N_i/N$, so that $N = \sum_{i=1}^{m} N_i = N \cdot \sum_{i=1}^{m} n_i$. As a result we receive the aggregate poverty measure as a weighted average:

$$FGT(\alpha) = P^{\alpha} = \sum_{i=1}^{m} P_i^{\alpha} n_i. \tag{11}$$

Considering two points in time, the additive separability allows the disaggregation of the difference of two poverty indices between $t+1$ and $t$ for $m$ sectors into intrasectoral and intersectoral effects. For our three sectors – state, private and transfers – the sectoral decomposition is defined as follows:

$$\begin{aligned} P_{t+1}^{\alpha} - P_t^{\alpha} = & \underbrace{\underbrace{(P_{t+1,1}^{\alpha} - P_{t,1}^{\alpha})n_{t,1}}_{\text{FGT}(\alpha)\text{ change between t and t+1 in sector 1 by a constant population}} + \underbrace{(P_{t+1,2}^{\alpha} - P_{t,2}^{\alpha})n_{t,2}}_{\text{FGT}(\alpha)\text{ change between t and t+1 in sector 2 by a constant population}} + \underbrace{(P_{t+1,3}^{\alpha} - P_{t,3}^{\alpha})n_{t,3}}_{\text{FGT}(\alpha)\text{ change between t and t+1 in sector 3 by a constant population}}}_{\text{Intrasectoral effects}} \\ & + \underbrace{\sum_{i=1}^{3}(n_{t+1,i} - n_{t,i})P_{t,i}^{\alpha}}_{\text{FGT}(\alpha)\text{ change through population shifts}} \\ & + \underbrace{\sum_{i=1}^{3}(P_{t+1,i}^{\alpha} - P_{t,i}^{\alpha})(n_{t+1,i} - n_{t,i})}_{\text{Interaction between intrasectoral effects and population shifts}}. \end{aligned} \tag{12}$$

By means of sectoral decomposition we can learn about the relative contribution of a particular sector to changes in aggregate poverty and about the influences of population shifts between the sectors.

*Application:* For our analysis we used poverty rates based on per equivalent adult income and expenditure derived from the RLMS database. We first assigned each household to one of three sectors {(prevailing…) state, private or transfer income}, computed the population shares and subgroup poverty rates for both periods and applied (12). For an implicit estimate of the influence of the voucher privatization of 1992-1994, we split the considered period into two subperiods: 1992 to 1994 and 1994 to 2000.

A household is assigned to the first or second income sector if the maximal share of household income comes from employment in this particular sector. Households whose income predominantly consists of state transfers constitute the transfer sector. Households whose overall income is positive but nothing is known about sources constitute a residual quantity *R* in our analysis.

Before presenting the results of the decomposition we should take a short look at the development of the poverty rates in the three income sectors (table A.5). Income as well as expenditure based calculations show the aggregate poverty rate growing by 9%-10% between 1992 and 2000. Comparison of the two subperiods shows a 3%-4% decrease of poverty in 1992 to 1994. The sectoral structure of employment has changed remarkably since the beginning of the 1990s. The share of households whose main income comes from employment in the state sector grew continuously between 1992 and 2000. As a result it accounted for 31% at the end compared to 53% at the beginning of the period. In contrast, the share of households that earned their incomes mainly in the private sector doubled during the same period. The number of households in the transfer sector increased by 7.5%.

The results of the sectoral decomposition for the whole period and the two subperiods are given in table A.6. The following trends can be identified:

*Poverty increase in 1992-2000*. Increase in poverty over the whole period is attributable to an increase of poverty in the sectors themselves, i.e. to purely intrasectoral effects, as well as to a positive net contribution of population shifts to poverty. In contrast, interaction between population shifts and intrasectoral effects had a negative effect on the poverty rate. The strongest poverty rate increase took place in the state sector, by 14%-15%, and the weakest one in the transfer sector, by about 4%. The state sector is responsible for 76%-83% of the overall intrasectoral effects and for 69% of the intra- and intersectoral effects combined. While poverty increases in the state sector strengthened aggregate poverty increases, migration from this sector decreased the poverty rate. In our income-based calculations the migration effect even overcompensated the intrasectoral effect in the state sector. In the expenditure-based perspective this is also true when taking into account the interaction term. So looking at the whole period, one can say that the Russian state could improve its position only by shifting social "responsibility" to other sectors. Migration took place towards the private and the transfer sector, especially pensions. In view of the strong real devaluation of wages in the state sector a change to another sector promised a relative improvement. Due to convenient adjustments of pensions in 1993 we can assume that many older employees in the state sector used the chance to change to the transfer sector in the first subperiod. Migration into the private sector resulted from privatizations as well as from voluntary changes of jobs. Interestingly, not only did intrasectoral poverty increase in the private sector, but especially migration into the private sector contributed remarkably to the increase of aggregate poverty. The latter shows that not every household was able to improve its income position by changing to the private sector. In the transfer sector poverty growth rates were more moderate at a 1%-4% level

during the 1990s. Intrasectoral poverty developments as well as population shifts contributed positively to poverty increase in this sector.

*Poverty decrease in 1992-1994*. The aggregate poverty decrease in the first subperiod is attributable to intrasectoral effects, first of all. Unfortunately, this was compensated by intersectoral population shifts by about one fifth. Again, we observe a strong poverty reducing effect of migration from the state sector. The immigration into the private and transfer sectors had, as a trend, an increasing effect on aggregate poverty, especially in the case of the latter sector. The interaction term slightly reduced poverty. Compared to income-based calculations, expenditure-based calculations report a contrary, i.e. positive, contribution of intrasectoral changes to aggregate poverty. The expenditure-based poverty rate in this sector increased slightly. The sign change of the intrasectoral component in the state sector – only due to the welfare indicator chosen – emphasizes the relatively worse situation in the state sector.

*Poverty increase in 1994-2000*. The increase in aggregate poverty in the second subperiod can be explained by purely intrasectoral poverty growth in all three sectors. The poverty rate in a particular sector grew by 9% to 19% depending on the welfare indicator used. The weakest poverty increase took place in the transfer sector. Using expenditures we can identify a 6% stronger poverty increase in the private sector than in the transfer sector. Intersectoral population shifts slightly compensated for the increase of aggregate poverty between 1994 and 2000.

Comparing migration from the state to the private sector in the two subperiods, we find that the motivation for migration was changing during the 1990s. In the first subperiod with the mass privatization programs, poverty in the private sector decreased much more than in the state sector – despite poverty-increasing immigration into the sector. So structural changes in the economy had a positive net influence. However, poverty in the private sector grew in the second half of the 1990s, and it grew more than in the other two sectors. Expenditure-based analysis shows that the intrasectoral poverty increase even exceeded the immigration effect. The interaction term, however, is relatively high. It is characterized, first of all, by strong immigration into the private sector. No matter how we interpret the interaction term, we have to state a stronger poverty migration towards the private sector than towards others. Poverty reduction through migration from the state sector may have contributed positively to the overall poverty outcome in the second subperiod. However, immigration into the private sector was not as successful as it was in the first half of the 1990s. Assuming rationality, the share of voluntary changes should have been higher at the beginning of the 1990s. Intrasectoral poverty in the transfer sector decreased during the first subperiod and was not overcompensated by immigration. Population shifts had a positive net effect like in the case of the private sector. The reasons for that may be the adjustment of pensions in 1993, but the effect is overlaid by an artificial statistical one of using equivalence scales, because lower weights are assigned to pensioners. It seems remarkable that the poverty increasing effect of the population shifts is much stronger than that in the first subperiod. But it was overcompensated by intrasectoral improvements. We can

see the clearly stronger immigration in the first subperiod as a result of a widely practiced early pension drawing. The poverty increase in the transfer sector has clearly been determined by intrasectoral factors independent of the welfare indicator used. If we had taken into account private transfers, the overall picture would be less dramatic.

Summarizing the section, we can say that a considerable structural change took place in employment in the 1990s. The state income sector shrunk considerably compared to the other sectors. Population shifts somewhat alleviated the problematic situation inside each of the sectors. Structural change had a positive effect on aggregate poverty development especially in 1992-1994. Net immigration contributed to the increase of poverty in the sectors. Positive developments in the private sector, however, were able to overcompensate, and the development in the transfer sector, to almost compensate for this negative immigration effect. In the second half of the 1990s the situation was much worse. The differing intrasectoral developments, however, indicated that the net outcome of structural change was a positive one because of its poverty-alleviating effect on the state sector.

**Inflation**

Russia experienced persistent inflation over the 1990s with two very different climaxes. With the beginning price liberalization of 1991-1992 the annual average CPI grew more than 14-fold. Six years later the financial crisis brought about the abrupt end of a phase of relative stabilization in the second half of the decade and, again, caused a dramatic increase of the annual overall CPI by more than 240% between 1997 and 1999. The two inflation waves, however, did not only differ in terms of their size. The first wave was dominated by rapid domestic purchasing power devaluation, whereas the second affected mainly the foreign value of money. It can therefore be suspected that the two waves affected poverty and income distribution differently. In principle, regional information in the RLMS together with regional monthly price indices provided by GOSKOMSTAT allow an analysis of inflation effects. Although RLMS does not claim representativity for single regions, it is possible to cluster regions based on their inflation level and/or volatility. A working hypothesis may be that a higher inflation or a higher volatility should positively correlate with a lower per capita income and inequality. EASTERLY, FISCHER (2000) find a positive relationship between inflation and the poverty rate and inflation and the share of the lowest income quintile in the long term over 38 countries. Most interestingly we found only very little evidence supporting this hypothesis in the RLMS data. In the entire second RLMS phase, i.e. the years 1994-2000, we could not identify any clear relationship between poverty measures or income shares of the lower quintiles and volatility (measured in the standard deviation of the regional annual average CPI) or level of inflation over three regional inflation clusters or regions themselves. Only for 1992 and 1993 we found a positive relationship, significant at the 5% level in a simple univariate OLS regression, between the annual change in *CPI* and the change in *FGT(0)*, both measured as differences in logs. Since we could find only one observation in time, we did not

cluster the regions but used all 16 regional observations in the regression. Explaining only $R^2=0.251$ of the whole variance this is far away from a satisfactory empirical model. What appears more interesting is our observation that we were not able to find such a stable relationship at any other point in time in any of our regional calculations. Considering the different character of the two inflation waves and bearing in mind the mentioned 'moving concentration', meaning that the lower quintiles were even able to enlarge their relative income position in the second half of the decade, we may suspect that the 1991/92 inflation affected the poor much more than that at the end of the 90s.

Another link between inflation and poverty could be seen in the heterogeneous devaluation of different sources of income: neither state wages nor transfers and only few private contracted wages were indexed systematically. Especially in the second half of the 1990s this was reinforced by the wide practice of wage arrears. Again, we found only very little and weak support for this assumption. Income shares from private or state employment and public transfers turned out to be astonishingly stable. COMMANDER, TOLSTOPIATENKO, YEMTSOV (1999, p. 20) were not able to find any significant link between inflation volatility and the share of wages and retirement benefits in total household income. They report a significant and clearly negative influence of regional inflation levels on the wage and transfer share, though. We found that their result is very sensitive towards the definition of income components and missing value assumptions. We were not able to replicate their findings using a wider definition of transfers, for example. A third link may be seen in the devaluation of private savings. EASTERLY and VIERA DA CUNHA estimated in 1994 that the money expansion and the associated inflation tax in 1992 caused a purchasing power loss of 12% GDP or equivalently ¼ of total household income. One can expect that wealth losses were regressively distributed, because high-income households usually have wider access to alternative asset investments. Unfortunately, RLMS data does not provide reliable information on household savings and asset holding. In summary, we found some evidence that the first inflation wave in 1991/92 contributed to the rapidly rising poverty. Inflation effects over the whole period are rather unclear however.

## 5. Conclusion

None of our four guiding questions are easy to answer. We found substantial differences in poverty estimations from the RLMS micro database in comparison to synthetic samples fitted to official information. The picture becomes even more colorful when considering different welfare indicators and taking into account economies of scale. Nevertheless, although depths of poverty vary depending on the method of analysis, we found similar patterns of poverty development in different datasets, indicators and measures. There is much evidence for close structural coherence between the development of poverty and aggregate income. Especially at the beginning of the decade a substantial progressive redistribution contributed significantly the poverty crisis. Over the 1990s relative income losses 'moved' from the poor to the middle class

and the rich, who were – relatively speaking – the main losers of the financial crisis in 1998. At present, given the pronounced inequality, a growth-neutral redistribution policy should be especially effective for pushing back poverty. One may establish a link between these considerations to the analysis of structural change on the labor market and its effects on poverty, as it could be shown that some evidence indicates a poverty alleviating contribution of the transfer sector. Despite all bitterness in the face of the apparent persistence of the poverty crisis on the aggregate level, we found some hopeful evidence that the structural change towards non-centrally organized private initiative and market activities also had a poverty-alleviating effect. There is also evidence in literature (cf. WORLD BANK, 1999) that poverty at the individual level seems to be largely a transitional phenomenon. It appears that there are ways out of poverty. No final answers have been given to any of the four questions, and literature will continue to discuss them. Of course, one question of special interest is how poverty can be overcome on the micro and macro level. Meanwhile, the 1990s will remain in the memory of broad sections of the population as a bitter transition into a new time.

Tab. A.1: Position and dispersion parameters of the empirical RLMS distributions (rounds 1 to 9):

| **1. Household per capita income** | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Round | Sum of weights | **Mean** | Std. error | **Percentiles** (in % of weighted households) 5 | 10 | 20 | 40 | **Median 50** | 60 | 80 | 95 | 100 | **Quintiles** (% of weighted households) 0 - 20 | 20 - 40 | 40 - 60 | 60 - 80 | 80 - 100 | CV | GINI |
| R1 (1992) | 6302 | **3,186.74** | (452.33) | 573.99 | 811.98 | 1,082.33 | 1,527.38 | **1,798.02** | 2,149.32 | 3,205.78 | 6,081.41 | 2,700,487.27 | 4.45 | 8.12 | 11.39 | 16.38 | 59.66 | 11.27 | 54.81 |
| R3 (1993) | 5763 | **3,469.05** | (139.95) | 572.98 | 858.65 | 1,231.51 | 1,872.11 | **2,213.26** | 2,646.24 | 4,214.28 | 8,130.15 | 516,316.79 | 4.50 | 8.93 | 12.86 | 19.07 | 54.65 | 3.06 | 49.41 |
| R5 (1994) | 3973 | **3,349.88** | (78.66) | 519.55 | 889.46 | 1,334.91 | 1,995.74 | **2,380.43** | 2,826.56 | 4,355.78 | 8,512.88 | 178,331.90 | 4.70 | 9.85 | 14.26 | 21.02 | 50.17 | 1.48 | 44.54 |
| R6 (1995) | 3781 | **2,588.01** | (92.02) | 261.85 | 549.58 | 942.46 | 1,500.95 | **1,804.52** | 2,167.83 | 3,386.29 | 6,750.89 | 295,511.64 | 3.57 | 9.59 | 14.02 | 20.88 | 51.95 | 2.19 | 47.52 |
| R7 (1996) | 3646 | **2,370.23** | (55.09) | 34.56 | 219.72 | 600.81 | 1,289.76 | **1,643.06** | 2,027.72 | 3,275.74 | 6,801.34 | 71,672.56 | 1.82 | 8.18 | 13.93 | 21.67 | 54.40 | 1.40 | 51.74 |
| R8 (1998) | 3465 | **1,883.95** | (33.90) | 152.29 | 396.94 | 702.95 | 1,184.82 | **1,417.78** | 1,700.61 | 2,597.63 | 5,018.03 | 25,940.35 | 3.79 | 10.06 | 15.18 | 22.37 | 48.60 | 1.06 | 44.28 |
| R9 (2000) | 3319 | **2,373.38** | (64.18) | 333.04 | 619.79 | 932.52 | 1,400.90 | **1,673.74** | 2,001.85 | 3,023.61 | 6,171.90 | 134,578.41 | 4.61 | 9.90 | 14.16 | 20.62 | 50.70 | 1.56 | 45.30 |
| **2. Household income per aquivalent adult** | | | | | | | | | | | | | | | | | | | |
| Round | Sum of weights | **Mean** | Std. Error | **Percentiles** (in % of weighted households) 5 | 10 | 20 | 40 | **Median 50** | 60 | 80 | 95 | 100 | **Quintiles** (% of weighted households) 0 - 20 | 20 - 40 | 40 - 60 | 60 - 80 | 80 - 100 | CV | GINI |
| R1 (1992) | 6302 | **3,624.12** | (461.17) | 626.22 | 912.99 | 1,287.82 | 1,896.25 | **2,191.11** | 2,548.17 | 3,733.36 | 6,730.73 | 2,700,487.27 | 4.50 | 8.83 | 12.14 | 16.97 | 57.56 | 10.10 | 52.62 |
| R3 (1993) | 5763 | **4,063.89** | (144.32) | 642.73 | 955.74 | 1,462.29 | 2,335.58 | **2,765.58** | 3,276.73 | 5,034.87 | 9,452.27 | 516,316.79 | 4.36 | 9.38 | 13.69 | 19.88 | 52.69 | 2.70 | 47.71 |
| R5 (1994) | 3973 | **3,951.73** | (87.83) | 574.01 | 967.28 | 1,511.51 | 2,417.03 | **2,892.17** | 3,462.30 | 5,326.39 | 9,921.67 | 205,925.98 | 4.40 | 9.90 | 14.63 | 21.54 | 49.53 | 1.40 | 44.22 |
| R6 (1995) | 3781 | **3,080.33** | (135.26) | 299.05 | 613.64 | 1,084.47 | 1,816.38 | **2,183.00** | 2,643.10 | 4,120.39 | 7,874.05 | 469,066.10 | 3.25 | 9.51 | 14.34 | 21.43 | 51.47 | 2.70 | 47.60 |
| R7 (1996) | 3646 | **2,774.37** | (60.23) | 45.07 | 268.95 | 676.63 | 1,527.11 | **1,982.43** | 2,491.33 | 3,952.02 | 8,080.00 | 71,672.56 | 1.77 | 7.93 | 14.26 | 22.59 | 53.44 | 1.31 | 51.26 |
| R8 (1998) | 3465 | **2,265.10** | (39.34) | 169.51 | 436.96 | 777.63 | 1,424.14 | **1,759.45** | 2,119.59 | 3,165.74 | 6,101.16 | 26,906.90 | 3.47 | 9.67 | 15.57 | 22.82 | 48.47 | 1.02 | 44.67 |
| R9 (2000) | 3319 | **2,814.83** | (73.54) | 359.22 | 669.39 | 1,062.51 | 1,735.57 | **2,103.87** | 2,461.68 | 3,702.21 | 7,143.10 | 165,126.89 | 4.29 | 9.96 | 14.94 | 21.19 | 49.62 | 1.50 | 44.74 |
| **3. Household expenditures per aquivalent adult** | | | | | | | | | | | | | | | | | | | |
| Round | Sum of weights | **Mean** | Std. Error | **Percentiles** (in % of weighted households) 5 | 10 | 20 | 40 | **Median 50** | 60 | 80 | 95 | 100 | **Quintiles** (% of weighted households) 0 - 20 | 20 - 40 | 40 - 60 | 60 - 80 | 80 - 100 | CV | GINI |
| R1 (1992) | 6302 | **3,875.29** | (64.32) | 543.29 | 851.17 | 1,359.02 | 2,332.49 | **2,849.97** | 3,513.44 | 5,431.26 | 10,311.08 | 260,291.52 | 4.22 | 9.48 | 14.84 | 22.54 | 48.92 | 1.32 | 44.33 |
| R3 (1993) | 5763 | **4,869.88** | (124.15) | 457.62 | 809.94 | 1,397.12 | 2,588.86 | **3,235.91** | 4,103.61 | 6,654.12 | 13,194.23 | 517,457.74 | 3.15 | 8.11 | 13.49 | 21.52 | 53.73 | 1.94 | 50.16 |
| R5 (1994) | 3973 | **5,219.98** | (118.57) | 849.12 | 1,202.36 | 1,766.38 | 2,898.63 | **3,512.82** | 4,307.21 | 6,838.86 | 14,379.16 | 207,352.92 | 4.31 | 8.89 | 13.58 | 20.70 | 52.51 | 1.43 | 47.23 |
| R6 (1995) | 3781 | **4,463.06** | (96.92) | 684.32 | 1,010.31 | 1,502.06 | 2,435.92 | **2,968.03** | 3,644.54 | 6,049.80 | 12,565.67 | 146,549.55 | 4.31 | 8.74 | 13.46 | 21.00 | 52.49 | 1.34 | 47.50 |
| R7 (1996) | 3646 | **3,839.77** | (82.65) | 541.30 | 823.87 | 1,254.82 | 2,052.23 | **2,554.00** | 3,160.58 | 5,207.33 | 11,335.35 | 141,432.03 | 4.03 | 8.47 | 13.47 | 20.96 | 53.07 | 1.30 | 48.19 |
| R8 (1998) | 3465 | **3,025.16** | (81.75) | 427.40 | 637.08 | 978.46 | 1,596.49 | **1,999.98** | 2,462.77 | 4,105.94 | 8,140.51 | 143,623.82 | 4.04 | 8.40 | 13.31 | 20.95 | 53.31 | 1.59 | 48.59 |
| R9 (2000) | 3319 | **3,566.08** | (81.52) | 601.39 | 831.06 | 1,244.15 | 2,043.90 | **2,469.83** | 3,039.67 | 4,718.63 | 9,309.24 | 88,947.82 | 4.50 | 9.15 | 13.99 | 21.11 | 51.25 | 1.32 | 46.24 |

CV: coefficient of variation.

Source: RLMS, own computations.

Tab. A.2: Poverty indices for Russia, 1985 – 2000, according to absolute poverty lines:

| Poverty indices with respect to the official GKS poverty line | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | LORENZ-model | | | LOGNORM-Model (10.000 generated values) | | | | | | | | | | | |
| | Data (Rbl., P06.92 =1) | FGT(0) headcount ratio | FGT(1) poverty gap | FGT(2) poverty gap | FGT(0): headcount ratio | annual chnage: std | (%Pt) | t-staistics | | FGT(1) poverty gap | annual chnage: std | annual change | t-staistics | | FGT(2): poverty gap | annual chnage: std | annual change | t-staistics | |
| 1985 | 2,288 | 5.48% | 0.010 | 0.004 | 5.37% | (0.0023) | | | | 0.009 | (0.0005) | | | | 0.002 | (0.0002) | | | |
| 1986 | 2,318 | 6.02% | 0.011 | 0.004 | 5.95% | (0.0024) | 0.58% | (1.7749) | * | 0.009 | (0.0005) | 0.03% | (0.5125) | | 0.002 | (0.0002) | -0.01% | -(0.6128) | |
| 1987 | 2,349 | 6.80% | 0.015 | 0.006 | 6.89% | (0.0025) | 0.94% | (2.7121) | *** | 0.012 | (0.0006) | 0.31% | (4.1646) | *** | 0.003 | (0.0002) | 0.13% | (4.6468) | *** |
| 1988 | 2,379 | 6.27% | 0.014 | 0.006 | 6.47% | (0.0025) | -0.42% | -(1.1895) | | 0.011 | (0.0006) | -0.08% | -(1.0039) | | 0.003 | (0.0002) | -0.03% | -(0.9337) | |
| 1989 | 2,471 | 6.34% | 0.015 | 0.007 | 6.27% | (0.0024) | -0.20% | -(0.5791) | | 0.011 | (0.0005) | -0.03% | -(0.3738) | | 0.003 | (0.0002) | -0.01% | -(0.4312) | |
| 1990 | 1,820 | 1.01% | 0.003 | 0.002 | 0.73% | (0.0009) | -5.54% | -(21.5608) | *** | 0.001 | (0.0002) | -0.99% | -(17.6138) | *** | 0.000 | (0.0000) | -0.28% | -(13.0451) | *** |
| 1991 | 2,050 | 0.16% | 0.000 | 0.000 | 0.03% | (0.0002) | -0.70% | -(8.0575) | *** | 0.000 | (0.0000) | -0.10% | -(6.6764) | *** | 0.000 | (0.0000) | -0.02% | -(4.9429) | *** |
| 1992 | 1,643 | 26.07% | 0.092 | 0.043 | 26.80% | (0.0044) | 26.77% | (60.3910) | *** | 0.094 | (0.0018) | 9.36% | (52.0258) | *** | 0.041 | (0.0010) | 4.11% | (42.4573) | *** |
| 1993 | 1,807 | 24.86% | 0.082 | 0.036 | 25.48% | (0.0044) | -1.32% | -(2.1244) | ** | 0.085 | (0.0017) | -0.91% | -(3.6831) | *** | 0.036 | (0.0009) | -0.49% | -(3.6505) | *** |
| 1994 | 1,859 | 23.64% | 0.077 | 0.034 | 23.78% | (0.0043) | -1.70% | -(2.7904) | *** | 0.078 | (0.0017) | -0.60% | -(2.4855) | ** | 0.035 | (0.0010) | -0.08% | -(0.5747) | |
| 1995 | 1,930 | 31.33% | 0.108 | 0.051 | 30.91% | (0.0046) | 7.13% | (11.3468) | *** | 0.108 | (0.0020) | 2.98% | (11.3412) | *** | 0.051 | (0.0012) | 1.57% | (10.1208) | *** |
| 1996 | 1,819 | 25.06% | 0.075 | 0.033 | 25.94% | (0.0044) | -4.97% | -(7.8028) | *** | 0.077 | (0.0016) | -3.17% | -(12.4878) | *** | 0.031 | (0.0008) | -2.03% | -(13.9988) | *** |
| 1997 | 1,761 | 23.48% | 0.066 | 0.026 | 24.50% | (0.0043) | -1.44% | -(2.3449) | ** | 0.067 | (0.0014) | -0.94% | -(4.4198) | *** | 0.025 | (0.0007) | -0.63% | -(5.9808) | *** |
| 1998 | 1,672 | 27.64% | 0.083 | 0.036 | 28.06% | (0.0045) | 3.56% | (5.7235) | *** | 0.084 | (0.0017) | 1.71% | (7.8403) | *** | 0.035 | (0.0009) | 1.02% | (9.2330) | *** |
| 1999 | 1,642 | 35.13% | 0.115 | 0.051 | 34.76% | (0.0048) | 6.70% | (10.2331) | *** | 0.115 | (0.0020) | 3.04% | (11.8315) | *** | 0.052 | (0.0011) | 1.69% | (11.8352) | *** |
| 2000 | 1,812 | 35.31% | 0.116 | 0.052 | 35.08% | (0.0048) | 0.32% | (0.4746) | | 0.115 | (0.0020) | 0.07% | (0.2562) | | 0.053 | (0.0012) | 0.17% | (1.0282) | |

| Poverty indices with respect to the PPP poverty line | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | LORENZ-model | | | LOGNORM-Model (10.000 generated values) | | | | | | | | | | | |
| | Data (Rbl., P06.92 =1) | FGT(0) headcount ratio | FGT(1) poverty gap | FGT(2) squared poverty gap | FGT(0): headcount ratio | annual chnage: std | (%Pt) | t-staistics | | FGT(1) poverty gap | annual chnage: std | annual change | t-staistics | | FGT(2): squared poverty gap | annual chnage: std | annual change | t-staistics | |
| 1985 | 2,042 | 3.25% | 0.007 | 0.003 | 3.08% | (0.0017) | | | | 0.005 | (0.0003) | | | | 0.001 | (0.0001) | | | |
| 1986 | 2,042 | 3.38% | 0.007 | 0.003 | 3.05% | (0.0017) | -0.03% | -(0.1231) | ** | 0.004 | (0.0003) | -0.05% | -(1.1838) | | 0.001 | (0.0001) | -0.03% | -(1.7481) | * |
| 1987 | 2,042 | 3.92% | 0.009 | 0.004 | 3.56% | (0.0019) | 0.51% | (2.0174) | | 0.006 | (0.0004) | 0.20% | (3.8890) | *** | 0.002 | (0.0002) | 0.07% | (4.0883) | *** |
| 1988 | 2,042 | 3.45% | 0.008 | 0.004 | 3.19% | (0.0018) | -0.37% | -(1.4488) | ** | 0.005 | (0.0004) | -0.08% | -(1.5178) | | 0.001 | (0.0001) | -0.03% | -(1.3976) | |
| 1989 | 2,042 | 3.20% | 0.009 | 0.005 | 2.71% | (0.0016) | -0.48% | -(2.0060) | *** | 0.004 | (0.0003) | -0.12% | -(2.3908) | ** | 0.001 | (0.0001) | -0.03% | -(1.8759) | * |
| 1990 | 2,042 | 1.55% | 0.004 | 0.002 | 1.32% | (0.0011) | -1.39% | -(7.0031) | *** | 0.002 | (0.0002) | -0.21% | -(5.3102) | *** | 0.000 | (0.0001) | -0.06% | -(3.9713) | *** |
| 1991 | 2,042 | 0.16% | 0.000 | 0.000 | 0.03% | (0.0002) | -1.29% | -(11.1744) | *** | 0.000 | (0.0000) | -0.20% | -(8.9217) | *** | 0.000 | (0.0000) | -0.05% | -(6.7295) | *** |
| 1992 | 1,979 | 33.38% | 0.127 | 0.064 | 32.84% | (0.0047) | 32.81% | (69.8124) | *** | 0.128 | (0.0022) | 12.83% | (59.4328) | *** | 0.063 | (0.0013) | 6.31% | (50.0190) | *** |
| 1993 | 1,923 | 27.23% | 0.093 | 0.042 | 27.20% | (0.0045) | -5.64% | -(8.7171) | *** | 0.095 | (0.0018) | -3.31% | -(11.6987) | *** | 0.043 | (0.0010) | -2.06% | -(12.7230) | *** |
| 1994 | 1,936 | 25.14% | 0.084 | 0.037 | 25.06% | (0.0043) | -2.14% | -(3.4451) | *** | 0.085 | (0.0018) | -1.02% | -(4.0104) | *** | 0.039 | (0.0010) | -0.35% | -(2.3823) | ** |
| 1995 | 1,815 | 28.58% | 0.095 | 0.044 | 28.39% | (0.0045) | 3.33% | (5.3245) | *** | 0.096 | (0.0019) | 1.14% | (4.3867) | *** | 0.045 | (0.0011) | 0.55% | (3.5808) | *** |
| 1996 | 1,763 | 23.58% | 0.070 | 0.031 | 24.60% | (0.0043) | -3.79% | -(6.0780) | | 0.071 | (0.0015) | -2.54% | -(10.5109) | *** | 0.028 | (0.0008) | -1.63% | -(12.0334) | *** |
| 1997 | 1,723 | 22.51% | 0.062 | 0.024 | 23.79% | (0.0043) | -0.81% | -(1.3374) | *** | 0.063 | (0.0014) | -0.77% | -(3.7556) | *** | 0.023 | (0.0006) | -0.54% | -(5.3524) | *** |
| 1998 | 1,697 | 28.39% | 0.086 | 0.038 | 28.74% | (0.0045) | 4.95% | (7.9658) | *** | 0.087 | (0.0017) | 2.39% | (10.9573) | *** | 0.036 | (0.0009) | 1.34% | (12.2153) | *** |
| 1999 | 1,648 | 35.33% | 0.115 | 0.051 | 34.94% | (0.0048) | 6.20% | (9.4312) | *** | 0.116 | (0.0020) | 2.84% | (10.9344) | *** | 0.052 | (0.0011) | 1.59% | (10.9984) | *** |
| 2000 | 1,648 | 30.32% | 0.095 | 0.040 | 30.11% | (0.0046) | -4.83% | -(7.2998) | | 0.094 | (0.0018) | -2.11% | -(7.8388) | *** | 0.043 | (0.0011) | -0.96% | -(6.0958) | *** |

Source: Goskomstat data, own computations.

Tab. A.3: Simulation of poverty rate development (FGT(0)) in Russia according to income-, distribution- and poverty line effect:

| | De facto | Simulation ... | | | Decomposition ... | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | development | inc++ | distr++ | (inc, distr)++ | difference | | z effect | inc. effect | distr. effect | R |
| | L(i), Y(i), z(i) | L(1), Y(i), z(1) | L(i), Y(1), z(1) | L(i), Y(i), z(1) | FGT[i] - FGT[90] | | | | | |
| 1985 | 5.5% | 2.4% | 0.7% | 2.0% | 0.0446 | = | 0.0347 | 0.0140 | -0.0030 | -0.0020 |
| 1986 | 6.0% | 2.3% | 0.8% | 2.1% | 0.0501 | = | 0.0392 | 0.0130 | -0.0020 | -0.0010 |
| 1987 | 6.8% | 2.1% | 1.2% | 2.6% | 0.0579 | = | 0.0420 | 0.0110 | 0.0020 | 0.0020 |
| 1988 | 6.3% | 1.7% | 1.4% | 2.3% | 0.0526 | = | 0.0397 | 0.0070 | 0.0040 | 0.0010 |
| 1989 | 6.3% | 1.2% | 1.8% | 2.2% | 0.0533 | = | 0.0414 | 0.0020 | 0.0080 | 0.0010 |
| **1990** | **1.0%** | **1.1%** | **1.1%** | **1.1%** | | | | | | |
| 1991 | 0.2% | 1.0% | 0.1% | 0.2% | -0.0085 | = | -0.0004 | 0.0000 | -0.0090 | 0.0000 |
| 1992 | 26.1% | 15.1% | 9.3% | 30.0% | 0.2506 | = | -0.0393 | 0.1410 | 0.0830 | 0.0650 |
| 1993 | 24.9% | 8.0% | 9.6% | 25.2% | 0.2385 | = | -0.0034 | 0.0700 | 0.0860 | 0.0850 |
| 1994 | 23.6% | 4.5% | 11.5% | 22.9% | 0.2263 | = | 0.0074 | 0.0350 | 0.1050 | 0.0780 |
| 1995 | 31.3% | 8.4% | 10.2% | 28.7% | 0.3032 | = | 0.0263 | 0.0740 | 0.0920 | 0.1100 |
| 1996 | 25.1% | 8.2% | 7.0% | 25.1% | 0.2405 | = | -0.0004 | 0.0720 | 0.0600 | 0.1080 |
| 1997 | 23.5% | 6.5% | 8.0% | 25.0% | 0.2247 | = | -0.0152 | 0.0550 | 0.0700 | 0.1140 |
| 1998 | 27.6% | 12.0% | 7.3% | 32.1% | 0.2663 | = | -0.0446 | 0.1100 | 0.0630 | 0.1370 |
| 1999 | 35.1% | 20.3% | 7.3% | 38.9% | 0.3412 | = | -0.0377 | 0.1930 | 0.0630 | 0.1220 |
| 2000 | 35.3% | 15.6% | 8.1% | 35.6% | 0.3430 | = | -0.0029 | 0.1460 | 0.0710 | 0.1280 |

Base year: 1990.
L(1), Y(i), z(1): FGT(0) with distribution(W1), income(W[i]), overy line(W1): pure income effect.
L(i), Y(1), z(1): FGT(0) with distribution(W[i]), income(W1), poverty line(W1): pure distribution effect.
L(i), Y(i), z(1): FGT(0) with distribution(W[i]), income(W[i]), poverty line(W1): income and distribution effect.

This table shows the decomposition of the distributionally invariant poverty rate FGT(0) in pure income-, distribution- and poverty line effects.

Source: GOSKOMSTAT data, own computations.

Tab. A.4: Year-to-year decomposition of FGT poverty indices in average marginal effects, Russia 1985-2000:

| | Changes of ... | | FGT(0) | | | | FGT(2) | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | average per cap. income | the lowest quintile | | average marginal ... effects | | | | average marginal ... effects | | |
| | | | FGT[i+1] - FGT[i] | income | distribution | pov. line | FGT[i+1] - FGT[i] | income | distribution | pov. line |
| 1985 - 1990 | 26% | -2% | -4.50% | -0.0247 | 0.0043 | -0.0247 | -0.21% | -0.0014 | 0.0006 | -0.0014 |
| 1990 - 1991 | 0% | 21% | -0.80% | -0.0002 | -0.0112 | 0.0033 | -0.15% | 0.0000 | -0.0017 | 0.0002 |
| 1991 - 1992 | -51% | -50% | 25.80% | 0.1522 | 0.1602 | -0.0543 | 4.29% | 0.0244 | 0.0286 | -0.0101 |
| 1992 - 1993 | 20% | -3% | -1.20% | -0.0662 | 0.0193 | 0.0348 | -0.73% | -0.0172 | 0.0009 | 0.0090 |
| 1993 - 1994 | 15% | -9% | -1.20% | -0.0525 | 0.0300 | 0.0105 | -0.22% | -0.0128 | 0.0080 | 0.0025 |
| 1994 - 1995 | -14% | 4% | 7.70% | 0.0645 | -0.0030 | 0.0155 | 1.71% | 0.0155 | -0.0021 | 0.0037 |
| 1995 - 1996 | 1% | 13% | -6.30% | -0.0045 | -0.0305 | -0.0280 | -1.74% | -0.0009 | -0.0107 | -0.0058 |
| 1996 - 1997 | 6% | -3% | -1.60% | -0.0280 | 0.0270 | -0.0150 | -0.75% | -0.0049 | 0.0001 | -0.0026 |
| 1997 - 1998 | -15% | 2% | 4.20% | 0.0795 | -0.0130 | -0.0245 | 1.02% | 0.0145 | 0.0002 | -0.0045 |
| 1998 - 1999 | -15% | 0% | 7.43% | 0.0892 | -0.0048 | -0.0101 | 1.41% | 0.0187 | -0.0025 | -0.0021 |
| 1999 - 2000 | 9% | 0% | 0.17% | -0.0491 | -0.0037 | 0.0545 | 0.13% | -0.0115 | 0.0001 | 0.0128 |
| **Sum 1985 - 2000** | | | **29.70%** | **0.1603** | **0.1747** | **-0.0380** | **4.75%** | **0.0243** | **0.0215** | **0.0017** |
| **Sum 1990 - 1993** | | | **23.80%** | **0.0858** | **0.1683** | **-0.0162** | **3.41%** | **0.0071** | **0.0278** | **-0.0009** |
| **Sum 1997 - 2000** | | | **11.80%** | **0.1196** | **-0.0215** | **0.0198** | **2.57%** | **0.0217** | **-0.0022** | **0.0062** |

This table shows the year-to-year decomposition of the distributionally neutral poverty rate (FGT(0)) and the distributionally sensitive squared poverty gap (FGT(2)) in average marginal income-, distribution and poverty line effects. The values are averages of the six possible permutations of the inclusion order of the three components.

Source: GOSKOMSTAT data, own computations.

Tab. A.5: Poverty rate and income shares in the three different income sectors, Russia 1992, 1994, 2000:

| | 1992 (round 1) | | | | |
|---|---|---|---|---|---|
| | state | private | transfers | R | sum |
| number of households weighted | 3366 | 803 | 2034 | 99 | 6302 |
| popuation shares | 53.42% | 12.74% | 32.27% | 1.57% | 100.00% |
| **headcount ratio in the sector according to ...** | | | | | |
| household income per aquivalent adult | 35.03% | 35.87% | 39.14% | 59.76% | 36.85% |
| | [0.0082] | [0.0168] | [0.0108] | [0.0488] | [0.0061] |
| household expenditures per aquivalent adult | 25.19% | 30.02% | 35.81% | 40.04% | 29.47% |
| | [0.0075] | [0.0162] | [0.0106] | [0.0405] | [0.0057] |
| | **1994 (round 5)** | | | | |
| | state | private | transfers | R | sum |
| number of households weighted | 1681 | 594 | 1544 | 155 | 3973 |
| popuation shares | 42.31% | 14.94% | 38.86% | 3.89% | 100.00% |
| **headcount ratio in the sector according to ...** | | | | | |
| household income per aquivalent adult | 32.95% | 28.06% | 29.84% | 79.68% | 32.83% |
| | [0.0115] | [0.0185] | [0.0116] | [0.0325] | [0.0075] |
| household expenditures per aquivalent adult | 25.87% | 18.91% | 27.82% | 40.81% | 26.17% |
| | [0.0107] | [0.0161] | [0.0114] | [0.0397] | [0.0070] |
| | **2000 (round 9)** | | | | |
| | state | private | transfers | R | sum |
| number of households weighted | 1014 | 846 | 1319 | 140 | 3319 |
| popuation shares | 30.56% | 25.48% | 39.75% | 4.21% | 100.00% |
| **headcount ratio in the sector according to ...** | | | | | |
| household income per aquivalent adult | 49.59% | 43.21% | 42.60% | 82.89% | 46.59% |
| | [0.0157] | [0.0170] | [0.0136] | [0.0320] | [0.0087] |
| household expenditures per aquivalent adult | 38.91% | 37.99% | 36.93% | 51.30% | 38.41% |
| | [0.0153] | [0.0167] | [0.0133] | [0.0424] | [0.0084] |

Source: RLMS, own computations.

Tab. A.6: Sectoral decomposition of the changes in the poverty rate, Russia, 1992-2000:

**1. Poverty rate according to household income per aquivalent adult**

| | Changes in poverty through ... | | intrasectoral effects | | | | shifts between the sectors | | | | interaction between population shifts and intrasectoral effects | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [%point] | | state | private | transfers | R | state | private | transfers | R | state | private | transfers | R |
| 1992 - 2000: | 0.0974 | = | 0.0778 | + 0.0093 | + 0.0112 | + 0.0036 | - 0.0801 | + 0.0457 | + 0.0292 | + 0.0158 | - 0.0333 | + 0.0094 | + 0.0026 | + 0.0061 |
| | (100.00 %) | | (79.88 %) | (9.59 %) | (11.48 %) | (3.73 %) | (-82.23%) | (46.96 %) | (30.02 %) | (16.21 %) | (-34.19%) | (9.60 %) | (2.66 %) | (6.27 %) |
| 1992 - 1994: | -0.0402 | = | -0.0111 | - 0.0099 | - 0.0300 | + 0.0031 | - 0.0389 | + 0.0079 | + 0.0258 | + 0.0139 | + 0.0023 | - 0.0017 | - 0.0061 | + 0.0046 |
| | (100.00 %) | | (27.59 %) | (24.75 %) | (74.64 %) | (-7.78%) | (96.85 %) | (-19.71%) | (-64.10%) | (-34.52%) | (-5.74%) | (4.29 %) | (15.23 %) | (-11.51%) |
| 1994 - 2000: | 0.1376 | = | 0.0704 | + 0.0226 | + 0.0496 | + 0.0012 | - 0.0387 | + 0.0296 | + 0.0026 | + 0.0026 | - 0.0195 | + 0.0160 | + 0.0011 | + 0.0001 |
| | (100.00 %) | | (51.17 %) | (16.45 %) | (36.04 %) | (0.91 %) | (-28.14%) | (21.50 %) | (1.93 %) | (1.85 %) | (-14.21%) | (11.60 %) | (0.82 %) | (0.07 %) |

**1. Poverty rate according to household expenditures per aquivalent adult**

| | Changes in poverty through ... | | intrasectoral effects | | | | shifts between the sectors | | | | interaction between population shifts and intrasectoral effects | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [%point] | | state | private | transfers | R | state | private | transfers | R | state | private | transfers | R |
| 1992 - 2000: | 0.0894 | = | 0.0733 | + 0.0101 | + 0.0036 | + 0.0018 | - 0.0576 | + 0.0383 | + 0.0268 | + 0.0106 | - 0.0314 | + 0.0102 | + 0.0008 | + 0.0030 |
| | (100.00 %) | | (81.96 %) | (11.35 %) | (4.04 %) | (1.97 %) | (-64.41%) | (42.80 %) | (29.92 %) | (11.83 %) | (-35.08%) | (11.36 %) | (0.93 %) | (3.32 %) |
| 1992 - 1994: | -0.0330 | = | 0.0036 | - 0.0142 | - 0.0258 | + 0.0001 | - 0.0280 | + 0.0066 | + 0.0236 | + 0.0093 | - 0.0007 | - 0.0025 | - 0.0053 | + 0.0002 |
| | (100.00 %) | | (-10.92%) | (42.88 %) | (78.14 %) | (-0.36%) | (84.80 %) | (-20.08%) | (-71.41%) | (-28.16%) | (2.27 %) | (7.44 %) | (15.94 %) | (-0.54%) |
| 1994 - 2000: | 0.1224 | = | 0.0552 | + 0.0285 | + 0.0354 | + 0.0041 | - 0.0304 | + 0.0199 | + 0.0025 | + 0.0013 | - 0.0153 | + 0.0201 | + 0.0008 | + 0.0003 |
| | (100.00 %) | | (45.07 %) | (23.29 %) | (28.92 %) | (3.33 %) | (-24.82%) | (16.27 %) | (2.02 %) | (1.07 %) | (-12.52%) | (16.43 %) | (0.66 %) | (0.27 %) |

Source: RLMS, own computations.

## 6. References

Araar, Adelkrim, Jean-Yves Duclos and Carld Fortin, 2002: DAD 4.1: A software for Distributive Analysis / Analyse Distributive", MIMAP programs. International Development Research Centre, Government of Canada and CREFA, Universite Laval, URL: http://www.mimap.ecn.ulaval.ca/.

Commander, Simon, Andrei Tolstopiatenko and Ruslan Yemtsov, 1999: Channels of Redistribution. Inequality and Poverty in the Russian Transition. In: Economics of Transition 7(2), 411-47.

Datt, Gaurav, 1998: Computational Tools for Poverty Measurement and Analysis. FCND Discussion Paper 50, October 1998.

Deaton, Angus, 1998: The Analysis of Household Surveys. A Microeconometric Approach to Development Policy, Baltimore and London: The Johns Hopkins University Press.

Deutsches Institut für Wirtschaftsforschung, Institut für Wirtschaftsforschung Halle, Institut für Weltwirtschaft, 1994: Die wirtschaftliche Lage Russlands. Fortsetzung des Niedergangs ohne hinreichenden Strukturwandel. Kiel Discussion Papers 240/241.

Easterly, William and Paulo Vieira da Cunha, 1994: Financing the Storm: Russia's Macroeconomic Crisis. In: Economics of Transition 2(4), 443-65.

Easterly, William and Stanley Fischer, 2000: Inflation and the Poor, Policy Research Working Paper 2335. The World Bank and International Monetary Fund, May 2000.

Foster, James, Joel Greer and Erik Thorbecke, 1984: A Class of Decomposable Poverty Measures. In: Econometrica 52(3), 761-6.

Kakwani, Nanak, 1980: Income Inequality and Poverty: Methods of Estimation and Policy Applications, New York: Oxford University Press.

Mintrud, 2001: Socialnye indikatory dochodov i urovnja shizni naselenia: Social income and living standard indicators 7 (93), Labor Ministry of the Russian Federation, Moskva.

Ovcharova, Lilyana, 1997: The Definition and Measurement of Poverty in Russia. Report Prepared for the Department for International Development, University of Warwick, URL: http://www.warwick.ac.uk/russia/Poverty.htm.

Ravallion, Martin, 1992: Poverty Comparisons. A Guide to Concepts and Methods, Living Standards Measurement Study Working Paper 88.

RLMS, 2001: The Russia Longitudinal Monitoring Survey. Carolina Population Center at the University of North Carolina at Chapel Hill, URL: http://www.cpc.unc.edu/projects/rlms/rlms_home.html.

Seidl, Christian, 1988: Poverty Measurement: A Survey. In: Bös, Dieter, Manfred Rose and Christian Seidl (Ed.), Welfare and Efficiency in Public Economics, Berlin, 71-147.

Shorrocks, Anthony F. and Stanislav Kolenikov, 2000: Poverty Trends in Russia During the Transition, Working Paper University of Essex, Institute for Fiscal Studies, URL: http://www.nes.ru/english/research/confprog/confer8-2000.htm.

Villasenor, J. and B. C. Arnold, 1984: The general quadratic Lorenz curve, Technical Report, Colegio de Postgraduados, Mexico City.

World Bank, 1999: Russia Targeting and the Longer-Term Poor, Report No. 19377-RU, Washington, D. C.