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Subjective Economic Welfare

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As conventionally measured, current household income relative to a poverty line can only partially explain how Russian adults perceive their economic welfare. Other factors include past incomes, individual incomes, household consumption, current unemployment, risk of unemployment, health status, education, and relative income in the area of residence.

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Summary findings

Paradoxically, when economists analyze a policy's impact on welfare they typically assume that people are the best judges of their own welfare, yet resist directly asking them if they are better off. Early ideas of "utility" were explicitly subjective, but modern economists generally ignore people's expressed views about their own welfare. Even using a broad set of conventional socioeconomic data may not reflect well people's subjective perceptions of their poverty.

Ravallion and Lokshin examine the determinants of subjective economic welfare in Russia, including its relationship to conventional objective indicators. For data on subjective perceptions, they use survey responses in which respondents rate their level of welfare from "poor" to "rich" on a nine-point ladder.

As an objective indicator of economic welfare, they use the most common poverty indicator in Russia today, in which household incomes are deflated by household-specific poverty lines.

They find that Russian adults with higher family income per equivalent adult are less likely to place themselves on the lowest rungs of the subjective ladder and more likely to put themselves on the upper rungs.

But current household income does not explain well self-reported assessments of whether someone is poor or rich. Expanding the set of variables to include incomes at different dates, expenditures, educational attainment, health status, employment, and average income in the area of residence doubles explanatory power.

Healthier and better educated adults with jobs perceive themselves to be better off, controlling for income.

The unemployed view their welfare as lower, even with full income replacement.

Individual income matters independent of per capita household income.

Relative income also matters. Living in a richer area lowers perceived economic welfare, controlling for income and other factors.

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Subjective Economic Welfare

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1. Introduction

It is a paradox that when economists analyze the welfare impacts of policies, they typically assume that people are the best judges of their own welfare, yet they resist directly asking people themselves whether they are better off. It is assumed instead that the economist knows the answer on the basis of objective data on incomes and prices. While early ideas of "utility" were explicitly subjective,[2] the modern approach in economics has generally ignored the expressed views of people themselves about their own welfare.

However, the view that we can make interpersonal comparisons of welfare by looking solely at demand behavior is known to be untenable. Households differ in characteristics, such as size and demographic composition, which can influence their welfare in ways which are not evident in their behavior as consumers (Pollak and Wales, 1979). The problem stems from the restrictions economists place on the information which is brought to bear in measuring welfare.

Responses to survey questions on perceived well-being may well provide the extra information needed for identifying welfare (van Praag, 1991; Kapteyn, 1994). There has been work by psychologists and economists on understanding self-perceptions of welfare. The most direct and common approach is to survey people's opinions about their own well-being, assuming that the answers are inter-personally comparable. The questions asked by subjective welfare surveys have typically related to a broad notion of "happiness" or "satisfaction with life". The evidence available does not suggest that the answers given can be predicted well by standard

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[2] Famously, Jeremy Bentham defined utility in terms of psychological states (pleasure and pain). On the distinction between "objective" and "subjective" utility see Kahnman and Varey (1991).

objective measures, such as income.[3]

However, for many purposes, including policy analysis, one is typically interested in a more narrow concept of "economic welfare"; is one person "poorer" than another? Possibly subjective assessments of this more narrow concept will accord better with objective data on incomes. A better understanding of the determinants of self-rated economic welfare may also help understand the political economy of economic policy making, such as why some sub-groups in society appear to be more opposed to policy change than a conventional calculation of income gains and loses would suggest.

This paper examines the systematic determinants of subjective economic welfare in Russia, including its relationship to conventional objective indicators. Our data on subjective perceptions use survey responses to a question in which respondents say what their level of welfare from "poor" to "rich" is on a nine-point ladder. We make the standard identifying assumption in analyzing attitudinal questions that there is inter-personal comparability of the interpretations given to the survey question; in our case, a given rung of the ladder is taken to mean the same thing to each person in terms of a continuous latent measure of economic welfare. Of course, there are still systematic differences in where people place themselves on the ladder, but these are interpreted as arising solely from differences in their economic welfare. Our objective indicator of economic welfare is the most common poverty indicator in Russia today, in which household incomes are deflated by household-specific poverty lines.

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[3] Simon (1974) found a weak association between income and subjective welfare in the U.S., and survey evidence since has generally suggested a significant but low correlation; for a survey see Furnham and Argyle (1998, Chapter 11). Also see Scitovsky (1978), Easterlin (1995) and Oswald (1997).

For a number of reasons, Russia is an interesting setting for this inquiry. The economic and political reforms of the last decade had a profound impact on the well-being of Russian households. A sharp drop of GNP was accompanied by a high level of inflation in the early 1990s, an increase in unemployment, and income inequality. The poverty rate rose sharply (Lokshin and Popkin, 1997). The problem of identifying those living in poverty is of increasing importance in Russia. Usually the problem is addressed by comparing household income with a poverty line which varies according to the prices faced and household size and demographic composition. In practice, this method has tended to show that it is larger and younger families that have higher incidence of poverty, and this finding has had considerable influence on anti-poverty policies. However, there appears to be a perception amongst many in Russia today that poverty is more acute in older (particularly pensioner) and smaller households. This suggests that there may well be disagreement between objective and subjective welfare indicators. We aim to compare the two types of indicators and to better understand the source of any divergence.

The following section discusses alternative approaches to welfare measurement, and our approach and data. Section 3 gives our results comparing the objective and subjective measures. Section 4 tries to explain the differences. Section 5 concludes.

2. Measuring economic welfare

The most widely used measure of a person's "economic welfare" is the real income of the household to which the person belongs, adjusted for differences in family size and demographic composition (relative to some reference, such as a single adult). This can be defined as the household's total income divided by a poverty line giving the cost of some reference utility level

at the prevailing prices and household demographics. Under certain conditions, this ratio can be interpreted as an exact money metric of utility defined over consumptions.[4]

Standard practice is to calibrate the cost function from consumer demand behavior. It is known, however, that there the parameters of the cost function are in general under-identified from demand behavior when household attributes vary (Pollak and Wales, 1979).[5] This problem has plagued applied work, and the policy interpretations of data on economic welfare including "poverty profiles" aiming to give consistent measures of poverty across sub-groups of society.

For example, consider one property of the cost function, its elasticity to household size when evaluated at the reference utility level used to set the poverty line. An elasticity of unity is equivalent to dividing income by household size, while an elasticity of zero implies that aggregate household income is the relevant indicator of individual welfare. There is evidence to support the intuition that at some critical value of that elasticity somewhere between zero and one, measured poverty will tend to be uncorrelated with household size, while at elasticities above (below) this critical value larger (smaller) households will be deemed poorer (Lanjouw and Ravallion, 1995). The same evidence indicates that the range of approaches to determining the size elasticity of the cost function found in practice spans both sides of this critical elasticity,

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[4] See Blackorby and Donaldson (1987) who refer to consumption normalized by a poverty line as the "welfare ratio". The main assumption required for this to be an exact money metric of utility is that the consumer's preferences are homothetic.

[5] Also see Pollak (1991), Blundell and Lewbel (1991), Browning (1992), and Kapteyn (1994). To understand the problem, suppose that we find that an indirect utility function $v(p, y, x)$ (depending on prices p, income y and other household characteristics x) supports observed demands $q(p, y, x)$ as an optimum. The indirect utility function then implies a cost function $c(p, x, u)$ for utility u, such that the objective welfare indicator is $y/c(p, x, u^*)$ for the reference utility u^* (interpretable as the poverty line in utility space). However, if $v(p, y, x)$ implies the demands $q(p, y, x)$ then so does every other indirect utility function $V[v(p, y, x), x]$.

so that one could go from saying that larger households are poorer to the opposite depending on the way one identifies the elasticity.

This indeterminacy has bearing on policy. The demographic poverty profile is important information for a number of questions in social policy, such as the allocation of public spending between family allowances and pensions. The issue has been prominent in discussions of social policy in Eastern Europe. Yet sensitivity tests on past objective welfare indicators for Russia and other countries in Eastern Europe and Central Asia suggest that the demographic profile of poverty can change appreciably with even seemingly small changes in the allowance made for scale economies in consumption within the household (Lanjouw, Milanovic and Paternostro, 1998).

Some economists have turned to data on self-perceptions of welfare as a source of the extra information needed for identification. There are various approaches. Van Praag (1968, 1971) introduced the Income Evaluation Question (IEQ) which asks what income is considered "very bad", "bad", "not good", not bad", "good", "very good". Another method is based on the Minimum Income Question (MIQ) which asks what income is needed to "make ends meet". Subjective poverty lines can be calibrated to the answers (see, for example, Kapteyn et al., 1988).[6] By this approach the welfare indicator is still taken to be objectively measured income or expenditure normalized by the (subjective) poverty line.

A common use of subjective welfare measures is to calibrate an objective welfare measure, such as setting equivalence scales. Survey-based subjective indicators are used to

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[6] Qualitative data on consumption adequacy can also be used, without the minimum income question (which is unlikely to give sensible answers in some settings) (Pradhan and Ravallion, 1998).

identify the consumer's cost function (Van Praag and Van der Sar, 1988; Kapteyn, 1994). But what variables should be included? Even within a given approach to measuring subjective welfare, the set of individual characteristics deemed relevant to the corresponding objective welfare measure can differ. An objective welfare indicator chosen to have best fit in explaining a subjective indicator may still leave worryingly large residuals.

Arguably the IEQ and MIQ are both motivated by a rather narrow, income-based, characterization of welfare. This has been recognized explicitly in the literature. For example, in estimating the Leyden poverty line using Russian data, Frijters and van Praag (1997) recognize that "..income is only one factor among others influencing individual life satisfaction levels ... Nevertheless, being economists, we'll assume that absolute and relative material circumstances define poverty" (p.6). They go on to calibrate their welfare metric to only a few variables – income, household size, and age.

A more open-ended approach can be found in the psychological literature on subjective perceptions of welfare. While the psychological literature has naturally tended to focus on mental health, a strand of the literature has attempted to understand people's self-rated welfare.[7] Respondents are asked to place themselves on a ladder – sometimes referred to as a Cantril ladder, following Cantril (1965) – according to their "happiness" or "satisfaction with life a whole."[8]

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[7] See, for example, Argyle (1987), Diener (1994), Diener, Suh and Oishi (1997) and Furnham and Argyle (1998). A strand of the economics literature has drawn on subjective assessments of welfare, following Van Praag (1968, 1971). (We discuss this approach in section 2 below.) There is remarkably little cross-referencing of the literatures in psychology and economics.

[8] For a useful cross-country compendium of the questions asked, and a summary of the answers, see Veenhoven et al., (1993).

However, this is arguably too broad a concept for measuring economic welfare, and assessing conventional income-based measures. When one says that someone is "poor" one typically does not mean that they are unhappy. It cannot be too surprising that income is not all that matters to "happiness" or "satisfaction with life". The more interesting question is how income, and other objective characteristics of people, relate to self-perceptions of economic welfare.

Here we adopt an alternative approach, in which the Cantril-type question is asked about economic welfare. In particular, we use the following question:

Please imagine a 9-step ladder where on the bottom, the first step, stand the poorest people, and on the highest step, the ninth, stand the rich. On which step are you today?

We will call this the Economic Ladder Question (ELQ).[9] The question serves the purpose of this paper well. It does not presume that "income" is the relevant variable for defining who is "poor" and who is not, but leaves that up to the respondent. At the same time, by using the words "poor" and "rich" the question focuses on a more narrow concept of economic welfare than the "ladder of life" questions often used in psychometric and other surveys. It does not appear plausible to us that discrepancies between answers to the ELQ, as posed above, and an objective measure of real income reflect the fact that they are aiming to measure different things.

Nonetheless, there are still ways in which the answers to the ELQ could deviate from conventional real income metrics. The following reasons for divergence can be identified:

(i) There might well be systematic differences in the values attached to specific

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[9] An antecedent is found in Mangahas (1995) who asked respondents in regular surveys for the Philippines whether they are "poor", "borderline" or "non-poor".

household characteristics in assessing differences in "needs", i.e., differences in the structure of the equivalence scales underlying the real income measure (as typically built into the poverty lines used as deflators) versus those which affect perceptions of welfare.

(ii) The ladder question is individual specific, and there may well be inequality within households not captured by aggregate household income or consumption.

(iii) There may be differences in the time period over which income is measured versus the time period on which perceptions of economic welfare are based. Past incomes may matter, as may expected future incomes, or determinants of these, such as education.

(iv) There could also be differences arising from the influence of relative incomes on perceptions of personal affluence. It has been argued that the circumstances of the individual, relative to others in some reference group, influence perceptions of well-being at any given level of individual command over commodities.[10]

(v) From psychological research it is known that subjective welfare is affected by both transient and fixed idiosyncratic factors. Intrinsic aspects of temperament, such as extroversion and neuroticism, influence self-rated welfare (see for example Costa and McCrae, 1980). Transient effects also matter such as short-lived peaks of happiness and how a recent experience ended (Fredrickson and Kahneman, 1993). For the purpose of assessing a person's "typical" welfare, there is clearly noise in subjective welfare data. This presumably also be the case for subjective economic welfare as assessed by the ELQ. We call this noise "mood effects".

To have any hope of understanding the systematic determinants of subjective economic

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[10] Runciman (1966) provided an influential exposition, and supportive evidence. Also see the discussions in van de Stadt et al., (1985), Easterlin (1995), Frank (1997) and Oswald (1997).

welfare one needs to have the above question (or something similar) asked in the context of a comprehensive objective socio-economic survey. However, the resistance to subjective welfare assessments in economics has been reflected in the nature of much of the socio-economic survey data available.[11] The lack of integration of subjective methods into comprehensive survey instruments has meant that it has not often been possible to examine the socio-economic determinants of self-rated welfare, and the relationship with the more conventional welfare measures favored by economists.

We shall use data from the Russian Longitudinal Monitoring Survey (RLMS) for 1996. The RLMS is a comprehensive survey of all aspects of levels of living, based on the first nationally representative sample of several thousand households across the Russian Federation.[12] In addition to a wide range of more conventional socio-economic data, all adults were asked the Economic Ladder Question discussed above.

As our main objective welfare indicator we use the "welfare ratio" given by total household income (y) as a proportion of the poverty line (z).[13] The distribution of such welfare ratios determines the level of absolute poverty. (Almost all measures of poverty are homogeneous of degree zero in incomes and the poverty line.) We use established poverty lines

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[11] For example, until recently, the household surveys done for the World Bank's Living Standards Measurement Study almost never asked for subjective assessments of welfare, even though welfare measurement was the main aim of the surveys.

[12] A range of issues related to the sample design and collection of these data are explained in the documents found in the home page of the RLMS, where the data sets can also be obtained free; see http://www.cpc.unc.edu/projects/rlms/rlms_home.html.

[13] We use income rather than consumption because income appears to have been more popular in past work on poverty in Russia; we leave aside the issue of which is preferable.

for Russia.[14] These used linear programming to find the food baskets which minimized the cost of reaching predetermined age- and gender-specific nutritional norms, subject to the constraint that the quantities obtained were no lower than certain positive bounds given by the averages for those with the lowest 30% of consumption. The food basket was created separately for children aged 0-6, 7-17, adult males and females, female pensioners aged 55 and older, and male pensioners aged 60 and older. Region-specific food prices were then used to cost these food baskets. Age- and gender-specific Engel coefficients were then used to obtain allowances for non-food spending. Thus, each age and gender grouping has its specific poverty line which is used to construct a household-specific poverty line according to the demographic composition of the household. Total real monthly disposable household income (in June 1992 prices) includes wages and salaries, social security, private transfers, income in-kind and from home production.

3. Comparing objective and subjective indicators

Table 1 summarizes the joint distribution of the objective and subjective indicators of economic welfare. We assign individuals to categories of welfare ratios (y/z) in such a way that the number of respondents in each category is equal to the number of respondents in the corresponding subjective welfare group. If there was a complete agreement between the two then the number of respondents in the non-diagonal cells of Table 1 would be zero. We decided to condense the highest 7th, 8th, and 9th rungs of the ELQ into one due to a small number of

[14] The poverty line are from Popkin et al., (1995). These were accepted as the guideline for all official Russian poverty line calculations. They are modified versions of those in Popkin et al. (1992) which were accepted as a law in Russian Federation in 1992 both on the regional and on the all Russia levels. The main modification is that the new poverty lines allow for economies of scale in consumption.

respondents who assigned themselves to these rungs (only 28 of the 7405 respondents put themselves in rung 8 and only 3 put themselves on rung 9).

The matching of objective and subjective rankings is clearly weak. For example, of the 993 adults who said they were on the lowest rung of the ladder, only 224 were amongst the poorest 993 adults in terms of y/z. The matrix is not even dominant diagonal, though it is not far from it. The value of Cramer's V statistic is under 0.1, though the association between the two variables is still highly significant.[15]

Naturally then there is only a weak matching in terms of poverty; while 29.4% of adults placed themselves in the lowest two rungs, less than half (43.0%) were also amongst the 32.7% of adults living in households with incomes below the poverty line. Figure 1 gives the mean proportion of the sample on the lowest two rungs against $\ln(y/z)$. The curve is downward sloping, but it is clearly quite flat, even near the poverty line. For example, going from 0.5 standard deviation below the poverty line to 0.5 above reduces the probability of being on the lowest two rungs from 0.34 to 0.25 (the objective poverty measure falls from 1.0 to 0.0); going

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[15] Let n_{ij}, $i=1,...,I$, $j=1,...,J$, be the number of observations in the i'th row and j'th column. The Pearson χ^2 statistics with $(I-1)(J-1)$ degrees of freedom is defined as:

$$X^2 = \sum_i \sum_j \frac{(n_{ij} - m_{ij})^2}{m_{ij}}$$

where

$$m_{ij} = n_{i.} n_{.j} / n; \quad n = \sum_i \sum_j n_{ij}; \quad n_{i.} = \sum_{j=1}^{J} n_{ij}; \quad n_{.j} = \sum_{i=1}^{I} n_{ij} .$$

Cramer's V is a measure of association given by:

$$V = [(X^2/n)/\min(I-1, J-1)]^{1/2}$$

for which $0 \leq V \leq 1$. See Agresti (1984) for further discussion.

from one standard deviation below to one above, it falls from 0.37 to 0.19. The standard deviation of $\ln(y/z)$ is 1.053 so the slope is -0.09 in both cases. So roughly doubling incomes will only reduce the subjective poverty rate by about 10 percentage points.

Figure 1 also gives the mean proportion of the sample on rungs five-plus at each value of $\ln(y/z)$. This is roughly the (subjectively) richest quarter of respondents. Here we find near zero gradient in the proportion of those responding that they are on the fifth rung or higher as $\ln(y/z)$ increases; amongst the "objectively poor" about one fifth put themselves on these upper rungs of the ladder, and it matters little how poor they are. But amongst the "objectively non-poor" there is a sharp increase in the proportion of respondents who see themselves as being on the upper rungs of the ladder as real income deflated by the poverty line increases. It is in the responses of the income non-poor that one sees a sharper differentiation in subjective perceptions of welfare.

An instructive way of looking at the relationship between the subjective and objective indicators is to start from an explicit assumption about the underlying continuous variable determining where one sees oneself on the ladder from "poor" to "rich". Let this latent continuous variable be denoted w and assume that this is determined by $\ln(y/z)$ as well as other variables, which (for the moment) we will simply lump into an error term, ε:

$$w = \beta ln(y/z) + \varepsilon \qquad (1)$$

Assuming level comparability of the ladder across persons, someone with $w < c_1$ (say) will respond that she is on the first rung; someone for whom $c_1 < w < c_2$ will be on the second, and so on up to the highest rung. On also assuming that ε is normally distributed (with distribution function F), we can use an ordered probit (OP) to model the Cantril ladder responses (C):

$$Prob(C=1) = F[c_1 - \beta \ln(y/x)]$$

$$Prob(C=i) = F[c_i - \beta \ln(y/x)] - F[c_{i-1} - \beta \ln(y/x)] \quad (i=2,..6) \qquad (2)$$

$$Prob(C=7) = 1 - F[c_6 - \beta \ln(y/x)]$$

This estimation method gives an estimate for β of 0.195 with a standard error of 0.0116 (t-ratio of 16.8, with 7377 observations).[16] There is clearly a highly significant correlation between the subjective and objective welfare indicators. However, the correlation is low. In assessing the fit of all OP models in this paper we use the (normalized) Aldrich-Nelson pseudo R^2 since the standard pseudo-R^2 (as calculated in STATA, for example) is known to be biased downward for the types of models we are estimating, and there is evidence that the Aldrich-Nelson R^2 performs better (see Appendix). The Aldrich-Nelson R^2 is 0.047. So, while the welfare ratio (as conventionally measured) is a highly significant predictor of a person's ladder rung, it is clear that this variable alone can only account for a small share of the variance (more strictly, the share of the restricted log-likelihood function) in responses to the ladder question. This result confirms the impression from Table 1 that there are clearly many other factors influencing subjective perceptions of economic welfare besides income.

What other factors underlie the differences between subjective and objective welfare? We investigate this question more systematically in the next section. But some simple descriptive statistics are revealing. In Figure 2 we give various "poverty profiles" in which we compare the proportion of adults living in households with an income below the poverty line

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[16] The estimated values of c_i (i=1,6) are -1.078 (st. error of 0.0186), -0.503 (0.0157), 0.104 (0.0150), 0.670 (0.0162), 1.597 (0.0234) and 2.1358 (0.0342) respectively.

with the percentage placing themselves in rungs 1 or 2 of the ladder which we shall term "subjective poverty". (By choosing the lowest two rungs, the overall subjective poverty rate is roughly the same as the overall headcount index of income poverty, as noted above).

While income poverty incidence tends to fall (or not rise) with age, subjective poverty clearly rises with age (panel a). Higher education has the same effect on both poverty indicators (panel b). Income poverty rises with household size; by contrast, subjective poverty is highest for single person households, falls as household size increases up to four persons, but then rises again (panel c). Similarly to the difference in demographic poverty profiles in panels a and c, we see a marked difference in the poverty rates amongst pensioners and large families (panel d).

There is also a marked geographic difference between the subjective and objective geographic poverty profiles, as can be seen from Figure 2e where we rank regions by the objective poverty rates by region in Russia (income relative to the poverty line) and give the corresponding percentages of people reporting that they are on the bottom two rungs of the ladder. There is clearly little relationship between the two.

4. Why do the subjective and objective indicators differ so much?

We now test two possible hypotheses as to why there is so much disagreement between the subjective and objective indicators.

The Wrong Weights Hypothesis: *As elsewhere, the Russian poverty lines depend on regional cost-of-living differences and equivalence scales. The low correlation between objective and subjective measures may be due to the weighting of these various components used in constructing the objective indicator. An alternative weighting may give a much better fit.*

The Low Dimensionality Hypothesis: *Even with an"ideal" deflator, the welfare ratio may be too narrow a measure of "economic welfare". Past incomes may matter as well as current incomes. Health, education and employment may matter independently of income. And where you live may matter, either directly or via perceptions of relative well-being.*

4.1 Testing the Wrong Weights Hypothesis

The poverty lines are determined by a vector of variables x_z and we now write this relationship explicitly as $z=z(x_z)$. To test the Wrong Weights Hypothesis we want to compare the function $z(x_z)$ with that which gives the best fit in explaining the subjective welfare indicator. To do so we estimate an augmented model in which the latent welfare function takes the form:

$$w = \beta \ln[y/z(x_z)] + \gamma_z x_z + \varepsilon \qquad (3)$$

This allows the subjective weights on x_z to differ from those built into the objective indicator.

The first column of Table 2 gives the estimates of the OP based on (3) and their standard errors. The second column gives the values of γ_z/β. This allows us to directly compare the weights on x_z with those built into the construction of the poverty lines, as given in the third column. The latter were obtained from an OLS regression of $\ln z(x_z)$ on x_z.[17]

There is clearly strong support for the Wrong Weights Hypothesis. In comparison to the model in (1) we observe almost a threefold increase in the log-likelihood explanatory power of the model by re-weighting x_z to give best fit in explaining the subjective indicator (pseudo-R^2 rises from 0.04 to 0.11). Comparing columns (2) and (3) of Table 2, there are striking

[17] While we know the precise variables in x_z, the formula used in obtaining the Russian poverty lines from x_z was not available. However, the fit of this semi-log specification is excellent, indeed there is near perfect prediction (Table 2), so we are clearly very close to the formula actually used.

differences in the properties of the equivalence scale consistent with the subjective welfare indicator versus that used in the objective poverty lines. The latter has an elasticity of 0.8 to household size, while the subjective indicator calls for an elasticity half this size. This explains the differences in the poverty rates between large and small households in Figure 2c. The demographic composition variables behave very differently. Most notably, due to the properties of the poverty lines, the objective welfare indicator deems pensioner households to be less poor than others ceteris paribus, while the subjective welfare indicator tells us the exact opposite.

Table 3 gives the distribution of the predicted subjective welfare (based on the estimation of the model in Table 2) against the actual. One can see a significant improvement in the degree of association; Cramer's V is 0.14 as compared to 0.10 in Table 1.

The lack of correspondence between the geographic effects is particularly striking; Figure 3 gives the regression coefficients on the geographic dummy variables for both the objective and subjective (γ_z/β) welfare indicators. While there are a number of strong geographic effects in perceptions of welfare, they bear very little relationship with the cost-of-living differences built into the objective poverty lines.

While there is support for Wrong Weights Hypothesis, income and the variables used in constructing the poverty lines still explain poorly the subjective perceptions of individuals.

4.2 Testing the Low Dimensionality Hypothesis

Next we investigate whether there are other dimensions of welfare which influence answers to the ELQ. The augmented model has the following form:

$$w = \beta \ln[y/z(x_z)] + \gamma_z x_z + \gamma_o x_o + \varepsilon \qquad (4)$$

where x_o is a vector of other variables that we hypothesize matter to self-rated economic welfare but are not in x_z. Examples include education, health, marital status, past incomes, employment and household expenditure.[18] There are possible concerns about assuming that these variables are exogenous. People with low self-rated welfare may be more likely to be divorced or less likely to think they are healthy. While noting these concerns, there is little that can be done about them while retaining a reasonably rich extended model for testing the Low Dimensionality Hypothesis.

Table 4 gives the OP estimation of this extended model. The new set of variables greatly improves the explanatory power of the model, as indicated by the doubling of pseudo R^2 to 0.25. The association between the predicted and actual ranking is stronger (Table 5). We move from Cramer's V_1=0.10 in model (1) to V_2= 0.14 in model (3) to V_3=0.20 for model (4).

The estimate of (4) shows that many variables not included in the objective income indicator have a strong influence on subjective welfare. Last year's income, and total household expenditure have positive and significant effects on subjective welfare. The source of income does not appear to matter.

Recall that the narrow subjective welfare model in Table 2 suggests a much lower elasticity of the cost function to household size than embodied in the poverty lines, which are closer to the "per capita" normalization. This no longer holds in our extended model in Table 4, though the calculation is complicated by the fact that there are multiple "income" variables. Suppose that there is an equi-proportional increase in all household incomes (at all dates) and expenditures, and that household size increases by the same proportion. Then it is readily

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[18] We include total expenditure as well as income, recognizing that there is a debate as to which of these is the more relevant "income" metric; for further discussion see Ravallion (1994).

verified from the estimates in Table 4 that subjective welfare will be virtually unchanged; more precisely, the sum of the coefficients on the logged household incomes and expenditures is 0.287, which is close to (minus one times) the coefficient on household size (Table 4). Individual income, however, matters independently of household income per capita. Subjective economic welfare clearly depends on both permanent household income per capita and individual income. The fact that we found a size elasticity well below unity in the narrow model of Table 2 appears to be attributable to the omission of this independent effect of individual income, rather than scale effects on household consumption.[19]

Among individual characteristics, middle-aged, divorced or widowed respondents put themselves on a lower rung of the ladder controlling for income and household size.[20] Gender makes no significant difference. Healthier people (by their own rating) have a higher self-evaluation of their economic welfare. Higher education raises perceived welfare. Unemployment lowers it,[21] as does the fear of unemployment for those with a job (as measured by the perceived risk of not finding other work if fired). The ownership of the durables such as car, washer, TV, and VCR has a positive effect on the subjective welfare.

Note that all these effects are conditional on incomes and other household and individual characteristics. For example, unemployment lowers self-rated welfare controlling for income. By implication, even with a very generous unemployment compensation scheme which restored

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[19] At mean individual income, the elasticity is 0.058.

[20] The turning point for the derivative with respect to household size is at 51 years.

[21] This is consistent with other evidence on the non-pecuniary costs of unemployment. See Winkelmann and Winkelmann (1998) for Germany. Oswald (1997) reviews the literature on this issue.

the individual's entire working income, unemployment would still lower subjective welfare. (Clearly this is inconsistent with claims that there are adverse effects on work incentives of unemployment compensation.) Similarly our results are consistent with the view that people care about education and health independently of their bearing on incomes (Sen, 1987).

What accounts for the geographic effects? One possibility is that they reflect perceptions of relative welfare, in that (other things constant) people in richer areas will feel relatively worse off. To test that explanation, we replaced the geographic dummy variables by the mean of the log welfare ratio in the area of residence.[22] The result is in Table 4. Consistently with the relative welfare explanation, the mean objective indicator had a negative effect on subjective welfare, and was highly significant (the variable had a coefficient of -0.189 with a t-ratio of -4.104). Furthermore there was only a small drop in pseudo R^2 to 0.237. So average objective welfare in the area of residence can account for almost all of the variance attributable to geographic effects. Other coefficients and standard errors are affected little.

However, these results do not suggest that only relative income matters. Suppose that all incomes and expenditures increase by the same proportion. Subjective welfare will still increase; the combined effect of a one percent increase in current and past household incomes, household expenditure and individual income (at sample mean) is 0.345, versus -0.189 for income in the area of residence. So, while relative income in the area of residence clearly matters, it is only one factor; absolute income also matters to subjective economic welfare.

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[22] We also tried the log of the mean, but this made almost no difference. We also tried including the difference between the log of the mean and the mean of the log to test for effects of inequality, but this variable was highly insignificant.

5. Conclusions

It is known that the objective measures of economic welfare widely used by economists, such as real income per equivalent single adult, are under-identified from consumer demand behavior. Thus conventional assessments of whether one person is better off than another, or has gained from a policy change, may disagree with peoples' own assessments.

Using an integrated survey for Russia in 1996 we have studied the determinants of self-rated economic welfare, and the relationship with more conventional objective measures. We find that Russian adults with higher family income per equivalent adult are also less likely to place themselves on the poorest rungs of a subjective ladder of economic welfare from "poor" to "rich", and (at least amongst the objectively non-poor by Russian standards) they are more likely to place themselves on the upper rungs.

However, measured household incomes cannot account well for self-reported assessments of whether one is "poor" or 'rich". The discrepancy between objective and subjective indicators of economic welfare is due in part to the weighting of the demographic and geographic variables that go into the Russian poverty lines used for assessing differences in needs at a given income. If we re-weight these variables to accord with the subjective indicator then the power of the objective welfare measure in explaining the variance in subjective economic welfare goes up substantially. Nonetheless, we still find that the bulk of the differences between people in their survey responses about their perceived economic welfare are left un-explained.

It is clear that the information normally incorporated into assessments of who is "poor" have rather limited explanatory power for the subjective assessments we have studied here. When we expand the set of variables to include incomes at different dates, expenditures, and

educational attainments, health status, employment and average income in the area of residence we can double the explanatory power. Healthier and better educated adults with jobs perceive themselves to be better off controlling for their incomes. The unemployed judge their economic welfare to be lower, even with full income replacement. Individual income matters independently of household income per capita (and it is this fact which appears to account for why subjective welfare is more elastic to household income than to household size, rather than scale effects in consumption). Relative income clearly also matters, in that living in a richer area lowers perceived economic welfare, controlling for own income and other characteristics.

So while our results confirm that even narrowly measured income gains raise subjective perceptions of economic welfare, they also suggest that the ways in which poverty is conventionally measured – the equivalence scales, regional cost-of-living deflators and so on – do not accord well with subjective perceptions of who is "poor". Indeed, economists should not expect to be able to predict well peoples' own perceptions of their economic welfare from even a quite broad set of conventional objective socio-economic data. Idiosyncratic and possibly transient differences in respondent's "moods" may well account for some of the unexplained differences in self-rated welfare found in our data. For certain purposes, including assessments of welfare impacts of policies and of overall social progress, one may choose to discount such differences. However, the systematic inconsistencies between a conventional objective measure and self-rated assessments suggest that greater caution is needed in the interpretations that economists and others routinely give to conventional metrics of welfare.

Appendix: The Aldrich-Nelson Pseudo-R^2

McFadden's (1974) pseudo-R^2 is widely used for probits and ordered probits and is programmed in packages such as STATA. If L_u is the log-likelihood value of the unrestricted discrete dependent variable model and L_r is the log-likelihood value if the non-intercept coefficients are restricted to zero then the McFadden pseudo-R^2 is

$$R_M^2 = \frac{L_u - L_r}{L_r}$$

Veall and Zimmerman (1996) show that for the discrete dependent variable models with more than three categories the McFadden's pseudo-R^2 is biased downward and the bias worsens with as the number of categories increases. To correct this, Veall and Zimmerman suggest different measures. One of the best measures according to Monte-Carlo simulations is the normalized Aldrich and Nelson (1990) R^2:

$$R_{AN}^2 = \frac{R_M^2}{\left[\frac{L_u}{(L_r - N/2)} - 1\right]}$$

This an upper bound of one whenever the observed dependent variable is discrete.

The bias in the standard pseudo-R^2 appears to be large in our application. The standard R^2 for the subjective welfare measure in Table 1 is 0.027 (versus 0.111 using the Normalized Aldrich-Nelson measure); for the extended model it is 0.067 (versus 0.241).

References

Agresti, A. (1984) *Analysis of Ordinal Categorical Data.* New York: John Wiley and Sons.

Aldrich, J., and Nelson, F., (1984) *Linear Probability, Logit, and Probit Models,* Sage University Press.

Argyle, M. (1987) *The Psychology of Happiness*, London: Methuen.

Blackorby, C., and D. Donaldson (1987) "Welfare Ratios and Distributionally Sensitive Cost-Benefit Analysis", *Journal of Public Economics* 34: 265-290.

Blundell, Richard and Arthur Lewbel (1991) "The Information Content of Equivalence Scales", *Journal of Econometrics* 50: 49-68.

Browning, Martin (1992) "Children and Household Economic Behavior", *Journal of Economic Literature* 30: 1434-1475.

Cantril, H. (1965) *The Pattern of Human Concern.* New Brunswick: Rutgers University Press.

Costa, P., and R.R. McCrae (1980) "Influence and Extroversion and Neuroticism on Subjective Well-Being: Happy and Unhappy People", *Journal of Personality and Social Psychology* 38: 668-678.

Deaton, Angus, and John Muellbauer (1980) *Economics and Consumer Behavior*, Cambridge: Cambridge University Press.

Diener, Ed (1994) "Assessing Subjective Well-Being: Progress and Opportunities", *Social Indicators Research* 31: 103-157.

Diener, Ed, Eunkook Suh and Shigehiro Oishi (1997) "Recent Findings on Subjective Well-Being", *Indian Journal of Clinical Psychology*, forthcoming.

Easterlin, Richard A., (1974) "Does Economic Growth Improve the Human Lot? Some Empirical Evidence", in P.A. David and M.W. Rider (eds) Nations and Households in Economic Growth. Essays in Honor of Moses Abramovitz. New York: Academic Press.

_____(1995) "Will Raising the Incomes of all Increase the Happiness of all?" *Journal of Economic Behavior and Organization* 27: 35-47.

Frank, Robert H. (1997) "The Frame of Reference as a Public Good", *Economic Journal* 107: 1832-1847.

Fredrickson, B.L., and D. Kahneman (1993) "Duration Neglect in Retrospective Evaluation of Affective Episodes", *Journal of Personality and Social Psychology* 65: 45-55.

Frijters, P., and van Praag Bernard.M.S. (1997) "Estimates of poverty ratios and equivalence scales for Russia and parts of the former USSR," mimeo, University of Amsterdam.

Furnham, Adrian and Michael Argyle (1998) *The Psychology of Money*, London: Routledge.

Kahneman, Daniel and Carol Varey (1991), "Notes on the Psychology of Utility". In Jon Elster and John E. Roemer (eds) *Interpersonal Comparisons of Well-Being*, Cambridge: Cambridge University Press.

Kapteyn, Arie, Peter Kooreman, and Rob Willemse (1988) "Some Methodological Issues in the Implementation of Subjective Poverty Definitions", *The Journal of Human Resources* 23: 222-242.

Kapteyn, Arie (1994) "The Measurement of Household Cost Functions. Revealed Preference Versus Subjective Measures", *Journal of Population Economics* 7: 333-350.

Lanjouw, Peter, Branko Milanovic and Stefano Paternostro (1998) "Poverty in the Transition Economies: A Case of Children Pitted Against the Elderly?", mimeo, Development

Research Group, World Bank.

Lanjouw, Peter, and Martin Ravallion (1995) "Poverty and Household Size", *Economic Journal* 105: 1415-1434.

Lokshin, Michael and Barry M. Popkin (1998) "The Emerging Underclass in the Russian Federation", mimeo, Carolina Population Center, University of North Carolina at Chapel Hill.

Mangahas, Mahar (1995) "Self-Rated Poverty in the Philippines, 1981-1992", *International Journal of Public Opinion Research* 7: 40-55.

McFadden, Daniel (1974) "Conditional Logit Analysis of Qualitative Choice Behavior", in P. Zarembka (ed) *Frontiers in Econometrics*, New York: Academic Press.

Nelson, J.A., (1993) "Household Equivalence Scales. Theory versus Policy?", *Journal of Labor Economics* 11: 471-493.

Oswald, A.J., (1997) "Happiness and Economic Performance", *Economic Journal* 107: 1815-1831.

Plug, Erik, (1997), *Leyden Welfare and Beyond*, Tinbergen Institute Research Series, University of Amsterdam.

Pollak, Robert, (1991) "Welfare Comparisons and Situation Comparisons", *Journal of Econometrics* 50: 31-48.

Pollak, Robert, and Wales, T., (1979) "Welfare Comparison and Equivalence Scale." *American Economic Review* 69(2): 216-21.

Popkin, Barry, Baturin, A., Mozhina, M., and Mroz, T., with assistance of Safronova, A., Dmintrichev, I., E. Glinskaya, Lokshin,M., (1995) "The Russian Federation Subsistence

Level: the Development of Regional Food Basket and Other Methodological improvements" Report to the World Bank and Ministry of Labor and Ministry of Social Protection Paper, Russian Federation" (Chapel Hill: Carolina Population Center, The University of North Carolina).

Popkin, Barry M., Marina Mozhina, and Alexander K. Baturin, (1992) "The Development of a Subsistence Income Level in the Russian Federation" (Chapel Hill: Carolina Population Center, The University of North Carolina).

Pradhan, Menno and Martin Ravallion, (1997) "Measuring Poverty Using Qualitative Perceptions of Welfare", Policy Research Working Paper, World Bank.

Ravallion, Martin (1994) *Poverty Comparisons* Fundamentals of Pure and Applied Economics Volume 56, Harwood Academic Press, Chur, Switzerland.

Runciman, W.G., (1966) *Relative Deprivation and Social Justice*. Routledge and Kegan Paul.

Sen, Amartya (1987) *The Standard of Living*. Cambridge: Cambridge University Press.

Scitovsky, Tibor (1978) *The Joyless Economy. An Inquiry into Human Satisfaction and Consumer Dissatisfaction.* Oxford: Oxford University Press.

Simon, Julian L. (1974) "Interpersonal Welfare Comparisons Can be Made - And Used for Redistribution Decisions", *Kyklos* 27: 63-98.

van de Stadt, Huib, Arie Kapteyn, and Sara van de Geer (1985) "The relativity of utility: Evidence from panel data", *Review of Economics and Statistics* 67: 179-187.

Van Praag, Bernard M.S. (1968) *Individual Welfare Functions and Consumer Behavior*, Amsterdam: North-Holland.

_____ (1971) "The welfare function of income in Belgium: An empirical

investigation." *European Economic Review*, 2: 337-69.

_____(1988) "Empirical Uses of Subjective Measures of Well-Being", *Journal of Human Resources* 32(2): 193-210.

_____(1991) "Ordinal and Cardinal Utility: An Integration of the Two Dimensions of the Welfare Concept", *Journal of Econometrics* 50: 69-89.

Veall, M., and Zimmerman, K., (1996) "Pseudo-R^2 measures for some common limited dependent variable models," *Journal of Economic Surveys*, Vol.10, No. 3:241-259.

Veenhoven, Ruut, with the assistance of Joop Ehrhardt, Monica Sie Dhian Ho and Astrid de Vries (1993) *Happiness in Nations: Subjective Perceptions of Life in 56 Nations 1946-1992*, Erasmus University, Rotterdam.

Winkelmann, Liliana and Rainer Winkelmann (1998) "Why Are the Unemployed So Unhappy" Evidence from Panel Data", *Economica*, 65: 1-15.

Table 1: Comparison of subjective and objective welfare indicators for Russia

	Subjective rank							
Adjusted household income rank	1	2	3	4	5	6	7+	Total
1	224	180	196	196	156	34	7	993
2	204	234	279	208	192	28	26	1171
3	244	287	405	332	306	65	35	1674
4	164	245	362	349	325	68	19	1532
5	126	194	340	352	400	90	28	1530
6	25	22	67	72	98	25	18	327
7+	6	9	25	23	53	17	17	150
Total	993	1171	1674	1532	1530	327	150	7377

Note: Cramer's V = 0.0991; Chi-square = 434 (significant at prob<0.0005).

Table 2: Comparison of the weights on the variables used to construct the poverty lines

	Subjective welfare indicator				Objective welfare indicator	
	(1) Ordered probit		(2) γ_z/β		(3) OLS	
	Coefficient	St. Error	Ratio	St. Error	Coefficient	St. Error
Log of total household income	0.223	*0.012*	1.000	*0.000*	1.000	*0.000*
Log of household size	-0.094	*0.034*	-0.420	*0.148*	-0.802	*0.001*
Household composition variables						
Proportion of small children	0.571	*0.112*	2.558	*0.512*	-0.048	*0.003*
Proportion of older children	0.492	*0.077*	2.205	*0.363*	-0.387	*0.002*
Proportion of adult men	0.266	*0.064*	1.193	*0.299*	-0.620	*0.001*
Proportion of adult women	0.363	*0.060*	1.624	*0.293*	-0.368	*0.001*
Proportion of pensioners			*Reference*			
Month of interview dummies						
Month 1			*Reference*			
Month 2	0.030	*0.032*	0.133	*0.145*	-0.012	*0.001*
Month 3	0.116	*0.055*	0.521	*0.247*	-0.025	*0.001*
Geographic dummies						
Territory 1			*Reference*			
Territory 2	-0.287	*0.095*	-1.287	*0.443*	0.048	*0.002*
Territory 3	0.018	*0.091*	0.082	*0.409*	-0.176	*0.002*
Territory 4	-0.003	*0.068*	-0.015	*0.302*	-0.001	*0.002*
Territory 5	0.006	*0.062*	0.026	*0.279*	0.145	*0.001*
Territory 6	0.124	*0.068*	0.556	*0.299*	0.202	*0.002*
Territory 7	0.109	*0.064*	0.487	*0.280*	0.035	*0.001*
Territory 8	0.314	*0.062*	1.405	*0.272*	0.153	*0.001*
Territory 9	0.160	*0.073*	0.718	*0.321*	0.163	*0.002*
Territory 10	0.145	*0.069*	0.648	*0.311*	-0.023	*0.002*
Territory 11	0.079	*0.075*	0.352	*0.336*	0.013	*0.002*
Territory 12	0.045	*0.075*	0.202	*0.334*	0.011	*0.002*
Territory 13	0.142	*0.065*	0.638	*0.292*	-0.098	*0.001*
Territory 14	0.310	*0.073*	1.388	*0.325*	-0.397	*0.002*
Constant					-12.235	*0.001*

	Ancillary parameters		
c_1	2.210	*0.178*	
c_2	2.803	*0.179*	
c_3	3.432	*0.180*	
c_4	4.015	*0.180*	
c_5	4.966	*0.182*	
c_6	5.520	*0.185*	
Pseudo-R^2	0.111		
R^2 (for poverty lines)			0.983

Note: 7377 observations.

Table 3: Comparison of re-weighted objective indicator with the subjective indicator

	Subjective rank							
Re-weighted rank based on Table 3	1	2	3	4	5	6	7+	Total
1	271	223	222	149	108	18	2	993
2	211	270	276	202	190	12	10	1171
3	231	285	413	323	331	56	35	1674
4	162	215	376	360	310	79	30	1532
5	96	151	310	388	425	116	44	1530
6	15	23	56	83	113	27	10	327
7+	7	4	21	27	53	19	19	150
Total	993	1171	1674	1532	1530	327	150	7377

Note: Cramer's V = 0.1376; Chi-square = 836 (significant at prob<0.0005).

Table 4: An extended model of the subjective welfare indicator

	Coefficient	St. Error	Coefficient	St. Error
Household income				
Log of total household income, round 7	0.104***	0.017	0.089***	0.018
Log of total household income, round 6	0.070***	0.017	0.051**	0.017
Log of total household income, round 5	0.026	0.020	0.019	0.019
Coefficient of variation in 3-year income (x100)	0.044	0.050	0.045	0.050
Wages from government enterprises	0.034	0.151	-0.145	0.154
Wages from private enterprises	0.061	0.157	-0.150	0.159
Wages from foreign enterprises	0.046	0.158	-0.117	0.160
Income from rent	-1.263*	0.670	-1.259*	0.671
Investment	0.395	0.306	0.186	0.308
Income from home production	0.062	0.153	-0.102	0.155
Other income sources	-0.121	0.154	-0.281	0.157
Government subsidies (pensions, etc.)	-0.141	0.153	-0.310	0.156
Household consumption				
Total household expenditure (x10000)	0.123***	0.022	0.112***	0.021
Share of household non-food expenditure	0.230***	0.075	0.170**	0.074
Household characteristics				
Log of household size	-0.256***	0.043	-0.266***	0.043
Proportion of small children	0.019	0.148	0.049	0.147
Proportion of big children	0.045	0.104	0.071	0.103
Proportion of adult men	-0.317***	0.087	-0.303***	0.087
Proportion of adult women	-0.104	0.083	-0.066	0.083
Proportion of pensioners	*Reference*			
Highest household educational level (University)	-0.095**	0.044	-0.088**	0.044
Households with non-university highest level	*Reference*			
Individual characteristics				
Individual income (/10000)	0.283***	0.046	0.292***	0.045
Age (x10)	-0.499***	0.054	-0.499***	0.054
Age squared (x100)	0.049***	0.059	0.049***	0.059
Male	0.018	0.032	0.016	0.032
Female	*Reference*			
Single	*Reference*			
Married	0.081*	0.051	0.096*	0.051
Divorced	-0.161**	0.069	-0.165**	0.068
Widowed	-0.204**	0.071	-0.193**	0.071
Has job	0.089	0.076	0.083	0.076
Uncertain of finding a job in case of unemployment	-0.167***	0.038	-0.166***	0.038

Table 4 (continued):

	Coefficient	St. Error	Coefficient	St. Error
Self-evaluation of health				
Very good	*Reference*			
Good	-0.218*	0.112	-0.257*	0.112
Normal	-0.358***	0.113	-0.414***	0.112
Bad	-0.610***	0.119	-0.657***	0.118
Very bad	-0.880***	0.147	-0.921***	0.146
Education				
High school	-0.143**	0.059	-0.126**	0.059
Technical/Vocational	-0.068	0.057	-0.057	0.057
University	*Reference*			
Occupation				
Officials managers	0.316**	0.182	0.345**	0.181
Professionals	0.066	0.087	0.072	0.086
Technicians and assistant profession	0.143**	0.085	0.137**	0.084
Clerks	-0.008	0.099	-0.019	0.099
Service, shop, market worker	-0.035	0.095	-0.009	0.094
Skilled agricultural and fishery	0.381*	0.233	0.353*	0.233
Craft and related work	0.021	0.083	0.016	0.082
Plant machinery operation assembly	-0.052	0.083	-0.073	0.082
Manual labor	-0.026	0.087	-0.030	0.086
Armed force	-0.367**	0.175	-0.392	0.175
Unemployed	-0.226***	0.064	-0.229***	0.063
Month 1	*Reference*			
Month 2	0.012	0.036	0.014	0.035
Month 3	0.096	0.063	0.108	0.061
Geographic variables				
Territory 1	*Reference*			
Territory 2	-0.149	0.106		
Territory 3	0.151	0.102		
Territory 4	0.083	0.077		
Territory 5	0.238***	0.072		
Territory 6	0.384***	0.078		
Territory 7	0.372***	0.074		
Territory 8	0.472***	0.072		
Territory 9	0.357***	0.084		
Territory 10	0.277***	0.079		

Table 4 (continued):

	Coefficient	St. Error	Coefficient	St. Error
Territory 11	0.257***	0.086		
Territory 12	0.264***	0.086		
Territory 13	0.137*	0.075		
Territory 14	0.332***	0.084		
Mean log of income in the territory			-0.189***	0.046
Assets and durables				
Car or truck	0.150***	0.033	0.148***	0.033
Summer house	-0.034	0.041	-0.023	0.041
House	-0.042	0.038	-0.012	0.038
Freezer	0.129**	0.057	0.107**	0.054
Refrigerator	0.033	0.064	0.004	0.064
Washer	0.180***	0.039	0.175***	0.038
TV B/W	0.092**	0.032	0.083**	0.032
TV Color	0.177***	0.041	0.175***	0.041
VCR	0.253***	0.035	0.228***	0.034
Ancillary parameters				
α_1	0.450	0.441	0.282	0.421
α_2	1.102	0.441	0.930	0.421
α_3	1.787	0.442	1.611	0.422
α_4	2.425	0.442	2.246	0.422
α_5	3.455	0.443	3.271	0.423
α_6	4.047	0.444	3.859	0.424
Pseudo-R^2	0.241		0.237	

Note: * is significant at 10% level; ** is significant at 5% level; *** is significant at 1% level. 6256 observations. Individual income is not logged, because there are many zeros. The mean individual income is 1966 rubbles per month (3182 if calculated only on positive incomes).

Table 5: Comparison of actual and predicted subjective economic welfare from Table 4

Rank based on predicted values based on Table 5	Subjective rank 1	2	3	4	5	6	7+	Total
1	311	247	152	75	56	5	3	849
2	207	216	284	163	131	14	3	1018
3	164	248	412	310	253	30	15	1432
4	111	188	310	333	292	56	20	1310
5	54	104	226	340	398	93	50	1265
6	2	11	39	69	86	39	16	262
7+	0	4	9	20	49	25	13	120
Total	849	1018	1432	1310	1265	262	120	6256

Note: Cramer's V = 0.2009; Chi-square = 1558 (significant at prob<0.0005).

Figure 1: Subjective Poverty and Affluence Against the Objective Welfare Indicator

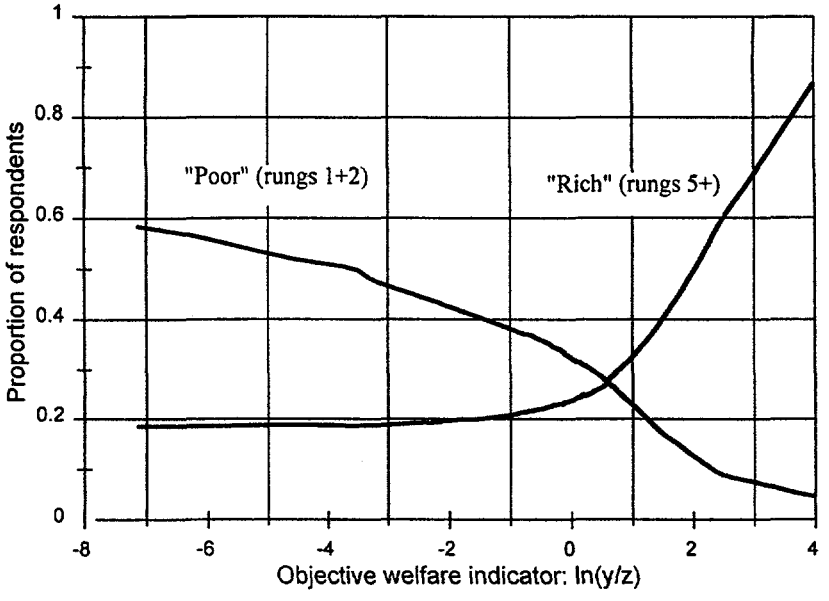


Figure 2a: Poverty and Household Size

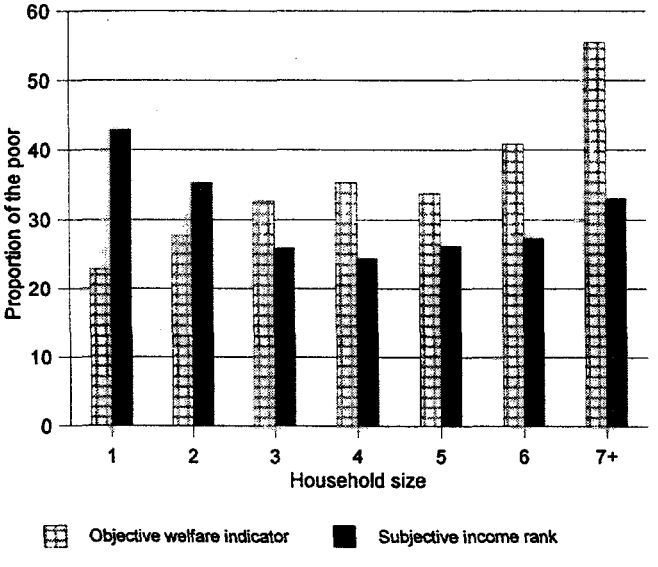


Figure 2b: Poverty and Type of Household

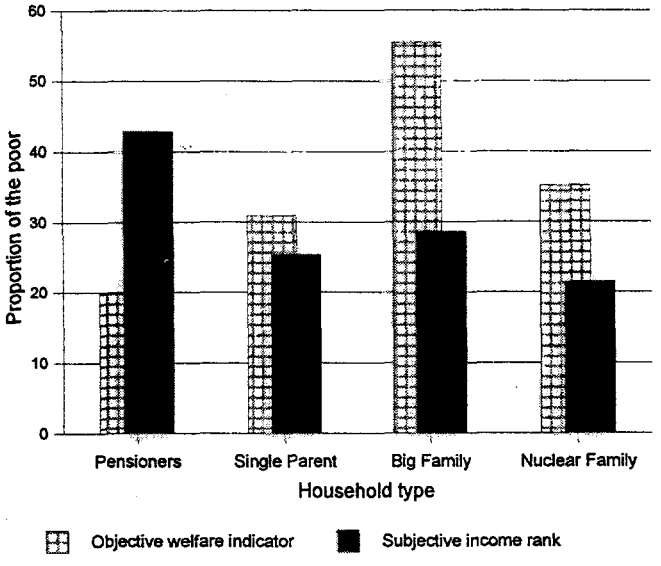


Figure 2c: Poverty and Age

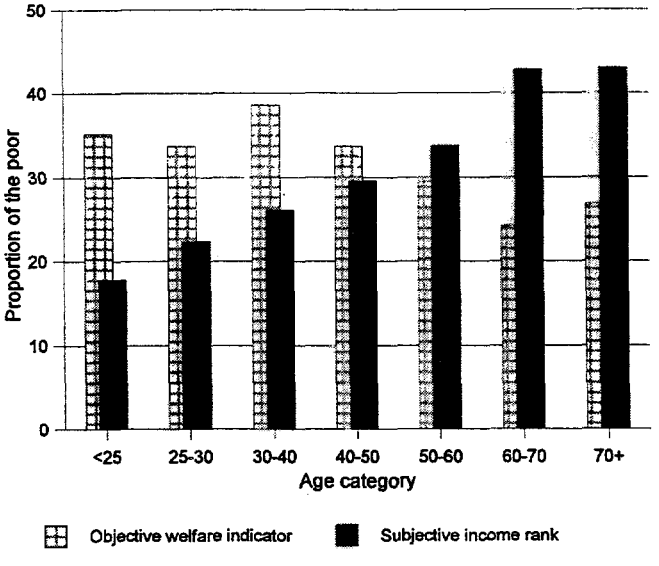


Figure 2d: Poverty and Education

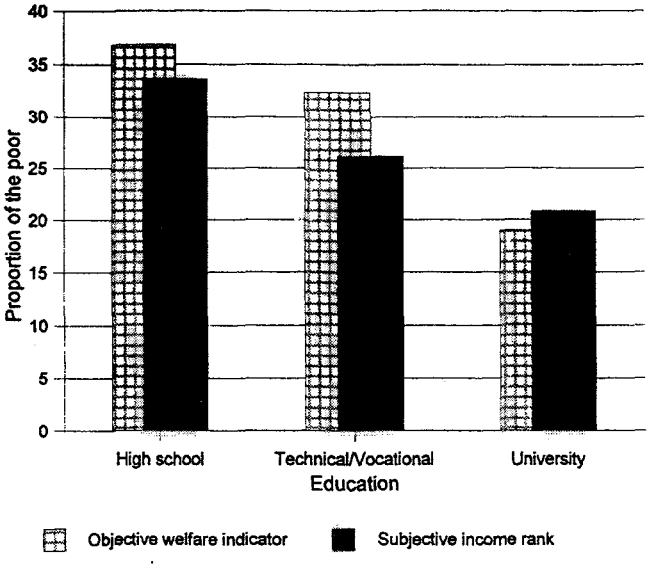
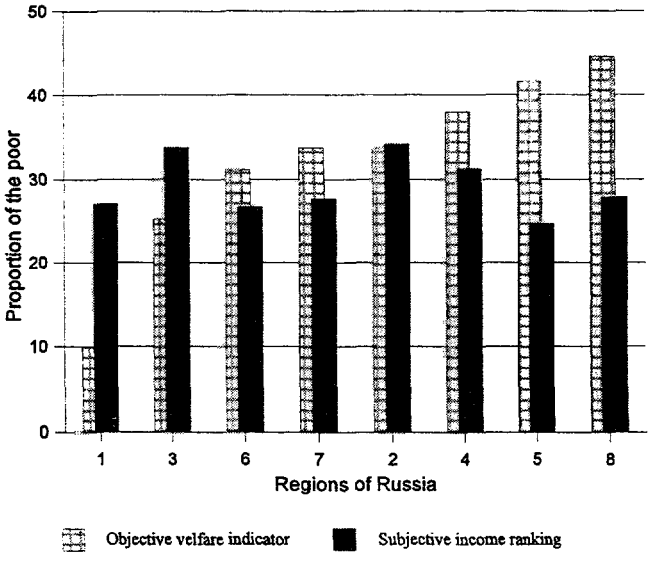
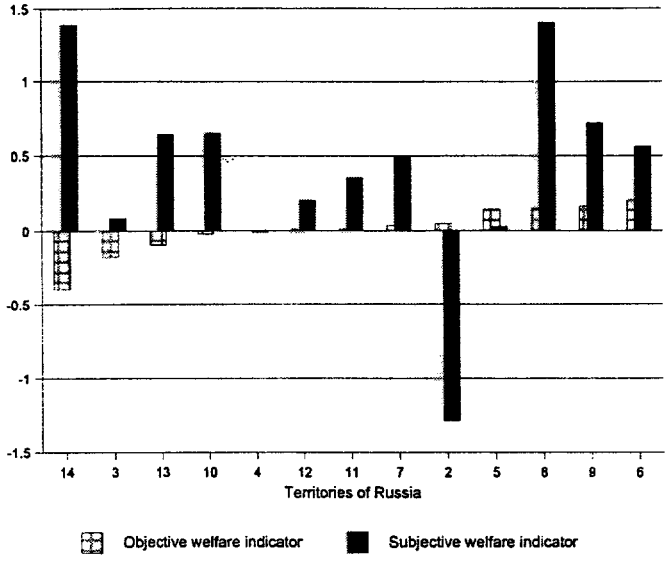


Figure 2e: Poverty by Region



Regions of Russia: 1-Moscow and Saint Petersburg; 2-Northern & North Western; 3-Central & Central Chernozem; 4-Volgo-Vyatskiy; 5-North Caucasian; 6-Ural; 7-Western Siberian; 8-Eastern Siberian;

Figure 3: Regression Coefficients on Geographic Dummy Variables



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