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ESTIMATING THE RELATIONSHIP BETWEEN A RATE OF TIME PREFERENCES AND SOCIO-ECONOMIC FACTORS IN RUSSIA[4]

A rate of time preferences reflects an individual's opinion on how to distribute consumption among periods. In this paper we examine various socio-economic factors that are related to the rate of time preferences in Russia. Necessary data are obtained from a survey from the Yuri Levada Analytical Center that was conducted in 2011. Our findings suggest that time preferences of men and women should be analyzed separately in Russia. Such factors as age, income, educational level, the size and structure of a household, marital status and a place of residence have significant impact on the rate of time preferences. However, these socio-economic factors influence the rate of time preferences in different ways for men and women.

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Key words: socio-economic factors, individual discount rate, Russia, individual time preferences.

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1. Introduction

Since the 19th century, economists have paid attention to the problem of intertemporal choice and its factors. Authors have examined economic aspects of intertemporal choice, as well as its sociological and psychological aspects. "A Note on the Measurement of Utility", a paper by P. Samuelson in 1937, has become a turning point of views on intertemporal choice by describing a discounted utility model. The main assumption of this model indicates that all the motives underlying intertemporal choice can be put in a single parameter called a discount rate. This rate (an "individual discount rate" (IDR) or a "rate of time preferences" (RTP)) reflects individual time preferences for obtaining utility from consumption, and shows how disadvantageous future utility is when compared to utility at the present. The higher the rate of time preferences, the more impatient the individual is. A positive rate means that, all else equal, an individual prefers utility from consumption today rather than the future.

Despite the broad use of the discounted-utility concept, there is much criticism about it in some research papers. For instance, Frederick and coauthors distinguish time discounting and time preferences (Frederick et al, 2002). They emphasize that one and the same rate of time preferences does not apply to all forms of consumption. Notwithstanding the defensible criticism of this model, we support the evidence of recent empirical studies that the rate of time preferences reflects the individual's intertemporal choice, particularly healthy/unhealthy behavior. Many research papers confirm the relation between the rate of time preferences and obesity (Komlos 2004), health care demand (Bradford 2010), decision to smoke (Harrison 2009), (Scharff, Viscusi 2011). Estimation of this rate and the analysis of relevant factors are useful for policy-makers since economic costs of unhealthy lifestyle are significant for the society. Such an analysis has been conducting abroad for some time now, for example, the research of Harrison for Denmark (Harrison 2002). The usefulness of the rate of time preferences for government decision-making is highlighted in many foreign studies (Ng 1989; Grignon 2009; Bradford 2010).

Wide popularity of the rate of time preferences abroad does not spread over Russia. This measure is not being applied here because of an insufficient methodological framework. Thus, our research aims to estimate the relationship between various socio-economic factors and the rate of time preferences in Russia. The results of individual discount rate estimation and conclusions on the socio-economic factors affecting this rate can help to improve the government policy through deeper understanding of individual intertemporal choice and to achieve budget savings through the correct decision-making.

2. Individual intertemporal choice and socio-economic factors

2.1. The rate of time preferences and problems with its estimation

From a variety of literature on the problem under consideration we outline the main points that are relevant for our research. Various studies usually suggest using a survey for rate of time preferences evaluation. Here respondents choose either to receive a certain amount of money today or to postpone in exchange for a cash reward to be received at a later date. The answers show individual time preferences of respondents. The most common ways of constructing questions are as following (Fuchs 1982):

I. an experimenter offers a respondent a sum of money relating to the future and asks what smaller amount would be acceptable to receive immediately;

II. an experimenter offers a respondent a sum of money today and asks what minimum amount would be acceptable in the future to compensate the delay in receiving money;

III. an experimenter offers a respondent two sums of money and asks what time period would make these sums equivalent.

It is worth noting that estimating the rate of time preferences faces several problems. First, respondents may inaccurately predict their behavior or not give answers at all.

Second, the rate is not constant with increases in the planning horizon (Tasset et al. 1999). Most economists agree that the rate of time preferences decreases with time. Individuals tend to be more patient in the long-run than in the short-run (Angeletos et al. 2001).

Third, questions in terms of benefits and questions in terms of payments lead to different results of estimation (Frederick et al. 2002). Many research papers confirm that the rate of time preferences for a benefit is higher than the rate for a payment (Benzion et al. 1989; Shelley 1993; Chapman and Elstein 1995; Warner and Pleeter 2001).

Forth, the size of the proposed prize strongly influences individual time preferences. Individuals use higher rates for smaller benefits than for larger ones (Thaler 1981; Benzion U. et al. 1989; Holcomb and Nelson 1992). In this case it is important to know an individual's subjective opinion on the significance of the proposed prize.

Fifth, a sequence of increasing benefits and a sequence of decreasing benefits have different impacts on the rate of time preferences (Chapman 2000). As a rule, a sequence of benefits which increase with time is more attractive for an individual than a sequence of decreasing benefits. However, this does not reconcile with the concept of a positive discount rate (Frederick et al. 2002).

Sixth, measurement should exclude the impact of market interest rates on individual time preferences. Otherwise, derived values of time preferences' rates will reflect an alternative market return, rather than time preferences (Harrison et al. 2002). To eliminate the impact of market interest rates it is necessary to consider what alternative money investments are available for an individual at the moment of a response to the questionnaire (Coller and Williams 1999).

Lastly, an option to delay receiving money has the additional risk of an experimenter's default (Harrison et al. 2002). If an individual has the option to receive money immediately and an option to receive a larger amount later, the second option is riskier than the first one. The individual associates the second option with high transaction costs, and the rate of time preferences also includes compensation for high risk. In order to prevent the overestimation of individual time preferences, it is possible to formulate questions in a way such that all options are devoted to the future. It enables us to fix transaction costs for an individual and eliminate the additional risk.

All confounding factors described above should be adequately controlled while estimating the rate of time preferences (Frederick et. al. 2002). Otherwise, the result of estimation will not reflect the pure time preferences of an individual.

Empirical studies on the problem demonstrate rather high values of rates of time preferences (appendix 1). When an individual is unable to delay obtaining utility from consumption, his or her rate of time preferences equals infinity. When an individual prefers a sequence of increasing benefits to a sequence of decreasing benefits his or her rate of time preferences is negative. It is interesting that there are no negative values and very high values of individual discount rates in studies from the last five years. This is mainly because of the intention to avoid overestimation. It is necessary to note here, that we cannot directly compare estimates given in various studies since studies are based on samples with significantly different characteristics.

2.2. Socio-economic factors related to the rate of time preferences

The literature suggests various factors that related to a rate of time preferences. These factors include social, cultural, psychological, and economic factors, as well as others. Most frequently mentioned among them are socio-economic factors such as the age of an individual, gender, income, educational level, and the current state of health. We focus the review on significant socio-economic factors and provide evidence to include these factors into our further analysis.

Gender. Many researchers agree that men and women have different rates of time preferences (Kirby, Marakovic 1996; Harrison et al. 2009; Bradford 2010). Several authors have concluded that men have higher rates than women (Coller and Williams 1999; Warner and

Pleeter 2001). On the contrary, Bradford (2010) shows that men have lower rates of time preferences than women. Scharff and Viscusi (2011) also describe that women have higher rates than men. Following this view, the time preferences of men and women should be analyzed separately (Fuchs 1982).

Age. Most researchers agree that there are significant differences in time preferences of individuals belonging to different age groups (Gafni 1995; Lahav et al. 2010). From one point of view, the rate of time preferences declines with age because children cannot delay utility at all. But as children get older, self-control increases (Warner and Pleeter 2001; Chesson et al. 2006). From another point of view, the rate of time preferences declines up to middle age and then starts rising as one gets older. This is due to the fact that older people place a high value on the risk that they might not live to see the utility from future consumption. Consequently, older people should have higher rates of time preference than middle-aged individuals. For instance, Vanr De Pol and Cairns (1999) suggest that individuals in the 64-and-older age group have higher rates than other age groups. Thus, the relation between the age of an individual and his or her rate of time preferences is not linear.

Income. Various studies show that the higher the income of an individual, the lower his or her rate of time preferences (Lawrance 1991; Poulos and Whittington 1999). For instance, Harrison et al (2002) suggest that individuals in households with the highest income have rates of time preferences that are about ten percentage points lower than that of individuals in households with the lowest income.

Some authors analyze the impact of welfare on individual time preferences rather than the impact of income (Atmadja 2008). However the conclusion remains the same. The higher the welfare of the individual, the more patient he or she is and the lower his or her individual discount rate for future utility from consumption (Dioikitopoulos and Kalyvitis 2010).

Educational level. The higher the educational level of the individual, the better that individual is at controlling his or her self. A higher educational level makes it easier for an individual to refuse the utility from consumption today in exchange for health benefits in the future. Therefore, individuals with a high level of education have relatively low rates of time preferences (Fuchs 1982; Becker and Mulligan 1997; Dioikitopoulos and Kalyvitis 2010). In addition, many authors agree that upgrading the skill level of an individual enables one to reduce his or her rate of time preferences (Harrison et al. 2002). In other words, easy access to education helps in reducing this rate.

State of health. Differences in an individual's state of health at the present explain the differences in values of rates of time preferences (Becker and Mulligan 1997; Dolan Gudex 1995; Vanr De Pol and Cairns 2000). Individuals with good health assess the risk of not

receiving utility from consumption in the future less than individuals with poor health assess the risk. Thus we can conclude that the better the health of an individual, the lower his or her rate of time preferences (Dioikitopoulos and Kalyvitis 2010).

Among the factors of individual time preferences, the ***size of a household*** is also mentioned in some studies. The larger the size of a household is, the higher the rate of its time preferences (Holden et al. 1998; Warner and Pleeter 2001).

In addition to the factors described above, authors include into analysis of individual time preferences such characteristics of the individual as ***marital status*** (Bradford 2010; Bradford, Burgess 2011), ***employment status*** (Bradford 2010; Bradford, Burgess 2011), and ***the type of employment*** in a case when respondents in the sample do differ on this criterion (Booij, van Praag 2009).

A brief review of the relevant literature on time preferences estimation in different countries makes it possible to formulate hypotheses on the individual intertemporal choice in Russia.

3. Assessing the impact of socio-economic factors on the rate of time preferences in Russia

3.1 Hypotheses and data

We base our analysis on a review of empirical studies and raise hypotheses on the following socio-economic factors that related to the rate of time preferences: age, gender, educational level, income, state of health, size of a household, marital status, employment status, and type of employment. Despite hypotheses are similar to those tested by other authors, conflicting results of their verification in different studies make testing them on Russian data necessary.

In addition, we assume that the place in which one resides has an impact on the formation of individual time preferences for Russians. The significant differentiation of Russian regions on the level of socio-economic development leads to different time preferences of Russians. Furthermore, Anderson and Gugerty also provide evidence that residency does matter within Russia, when considering intertemporal choice (Anderson, Gugerty 2009).

Table 1 presents the hypotheses tested in the given study.

Table 1

Hypotheses on factors related to the rates of time preferences of Russians

Hypothesis №1	Gender influences the rate of time preferences.
Hypothesis №2	The rate of time preferences declines with age
Hypothesis №3	The rate of time preferences declines as an individual’s income increases

Hypothesis №4	The higher the education level of an individual, the lower the rate of time preferences
Hypothesis №5	The better an individual's state of health, the lower the rate of time preferences
Hypothesis №6	The larger the size of a household, the higher the rate of time preferences
Hypothesis №7	Marital status has an impact on individual time preferences
Hypothesis №8	The employment status (employed or unemployed) have an impact on individual time preferences
Hypothesis №9	The place in which an individual resides has an impact on individual time preferences

Testing the hypotheses described in Table 1 are based on the data from a study conducted by the Yuri Levada Analytical Center entitled "A Study of the Population on the Development of Healthy Lifestyles and Specification of Government Guarantees of Healthcare in 2011".

To conduct this survey we construct a multistage stratified probability sample. The sample represents the adult population of Russia aged 15 years and older. Individuals below this age were not surveyed.

The principles of this sampling are as follows:

I. The first stage is a preliminary stratification of settlements on a geographical basis, population, and administrative status, including 36 strata. Distribution of the total size of the sample among all strata is proportional to the weight of each stratum (number of adults).

II. The second stage is the selection of questionnaire stations. The number of questionnaire stations should satisfy the condition such that one questionnaire station gives answers of about 8-10 respondents on average. Thus, two settlements are selected in rural areas. In urban areas we utilize from 1 to 5 questionnaire stations (2-3 on average). Exceptions are Moscow and St. Petersburg, where 36 and 16 questionnaire stations are selected, respectively.

The selection of questionnaire stations in urban areas and rural settlements is made by a probabilistic approach from complete lists of polling stations of the city (settlements of the specified rural area). In total, the survey was conducted in 320 settlements, including 174 cities and towns, and 146 villages.

III. The third stage is the selection of households by systematic approach with three obligatory visits of selected addresses.

IV. The fourth stage is the selection of respondents. In a selected household one respondent is polled. The research is conducted at the respondent's home by personal interview. The selection of respondents into the sample is made by the nearest birthday. The survey is carried out on working days in the evening, and all day on weekends. Thus, it is an equal probability of inclusion in the sample of employed and unemployed population.

The proposed design provides a statistical error of the sample estimates for the investigated variables (for dichotomous traits) of not more than 2.3% at a confidence level of 95%. The

principles of sampling mentioned above should provide its representativeness with the following parameters: gender, age, educational level, region, and size of a population settlement.

The sample totally consists of 4001 respondents: 1378 men and 2623 women. Descriptive statistics of the main respondents' characteristics are presented in table 2.

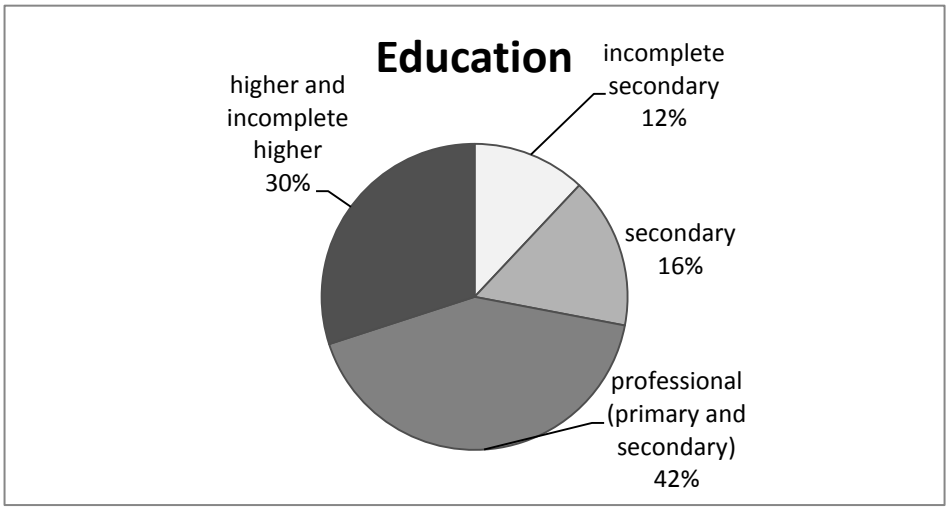
Table 2

Descriptive statistics of the sample

	Age	Size of a household	Children	Income (thousand rubles)
Mean	44.95	2.43	0.36	10.91
Median	45.00	2.00	0.00	8.75
Maximum	93.00	10.00	6.00	166.67
Minimum	15.00	1.00	0.00	0.25
Std. Dev.	18.52	1.19	0.68	8.71

Diagram 1 shows the distribution of respondent education. Here we pay attention to Russian specifics, where education is considered in terms of education levels instead of the total years of education.

Diagram 1. Distribution of respondents' education level



More precisely, the sample is characterized as follows. The mean age of respondents is 45 years. About 40% of respondents have a professional (primary and secondary) education. 16% of respondents have a secondary education, and 30% of respondents have a higher or an incomplete higher education. The percentage of respondents with higher education (27% of men and 32% of women) is slightly above the national average, which is 23% according to the 2010 population census.

Half of all households consist of two persons. The majority of households do not include children younger than 15 years.

The average per capita income in this sample is 10,915 rubles. This sum is substantially lower than average per capita income, which is 20,700 rubles, according to data of the Federal

State Statistics Service for 2011. Therefore, we conclude that the sample is shifted down according to population income.

With all of these, a subjective evaluation of income shows that only 315 households (8%) indicate that they "can hardly make ends meet," and "don't have enough money even for food". The largest number of respondents (50%) "have enough money for food and clothes, but buying durable goods (a TV set, a refrigerator, etc.) is a problem for them."

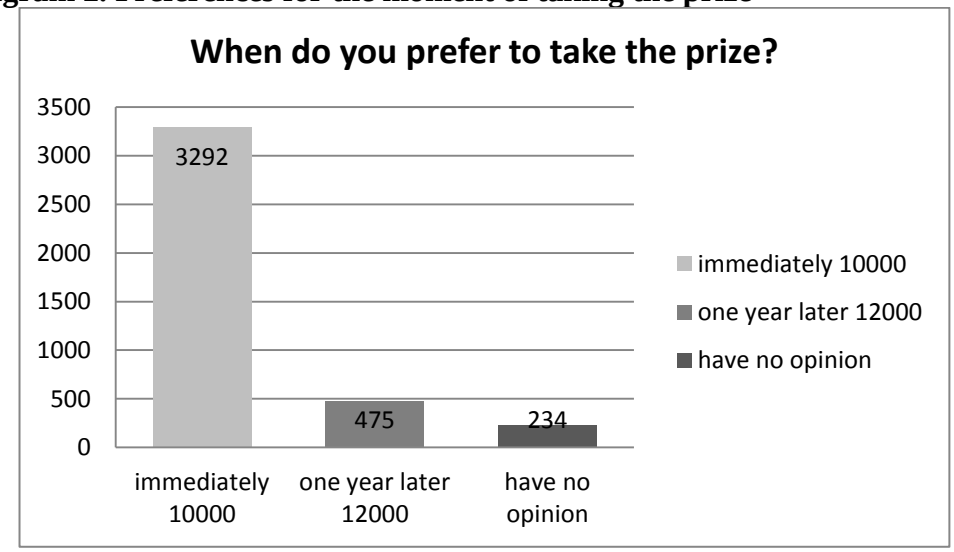
Thus, a representative of the sample is a woman of 45 years who has a secondary or higher education and income below the Russian subsistence minimum. She lives in a household that consists of two persons, and she doesn't have any children younger than 15 years.

In our research, we use two questions to estimate the individual discount rate of a respondent:

1. "Imagine that you win a money prize. The sum depends on the moment you take it. If you take the prize right now, the sum is 10,000 rubles. If you take the prize one year later, the sum will be 12,000 rubles. When would you prefer to receive the prize: now or in one year?"
2. "At what amount (at least) should the prize be increased for you to agree to receive it one year later?"

Answers of respondents to the first question are presented in the diagram 2.

Diagram 2. Preferences for the moment of taking the prize



As we see in the diagram 2, the vast majority of respondents prefer to take the prize immediately.

The second question was asked to those respondents, who do not agree to wait for one year or have no opinion. Diagram 3 shows all individuals' responses.

Diagram 3. Preferences for the increase of the prize

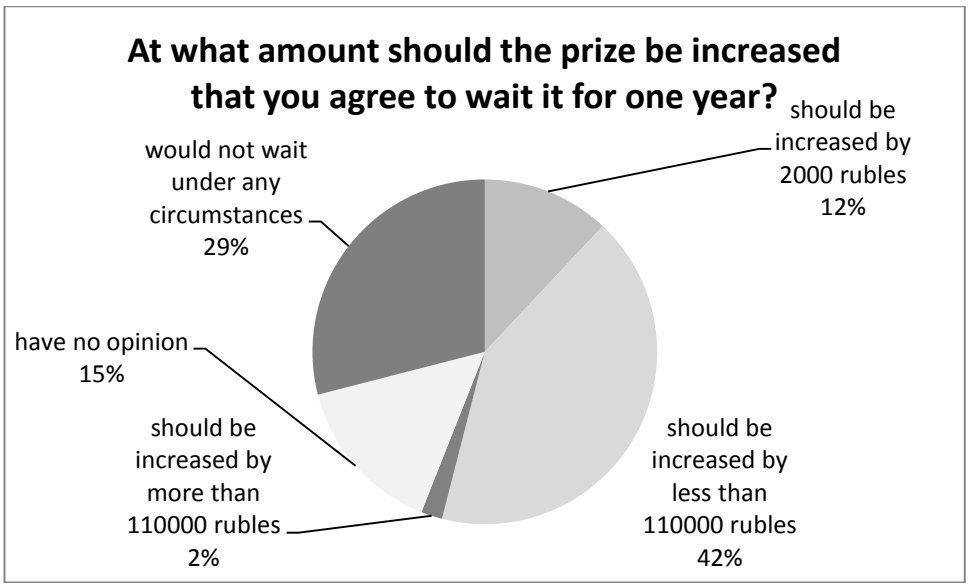
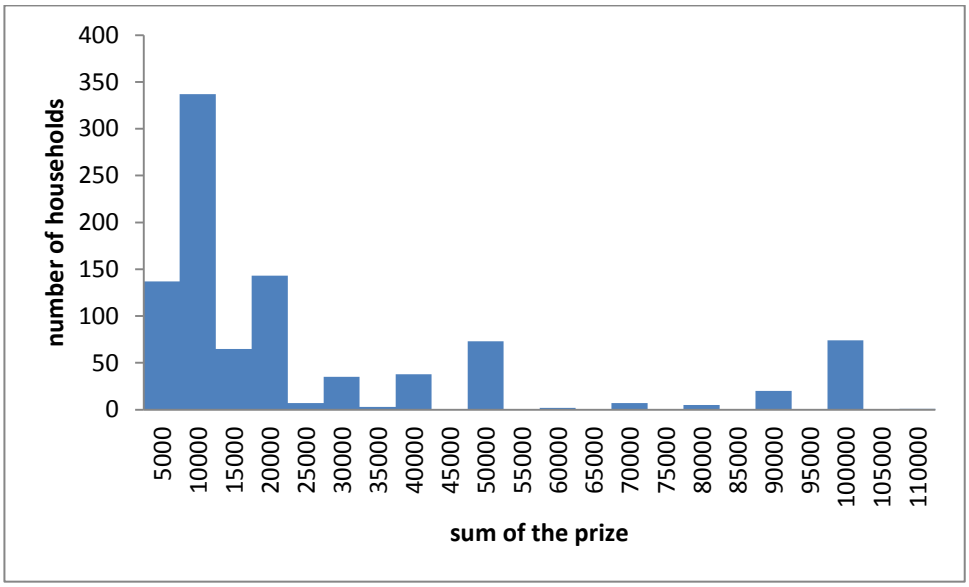


Diagram 3 demonstrates that about a third of the respondents (29%) would not agree to delay the prize for a year under any conditions. Another possible case is that respondents (2%) answer unreasonably high values that are more than 110,000 rubles. This means that they desire an increase in the prize amount of more than 1,000%. A significant number of respondents (15%) could not answer this question. This result probably reflects the fact that many Russians regard the risk of experimenter's default as being high.

The distribution of answers from respondents who are willing to delay the prize for one year and agree to receive a sum less than 110,000 rubles is presented in diagram 4.

Diagram 4. Distribution of respondent preferences for the sum of the prize



The diagram 4 indicates that the majority of respondents in this category agree to a sum within the limits of 25,000 rubles. For most of them the size of the desired prize is in a range from 5,000 to 10,000 rubles. This corresponds to the rate of time preferences, which is from 50% to 100%. The obtained values seem to be extremely high since the alternative market return is significantly lower than these values.

Thus, the results of our survey suggest that formulating questions in terms of delaying a prize is inappropriate for estimating absolute values of rates of time preferences in Russia. At the same time, the distribution of respondent answers enables us to estimate the relation between the rate of time preferences and the socio-economic factors.

All the arguments determine reasonability of using measures of the individual discount rate in models rather than its absolute values. Measures define the principal willingness of a respondent to defer the prize at a later date and the relative (ordered) amount of the required prize. In our research we select the following variables as measures which define the individual discount rate:

"Now" is a dummy variable that is 1 for respondents who prefer to take the prize immediately (10,000 rubles) and 0 for those who prefer to take 12,000 rubles one year later.

"Never" is a variable takes a value of 1 for respondents who are not able to wait for one year under any conditions and for respondents who indicate a sum more than 110,000 rubles. We can assume that the individual discount rate for them is infinite. For all other respondents, the value of the dependent variable is 0.

"IR" is a variable takes a value of 2,000 for respondents who agree to wait 12,000 rubles for one year, or equals to the sum of the desired prize named by respondents in the answer to the second question. In accordance with the distribution of respondents' answers, this variable takes 53 values from 2,000 rubles to 5 million rubles. Particularly, it is 34 values from 2,000 rubles to 110,000 rubles inclusive and 19 values higher than 110,000 rubles.

"IR_order" is a variable which takes values from 1 to 33 in accordance with the order number of "IR" in a case when the sum of the desired prize is lower than 110,000 rubles. This variable takes a value of 34, if the sum of the desired prize equals or higher than 110,000 rubles or an individual do not agree to wait for one year under any conditions.

"Order" is a variable based on "IR_order". The variable "Order" enables us to consolidate categories in such a way that each category includes no less than 100 observations. As a result, we have 8 values of the variable instead of 34 values.

"IR^{c}" is a censored variable takes a value of "IR" if the sum of the desired prize is lower than 110,000 rubles, and a value of 110,000 if the sum of the desired prize equals or higher than 110,000 rubles.

"$IR^{c\infty}$" is a censored variable, which takes a value "IR", if the sum of the desired prize is lower than 110,000 rubles; and takes a value of 110,000, if the sum of the desired prize equals or higher than 110,000 rubles, or respondents do not agree to wait for one year under any conditions.

We consider the following characteristics as possible factors of the rate of time preferences. First of all, it is characteristics of the individual: gender, age, education, marital status, self-reported health and chronic disease, employment status. It is important to note that categorical variables are included as a set of dummy variables. The age of an individual is taken into account as both a continuous variable and a set of dummy variables for the following age groups: under 25, from 26 to 35, from 36 to 45, from 46 to 55, from 56 to 65, and over 65. For education we use the following levels: primary and professional secondary, incomplete secondary, secondary, higher and incomplete higher. The factor of "marital status" includes both official and unofficial marriage, as well as "not married" status and "widow/widower" status. It is important to note, that unofficial marriage is very common in Russia, and this form should be taken into account.

Second, we consider characteristics of an individual's household: size and structure of a household, what is the total number of household members, number of employees, number of children younger than 15 years, self-assessed household income. We choose "self-assessed household income" as an indicator of "income" instead of "personal income", because less than half of respondents answer the question about their personal income. Consequently, the sample is dramatically reduced.

Third, we examine the place of residence of the individual: Federal District and type of a population center. Population centers are divided among Moscow and St. Petersburg, large cities (more than 300,000 people), medium and small cities (less that 300,000 people), and rural settlements.

Values for the characteristics described above are based on respondent answers to the questionnaire in the Appendix 2.

3.2 Model description

We estimate three types of models based on the available data with the help of the maximum-likelihood method: binary choice models, ordered models, and tobit models.

1. Binary choice (probit) models

We consider a dependent variable "Yi" which is an indicator of event. We assume that:

$$P(Y_i = 1) = \Phi(x_i'\beta) \quad (1)$$

The log-likelihood for the probability (probit) model is

$$\ln(L) = \sum_{y_i=1} \ln \Phi(x_i'\beta) + \sum_{y_i=0} \ln(1 - \Phi(x_i'\beta)) \quad (2)$$

where x_i' is the row vector of values for an individual characteristics and characteristics of the individual's household,

β is the vector of parameters of the model,

Φ(t) the standard normal distribution.

In model I the dependent variable *Y* = "Now". This model allows us to identify those factors affecting the probability such that the rate of time preferences for an individual will be more than 20% per year.

In model II the dependent variable *Y* = "Never". This model enables us to determine the characteristics of individuals who do not agree to wait for one year under any conditions and therefore have an infinite rate of time preferences.

Signs of the coefficients in these models coincide with the direction of the impact of relevant variables on the probability that an indicator of heightened or infinite rate of time preferences equals 1, since

$$\frac{\partial P(Y_i = 1)}{\partial x_k} = \varphi(x_i' \beta)\beta_k ,$$

where φ(t) – standard normal density function.

2. Ordered (probit) models

Here we assume that the sum required by respondents reflects only the order of the desired reward. This assumption is supported by the fact that respondents evaluate the sum of the prize approximately. As a rule, the sum is equal to an integer of a thousand rubles. As we can see from the diagram 3, half of the respondents indicate a sum up to 10,000 rubles (inclusive). 75% of respondents point out the following values: 5,000 (n=194), 10,000 (n=543), 20,000 (n=240), 50,000 (n=119), 100,000 (n=162) rubles.

The dependent variable "Y" is the following ordered variables: "IR_order" (model III) which takes 34 values, and "Order" (model IV) which takes 8 values. The use of ordered variables allows us to assume that there is a latent variable "IR*" which is the true sum of the desired prize:

$$IR_i^* = x_i'\beta + \varepsilon_i \qquad (3)$$

Then

$$Y_i = \begin{cases} 1, & if \quad IR_i^* \le \alpha_1 \\ 2, & if \quad \alpha_1 < IR_i^* \le \alpha_2 \\ & \quad ... \\ s, & if \quad IR_i^* > \alpha_{s-1} \end{cases}$$

The log-likelihood for the ordered probit model is

$$\ln(L) = \sum_{k=1}^{s} \sum_{y_i = k} \left(\ln \Phi(\alpha_k - x_i'\beta) - \Phi(\alpha_{k-1} - x_i'\beta) \right), \qquad (4)$$

where *s* is the number of categories (34 for model III; 8 for model IV), $\alpha_0 = -\infty, \quad \alpha_s = +\infty$.

x_i' is the row vector of values for an individual characteristics and characteristics of the individual's household,

β is the vector for parameters of the model with unknown coefficients of the explanatory variables,

α is the vector for auxiliary parameters of boundaries,

Φ(t) is the standard normal distribution .

We can write for this model the following:

$$\frac{\partial E(IR_i^*)}{\partial x_k} = \beta_k$$
$$\frac{\partial P(Y_i = k)}{\partial x_k} = (\varphi(\alpha_{k-1} - x_i'\beta) - \varphi(\alpha_k - x_i'\beta))\beta_k, \quad 1 \le k \le s \qquad (5)$$

The sign of the coefficient β_k enables us to examine in what direction the variable x_k influences the true sum of the desired prize (and, consequently, the rate of time preferences), and the probability of getting to the category s, which indicates the highest rate of time preferences.

3. Tobit models

In these models the dependent variables are logarithm of "IR^c" (model V) and logarithm of "$IR^{c\infty}$" (model VI).

These variables are censored, as they are based on the variable "IR" which is also censored. The variable "IR" is censored from below by the value of 2,000. It is so, since we do not know the true rate of time preferences for those respondents who agree to receive 12,000 rubles in one year. We only notice that their rate of time preferences equals or lower than 20%.

Variables "IR^c" and "$IR^{c\infty}$" are censored from above by the value of 110,000. We choose such construction, because 2% of respondents indicate unfeasibly large amounts of money. The difference between model V and model VI lies in observations that are included into estimation. For model V we use observations where respondents agree to the proposed sum of the prize or indicate an exact sum of the desired prize. For model VI we use the entire sample. If an individual has an infinite rate of time preferences, we assign a value of 110000 to the dependent variable "$IR^{c\infty}$". For censored data we choose Censored Regression (Tobit) Model.

Thus, we assume that there is a latent variable "IR^*". This variable can be interpreted as the true amount of the desired prize. It is right for this variable that

$$Ln(IR_i^*) = x_i'\beta + \varepsilon_i \qquad (6)$$

Random errors ε_i are independent and identically distributed. They have normal distribution with zero expectation and variance σ^2. As before, x_i' *is* row vector of values of individual characteristics and characteristics of individual's household, β – vector of parameters of the model.

For those respondents who refuse the option "do not agree to wait for the prize under any conditions", the value of the latent variable "IR*" equals "IR".

We define the dependent variable $Y = IR^c$ for a model V, and $Y = IR^{c\infty}$ for a model VI.

The log-likelihood for the censored regression model is the following:

$$\ln(L) = \sum_{\ln(2000)<y_i<\ln(110000)} \ln\left(\frac{1}{\sigma}\varphi\left(\frac{y_i - x_i'\beta}{\sigma}\right)\right) + \sum_{y_i=\ln(2000)} \ln\Phi\left(\frac{\ln(2000) - x_i'\beta}{\sigma}\right) + \\ + \sum_{y_i=\ln(110000)} \ln\left(1 - \Phi\left(\frac{\ln(110000) - x_i'\beta}{\sigma}\right)\right) \quad (7)$$

where $\Phi(t)$, $\varphi(t)$ – standard normal distribution function and density function respectively.

We note here, that signs of the coefficients coincide with the direction of the influence of relevant factors on the "true" "IR*" and on the observable sum of the prize "Y", since marginal effects in Censored Regression Model are:

$$\frac{\partial(E(\ln(IR_i^*))}{\partial x_k} = \beta_k$$
$$\frac{\partial(E(Y_i))}{\partial x_k} = \beta_k * \left(\Phi\left(\frac{\ln(110000) - x_i'\beta}{\sigma}\right) - \Phi\left(\frac{\ln(2000) - x_i'\beta}{\sigma}\right)\right) \quad (8)$$

3.3 Results of estimation

First of all we compare advantages and disadvantages of six models described above. Model I and model II use less information than other models and consider only those indicators of events when the rate of time preferences is heightened or infinite. At the same time these models are estimated at the maximum possible number of observations. Moreover, models I and II contain no assumptions on the form of the distribution of respondents' answers.

Models III and IV use ordered depending variables. These models differ from each other only in the way of grouping respondents' answers. Therefore they should give similar results. As a dependent variable we use the ordered number of the sum of the desired prize instead of the absolute value of the prize. It enables us to avoid bias of estimation caused by a rough determination of the sum of the desired prize. Such a consolidation serves to increase the reliability of estimates. However, it might leads to the loss of information.

It is interesting to examine whether it is necessary to take into account the rates of time preferences of those respondents who do not agree to wait the prize for one year under any

conditions. On the one hand, it is reasonable to include them in estimation, because respondents who are not able to wait at all are about one-third of respondents who do not agree to take 12,000 rubles. In order to take such respondents into account, we assume that their desired prize is finite but unfeasibly large. That is why they indicate that they are not able to wait for one year and demonstrate an infinite rate of time preferences. On the other hand, the inclusion of these respondents could lead to situation when assumption of a normal distribution of errors in the model of Tobin is unrealistic. For this reason we estimate the Tobin's model on two samples, including and excluding respondents with an infinite rate of time preferences.

We estimate the Tobin's model (VI) at the maximum possible number of observations. However, a serious limitation of this model is an assumption that logarithm of the sum of the desired prize should have censored normal distribution. When interpreting estimation results of model V, it is necessary to remember that we estimate conditional expectation of sum of the prize in a case an individual indicates a finite rate of time preferences.

One of the hypotheses raised in our research is a significant effect of gender on the rate of time preferences. We base our estimations on Fuchs's arguments to run regressions for men and women separately (Fuchs 1982). However, we take into account the debate on this point, and we run Likelihood ratio test about integration of men and women into one model with a dummy variable "gender". This hypothesis is rejected for all models I – VI (Prob(LR)<0.01), except model II (Appendix 3). Therefore, we estimate model II on the basis of the joint sample of men and women.

Table 3 presents estimation results of five models (I, II, III, V, VI) for women. Model IV is presented only in Appendix 4, since results are very similar to the results of estimating model III.

Table 3

The relation between socio-economic factors and the rate of time preferences for women

Models	(I)	(II)	(III)	(V)	(VI)
Variables	Now	Never	IR_order	$\ln(IR^c)$	$\ln(IR^{c\infty})$
Age≤ 25	-	-0.159**	-	-	-
		(0.0676)			
25<Age≤ 35	-0.270***	-0.103	-	-	-
	(0.0935)	(0.0646)			
45<Age≤ 55	-	-	-	-	-
55<Age≤ 65	-	-0.204**	-	0.506***	-
		(0.0846)		(0.178)	
Age>65	-	0.398***	0.176***	-0.674***	0.405**
		(0.0827)	(0.0575)	(0.160)	(0.172)
Secondary education	-	-0.123	-0.174**	-	-0.505**
		(0.0888)	(0.0804)		(0.234)
Primary and professional secondary education	-	-0.164**	-0.174**	-	-0.505**
		(0.0790)	(0.0804)		(0.234)
Higher and incomplete	-	-0.240***	-0.230***	-	-0.716***

Higher education		(0.0823)	(0.0867)		(0.252)
Unofficial marriage	-	-	-	0.362*	-
				(0.220)	
Official marriage	-	-	-	-	-
Widow	-	0.211***	-	-	-
		(0.0761)			
Children under 15 years	0.295***	-	0.102*	0.270**	0.344**
	(0.0836)		(0.0556)	(0.126)	(0.162)
Number of household members	-	-	-	0.109**	-
				(0.0482)	
Number of workers in a household	-	-	-	-	-
Self-reported health: good	-	-	-	-	-
No chronic disease	-	0.0959**	-	-0.275***	-0.236*
		(0.0488)		(0.0996)	(0.143)
Self-assessed income: have enough money only for food	0.186**	-	-	-	-
	(0.0780)				
Self-assessed income: have enough money for food and clothes, but not durables	-	-	-0.187***	-0.309***	-0.549***
			(0.0512)	(0.105)	(0.149)
Self-assessed income: have enough money for durables, but not expensive items	-	-	-0.187***	-0.309***	-0.549***
			(0.0512)	(0.105)	(0.149)
Self-assessed income: have enough money for expensive items	-0.620*	0.637**	-0.506*	-1.335**	-1.541*
	(0.341)	(0.269)	(0.302)	(0.579)	(0.870)
Student	-0.232**	-	-0.200**	-	-0.523**
	(0.112)		(0.0893)		(0.259)
Employed	-	-	-	-	-
Moscow	-	-	-	-	-
Saint-Petersburg	-	-	-	-	-
Large cities	-	-	-	-	-
Medium and small cities	-	-	-	-	-
Central Federal District	-	-0.163**	-0.259***	-	-0.742***
		(0.0680)	(0.0731)		(0.213)
Southern Federal District	-0.486***	-0.226***	-0.587***	-0.239*	-1.668***
	(0.0883)	(0.0771)	(0.0820)	(0.129)	(0.240)
Volga Federal District	-0.315***	-0.283***	-0.560***	-0.275**	-1.601***
	(0.0807)	(0.0714)	(0.0753)	(0.111)	(0.220)
Ural Federal District	-	-	-	-	-
Siberian Federal District	-	-0.362***	-0.316***	-	-0.916***
		(0.0794)	(0.0831)		(0.242)
Far Eastern Federal district	-0.381**	-0.385***	-0.766***	-	-2.125***
	(0.153)	(0.120)	(0.129)		(0.374)
Constant	0.983***	0.261***		9.127***	12.24***
	(0.111)	(0.101)		(0.192)	(0.388)
Observations	2474	3,388	2216	1435	2216
LR	82.73	173.89	150.93	78.64	151.23

Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000

Standard errors are in parentheses; *** p<0.01, ** p<0.05, * p<0.1
Symbol «-» means that a variable was included in the initial model specification. However, results of LR-test on insignificant variables lead to exclusion of this variable from a model. Models with the complete set of variables are given in Appendix 4.

For women we reveal a complex relationship between the rate of time preferences and the factor of "age". Here, this factor is a set of dummy variables for age groups. As a reference group we use respondents from 36 to 45 years. The joint model II shows that respondents older than 65 years are more likely to choose an answer that they do not agree to wait the prize for one year under any conditions. That is why coefficients for this age group are positive in models III, VI. Named models include respondents with an infinite rate of time preferences. This conclusion concurs with results of Vanr De Pol and Cairns (1999). Older people have smaller needs than young people, and they are not able to delay consumption because of the risk that they might not live to see the utility from future consumption. At the same time, if an old respondent indicates a finite sum of the desired prize, this sum is lower than young respondents show (model V).

In order to obtain more information about the relationship between the rate of time preferences and the factor of "age", we estimate models V and VI once again with "age" as a continuous variable (Appendix 5). In these models a dependent variable (logarithm of the sum of the desired prize) is continuous. In model V we reveal a negative relation of respondent's age and the sum of the desired prize. In model VI we take into account those respondents who do not agree to wait for the prize and, therefore, have an infinite rate of time preferences. Here, we explore a positive relation of respondent's age and the sum of the desired prize. It can be explained by the increase of probability to reveal an infinite rate of time preferences for individuals of 65 years and older.

The factor of "education" is significant in three of five models. The reference group for this factor is "incomplete secondary education". We conclude that women whose level of education is higher than "incomplete secondary education" have lower rate of time preferences than other women. Respondents who have professional and higher education less frequently show an infinite rate of time preferences compared to those with secondary and incomplete secondary education. We note that in probit model I, ordered model III, and the Tobin's model (VI) the impact of higher education is slightly above the impact of professional and secondary education.

We reveal the relationship between marital status and the rate of time preferences in model V. Women who live in unofficial marriage indicate a higher sum of a desired prize that single women and women in official marriage. It is also worth noting, that widows and widowers are more likely to refuse the delay in receiving the prize, than other respondents (model II).

Considering children, we conclude that this factor is significant in all models except model II. Respondents from a household with children under 15 years have higher rates of time preferences in comparison with respondents who do not have young children.

Respondents from large households, all things being equal, indicate greater amounts of the desired prize. This conclusion is true when a respondent has a finite rate of time preferences (model V).

The relationship between health and the rate of time preferences is revealed in model II, V and VI. Respondents, who do not have chronic diseases, indicate a lower sum of the desired prize, than respondents, who have chronic diseases. However, they are more likely to refuse one-year delay in receiving money.

The impact of self-assessed income on the rate of time preferences for women is shown somehow in all models. Models III, V, and VI show that respondents with income enough for buying clothes and durables indicate lower sum of the desired prize than respondents with income enough only for making ends meet. Respondents with income enough for buying expensive items indicate the sum less than the others do. Therefore, we conclude that respondents with the highest income in our sample have lower rate of time preferences, than other respondents. However, these respondents are more likely to have an infinite rate of time preferences than other respondents (model II).

Table 3 shows that students in the sample have lower rate of time preferences, than other respondents. Moreover, students are less likely to refuse one-year delay in receiving the prize, than others.

We conclude on the relationship between the place of residence and the rate of time preferences as follows. Residents of the North-Western Federal District (the reference district) have higher rates of time preferences than residents of all other regions. The greatest difference exists between the reference district and the Far Eastern Federal district, and the smallest difference is between the reference district and Central Federal District. This fact reflects significant differences of Russian regions in their socio-economic environment.

Table 4 presents estimation results of models I – VI for men. Similarly to the analysis for women, model IV gives results that are very close to the results of estimating model III (see Appendix 6).

Table 4

The relation between socio-economic factors and the rate of time preferences for men

Models	(I)	(II)	(III)	(V)	(VI)
Variables	Now	Never	IR_order	$\ln(IR^{c})$	$\ln(IR^{c\infty})$
Age≤ 25	-0.240	-0.159**	-0.145*	-	-0.398
	(0.194)	(0.0676)	(0.0869)		(0.245)

25<Age≤ 35	0.215	-0.103	-	-	-
	(0.171)	(0.0646)			
45<Age≤ 55	-0.283**	-	-0.255***	-0.633***	-0.768***
	(0.130)		(0.0947)		(0.265)
55<Age≤ 65	-	-0.204**	-	-	-
		(0.0846)			
Age> 65	-0.272**	0.398***	-0.149*	-0.831***	-0.485*
	(0.116)	(0.0827)	(0.0890)	(0.164)	(0.248)
Secondary education	-	-0.123	-	-	-
		(0.0888)			
Primary and professional secondary education	-	-0.164**	-	-	-
		(0.0790)			
Higher and incomplete Higher education	-	-0.240***	-	-	-
		(0.0823)			
Unofficial marriage	-	-	-	-	-
Official marriage	-	-	-	-	-
Widower	-	0.211***	0.424**	-	1.023**
		(0.0761)	(0.169)		(0.471)
Children under 15 years	-	-	-	-	-
Number of household members	-	-	-	-	-
Number of workers in a household	-	-	-	-	-
Self-reported health: good	-	-	-	-	-
No chronic disease	-0.349***	0.0959**	-0.203***	-0.558***	-0.570***
	(0.106)	(0.0488)	(0.0700)	(0.139)	(0.196)
Self-assessed income: have enough money only for food	-	-	-	-	-
Self-assessed income: have enough money for food and clothes, but not durables	-	-	-	-	-
Self-assessed income: have enough money for durables, but not expensive items	-	-	-	-	-
Self-assessed income: have enough money for expensive items	-	0.637**	-	-	-
		(0.269)			
Student	-	-	-	-	-
Employed	-	-	-	-	-
Moscow	-0.361**	-	-0.311***	-	-1.015***
	(0.168)		(0.119)		(0.332)
Saint-Petersburg	-	-	-	-	-
Large cities	-	-0.0769	-0.189**	-	-0.521**
		(0.0515)	(0.0738)		(0.207)
Medium and small cities	0.265***	-	-	-	-
	(0.102)				
Central Federal District	-	-0.163**	-	-0.442***	-

		(0.0680)		(0.148)	
Southern Federal District	-	-0.226***	-	-	-
		(0.0771)			
Volga Federal District	-0.572***	-0.283***	-0.376***	-0.855***	-1.129***
	(0.106)	(0.0714)	(0.0784)	(0.158)	(0.220)
Ural Federal District	-	-	-	0.494**	-
				(0.246)	
Siberian Federal District	-	-0.362***	-	-	-
		(0.0794)			
Far Eastern Federal district	-0.625***	-0.385***	-0.442***	-	-1.075***
	(0.186)	(0.120)	(0.147)		(0.416)
Constant	1.622***	0.261***		10.241***	11.80***
	(0.121)	(0.101)		(0.479)	(0.227)
Observations	1,293	3,388	1,172	784	1,172
LR	59.78	173.89	63.57	65.45	64.62
Prob > chi2	0.0000	0.0000	0.0001	0.0000	0.0000

Standard errors are in parentheses; *** p<0.01, ** p<0.05, * p<0.1
Symbol «-» means that a variable was included in the initial model specification. However, results of LR-test on insignificant variables lead to exclusion of this variable from a model. Models with the complete set of variables are given in Appendix 6.

Models estimated for men contain less number of significant variables than models for women.

Similarly to estimation results for women, dummy variables for the factor of "age" do not allow to make a clear conclusion about the influence of this factor on the rate of time preferences. According to model II for the entire sample, there is an increase of probability to reveal an infinite rate of time preferences for individuals of 65 years and older. However, we can see in model I negative coefficients for this age group. Such coefficients are also negative in models III, V, VI that estimated at the sample of respondents who have both finite and infinite rate of time preferences. Thus, we conclude that there is a decrease of the rate of time preferences for men of 65 years and older in comparison with the reference group. This conclusion is supported by model V with a continuous variable "age" (see Appendix 7). If a respondent indicates a finite rate of time preferences, we reveal a negative relationship between the sum of the desired prize and age of a respondent.

Respondents who have professional and higher education level are less likely to have an infinite rate of time preferences in comparison with respondents who have secondary and incomplete secondary education. We note that the impact of higher education is more significant, than the impact of professional education (model II).

Marital status is significant only in the form of widower status. Widowers are more likely to have an infinite rate of time preferences (model II). They indicate larger sum of the desired prize, than other respondents (models III, VI).

Opposite to estimation results for women, children do not influence the rate of time preferences of men.

The status “no chronic diseases” has a downward effect on the rate of time preferences of male respondents (models III-VI). At the same time this status positively influences the probability that a male respondent have an infinite rate (Model II).

We reveal the relation between self-assessed income and the rate of time preferences only in model II. Respondents, who have enough money for buying expensive items, are more likely to have an infinite rate of time preferences.

Models for men and women show the same relations between the place of individual’s residence and his / her rate of time preferences. We note that men in the Ural Federal District point out higher sum of the desired prize, than the sum indicated by residents of other regions.

Table 4 shows that male respondents, who live in large cities, have lower rates of time preferences, than respondents from medium and small cities (models III, VI). Moreover, they are less likely to have an infinite rate. It is worth noting, that mentioned effects are stronger for Moscow residents than for others (models I, III, VI).

Overall, estimation results allow us to conclude that most of the hypotheses set forward in this research are accepted for Russia. Key findings on the hypotheses are given below.

Hypothesis №1. Estimations of econometric models confirm that gender does have a significant impact on the rate of time preferences. Socio-economic factors influence the rate of time preferences of men and women differently.

Hypothesis №2. Our hypothesis that the rate of time preferences decreases with age is accepted for men. We have determined that male respondents have rates that decrease linearly with age. This conclusion is correct for women in a case they indicate a finite rate of time preferences. If we take into account women with an infinite rate, there is an effect of rates that are increased with age of a respondent. A possible reason is that the probability of identifying an infinite rate is increased for women older than 65 years.

Hypothesis №3. The hypothesis that the rate of time preferences decreases with the growth of income is accepted only for women. When analyzing the influence of income on time preferences, we use self-assessed income of an individual. Female respondents with the lowest rates of time preferences assess their income as enough to buy expensive items.

It is correct for men and women that richer respondents are more likely to have an infinite rate of time preferences, than poorer respondents. It can be explained by the supposition that the prize of 10,000 rubles is insignificant for wealthy individuals.

Hypothesis №4. Our hypothesis that the rate of time preferences decreases as an individual’s education level increases is accepted for women and partially for men. For women the rate of time preferences declines as an educational level increases. The most significant effect

is caused by higher education. This is correct for both men and women that an increase in individual's educational level reduces the probability that he or she has an infinite rate.

Hypothesis №5. The hypothesis about the inverse relationship between the rate of time preferences and the state of one's health is accepted. Among the factors that characterize the state of health of an individual there is only one significant variable which is absence of chronic diseases. Respondents without chronic diseases have lower rates than other respondents.

Hypothesis №6. The hypothesis about a significant impact of the size and structure of a household on the rate of time preferences is accepted only for women. Estimation results show, that the sum of the desired prize increases with a growth of a household's size. In addition, the individual discount rate increases if a respondent's household includes children under 15 years.

Considering men, such factors as "size of a household" and "children under 15 years" do not influence the rate of time preferences.

Hypothesis №7. The hypothesis about the impact of marital status on the rate of time preferences is accepted only partially. The results of our study suggest that the marital status of men does not influence their individual time preferences. For women we observe an interesting effect: women who live in an unregistered marriage have higher rates than other female respondents, which can be explained by the fact that women regard an unregistered marriage as a vulnerable position. Furthermore we discover that widows and widowers are more likely to have an infinite rate of time preferences than other respondents.

Hypothesis №8. The hypothesis regarding the impact of employment status on the rate of time preferences is rejected in our research.

Hypothesis №9. According to the estimation results, the place of residence has a significant impact on the rate of time preferences for both men and women in Russia. We reveal a significant relationship between the rate and the district of residence as well as type of a population center.

4. Conclusions

This study contributes to the literature by estimating time preferences in Russia and analyzing factors related to this rate suggested by theory and empirical papers. The confirmation of a majority of the hypotheses in our research allows us to make assumptions regarding the similarity of trends in the formation of individual time preferences in Russia and in other countries. However, this assumption should be supported by careful juxtapositions.

Our study confirms that the time preferences of men and women should be analyzed separately in Russia, since the influence of socio-economic factors on the rate of time preferences is different for men and women. Significant factors affecting the rate of time

preferences in Russia are the age of an individual, the size and structure of a household, marital status, self-assessed income, health status, educational level, and a place of residence. Since the place where an individual resides has a significant impact on the rate of time preferences in Russia, our study can be continued by a detailed analysis of individual time preferences in Russia's regions. An investigation of regional differences can help to intensify the impact of government initiatives in particular regions of the country.

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Appendix 1

Empirical estimates of rates of time preferences

Authors	Year	Time period	Annual discount rate
Hausman	1979	undefined	5% - 89%
Thaler	1981	from 3 months to 10 years	7% - 345%
Houston	1983	1 – 20 years	22.5%

Loewenstein	1987	0 – 10 years	7,5% - 376%
Benzion et al	1989	from 6 months to 4 years	7.5% - 60%
Shelley	1994	from 6 months to 2 years	4% - 22%
Chapman & Elstein	1995	from 6 months to 12 years	11% - 263%
Chapman	1996	1 – 12 years	From a negative value to 300%
Wahlund & Gunnarson	1996	from 1 month to 1 year	18% - 158%
Madden et al	1997	from 1 week to 25 years	8% - ∞
Chapman & Winquist	1998	3 months	426%
Chapman, Nelson & Hier	1999	1 - 6 months	12% - 1800%
Coller & Williams	1999	1 - 3 months	15% - 25%
Kirby, Petry & Bickel	1999	7 - 186 days	50% and higher
Hesketh	2000	from 6 months to 4 years	4% - 36%
Warner & Pleeter	2001	0 – 22 years	0% - 30%
Harrison, Lau & Williams	2002	1 – 37 months	28%
Botelho et al	2006	1 – 25 months	12.7%
Andersen et al	2006	1 – 7 months	25.3%
Harrison, Lau & Rutström	2009	0 – 3 years	9.2% - 72.8%
Bradford	2010	undefined	24%
Bradford, Zoller J. & Silvestri G.	2010	undefined	25.1%
Castillo M. et al	2011	undefined	20% - 140%
Scharff & Viscusi	2011	undefined	8.1% - 13.8%

Appendix 2

Questionnaire for identification of the relation between the rate of time preferences and socio-economic factors

1. *What is your gender?*

2. *How old are you?* (Age of respondents is 15 years and older)

3. *What is your education?*

1 primary education or less (not completed 7-9 years)

2 incomplete secondary / basic secondary education (graduated from incomplete school: 7-9 years)

3 complete secondary education (graduated from school, lyceum, gymnasium:10-11 years)

4 vocational technical training / primary vocational based on incomplete secondary education

5 vocational technical training / primary vocational based on complete secondary education

6 specialized secondary / secondary vocational education (graduated from technical school, college with a specialized secondary / secondary vocational education)

7 incomplete higher education, higher education (graduated from one higher education institution: institute, university, academy)

8 post-graduate education, second higher education including another institution, business-school

4. *What is your health?*

1 very good health

2 good health

3 middle health

4 poor health

5 very poor health

6 it is difficult to answer

5. *What is your weight in kilograms?*

6. *What is your height in centimeters?*

7. *Do you know what your blood cholesterol level is?*

8. *Can you say that you take regular medical examinations irrespective of the way you feel?*

9. *Can you say that you maintain a healthy lifestyle?*

10. *Do you have any chronic diseases? If so, which diseases?*

11. *Are you in a disability group? If so, which group (first, second, third)?*

12. *Do you take any <u>prescription</u> drugs regularly? Please, take into account courses of medical treatment with breaks.*

13. *Do you read the information about a product's composition included on its packaging when buying groceries in the store?*

14. *What is your marital status?*

15. *How many people are in your family? Please, take into account all people who live with you and have a common household, including yourself, your husband / wife, all you children, and temporarily absent persons.*

16. *How many children under 15 years live with you in your family (including those who are temporarily absent)?*

17. *How many people currently work in your family?*

18. *Do you currently work? If so, what terms of a contract do you have in your main job?*

1 do not work

2 employed on a permanent job (have a contract for an indefinite period)

3 employed by contract for a certain period or for a certain job

4 employed on the basis of a verbal agreement (without official registration)

5 work on your own business or farm; engaged in business with employees. Please, do not take into account members of your family who work without salary

6 self-employed, private entrepreneurship without employees

7 am in active military service (in the bodies of internal affairs or in the security service) or am a professional soldier

8 other _____

19. *Do you only work, or do you combine your work with studies? Are you a working pensioner?*

20. *What was the size of your salary (income from main work) gained in the last month, including bonuses, holiday pay, and other payments (after taxes)? Please, convert income earned in a foreign currency into rubles at the current exchange rate.*

21. *Which group of employees do you belong to at your main place of work?*

1 administrator, chief expert, including administrators and chief experts in agriculture enterprises

2 head of a structural division of an organization/department/laboratory, including managers of departments at agricultural enterprises.

3 specialist (position requires a higher education or a specialized secondary education, including the officers)

4 employee from the technical and service staff

5 qualified worker (excluding agriculture)

6 qualified worker in agriculture

7 unskilled worker (excluding agriculture)

8 unskilled worker in agriculture

9 soldier in the army, a police officer, traffic police, an officer in the security service

10 other group _____

22. *What type of enterprises are you employed in (considering your main job)?*

1 government agency, administration, a military unit (budget organization)

2 government unitary enterprise, municipal enterprise

3 private enterprise: public corporation, closed joint-stock company, limited liability company, individual enterprise

4 cooperative, entrepreneur without a legal entity

5 public organization or nonprofit institution

6 other _____

23. *What type of economic activity does the enterprise of your main job relate to? If you are self-employed, what type of economic activity are you involved in?*

24. *What is your main occupation?*

1 studying in school

2 studying at a university or attending a college, technical secondary school, etc., full-time.

3 retired or long-service pension

4 disability pension

5 housekeeping

6 on maternity leave / in child care leave

7 unemployed, do not work but am looking for a job

8 do not work and am not looking for a job

9 other _____

25. *Have you had any work in the last month (besides your main job) that has brought you extra income?*

26. *Please calculate the last month's total income of all your family members who live with you. Convert income earned in a foreign currency into rubles at the current exchange rate.*

27. *In which of the following groups could you most likely classify yourself?*

1 we can hardly make ends meet, we don't have enough money even for food

2 we have enough money for food, but buying clothes is a serious problem for us

3 we have enough money for food and clothes, but buying durables (a TV set, a refrigerator) is a problem for us

4 we can easily buy durables, but it is difficult to purchase really expensive items

5 we can buy really expensive items: an apartment, a cottage, and many others

Appendix 3

Estimation results of joint models for men and women

Models Variables	(I) Now	(II) Never	(III) IR_order	(IV) Order	(V) $\ln(IR^c)$	(VI) $\ln(IR^{c\infty})$
Age≤ 25	-0.0452	-0.190**	-0.0508	-0.0541	0.287*	-0.127
	(0.119)	(0.0967)	(0.0814)	(0.0815)	(0.157)	(0.234)
25<Age≤ 35	-0.0603	-0.126	-0.0461	-0.0494	0.210	-0.0992
	(0.0986)	(0.0782)	(0.0664)	(0.0665)	(0.131)	(0.191)
45<Age≤ 55	-0.0440	-0.0545	-0.0762	-0.0825	-0.0898	-0.230
	(0.104)	(0.0824)	(0.0701)	(0.0702)	(0.138)	(0.202)
55<Age≤ 65	-0.0819	-0.177**	-0.102	-0.103	0.330**	-0.262

	(0.104)	(0.0867)	(0.0747)	(0.0747)	(0.160)	(0.215)
$Age_{>65}$	-0.0208	0.289***	0.0981	0.0916	-0.473**	0.230
	(0.138)	(0.112)	(0.0959)	(0.0961)	(0.198)	(0.276)
Secondary education	0.0654	-0.135	-0.0797	-0.0782	-0.0842	-0.201
	(0.107)	(0.0896)	(0.0764)	(0.0765)	(0.158)	(0.220)
Primary and professional secondary education	0.0151	-0.169**	-0.0943	-0.0930	0.0338	-0.262
	(0.0969)	(0.0815)	(0.0697)	(0.0697)	(0.145)	(0.200)
Higher and incomplete Higher education	-0.00745	-0.243***	-0.145**	-0.146**	0.0467	-0.443**
	(0.103)	(0.0859)	(0.0732)	(0.0732)	(0.150)	(0.210)
Unofficial marriage	-0.0455	-0.150	-0.0818	-0.0892	0.0942	-0.249
	(0.131)	(0.109)	(0.0908)	(0.0909)	(0.174)	(0.261)
Official marriage	-0.0195	-0.0673	-0.0613	-0.0577	-0.0928	-0.199
	(0.0739)	(0.0594)	(0.0504)	(0.0504)	(0.0998)	(0.145)
Widow/widower	-0.00878	0.146*	0.0869	0.0927	-0.229	0.219
	(0.106)	(0.0861)	(0.0741)	(0.0742)	(0.158)	(0.213)
Children under 15 years	0.201**	-0.0482	0.101*	0.0980	0.202*	0.245
	(0.0899)	(0.0719)	(0.0608)	(0.0609)	(0.118)	(0.175)
Number of household members	0.00579	-0.0147	0.00949	0.00917	0.0812	0.0532
	(0.0413)	(0.0331)	(0.0282)	(0.0282)	(0.0558)	(0.0812)
Number of workers in a household	0.0484	-0.00636	0.0152	0.0156	0.0259	0.0329
	(0.0499)	(0.0408)	(0.0346)	(0.0346)	(0.0680)	(0.0998)
Self-reported health: good	-0.0258	0.00390	-0.0257	-0.0273	-0.163*	-0.0549
	(0.0676)	(0.0559)	(0.0472)	(0.0473)	(0.0919)	(0.136)
No chronic disease	-0.140**	0.100*	-0.0894**	-0.0881**	-0.347***	-0.314**
	(0.0627)	(0.0516)	(0.0436)	(0.0436)	(0.0860)	(0.125)
Self-assessed income: have enough money only for food	0.235**	-0.0959	0.0814	0.0890	0.110	0.214
	(0.109)	(0.0915)	(0.0782)	(0.0782)	(0.162)	(0.226)
Self-assessed income: have enough money for food and clothes, but not durables	0.112	-0.109	-0.0450	-0.0419	-0.154	-0.171
	(0.104)	(0.0882)	(0.0753)	(0.0754)	(0.155)	(0.217)
Self-assessed income: have enough money for durables, but not expensive items	0.0380	-0.103	-0.0720	-0.0641	-0.0800	-0.194
	(0.121)	(0.102)	(0.0867)	(0.0868)	(0.174)	(0.250)
Self-assessed income: have enough money for expensive items	-0.420	0.548*	-0.185	-0.181	-1.267**	-0.683
	(0.285)	(0.282)	(0.234)	(0.234)	(0.492)	(0.668)
Student	-0.115	-0.118	-0.171*	-0.173*	-0.0369	-0.512*
	(0.137)	(0.117)	(0.0979)	(0.0980)	(0.186)	(0.282)
Employed	0.00809	-0.0559	-0.0115	-0.0134	0.124	0.00168
	(0.0902)	(0.0730)	(0.0622)	(0.0623)	(0.124)	(0.179)
Moscow	-0.213*	-0.0470	-0.0908	-0.0938	0.00736	-0.341
	(0.127)	(0.104)	(0.0886)	(0.0886)	(0.176)	(0.254)
Saint-Petersburg	-0.109	-0.0562	-0.115	-0.119	-0.529*	-0.559
	(0.215)	(0.164)	(0.143)	(0.143)	(0.310)	(0.410)
Large cities	-0.00671	-0.0918	-0.0872	-0.0820	-0.0228	-0.249
	(0.0779)	(0.0647)	(0.0549)	(0.0549)	(0.110)	(0.158)
Medium and small cities	0.00152	-0.0333	-0.0285	-0.0253	0.0125	-0.0693
	(0.0694)	(0.0575)	(0.0489)	(0.0490)	(0.0996)	(0.141)
Central Federal District	-0.214	-0.228**	-0.295***	-0.288***	-0.350*	-0.873***
	(0.142)	(0.106)	(0.0928)	(0.0929)	(0.205)	(0.269)
Southern Federal District	-0.512***	-0.313***	-0.487***	-0.485***	-0.282	-1.401***
	(0.143)	(0.110)	(0.0956)	(0.0956)	(0.208)	(0.277)
Volga Federal District	-0.567***	-0.354***	-0.596***	-0.598***	-0.597***	-1.757***
	(0.139)	(0.106)	(0.0920)	(0.0921)	(0.201)	(0.267)

Ural Federal District	0.00693	-0.140	-0.0532	-0.0515	0.0880	-0.0952
	(0.167)	(0.121)	(0.106)	(0.106)	(0.234)	(0.308)
Siberian Federal District	-0.0736	-0.443***	-0.319***	-0.307***	-0.0772	-0.962***
	(0.152)	(0.111)	(0.0965)	(0.0966)	(0.210)	(0.280)
Far Eastern Federal district	-0.590***	-0.466***	-0.729***	-0.721***	-0.376	-1.999***
	(0.170)	(0.143)	(0.122)	(0.122)	(0.246)	(0.352)
Gender	**0.0319**	**0.0153**	**0.0339**	**0.0381**	**0.0363**	**0.0850**
	(0.0593)	**(0.0485)**	**(0.0412)**	**(0.0413)**	**(0.0821)**	**(0.118)**
Constant	1.177***	0.694***			9.320***	12.11***
	(0.241)	(0.192)			(0.346)	(0.478)
Observations	3767	3388	3388	3388	2219	3388
LR	106.77	185.43	193.59	195.16	133.18	192.65
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Standard errors are in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Appendix 4

The relation between socio-economic factors and the rate of time preferences for women (complete models)

Models Variables	(I) Now	(II) Never	(III) IR_order	(IV) Order	(V) $\ln(IR^{c})$	(VI) $\ln(IR^{c\infty})$
Age≤ 25	0.121	-0.149	0.0834	0.0770	0.326	0.210
	(0.158)	(0.125)	(0.104)	(0.104)	(0.199)	(0.301)
25<Age≤ 35	-0.196	0.0609	-0.0206	-0.0242	0.0583	-0.0747
	(0.125)	(0.101)	(0.0856)	(0.0856)	(0.166)	(0.247)
45<Age≤ 55	0.0927	-0.0331	0.0485	0.0396	0.128	0.160
	(0.133)	(0.104)	(0.0880)	(0.0881)	(0.171)	(0.254)
55<Age≤ 65	-0.0946	-0.217**	-0.126	-0.132	0.396**	-0.323
	(0.127)	(0.105)	(0.0906)	(0.0907)	(0.196)	(0.262)
Age>65	0.134	0.391***	0.286**	0.281**	-0.306	0.780**
	(0.174)	(0.142)	(0.121)	(0.121)	(0.250)	(0.351)
Secondary education	0.0716	-0.168	-0.148	-0.144	-0.214	-0.468*
	(0.137)	(0.115)	(0.0979)	(0.0980)	(0.204)	(0.283)
Primary and professional secondary education	0.0311	-0.163	-0.120	-0.115	-0.109	-0.365
	(0.123)	(0.104)	(0.0887)	(0.0887)	(0.188)	(0.257)
Higher and incomplete Higher education	0.0236	-0.264**	-0.170*	-0.168*	-0.0580	-0.561**
	(0.130)	(0.109)	(0.0924)	(0.0925)	(0.192)	(0.267)
Unofficial marriage	0.00210	-0.105	0.0268	0.0214	0.327	0.121
	(0.180)	(0.147)	(0.122)	(0.122)	(0.233)	(0.354)
Official marriage	-0.0221	-0.0642	-0.0537	-0.0526	-0.101	-0.190
	(0.0927)	(0.0746)	(0.0630)	(0.0631)	(0.124)	(0.182)
Widow	-0.0334	0.0543	0.00783	0.0123	-0.248	-0.0110
	(0.120)	(0.0974)	(0.0838)	(0.0839)	(0.177)	(0.243)
Children under 15 years	0.258**	-0.0440	0.149**	0.144*	0.336**	0.422*
	(0.112)	(0.0887)	(0.0749)	(0.0750)	(0.145)	(0.217)
Number of household members	0.0304	-0.0709*	-0.000672	0.000912	0.116*	0.0301
	(0.0517)	(0.0408)	(0.0343)	(0.0343)	(0.0670)	(0.0995)
Number of workers in a household	0.0202	0.0445	0.0224	0.0211	-0.0127	0.0556
	(0.0646)	(0.0524)	(0.0442)	(0.0442)	(0.0863)	(0.128)
Self-reported health: good	-0.00890	-0.0261	-0.0366	-0.0351	-0.149	-0.0729
	(0.0857)	(0.0711)	(0.0598)	(0.0599)	(0.116)	(0.173)
No chronic disease	-0.0459	0.0780	-0.0408	-0.0417	-0.245**	-0.191
	(0.0772)	(0.0642)	(0.0541)	(0.0542)	(0.106)	(0.157)

Self-assessed income: have enough money only for food	0.226*	-0.135	0.0225	0.0304	0.0454	0.0351
	(0.133)	(0.112)	(0.0950)	(0.0951)	(0.199)	(0.277)
Self-assessed income: have enough money for food and clothes, but not durables	0.0280	-0.129	-0.156*	-0.151	-0.343*	-0.501*
	(0.128)	(0.109)	(0.0928)	(0.0929)	(0.193)	(0.270)
Self-assessed income: have enough money for durables, but not expensive items	-0.0286	-0.133	-0.165	-0.158	-0.222	-0.509
	(0.154)	(0.130)	(0.110)	(0.110)	(0.222)	(0.320)
Self-assessed income: have enough money for expensive items	-0.592	0.556	-0.469	-0.459	-1.249**	-1.534*
	(0.364)	(0.373)	(0.313)	(0.313)	(0.601)	(0.900)
Student	-0.244	-0.0603	-0.210*	-0.212*	-0.0811	-0.579
	(0.178)	(0.150)	(0.125)	(0.125)	(0.237)	(0.360)
Employed	0.0839	-0.112	0.0283	0.0280	0.226	0.0952
	(0.111)	(0.0896)	(0.0760)	(0.0760)	(0.150)	(0.220)
Moscow	-0.108	-0.0625	-0.0465	-0.0498	0.162	-0.173
	(0.163)	(0.131)	(0.112)	(0.112)	(0.224)	(0.324)
Saint-Petersburg	-0.0694	-0.128	-0.187	-0.189	-0.296	-0.620
	(0.266)	(0.204)	(0.177)	(0.177)	(0.389)	(0.510)
Large cities	0.00856	-0.0993	-0.0839	-0.0784	0.0485	-0.234
	(0.0983)	(0.0805)	(0.0681)	(0.0682)	(0.137)	(0.197)
Medium or small cities	-0.0916	-0.0288	-0.0963	-0.0912	-0.0442	-0.252
	(0.0856)	(0.0714)	(0.0605)	(0.0606)	(0.123)	(0.175)
Central Federal District	-0.225	-0.267**	-0.345***	-0.337***	-0.163	-0.925***
	(0.174)	(0.132)	(0.116)	(0.116)	(0.263)	(0.335)
Southern Federal District	-0.624***	-0.374***	-0.673***	-0.667***	-0.286	-1.864***
	(0.174)	(0.136)	(0.119)	(0.119)	(0.266)	(0.345)
Volga Federal District	-0.466***	-0.493***	-0.636***	-0.636***	-0.298	-1.772***
	(0.170)	(0.131)	(0.114)	(0.114)	(0.256)	(0.332)
Ural Federal District	-0.00924	-0.103	-0.0913	-0.0907	0.169	-0.158
	(0.201)	(0.150)	(0.132)	(0.132)	(0.300)	(0.383)
Siberian Federal District	-0.0571	-0.523***	-0.395***	-0.385***	0.0978	-1.080***
	(0.185)	(0.137)	(0.119)	(0.119)	(0.267)	(0.346)
Far Eastern Federal district	-0.510**	-0.653***	-0.841***	-0.837***	-0.238	-2.289***
	(0.214)	(0.184)	(0.154)	(0.154)	(0.315)	(0.447)
Constant	0.985***	0.855***			8.995***	12.108***
	(0.302)	(0.244)			(0.401)	(0.568)
Observations	2474	2216	2216	2216	1435	2216
LR	82.73	164.27	162.10	161.97	96.69	160.70
Prob > chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Standard errors are in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Appendix 5

Estimation of models with a factor of "age" as a continuous variable (women)

VARIABLES	(V) $\ln(IR^{c})$	(VI) $\ln(IR^{c\infty})$	(V) $\ln(IR^{c})$	(VI) $\ln(IR^{c\infty})$
Age	0.00574	-0.0297	-0.00878***	0.0172***
	(0.0185)	(0.0258)	(0.00310)	(0.00416)
Age^2	-0.000144	0.000458*		
	(0.000198)	(0.000269)		
Secondary education	-0.184	-0.385	-0.142	-0.477*
	(0.205)	(0.286)	(0.200)	(0.276)

Primary and professional secondary education	-0.0891	-0.289	-0.0348	-0.398*
	(0.191)	(0.261)	(0.177)	(0.234)
Higher and incomplete Higher education	-0.0491	-0.492*	-0.0196	-0.603**
	(0.195)	(0.272)	(0.182)	(0.247)
Unofficial marriage	0.336	0.127	0.385*	
	(0.233)	(0.353)	(0.221)	
Official marriage	-0.112	-0.203		
	(0.124)	(0.182)		
Widow	-0.255	-0.0486		
	(0.177)	(0.244)		
Children under 15 years	0.272*	0.378*	0.249*	0.405**
	(0.142)	(0.211)	(0.127)	(0.160)
Number of household members	0.111*	0.0278	0.124***	
	(0.0667)	(0.0991)	(0.0479)	
Number of workers in a household	0.0188	0.0722		
	(0.0849)	(0.126)		
Self-reported health: good	-0.169	-0.0912		
	(0.115)	(0.172)		
No chronic disease	-0.249**	-0.193	-0.296***	
	(0.106)	(0.157)	(0.101)	
Self-assessed income: have enough money only for food	0.0687	0.0138		
	(0.199)	(0.277)		
Self-assessed income: have enough money for food and clothes, but not durables	-0.331*	-0.528*	-0.365***	-0.566***
	(0.194)	(0.270)	(0.110)	(0.154)
Self-assessed income: have enough money for durables, but not expensive items	-0.199	-0.526	-0.280*	-0.591***
	(0.223)	(0.320)	(0.146)	(0.214)
Self-assessed income: have enough money for expensive items	-1.243**	-1.532*	-1.349**	-1.642*
	(0.601)	(0.898)	(0.580)	(0.866)
Student	0.0188	-0.504		
	(0.235)	(0.355)		
Employed	0.176	0.0605	0.251***	
	(0.145)	(0.212)	(0.0962)	
Moscow	0.149	-0.177		
	(0.224)	(0.323)		
Saint-Petersburg	-0.224	-0.632		
	(0.343)	(0.508)		
Large cities	0.0262	-0.248		
	(0.137)	(0.196)		
Medium and small cities	-0.0597	-0.265		
	(0.123)	(0.174)		
Central Federal District	-0.0481	-0.924***		-0.727***
	(0.193)	(0.335)		(0.212)
Southern Federal District	-0.172	-1.848***	-0.253**	-1.637***
	(0.195)	(0.345)	(0.129)	(0.240)
Volga Federal District	-0.177	-1.756***	-0.269**	-1.578***
	(0.183)	(0.331)	(0.112)	(0.219)
Ural Federal District	0.289	-0.139		
	(0.241)	(0.383)		
Siberian Federal District	0.221	-1.062***		-0.869***
	(0.198)	(0.346)		(0.242)
Far Eastern Federal district	0.254	-2.267***		-2.095***
	(0.318)	(0.446)		(0.374)

Constant	9.083***	12.65***	9.287***	11.271***
	(0.528)	(0.764)	(0.266)	(0.426)
Observations	1,435	2,216	1,435	2,216
LR	92.14	160.73	78.68	121.65
Prob > chi2	0.0000	0.0000	0.0000	0.0000

Standard errors are in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Appendix 6

The relation between socio-economic factors and the rate of time preferences for men (complete models)

Models	(I)	(II)	(III)	(IV)	(V)	(VI)
Variables	Now	Never	IR_order	Order	$\ln(IR^{c})$	$\ln(IR^{c\infty})$
Age≤ 25	-0.240	-0.289*	-0.219	-0.215	0.274	-0.513
	(0.194)	(0.159)	(0.135)	(0.135)	(0.262)	(0.379)
25<Age≤ 35	0.215	-0.408***	-0.0779	-0.0811	0.412*	-0.120
	(0.171)	(0.127)	(0.108)	(0.108)	(0.213)	(0.302)
45<Age≤ 55	-0.308*	-0.103	-0.301**	-0.303**	-0.462**	-0.870***
	(0.174)	(0.139)	(0.119)	(0.119)	(0.235)	(0.331)
55<Age≤ 65	-0.0294	-0.0973	-0.0439	-0.0323	0.232	-0.135
	(0.198)	(0.160)	(0.137)	(0.137)	(0.280)	(0.379)
Age> 65	-0.341	0.0977	-0.232	-0.246	-0.779**	-0.652
	(0.247)	(0.193)	(0.166)	(0.166)	(0.334)	(0.460)
Secondary education	0.0643	-0.109	-0.0151	-0.0165	0.0608	0.0995
	(0.179)	(0.146)	(0.124)	(0.124)	(0.247)	(0.345)
Primary and professional secondary education	-0.0176	-0.184	-0.0709	-0.0725	0.210	-0.146
	(0.164)	(0.135)	(0.115)	(0.115)	(0.226)	(0.318)
Higher and incomplete Higher education	-0.0809	-0.227	-0.115	-0.120	0.219	-0.266
	(0.174)	(0.144)	(0.122)	(0.122)	(0.238)	(0.339)
Unofficial marriage	-0.0789	-0.221	-0.173	-0.184	-0.0975	-0.558
	(0.202)	(0.171)	(0.142)	(0.142)	(0.264)	(0.391)
Official marriage	0.0521	-0.0814	-0.0135	-0.00392	0.0889	-0.0320
	(0.135)	(0.107)	(0.0904)	(0.0905)	(0.179)	(0.252)
Widower	0.124	0.451**	0.397**	0.407**	-0.104	0.975*
	(0.269)	(0.223)	(0.191)	(0.191)	(0.426)	(0.527)
Children under 15 years	0.118	-0.133	-0.0251	-0.0251	-0.0531	-0.157
	(0.165)	(0.130)	(0.110)	(0.111)	(0.212)	(0.307)
Number of household members	-0.0179	0.0943	0.0545	0.0503	0.0278	0.163
	(0.0726)	(0.0594)	(0.0508)	(0.0508)	(0.101)	(0.141)
Number of workers in a household	0.0746	-0.0901	-0.0317	-0.0281	0.0347	-0.101
	(0.0836)	(0.0674)	(0.0574)	(0.0575)	(0.111)	(0.159)
Self-reported health: good	-0.0251	0.0492	0.00364	-0.00336	-0.187	0.00789
	(0.116)	(0.0927)	(0.0783)	(0.0784)	(0.150)	(0.218)
No chronic disease	-0.340***	0.129	-0.200***	-0.194***	-0.544***	-0.575***
	(0.114)	(0.0885)	(0.0749)	(0.0750)	(0.148)	(0.209)
Self-assessed income: have enough money only for food	0.200	-0.00874	0.165	0.177	0.233	0.433
	(0.200)	(0.165)	(0.141)	(0.141)	(0.276)	(0.391)
Self-assessed income: have enough money for food and clothes, but not durables	0.236	-0.0383	0.156	0.160	0.215	0.386
	(0.187)	(0.155)	(0.132)	(0.132)	(0.256)	(0.366)
Self-assessed income: have enough money for durables, but not expensive items	0.0930	-0.0131	0.0949	0.106	0.228	0.315
	(0.205)	(0.171)	(0.145)	(0.145)	(0.280)	(0.403)

Self-assessed income: have enough money for expensive items	-0.101	0.554	0.273	0.267	-1.051	0.603
	(0.499)	(0.439)	(0.367)	(0.367)	(0.852)	(1.011)
Student	0.0409	-0.178	-0.0773	-0.0821	0.157	-0.277
	(0.241)	(0.202)	(0.170)	(0.170)	(0.317)	(0.472)
Employed	-0.186	0.0950	-0.0511	-0.0581	-0.0200	-0.0645
	(0.178)	(0.139)	(0.118)	(0.119)	(0.233)	(0.329)
Moscow	-0.335	-0.00526	-0.114	-0.116	-0.192	-0.447
	(0.210)	(0.175)	(0.147)	(0.148)	(0.281)	(0.408)
Saint-Petersburg	-0.181	0.109	0.0301	0.0208	-0.895*	-0.373
	(0.377)	(0.282)	(0.245)	(0.245)	(0.510)	(0.681)
Large cities	-0.0525	-0.0597	-0.0853	-0.0815	-0.143	-0.252
	(0.134)	(0.111)	(0.0941)	(0.0943)	(0.181)	(0.262)
Medium and small cities	0.233*	-0.0450	0.120	0.118	0.111	0.309
	(0.126)	(0.0994)	(0.0846)	(0.0847)	(0.167)	(0.235)
Central Federal District	-0.134	-0.178	-0.201	-0.197	-0.591*	-0.762*
	(0.253)	(0.181)	(0.157)	(0.157)	(0.322)	(0.444)
Southern Federal District	-0.196	-0.227	-0.130	-0.137	-0.146	-0.499
	(0.262)	(0.188)	(0.163)	(0.163)	(0.333)	(0.460)
Volga Federal District	-0.689***	-0.112	-0.510***	-0.516***	-1.048***	-1.655***
	(0.245)	(0.181)	(0.157)	(0.157)	(0.320)	(0.444)
Ural Federal District	0.123	-0.224	0.0509	0.0550	0.0693	0.121
	(0.306)	(0.208)	(0.180)	(0.180)	(0.371)	(0.511)
Siberian Federal District	-0.0153	-0.310	-0.143	-0.126	-0.253	-0.639
	(0.272)	(0.192)	(0.166)	(0.166)	(0.337)	(0.467)
Far Eastern Federal district	-0.704**	-0.164	-0.561***	-0.546***	-0.584	-1.556***
	(0.289)	(0.236)	(0.201)	(0.201)	(0.390)	(0.568)
Constant	1.523***	0.461			9.808***	12.20***
	(0.412)	(0.317)			(0.479)	(0.696)
Observations	1,293	1,172	1,172	1,172	784	1,172
LR	77.65	55.71	79.20	79.18	84.79	82.37
Prob > chi2	0.0000	0.0042	0.0001	0.0000	0.0000	0.0000

Standard errors are in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Appendix 7

Estimation of models with a factor of "age" as a continuous variable (men)

VARIABLES	(V) $\ln(IR^{c})$	(VI) $\ln(IR^{c\infty})$	(V) $\ln(IR^{c})$	(VI) $\ln(IR^{c\infty})$
Age	-0.0400	-0.00362	-0.0208***	
	(0.0260)	(0.0361)	(0.00396)	
Age^2	0.000170	-8.99e-05		
	(0.000285)	(0.000389)		
Secondary education	0.0713	0.0317		
	(0.253)	(0.350)		
Primary and professional secondary education	0.227	-0.180		
	(0.233)	(0.325)		
Higher and incomplete Higher education	0.250	-0.281		
	(0.244)	(0.344)		
Unofficial marriage	-0.0599	-0.490		
	(0.264)	(0.391)		
Official marriage	0.124	0.00220		

	(0.177)	(0.249)		
Widower	-0.0923	1.044**		0.888*
	(0.428)	(0.527)		(0.455)
Children under 15 years	0.0570	0.0357		
	(0.207)	(0.299)		
Number of household members	0.000582	0.144		
	(0.1000)	(0.140)		
Number of workers in a household	0.0173	-0.139		
	(0.111)	(0.160)		
Self-reported health: good	-0.177	0.00806		
	(0.151)	(0.220)		
No chronic disease	-0.523***	-0.540***	-0.549***	-0.443**
	(0.147)	(0.208)	(0.140)	(0.184)
Self-assessed income: have enough money only for food	0.247	0.469		
	(0.277)	(0.391)		
Self-assessed income: have enough money for food and clothes, but not durables	0.223	0.422		
	(0.258)	(0.367)		
Self-assessed income: have enough money for durables, but not expensive items	0.252	0.373		
	(0.281)	(0.404)		
Self-assessed income: have enough money for expensive items	-1.022	0.729		
	(0.855)	(1.013)		
Student	-0.0749	-0.556		
	(0.318)	(0.473)		
Employed	0.00875	-0.0817		
	(0.233)	(0.329)		
Moscow	-0.222	-0.470	-0.337	-0.987***
	(0.281)	(0.409)	(0.225)	(0.333)
Saint-Petersburg	-0.857*	-0.263		
	(0.512)	(0.681)		
Large cities	-0.128	-0.209		-0.472**
	(0.182)	(0.262)		(0.207)
Medium and small cities	0.118	0.322		
	(0.167)	(0.236)		
Central Federal District	-0.561*	-0.743*		
	(0.323)	(0.445)		
Southern Federal District	-0.103	-0.420		
	(0.333)	(0.460)		
Volga Federal District	-1.022***	-1.639***	-0.636***	-1.148***
	(0.322)	(0.445)	(0.150)	(0.221)
Ural Federal District	0.0547	0.134	0.458*	
	(0.372)	(0.511)	(0.246)	
Siberian Federal District	-0.252	-0.653		
	(0.338)	(0.468)		
Far Eastern Federal district	-0.593	-1.499***		-1.065**
	(0.391)	(0.568)		(0.415)
Constant	10.886***	11.692***	10.53***	11.47***
	(0.676)	(0.981)	(0.220)	(0.321)
Observations	784	1,172	784	1,172

LR	78.80	74.44	56.62	55.10
Prob > chi2	0.0000	0.0000	0.0000	0.0000

Standard errors are in parentheses; *** p<0.01, ** p<0.05, * p<0.1

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