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ABSTRACT

Government Transfers, Work and Wellbeing: Evidence from the Russian Old-Age Pension*

This paper examines the impacts of a large and anticipated government transfer, the Russian old-age pension, on labor supply, home production and subjective wellbeing. The discontinuity in eligibility at pension age is exploited for inference. The 2006-2011 Russian Longitudinal Monitoring Survey is employed. Causal impacts differ across the sexes. Women reduce market work and appear to increase home production. They report increased wellbeing. Men reduce labor supply without any apparent increase in wellbeing. Pension receipt does not impact household composition.

JEL Classification: I31, J22, J26, Z13

Keywords: labor supply, pensions, subjective wellbeing, fuzzy regression discontinuity

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1 Introduction

Economists have long been concerned with the incentive effects of social transfers. Pension transfers and retirement behavior are particularly important policy issues because of aging populations in many middle and high-income countries. This paper identifies the causal impact of old-age pension receipt on labor supply, home production and subjective wellbeing outcomes. Fuzzy Regression Discontinuity (RD) estimation techniques with fixed effects exploit age-based eligibility rules for the Russian old-age pension. Because retirement is an important lifecycle milestone, non-monetary factors can also be expected to influence behavior and wellbeing among pension-eligible workers. For example, social norms that are acquired early in life may affect preferences about work and leisure, and so have strong impacts on the way older individuals internalize the value of income transfers.

The Russian old-age pension provides the opportunity to study an unconditional and anticipated income transfer. In Russia, old-age pensions are universal and age thresholds for pension receipt are mandated by laws inherited from the Soviet era. These age thresholds are 55 for women and 60 for men. Early pension withdrawal is not a choice, and delayed retirement does not change the expected lifetime pension amount (Eich et al., 2012). Furthermore, the pension is not means-tested and workers remain eligible regardless of their labour supply decisions. The pension system in Russia was reformed in 2002, following arrears during the late 1990s. After these reforms pensions were generally paid on time and in full (Jensen and Richter, 2003). In June 2018, Vladimir Putin announced increases in the age of eligibility for state pensions from 55 to 63 for women, and from 60 to 65 for men. This announcement provoked a strong negative reaction amongst the Russian public and lead to a drop in President Putin's approval ratings (Economist, 2018).

The literature measuring individual reactions to receipt of old-age pension in-

come is sparse. Danzer (2013) exploits a quasi-natural experiment to show that a doubling of pension generosity reduced market labour supply in the Ukraine. Brinch et al. (2015) find that Norway's 2011 pension reforms led to increases in labor supply amongst pension-eligible workers by removing financial disincentives for working past retirement age. However, virtually nothing is known about the effects of pension income on home production decisions or self-reported life-satisfaction. Home production is likely very important to living standards, particularly in lower income countries where services and processed foods are beyond the reach of many consumers. This was historically true in Russia, where home production accounted for approximately 27% of GDP as recently as the late 1990s (Kim, 2003). Life-satisfaction may be an important measure of individual wellbeing if it captures the hedonic experiences of individuals (Kahneman and Sarin, 1998; Rabin, 1998). Furthermore, epidemiological studies show that self-reported life satisfaction is a strong predictor of longevity, particularly among men (Koivumaa-Honkanen et al., 2000).

The existing literature does not find the wellbeing impacts of the transition to retirement to be unambiguously positive. If individuals smooth consumption imperfectly, experience identity shocks, or must renegotiate household roles when they retire, even fully anticipated pension income may affect behavior and wellbeing. Hetschko et al. (2014) document wellbeing increases among German males for whom attaining statutory retirement age amounts to an escape from an identity of unemployed. Also using German data, Bonsang and Klein (2012) show that life-satisfaction gains from increased leisure are fully offset when retirement is involuntary. Kesavayuth et al. (2016) find that retirement at state pension eligibility age may not increase wellbeing among British workers.

The main analysis comprises measuring the impact of receiving an old-age pension transfer on labor supply, home production, self-reported occupational identity and life satisfaction. The 2006-2011 panel data from the Russian Longitudinal Mon-

itoring Survey (RLMS) and Fuzzy RD estimation techniques with fixed effects are employed. Age-based eligibility rules are exploited for identification. We also examine the data for potential impacts of pension receipt on household composition. Our approach is similar to Edmonds (2004) and Edmonds et al. (2005) in examining anticipated changes. The approach differs slightly because of the use of panel data and the inclusion of individual fixed effects. Efficiency gains from the inclusion of fixed effects may be important to inference this context. For example, health status may vary considerably among the older workers in our sample and should be expected to decline slowly as people age. Unobserved individual-fixed factors may be particularly key in determining life satisfaction and home production if even perfectly anticipated pension income can have nuanced wellbeing implications.

The measurement of impacts of age-based transfers with RD is feasible in the Russian context because limitations on household liquidity. Age-based pension transfers are fully anticipated and so estimation by RD is problematic in a setting where individuals can borrow against future pension income in order to alter their behavior prior to pension age. However, consumption smoothing behavior across the pension threshold was not possible for most households even though pensions are fully anticipated. Many retirees in our analysis had their savings wiped-out with the collapse of the Soviet Union during the hyperinflation period of the 1990s (Goldman, 2003). Savings are zero for the vast majority of households in our data, before and after pension age (See Appendix Figure A.1). World Bank calculations of savings rates of RLMS respondents also indicate that the cohorts of older workers here studied have the lowest savings rates, reaching at most 5% (Bussolo et al., 2015). In this context the Russian pension can be expected to have a pure income effect, decreasing labour supply and increasing wellbeing, as in the classical labor supply model (Gronau, 1977).

In the Soviet Union, and in contemporary Russia, those engaged in high-risk oc-

cupations have earlier official ages of pension receipt. In very physical or dangerous jobs, workers may retire at age forty with full pensions, although retirement is not mandatory. Individuals working in the Far North receive higher wages and greater benefits. Early retirement packages help compensate for the hardship of residence in cold and isolated mono-industrial cities.

The use of a fuzzy RD with fixed effects overcomes the challenge that early pension provisions might pose to our identification strategy. The eligibility threshold for regular workers is used as an instrument for pension income receipt. Exogenous variation in pension receipt status derives from those individuals receiving their pensions exactly at the old-age pension threshold. Since those who obtain old-age pensions earlier do not change receipt status at this age, their data do not contribute to our measurement of causal effects.

Because retirement was not mandatory for pension receipt, working past retirement age was common in the Soviet Union. Almost all workers who delayed retirement received full pensions in addition to their income (Jones and Moskoff, 1987). Retirement continues to be optional in modern Russia but poverty drives many to work while receiving pensions. In 2006, 53% of women and 60% of men in the RLMS data still worked in the 5 years following pension eligibility age. Even in 2010, the basic pension amount was only 3170 roubles (12% of the average wage), approximately $105 US (Eich et al., 2012). The modest size of pension transfers and lack of means-testing suggest that other non-monetary factors can be expected to play a particularly important role in retirement decisions in the Russian context. One potentially important aspect of responses to pension receipt may be intergenerational changes in social norms regarding work that moderate the perceived return to market work.

The paper proceeds as follows. In Section 2 we describe the RLMS data and present summary statistics. We show that household composition does not vary around

the pension age threshold. Section 3 is devoted to identification of the impact of old-age pension receipt. The causal effects of individuals' self-reported occupational identities, incomes, home production and subjective wellbeing measures are estimated. Our findings suggest that both men and women alter their home production at pension age: women positively and men negatively. Furthermore, we show that older men do not report wellbeing gains commensurate with their increased unearned income and the implied increased leisure time. We show that our findings cannot be explained by the movement of younger family members into households with pension income. Section 4 concludes.

2 Data and summary statistics

Labor supply behavior and wellbeing can be compared before and after attaining pension age using Phase 2 of the RLMS panel data spanning 2006-2011 (RLMS-HSE, 2012). The RLMS is a nationally representative household survey for Russia containing information on hours of work, home production for cash and in kind, real income, measures of health, subjective wellbeing and information about whether or not a respondent considers their main occupation to be retired and not working. Women aged 46 through 59, and men aged 51 through 64 in 2006 are included. These age group restrictions focus the analysis around the pension eligibility ages, which are 55 for women and 60 for men, respectively. Pension eligibility was essentially universal during the period of analysis, which corresponds to a period of high oil prices and growth in Russia. A further discussion of the Russian pension system is presented in the Appendix Section A.1.

Neither for women nor for men is income greater among those of pension age than for slightly younger workers during 2006-2011. Descriptive statistics in Table 1 confirm that old-age pensions are not particularly lucrative for either sex. The reason

why income does not increase with the pension transfer is clearly that people reduce their hours of work when they attain pension age. Women of pension age worked about 44 hours per month less than younger women and men of pension age worked an average of 59 hours per month less than younger workers in 2006. Women were working about 6 hours fewer than men per week prior to pension age in 2006. Women below pension age appear to produce slightly less home production for cash relative to older women while men above pension age produce an average of about 364 real roubles per month less in the home than do their slightly younger counterparts. Men above pension age also produce significantly less non-cash output in the home than do their younger counterparts.

Observable characteristics are quite similar among individuals of the same sex on either side of the pension age thresholds. Russians near pension age are highly educated relative to older workers in other countries. Approximately one-third in our data have completed post-secondary education. Even among older workers without higher education the mean years of schooling is quite high at 9.5 of a possible 11 years. Most respondents self-evaluate their health as "average". Of the respondents in our sample, about 14 percent believe their health to be above average while 22 percent believe their health to be less than average. A further 1 percent believe their state of health to be "very bad".

3 Estimation

This section identifies the causal impacts of old-age pension receipt on labor supply and wellbeing outcomes using fuzzy RD estimation techniques.

3.1 Identification

The Russian old-age pension provides a particularly good testing-ground for pension attainment behavior for two reasons. First, pensions are awarded at exogenously determined age thresholds and are independent of the decision to retire. Second, the majority of workers in our data face significant barriers to early retirement due to the collapse of the Soviet Union during the peak of their careers. Under these conditions the causal impact of pension receipt can be estimated using RD estimation techniques. Identification of a treatment effect in this particular RD setup requires that individuals are unable to manipulate their pension eligibility and do not engage in labor supply smoothing behavior in anticipation of the pension income. Among RLMS respondents with sufficient liquidity to engage in this behavior, our estimates would understate causal impacts on behavior. Thus the impacts presented here may be interpreted as slightly conservative. However, the fact that very few households report any private savings (See Appendix Figure A.1) suggests that any downward bias would be minimal.

Pension age thresholds represent an increase in the probability of receiving the pension because individuals in select regions and occupations qualify for pensions earlier. The fuzzy RD estimator used in this paper identifies the impact of old-age pension receipt using variation in pension receipt that coincides with an administratively determined eligibility age threshold. Hahn et al. (2001) show that this approach is analogous to the Wald estimator. A binary eligibility indicator Z acts as an instrumental variable for a binary indicator of actual old-age pension receipt, P. Dong (2018) shows that fuzzy RD estimators identify Local Average Treatment Effects (LATEs) under some conditions. When individuals cannot precisely manipulate treatment status, there is smoothness in the density of the treatment assignment variable (age in our case) at the discontinuity. Appendix Table A.2 presents results of

Cattaneo et al. (2017) tests that confirm the smoothness of age densities at the old-age pension threshold our data. Our estimates therefore identify the LATE of pension receipt in Russia, at the age threshold. Outcomes include home production measures, market work, occupational identity and subjective wellbeing.

A variety specifications are estimated for each outcome Y. Parametric specifications with various age polynomials in vector $\mathbf{A}$ are estimated by two-stage least squares. First and second stage equations, respectively, for an individual i in household h at time t are given by:

$$P_{iht} = \xi + \rho Z_{iht} + \mathbf{A'}_{iht}\mathbf{\Omega} + \mathbf{T'}_{iht}\mathbf{\Phi} + \mu_i + e_{iht} \tag{1}$$

$$Y_{iht} = \alpha + \beta P_{iht} + \mathbf{A'}_{iht}\mathbf{\Lambda} + \mathbf{T'}_{iht}\mathbf{\Theta} + \mu_i + \epsilon_{iht}. \tag{2}$$

Control variables include year and month of interview (October-January) dummies and their interactions, in the vector $\mathbf{T}$, and time-invariant individual fixed effects μ_i. These controls are not generally considered necessary for identification with RD estimation but provide efficiency gains (Lee and Lemieux, 2010). Efficiency gains may be particularly important in gauging outcomes such as life satisfaction, which are strongly moderated by individual-specific time-invariant unobservables. Calonico et al. (2018) show that identification in RD with control variables requires only that treatment does not affect the covariate values. This must be true for individual fixed effects and time controls. Utility is an ordinal measure of wellbeing with an arbitrary scale, so individual fixed effects are also important for the interpretation of wellbeing estimates.

Non-Parametric local linear regression specifications are also estimated because they perform relatively well at boundaries, which is precisely where impacts are identified (Lee and Lemieux, 2010). To account for control variables, we follow the process outlined by (Lee and Lemieux, 2010). Residualized outcome variables $\tilde{Y}_{iht}$ are first created by regressing outcomes on $\mathbf{T}$ and μ_i using OLS. Calonico et al.

(2018) also propose that covariate adjustment be linear in parameters and additively separable from the running variable. The resulting Fuzzy RD specification is given by:

$$P_{iht} = \xi + \rho Z_{iht} + \delta_l(age_{iht} - c) + (\delta_r - \delta_l)Z_{iht}(age_{iht} - c) + e_{iht} \quad (3)$$

$$\tilde{Y}_{iht} = \alpha + \beta P_{iht} + \gamma_l(age_{iht} - c) + (\gamma_r - \gamma_l)P_{iht}(age_{iht} - c) + \epsilon_{iht}, \quad (4)$$

$$\text{where } c - k \leq age_{iht} \leq c + k$$

Estimation employs a rectangular kernel, which applies even weighting to observations within the window k of the pension age cutoff, c. A variety of bandwidths are used to demonstrate robustness to the non-parametric smoothing process. Our preferred specification uses the optimal bandwidth as chosen by the techniques outlined in (IK) Imbens and Kalyanaraman (2012). Alternative estimates include several bandwidths neighboring the IK optimum, and the CCT bandwidth selected using the techniques in Calonico et al. (2014).

First stage estimates

First stage estimates are provided in Table 2 for a variety of polynomial and non-parametric specifications. Columns (1)-(7) differ according to the variation in sample size and bandwidths used in the second stage estimation. Across all polynomial specifications and outcomes, the first-stage coefficient estimate $\hat{\rho}$ is positive and highly significant. These coefficients suggest that the pension age thresholds are sound predictors of pension receipt for a majority of the population. The F-statistics are also very large among the polynomial specifications. In all cases, values are well in excess of 10, a common rule-of-thumb for instrument significance.

The strength of the instrument Z in the local linear regressions can be seen graphically. A nonparametric version of $E[P|age]$ on either side of the pension threshold is depicted in Figure 1. This graphical evidence confirms that pension age is associated

with pension receipt for a large proportion of our sample. A sharp increase in the share of workers that report receiving a pension is visible for both sexes, amounting to an increase of about 40 percentage points. Corroborating evidence is also provided in the form of a corresponding jump in average pension income at pension age in Figure 2. Given that the bulk of the population are outside the special early-qualifying groups, there is little doubt that the pension age thresholds are sufficient predictors of pension receipt in our sample. Standard errors for the local linear regression estimates are produced from an estimate of the variance based on nearest neighbor matched residuals (Calonico et al., 2014; Abadie and Imbens, 2006). As a result, standard F-statistics are not reliably calculated for these estimates.

Graphical analysis of outcomes

We also use graphical evidence to support our analysis. Graphical analysis can serve to provide evidence of a discontinuity at the threshold (Imbens and Lemieux, 2008). The discontinuities for each sex in both periods of the RLMS data are presented in Figures 3-8. Observations are collapsed to binned averages, as in a histogram. The resulting grouped series is plotted against age with a local linear fit. Confidence intervals are included in light of recommendations from Lee and Lemieux (2010) that these plots should be created in a way that is agnostic about the existence of a discontinuity.

For both men and women, there is a noticeable jump upwards in the probability of self-identifying as a pensioner in Figure 3. Noticeable decreases in the monthly hours spent in formal work are shown in Figure 4. A sudden decrease in the probability of working outside the home is observed for the women in Figure 5. For men there appears to be a small discontinuity at pension age. At this age there is also a clear change in the slope. After becoming eligible for the pension, individuals become increasingly likely to retire as they age. Although less conclusive than for the women,

the data for men do suggest the possibility of a significant impact. The precise size of the discontinuity in the grouped data, however, may not be expected to reflect the exact size of the measured impact in the microdata (Lee and Lemieux, 2010). These visible changes in outcomes at pension age are consistent with the predicted behavior and identity changes that accompany pension age attainment. In contrast, life satisfaction scores for men are stable across the pension age threshold, as shown in Figure 6.

These figures suggest that sex-specific non-monetary factors may mitigate the impacts of pension receipt on wellbeing. Consistent with this, differences across the sexes in the impact of pension receipt on household level home production output are also observed in Figures 7 and 8. Whereas state pension age does not obviously coincide with a meaningful jump or fall in home production for women, there is some suggestion of a fall in the home production activities of men.

3.2 Causal Impacts for the period 2006-2011

Pension receipt appears to cause different changes in behavior and in subjective well-being across the sexes. Panels A and B of Table 3 present fuzzy RD impacts, $\hat{\beta}$ for all specifications for women and men, respectively. Parametric impacts are presented for various polynomials in age alongside local linear regression impacts with various choices of bandwidth. The preferred estimates (IK optimal bandwidth) appear in the fifth row in boldface. All estimates employ time dummies and individual fixed effects.

Home production

The RLMS contains information on home production for cash and non-cash home production activities, collected at the household level. Although the contributions of individuals to home production output are not detailed, the impacts of attaining

pension age on home production can still be identified with our estimators. Table 3 presents impacts on home production output in cash (column(1)) and non-cash (column(2)). In the preferred specifications, household home production increases by 264 real 2002 roubles per month, or about $8.8 US, when women receive the old-age pension. This coefficient is suggestive of an effect, although the measured impact varies with bandwidth and polynomial specification and is not statistically significant in some specifications. No specification shows a decrease in home production for women at pension age. Women continue to supply their labor to non-market activities at least as much as they did prior to old-age pension receipt. This result is consistent with expectations in Russian society for women to undertake tasks in the home past retirement age.

Results for men differ substantially. The impact of men's pension receipt on non-cash home production is strongly negative in the preferred specification. This estimate suggests that non-wage income reduces the value of the household contribution to non-market activities by about 263 real roubles per month. Estimates of a larger magnitude are found for cash home production. Our preferred estimates suggest a corresponding reduction of 595 real roubles, although the coefficient is not statistically significant in some specifications.

Home production information is unavailable for about 500 female and about 150 male observations. However, these missing observations have minimal effect on the estimation sample due to sample trimming as a result of the optimal bandwidth selection procedure. Robustness checks are available from the authors upon request.

Incomes

Impacts reported in column (4) of Table 3 illustrate how the old-age income transfer affects individual monthly income. Impacts are positive, although not significantly so for women in the preferred specification. Weakly positive impacts are consistent

with standard labor supply models, which predict that non-labor income transfers have modest effects on total income because the income effect reduces hours worked and therefore reduces labor income. Larger increases in income among men reflect the fact that, even in 2006-2011, some male pension recipients do not reduce labor supply.

The impact of pension age attainment on household finances was also estimated using the preferred specification. Results for real household income and pension amounts are presented in Table 4 (columns (1) and (2)). Pension receipt is associated with increased household pension income but not a significant increase in overall household income. The fact that pension income does not increase overall income can be explained by the decreased labor supply documented at the individual level in the main text. In columns (3) and (4), impacts on real household expenditure and savings are presented. No significant change is found on either use of income. Although insignificant, the positive point-estimate for household savings suggests that older Russians do not begin to draw upon significant household savings at retirement age. This is indicative of the overall lack of savings among households in our sample and supports our assertion that consumption smoothing at retirement age is minimal in these data. Finally, we consider the possibility that pension receipt may affect income transfers from non-household family members (in column (5)). Neither for female nor male pension recipients is there a significant change in intra-household family assistance.

Subjective wellbeing

Subjective wellbeing is captured using an ordinal measure of overall life satisfaction, scored from completely dissatisfied (1) to completely satisfied (5). This particular measure can be expected to proxy for changes in utility that occur at pension age. The measure is admittedly imperfect, however, a growing body of economic research

reviewed in Di Tella and MacCulloch (2006) suggests that subjective measures of happiness are important in understanding individual and social welfare. In this particular contest, subjective wellbeing may capture both monetary and non-monetary effects of an income transfer.

Conditional on income, basic labor supply models predict that wellbeing should unambiguously improve when a larger fraction of that income is unearned (Gronau, 1977). This is the case with old-age pension receipt in Russia. Individuals must work less to obtain a given level of income when they attain pension age and pension income might have been considered relatively secure compared to employment income during this period. The main exception to this prediction is the case of perfect consumption smoothing. Such liquidity is highly unlikely for most pensioners in Russia during this period and is not evident in our data.

Pension receipt does not appear to increase subjective wellbeing responses for men despite the greater fraction of household income that is unearned and reductions in hours of work. The point estimate of 0.084 is statistically insignificant and very small in magnitude relative to a mean of 2.7 among pension age men. One interpretation of this finding is that men who had grown up expecting to work all their lives are unfulfilled in retirement. Monetary pension effects may be accompanied by stigma in work, but also in other productive activities. As a result, men may not be any better off in retirement than while working.

Some of these men may also derive satisfaction from their work, particularly if their preferences were influenced by Russian societal views that men belong in the workplace. For this group, leisure is perhaps not a normal good. Column (3) of Table 3 presents results for overall life satisfaction scores. Results for women are presented in Panel A. There is a statistically significant increase in life satisfaction, about three times as large as the insignificant impact for men. These findings are consistent with stylized facts about gender roles for Russia. We cannot rule out the possibility that

some of the sex differences in impacts arise because pension age is 5 years earlier for women. However, estimates in Appendix Table A.1 suggest that other subjective measures of wellbeing, including changes in overall health, cannot explain the overall life satisfaction impacts observed for either sex.

Work and occupational identity

An individual's self-reported occupational identity and hours of work both change substantially with the receipt of the old-age pension. Women are significantly more likely to identify as pensioners when they receive pension income, in Column (5) in Panel A of Table 3. The impact in our preferred specification is a 36 percent increase. Pension receipt increases the likelihood that a man in the data considers himself a pensioner by 49 percent, in Panel B. These impacts suggest that pension age brings about changes in how individuals perceive their position in the life cycle.

Increases in the likelihood of holding the occupational identity of pensioner coincide with decreased labor supply in market work. Impacts in Column (6) show significant decreases in the monthly hours worked for both women and men, despite the fact that retirement is not mandatory for most Russian workers. Impacts from the preferred specification suggest a decrease of 21 hours for women. Given that mean work hours for women below pension age was 120 per month in 2006, this is an important reduction. This reduction for men is greater than that observed for women, as might be expected since men are five years older when they attain pension age. Preferred estimates suggest a decrease of 40 hours per month for men. In 2006, mean hours worked by men just under pension age was 126. For both sexes these estimates are similar in magnitude and significance across all specifications.

The reduction in labor supply is also visible on the extensive margin. Column (7) shows that pension receipt decreases the probability of working outside the home in the reference month. This decrease is about 10 percent for women and 20 percent

for men. The results for men are significant across almost all specifications in Table 3 even if the confidence intervals in Figure 5 were less indicative of measurable impacts for men. One reason why results are less significant in Figure 5 may be the way in which the data are grouped for the visual plot. The plot comprises our full estimation sample. Instead, the Fuzzy RD impacts are identified on the sub-sample of men who receive the pension precisely at the qualification age. Because there are relatively few men in the sample, this result may be more sensitive to the window of measurement around the pension age threshold.

When samples are divided by 2006 health status or educational attainment, similar results are observed. To summarize, men who report having experienced a health problem in the past 30 days do not significantly reduce either hours of work or employment propensities when they obtain old age pensions. Women with less than university education also do not measurably reduce labor supply as a result of the pension. In both cases, however, incomes increase substantially. We discuss this in more detail in the Appendix Section A.3.

Impacts of old-age pensions may also include important non-monetary effects. These effects are explored in Appendix Section A.4 using the World Values Survey data spanning the years 1009-2011. The WVS data are consistent with an idea that old-age pension receipt in modern Russia involves an implicit social contract of leaving the workforce. These attitudes may reflect a variety of underlying motives, including the belief that pension recipients are burdens on society or a dismal view of the capabilities of workers with primarily Soviet-era work experience.

Robustness with Respect to Covariates

RD estimation is generally undertaken without the inclusion of covariates. However, conditioning RD estimates on covariates may help to reduce small sample bias (Imbens and Lemieux, 2008). In practice, observations somewhat further from the cutoff

are often employed in the estimates. The possibility of small-sample bias is important to consider in this context because macroeconomic changes over the 2006-2011 period might affect the magnitude of pension receipt impacts. These are accounted for in the preferred specification by time fixed-effects, but not in estimation without covariates. Calonico et al. (2018) explain that impacts, conditional on covariates, are still identified in the neighborhood of the cutoff.

Estimates of the preferred specification without any covariates are presented in Table 5. Second stage impact estimates for the preferred specification with covariates, taken from Table 3, are provided at the bottom of each panel for comparison. Relative to estimates with no covariates in the second row, the main results in row 3 show the expected efficiency gains. Standard errors are particularly reduced for estimates on men (Panel B). Point estimates are slightly larger without covariates, suggesting that some small sample bias was alleviated with the inclusion of covariates in the main results. In contrast, the measured impact of pension receipt on women's home production increases with controls (column (1)). This particular estimate may be less robust than others since individual-specific changes in home production are not statistically significant at the 10% level in the pooled cross-section. Fixed effects appear to be particularly important in the measurement of home production impacts. This may be the case because so much about hone production is idiosyncratic and because home production is measured at the household level.

3.3 Household Composition

Income transfers have the potential to affect the household beyond the recipient themselves. Edmonds et al. (2005) find that household composition changes in response to pension receipt in South Africa. Women of child-bearing age move into households with pension income. (Duflo, 2003) shows that co-residence with pensioners is relatively beneficial to female children residing with their grandmothers. This finding

suggests that the gender of the recipient may affect pension transfer impacts at the household level. Changes in household composition because of pension eligibility may help to explain changes in home production that differ across the sexes in our main results.

Pension receipt appears to have no affect on household composition in Russia. Table 6 presents sex-specific summary statistics and RD impact estimates for various household composition measures similar to those in Edmonds et al. (2005), including the number of women aged 18-23, the number of women aged 24-35, the total adult household membership, the number of children aged 4 and under and the likelihood of cohabiting with a spouse or partner. In Panel A, we find that pension receipt by older women does not have a statistically significant impact on household membership, fertility or the likelihood of cohabitation. Results for pension age men in Panel B are also insignificant except for the number of young children, which appears to decrease slightly with pension age attainment.

Sample means suggest that household composition is very similar across the sexes. Mean values for household composition measures among those above and below pension age are presented in the bottom rows of each panel. For example, the number of female household members aged 24-35 differs by less than 0.1 between women and men, both above and below pension age. Differences for younger women and the number of children are even smaller. The largest difference in household membership is the total number of adults. For men near pension age, average household membership is about 0.5 persons lower than for women. Thus, it does not appear that decreased home production, leading to apparent increases in leisure time among pension age men, could be explained by retirement-age men receiving more help from other family members relative to retirement age women.

Household composition in Russia may not change as dramatically as in South Africa (Edmonds et al., 2005) because the Russian old-age pension is relatively

small. The relatively modest pension income may also help to explain why we do not see the effect on household fertility that might be expected in light of the evidence from wealthier countries in (Cigno and Rosati, 1996; Cigno et al., 2003).

4 Conclusions

This paper identifies the causal impact of old-age pension receipt in Russia on labor supply, home production and subjective wellbeing outcomes. Age-based eligibility rules and fuzzy RD estimation techniques with fixed effects are exploited for identification. Household composition effects are also examined.

The unconditional nature of the old-age pension was initially intended to encourage labor force participation beyond pension age in order to address Soviet labor shortages (see, for example Anderson (1986)). However, our results suggest that non-monetary aspects of pension transfers may also be important to consider. Because of changes induced in the effective returns to different activities with old-age pensions, which are particularly likely among older Russian men, utility gains from the increase in unearned income may be effectively clawed-back.

Fully-anticipated old-age pension receipt is shown to affect household home production decisions even when receipt is not conditioned on labor supply. Men do not experience life satisfaction gains with pension receipt, despite increased non-labor income and greater leisure time. Attaining pension age is not found to alter household composition. This differs from the findings for South Africa in Edmonds et al. (2005).

Our findings are consistent with the observation that Russia has so few older men. Older Russian men may have little role outside of work. The world-beating gender gap in life expectancy at birth in Russia, fourteen years in 2001 (Human Mortality Database, 2015), may be partially explained by a failure of social norms about gender

roles to evolve as rapidly as society's views about rights to scarce jobs. The results are also similar in spirit to Case and Deaton (2015), who show that low-skilled white men in the US, a group that was previously well-paid and employable, have both low labor force participation rates and very high mortality. Understanding why non-monetary factors arbitrate income transfer impacts is an important topic for future research.

Compliance with Ethical Standards

The authors declare that they have no conflict of interest.

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Table 1: RLMS individual sample means by old-age pension eligibility status, 2006

	Receives Any Pension	Real Ind. Income Amount	Main Occ. Pensioner	Life Sat. 5 fully sat. 1 not at all	Monthly Hours Worked	Works Outside the Home	Age in Years	Sub. Hlth 1=v. bad 5=v. good	Years of School	Real H Prod Cash	Real H Prod Non-Cash
Age<55				**Panel A: Women**							
Mean	0.315	40.165	0.112	2.737	119.713	0.682	52.385	2.958	9.562	1.663	5.670
SD	0.465	40.469	0.316	1.119	91.852	0.466	1.456	0.533	0.967	9.008	20.630
N	578	565	578	575	550	578	578	574	577	536	536
Age≥55											
Mean	0.946	39.712	0.511	2.777	75.579	0.466	56.823	2.861	9.535	2.509	4.356
SD	0.227	42.309	0.500	1.082	92.371	0.499	1.104	0.560	1.219	22.047	9.733
N	405	399	405	404	390	412	405	403	404	378	378
Difference	-0.631	0.453	-0.399***	-0.040	44.133***	0.216***	-4.437***	0.097***	0.027	-0.847	1.315
Age<60				**Panel B: Men**							
Mean	0.390	48.975	0.155	2.828	125.590	0.647	56.836	3.015	9.448	4.898	6.731
SD	0.488	50.225	0.362	1.154	106.160	0.479	1.726	0.596	1.309	33.497	15.667
N	413	405	413	413	385	334	413	412	413	312	312
Age≥60											
Mean	0.923	46.900	0.554	2.736	66.456	0.397	61.366	2.885	9.308	1.256	3.857
SD	0.268	40.458	0.499	1.149	84.707	0.491	1.112	0.605	1.534	7.384	5.568
N	130	128	130	129	125	131	130	130	130	127	127
Difference	-0.533***	2.076	-0.399***	0.092	59.134***	0.250***	-4.530***	0.130**	0.140	3.641*	2.874***

RLMS-HSE 2006 data for workers near age of state pension eligibility at ages 55 for women and 60 for men. Monetary amounts for individual income and both home production measures are thousands of 2002 roubles per month. Own market hours worked are measured monthly. Receives any pension, Works Outside the Home and Main Occupation Pensioner are binary. Sample includes males ages 55-59 before pension age, and 60-64 after and females ages 50-54 before pension age, and 55-59 after. Difference is the result of a two-sample t-test with H_0: equality of means across age groups. N is the number of person-wave observations.

Table 2: First stage estimates. The impact of crossing the old-age pension threshold on the probability of old-age pension receipt. Russia 2006-2011

Panel A: Women

Second Stage Outcome	Real Home Prod Cash	Real Home Prod Non-Cash	Life Satisf. 5 fully sat. 1 not at all	Real Indiv. Income Amount	Main Occupation "Pensioner"	Hours Worked Per Month	Work Outside Home
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Linear	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**
Pens. Age	0.541***	0.541***	0.543***	0.540***	0.544***	0.543***	0.544***
SE	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
N	7,662	7,662	8,147	8,056	8,188	8,115	8,188
F	130.15	130.15	140.52	137.08	141.89	139.12	141.89
Quadratic							
Pens. Age	0.540***	0.540***	0.543***	0.539***	0.544***	0.542***	0.544***
SE	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
N	7,662	7,662	8,147	8,056	8,188	8,115	8,188
F	129.15	129.15	139.25	136.18	140.67	138.07	140.67
Cubic							
Pens. Age	0.513***	0.513***	0.516***	0.514***	0.517***	0.517***	0.517***
SE	(0.013)	(0.013)	(0.012)	(1.013)	(1.012)	(0.012)	(0.012)
N	7,662	7,662	8,147	8,056	8,188	8,115	8,188
F	125.97	125.97	135.82	132.74	137.19	134.52	137.19
Quartic							
Pens. Age	0.510***	0.510***	0.512***	0.510***	0.514***	0.514***	0.514***
SE	(0.013)	(0.013)	(0.013)	(1.013)	(1.012)	(0.013)	(0.012)
N	7,662	7,662	8,147	8,056	8,188	8,115	8,188
F	122.63	122.63	132.23	129.27	133.59	130.98	133.59
Loc.Linear IK BW							
Pens. Age	**0.489*** **	**0.494*** **	**0.488*** **	**0.436*** **	**0.465*** **	**0.495*** **	**0.449*** **
SE	**(0.027)**	**(0.026)**	**(0.026)**	**(0.035)**	**(0.030)**	**(0.024)**	**(0.034)**
N	**3,563**	**3,670**	**3,682**	**2,305**	**2,937**	**4,241**	**2,435**
BW	**3.274**	**3.399**	**3.194**	**2.047**	**2.569**	**3.678**	**2.131**
Loc.Linear IK×4 BW							
Pens. Age	0.553***	0.553***	0.551***	0.536***	0.550***	0.551***	0.542***
SE	(0.015)	(0.015)	(0.015)	(0.016)	(0.015)	(0.015)	(0.015)
N	6,774	7,662	7,839	4,269	7,500	7,949	7,880
BW	13.10	13.60	12.78	8.187	10.28	14.71	8.525
Loc.Linear IK×2 BW							
Pens. Age	0.520***	0.521***	0.520***	0.506***	0.516***	0.529***	0.512***
SE	(0.018)	(0.018)	(0.018)	(0.023)	(0.020)	(0.016)	(0.022)
N	6,501	6,631	6,778	4,670	5,799	7,339	4,933
BW	6.548	6.799	6.388	4.094	5.138	7.356	4.263
Loc.Linear IK/2 BW							
Pens. Age	0.409***	0.403***	0.410***	0.310***	0.353***	0.423***	0.315***
SE	(0.041)	(0.040)	(0.040)	(0.054)	(0.046)	(0.037)	(0.054)
N	1,759	1,849	1,863	1,174	1,495	2,138	1,194
BW	1.637	1.700	1.597	1.023	1.285	1.839	1.066
Loc.Linear IK/4 BW							
Pens. Age	0.283***	0.288***	0.279***	0.253***	0.248***	0.311***	0.258***
SE	(0.065)	(0.062)	(0.064)	(0.085)	(0.075)	(0.057)	(0.083)
N	874	953	930	614	722	1,097	627
BW	0.818	0.850	0.798	0.512	0.642	0.920	0.533
Loc.Linear CCT BW							
Pens. Age	0.404***	0.466***	0.450***	0.402***	0.419***	0.459***	0.449***
SE	(0.039)	(0.031)	(0.034)	(0.041)	(0.037)	(0.033)	(0.034)
N	1,942	2,758	2,421	1,846	2,156	2,529	2,435
BW	1.757	2.572	2.131	1.645	1.908	2.230	2.105

Panel B: Men

Second Stage Outcome	Real Home Prod Cash	Real Home Prod Non-Cash	Life Satisf. 5 fully sat. 1 not at all	Real Indiv. Income Amount	Main Occupation "Pensioner"	Hours Worked Per Month	Work Outside Home
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Linear	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**
Pens. Age	0.416***	0.416***	0.421***	0.422 ***	0.433***	0.422***	0.424***
SE	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
F	50.36	50.36	53.92	52.63	54.07	51.88	54.07
N	4,007	4,007	4,162	4,106	4,179	4,130	4,179
Quadratic							
Pens. Age	0.428***	0.428***	0.433***	0.434***	0.435***	0.434***	0.435***
SE	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
F	49.74	49.74	53.25	52.09	53.36	51.34	53.36
N	4,007	4,007	4,162	4,106	4,179	4,130	4,179
Cubic							
Pens. Age	0.411***	0.411***	0.416***	0.420***	0.419***	0.419***	0.420***
SE	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
F	48.16	48.16	51.55	50.38	51.65	49.68	51.65
N	4,007	4,007	4,162	4,106	4,179	4,130	4,179
Quartic							
Pens. Age	0.412***	0.412***	0.417***	0.421***	0.420***	0.419***	0.420***
SE	(0.019)	(0.019)	(0.018)	(0.019)	(0.019)	(0.019)	(0.019)
F	46.69	46.69	50.01	48.90	50.09	48.18	50.09
N	4,007	4,007	4,162	4,106	4,179	4,130	4,179
Loc.Linear IK BW							
Pens. Age	**0.401*** **	**0.400*** **	**0.405*** **	**0.418*** **	**0.392*** **	**0.396*** **	**0.403*** **
SE	**(0.033)**	**(0.025)**	**(0.025)**	**(0.036)**	**(0.044)**	**(0.040)**	**(0.029)**
N	**2,215**	**3,374**	**3,465**	**1,924**	**1,436**	**1,663**	**2,705**
BW	**3.962**	**6.576**	**6.336**	**3.272**	**2.366**	**2.760**	**4.724**
Loc.Linear IK×4 BW							
Pens. Age	0.416***	0.416***	0.418***	0.417***	0.415***	0.416***	0.417***
SE	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
N	4,007	4,007	4,162	4,106	4,138	4,130	4,179
BW	15.85	26.30	25.34	3.272	9.463	11.04	18.90
Loc.Linear IK×2 BW							
Pens. Age	0.408***	0.416***	0.418***	0.401***	0.403***	0.395***	0.415***
SE	(0.023)	(0.021)	(0.021)	(0.025)	(0.029)	(0.027)	(0.021)
N	3,738	4,007	4,162	3,458	2,705	3,089	4,138
BW	7.923	13.15	12.67	6.544	4.732	5.520	9.448
Loc.Linear IK/2 BW							
Pens. Age	0.378***	0.415***	0.405***	0.374***	0.337***	0.340***	0.392***
SE	(0.050)	(0.037)	(0.037)	(0.055)	(0.066)	(0.061)	(0.044)
N	1,135	1,873	1,887	972	746	843	1,436
BW	1.981	3.288	3.168	1.636	1.183	1.380	2.362
Loc.Linear IK/4 BW							
Pens. Age	0.349***	0.381***	0.360***	0.382***	0.302***	0.306***	0.337***
SE	(0.080)	(0.057)	(0.056)	(0.088)	(0.103)	(0.097)	(0.066)
N	281	281	289	497	291	443	746
BW	0.458	0.488	0.444	0.818	0.459	0.745	1.818
Loc.Linear CCT BW							
Pens. Age	0.387***	0.378***	0.371***	0.392***	0.373***	0.391***	0.376***
SE	(0.051)	(0.050)	(0.052)	(0.043)	(0.050)	(0.039)	(0.709)
N	1,095	1,135	1,083	1,455	1,145	1,759	1,091
BW	1.833	1.953	1.776	2.472	1.836	2.981	1.806

First stage estimates corresponding to fuzzy RD impacts from columns (1)-(7) in Table 3. Outcome is a binary variable indicating whether an individual "received any pension" during the prior month. Pension Age is binary indicator for exogenous pension age thresholds, 55 for women and 60 for men. F-statistic reported for parametric specifications is from the first-stage regression for the joint significance of all coefficients. Bandwidth reported for non-parametric specifications is identical to the second stage. IK is the optimal bandwidth using the method from Imbens and Kalyanaraman (2012). CCT is the optimal bandwidth suggested in Calonico et al. (2014). Parametric standard errors are robust to heteroskedasticity and clustered on individual. Local linear models use standard errors based on fixed-match variance estimator with 3 nearest neighbor matches. Parametric models estimated with individual fixed effects, dummies for month, year, and month-year interactions. Local-linear estimates use a rectangular kernel and outcomes are residualized to remove year, month, and individual fixed effects. N is the number of person-wave observations.

Table 3: Fuzzy RD Impacts of old-age pension age receipt. Russia 2006-2011

Panel A: Women

	(1) **Real Home Prod Cash**	(2) **Real Home Prod Non-Cash**	(3) **Life Satisf. 5 fully sat. 1 not at all**	(4) **Real Indiv. Income Amount**	(5) **Main Occupation "Pensioner"**	(6) **Hours Worked Per Month**	(7) **Work Outside Home**
Linear							
RD Impact	4.104***	0.362	0.152**	17.810*	0.441***	-25.617***	-0.149***
SE	(1.502)	(0.963)	(0.076)	(9.539)	(0.023)	(5.594)	(0.024)
N	7,662	7,662	8,147	8,056	8,188	8,115	8,188
Quadratic							
RD Impact	4.160***	0.354	0.152**	17.834*	0.441***	-25.790***	-0.150***
SE	(1.504)	(0.965)	(0.076)	(9.553)	(0.023)	(5.595)	(0.025)
N	7,662	7,662	8,147	8,056	8,188	8,115	8,188
Cubic							
RD Impact	3.143*	-0.850	0.203**	19.494*	0.421***	-23.599***	-0.127***
SE	(1.835)	(1.177)	(0.093)	(11.633)	(0.028)	(6.803)	(0.030)
N	7,662	7,662	8,147	8,056	8,188	8,115	8,188
Quartic							
RD Impact	2.732	-0.714	0.228**	19.436*	0.423*	-25.419***	-0.130***
SE	(1.859)	(1.194)	(0.094)	(11.725)	(0.028)	(6.874)	(0.030)
N	7,662	7,662	8,147	8,056	8,188	8,115	8,188
Loc.Linear IK BW							
RD Impact	**2.639***	**-0.363**	**0.227****	**11.145**	**0.362*****	**-20.848*****	**-0.095****
SE	**(1.597)**	**(1.227)**	**(0.103)**	**(11.713)**	**(0.044)**	**(7.216)**	**(0.045)**
N	**3,563**	**3,670**	**3,682**	**2,305**	**2,937**	**4,241**	**2,435**
BW	**3.274**	**3.399**	**3.194**	**2.047**	**2.569**	**3.678**	**2.131**
Loc.Linear IK×4 BW							
RD Impact	2.793***	0.220	0.100*	14.044*	0.303***	-18.132***	-0.110***
SE	(1.184)	(0.691)	(0.059)	(7.736)	(0.022)	(4.301)	(0.019)
N	6,774	7,662	7,839	4,269	7,500	7,949	7,880
BW	13.10	13.60	12.78	8.187	10.28	14.71	8.525
Loc.Linear IK×2 BW							
RD Impact	3.105**	-0.253	0.175**	11.313	0.343***	-19.557***	-0.123***
SE	(1.257)	(0.836)	(0.069)	(7.328)	(0.027)	(4.779)	(0.028)
N	6,501	6,631	6,778	4,670	5,799	7,339	4,933
BW	6.548	6.799	6.388	4.094	5.138	7.356	4.263
Loc.Linear IK/2 BW							
RD Impact	-0.073	-1.408	0.230	-0.180	0.338***	-27.783**	-0.011
SE	(2.238)	(2.113)	(0.175)	(17.182)	(0.084)	(12.392)	(0.094)
N	1,759	1,849	1,863	1,174	1,495	2,138	1,194
BW	1.637	1.700	1.597	1.023	1.285	1.839	1.066
Loc.Linear IK/4 BW							
RD Impact	4.996	-6.782	-0.026	-13.749	0.398**	-30.401	0.042
SE	(4.013)	(4.645)	(0.381)	(19.979)	(0.181)	(25.516)	(0.166)
N	874	953	930	614	722	1,097	627
BW	0.512	0.642	0.798	0.920	0.533	0.818	0.850
Loc.Linear CCT BW							
RD Impact	-0.063	-1.401	0.221	17.572	0.369***	-24.895***	-0.095**
SE	(1.931)	(1.524)	(0.138)	(14.824)	(0.058)	(10.420)	(0.045)
N	1,942	2,758	2,421	1,846	2,156	2,529	2,435
BW	1.757	2.572	2.131	1.645	1.908	2.230	2.105

Panel B: Men

Linear	(1) **Real Home Prod Cash**	(2) **Real Home Prod Non-Cash**	(3) **Life Satisf. 5 fully sat. 1 not at all**	(4) **Real Indiv. Income Amount**	(5) **Main Occupation "Pensioner"**	(6) **Hours Worked Per Month**	(7) **Work Outside Home**
RD Impact	-5.847	-4.312**	0.040	15.628***	0.703***	-47.107***	-0.278***
SE	(3.979)	(1.750)	(0.139)	(4.912)	(0.045)	(10.700)	(0.045)
N	4,007	4,007	4,162	4,106	4,179	4,130	4,179
Quadratic							
RD Impact	-5.607	-4.036**	0.031	13.798***	0.660***	-46.771***	-0.256***
SE	(3.913)	(1.720)	(0.136)	(4.818)	(0.044)	(10.521)	(0.045)
N	4,007	4,007	4,162	4,106	4,179	4,130	4,179
Cubic							
RD Impact	-3.536	-2.708	0.094	17.590***	0.629***	-42.021***	-0.218***
SE	(4.701)	(2.065)	(0.164)	(5.764)	(0.052)	(12.551)	(0.053)
N	4,007	4,007	4,162	4,106	4,179	4,130	4,179
Quartic							
RD Impact	-3.779	-2.890	0.111	56.128***	0.623***	-41.713***	-0.216***
SE	(4.691)	(2.059)	(0.163)	(11.241)	(0.052)	(12.536)	(0.053)
N	4,007	4,007	4,162	4,106	4,179	4,130	4,179
Loc.Linear IK BW							
RD Impact	**-5.950***	**-2.631***	**0.084**	**16.898*** **	**0.485*** **	**-39.847*** **	**-0.198*** **
SE	**(3.517)**	**(1.477)**	**(0.121)**	**(5.113)**	**(0.084)**	**(14.872)**	**(0.047)**
N	**2,215**	**3,374**	**3,465**	**1,924**	**1,436**	**1,663**	**2,705**
BW	**3.962**	**6.576**	**6.336**	**3.272**	**2.366**	**2.760**	**4.724**
Loc.Linear IK×4 BW							
RD Impact	-3.905*	-3.019**	0.023	10.619***	0.487***	-31.874***	-0.191***
SE	(2.008)	(1.278)	(0.101)	(3.624)	(0.042)	(8.090)	(0.035)
N	4,007	4,007	4,162	4,106	4,138	4,130	4,197
BW	15.85	26.30	25.34	3.272	9.463	11.04	18.90
Loc.Linear IK×2 BW							
RD Impact	-3.394	-3.019**	0.023	13.599***	0.539***	-33.694***	-0.191***
SE	(2.215)	(1.278)	(0.101)	(4.320)	(0.060)	(10.621)	(0.036)
N	3,738	4,007	4,162	3,458	2,705	3,089	4,138
BW	7.923	13.15	12.67	6.544	4.732	5.520	9.488
Loc.Linear IK/2 BW							
RD Impact	-8.342	-2.092	0.075	10.502	0.433***	-70.452***	-0.122*
SE	(6.624)	(1.910)	(0.165)	(7.839)	(0.132)	(25.918)	(0.067)
N	1,135	1,873	1,887	972	746	843	1,436
BW	1.981	3.288	3.168	1.636	1.183	1.380	2.362
Loc.Linear IK/4 BW							
RD Impact	-60.638	-2.424	-0.641	19.622	1.713	-85.177*	-0.091
SE	(75.910)	(14.681)	(1.543)	(12.748)	(1.490)	(44.125)	(0.105)
N	281	281	289	497	291	443	746
BW	0.458	0.488	0.444	0.818	0.459	0.745	1.818
Loc.Linear CCT BW							
RD Impact	-9.685	-1.078	0.110	15.472**	0.464***	-35.624**	-0.135*
SE	(6.745)	(2.641)	(0.244)	(6.256)	(0.098)	(14.579)	(0.079)
N	1,095	1,135	1,083	1,455	1,145	1,759	1,091
BW	1.833	1.953	1.776	2.472	1.836	2.981	1.806

Fuzzy RD estimates of the causal impact of pension receipt. Variable "receives any pension" instrumented with exogenous pension age attainment indicator at age 55 for women and 60 for men. Parametric models estimated with individual fixed effects, dummies for month, year, and month-year interactions. Local-linear estimates use a rectangular kernel. Outcomes are residualized to remove year, month, and individual fixed effects. IK is the optimal bandwidth using the method from Imbens and Kalyanaraman (2012). CCT is the optimal bandwidth suggested in Calonico et al. (2014). Parametric standard errors are robust to heteroskedasticity and clustered on individual. Local linear models use standard errors based on fixed-match variance estimator with 3 nearest neighbor matches. Productivity in home production is measured at the household level, with the imputation for non-monetary home production performed by RLMS-HSE staff. All other outcomes are measured at the individual level, and hours of work are reported monthly. Income and home production amounts are hundreds of real 2002 roubles per month. N is the number of person-wave observations.

Table 4: The causal impact of attaining state pension age on other household outcomes, Russia 2006-2011

Panel A: Women

	(1)	(2)	(3)	(4)	(5)
First Stage	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**
Pens Age	0.466***	0.453***	0.462***	0.489***	0.490***
SE	(0.031)	(0.035)	(0.030)	(0.027)	(0.024)
Second Stage	**Real Hhld Income**	**Real Hhld Pensions**	**Real Hhld Expend.**	**Real Hhld Real Hhld Saving**	**Total Hhld Family Transfers**
RD Impact	11.523	19.893***	-21.387	2.391	-0.152
SE	(18.839)	(2.537)	(20.765)	(3.838)	(2.356)
N	2,758	2,289	2,930	3,563	4,098
BW	2.563	2.132	2.700	3.312	3.775

Panel B: Men

	(1)	(2)	(3)	(4)	(5)
First Stage	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**
Pens Age	0.403***	0.406***	0.395***	0.408***	0.392***
SE	(0.033)	(0.038)	(0.039)	(0.031)	(0.048)
Second Stage	**Real Hhld Income**	**Real Hhld Pensions**	**Real Hhld Expend.**	**Real Hhld Real Hhld Saving**	**Total Hhld Family Transfers**
RD Impact	13.595	26.387***	-27.421	6.317	-2.437
SE	(16.104)	(3.625)	(31.076)	(4.101)	(3.537)
N	2,176	1,818	1,697	2,471	1,214
BW	3.887	3.220	2.963	4.478	2.136

Fuzzy RD estimates of the causal impact of pension receipt at the household level using preferred specification, local linear regressions with rectangular kernel and optimal bandwidth suggested by Imbens and Kalyanaraman (2012). Variable "receives any pension" instrumented with exogenous pension age attainment indicator at age 55 for women and 60 for men. Parametric models estimated with individual fixed effects, which subsume household fixed effects, dummies for month, year, and month-year interactions. Impact standard errors in parentheses based on fixed-match variance estimator with 3 nearest neighbor matches. Family transfer is "total help from family and relatives" outside of the household. Amounts are hundreds of 2002 roubles per month. N is the number of person-wave observations.

Table 5: Robustness Check: Main results with no control variables

Panel A: Women

	(1)	(2)	(3)	(4)	(5)	(6)	
First Stage	**Received**	**Received**	**Received**	**Received**	**Received**	**Received**	**Received**
No Covariates	**Any Pens.**	**Any Pens.**	**Any Pens.**	**Any Pens.**	**Any Pens.**	**Any Pens.**	**Any Pens**
Pens. Age	0.491***	0.489***	0.488***	0.450***	0.482***	0.518***	0.449***
SE	(0.025)	(0.027)	(0.026)	(0.033)	(0.027)	(0.018)	(0.034)
	Real	**Real**	**Life Satisf.**	**Real Indiv.**	**Main**	**Hours**	**Work**
Second Stage	**Home Prod**	**Home Prod**	**5 fully sat.**	**Income**	**Occupation**	**Worked**	**Outside**
No Covariates	**Cash**	**Non-Cash**	**1 not at all**	**Amount**	**"Pensioner"**	**Per Month**	**Home**
RD Impact	1.570	-0.215	0.296**	23.247	0.460***	-28.024***	-0.193**
SE	(2.648)	(2.066)	(0.148)	(17.484)	(0.056)	(8.580)	(0.085)
N	4,008	3,563	3,682	2,511	3,517	6,625	2,435
BW	3.706	3.325	3.208	2.172	3.053	6.203	2.160
	Real	**Real**	**Life Satisf.**	**Real Indiv.**	**Main**	**Hours**	**Work**
Second Stage	**Home Prod**	**Home Prod**	**5 fully sat.**	**Income**	**Occupation**	**Worked**	**Outside**
With Covariates	**Cash**	**Non-Cash**	**1 not at all**	**Amount**	**"Pensioner"**	**Per Month**	**Home**
RD Impact	2.639*	-0.363	0.227**	11.145	0.362***	-20.848***	-0.095**
SE	(1.597)	(1.227)	(0.103)	(11.713)	(0.044)	(7.216)	(0.045)
N	3,563	3,670	3,682	2,305	2,937	4,241	2,435
BW	3.274	3.399	3.194	2.047	2.569	3.678	2.131

Panel B: Men

	(1)	(2)	(3)	(4)	(5)	(6)	
First Stage	**Received**	**Received**	**Received**	**Received**	**Received**	**Received**	**Received**
No Covariates	**Any Pens.**	**Any Pens.**	**Any Pens.**	**Any Pens.**	**Any Pens.**	**Any Pens**	**Any Pens.**
Pens. Age	0.415***	0.410***	0.411***	0.418***	0.387***	0.395***	0.399***
SE	(0.037)	(0.036)	(0.035)	(0.036)	(0.046)	(0.042)	(0.028)
	Real	**Real**	**Life Satisf.**	**Real Indiv.**	**Main**	**Hours**	**Work**
Second Stage	**Home Prod**	**Home Prod**	**5 fully sat.**	**Income**	**Occupation**	**Worked**	**Outside**
No Covariates	**Cash**	**Non-Cash**	**1 not at all**	**Amount**	**"Pensioner"**	**Per Month**	**Home**
RD Impact	-5.440	-4.431	0.115	27.724	0.548***	-48.626**	-0.240***
SE	(4.626)	(2.979)	(0.232)	(18.744)	(0.116)	(24.668)	(0.086)
N	1,873	1,931	2,078	1,924	1,328	1,556	2,919
BW	3.265	3.371	3.578	3.268	2.197	2.620	5.094
	Real	**Real**	**Life Satisf.**	**Real Indiv.**	**Main**	**Hours**	**Work**
Second Stage	**Home Prod**	**Home Prod**	**5 fully sat.**	**Income**	**Occupation**	**Worked**	**Outside**
With Covariates	**Cash**	**Non-Cash**	**1 not at all**	**Amount**	**"Pensioner"**	**Per Month**	**Home**
RD Impact	-5.950*	-2.631*	0.084	16.898***	0.485***	-39.847***	-0.198***
SE	(3.517)	(1.477)	(0.121)	(5.113)	(0.084)	(14.872)	(0.047)
N	2,215	3,374	3,465	1,924	1,436	1,663	2,705
BW	3.962	6.576	6.336	3.272	2.366	2.760	4.724

Non-parametric RD estimates use local linear regression with rectangular kernel. Second Stage outcomes with Covariates taken from corresponding estimates of the preferred specification, row 5 of Panels A and B, respectively, in Table 3 . Bandwidth chosen using the method from Imbens and Kalyanaraman (2012). Local linear models use SE's based on fixed-match variance estimator with 3 nearest neighbor matches. Productivity in home production is measured at the household level, with imputation for non-monetized home production performed by RLMS-HSE staff. All outcomes are measured at the individual level, and hours of work are reported monthly. Pension and home production amounts are hundreds of real 2002 roubles per month. N is the number of person-wave observations.

Table 6: The causal impact of attaining state pension age on household composition, Russia 2006-2011

Panel A: Women

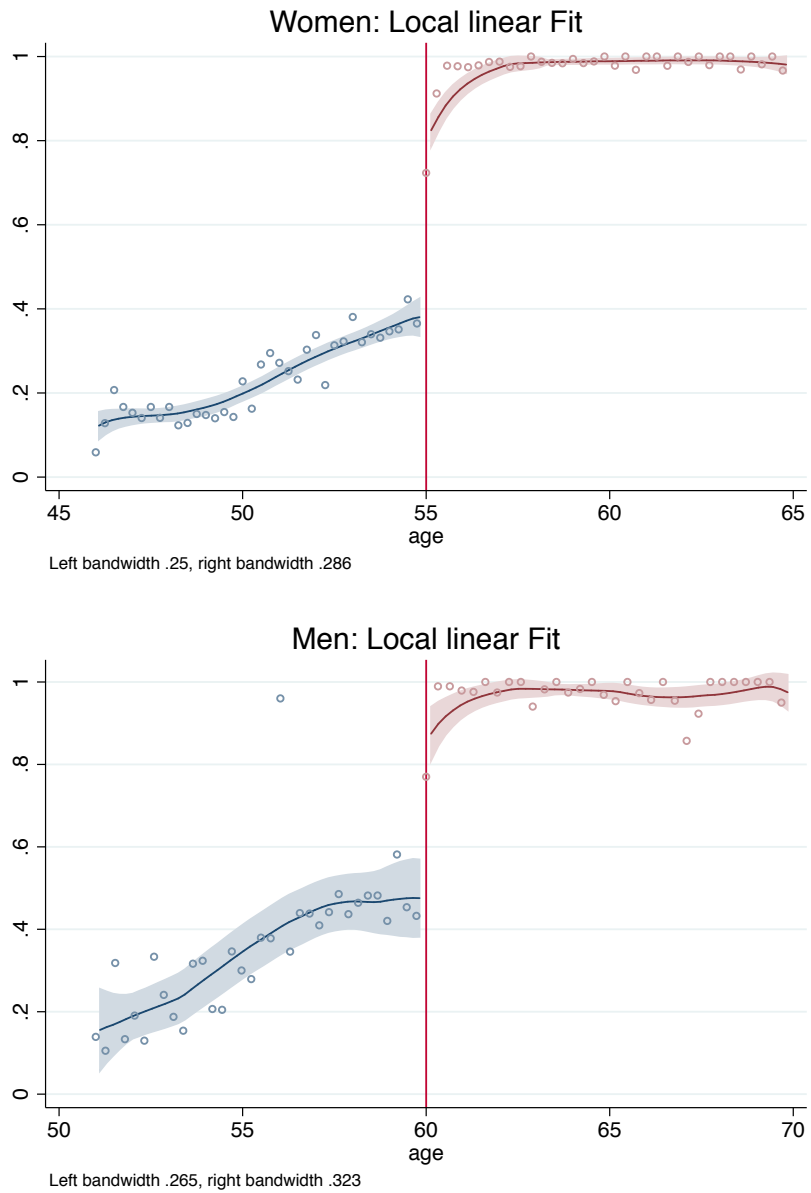
	(1)	(2)	(3)	(4)	(5)
First Stage	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**
Pens Age	0.471***	0.470***	0.367***	0.478***	0.406***
SE	(0.033)	(0.035)	(0.050)	(0.032)	(0.041)
Second Stage	**No. Women Ages 18-23 in Hhold**	**No. Women Ages 24-35 in Hhold**	**Total No. of Adults in Hhold**	**No. Children Aged 0-4 in Hhold**	**Lives with spouse or partner**
RD Impact	0.023	-0.079	-0.113	0.009	-0.028
	(0.033)	(0.051)	(0.233)	(0.034)	(0.026)
N	2,489	2,292	1,295	2,583	1,684
BW	2.252	2.144	1.218	2.394	2.823
$\overline{Y}\|_{age<55}$	0.097	0.328	3.043	0.079	0.642
$\overline{Y}\|_{age\geq 55}$	0.083	0.281	3.137	0.079	0.660

Panel B: Men

	(1)	(2)	(3)	(4)	(5)
First Stage	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**
Pens. Age	0.394***	0.406***	0.329***	0.409***	0.398***
SE	(0.044)	(0.043)	(0.077)	(0.039)	(0.053)
Second Stage	**No. Women Ages 18-23 in Hhold**	**No. Women Ages 24-35 in Hhold**	**Total No. of Adults in Hhold**	**No. Children Aged 0-4 in Hhold**	**Lives with spouse or partner**
RD Impact	0.007	0.062	0.368	-0.075*	-0.021
SE	(0.045)	(0.066)	(0.297)	(0.045)	(0.026)
N	1,389	1,469	584	1,697	942
BW	2.495	2.600	1.081	3.009	3.215
$\overline{Y}\|_{age<60}$	0.050	0.269	2.684	0.065	0.899
$\overline{Y}\|_{age\geq 60}$	0.044	0.204	2.686	0.052	0.872

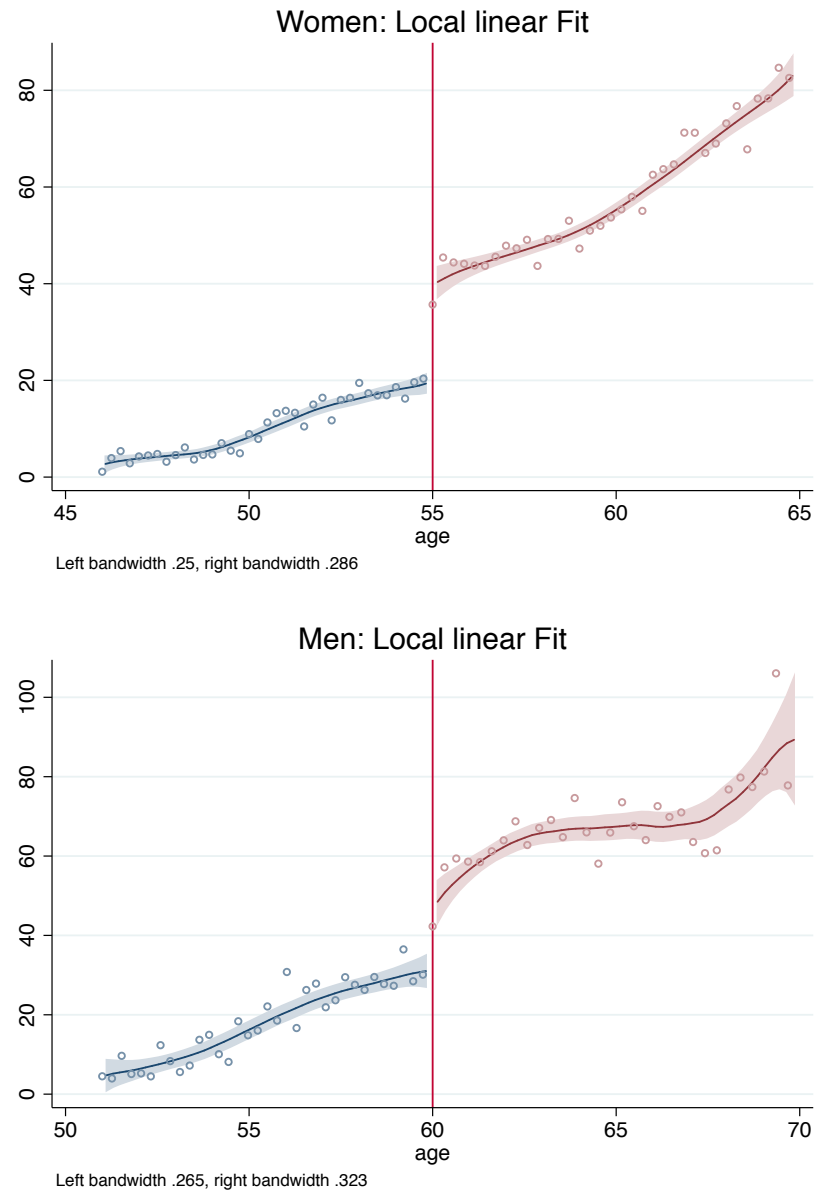
Non-parametric RD estimates use local linear regression with rectangular kernel. Outcomes are residualized to remove year, month, and individual fixed effects. Bandwidth chosen using the method from Imbens and Kalyanaraman (2012). Local linear models use SE's based on fixed-match variance estimator with 3 nearest neighbor matches. All outcomes at the household level. Family and relatives income represents intra-household transfers, with amounts real 2002 roubles per month. $\overline{Y}$ are means of raw (non-residualized) outcome variables for the estimation sample above and below pension age cutoffs of age 55 for women and age 60 for men. Excluded group for lives with spouse or partner include unmarried and married individuals who do not live with a spouse or partner. Total number of adults includes all household members aged 18 or greater. N is the number of person-wave observations.

Figure 1: Discontinuity in pension receipt propensity at old-age pension threshold. Russia 2006-2011.



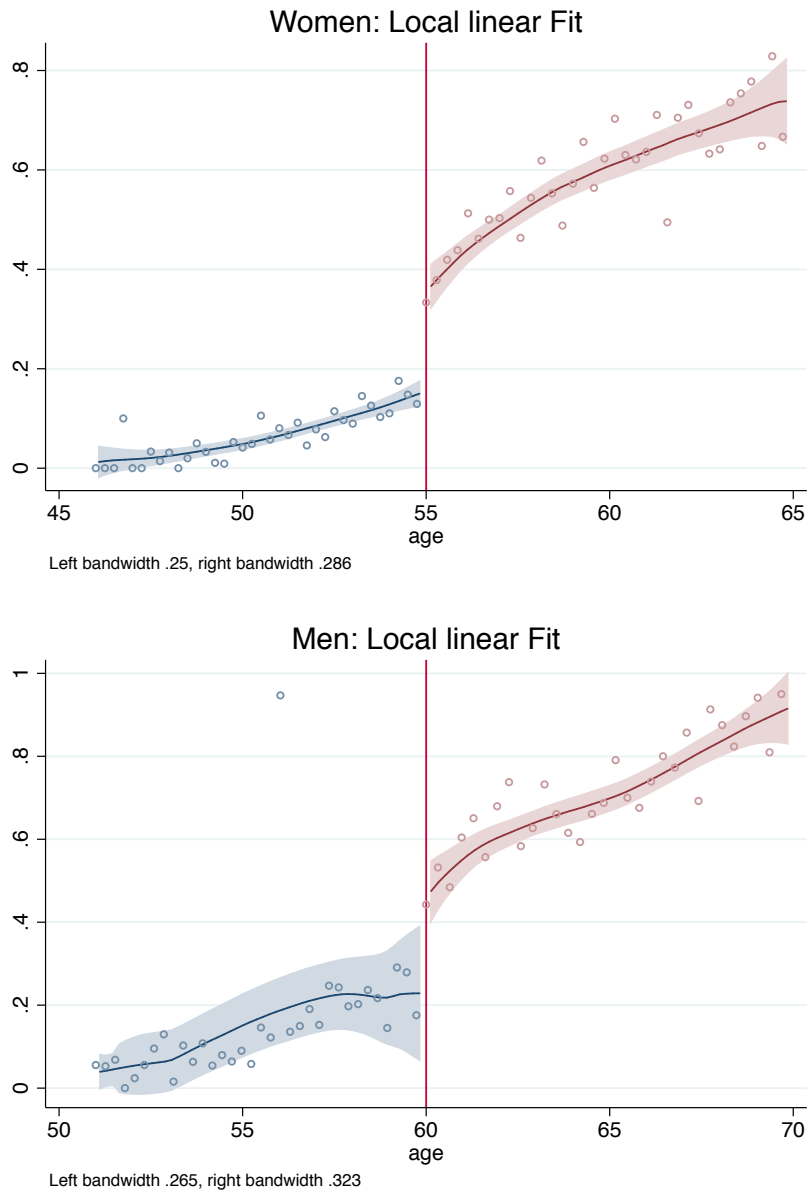
Local linear regression before and after Russian state pension age, conditional on year and month dummies, their interactions, and individual fixed effects. Pension age is 55 for women and 60 for men. Pension receipt is a binary measure. Shaded area is 95 percent confidence interval.

Figure 2: Discontinuity in individual pension income amount at old-age pension threshold. Russia 2006-2011.



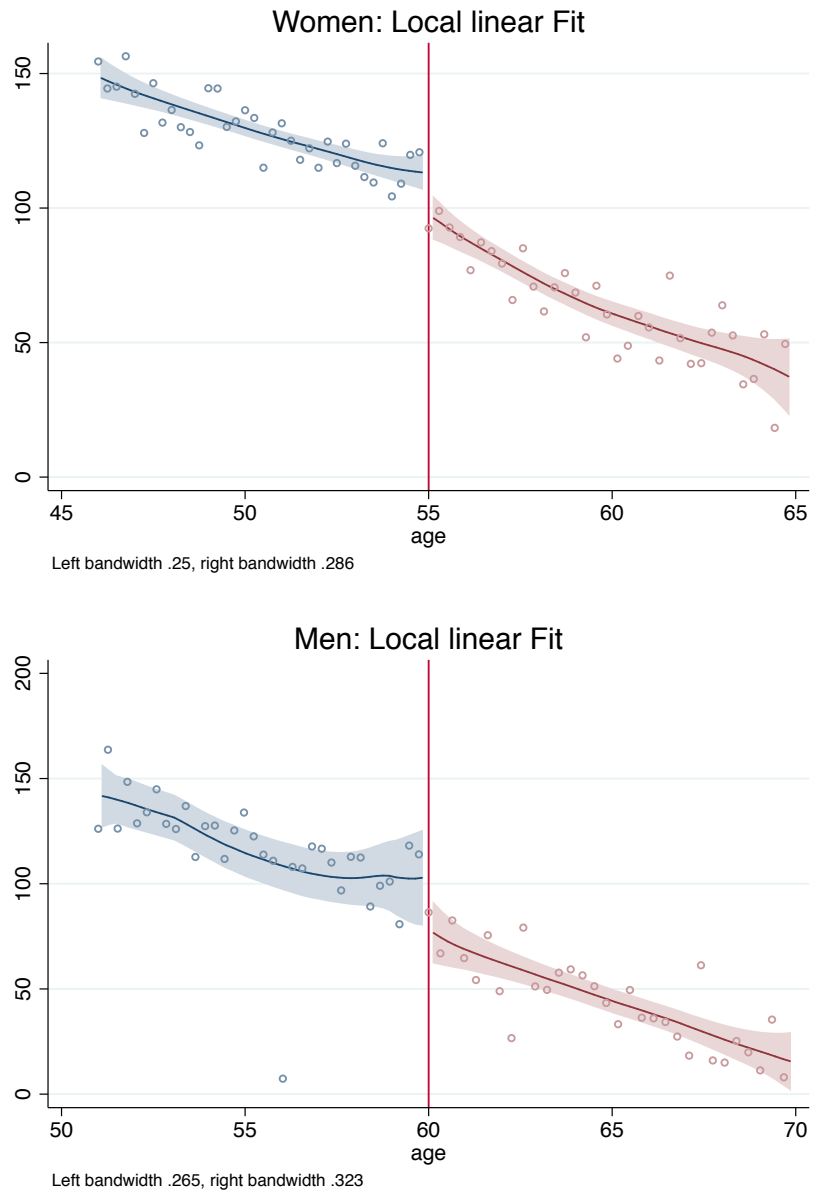
Local linear regression before and after Russian state pension age, conditional on year and month dummies, their interactions, and individual fixed effects. Pension age is 55 for women and 60 for men. Income amount is real monthly 2002 roubles for an individual. Shaded area is 95 percent confidence interval.

Figure 3: Discontinuity in "Pensioner" occupational identity at old-age pension threshold. Russia 2006-2011.



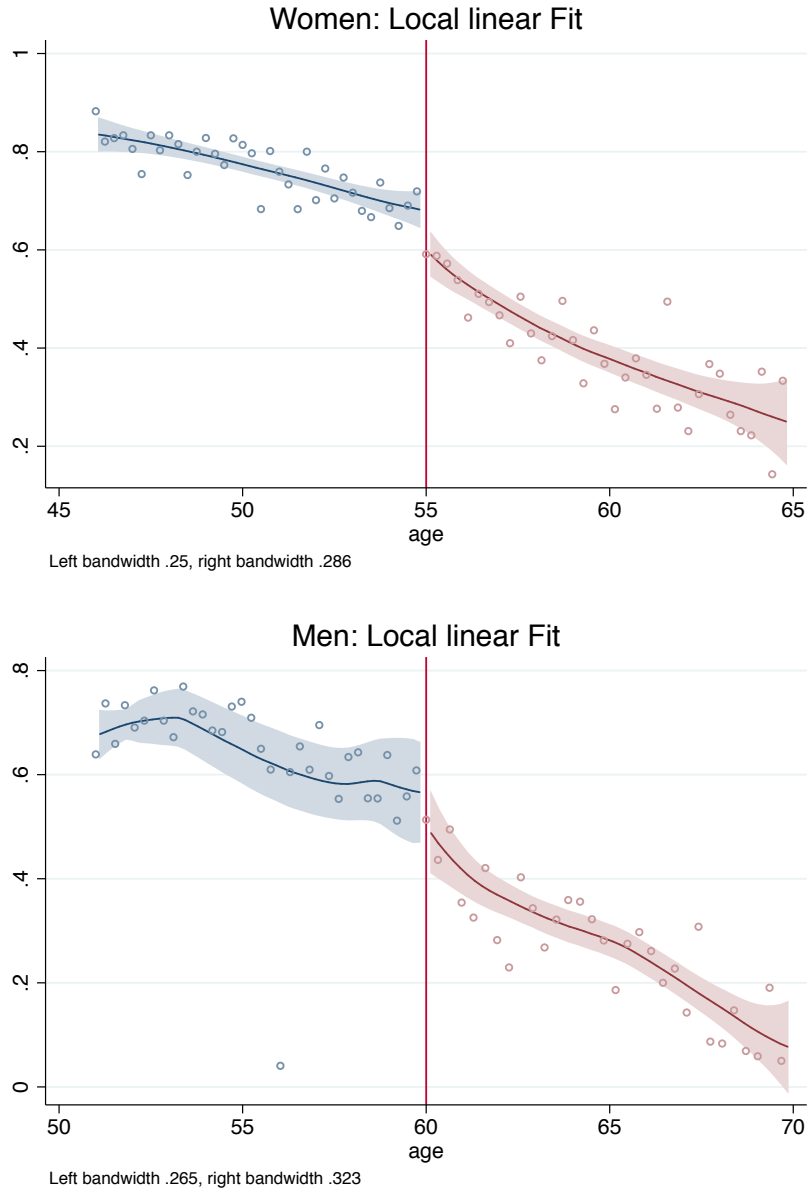
Local linear regression before and after Russian state pension age, conditional on year and month dummies, their interactions, and individual fixed effects. Pension age is 55 for women and 60 for men. Occupational identity is a binary measure. Shaded area is 95 percent confidence interval.

Figure 4: Discontinuity in monthly hours worked at old-age pension threshold. Russia 2006-2011.



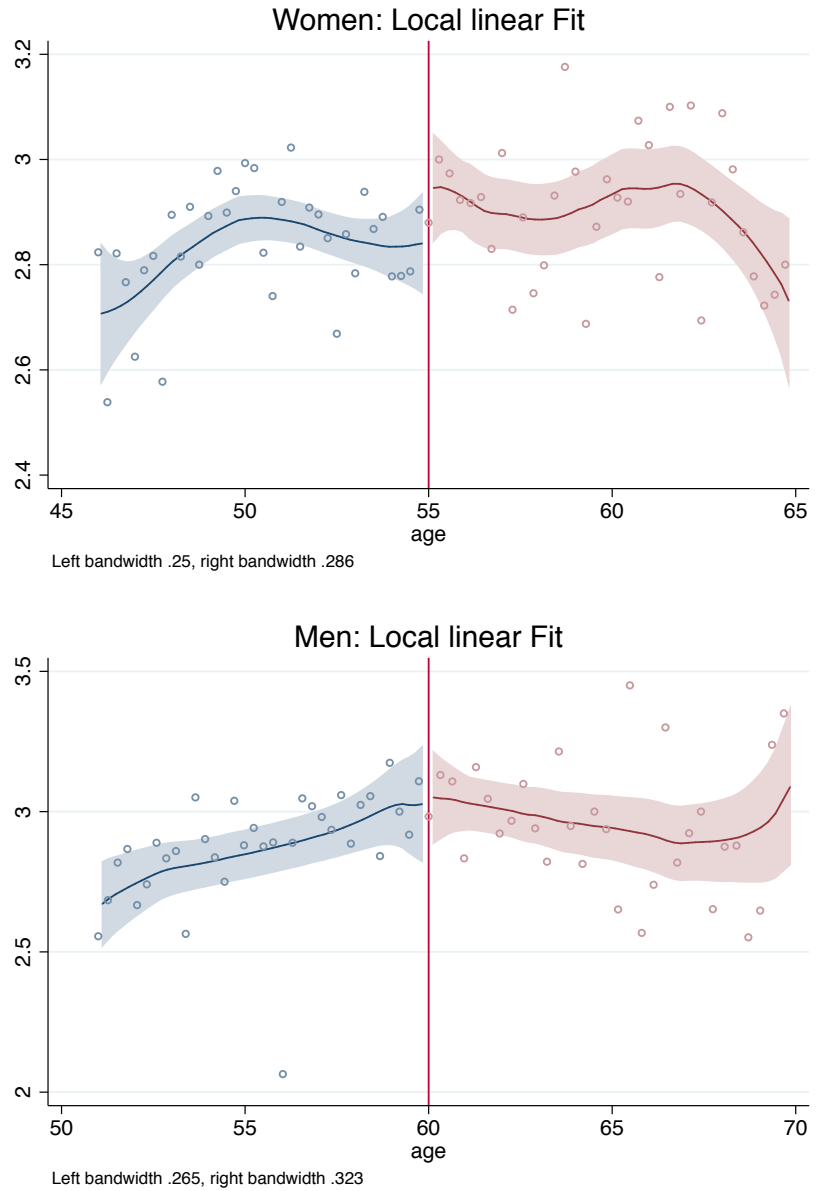
Local linear regression before and after Russian state pension age, conditional on year and month dummies, their interactions and individual fixed effects. Pension age is 55 for women and 60 for men. Shaded area is 95 percent confidence interval.

Figure 5: Discontinuity in the probability of working outside the home at old-age pension threshold. Russia 2006-2011.



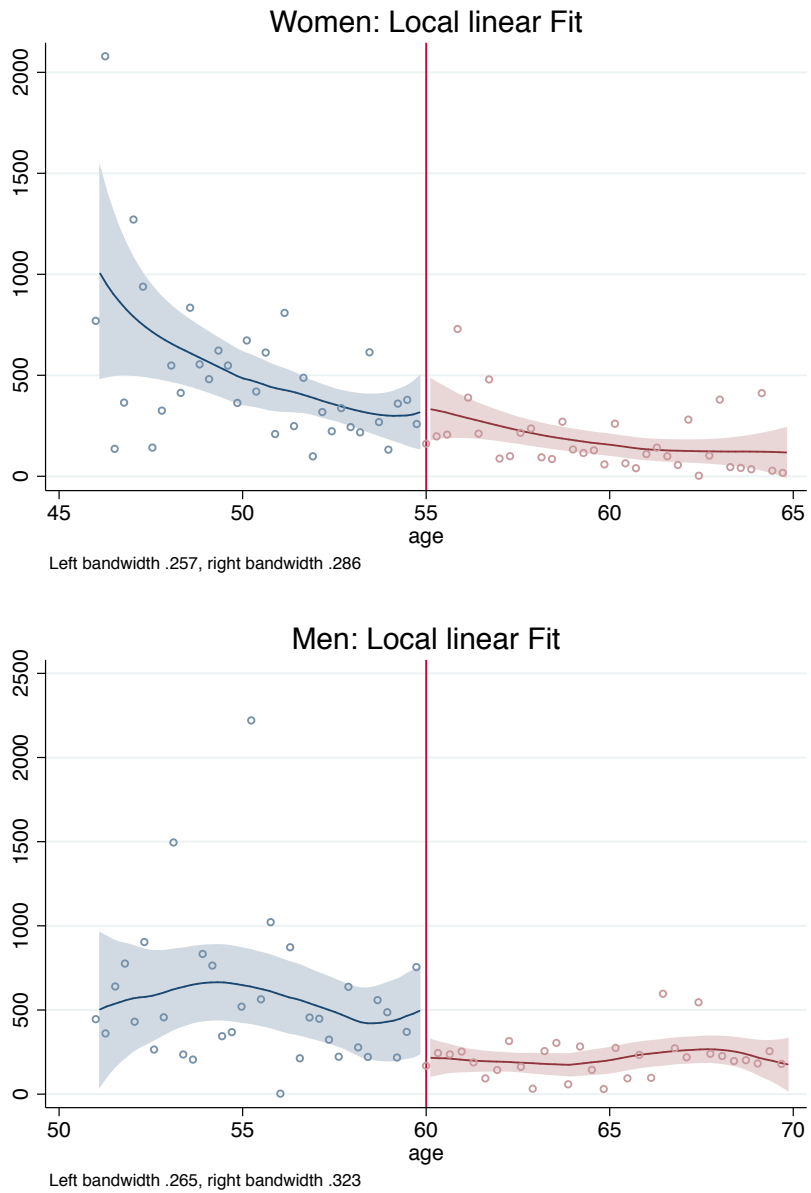
Local linear regression before and after Russian state pension age, conditional on year and month dummies, their interactions and individual fixed effects. Pension age is 55 for women and 60 for men. Shaded area is 95 percent confidence interval.

Figure 6: Discontinuity in Subjective Life Satisfaction Scores at old-age pension threshold. Russia 2006-2011.



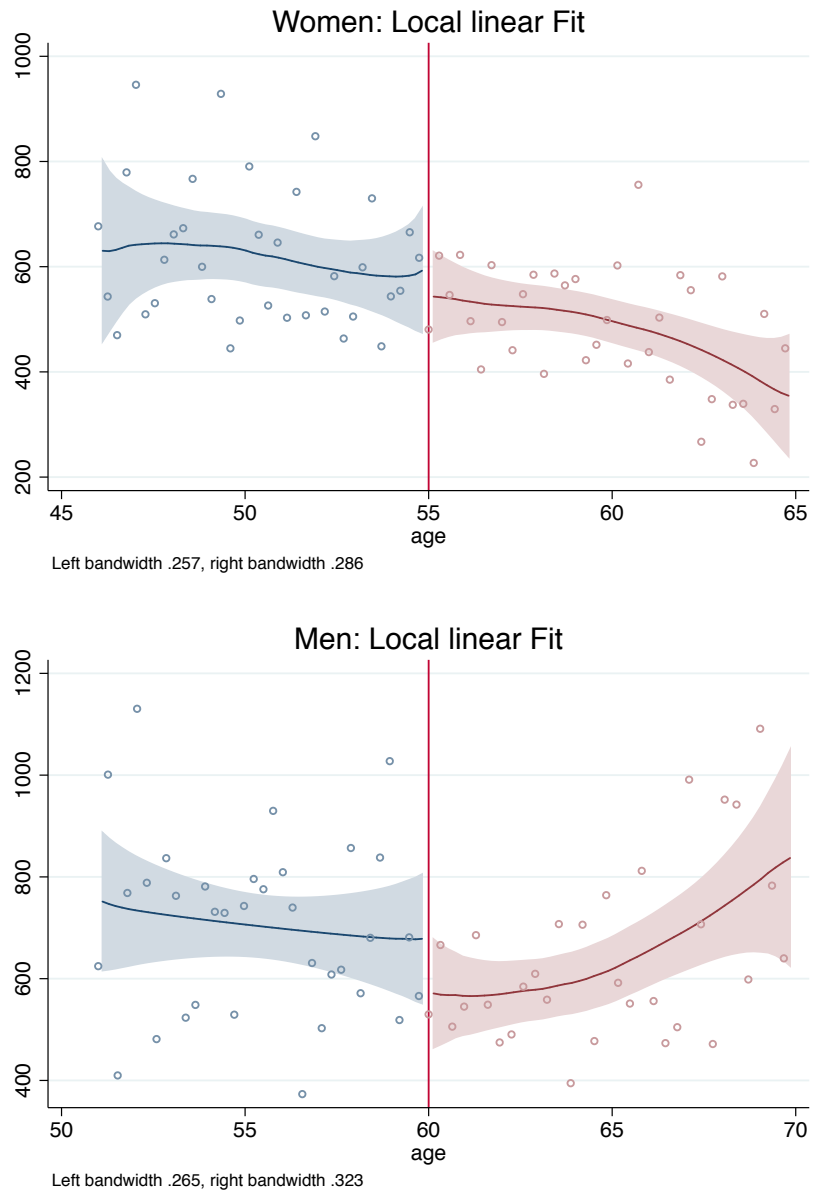
Local linear regression before and after Russian state pension age, conditional on year and month dummies, their interactions and individual fixed effects. Pension age is 55 for women and 60 for men. Life satisfaction scored from 5 (high) to 1 (low). Shaded area is 95 percent confidence interval.

Figure 7: Discontinuity in cash home production amount at old-age pension threshold. Russia 2006-2011.



Local linear regression before and after Russian state pension age, conditional on year and month dummies, their interactions, and individual fixed effects. Pension age is 55 for women and 60 for men. Home production values in real monthly (2002) roubles. Shaded area is 95 percent confidence interval.

Figure 8: Discontinuity in non-cash home production amount at old-age pension threshold. Russia 2006-2011.



Local linear regression before and after Russian state pension age, conditional on year and month dummies, their interactions, and individual fixed effects. Pension age is 55 for women and 60 for men. Home production values in real monthly (2002) roubles. Shaded area is 95 percent confidence interval.

Appendix

A.1 Russian Old-age State Pensions

The Russian pension system retained much of the structure of the Soviet pension system through the 1990s and early 2000s. Pension eligibility is based on age thresholds that were first introduced under Khrushchev's leadership in 1956. As in the Soviet Union, old-age state pensions require only five years of work experience. The pensions had two main components including a fixed amount that is supplemented by a labor pension amount. The labor amount can vary with individual contributions based on wages, but the rate of return is prescribed by law. Base amounts were set at 55 percent of income in the preceding 2 years, plus 1 percent for every year of service beyond 25 years. Many supplements were available. For example, an additional 25 percent of the minimum pension amount was available for those with health problems. An additional two-thirds of the minimum pension amount was paid for each dependent in the household and to war veterans.

Working past retirement age was common in the Soviet Union. Pensions were reformed in 1970 to encourage this. By the early 1980s one-third of eligible pensioners continued to work. Almost all workers who delayed retirement received full pensions in addition to their income (Jones and Moskoff, 1987). Except for about 10 percent of workers in white-collar occupations, everyone was able to receive pension and labor income amounts together. Even the small fraction of the civil service who are subject to age limitations in the workplace, such as public university rectors and ministers, have the option of postponing retirement for up to five years. Because pension amounts were based on past records of earnings and not indexed to inflation, replacement values remained low through the 1990s. Pension replacement rates fell from 75 percent prior to 1990 to below 30 percent by 2005 (Rashid et al., 2002; Rosstat, 2015). In addition, many state-provided essentials including heat and trans-

portation subsidies were removed. The ability of pension income to meet the needs of Russians was generally lower in the post-Soviet era than it had been just prior to the collapse.

A.2 Supplementary Tables and Figures

Table A.1: The causal impact of attaining state pension age on other subjective well-being outcomes. RD estimates, Russia 2006-2011

Panel A: Women

	(1)	(2)	(3)	(4)	(5)	(6)
First Stage	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**
Pens. Age	0.460***	0.482***	0.515***	0.445***	0.452***	0.494***
SE	(0.029)	(0.028)	(0.110)	(0.037)	(0.032)	(0.026)
Second Stage	**Econ Rank 1 low 9 high**	**Power Rank 1 low 9 high**	**Respect Rank 1 low 9 high**	**Believe about Life Next Year 1 mch better 5 mch worse**	**Concrnd for Basic Needs. Next Year 1 very 4 not at all**	**Self-report Overall Health 1 very good 5 very bad**
RD Impact	0.081	-0.014	0.097	-0.111	0.161	-0.054
SE	(0.142)	(0.145)	(0.110)	(0.109)	(0.143)	(0.048)
N	3,089	3,439	5,958	2,019	2,628	3,897
BW	2.736	3.053	5.583	2.200	2.272	3.401

Panel B: Men

	(1)	(2)	(3)	(4)	(5)	(6)
First Stage	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**
Pens. Age	0.400***	0.391***	0.402***	0.414***	0.393***	0.403***
SE	(0.036)	(0.032)	(0.035)	(0.048)	(0.042)	(0.038)
Second Stage	**Econ Rank 1 low 9 high**	**Power Rank 1 low 9 high**	**Respect Rank 1 low 9 high**	**Believe about Life Next Year 1 mch better 5 mch worse**	**Concrnd for Basic Needs. Next Year 1 very 4 not at all**	**Self-report Overall Health 1 very good 5 very bad**
RD Impact	0.252	0.079	0.097	-0.041	0.654	-0.043
SE	(0.200)	(0.224)	(0.243)	(0.153)	(0.217)	(0.094)
N	1,980	2,337	2,055	1,180	1,519	1,809
BW	3.415	4.096	3.658	2.299	2.555	3.038

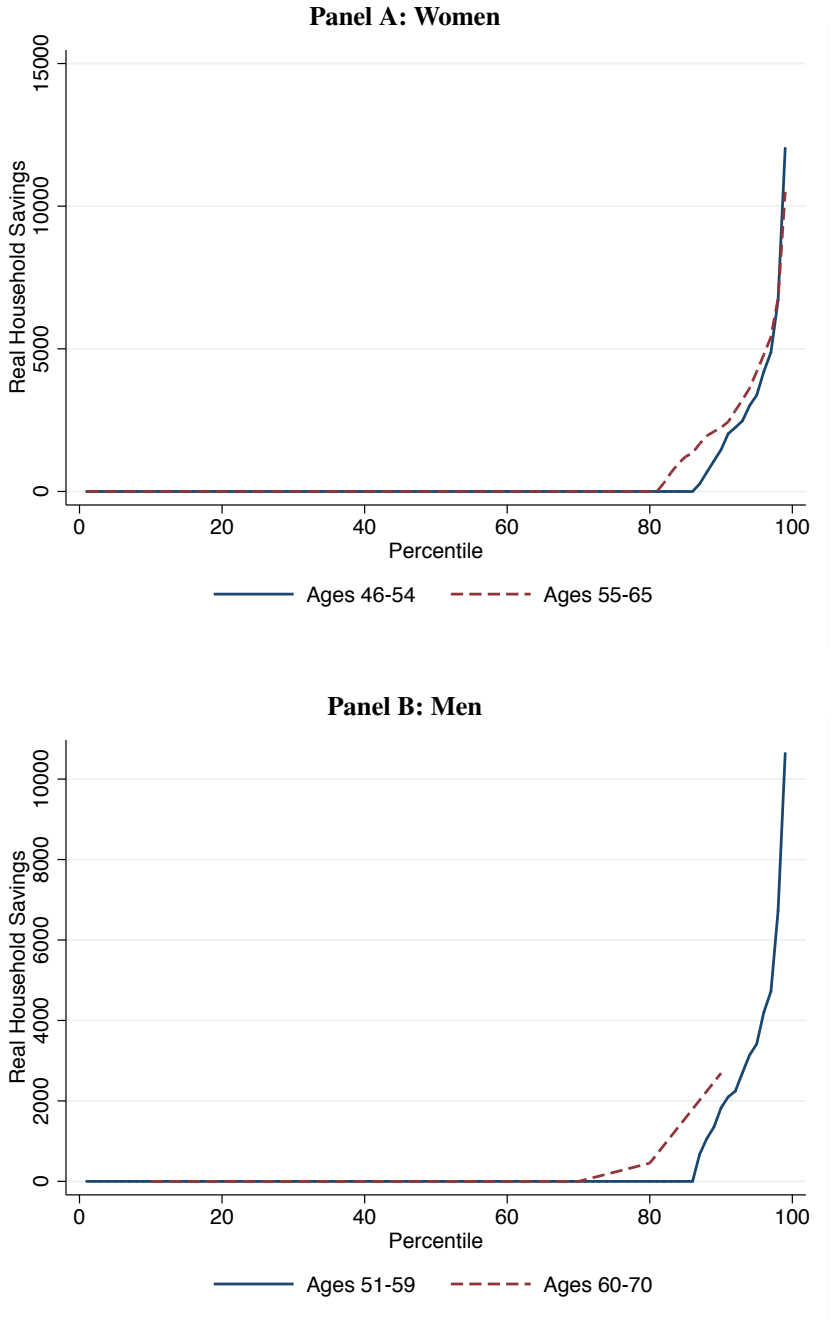
Local linear regressions use rectangular kernel and optimal bandwidth suggested by Imbens and Kalyanaraman (2012). SE's in parentheses based on fixed-match variance estimator with 3 nearest neighbor matches. Outcomes are residualized to remove year, month, and individual fixed effects. Ranked outcomes are relative to others in Russia at the time. N is the number of person-wave observations.

Table A.2: Test for discontinuity in density of age at pension threshold

	(1) **Women**	(2) **Women**	(3) **Men**	(4) **Men**
t	0.412	0.319	0.928	0.094
$p > \|t\|$	[0.681]	[0.749]	[0.353]	[0.925]
BW_-	3.210	2.135	4.599	6.232
BW_+	3.210	2.777	4.599	4.621
N_-	1925	1229	1595	2134
N_+	1781	1566	1073	1073

Non-parametric boundary-adaptive density estimates proposed by Cattaneo et al. (2017). t is the t-statistic for a test with the null hypothesis of equality in densities at the pension age cutoff c: $t = (f_+(c) - f_-(c))/\sqrt{\sigma^2_+(c) + \sigma^2_-(c)}$. p-values for a 2-sided test in square brackets. Robust density estimation uses quadratic polynomial with cubic bias reduction and rectangular kernel. Estimates in columns (1) and (3) use common bandwidth (BW) selected according to sum of the MSE on either side of the pension age cutoff. Estimates in columns (2) and (4) allow separate bandwidths above (BW_+) and below (BW_-) the age cutoff c, which is 55 for women and 60 for men. N is the number of person-wave observations.

Figure A.1: Household Savings Percentiles by Sex, Russia 2006-2011.



Source:RLMS-HSE 2006-2011. Monthly real household savings in 2000 Roubles. Solid line shows percentiles before pension age, dashed line after pension age. Pension ages are 55 for women and 60 for men.

A.3 Results by Education and Health

Estimates for sub-samples of men and women by reported health and education offer insight about the heterogeneity of effects by human capital. We split the samples according to respondent reports in 2006.

Results are estimated separately for individuals who did and did not report having a serious health problem in the 30 days prior to survey response. Table A.3 presents fuzzy RD results for our preferred specification. Means of outcome variables are reported at the bottom of each panel. These means are reported separately for the periods before and after pension age, each of which span 5 years. The impact of pension receipt on the labor supply decisions of women with health problems in Panel A and without health problems in Panel B is very similar. Monthly hours worked are reduced by 26 and 21, respectively. The measured effect of pension receipt on whether or not a woman is working outside the home is negative for both groups, although it is significant only for women without health concerns.

The impacts for male retirement behavior in Panels C and D are more distinct. Men reporting no health problems exhibit retirement behavior at pension age. Pension receipt decreases the likelihood of working outside the home and amounts to a reduction of 62 hours worked per month. In contrast, results are statistically insignificant among those reporting a health concern. This is true despite the fact that the impact of pension receipt on the incomes of these men with health concerns is more than twice as large as the effect on those without any health concern. Means of the outcome variables show that the men with and without health concerns work an average of 86 and 107 hours per month, respectively.

Results are also estimated separately for individuals who did and did not complete higher education. We code individuals who reported obtaining a diploma from an institute; university; post-graduate residency or individuals holding a masters de-

gree; diploma of candidate of science or doctor of science, as having completed higher education and others as having completed less than higher education. Results in Table A.4 show that only those having completed higher education exhibit significant decreases in monthly hours worked. Increases in total monthly income and life satisfaction are slightly more significant for less-educated women. These results suggest that highly educated workers are most likely to have the financial resources to retire at pension age. Those with less education must continue working. Sub-sample means show that average monthly income for less educated women is about 5,000 roubles less than for women with high education.

For men, impacts on the probability of working outside the home are negative for both those who have and those who have not completed higher education. The impact of pension receipt on home production for cash is large and significant among those households where men have less education. Sub-sample means suggest that the larger impact for these men arises because home production output for cash was much larger in these households prior to pension age. We cannot reject a null hypothesis of no impact on life satisfaction for either sub-sample of males.

Table A.3: Main results, separately by health status in 2006

Panel A: Women reporting no health problems in last 30 days in 2006 RLMS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
First Stage	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**
Pens. Age	0.496***	0.424***	0.446***	0.421***	0.471***	0.490***	0.440***
SE	(0.031)	(0.046)	(0.039)	(0.046)	(0.036)	(0.032)	(0.042)
Second Stage	**Real Home Prod Cash**	**Real Home Prod Non-Cash**	**Life Satisf. 5 fully sat. 1 not at all**	**Real Indiv. Income Amount**	**Main Occupation "Pensioner"**	**Hours Worked Per Month**	**Work Outside Home**
RD Impact	2.227	-2.679	0.202	7.750	0.362***	-25.636***	-0.115**
SE	(2.516)	(2.371)	(0.163)	(20.879)	(0.053)	(9.029)	(0.058)
N	2,385	1,292	1,703	1,305	1,971	2,389	1,525
BW	4.269	2.317	2.850	2.226	3.295	4.045	2.523
$\overline{Y}\|_{age<55}$	3.143	6.198	2.898	46.845	0.127	119.735	0.719
$\overline{Y}\|_{age\geq 55}$	2.727	4.971	3.013	55.104	0.393	94.515	0.593

Panel B: Women reporting some health problems in last 30 days in 2006 RLMS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
First Stage	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**
Pens. Age	0.530***	0.536***	0.491***	0.511**	0.523***	0.537***	0.500***
SE	(0.026)	(0.030)	(0.046)	(0.034)	(0.038)	(0.030)	(0.043)
Second Stage	**Real Home Prod Cash**	**Real Home Prod Non-Cash**	**Life Satisf. 5 fully sat. 1 not at all**	**Real Indiv. Income Amount**	**Main Occupation "Pensioner"**	**Hours Worked Per Month**	**Work Outside Home**
RD Impact	4.612***	-0.155	0.204	12.670***	0.347***	-21.247**	-0.042
SE	(1.680)	(1.387)	(0.175)	(4.740)	(0.049)	(8.853)	(0.053)
N	3,201	2,583	1,311	2,146	1,886	2,660	1,506
BW	6.625	5.015	2.346	3.973	3.392	4.880	2.732
$\overline{Y}\|_{age<55}$	3.156	5.759	2.782	49.092	0.130	111.490	0.680
$\overline{Y}\|_{age\geq 55}$	2.484	5.847	2.881	49.298	0.450	80.957	0.535

Panel C: Men reporting no health problems in last 30 days in 2006 RLMS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
First Stage	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**
Pens. Age	0.406***	0.444***	0.418***	0.442***	0.460***	0.425***	0.460***
SE	(0.056)	(0.048)	(0.053)	(0.043)	(0.037)	(0.052)	(0.037)
Second Stage	**Real Home Prod Cash**	**Real Home Prod Non-Cash**	**Life Satisf. 5 fully sat. 1 not at all**	**Real Indiv. Income Amount**	**Main Occupation "Pensioner"**	**Hours Worked Per Month**	**Work Outside Home**
RD Impact	-4.342	-2.939	-0.015	12.141*	0.455***	-61.566***	-0.205***
SE	(3.080)	(2.191)	(0.224)	(6.215)	(0.062)	(17.571)	(0.054)
N	815	1,066	923	1,281	1,667	951	1,667
BW	2.194	2.867	2.407	3.379	4.451	2.420	4.421
$\overline{Y}\|_{age<60}$	2.774	6.287	3.091	51.635	0.203	107.369	0.627
$\overline{Y}\|_{age\geq 60}$	1.884	5.189	3.071	58.959	0.534	80.496	0.456

Panel D: Men reporting some health problems in last 30 days in 2006 RLMS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
First Stage	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**
Pens. Age	0.311***	0.297***	0.298***	0.319**	0.307**	0.301***	0.308***
SE	(0.066)	(0.071)	(0.067)	(0.067)	(0.055)	(0.060)	(0.072)
Second Stage	**Real Home Prod Cash**	**Real Home Prod Non-Cash**	**Life Satisf. 5 fully sat. 1 not at all**	**Real Indiv. Income Amount**	**Main Occupation "Pensioner"**	**Hours Worked Per Month**	**Work Outside Home**
RD Impact	-15.132	0.929	0.578	33.945***	0.706***	15.926	-0.066
SE	(14.853)	(5.498)	(0.442)	(12.043)	(0.168)	(30.238)	(0.136)
N	629	547	609	602	847	745	552
BW	3.145	2.727	2.869	2.892	4.085	3.612	2.657
$\overline{Y}\|_{age<60}$	9.459	7.758	2.879	48.161	0.236	86.094	0.516
$\overline{Y}\|_{age\geq 60}$	2.486	6.486	2.948	54.976	0.559	68.094	0.385

Non-parametric RD estimates use local linear regression with rectangular kernel. Outcomes are residualized to remove year, month, and individual fixed effects. Bandwidth chosen using the method from Imbens and Kalyanaraman (2012). Local linear models use SE's based on fixed-match variance estimator with 3 nearest neighbor matches. Productivity in home production is measured at the household level, with imputation for non-monetized home production performed by RLMS-HSE staff. All outcomes are measured at the individual level, and hours of work are reported monthly. Pension and home production amounts are hundreds of real 2002 roubles per month. N is the number of person-wave observations.

Table A.4: Main results, separately by Education Level in 2006

Panel A: Women that have completed higher education, as reported in 2006

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
First Stage	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**
Pens. Age	0.482***	0.468***	0.464***	0.448***	0.471***	0.470***	0.471***
SE	(0.029)	(0.032)	(0.033)	(0.039)	(0.032)	(0.032)	(0.032)
Second Stage	**Real Home Prod Cash**	**Real Home Prod Non-Cash**	**Life Satisf. 5 fully sat. 1 not at all**	**Real Indiv. Income Amount**	**Main Occupation "Pensioner"**	**Hours Worked Per Month**	**Work Outside Home**
RD Impact	4.365	-0.007	0.161	8.536	0.346***	-25.880**	-0.098**
SE	(2.258)	(1.589)	(0.131)	(14.794)	(0.048)	(10.285)	(0.043)
N	2,932	2,468	2,437	1,842	2,520	2,502	2,520
BW	3.714	3.150	2.865	2.167	2.994	2.935	2.920
$\overline{Y}\|_{age<55}$	2.236	5.358	2.856	50.305	0.120	117.203	0.708
$\overline{Y}\|_{age\geq 55}$	3.321	5.451	2.972	53.855	0.415	94.327	0.562

Panel B: Women that have completed less than higher education, as reported in 2006

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
First Stage	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**
Pens. Age	0.516***	0.517***	0.465***	0.493***	0.462***	0.517***	0.432***
SE	(0.053)	(0.054)	(0.061)	(0.050)	(0.058)	(0.051)	(0.071)
Second Stage	**Real Home Prod Cash**	**Real Home Prod Non-Cash**	**Life Satisf. 5 fully sat. 1 not at all**	**Real Indiv. Income Amount**	**Main Occupation "Pensioner"**	**Hours Worked Per Month**	**Work Outside Home**
RD Impact	0.366	-0.372	0.490*	11.888**	0.435***	-15.395	-0.020
SE	(2.391)	(2.941)	(0.266)	(6.015)	(0.084)	(13.804)	(0.096)
N	892	868	699	993	563	963	540
BW	3.073	2.943	2.288	3.272	2.469	3.178	1.785
$\overline{Y}\|_{age<55}$	4.749	6.400	2.854	45.576	0.144	101.288	0.632
$\overline{Y}\|_{age\geq 55}$	4.768	5.473	2.902	47.589	0.390	83.544	0.597

Panel C: Men that have completed higher Education, as reported in 2006

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
First Stage	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**
Pens. Age	0.392***	0.391***	0.388***	0.398***	0.391***	0.388***	0.396***
SE	(0.047)	(0.039)	(0.051)	(0.044)	(0.054)	(0.052)	(0.042)
Second Stage	**Real Home Prod Cash**	**Real Home Prod Non-Cash**	**Life Satisf. 5 fully sat. 1 not at all**	**Real Indiv. Income Amount**	**Main Occupation "Pensioner"**	**Hours Worked Per Month**	**Work Outside Home**
RD Impact	-4.500	-3.556	0.231	19.762***	0.451***	-47.485**	-0.131*
SE	(6.149)	(2.281)	(0.230)	(6.864)	(0.104)	(19.642)	(0.042)
N	1,160	1,583	1,015	1,289	925	988	1,411
BW	3.141	4.403	2.658	3.347	2.372	2.520	33.655
$\overline{Y}\|_{age<60}$	2.758	5.987	3.072	54.959	0.218	104.023	0.620
$\overline{Y}\|_{age\geq 60}$	1.951	5.061	3.134	61.510	0.472	75.937	0.474

Panel D: Men that have completed less than higher education, as reported in 2006

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
First Stage	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**	**Received Any Pens.**
Pens. Age	0.410***	0.439***	0.427***	0.420***	0.405***	0.429***	0.431***
SE	(0.073)	(0.062)	(0.061)	(0.059)	(0.139)	(0.063)	(0.062)
Second Stage	**Real Home Prod Cash**	**Real Home Prod Non-Cash**	**Life Satisf. 5 fully sat. 1 not at all**	**Real Indiv. Income Amount**	**Main Occupation "Pensioner"**	**Hours Worked Per Month**	**Work Outside Home**
RD Impact	-7.388**	-0.463	0.095	11.699	0.582***	-8.445	-0.170**
SE	(3.473)	(3.077)	(0.264)	(7.813)	(0.139)	(21.857)	(0.086)
N	522	654	700	734	545	671	681
BW	2.664	3.267	3.447	3.710	2.648	3.306	3.285
$\overline{Y}\|_{age<60}$	4.615	8.808	2.859	41.984	0.238	94.790	0.523
$\overline{Y}\|_{age\geq 60}$	1.794	7.413	2.852	49.682	0.522	77.286	0.407

Non-parametric RD estimates use local linear regression with rectangular kernel. Outcomes are residualized to remove year, month, and individual fixed effects. Bandwidth chosen using the method from Imbens and Kalyanaraman (2012). Local linear models use SE's based on fixed-match variance estimator with 3 nearest neighbor matches. Productivity in home production is measured at the household level, with imputation for non-monetized home production performed by RLMS-HSE staff. All outcomes are measured at the individual level, and hours of work are reported monthly. Pension and home production amounts are hundreds of real 2002 roubles per month. Individuals entering the 2006 panel with "higher education" reported obtaining a diploma from an institute, university, post-graduate residency or that they held a masters degree, diploma of candidate of science or doctor of science. N is the number of person-wave observations.

A.4 Social Norms

Differences in social norms arising from the historical context in Russia provide one explanation for the observed changes in home production. Age-and sex-specific norms about workers and recipients of old-age pension may help to explain wellbeing impacts if they strongly influence the perceived returns to engaging in different activities. Pension income may be expected to bring about changes in the self-perceptions and time use of older workers if pension receipt is accompanied by a retirement identity that may reflect a shift in the social norms to which an individual feels they must conform. This phenomenon has been described across social science disciplines (Clark, 2003; Ekerdt, 1986; Szinovacz and DeViney, 1999).

The economics literature contains mixed evidence about the importance of non-monetary factors in governing behavioral responses to social transfers. Keane and Moffitt (1998); Moffitt (1983); Ranney and Kushman (1987) suggest that welfare or food stamps might induce stigma among recipients. In the labeling effects literature, Kooreman (2000), Abeler and Marklein (2008) and Hener (2013) show that certain income sources are more likely to be spent on particular items for the household, perhaps as the result of an implicit social contract. However, Case and Deaton (1998) find no differential use of South African pensions on household expenditures relative to earned income. Impacts attributed to labelling or other non-monetary aspects of social transfers may in fact be the result of failure to control for individual-specific fixed effects or the use of IV estimates in the cross-section where exclusion restrictions are more likely violated. There is extensive evidence of social norms from the environmental economics and experimental economics literatures, including Allcott (2011); Campa and Serafinelli (2016); Cappelen et al. (2013); Dal Bó and Tervió (2013); DellaVigna et al. (2012); Fellner et al. (2013); Ferraro and Price (2013); Fershtman et al. (2012); Fischbacher and Föllmi-Heusi (2013); Gächter et al. (2013);

Gneezy et al. (2016); Krupka and Weber (2009, 2013); Pruckner and Sausgruber (2013); Viscusi et al. (2011). Social interaction effects, themselves possible manifestations of social norms have also been shown to affect participation in various programs including disability insurance in Norway (Rege et al., 2012).

Economists and psychologists have found that preferences formed during recessionary periods experienced between the ages of 18 and 25 remain remarkably stable later in life (Giuliano and Spilimbergo, 2014). This suggests that social norms may be set during the sensitive ages of youth and persist through retirement age. Individuals in our sample would have formed these norms during the Soviet period.

Alesina et al. (2013) show that gender norms formed by ancestors significantly impact contemporary female labor force participation. Cigno et al. (2017) also provide complementary theoretical results which supports the transmission of preferences from parents to children. Gender norms formed during the Soviet period may also persist across generations. Lasting impressions of mothers and grandmothers may have suggested a woman's role was to retire to the home at pension age and engage in home production (Höjestrand, 2009). The observed male role, instead, was centered around the continued importance of work beyond pension age. Men generally did not retire and historically participated little in child-rearing (Utrata, 2011). Thus, for older Russian men, the typical assumption that leisure is a normal good may not hold.

The moderating effects of social norms on reactions to receiving old-age pensions are likely to be particularly strong for individuals whose impressionable years were spent in the Soviet Union. Social norms can be examined using The World Values Survey (WVS, 2015), a nationally-representative questionnaire designed to assess beliefs and values. Cross-sections are available for Russia for the years 1990, 1995, 2006 and 2011 and include subjective responses to questions regarding about acceptable ages for workers. Details of the questions posed are given in the Appendix

Section A.5.

WVS data show that social norms about work have changed substantially across generations during the period 1990-2011. Older generations are more likely to hold norms that favor the continued employment of males beyond pension age. Meanwhile, attitudes towards work among older workers remain similar to those promoted by the state during Soviet times. Table A.5 presents ordered probit estimates using existing waves of the WVS. Compared to the 1990 survey, in the 2011 survey both sexes were more likely to report agreement with the statement "When jobs are scarce, men should have more right to a job than women". The idea that women should cede jobs to men in difficult economic times grew more acceptable over time. WVS responses indicating agreement with the statement "When jobs are scarce older people should be forced to retire" also change across generations. In 1995, the last year for which the question was posed, both sexes were significantly more likely to agree with this statement than in 1990. Agreement with these statements differs slightly between the sexes but the trend in beliefs was the same for women and men, *ceteris paribus*.

To further demonstrate differences in social norms across cohorts, Table A.6 presents the impact of reaching pension age on the subjective importance of work. Negative estimates for women suggest that they were relatively happy to retire and contribute to the family upon reaching pension age. This effect is most evident among less-educated women. However, there is no evidence that the importance of work for men decreases at pension age. The lack of change in views of men at retirement age about the importance of work to life contrasts with the observed broad changes in general views of work in Russian society. The sustained importance of work for men beyond retirement age may be partly due to persistent social norms venerating work among there older cohorts. Additional results in Table A.7 confirm that these social norms in Russia differ substantially from those held in the US.

Table A.5: Social norms about work and leisure in Russia, 1990-2011

	How Important is Family in your life 1 unimportant 4 important	**How Important are Friends in your life 1 unimportant 4 important**	**How Important is Religion in your life 1 unimportant 4 important**	**How Important is Work in your life 1 unimportant 4 important**	**How Important is Leisure in your life 1 unimportant 4 important**	**Jobs Scarce: men have job priority over women 1 disagree 3 agree**	**Jobs Scarce: force old to retire 1 disagree 3 agree**
Ordered Probit Coefficients	(1)	(2)	(3)	(4)	(5)	(6)	(7)
year=1995	0.117	-0.038	0.367***	-0.090	-0.057	0.387***	0.307***
	(0.076)	(0.062)	(0.065)	(0.066)	(0.062)	(0.072)	(0.082)
year=2006	0.257***	0.222***	0.555***	-0.169***	-0.021	0.327***	
	(0.080)	(0.065)	(0.065)	(0.066)	(0.064)	(0.070)	
year=2011	0.122	0.013	0.476***	-0.329***	-0.067	0.198***	
	(0.076)	(0.066)	(0.066)	(0.067)	(0.062)	(0.068)	
Female	0.325***	-0.129**	0.496***	-0.165***	-0.035	-0.342***	0.156***
	(0.062)	(0.051)	(0.054)	(0.051)	(0.052)	(0.064)	(0.060)
1995 × Female	-0.126	0.061	-0.082	-0.053	-0.067	0.055	-0.093
	(0.091)	(0.071)	(0.073)	(0.073)	(0.071)	(0.087)	(0.084)
2006 × Female	0.213***	0.038	-0.085	-0.094	-0.008	0.299***	
	(0.101)	(0.073)	(0.074)	(0.075)	(0.074)	(0.079)	
2011 × Female	0.009	0.058	-0.126*	0.030	0.034	-0.095	
	(0.089)	(0.072)	(0.073)	(0.073)	(0.070)	(0.079)	
χ^2	205.10	293.00	538.18	401.61	287.53	338.59	43.48
df	10	10	10	10	10	10	6
No. obs.	8457	8429	8117	8207	8332	8229	3749

Source: World Values Surveys 1990 (Russian Soviet Socialist Republic), 1995, 2006, and 2011. Omitted year is 1990, omitted gender is male. Heteroskedasticity-robust standard errors in parentheses. All outcomes are measured at the individual level. All estimates also include a linear term in age, educational attainment dummies, and a full set of interactions between female and these two.

Table A.6: The effect of pension age attainment on the perceived importance of work, separately by gender. Russia 1990-2011.

How important is work in your life: 1= not at all, 4= very						
	(1) **Women Less ed.**	(2) **Women High ed.**	(3) **Women All**	(4) **Men Less ed.**	(5) **Men High ed.**	(6) **Men All**
Pension Age	-0.403**	-0.174	-0.340***	0.166	-0.345	-0.009
	(0.174)	(0.196)	(0.131)	(0.232)	(0.345)	(0.185)
1995	0.247	0.208	0.174*	0.034	0.213	0.116
	(0.194)	(0.132)	(0.104)	(0.341)	(0.210)	(0.157)
2006	0.142	0.024	0.052	0.167	0.076	0.174
	(0.191)	(0.143)	(0.104)	(0.344)	(0.207)	(0.155)
2011	0.072	-0.117	-0.035	-0.276	-0.161	-0.208
	(0.186)	(0.139)	(0.101)	(0.345)	(0.202)	(0.153)
High Ed.			0.254***			0.162
			(0.073)			(0.103)
age	-0.498	0.371	-0.180	-1.348	0.238	-0.670
	(0.595)	(0.799)	(0.461)	(0.892)	(1.166)	(0.712)
age2	0.004	-0.004	0.001	0.010	-0.002	0.005
	(0.005)	(0.007)	(0.004)	(0.008)	(0.010)	(0.006)
Constant	17.175	-5.614	8.696	47.025*	-4.255	25.241
	(16.148)	(21.288)	(12.443)	(26.154)	(34.087)	(20.878)
Observations	508	244	752	316	156	472
R-squared	0.066	0.064	0.081	0.124	0.043	0.087

Quadratic RD estimates of the impact of pension age attainment on the importance of work. Pooled cross sections from WVS survey years 1990, 1995, 2006 and 2011. Base group is 1990. Robust standard errors in parentheses. High education refers to workers reporting having completed university education in years 1995, 2006 and 2011. In 1990, high education is workers whose age at graduation was 19 years or older. Questionnaire asks respondents "For each of the following [Work Family, friends, Leisure time, Politics, Religion and Service to others], indicate how important it is in your life".

Table A.7: Comparison of views about older people in Russia and the US, World Values Surveys 1995 and 2011

	Jobs scarce: Force old to retire? 1 disagree 3 agree (1)	**Is a 30 yr old boss completely... 1 unacceptable 10 acceptable** (2)	**Is a 70 yr old boss completely... 1 unacceptable 10 acceptable** (3)
Russia	1.710***	0.604***	-0.569***
	(0.060)	(0.042)	(0.041)
Pension Age	0.247**	-0.044	0.130**
	(0.109)	(0.067)	(0.065)
Russia ×	-0.600***	0.110	-0.076
Pension Age	(0.101)	(0.072)	(0.073)
χ^2	1078	362	350
No. obs.	3412	4566	4525

Source: World Values Survey. Russian pension age is 55 for women and 60 for men. "Jobs scarce" question is from the 1995 WVS, other questions are from 2011 survey year. The reference group is US male working age with less than higher education. Heteroskedasticity-robust standard errors in parentheses. Individual sample weights employed. "Age of boss" responses are rescaled to values ranging from 1 (completely acceptable) to 10 (completely unacceptable). "Force old to retire" scaled 1-3 (3=agree), and companies with young scaled 1 (strongly disagree) to 4 (strongly agree). Estimation is by ordered probit, with coefficients reported. All estimates include a linear term in age, controls for high-school and higher education completion, and a female dummy.

A.5 World Values Survey (WVS) Questionnaire

For interviews carried out in wave 3 (Russia 1995 and US and 1997), respondents were asked the following questions related to age and retirement:

$(i.)$ "**Do you agree or disagree with the following statement? When jobs are scarce, older people should be forced to retire from work early.**"
Respondents could choose one of the following responses: Agree (1), Neither (2), Disagree (3).

$(ii.)$ "**Please tell me how acceptable or unacceptable you think most people in [country] would find it if a suitably qualified 30 year old was appointed as their boss?**"
Respondents could choose responses on a scale from Completely unacceptable (1), to Completely acceptable (10).

(iii) "**Please tell me how acceptable or unacceptable you think most people in [country] would find it if a suitably qualified 70 year old was appointed as their boss?**"
Respondents could choose responses on a scale from Completely unacceptable (1), to Completely acceptable (10).

$(iv.)$ "**Now could you tell me whether you agree, agree strongly, disagree or disagree strongly with each of the following statements: Companies that employ young people perform better than those that employ people of different ages.** "
Respondents could choose between the following responses: Strongly agree (1), Agree(2), Disagree (3), Strongly disagree (4).

A.6 Russian Longitudinal Monitoring Survey (RLMS) Questionnaire

The subjective wellbeing questions included in the RLMS 2006-2011 are:

$(i.)$ "**To what extent are you satisfied with your life at the present time?**"
Respondents could choose one of the following responses [recoded in this paper to be increasing in sat-

isfaction]: Fully satisfied (5), Rather satisfied (4), Both yes and no (3), Less than satisfied (2), or Not at all satisfied (1).

$(ii.)$ "**And now, imagine please a nine-step ladder, where on the bottom, the first step, stand the poorest people, and on the highest step, the ninth, stand the richest people. On what step are you?**" Respondents chose a number in the range 1-9, inclusive.

$(iii.)$ "**And now, imagine please a nine-step ladder, where on the bottom, the first step, stand the powerless people, and on the highest step, the ninth, stand the most powerful people. On what step are you?**"
Respondents chose a number in the range 1-9, inclusive.

$(iv.)$ "**And now, another nine-step ladder where on the lowest step stand people who are absolutely not respected, and on the highest step stand those who are very respected. On which of the nine steps are you personally standing today?**"
Respondents chose a number in the range 1-9, inclusive.

$(v.)$ "**Do you think that 12 months from now your family will live better than today, or worse?**"
Respondents chose from responses: Will live much better (1), Will live somewhat better (2), Nothing will change (3), Will live somewhat worse (4), Will live much worse (5).

$(vi.)$ "**To what extent are you concerned about your family's ability to procure basic necessities in the next twelve months?**"
Respondents chose from responses: Very concerned (1), A little concerned (2), Not very concerned (3), Not concerned at all (4).

$(vii.)$ "**Tell me, please, how would you evaluate your health?**"
Respondents chose from responses: Very good (1), Good (2), Average (3), Bad (4) or Very bad (5).