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Feeling Richer and Happier? Self-Perceived Economic Welfare and Life Satisfaction: Evidence of 'Easterlin Paradox' from Russian Longitudinal Data

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“Feeling Richer and Happier?
Self-Perceived Economic Welfare and Life Satisfaction: Evidence of ‘*Easterlin Paradox*’ from
Russian Longitudinal Data**”

“... *in the end, economics is not about wealth, it ’s about the pursuit of happiness.*”

Krugman, 1998

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Abstract: Do you feel happier when you think you are richer? How does the perception of your own economic welfare affect your life satisfaction? This study examines subjective economic welfare and life satisfaction using the Russia Longitudinal Monitoring Survey covering years 1994 through 2018. The study shows that those who perceive themselves to be better off are also more satisfied with their lives, even while controlling for income, unemployment and other demographic characteristics. This study aims to provide a possible explanation of the ‘*Easterlin Paradox*’, a phenomenon in which individuals’ happiness increases with income, yet an increase in income of the whole society does not necessarily increase the happiness of all (Easterlin, 1974). The results from this study suggests that the way one perceives their own economic welfare is a significant determinant of life satisfaction, and that the subjective economic welfare may be the driver of the ‘Easterlin paradox.’ The study also suggests the importance of studying subjective economic welfare, with possible implications on income inequality. Our findings suggest that a society with high income inequality, in which a small proportion of the population earns a large proportion of society’s income, will have lower collective life satisfaction.

JEL Classification: D60 (Welfare Economics: General), D63 (Equity, Justice, Inequality, and Other Normative Criteria and Measurement), I31 (General Welfare: Well-Being)

Keywords: Easterlin Paradox, life satisfaction, Ordered Probit, self-perceived economic welfare, subjective wellbeing, Russian longitudinal data

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1. Introduction

What determines life satisfaction? Can money buy happiness? These are common questions with vastly different answers depending on who you ask. Many researchers in the past have examined these questions. There are studies that examine the effects of income on life satisfaction (Easterlin, 1974, 1995, 2003, 2016; Oswald, 1997; Diener and Oishi, 2000; McBride, 2001; Frey and Stutzer, 2001; Hagerty and Veenhoven, 2003; Veenhoven and Hagerty, 2006; Frijters et al., 2004; Kahneman and Deaton, 2010; Angeles, 2011), as well as studies that examine subjective measures of economic welfare of individuals and societies (Ravallion and Lokshin, 2001, 2002; Lokshin and Ravallion, 2005; Mangahas, 1995; Pradhan and Ravallion, 2000; Lokshin, Umapathwe and Paternostro, 2006). This study aims to bridge the gap between these two groups of literature and ask a similar question with a slight twist: does your perception of your own economic welfare affect your life satisfaction?

In addition, this study aims to provide a potential explanation of the ‘Easterlin paradox.’ The paradox describes a phenomenon in which individuals’ happiness increases with income, but an increase in income of the whole society does not increase the happiness of all (1974, 1995, 2003, 2016). Easterlin suggests an explanation to the paradox, namely that when income of a society increases, the material norms that people base their happiness on also change, and thus the increase in income does not affect the collective happiness. Our research aims to further delve into this paradox and the idea of relative economic welfare being a determinant of life satisfaction. In line with the ‘Easterlin paradox’, we hypothesize that if one perceives his/her own economic welfare to be better, then his/her life satisfaction will be higher.

In order to examine this hypothesis, we will use the data from the Russia Longitudinal Monitoring Survey (RLMS), which is longitudinal survey data that is nationally representative the Russian population on both individual- and household-level. We specifically focus on Phase II of the survey, in which the survey has taken place almost every year from 1994 to 2018. Russia experienced an economic transition from communism to a free market economy in the early 1990s after the collapse of the Soviet Union, and it underwent various economic liberalization reforms in 1992 (Kozyreva, Kosolapov, and Popkin, 2016). By the late 1990s and throughout the 2000s, Russia experienced large economic growth (The World Bank, “GDP,” “GDP growth”). In addition to increases in gross domestic product (GDP) throughout this time period, Figure 1 and Figure 2 show that individuals in Russia have, on average, experienced general increases in life satisfaction and self-perceived economic welfare between 1994 and 2018. The advantage of studying Russia is that many economic changes have occurred during this time period, and the longitudinal data allows us to examine the changes in individuals’ life satisfaction and self-perceived economic welfare over time.

The implications of the results of this study are two-fold. First, since there are few existing studies that explore self-perceived economic welfare as a determinant of individual’s life satisfaction, this study adds to the existing literature on the determinants of one’s happiness. Secondly, the findings of this study may be able to provide a partial explanation to the ‘Easterlin paradox,’ specifically as to why an increase in income does not affect happiness on a macro-level. The evidence from this study suggests that one’s perception of their own economic welfare, perhaps relative to others or to material norms of the society, is in fact a significant determinant of life satisfaction

Figure 1: Trends in Mean Life Satisfaction Rank from 1994 to 2018

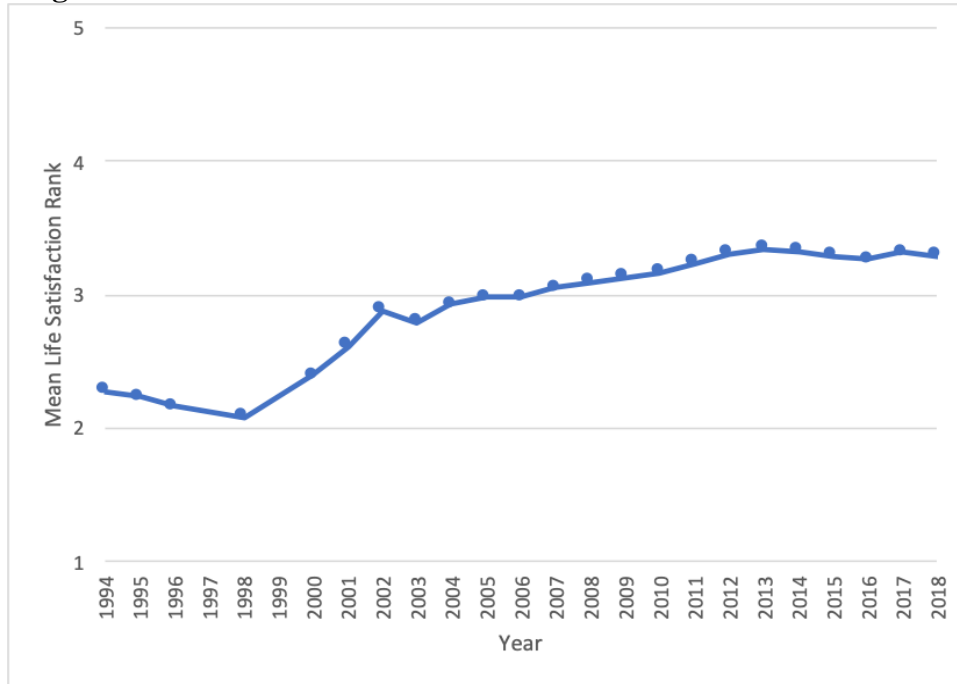
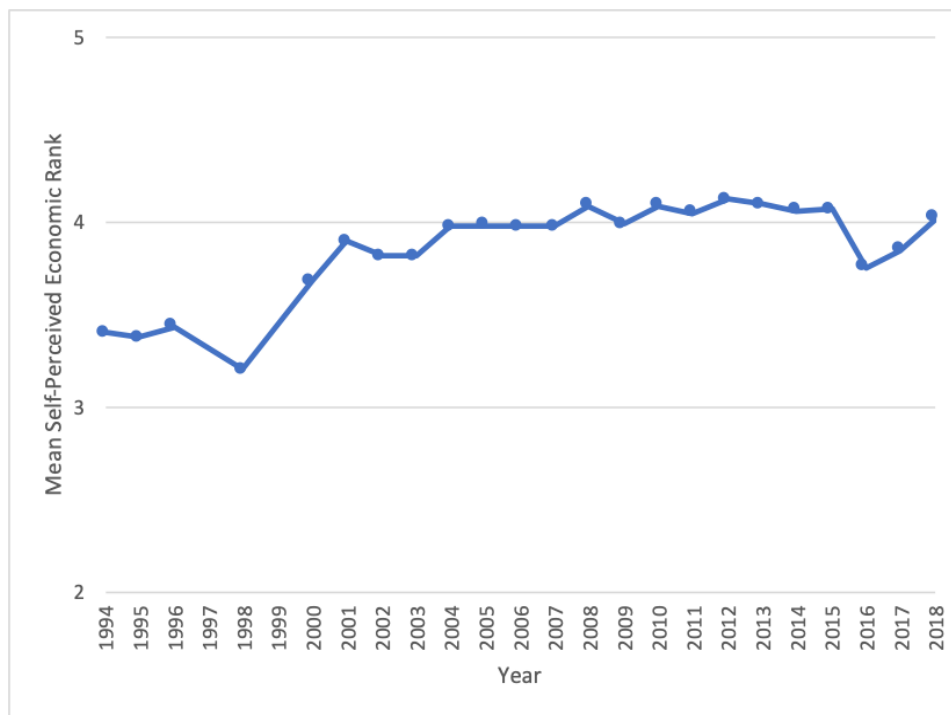


Figure 2: Trends in Mean Self-Perceived Economic Welfare Rank from 1994 to 2018



The rest of the paper is organized as follows. We discuss existing literature in section 2. Methodology is in section 3, and empirics is in section 4. In section 5, we summarize our findings, and we discuss possible extensions.

2. Insights from the Literature

The following section examines existing literature on topics related to subjective measures of economic welfare and life satisfaction. We first focus on existing literature that examines determinants of life satisfaction, specifically those that focus on economic welfare. Next, we discuss previous studies that examine subjective measures of economic welfare.

2.1. Determinants of Life Satisfaction

Our research aims to examine the effects of self-perceived economic welfare on life satisfaction. Therefore, it is important to understand the large body of literature that examines the different determinants of life satisfaction. Studies have found that determinants of life satisfaction include age (Mroczek and Kolarz, 1998; Chen, 2001; Mroczek and Spiro, 2005), marital status (Chen, 2001; Lucas et al., 2003; Lucas, 2007), self-rated health (Palmore and Luikart, 1972; Chen, 2001) and education (Fernandez-Ballesteros et al., 2001; Castriota, 2006). Some studies have also found that ethnic minority groups have lower life satisfaction in general (Utsey et al., 2002; Verkuyten, 2008). Our study aims to specifically examine economic welfare as a determinant of life satisfaction. In this subsection, we will further discuss previous studies that examine economic welfare, specifically income and unemployment, on life satisfaction.

2.1.1. *Income on life satisfaction*

There are various studies that examine how economic welfare affects life satisfaction. One key concept that we focus on in this paper is the ‘Easterlin Paradox,’ in which Easterlin finds that while an increase in individual’s income increases happiness, an increase in income of a society as a whole does not increase the collective happiness (1974, 1995, 2003, 2016). Easterlin finds that in 19 different countries between 1946 and 1970, there are positive correlations between income and happiness, yet he does not find a positive correlation between these two variables when comparing richer and poorer countries. In addition, he uses time-series data in the US from 1946 to 1970 to find that although income per capita doubled during the time period, happiness did not consistently increase with income (1974). He further shows the persistence of this paradox in the US and multiple other countries in his later papers (1995, 2003, 2016). He offers an explanation that people derive happiness in relation to others, and as the whole society becomes richer, people are not necessarily becoming richer in relation to each other on average. Thus an increase in income of the whole society does not significantly affect the collective happiness (1995).

Easterlin’s findings have been influential in the field of happiness economics, and there are various studies that aim to test the paradox (Oswald, 1997; Hagerty and Veenhoven, 2003; Veenhoven and Hagerty, 2006; Frijters et al., 2004; Angeles, 2011). Oswald (1997) finds that in the US and other European nations, economic growth came with an increase in national happiness, although it does not seem to have increased in proportion to economic growth. He concludes that economic progress leads to an increase in happiness, but only by a small magnitude. In a way, Oswald’s findings support Easterlin’s paradox that income does not matter significantly when it comes to the society’s happiness. Other studies have also found positive relationships between economic growth and happiness in the US and several European countries in the second half of the twentieth century (Hagerty and Veenhoven, 2003; Veenhoven and Hagerty, 2006). Another study examines this effect using the case of the German reunification. They examine the increase in real income in East Germany following the reunification and its effects on life satisfaction, in which they find a positive effect (Frijters et al., 2004).

There are various studies that support the paradox (Diener and Oishi, 2000; McBride, 2001; Frey and Stutzer, 2001), but more importantly, Easterlin’s research has led to an increase in

numbers of studies that examine relative measures of economic welfare and society's wellbeing (Clark and Oswald, 1994; McBride, 2001; Clark, Frijters and Shields, 2008; Dwe Tella and MacCulloch, 2008). There has also been a development of the Gross National Happiness Index (GNH index) in Bhutan, which is an alternative measure of society's wellbeing that focuses on "psychological wellbeing, time use, community vitality, cultural diversity, ecological resilience, living standard, health, education, [and] good governance" (Ura et al., 2012). We will further discuss other studies that incorporate subjective measures of economic welfare later in this section.

While many disagree on the impact of income on life satisfaction on a macro-level, many agree on the positive effects of income on life satisfaction on a micro-level (Easterlin, 1974, 1995; Diener and Oishi, 2000; Clark, Frijters and Shields, 2008; Dwe Tella and MacCulloch, 2008). A study by Kahneman and Deaton (2010) examines the effects of individual's high income on happiness, both in terms of life satisfaction (they define this as long-term satisfaction) and emotional wellbeing (defined as 'happiness', or day-to-day satisfaction). They find that high income is positively correlated with life satisfaction. Interestingly, the key finding is that while the effect of income seems to be positive without limit for long-term satisfaction, the effect on day-to-day satisfaction plateaus after an annual income threshold of around 75,000 USD. The findings imply that while money can buy long-term satisfaction without limit, there is a limit on how much short-term day-to-day happiness it can buy.

2.1.2. Unemployment on life satisfaction

Existing studies have also examined the effects of unemployment on life satisfaction. For example, Clark and Oswald (1994) attempts to answer whether unemployment is voluntary or not by examining the effects of unemployment on mental wellbeing. They use data from the British Household Panel Study to find that those who are unemployed on average are unhappier, leading to the conclusion that unemployment is not voluntary. Another study (Winkelmann and Winkelmann, 1998) examines the effects of unemployment on life-satisfaction of working-age men in Germany from 1984 to 1989 using the German Socio-Economic Panel. They compare the effects of unemployment on life satisfaction to the effect of non-participation on life satisfaction. They find that unemployment has a negative effect on life-satisfaction, and they specifically find that the non-monetary costs of unemployment have a significant effect on life-satisfaction, more than the monetary costs of unemployment. Many other existing studies support the hypothesis that unemployment has a negative effect on life satisfaction (Gerlach and Stephan, 1996; Korpi, 1997; Oswald, 1997; Theodossiou, 1998; Hagler et al., 2016).

2.2. Self-Perceived Economic Welfare

We aim to examine whether a subjective measure of economic welfare, specifically self-perceived economic welfare, is a determinant of one's life satisfaction. In order to better understand self-perceived economic welfare and to provide insight into the importance of studying it, this subsection explores previous studies that use subjective measures of economic welfare.

2.2.1. Importance of studying self-perceived economic welfare

Some studies have examined economic welfare using subjective measures rather than more common measures such as income, and find importance in using subjective measures (Mangahas, 1995; Pradhan and Ravallion, 2000; Lokshin, Umapathwe and Paternostro, 2006). One study examines poverty in the Philippines between 1981-1992 using self-rated poverty, and the author emphasizes the importance of examining poverty from a bottom-up perspective, rather than a more common top-down perspective. They argue that using a self-rating approach allows one to better study time-trends in poverty, as it allows poverty to be surveyed more frequently than if it were to

be measured using income or expenditures, given that collecting the necessary data to measure poverty using the more common measures such as income is more expensive. They also argue that self-rating is advantageous because it cannot be institutionally manipulated, unlike official poverty lines (Mangahas, 1995). Similarly, another study examined the use of self-rated economic welfare as a measure of poverty line using survey data from Nepal and Jamaica. The surveys ask whether individual's consumptions adequately meet their family's needs. This data was then used to create a subjective poverty line, which was different from the more common poverty lines that use income (Pradhan and Ravallion, 2000). Another study examines subjective poverty measures in Madagascar using a survey that asks the adequacy of consumption for the household's needs. They argue that subjective poverty analysis is useful in developing countries for assessing various policy interventions and evaluating households' monetary and non-monetary wellbeing (Lokshin, Umapathwe and Paternostro, 2006). The previous two studies also find that subjective poverty measures align well with objective poverty measures.

2.2.2. Self-perceived economic welfare of individuals using the RLMS

There are previous studies that examine self-perceived economic welfare using the RLMS data, such as a study by Ravallion and Lokshin (2002). They find that while there is a positive correlation between subjective economic welfare and income, they also find large discrepancies between the two measures of economic welfare. They further find that in many cases, where people placed themselves on the welfare ladder did not necessarily match where they would be placed using an objective measure. Ravallion and Lokshin's earlier study (2001) examines the different factors that affect individual's subjective economic welfare, which includes income, as well as ill-health and unemployment. In Lokshin and Ravallion's later study (2005), they examine the effects of income and subjective economic welfare on self-rated power, in which they find a positive correlation between the two.

2.2.3. Policy implications for studying self-perceived economic welfare

Some studies have found that self-perceived economic welfare has implications for redistribution policies (Ravallion and Lokshin, 2000; Alesina et al., 2005; Cruces et al., 2013). Alesina et al. (2005) explores the different determinants of preferences for redistribution in the US, and they find that preferences depend on future income prospects, using both subjective and objective measures of future mobility. They also find that those who believe that the American society "offers equal opportunities" find redistribution less preferable. Similarly, Cruces et al. (2013) examine how biased perceptions affect preferences for policies, specifically how biased self-perceived economic welfare affects preferences for redistribution policies. They find that those who overestimate their economic ranking and are then informed of their true lower ranking prefer higher levels of redistribution. The implications of these studies show the importance of studying self-perceived economic welfare. An earlier study by Ravallion and Lokshin (2000) uses the RLMS to examine the determinants of individuals' preference to redistribute in Russia, and they find that those who expect their economic welfare to fall in the future tend to support redistribution policies.

Many studies have used the RLMS to explore self-perceived economic welfare, and we aim to add to the existing literature by examining how self-perceived economic welfare affects life satisfaction.

3. Methodology

In order to learn more about the effects of subjective economic welfare on life satisfaction, we use the RLMS, Russian longitudinal data that spans from 1994 to 2018. We use ordered probit models to identify the effects of self-perceived economic welfare on life satisfaction in order to account for both the categorical and numerical aspects of the ‘life satisfaction’ variable. Our approach is similar to the two studies that use the RLMS: One examines self-rated economic welfare as a measure of economic well-being (Ravallion and Lokshin, 2002), and the other examines the effects of economic welfare on self-rated power (Lokshin and Ravallion, 2005).

Ideally, we could examine the causal effects of self-perceived economic welfare on life satisfaction using research designs such as a valid instrumental variable (IV) or a difference-in-difference method. However, it is difficult to identify a valid IV (a variable that is correlated with self-perceived economic welfare but not life satisfaction) as many variables that are correlated with one’s belief of their own economic welfare may also influence one’s life satisfaction. For a difference-in-difference model, there needs to exist an exogenous event that acts as a natural experiment, one that impacts a group of individuals’ self-perceived economic welfare (the treatment group) while not impacting another group of individuals (the control group). In addition, given a longitudinal dataset that spans 25 years, it would be difficult to conduct a difference-in-difference method without limiting the data to a narrower time span and/or compromising the number of observations.

Instead, we aim to identify the effects of self-perceived economic welfare on life satisfaction by using demographic controls in order to account for omitted variable bias. It would perhaps be an overstatement to say that the results show causal effects, as there may not only be other contributing factors but also a possibility for reverse causality (where life satisfaction might affect one’s self-perceived economic welfare) neither of which are accounted for in our model. For example, one could argue that higher life satisfaction may be correlated with better mental health, which may in turn affect labor market outcomes such as employment or productivity. This may lead to an inflated perception of where individuals’ stand economically which would cause an upward bias in our estimates. We are able to account for some of the omitted variable bias by controlling for income, unemployment, self-rated health and other attitudinal responses in our regression models, but given that both life satisfaction and self-perceived economic welfare are both subjective measures, there may be other unobservable factors at play. Therefore, we are not be able to completely negate the effects of omitted variable bias and reverse causality in our findings.

For our main specification, we first identify the true-life satisfaction of an individual as the latent variable, denoted as y_i^* (Green and Hensher, 2010). This is the unobservable sentiment of an individual that factors in during the decision-making process of ranking their own life satisfaction from 1 to 5 in the survey. For simplicity, we first focus on the relationship between the latent variable and the main explanatory variable, $perception_i$ (self-perceived economic welfare). All other control variables will be denoted as the error term, ε_i , for now. The model is given in the following equation (1):

$$\begin{aligned} & (+) \\ & y_i^* = \beta perception_i + \varepsilon_i \end{aligned} \tag{1}$$

In the model, there are 4 different cutoffs, denoted μ_1 , μ_2 , μ_3 and μ_4 , where $\mu_1 < \mu_2 < \mu_3 < \mu_4$. If the life satisfaction sentiment is $y_i^* \leq \mu_1$, then the individual will rank their life satisfaction as 1. If $\mu_1 \leq y_i^* \leq \mu_2$ then the individual will rank their life satisfaction as 2, and so on until $y_i^* \geq \mu_4$, where life satisfaction will be ranked as 5. Under the assumption that the error term ε_i has a standard normal distribution, $N(0,1)$, We use ordered probit to model the index model above (Green and Hensher, 2010).

The probability of life satisfaction, y , being ranked 1 can be written as the following equation (2):

$$\begin{aligned} P(y = 1) &= P(y_i^* \leq \mu_1) = P(\beta perception_i + \varepsilon_i \leq \mu_1) \\ &= P(\varepsilon_i \leq \mu_1 - \beta perception_i) \\ &= \Phi(\mu_1 - \beta perception_i) \end{aligned} \quad (2)$$

For simplicity, we will write the probabilities of life satisfaction being ranked from 2 to 5 just with respect to $\Phi(\cdot)$, which is the probability density function of a standard normal distribution. They are as follows:

$$P(y = 2) = \Phi(\mu_2 - \beta perception_i) - \Phi(\mu_1 - \beta perception_i) \quad (3)$$

$$P(y = 3) = \Phi(\mu_3 - \beta perception_i) - \Phi(\mu_2 - \beta perception_i) \quad (4)$$

$$P(y = 4) = \Phi(\mu_4 - \beta perception_i) - \Phi(\mu_3 - \beta perception_i) \quad (5)$$

$$P(y = 5) = 1 - \Phi(\mu_4 - \beta perception_i) \quad (6)$$

In order to account for omitted variable bias, we also control for other factors that may affect life satisfaction. We control for income and unemployment since much of the existing literature has found that they are important contributing determinants (Easterlin, 1974, 1995; Clark and Oswald, 1994; Gerlach and Stephan, 1996; Korpi, 1997; Oswald, 1997; Theodossiou, 1998; Winkelmann and Winkelmann, 1998; Diener and Oishi, 2000; Clark, Frijters and Shields, 2008; Dwe Tella and MacCulloch, 2008; Hagler et al., 2016). We use natural logarithm of monthly income in order to account for the right-skewed nature of the monthly income variable. We also include other determinants of life satisfaction, such as gender, age, marital status, self-rated health, education, and Russian ethnicity. Household size and different household assets are also included. We also control for different attitudinal variables, including one's expectations for the future, self-perceived power and respect, job insecurity, as well as their confidence in being reemployed if unemployed.

The following is the index model given in equation (1) with other controls and fixed effects:

$$\begin{matrix} (+) & & (+) & & (+) \end{matrix}$$

$$y_{ijt}^* = \beta_1 perception_{ijt} + \beta_2 lnincome_{ijt} + \beta_3 unemployed_{ijt} + \alpha_{ijt} + \lambda_t + \lambda_j + \varepsilon_{it} \quad (7)$$

where the variable $lnincome_{ijt}$ is monthly income in natural logarithm (rubles) for individual i in region j at time t , and $unemployed_{ijt}$ is whether the individual i is unemployed in region j at time t . The variable α_{ijt} represents a matrix of control variables included in the model. We include year fixed-effects λ_t in order to account for other time-variant factors that are not controlled for in the model, such as the Russian economy and changes in income inequality. We also include regional

fixed-effects λ_j in order to account for differences across different regions. We include 8 different federal districts in Russia, including Central, Northwestern, Southern, North Caucasian, Volga, Ural, Siberian and Far Eastern Federal Districts. Standard errors are clustered at the individual level in order to account for heteroskedasticity across individuals.

Treating the self-perceived economic welfare variable as continuous, we can derive equations (2) to (6) to estimate the marginal effects, or the effects of one-unit change in self-perceived economic welfare rank on the probability of each life satisfaction rank. These can be written as follows:

$$\frac{\partial P(y = 1)}{\partial perception_i} = -\Phi(\mu_1 - \beta perception_i) \times \beta \quad (8)$$

$$\frac{\partial P(y = 2)}{\partial perception_i} = [\Phi(\mu_1 - \beta perception_i) - \Phi(\mu_2 - \beta perception_i)] \times \beta \quad (9)$$

$$\frac{\partial P(y = 3)}{\partial perception_i} = [\Phi(\mu_3 - \beta perception_i) - \Phi(\mu_4 - \beta perception_i)] \times \beta \quad (10)$$

$$\frac{\partial P(y = 4)}{\partial perception_i} = [\Phi(\mu_4 - \beta perception_i) - \Phi(\mu_5 - \beta perception_i)] \times \beta \quad (11)$$

$$\frac{\partial P(y = 5)}{\partial perception_i} = \Phi(\mu_4 - \beta perception_i) \times \beta \quad (12)$$

We hypothesize that there will be a positive correlation between self-perceived economic welfare and life satisfaction; specifically that the probability of an individual's life satisfaction rank increases with self-perceived economic welfare.

4. Empirics

The RLMS Phase II is an unbalanced panel of data that is nationally representative of Russia starting in 1994¹. The survey is conducted by several organizations: Higher School of Economics, ZAO "Demoscope" together with Carolina Population Center, University of North Carolina at Chapel Hill, and the Institute of Sociology Russia Academe of Sciences. The survey's Phase I initially began in 1992 as a way to obtain accessible and objective data on the social, medical and economic aspects of the Russian state of affairs after the major economic liberalization reforms in 1992 (Kozyreva, Kosolapov, and Popkin, 2016)². Phase II started in 1994 with a target sample of ~4,000 households with the goal of providing data on a nationally representative sample in Russia. In each of the interviews, interviewers visited each selected dwelling up to three times to conduct the interview. Following the first round in Phase II (round V) in 1994, interviewers attempted to return to the same dwellings of the selected households. Starting in round VII (1998),

¹ The survey was not conducted in 1997 and 1999 due to funding lapses (Kozyreva, Kosolapov, and Popkin, 2016).

² The RLMS Phase I data did not provide a representative profile of the Russian population (UNC Carolina Population Center). "Russia Longitudinal Monitoring survey, RLMS-HSE" Phase II was conducted by Higher School of Economics and ZAO "Demoscope" together with Carolina Population Center, University of North Carolina at Chapel Hill and the Institute of Sociology RAS. (RLMS-HSE sites : <http://www.cpc.unc.edu/projects/rlms-hse>, <http://www.hse.ru/org/hse/rlms>).

the RLMS attempted to follow individuals and households when they moved out of the household units, and also attempted to find households who moved between rounds V and VII (Kozyreva, Kosolapov, and Popkin, 2016).

The individual-level survey includes a question on life satisfaction of individuals ranging from ranks 1 to 5, with 1 being fully satisfied and 5 being the least satisfied. The life satisfaction question is phrased as follows: “To what extent are you satisfied with your life in general at the present time?” Originally, the responses were coded as 1 being fully satisfied and 5 being the least satisfied. However, in order to make the coefficients in the regression more intuitive, we modified the way this variable is defined to make 5 being fully satisfied. The question leaves room for the respondent to interpret this ‘life satisfaction’ as either a long-term life satisfaction or a short-term day-to-day happiness, unlike Kahneman and Deaton (2010) who differentiated the two kinds of happiness. Unlike their study, we will not be differentiating between the two kinds of happiness – Both ‘happiness’ and ‘life satisfaction’ will be used interchangeably for the duration of this study.

The self-perceived economic welfare variable is based on a question that asks individuals to rank their own economic welfare on a nine-step ladder, with 1 being the poorest and 9 being the richest. The question is specifically phrased as follows for all 23 rounds:

“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?”

The data also includes an extensive list of household and individual-level survey questions, which we use as demographic controls in our models. These controls are further discussed in the following section.

Table 1: Summary Statistics³

	# of Observations	Means	SD	Min	Max
<u>Life satisfaction</u>	169,291	2.96	1.15	1.00	5.00
<u>Economic rank</u>	169,291	3.87	1.48	1.00	9.00
<u>Monthly income in rubles</u>	169,291	6,063.84	12,322.33	1.00	430,000.00
<u>Monthly income in natural log</u>	169,291	3.99	4.48	0.00	12.97
<u>Unemployed</u>	169,291	0.06	0.24	0.00	1.00
<u>Occupation</u>					
Professional	169,291	0.09	0.29	0.00	1.00
Technician or associate professional	169,291	0.09	0.28	0.00	1.00

³ There are 55,660 distinct individuals that participated in the 23 rounds of the RLMS with 353,827 observations total. This means that an individual on average participated in approximately six rounds of the survey although in reality, the participation of individuals spanned the entire range. In our analysis, we limit the individuals to those who have participated in at least five rounds. The data also includes post-stratification weights on both household and individual-levels, which adjust for both design factors of the survey as well as deviations from the census characteristics. Our final weighted sample contained 169,291 observations from 21,109 distinct individuals.

Service or sales worker	169,291	0.09	0.28	0.00	1.00
Craft or related trades worker	169,291	0.07	0.26	0.00	1.00
Plant or machine operators, or assemblers	169,291	0.08	0.26	0.00	1.00
Other work	169,291	0.11	0.31	0.00	1.00
<u>Self-assessed health</u>	169,291	3.16	0.74	1.00	5.00
<u>Male</u>	169,291	0.41	0.49	0.00	1.00
<u>Age</u>	169,291	45.93	18.57	13.00	102.00
<u>Marital Status</u>					
Single	169,291	0.27	0.44	0.00	1.00
Married	169,291	0.46	0.50	0.00	1.00
Divorced	169,291	0.08	0.27	0.00	1.00
Widowed	169,291	0.13	0.34	0.00	1.00
<u>Education</u>					
Secondary education diploma or less	169,291	0.56	0.50	0.00	1.00
Vocational secondary education diploma	169,291	0.24	0.43	0.00	1.00
Higher education diploma or more	169,291	0.21	0.40	0.00	1.00
<u>Non-Russian</u>	169,291	0.17	0.38	0.00	1.00
<u>Household size</u>	169,291	3.38	1.70	1.00	16.00
<u>Ownership of Household Assets</u>					
Own car	169,291	0.42	0.49	0.00	1.00
Own freezer	169,291	0.12	0.32	0.00	1.00
Own refrigerator	169,291	0.68	0.47	0.00	1.00
Own washer	169,291	0.78	0.42	0.00	1.00
Own TV	169,291	0.98	0.15	0.00	1.00
Own VCR/computer	169,291	0.65	0.48	0.00	1.00
<u>Expect to live better in next 12 months</u>	169,291	0.23	0.42	0.00	1.00

<u>Expect to live worse in next 12 months</u>	169,291	0.62	0.49	0.00	1.00
<u>Self-perceived power</u>	169,291	3.61	1.68	1.00	9.00
<u>Self-perceived respect</u>	169,291	6.08	1.71	1.00	9.00
<u>Afraid of losing job</u>	169,291	0.30	0.46	0.00	1.00
<u>Uncertain of re-employment if unemployed</u>	169,291	0.23	0.42	0.00	1.00

4.1. Summary Statistics

Table 1 shows the summary statistics for all the variables that are included in our model. There are 23 different rounds and representation from all 8 federal districts of Russia in the dataset. There are 169,291 observations from 21,109 distinct individuals. The mean value of life satisfaction is approximately 2.96 on scale of 1 to 5, and the mean value of the self-perceived economic welfare rank is approximately 3.87 on a scale of 1 to 9. Please refer to Appendix A, for further breakdown of the response variable, and Appendix B, for the key control variable used in the empirical analysis.

We also include individuals' monthly income using natural logarithm.⁴ In the survey, those that are unemployed are not asked for their monthly income. We assign them a monthly income value of 1 ruble so that the natural logarithm of their income becomes 0. We also include an unemployment dummy variable to control for their employment status whether or not they are unemployed at the time of the survey. We also include different occupations for those that are currently employed.

Other demographic controls, such as self-assessed health, gender, age, marital status, education, whether one is an ethnic minority, household size, ownership of household assets, and other attitudinal variables are included in the model. Only a small proportion of the sample, around 17%, are not ethnically Russian, but we include the dummy variable in the model in order to account for the effects of being an ethnic minority on life satisfaction (Utsey et al., 2002; Verkuyten, 2008). Also, only a small proportion of the sample is divorced (8%) or widowed (13%), but we include these individuals in the model separately in order to account for difference in effects of the two marital statuses (Chen, 2001; Lucas et al., 2003; Lucas, 2007).

4.2. Empirical Results and Analysis

Table 2 shows the regression results for the sample weighted ordered probit models, where column (1) is the first baseline model without any controls or fixed-effects, shown in equation (1). Columns (2) and (3) are also baseline models that include other measures of economic welfare as control variables. Column (2) includes monthly income in natural logarithm and Column (3) includes both income and unemployment status. Column (4) includes the rest of control variables, and Column (5) is the result of estimating equation (7), which includes regional and year fixed-effects. All standard errors are clustered at the individual level.

⁴ Russia had a monetary reform in 1998, in which starting January 1, 1998, 1000 rubles became worth 1 ruble. In order to account for this, we divided the income value by 1000 for responses before 1998.

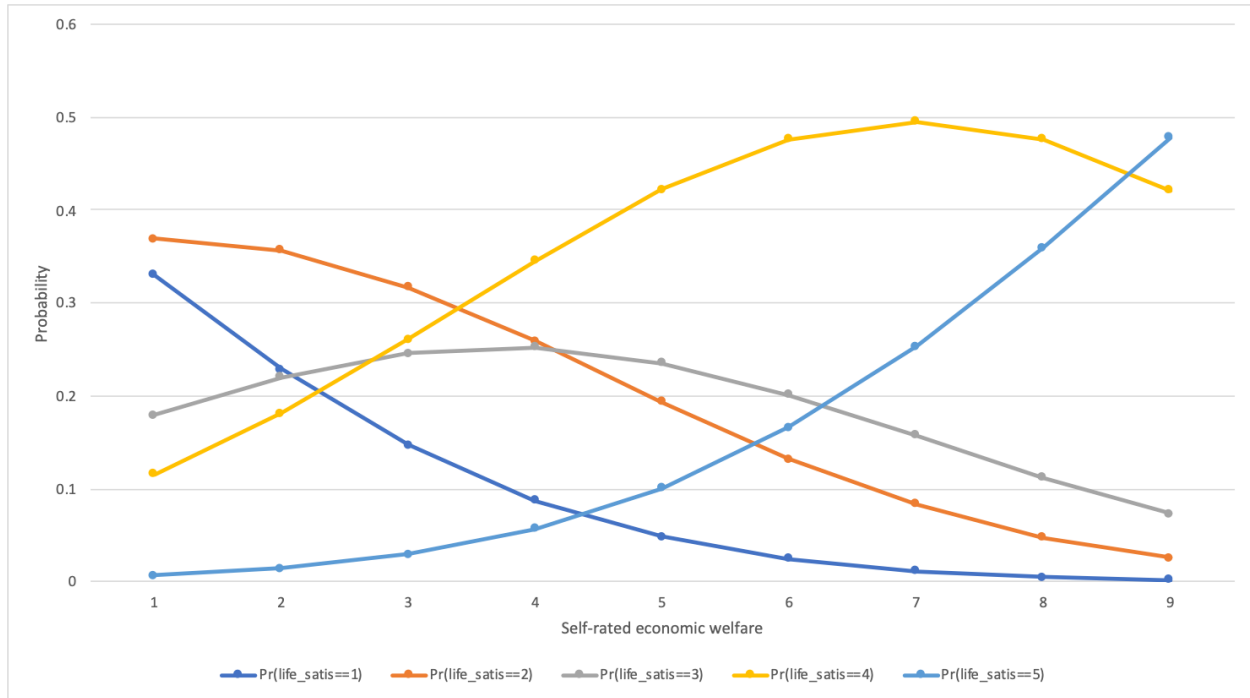
Table 2: Ordered Probit Regression Results

	(1)	(2)	(3)	(4)	(5)
Model	Baseline 1	Baseline 2	Baseline 3	Controls	Controls & FE
perception	0.306*** (0.00295)	0.297*** (0.00296)	0.298*** (0.00296)	0.164*** (0.00331)	0.179*** (0.00329)
lnincome		0.0293*** (0.000925)	0.0244*** (0.000961)	0.0471*** (0.00154)	0.0191*** (0.00152)
unemployed			-0.391*** (0.0139)	-0.498*** (0.0150)	-0.474*** (0.0152)
health				0.306*** (0.00654)	0.299*** (0.00656)
age				-0.0445*** (0.00150)	-0.0416*** (0.00151)
age2				0.000513*** (0.0000163)	0.000461*** (0.0000164)
married				0.132*** (0.0109)	0.105*** (0.0121)
divorced				-0.0928*** (0.0175)	-0.132*** (0.0178)
widowed				-0.0829*** (0.0184)	-0.0906*** (0.0188)
vocational				-0.00973 (0.0112)	-0.0174 (0.0111)
university				0.0141 (0.0132)	-0.0140 (0.0132)
nonrussian				-0.00741 (0.0112)	0.0111 (0.0125)
# of Observations	169,291	169,291	169,291	169,291	169,291
Pseudo R2	0.0568	0.0620	0.0645	0.118	0.133

Year FE	No	No	No	No	Yes
Region FE	No	No	No	No	Yes

Columns (4) and (5) include occupation, gender, household size, ownership of household assets, and other attitudinal variables that are not reported on the table above. Furthermore, Column (5) include Year/Region Fixed-Effects. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Figure 3: Visualization of the Predicted Probabilities based on Baseline 1 Ordered Probit Model



4.2.1. Analysis of Self-Perceived Economic Welfare

For the baseline model in column (1), the coefficient for self-perceived economic welfare is approximately 0.306 and its standard error is 0.00295, thus it is statistically significant at the 1% level. The coefficient is positive, indicating that the probability of ranking higher on the life satisfaction rank increases when self-perceived economic welfare increases.

Figure 3 visualizes the predicted probabilities of each life satisfaction rank for each self-perceived economic welfare rank for the baseline model in Column (1). The figure is limited in that it does not account for other control variables or fixed effects, but it provides a simple visualization of the predicted probabilities. As self-perceived economic welfare increases, the predicted probability of life satisfaction being ranked between 1 to 3 (“not at all satisfied”, “less than satisfied”, and “both yes and no” respectively) generally decreases. The probability of life satisfaction being ranked at 4 (“rather satisfied”) generally increases with an increase in self-perceived economic welfare rank, peaking at the economic rank of 7, then slightly decreasing at ranks 8 and 9. Lastly, the probability of life satisfaction being ranked at 5 (“fully satisfied”) increases steeply with an increase in self-perceived economic welfare rank. The findings support our hypothesis that there is a strong positive correlation between self-perceived economic welfare and life satisfaction.

It should be noted that the coefficients for self-perceived economic welfare remain stable even with the inclusion of control variables and fixed-effects in Table 2 Columns (2) thru (5).

Column (2) includes individual's monthly income using natural logarithm, and Column (3) includes both income and unemployment status. Even with the inclusion of these economic welfare measures, the coefficient for self-perceived economic welfare remains stable at around 0.297 in Column (2) and ~0.298 in Column (3). In Column (4), the inclusion of other control variables shifts the coefficient to ~0.164, but it still remains positive and statistically significant at the 1% level. In Column (5), the coefficient remains stable ~0.179 with region and time fixed-effects. While the coefficients shift slightly with the inclusion of different control variables, the general stability of the coefficients across all 5 columns suggests the robustness of the results, which further strengthens the finding that life satisfaction rank increases with an increase in self-perceived economic welfare.

Table 3: Cutoffs of Ordered Probit models

	(1)	(2)	(3)	(4)	(5)
Model	Baseline 1	Baseline 2	Baseline 3	Controls	Controls & FE
μ_1	-0.133*** (0.0131)	-0.0578*** (0.0133)	-0.107*** (0.0135)	-1.554*** (0.0464)	-1.364*** (0.0511)
μ_2	0.827*** (0.0133)	0.915*** (0.0136)	0.871*** (0.0138)	-0.482*** (0.0461)	-0.262*** (0.0509)
μ_3	1.471*** (0.0140)	1.566*** (0.0143)	1.525*** (0.0145)	0.241*** (0.0461)	0.483*** (0.0509)
μ_4	2.806*** (0.0166)	2.906*** (0.0171)	2.869*** (0.0172)	1.703*** (0.0470)	1.972*** (0.0519)
# of Observations	169,291	169,291	169,291	169,291	169,291
Pseudo R2	0.0568	0.0620	0.0645	0.118	0.133
Year FE	No	No	No	No	Yes
Region FE	No	No	No	No	Yes

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3 shows the cutoffs of each of the models. In the final model in Column (5), the cutoffs are approximately -1.364, -0.262, 0.483, and 1.972, from μ_1 to μ_4 respectively. If the latent variable, the unobservable true-life satisfaction of an individual is $y_i^* \leq -1.364$, then the individual will rank their life satisfaction as 1. If $-1.364 \leq y_i^* \leq -0.262$ then the individual will rank their life satisfaction as 2, and so on until $y_i^* \geq -1.972$, where life satisfaction will be ranked as 5. For each of the models, the cutoffs are used in equations (8) to (12) to calculate the marginal effects of self-perceived economic welfare on the probability of each of the life satisfaction rank outcomes.

Table 4: Marginal effects of one-unit change in self-perceived economic welfare rank on the probability of the life satisfaction rank outcome

	(1)	(2)	(3)	(4)	(5)
Model	Baseline 1	Baseline 2	Baseline 3	Controls	Controls & FE
$\frac{\partial P(y = 1)}{\partial perception_i}$	-0.0506***	-0.0483***	-0.0480***	-0.0219***	-0.0226***
	(0.000646)	(0.000626)	(0.000624)	(0.000490)	(0.000474)
$\frac{\partial P(y = 2)}{\partial perception_i}$	-0.0635***	-0.0626***	-0.0630***	-0.0382***	-0.0430***
	(0.000734)	(0.000740)	(0.000745)	(0.000805)	(0.000827)
$\frac{\partial P(y = 3)}{\partial perception_i}$	-0.00332***	-0.00311***	-0.00308***	-0.00198***	-0.00212***
	(0.000402)	(0.000393)	(0.000395)	(0.000220)	(0.000245)
$\frac{\partial P(y = 4)}{\partial perception_i}$	0.0842***	0.0822***	0.0826***	0.0487***	0.0540***
	(0.00101)	(0.00100)	(0.00101)	(0.00102)	(0.00103)
$\frac{\partial P(y = 5)}{\partial perception_i}$	0.0332***	0.0318***	0.0315***	0.0134***	0.0137***
	(0.000460)	(0.000454)	(0.000449)	(0.000322)	(0.000316)
# of Observations	169,291	169,291	169,291	169,291	169,291

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4 shows the marginal effects at the mean self-perceived economic welfare for the five models above. The results reveal similar findings to those in Table 2. It further shows how an increase in self-perceived economic rank by 1 unit affects the probability of an individual choosing each of the 5 life satisfaction ranks. In Column (5) of Table 4, which includes controls and fixed-effects, when the self-perceived economic welfare rank increases by 1 from its mean of 3.87 while controlling for all other variables at their mean, the probability of the individual choosing the life satisfaction rank of 1 decrease by 2.26%. The probability decreases by 4.30% for rank 2, and decreases by 0.212% for rank 3. However, the probability increases by 5.40% for rank 4, and finally, increases 1.37% for rank 5, the highest life satisfaction rank. These results support the hypothesis that an increase in self-perceived economic welfare increases life satisfaction.

4.2.2. Analysis of Income, Unemployment and Other Variables

Table 3 also suggests that monthly income, unemployment, health, age, and marital status are important determinants of life satisfaction. We find that that life satisfaction increases with a statistically significant *increase* in monthly income, while unemployment causes a statistically significant *decrease* in life satisfaction. The results also suggest that when one ranks their health to be better, life satisfaction rank also increases. We also find that in comparison to being single, being married increases life satisfaction, while being divorced or widowed decreases life satisfaction.

Interestingly, we find that education is not a significant determinant of life satisfaction. When compared to those who have completed secondary education or less, those who have technical or vocational education are more likely to rank themselves lower on the life satisfaction rank while those with a university degree are more likely to rank higher, but these effects are *not* statistically significant. We also find that being non-Russian has negligible effects on life satisfaction, contrary to previous literature that find that ethnic minorities generally have lower life satisfaction (Utsey et al., 2002; Verkuyten, 2008).

Finally, we find that household size, ownership of household assets, and other attitudinal variables, such as expectations for the future, self-perceived power and respect, perception of job security are significant determinants of life satisfaction. These results are available upon request.

5. Conclusions, Policy Implications, and Possible Extensions

The empirics from the previous section provide evidence that is consistent with our hypothesis that life satisfaction increases with self-perceived economic welfare. This is especially underscored by the stability of the coefficients for self-perceived economic welfare across all 5 models in Table 2.

The findings from this paper are consistent with previous literature, which suggests that better economic welfare is in fact correlated with higher life satisfaction in general. More importantly however, is the contribution that the findings from this paper make to the limited existing literature that examines subjective economic welfare as a determinant of life satisfaction. The statistically significant results suggest an importance in studying subjective measures of economic welfare and their effects on life-satisfaction.

The conclusions from this study also provide a potential explanation of the ‘Easterlin paradox.’ Our findings suggest that *how* people perceive their economic welfare matters, whether it be relative to others or to the material norms of society.

In closing, this study provides policy implications for societies with income inequalities. Under the assumption that people measure their own subjective economic welfare relative to others and to the material norm of the society, our findings suggest that relative economic welfare matters. This in turn implies that societies with higher income inequality will have lower collective life satisfaction. In a society with high income inequality where a small proportion of a population earns a large proportion of the society’s income, an average individual may feel much less economically successful compared to both others and material norms, which would lead to lower life satisfaction for those who are not a part of the small wealthy population. It would be interesting to further explore this topic by looking at neighborhoods or regions with different income inequality to examine how income inequality affects subjective measures of economic welfare, and subsequently life satisfaction. Exploring how subjective economic welfare differs across individuals of different income levels could allow us to expand on Kahneman and Deaton’s (2010) ‘75,000 USD threshold,’ after which there is a plateau in day-to-day happiness. Examining how the effects of self-perceived economic welfare on life satisfaction are different for individuals with

different income levels and societies with different income inequality may provide further insight into income inequality and individuals' wellbeing.

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Appendix A: Count of Observations for each of the Life Satisfaction Ranks from 1994 to 2018

Life Satisfaction Rank	Frequency	Percent
Not at all satisfied	20,162	11.91
Less than satisfied	43,961	25.91
Both yes and no	38,811	22.93
Rather satisfied	55,235	32.63
Fully satisfied	11,222	6.63
Total	169,291	100

Appendix B: Count of Observations for each of the Self-Perceived Economic Welfare Ranks from 1994 to 2018

Self-Perceived Economic Welfare on 9-Step Ladder (higher is better)	Frequency	Percent
1	9,916	5.86
2	20,535	12.13
3	38,916	22.99
4	40,568	23.96
5	39,331	23.23
6	13,370	7.90
7	5,388	3.18
8	969	0.57
9	298	0.18
Total	169,291	100

Appendix C: Variable Definitions

Variable	Definitions
life_satis	Life satisfaction rank
perception	Self-perceived economic welfare rank
lnincome	Monthly income in natural log
unemployed	Unemployed
professional	Professional
technician	Technician or associate professional
service	Service or sales worker
craft	Craft or related trades worker
plant_machine	Plant or machine operators, or assemblers
other_emp	Other work
health	Self-assessed health
male	Male
age	Age
age2	Age squared
married	Married
divorced	Divorced
widowed	Widowed
vocational	Vocational secondary education diploma
university	Higher education diploma or more
nonrussian	Non-Russian
hhsiz	Household size
car	Own car
freezer	Own freezer
fridge	Own refrigerator

washer	Own washer
tv	Own TV
computer	Own VCR/computer
live_better	Expect to live better in next 12 months
live_worse	Expect to live worse in next 12 months
power_rank	Self-perceived power
respect_rank	Self-perceived respect
job_insec	Afraid of losing job
reemp_insec	Uncertain of re-employment if unemployed
central	Central Federal District
northern	Northwestern Federal District
southern	Southern Federal District
north_caucasian	North Caucasian Federal District
volga	Volga Federal District
ural	Ural Federal District
siberian	Siberian Federal District
far_eastern	Far Eastern Federal District
1994-2018	Year dummies 1994-2018