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Do we know how relatively rich are we? Actual and perceived place in the income distribution¹

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1. Introduction

Inequality has recently become a very hot topic in both agendas - the academic and the political ones. Many theories in economics and political science suggest that various dimensions of human behavior are effectively shaped by income inequality. The famous Meltzer-Richard median voter model predicts that a wide gap between median and mean incomes is likely to raise support for redistribution while politicians cannot ignore these claims [Meltzer and Richard, 1981]. Those who are poorer may expect some gain from the redistribution from the rich and, therefore, are eager to vote for such policies. This logic assumes implicitly that individuals have correct estimates of inequality in general and know their own location in the income distribution relative to the median and to the mean, in particular. However, there are many reasons to believe why the association between inequality and behavioral outcomes may not hold at all in reality or be quite weak. Among the candidates to explain this are prospects for upward mobility (Benabou and OK 2001; Alesina and La Ferrara 2005; Ravallion and Lokshin 2001), ideology (Alesina and Fuchs-Schondeln 2007), representations about fairness in the income distribution (Alesina and Angeletos 2005), belief in the just world (Benabou and Tirole 2006).

An alternative way to reconcile the gap between the theoretic expectations and the observed behavior is to assume that ordinary individuals tend to misperceive how the actual income distribution in their country looks like. They may have incorrect understanding of how incomes are distributed across population and what is their own actual place in this distribution. They may know little about both and believe strongly that they are either much poorer or much richer in relative terms than they are in fact. As a result of these distortions, perceptions of inequality can emerge as better predictors of observed behavior than the actual

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inequality as measured by special sophisticated statistical indexes (Niehues 2014; Gimpelson and Treisman, 2018; Kuhn 2011; Kuhn 2015).

Experimental studies contribute as well to our understanding of how the true knowledge about inequality may alter people's attitudes. In such studies, a random subsample of respondents gets informational treatment that allows them either to acquire knowledge of "true" inequality in the society or to correctly place themselves in the income distribution (Cruces et al. 2013; Kuziemko et al. 2015; Karadja et al. 2016; Bublitz 2017 among others).

As Bublitz (2017) shows, individuals in Russia and Germany, who had negative perception bias of their income distribution placement but then learned their true position due to special informational treatment, are likely to demand less redistribution compared to those in non-treated control group. Cruces et al (2013) provide evidence for Argentina suggesting that those who overestimated their relative position tend to demand higher levels of redistribution when they are informed of their true ranking. Kuziemko et al. (2015) provide respondents with information about income inequality and find that it seriously affects whether inequality is viewed as a pressing problem but only slightly affects individuals' support for government intervention with regard to the distribution of income. Karadja et al., (2016) finds that in Sweden individuals, who learned that they are better-off than they have previously thought, weaken their redistributive demands.

The extent individuals know how their income and wealth compare to others' in the society has implications to many other aspects of people's behavior, attitudes and aspirations. Recent research shows correlations of perceived inequality with attitudes like life satisfaction (see a review of evidence in Clark and D'Ambrosio 2015) and generalized trust (Hu 2017) and behavior patterns like participation in political protests (Justino, Martorano 2016).

Many studies show that the majority of individuals misperceive income differentiation (see a review of evidence in the section 2.2). Though the extent and even the sign of misperception bias remain unclear in many cases. There exist a few approaches for measuring subjective (views on) inequality but they lead often to conflicting results. Though the fact of misperception is becoming a kind of stylized fact, why the gap between subjective and objective measures of inequality emerges and how it varies across and within countries remain almost uncharted territory.

Our paper contributes to the literature on how perceptions of economic reality are shaped. We look closely at individuals' perception of welfare distribution through their subjective place in this distribution. As many previous studies did, we find systematic biases in

individual beliefs: people think they are poorer than they actually are. Further, we try to explain this divergence (between perceived and actual place in the welfare distribution) exploiting a rich set of socio-demographic and economic characteristics.

Recently, the issue of inequality (mis)perception and its association with the actual inequality has drawn growing scholarly attention. Most of the studies rely on multi-country surveys which allow explore cross-country differences but include usually a very limited set of explanatory variables. One-country studies, in their turn, hold institutions and culture constant but can benefit from using a larger set of explanatory characteristics. For this end, we exploit the RLMS-HSE – a very rich data set which includes questions that allow identify not only perceived and actual locations but also many other individual and contextual parameters.

Russia can be an interesting country to explore these issues due to a number of reasons. The first one is substantive. Russia is considered a very unequal country (Novokmet et al 2017). High income polarization is often expected to lead to either pro-populist policies, or to make the state captured by a few top income and wealth owners what may give a way to pro-oligarchic policies.

The second reason is data-driven. We have representative microdata allowing explore perceptions of inequality with an explicit link to the actual distribution of income. To the best of our knowledge, these simultaneous measurements for other countries are rare (except the 3d wave of the cross-country EBRD's Life in Transition Survey (LiTS) which has small country samples and limited number of variables).

There are several approaches to measure perception bias (as the divergence between perceptions of inequality and actual inequality as the latter is objectively measured). Our approach in this paper is to exploit the question asking respondents to self-locate on the income scale by choosing the particular decile in the distribution to which they belong. Comparing self-placement and actual location one can estimate the scale of misperception - how large is the difference (the distance) between perceived and actual income positions and what factors can explain this divergence, if they diverge.

The paper raises and seeks to answer two interconnected questions:

1. How individuals see their place in the income distribution and how this perception differs from the reality?

2. What shapes the misperception?

If the first question has already been raised and partially answered, the second question got less attention in the literature and is still waiting to be explored. Among potential explanatory factors we consider various socio-demographic characteristics (age, gender, education, marital status, health and characteristics of the place of residence), household's actual economic status now, in the past and prospects for the future and access to information measured by internet access. We also explore the relation of the mismatch with other subjective characteristics, such as life satisfaction and satisfaction with economic conditions.

The paper consists of 7 sections and is structured as the following. In the next section we review the relevant literature and describe previous findings. In Section 3 we present our empirical data and define main variables. Section 4 provides descriptive evidence of welfare distribution placement misperceptions in Russia. Sections 5 and 6 address associations between individuals and contextual characteristics and the existing misperceptions. Finally, we draw conclusions from our research.

2. Literature overview

2.1. Measuring misperception

There is a growing psychological, sociological and economic research literature that explores how individuals perceive various economic subjects like poverty, inflation, unemployment, tax rates, and corruption. Subjective perception of inequality has also recently gained scholarly attention. Deciphering individual inequality perceptions is not an easy matter and there are a few methodological approaches for doing it.

Niehues (2014) in her very influential paper explores perceptions of inequality in 23 European countries plus the US using data from the International Social Science Program (ISSP 2009). This survey offers to respondents visual images for various types of income differentiation and asks them to choose one that better resembles differentiation in their country - the so called "type of society" question. In a similar manner, Page and Goldstein (2016) ask respondents to specify the income distribution using for that an interactive graphical tool.

A number of studies try to reconstruct Gini-like measures of inequality from subjective answers of survey respondents to various questions or from visual representations of income distributions (Niehues 2014; Gimpelson and Treisman 2018). Then these “subjective” or perceived Ginis can be confronted with “objective” ones which are estimated from the representative household survey or registry data. This approach is very fruitful though faces serious limitations. First, visual images of this sort allow multiple interpretations and require strong assumptions in order to be converted into Gini-like measures. Second, the Gini measure characterizes the distribution in a community (country, region, etc) and is useful for cross-country or cross-regional studies but has limited use in one-country study. Third, group level measures are exposed to mismeasurement due to statistical data quality issues and individual responses are subject to misunderstanding. Therefore, if the perception bias equals to difference between two measures, both parts of the equation are not error free. Another approach to recover individuals’ perception of income distribution relies on respondents’ views on actual wages in a number of specific occupations that stand along the whole wage distribution - from unskilled worker to chairman of a large national company (see Osberg and Smeeding 2006, Kuhn 2011, Kuhn 2015, Osberg and Bechert 2016). The answers can be converted into subjective inequality measures like the perceived ratio of high-income to low-income occupations or a subjective Gini coefficient.

Respondents can be asked directly about different attributes of wealth or income distribution. For example, they can be asked about fraction of wealth (income) owned (earned) by each quintile of the distribution as done by Norton and Ariely (2011); or about average wealth or income of households in each quintile as in Eriksson and Simpson (2012); or to guess the cut-offs of quintiles (Chambers et al. 2014); or to guess a share of population that falls between certain cut-offs as in (Chambers et al. 2014). These reconstructed subjective inequality measures can be confronted with actual inequality measures but at the country (or regional) level only.

Finally, to recover the perceived income distribution one can ask survey respondents to mark which income decile they belong. By definition, each decile contains 10% of the population and the deviation from this flat distribution is a potential measure of misperception (Gimpelson and Treisman 2018). The location received in this way can be also compared with the actual location estimated with objective income data from the same survey if such information is available. Another version of the same approach is to ask respondents what percentage of households (or individuals) in their country earns less than they do (or earns

more than they). These percentages can be then converted into perceived income distribution (this is applied in: Cruses et al 2013; Fernandez-Albertoz and Kuo 2015; Bublitz 2017).

Some scholars who explored the relation between objective and subjective economic standing have been looking at the divergence between the answers to the so-called “Economic ladder question” (ELQ) and objective income or consumption distributions. ELQ does not allocate respondents across percentiles and gives only relative ranking.

Answering the ELQ does not imply that people form their images of being rich or being poor comparing themselves to the whole society. The research (e.g. [Clark and Senik 2010]) actually shows that people compare their income to friends, colleagues and family and much rarer to “others”. Moreover, reference group varies with a bunch of factors including actual income and socio-demographic characteristics. Thus, to compare ones’ subjective socio-economic standing to her relative position in actual income distribution the researcher should make respondents to compare themselves to country population and not to any kind of internal reference. While in the ELQ case the reference-framing bias can be interpreted as an additional factor that contributes to formation of subjective socio-economic status, the existence of such effect in case of direct question on decile placement should be interpreted as a cognitive bias. While there is some correlation between relative subjective standing and objective measures like household per capita income, there is little correspondence between the two, when subjective placement is related to income decile (see Ravallion and Lokshin 1999, Ravallion and Lokshin 2001).

All inequality related studies suggest that its perceptions significantly diverge from the reality as the latter is measured statistically, though particular estimation method can matter. As one can see below, researchers get conflicting results even for one single country when applying different methodologies to measure subjective views on inequality.

Using different measures and presenting multiple evidence of widespread inequality misperception, Gimpelson and Treisman (2018) argue that ordinary individuals have incorrect understanding of how income distribution in their countries look like, in which part of the distribution respondents themselves are and how inequality changes over time. The fact that citizens tend to believe that they belong to middle-income groups, though they are in reality much richer or poorer, emerges from a number of cross-country surveys and one country case studies.

Niehues (2014) compares the perceived inequality profiles from the type-of-society question with those reconstructed from actual disposable income distributions and concludes

that in most countries people tend to overestimate the extent of inequality. When the visual images are converted into Gini coefficients the correlation with actual Gini is rather low - 0.37 as calculated by Gimpelson and Treisman (2018).

Norton and Ariely (2011) find that in the United States respondents systematically underestimate wealth inequality when asked about shares of wealth owned by each quintile thinking that 56% of wealth was held by the richest quintile while the true percentage was 84%. However, when Eriksson and Simpson (2012) reformulated the survey question for asking about average wealth of households in each quintile, respondents turned out to overestimate the top-to-bottom ratio dramatically. Chambers et. al. (2014) also find that Americans tend to overestimate the gap between the top 20 percent and the bottom 20 percent of population. With regards to incomes, Page and Goldstein (2016) find that respondents in the USA overestimate the average household incomes and underestimate the extent of inequality (lower interquartile range and lower Gini coefficient) of household incomes in their country.

Bublitz (2017) looking at inequality misperceptions in six countries (Brazil, France, Germany, Russia, Spain, and the United States) asks the question: “what is the share of individuals with a lower income than yours”. She finds that only in Brazil respondents have on average positive bias in defining their income position. Largest negative biases are observed in Russia and Germany.

It is not surprising that individuals are typically not able to place themselves correctly in country’s income or wealth distribution. Research shows that they fail to correctly place themselves in income distribution even within small communities. Clark and Senik (2014) in their study of Chinese villages show that answering the question “Within your village what socioeconomic level does your family’s income place you?” with answers on a five-point scale from “Much below average” to “Much higher than average” “less than ten percent of respondents consider themselves to be above the average”.

2.2. Explaining misperception

While there is a considerable body of evidence documenting divergence between subjective and objective measures of inequality, how these deviations are shaped and how they vary across population remains understudied. Following Gimpelson and Treisman (2018) we can advance a few hypotheses about the divergence generating process. Below we review shortly available research evidence.

One of the hypotheses links perceptions to reference group, or to the social environment within which individuals live and shape their more general world views. They compare themselves to others – to those who are close and visible – friends, relatives, neighbors. Knell and Stix (2017) note two types of biases that can emerge. Either individuals perceive only a limited part of the income distribution around their own position or they consider the entire distribution but “put more weight on income levels close to their own position”. Hadavand (2017) suggests that subjective-objective gap would be smaller if the objective distribution is adjusted according to person’s reference group. Bublitz (2017), however, does not find a support for reference group hypothesis as measured by polarization of the respondent’s network.

A number of studies test how characteristics of respondent’s locality affect the perception bias. In this exercise, it is usually assumed that the locality is a natural reference frame for the respondents. Remarkably, it is not always possible to find such connection. Page and Goldstein (2016) show that individuals’ misperception of the income distribution is not influenced by the characteristics of the local area where they live.

Cruces et al (2013) discuss one of the bias-generating mechanisms based on the extrapolation of information from endogenous reference groups. They underline that many factors affect the reference group formation and, thus, can be used as explanatories for the extent of misperception which can be interpreted both in terms of information effect and in terms of reference group formation effect. These two effects can often go in the opposite directions. For example, better educated individuals usually have better access to information (smaller bias) but also belong to higher-income reference group (larger negative or smaller positive bias). The same concern would arise with any measure of access to information, such as internet use: more accurate knowledge about true welfare distribution may be distorted with a higher income reference.

Another important potential explanation relates to ideological beliefs. Leftists can overestimate the inequality (first of all, the upper part of the distribution), thus putting themselves at lower positions than they in fact occupy. Those with more liberal views care less about inequality in general and are more likely to identify themselves (and those around themselves) as the middle class (see Gimpelson and Treisman 2018).

Researchers have also tried to explain misperception with a number of socio-demographic characteristics. Bublitz (2017) explains the misperception gap using OLS

regressions of self-placement in the income distribution and multinomial logistic regression for the sign of the bias. Self-assessed social class turns out to be an important factor highly correlated with subjective income position (controlling for actual income). Among other findings she shows that Russia is the only country where higher education levels lead to lower reported income positions when actual income is controlled for. Page and Goldstein (2016), explaining the gap between actual and perceived inequality in the USA, find that older and more educated people tend to have more realistic image of the income distribution while wealthier respondents tend to overestimate the income of the bottom 90% of the population. Hadavand (2017) finds also that variations in perceived inequality are affected by respondents' education and their actual income.

Trying to explain misperceptions we can also refer to the literature that looks for determinants of subjective socio-economic status. One of the ideas in this literature is that experience or prospects of social mobility affect current subjective status as well. Usually prospects of future advancement improve perceptions of the current status, while experience of downward mobility downplays perceptions. These dynamic effects when they are not directly controlled for may help to interpret effects of such individual characteristics as age and education.

Such factors as family size and composition, marital status, health status, unemployment experience and latent psychological traits may also help to explain subjective economic standing (see Ravallion Lokshin 1999). Ravallion and Lokshin (2001) show that household income change (along with some other variables, such as health shock or becoming unemployed) emerge as a strong predictor for change in self-rated welfare.

Though consensus seems to emerge that individuals misperceive income differentiation, there is still no convincing answer what shapes the gap between perceptions and reality. Measuring this gap is also far from perfect.

3. Data and our analytical logic

For the aim of our analysis we need to compare two measures. The first one – we call it “objective” - defines location of respondents within the distribution using actual (“objective”) income data. The second - “subjective” measure - is based on respondents' self-perceptions concerning the income decile they belong to. Since these two measures can diverge, the

difference reflects how respondents (mis)perceive their place in the welfare distribution. In order to measure the extent of misperception and explain what factors shape it, we need a set of microdata that, besides these key variables, would contain a wide range of individual and contextual characteristics. All that we can find in the Russian Longitudinal Monitoring Survey - Higher School of Economics (RLMS-HSE), which is a 25-year long panel study and is well known for its good data quality.² Each annual wave is a sample representative on the country level and for the rural and urban subpopulations, and it contains also a longitudinal segment. The representative sample contains information on about 10 thousand adults who live in nearly 5 thousand households. The dataset is rich with household and individual level information describing various aspects of respondents' life and personality. For the sample descriptive statistics see Appendix Table A1.

The 25th wave of RLMS-HSE conducted in October 2016 contains required information on both dimensions (perceived place in the welfare distribution and actual income data).³ This makes possible to go beyond simple measurement of the mismatch, but also to explain its scale, sign and determinants exploiting large set of individual and household characteristics.

Let us first describe the measures we are going to apply for matching respondents' objective and subjective place in the welfare distributions. The RLMS question that asks about perceived decile is formulated in the following way:

"Please imagine a ladder with ten steps where on every step a 10 percent of our country population are standing. On the lowest first step there are 10 percent consisted of the poorest families and on the highest tenth - the richest families 10 percent. Where on this ladder is your family standing today?"

When answering the above question the respondent has to self-place herself into a particular decile according to her own idea about the income distribution in the society. Thus, this question aims to measure *relative* respondent's welfare not as a simple ranking but as linked to the income distribution.

² "The Russian Longitudinal Monitoring Survey, RLMS-HSE», conducted by National Research University "Higher School of Economics" and OOO "Demoscope" together with Carolina Population Center, University of North Carolina at Chapel Hill and the Institute of Sociology of the Federal Center of Theoretical and Applied Sociology of the Russian Academy of Sciences. (RLMS-HSE web sites: <http://www.cpc.unc.edu/projects/rlms-hse>, <http://www.hse.ru/org/hse/rlms>)

³ Another source that we are aware of and having both variables is the third wave of the Life in Transition Survey, or LiTS 3. However, the RLMS is much richer in additional characteristics than LiTS, and has also the panel structure thus allowing account for income mobility.

Individual's objective position in the welfare distribution can be measured using different indicators such as income, consumption or wealth. We present results that use alternative variables, but our preferred measure is the household per capita income derived from the single household income question:

"Tell me, please: What was the monetary income of your entire family in the last 30 days? Include here all the money received by all members of the family: wages, pensions, stipends, and any other money received, including hard currency converted into rubles".

While answering this question respondent has to sum up all recent monetary incomes in her household and provide the total. Then we convert it into the per capita income using the OECD equivalence scale to account for household size and composition.⁴ Respondents are assigned to an objective decile according to their place in the RLMS sample distribution according to this variable. Our chosen way of defining it has already been used in Jäntti et al (2014), Denisova (2007), Stillman (2001), Ravallion and Lokshin (1999).

Though the comparison seems to be a simple and quite straightforward procedure, in fact it is not. Potential measurement problems relate to the subjective as well as to the objective measures. While with subjective measure, as we think, there is little reason not to report how they feel at the moment of interview, objective income position can be measured with significant errors. Constructing the objective decile faces a number of complications. We check robustness our results by applying alternative objective measures.

First, monetary income is subject to considerable measurement error. While reporting it, respondents might err intentionally or not. The RLMS dataset allows obtain two different income estimates: one from the single income question (as described above) and the other one derived by summing up various income components coming from different sources. This makes possible to cross-check household income positions.

Second, we don't know what kind of particular welfare distribution our respondents have in mind when they are answering the subjective placement question. They may think not of income but of wealth or consumption. So, to check our basic results we use welfare measures other than income to construct objective deciles, namely current consumption expenditures and asset index. Current consumption expenditures are obtained from a detailed

⁴ The variable was also truncated by 0.25% on both sides of distribution and corrected according to relative regional prices

survey on food and non-food spending and consumption. The measure includes food as well as non-food consumption expenditures but excludes spending on housing refurbishment or construction works. Consumption of durables and housing rent are not included either because of data limitations. Asset index is constructed using the principle component method and utilizes information on household assets such as durables, vehicles and living conditions. Our methodology of index construction using RLMS data follows one presented in [Wall, Johnston 2008].

Finally, our survey income distribution may not represent population distribution adequately. That will bias our results even if respondents know a correct one. To check this we compare the RLMS income distribution with per capita household income distribution provided by Rosstat.

4. Where do we place ourselves in the income distribution?

4.1. Distance between objective and subjective location measures: descriptives

The distribution by objective deciles is – by construction – uniform (with assumption that our sample distribution represents the population correctly). Each respondent belongs to one decile only and each decile contains 10% of the sample. Answers to the 10-step subjective decile question are presented by Fig.1. Majority of respondents place themselves just below the center of distribution: over 70% are on the steps 3 to 5. Respondents are heavily underrepresented on the step 1 (4.7% of respondents instead of 10%) and on the steps 6 to 10 (10% in total instead of 50%). As a result, instead of being uniform (by having 10% of the sample in each decile) the distribution appears to be quasi-normal with the modal value at the 3rd decile. Thus, we confirm that incorrect estimation of actual location in the income distribution is widespread. Though most of respondents tend to underestimate, many overestimate. This picture is very close to that presented in (Gimpelson and Treisman, 2018).

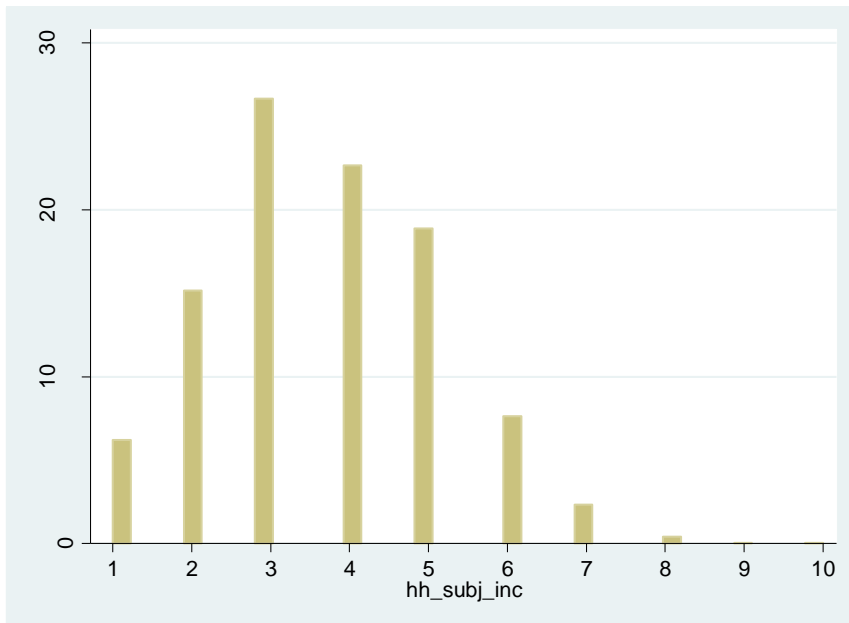


Figure 1 Perceived deciles of welfare distribution

Since we know to which (objective and subjective) deciles each respondent belongs, we can estimate deviations (“mistakes” or “gaps”) between the two.

Respondents’ misestimation is very common and both biases – negative when respondents underestimate their true position and positive one when respondents overestimate their true position - take place (see Figure 2). Two thirds of respondents (67%) underestimate the decile they belong to and only one of ten (11%) estimates it correctly. Moreover, each fifth (21%) respondent “mistakes” by 5 deciles at least. The considerable part of the sample - 23% - estimates their place as higher than it actually is. The mean “mistake” in the sample is -1.9 deciles (with SD=2.9) and average size of its absolute value is 2.8 (with SD of 1.9).

We can introduce the misperception index as:

$$Imp = (\sum_j |Xmp_j - Xact_j|) / 10,$$

where Xmp_j is the fraction of the sample that belongs to the j -th subjective decile and $Xact_j$ is the fraction that belongs to the j -th objective decile (it makes 10% by construction).

The index sums all deviations of perceived deciles from 10%. In our sample the misperception index equals to 8.8, what means that on average each subjective decile is under- or overfilled by nearly 9 percent of the sample.

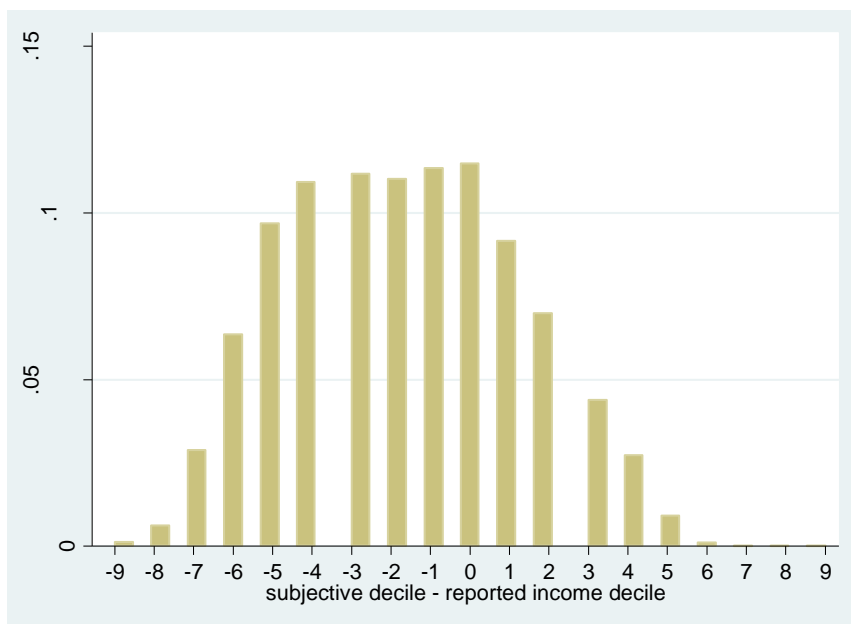


Figure 2 The difference between perceived and actual deciles of the income distribution

Table 1 shows the perception gaps (the mean difference between subjective and objective placement in the income distribution) for respondents in all objective deciles. Those belonging to objective deciles 1 and 2 overestimate, on average, their position in welfare distribution, while those located in the objective deciles 5 to 10 tend to underestimate their position (see col 1, Table 1). Those in the 3rd and 4th objective deciles give the most precise estimates of their positions in the national income distribution. The absolute size of mistake is always statistically different from zero. Moreover, those who are in fact in deciles from 6 to 10 almost never overestimate their position, as absolute value of the mean perception gap is close or equal to the value (see col 3, Table 1). The size of mistake rises near the tails of distribution.

Table 1 The difference between perceived and actual deciles, by actual decile

	absolute subjective- objective gap
subjective-objective gap	

objective decile	mean	standard deviation	mean	standard deviation
1	2.31	1.54	2.31	1.54
2	1.24	1.46	1.48	1.22
3	0.42	1.42	1.13	0.96
4	-0.59	1.36	1.19	0.89
5	-1.53	1.28	1.65	1.12
6	-2.50	1.31	2.54	1.23
7	-3.30	1.38	3.31	1.36
8	-4.10	1.28	4.10	1.28
9	-4.87	1.34	4.87	1.34
10	-5.65	1.32	5.65	1.32

To summarize, we observe substantial differences between the perceived and actual positions in respondents' income distribution and majority of respondents underestimate their actual placement as measured by the household per capita income. Respondents tend to place themselves just below the center of the distribution – into the 3rd and 4th deciles.

4.2. What if misperception is mismeasured? Robustness of basic results

As discussed before, our estimates can be subject to numerous problems. We compare the perceived position with the “objective” one in the income distribution but the latter one can be estimated in different ways. Our “subjective” distribution is also open to critique and should be used with a caution. Answering the related question people may have in mind different things. Apart from the monetary income people may think of the “rich” and the “poor” in terms of consumption or accumulated wealth. Are our conclusions robust enough if alternative measures are applied? Table 2 presents alternative estimates, separately for mean gap and mean absolute gap.

Table 2. Alternative estimates of the perception gap

	Number of observations	mean gap	standard deviation	mean absolute gap	standard deviation
One-question income (baseline, cut 0,25% each side)	9507	-1.98	2.86	2.86	1.97
One-question income, cut 2.5% each side	9841	-1.94	2.96	2.94	1.98
Income combined from different questions	10072	-1.82	2.99	2.85	2.04
Total consumption expenditures	10068	-1.85	3.02	2.88	2.05
Current consumption expenditures (no housing refurbishment, construction and durables)	10009	-1.72	2.91	2.72	2.01

spending)					
Total consumption expenditures, baseline sample	9094	-1.99	2.88	2.88	2.00
Current consumption expenditures (no refurbishment, construction and durables spending), baseline sample	9476	-1.90	2.92	2.83	2.04
Asset index	10114	-1.71	2.86	2.68	1.98

Though alternative estimates can vary, they are consistent in revealing the gap. Regardless of the particular measure, the mean gap, when the sign of the bias (under- or overestimation) is accounted for, hovers in the range of -1,7-2,0 deciles, or the average respondent sees herself poorer than she in fact is. If we ignore the sign, summing up all absolute gaps, the misperception is larger (2,7-3,0 deciles) and is also consistent across all measures.

Observed misperceptions can be caused by misreporting of income. As we can expect, majority of “misreporters” falls into the 1st and 10th income deciles. The simplest way to check robustness of our results is to cut tails of income distribution since they are most exposed to measurement errors. When we truncate the distribution by 2.5% on each tail, the absolute error size increases, probably due to (incorrectly) removed top income observations⁵ (see line 2 in Table 2). If alternatively we sum up all reported incomes from different sources and use it as an income measure, the outcome barely changes compared to the baseline for the mean absolute gap and just slightly decreases for the mean gap (see line 3 Table 2). This may happen since we get more observations on the left end of the income distribution where people tend to overestimate their relative place.

What if monetary income is not the most adequate welfare measure respondents have in mind when answering subjective decile question? First, we exploited current consumption expenditures in order to design objective deciles. This measure is close to the traditional consumption variable used in the standard welfare analysis. As it can be seen from Table 2, the consumption-based objective distribution provides a slightly closer approximation of the subjective placement than the income-based one. However, much of the difference comes from changing sample composition as those on the very left end are more inclined to report consumption than incomes (see lines 6 and 7 in Table 2).

⁵ If we cut only the left tail of distribution result does not change at all

The next alternative is to utilize the asset index. We construct it as the first principle component based on information about reported assets owned by households and their housing characteristics. This measure is supposed to reflect long-term household welfare which respondents may think of when answering the subjective decile question. Also it benefits from fewer missing values. The asset index has the closest correspondence with the subjective placement among all indicators used in our analysis. Although the difference between estimates is not that large it is statistically significant – the mean absolute gap with the asset index used to construct the objective decile is 2.68 compared to the baseline value of 2.86.

The potential bias in our results can also be caused by the sampling bias. Assume that the RLMS respondents allocating themselves along the perceived distribution keep in mind the “actual correct” one which may differ from that we have in the RLMS. Then we can impose the RLMS subjective distribution on this “correct” one knowing border values for the decile intervals. The problem is where to find the “correct”? For this, we can use data from the Rosstat household survey, the sample of which is much larger and is representative nationally as well regionally. The RLMS distribution is more equal and more compressed what is of little surprise as those who are on extreme tail of welfare are the most difficult for outreach (see Table 3). Thus, if we assume knowledge of true income distribution close to perfect among our respondents, than some underestimation in top deciles could be reasonable. Underestimation in lower deciles, though, does not support this idea.

Table 3 Share of the total income owned by quintile groups, 2016

	Per capita household monetary income	
	Share	Freq.
	RLMS	Rosstat
1	7.8	5.3
2	12.5	10.0
3	16.5	15.0
4	21.1	22.6
5	42.1	47.1

Finally, let us look at our subjective measure. The distribution of answers resembles that comes from the 9-step Economic Ladder Question (ELQ) which asks respondents to place themselves on the ladder where the poorest stand on the bottom and the richest are on the top. Correlation of the ELQ and our subjective decile questions is as high as 0.75 suggesting the consistency in estimating relative positions. The key feature of the ELQ is that it measures

relative rankings without any link to particular locations in the income distribution and therefore cannot be directly compared to the objective distribution. Instead of thinking of country population as a whole they might think of how far or close are they standing relative to imaginary rich and poor.

5. How does the subjective location differ from the objective one and who is more likely to err?

As our descriptive analysis suggests, RLMS respondents tend to place themselves disproportionately into the quantiles from 3 to 5. On average, they misplace themselves by 2.8 deciles (in absolute terms). Closer to the top objective deciles the gap looms larger. But how does the perception gap vary?

Table 4 presenting gaps for different socio-demographic groups shows no statistically significant difference between them. Still, some patterns can be noticed: misplacements are larger for those who are not married, better educated, having good health (that concerns absolute mistakes, not when sign is considered) and employed. As for the place of residence, deviations are the largest for regional capitals. Age does not show any stable pattern.

Table 4 Difference between subjective and actual decile of income distribution by respondents characteristics

	mean gap	standard error	mean absolute gap	standard error
Women	-1.9	0.04	2.8	0.03
Men	-1.9	0.05	2.8	0.03
Married	-1.7	0.05	2.7	0.03
Not Married	-2.0	0.04	2.9	0.03
<i>Educational attainment</i>				
Below secondary general	-1.1	0.08	2.3	0.05
Secondary general	-1.4	0.07	2.7	0.04
Secondary general+vocational	-1.8	0.08	2.7	0.06
College	-2.0	0.06	2.9	0.04
University	-2.8	0.06	3.3	0.04
<i>Age group</i>				
18-30	-1.8	0.07	2.9	0.05
31-40	-1.7	0.07	2.8	0.05
41-50	-2.0	0.08	2.9	0.05
51-60	-2.3	0.07	3.1	0.05
>60	-1.9	0.05	2.6	0.04

<i>Self-assessed health status</i>				
Good or very good	-1.7	0.06	2.9	0.03
Normal	-2.0	0.04	2.8	0.03
Bad or very bad	-2.0	0.07	2.5	0.05
Not employed	-1.3	0.04	2.4	0.03
Employed	-2.4	0.04	3.2	0.03
<i>Place of residence</i>				
Moscow, Spb	-2.2	0.08	2.9	0.06
Regional Capital	-2.8	0.05	3.2	0.04
City	-2.3	0.05	2.9	0.04
Urbanized settlement	-0.6	0.13	2.8	0.07
Rural settlement	-0.6	0.06	2.3	0.04

As the next step in exploring factors that may affect the extent of misperception we regress it on observable characteristics. Our equation (1) looks as the following:

$$M_i = \beta \ln(y_i) + \gamma X_i + \varepsilon_i, \quad (1)$$

Where M_i is the difference between subjective and objective deciles in the income distribution (or absolute difference or subjective decile), X_i is the set of explanatory variables, $\ln(y)$ – log of household per capita income, ε_i – random error.

Another equation to be estimated (2) is a multinomial logistic regression, where dependent variable takes three states:

$$P(\text{Bias} = c) = \frac{\exp(\beta_c \ln(y_i) + \gamma_c X_i)}{\sum_{k=1}^K \exp(\beta_k \ln(y_i) + \gamma_k X_i)}, \quad (2)$$

Where Bias is a variable with three categories: negative subjective-objective bias, no bias or positive bias; X_i is the set of explanatory variables; $\ln(y)$ – log of household per capita income.

The set of explanatory variables includes education, age, gender, employment status, household size and composition, and health and location. The X 's can affect the gap through income as well as through perceptions. The effects can be mediated by various mechanisms including different consumption needs, different reference group, different access to information, or different psychological and ideological features.

Table 5 presents the OLS regression results where the size of misperception is regressed on the set of explanatory variables described above. In this case, the dependent variable can be

negative if respondents underestimate their position, and positive if they overestimate. The positive sign for a regression coefficient signals that the size of misperception gets larger with increase in X.

Table 5 Determinants of difference between subjective and actual decile of income distribution

VARIABLES	(1) OLS deviation	(2) OLS Absolute deviation	(3) OLS Subjective decile	(4) mlogit Negative deviation	(5) mlogit Positive deviation
Log of household per capita income	-4.49*** [0.131]	2.21*** [0.254]	0.51*** [0.073]	7.46*** [0.352]	-2.92*** [0.339]
Asset index	0.07* [0.032]	-0.01 [0.021]	0.11*** [0.030]	-0.05 [0.053]	0.19*** [0.041]
Log of household per capita consumption expenditures	0.08 [0.084]	0.26** [0.109]	0.11 [0.087]	-0.15 [0.107]	0.04 [0.118]
Male	-0.01 [0.027]	-0.02 [0.020]	-0.01 [0.029]	0.01 [0.092]	-0.08 [0.063]
Age	-0.03*** [0.008]	0.03*** [0.006]	-0.04*** [0.008]	0.07*** [0.019]	-0.02 [0.020]
sq_age	0.00*** [0.000]	-0.00*** [0.000]	0.00*** [0.000]	-0.00*** [0.000]	0.00 [0.000]
Married	0.04 [0.054]	-0.13*** [0.046]	0.11* [0.056]	-0.27** [0.111]	-0.12 [0.135]
<i>Education attainment: Below secondary general - base category</i>					
Secondary general	0.17* [0.097]	0.06 [0.075]	0.15 [0.097]	-0.05 [0.181]	0.33* [0.185]
Secondary general+vocational	0.08 [0.069]	0.03 [0.071]	0.07 [0.057]	-0.14 [0.170]	0.18 [0.179]
College	0.12* [0.064]	0.01 [0.077]	0.12** [0.056]	-0.28* [0.170]	0.12 [0.148]
University	0.22*** [0.080]	-0.02 [0.085]	0.26*** [0.076]	-0.35* [0.205]	0.07 [0.194]
<i>Health: good- base category</i>					
Normal	-0.23** [0.084]	-0.08 [0.064]	-0.29*** [0.090]	0.03 [0.167]	-0.48*** [0.158]
Bad	-0.61*** [0.123]	-0.07 [0.100]	-0.68*** [0.127]	0.62*** [0.213]	-0.84*** [0.231]
Employed	-0.12** [0.046]	0.05 [0.052]	0.12** [0.049]	0.06 [0.120]	0.24* [0.133]
Log size of household	0.06 [0.131]	0.09 [0.081]	0.07 [0.120]	0.16 [0.171]	0.28* [0.157]
Share of children in hh	0.44* [0.241]	-0.62*** [0.208]	0.09 [0.218]	0.34 [0.457]	0.35 [0.393]
Share of pensioners in hh	-0.04 [0.080]	-0.23*** [0.085]	-0.06 [0.068]	0.55** [0.233]	0.41* [0.239]
<i>Settlement status: Capitals (Moscow+Spb) -base category</i>					
Regional center	-0.71***	0.45***	-0.51***	0.64**	-0.37

	[0.192]	[0.127]	[0.159]	[0.277]	[0.243]
City	-0.42***	0.25**	-0.31***	0.41*	-0.11
	[0.134]	[0.097]	[0.098]	[0.226]	[0.216]
Urbanized settlement	0.23	0.51**	0.29	0.38	0.66***
	[0.218]	[0.216]	[0.239]	[0.274]	[0.229]
Rural settlement	-0.20	0.36***	-0.21	0.25	-0.00
	[0.163]	[0.088]	[0.127]	[0.208]	[0.163]
Constant	42.57***	-22.18***	-1.56**	-71.64***	28.10***
	[1.024]	[1.697]	[0.589]	[3.303]	[3.306]
Observations	8,688	8,688	8,688	8,688	8,688
R-squared	0.719	0.413	0.185		

Note: *** p<0.01, ** p<0.05, * p<0.1; Regions (federal districts) are controlled for. Standard errors clustered in psu in brackets

As it follows from Table 5, rising incomes are associated with increasing gaps. Richer individuals are more likely to underestimate their income position in the distribution. Adding the asset index into the regression shows that, if current monetary income is fixed, higher accumulated wealth makes one's perception more positive (see columns 1 and 3 in Table 5). Column 5 shows that the effect operates through those respondents who tend to have positive bias. These results support the inclusion of additional welfare measures: monetary income alone does not fully represent household material wellbeing. Interestingly, for the case of absolute deviation household consumption introduces more bias into perception.

Table 5 provides general picture of how the perception gap varies across major socio-demographic characteristics, other things being equal. Thus, older respondents and those with deteriorating health tend to underestimate their relative income position to larger extent (columns 1 and 3 Table 5). This pessimism may reflect not only a cognitive bias but also an increased demand for health-related spending that worsens person's standard of living and thus downshifts perceived place in the welfare distribution. With rising age the probability to underestimate income position gets larger but the probability to overestimate it does not change. With more children in household the perception becomes more positive and less biased overall. This "optimism" can be due to positive psychological bias as well as due to the effect of economy of scale in larger households that we cannot fully capture. Interestingly, there are no statistically significant gender differences in perception. Marital status tends to shift subjective position upward and it reduces absolute bias lowering probability to be excessively negative in self-placement. Finally, higher share of pensioners in the household increases both the probability to over- and underestimate one's position resulting in decreasing absolute misperception.

Results for education seem intuitive: better educated have more positive perceptions and are less likely to underestimate their current position. They are better informed about true distribution and also expect better prospects for future. Employment status is significant and negative in the regression for the subjective-objective gap. (The latter may look surprising as at the same time they have a higher-rated subjective status and are more likely to have positive bias.)

Effects of geography and location are also interesting to consider. Residents of regional centers have the least positive gap between subjective and objective measures. Regional centers are followed by other smaller cities whose residents have slightly more positive perceptions. The two capitals (Moscow and Sankt-Petersburg) have even more positive perceptions, which are at the same level as urbanized and rural settlements are. This result can fit to the idea that the position in local income distribution affects respondents' perceptions as we compare individuals with the same level of income but residing in different locations. Capitals stand out because, despite of higher inequality there, living in the capitals increases respondents' perceived socio-economic status, in capitals citizens enjoy better public services and more diverse cultural and social life that makes their perceptions more positive. As for the absolute bias, it is the smallest in the capitals and largest in urbanized settlements.

6. How to explain income misperception? A few hypotheses

Misperception can be shaped by different factors apart from the socio-demographic characteristics.

First, individuals while thinking of their relative place in the income distribution may consider themselves within their reference group made of friends, relatives, colleagues or neighbors. Communities of limited size and endogenously formed are quite homogeneous and for each member of such community there are those who are poorer and richer. This motivates them to self-place somewhere in the middle of distribution allowing for some moderate differentiation regardless of the absolute income level. We can call this *reference group hypothesis*. For testing it, we control for average income in the locality – in the primary sampling unit (see Table 5, col 1). As could be expected, with higher average income people tend to underestimate their actual position and we observe considerable negative effect on the gap.

Second, perceptions can be shaped by popular media. Glossy images of rich people and chic life circulated by the mass media and social networks may create an illusion that ordinary people (consumers of this media) have very low social standing while ignoring the fact that the fraction of such super-rich in the total population is miserable. We call this “mass-media” hypothesis. In order to test it, we control for internet access – a proxy for more available information. The internet access makes the gap more negative (see Table 5 col 2). This might suggest that instead of bringing more adequate information about actual welfare distribution internet suppresses person’s subjective position by showing surreal pictures of “beautiful life”.

Third, subjective well-being can also affect perceptions. Various psychological feelings like feeling deprived, feeling happy, being an optimist or a pessimist, life satisfaction or future expectations etc, can bias our current perceptions of the relative place that we occupy. We call this “psychological” hypothesis. We look at correlations of misperception with experience and expectations of income mobility and life satisfaction.

Pessimistic expectations or bad experience reduce self-rated wellbeing and make subjective – objective gap more negative (see Table 5 cols 3,4). This observation probably reveals psychological bias in answering subjective wellbeing questions.

Table 5. Determinants of difference between subjective and actual decile of income distribution

VARIABLES	(1) OLS	(2) OLS	(3) OLS	(4) OLS
Log mean per capita household income in psu	-0.69*** [0.100]			
Internet access		-0.36*** [0.056]		
Welbeing change during last 12 months: considerably improved - base category			-0.78*** [0.225]	
slightly improved				
the same			-0.79*** [0.222]	
slightly worsened			-1.10*** [0.225]	
considerably worsened			-1.31*** [0.234]	
Expected welbeing change during future 12 months: will considerably improve - base category				
will slightly improve			-0.33* [0.177]	
will be the same			-0.68***	

			[0.176]	
will slightly worsen			-0.90***	
			[0.185]	
will considerably worsen			-1.21***	
			[0.198]	
Expected change in subjective decile in future 4 years			-0.07***	
			[0.022]	
Change in subjective decile in last 4 years			0.38***	
			[0.023]	
Controls	YES	YES	YES	YES
Assets	YES	YES	YES	YES
Constant	41.15***	34.91***	36.35***	34.68***
	[1.046]	[0.516]	[0.610]	[0.593]
Observations	6,817	6,817	5,676	5,101
R-squared	0.675	0.675	0.684	0.682

Note: *** p<0.01, ** p<0.05, * p<0.1; Standard errors clustered in psu in brackets

7. Conclusions

This paper explores how people perceive the distribution of welfare in Russia. We answer two interconnected questions: How individuals see their place in the income distribution and how perception differs from the reality? and What shapes the misperception?

To answer the above questions we turn to 2016 round of RLMS-HSE – a very rich data set which contains various individual and contextual parameters including a question about subjective placement in country’s welfare distribution. This question asks about the decile of welfare distribution respondent thinks her household belongs to. We compare this subjective placement with individual’s actual decile of income distribution and try to explain the difference between them with various factors.

The summary of our findings is the following. We find that the total size of mis-estimation is huge and both (negative and positive) biases take place. Only one of ten is correct in locating herself in the income distribution. Two thirds of respondents underestimate the decile they belong to each fifth respondent estimates their place higher than it actually is. The size of misperception is considerable: respondents’ average “mistake” is equal to nearly 3 steps.

To define determinants of misperception we regress the size of “mistake” on a large set of socio-demographic characteristics. We find a list of factors that contribute to difference between objective and subjective placement. Among socio-demographic factors we see significant effect of respondents’ age, employment status, having children, geography and location.

We test a number of mechanisms that could explain misperception. First, there might be orientation on referent group that defines subjective placement. We control for average income in the locality. As could be expected, higher average income has considerable negative effect on the gap with a control for income. Second, perceptions can be shaped by popular media. To test this, we control for internet access – a proxy for more available information – and find that it makes the gap more negative. Third, we look at correlations of misperception with experience and expectations of income mobility. Pessimistic expectations or bad experience reduce self-rated wellbeing and make subjective – objective gap more negative. Finally, correlation could be observed between the gap and other measures of subjective wellbeing. Respondents who are more satisfied with their life rate themselves higher in welfare distribution and thus have more positive subjective-objective gap.

To sum up, this paper contributes into quickly expanding literature on people’s perceptions of economic subjects by exploring the determinants of gap between objective and subjective place in income distribution. We find a wide range of socio-demographic and economic factors that affect the size of misperception.

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Appendix

Table A1. Sample descriptive statistics

	mean	st. dev.
Personal characteristics		
Age, years	49.1	18
Male, %	41.2	0.5
Married, %	62.1	0.5
Educational attainment		
Below secondary general	23.2	0.4
Secondary general	13.5	0.4
Secondary general+vocational	23.2	0.4
College	27.4	0.5
University	34.5	0.5
Self-assessed health status		
good (good or very good), %	51.5	0.5
normal, %	14	0.4
bad (bad or very bad), %	56.3	0.5
Employed, %	11.6	0.3
Household characteristics		
Number of hh members	3.3	1.8
Share of children in the hh	0.1	0.2
Share of pensioners in the hh	0.4	0.4
Per capita household income, RuR	22828.3	13918.6
Per capita current consumption expenditures (no housing refurbishment, construction and durables spending), RuR	15270.2	9714.7
Place of residence		
Moscow, Spb, %	11.6	0.3
Regional Capital, %	30.8	0.5
City, %	25.3	0.4
Urbanized settlement, %	6.6	0.3
Rural settlement, %	25.8	0.4