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Pushed, pulled, or blocked? The elderly and the labor market in post-Soviet Russia

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Abstract

Russia provides an interesting context for studying the labor market experiences of the elderly because of its experience with market transition, its looming growth in the elderly dependency ratio, and its unusual pension policies that do not penalize pensioners for working. We use data from twenty surveys of the Russian population conducted from February 1991 to November 2007 to analyze the labor market participation and earnings of elderly Russians following market transition. Economic desperation, exacerbated by low pension levels, pushed some elderly to seek employment for income on the labor market. Elderly Russians with more education had more opportunities to work, and education differentials increased as market reforms progressed. The correlates of earnings operate similarly for retirement- and pre-retirement age Russians, with several exceptions: unobserved factors favoring employment are negatively associated with earnings for the elderly, occupation mediates most of the effects of education, and patterns of change over time differ somewhat. Elderly Russians are not disproportionately blocked from employment following market reforms. Following the initial transition shock, their labor market activity increased. Overall, both push and pull factors shape the employment and earnings of the elderly, affecting different segments of them.

Keywords

Labor market; Employment; Elderly; Pensioners; Earnings; Market transition; Russia

1. Introduction

The labor market participation of the elderly is an important issue for scholars studying the consequences of population aging and policymakers who deal with those consequences. The aging of populations throughout the developed world puts a growing burden on public pension budgets (Bosworth and Burtless, 1998; Kinsella and Velkoff, 2001). Trends toward earlier retirement and lower labor force participation by the elderly in these countries exacerbate the burden, because wage earnings are an alternative source of income for the elderly that does not require public expenditures (Lumsdaine and Wise, 1994; Gruber and Wise, 1998; O'Rand and Henretta, 1999, chap. 8). Simulation analyses in twelve advanced

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capitalist countries suggest that increasing the labor force participation rates of the elderly could alleviate the public cost of providing for the elderly even in the face of growing dependency ratios (Gruber and Wise, 2007).

The extent and impact of labor market participation by the elderly are of even greater concern in the less stable institutional contexts of countries like Russia that have undertaken the transition from state socialism to market economies since the late 1980s. These countries experienced dramatic contractions of state revenues in the economic crises that followed market reforms, making it especially hard to support the elderly populations through pension payments. Meanwhile, the very logic of market transition implies that the role of the market should supersede that of the government in providing for the well-being of groups in the population, even those—such as the elderly—who are especially vulnerable in times of economic crisis. Accordingly, paid employment in the labor market should have become a more important source of income among the elderly in transition countries. However, the general shrinking of their economies and the rise of unemployment would seem to undermine the prospects for such a development.

The performance of transition economies generally improved after the initial years of market reforms, but now the burdens posed by population aging are sure to grow due to long-term declines in fertility. In Russia census data show that the elderly dependency ratio grew slightly from .325 in 1989 to .335 in 2002, and official estimates put the number at .331 at the start of 2008 (calculated from data reported in Rosstat, 2005, 2009). It is certain to increase rapidly in the coming years as the relatively large baby boom cohorts retire and are replaced among the working-aged by the ever smaller cohorts born in the 1990s (Buckley and Donahue, 2000; Velkoff and Kinsella, 2000; DaVanzo and Grammich, 2001). Thus, it is of considerable interest how the elderly have fared in the labor market of post-Soviet Russia.

Russia is also an interesting testing ground for public policies because of unique institutional features of its pension system. Old-age pensions in Russia are not conditional on employment withdrawal, which raises the question: to what extent do older people keep on working although they are receiving pension payments? Put differently, are pension benefits high enough to provide significant disincentives to work among the elderly? Are pensionable ages too low?

Three plausible scenarios might describe the relationship of the elderly to the labor market in Russia during the post-Soviet era: (1) Mounting material hardships *push* ever larger numbers of the elderly into the labor market in search of earnings to supplement dwindling pensions and support from relatives. (2) Russia's market transition produces new opportunities that *pull* certain groups of the elderly who are well-positioned to exploit them into the labor market. (3) The steep contraction of the Russian labor market as poses ever more formidable obstacles that *block* the labor market participation of retirement age Russians.¹

¹Note that this terminology diverges from the push-vs.-pull distinction used in other contributions to the retirement literature (e.g. Kohli et al., 1991).

In short, in the post-Soviet era the Russian elderly may be pushed into the labor market by desperation, pulled by opportunity, or blocked from the labor market by the general labor market contraction. Moreover, all three forces may be operating simultaneously, but affecting different groups of elderly (some of whom are desperate, some of whom have new opportunities, and some of whom are blocked from the labor market) and/or varying over time in the strength of their effects. Only a systematic empirical analysis can resolve whether and how the labor market participation and rewards of elderly Russians have been affected by the market transition process.

We undertake this analysis using data from twenty surveys of the Russian population conducted from February 1991 to November 2007. These data reveal the main trends in the employment rates of retirement-age men and women following the collapse of the Soviet Union, as well as trends in the types of jobs they take and their earnings. They also support a more detailed examination of how individual characteristics and macroeconomic conditions increase or diminish the propensity of elderly Russians to find employment on the labor market, and the characteristics that influence the earnings of elderly Russians in their primary jobs. Finally, our analyses show whether the elderly's labor market activity and rewards are distinct from those of pre-retirement Russians.²

2. Economic background

In January 1992, following the collapse of the Soviet Union, the Russian government implemented “shock therapy” market reforms, freeing prices, exchange rates, and foreign trade, eliminating Soviet-style planning, and removing all restrictions on private ownership (for details, see Aslund, 2007). In the following years a mass privatization campaign turned many state-owned enterprises over to private hands. Intended to produce macro-economic stabilization and establish a productive market economy based on private ownership, these measures instead led to a prolonged period of rampant inflation, output contraction, and structural dislocations (Gerber and Hout, 1998; Clarke, 1999). The economy bottomed out after August 1998, when a government default on short-term bonds provoked a financial crisis. The deflated currency then spurred import substitution industrialization, and during the 2000s surging global energy prices helped put Russia on a path of impressive growth until the global financial crisis of 2008. Market reforms also produced significant structural changes in the Russian economy (Gerber, 2002, 2012). Although workers in branches of the economy and regions that declined in the face of competition and the loss of state subsidies suffered widespread dislocations, other branches and regions that planners had neglected or underfunded emerged to offer new opportunities, as did small businesses and foreign joint ventures (Gerber and Hout, 1998; Clarke, 1999; Gerber, 2001, 2002).

In sum, the 1990s and 2000s were very turbulent times for Russia's economy, seeing massive institutional changes (the retreat from the state socialist planned economy and the rise of a private sector) and a sustained decline in performance, followed by recovery. These developments are captured in time series of six macro-economic indicators displayed in Fig.

²Throughout this paper, we define the “elderly” as those who have reached the official retirement age (55 for women, 60 for men). “Pre-retirement” Russians are those who are within 10 years of retirement age (45–54 for women and 50–59 for men).

1. Gross domestic product (GDP) per capita followed a U-shaped trend, reaching its nadir in 1998; correspondingly, unemployment initially rose, then fell. The impact of liberalization and privatization are evident in the initially dramatic then slower growth of private sector employment and the steady rise of joint venture employment. Increasing employment in the trade, catering, and personal services sector reflects the structural changes linked to the shift away from planning. These developments combined to foster a dramatic rise in income inequality at the outset of Russia's transition period, after which the household income gini coefficient essentially stabilized.

3. The Russian pension system

In 1991 the Russian pension system was created on the grounds of the former soviet system, preserving its basic characteristics: a mandatory public defined-benefit pay-as-you-go pension system (Sinyavskaya, 2005; OECD, 2011). During the 1990s the majority of pensioners received a labor pension which required a contribution period of 25 years for men and 20 years for women. At age 60 for men or 55 for women workers were entitled to full benefits, which amounted to 50–75% of the baseline salary (the average of the last two or any best 5 years of service) depending on the number of years worked. However, average net replacement ratios were much lower. People who reach pension age but do not qualify for a labor pension were entitled to a so-called state pension which only provides subsistence-level support (OECD, 2011). Historically, an important role has been played by special early-retirement pensions for working in the far northern regions or in specific occupations (including not only hazardous occupations but also occupations such as teachers, ballet dancers and musicians), which allowed pension ages of 50 or less (Turner and Guenther, 2005). According to calculations for the year 2003, over 25% of men aged 55–59 and of women aged 50–54 received an early-retirement pension (Sinyavskaya, 2005; OECD, 2011).

A unique feature of the Russian pension system has been that the receipt of a pension is fully compatible with earnings from paid work. Almost all Western pension systems allow little or no employment earnings for recipients of early retirement benefits. In contrast, withdrawal from the labor market in Russia is never a precondition for pension eligibility (Kolev and Pascal, 2002). This is true of labor pensions as well as special early-retirement pensions or disability pensions. As a consequence, 30% of pensioners were in work in 2010; and even among the recipients of a disability pension the employment rate was still at 24% (OECD, 2011: 164).

This approach may have roots in the Soviet period, when encouraging the elderly to work past retirement age was a way to help meet the country's manpower needs (Anderson, 1986). In the mid-1990s the government discussed limiting pension payments for those with earned income from labor market activity, but these plans were never implemented (Buckley and Donahue, 2000). The lack of a disincentive to forego employment is a distinguishing institutional feature of Russia's pension system. Whereas employment rates in other countries decline rapidly at pension eligibility ages, among Russian pensioners paid work is very common. At the same time, virtually all men receive a pension at age 60 and all women do so at age 55. Early pensioners who work usually stay in their previous jobs: an estimated

three quarters remains employed where they worked before starting to draw a pension (Sinyavskaya, 2005: 12).

While the Soviet pension system was generous (Williamson et al., 2006), today the overall level of pension benefits is low. In fact, almost 30% of Russians over 65 years old are poor (OECD, 2011). Among older people's coping strategies are domestic production and informal exchange (Tchernina and Tchernin, 2002). Many pensioners grow their own food in gardens or small allotment plots; others hunt or fish or even keep livestock. Domestic food production is not only destined for own consumption but also to generate additional household income, and many older people work as street vendors selling food produce or other items (Tchernina and Tchernin, 2002). Moreover, because of hyperinflation the real purchasing power of pensions has fluctuated in a volatile manner over the 1990s. Average net replacement rates oscillated between 25% and 40% during the decade (Gurvich, 2002; Fornero and Forrareesi, 2007). In the aftermath of the financial crisis of 1998, the average pension even fell below the subsistence level (Gurvich, 2002).

Although pension levels are low, the large number of early pensioners produces high costs for society. In other words, the Russian system “combines fairly meagre benefits with a high fiscal cost, primarily as a result of the early age at which people draw pensions” (OECD, 2011). Only about 40% pension benefits are paid for by contributions, with the rest being covered by the general government budget. Public spending on pensions in Russia is still below the OECD average, but this is only achieved because of low life expectancy. However, mortality differentials show marked social inequalities that lead to varying pension benefit durations. While life expectancy at birth is only slightly over 60 years among Russian men, those who reach 60 are likely to live another 14 years (OECD, 2011).

4. Orienting hypotheses

How might the changing macro-economic conditions and institutional features associated with Russia's market transition affect the employment rates and labor market earnings of the elderly? To motivate our empirical analysis of the labor market activities and rewards of the Russian elderly during the 1990s and 2000s, we propose three broad hypotheses.

First, it is possible that the poor macro-economic conditions—in particular, high rates of inflation and macro-economic contraction—push the elderly to seek earnings on the labor market. Inflation, inadequate indexation, and endemic delays in payment eroded the real value of pensions (Mikhalev, 1996; Chandler, 2004). The general deprivations faced by the population meant that few retirees could count on receiving material support from their children or other relatives (Buckley and Donahue, 2000). The uncertainty surrounding these two important sources of income should, in principle, provide a strong “push” incentive for the elderly to seek employment.

Hypothesis 1 (*push factors*)

Increased economic hardship pushed elderly Russians into the labor market during the 1990s.

Russia's rising inequality in the post-Soviet era indicates that some new opportunities were emerging as market transition progressed. Some groups of the elderly—in particular, those with high levels of human capital and extensive experience in certain professions or administration—could have been positioned to exploit these opportunities, which in effect pulled them into the labor market. There is a precedent for this in China, where market reforms initiated in 1978 spawned demand for administrative and intellectual skills in urban areas that certain retirement-age Chinese were more likely than younger cohorts to have (Raymo and Xie, 2000). The rapid increase in income inequality at the outset of the transition period implies that *some* Russians benefitted from emergent opportunities, and it may be that some elderly—especially those with special skills, long experience in certain pursuits, and particularly valuable network connections—were among them.

Hypothesis 2 (*pull factors*)

New opportunities associated with market reforms offered incentives pulling some elderly to work for hire in order to reap higher rewards than they might have in Soviet times.

Despite strong push and pull incentives for greater labor force participation by the elderly, it is also possible that the overall contraction of the labor market posed significant barriers to their employment during the post-Soviet era. As seen in Fig. 1, the official unemployment rate grew from virtually zero in 1991 to 12.9% in 1999 (Goskomstat Rossii, 2001). In addition, hidden forms of unemployment such as involuntary furloughs and wage arrears became fixtures of the Russian economic landscape (Earle and Sabirianova, 2002; Gerber, 2006a). In a context where employers faced pressure to curtail their workforces, they may have found it desirable to shed more senior workers for both economic reasons (their higher salaries due to seniority and, possibly, lower productivity) and for normative concerns (the availability of pensions as alternative sources of financial support to dismissed elderly employees). Notwithstanding any incentives for the elderly to participate in the labor market, these developments may pose obstacles to those retirees who wished to do so.

Hypothesis 3

The labor market activity of the elderly decreased following the onset of Russia's market transition, because the labor market contracted along with the economy.

Our hypotheses imply different effects of macro-economic conditions and individual- and household-level economic resources on the employment rates and earnings of elderly Russians, as well as different patterns of occupational concentration among employed pensioners. We lay out the measures and models we use to test for these effects and the specific patterns implied by each hypothesis in the following section, after describing our data.

5. Data and analytic approach

5.1. Twenty surveys

We merged data from twenty nationally representative surveys conducted in the Russian Federation from 1991 through 2007 (see Appendix Table A1 for details on the surveys).³

The first survey was conducted in February 1991 by a team of researchers from the Institute of Sociology in Moscow. The remaining surveys were conducted by the All-Russian Center for Public Opinion and Market Research (VTsIOM), whose core staff formed a new research firm called the Levada Analytic Center in 2002 (named after the late Yuri Levada, the erstwhile director of VTsIOM who was ousted in a move by the Russian government to take over management of VTsIOM). The February 1992 survey was part of the International Social Survey Project. Three specially commissioned multi-wave surveys, the Survey on Employment, Income, and Attitudes in Russia (Gerber, 1999), the Survey on Educational Stratification in Russian (see Gerber, 2003), and the Survey on Stratification and Migration Dynamics in Russia (Gerber, 2006b), were explicitly designed to measure different aspects of social stratification in Russia. The rest of the surveys were all part of a regular “Monitoring” series conducted by the VTsIOM and continued by the Levada Analytic Center. The total and elderly sample sizes of each survey are reported in Table A1. All surveys were based on multi-stage, stratified, cluster samples of the adult population of Russia.

None of the surveys were conducted with the main purpose of generating representative samples of the elderly population: instead, each was intended to represent the Russian adult population. However, the data producers provided post-sampling weights to correct for age, gender, and education imbalances. Weights are not necessary for our regression analyses, because we control directly for the variables that may be over- or under-sampled in our retirement-age sub-samples, and under such circumstances weights can produce suboptimal standard errors (Winship and Radbill, 1994). But we apply the weights when reporting univariate descriptive statistics on the background characteristics and labor market activity for our elderly and pre-retirement respondents.

Three comparisons with estimates of the size of employment rates among different groups of elderly all suggest that our data are consistent with other surveys.⁴ Although survey data should always be used with caution, the time span covered by these surveys, the rich information they provide about individual and contextual variables, and the strong reputations of the Institute of Sociology and VTsIOM/Levada Center as data producers speak to the immense value of such data in the analysis of topics such as the labor market activity of the elderly during the 1990s.⁵

5.2. Methods of analysis

We estimate models for two dependent variables in this study: employment and earnings. First, we assess the effects of variables on the probability that a retirement-age Russian will be gainfully employed for hire. Because our respondents are nested in surveys conducted at different points in time and we are interested in systematic temporal variations in baseline

³Strictly speaking, the February 1991 survey was representative of the European part of Russia. However, we have no reason to suspect that this would bias comparisons with the nationally representative surveys.

⁴Specifically, we compared the estimates of employment rates of the different groups of the elderly based on different surveys at three different points in time from Tchernina and Tchernin (2002) and Cherkashina (2011), in each case finding no statistically significant differences from the estimates based on our surveys.

⁵For details on the sampling, field procedures, and response rates of the February 1991 survey, see Hout et al. (1991). For similar details on the VTsIOM (and later the Levada Analytic Center) surveys, see Gerber (1999, 2006b).

employment rates, we specify our models for employment as hierarchical two-level Bernoulli models, with elderly respondents constituting the first level and surveys the second. The level-1 dependent variable is the natural logarithm of the odds of being employed (or self-employed) at the time of the survey, based on a question common to all the surveys that ascertained the respondent's main activity during the previous week. Our measure does not distinguish formal from informal employment: if respondents working informally indicated that they were engaged in "individual work activity" during the previous week they are coded as being self-employed (and therefore as working). Most likely we do not capture some informal work activity of respondents, particularly of a more sporadic nature. Other studies have examined this form of activity on the part of the elderly (e.g. Tchernina and Tchernin, 2002). In place of a detailed analysis of informal activity at a particular point in time we offer a broader study of overall elderly participation rates spanning nearly two decades. We treat the baseline log-odds of being employed, represented by the level-1 intercept, as a random variable that varies across surveys. In turn, we test for systematic variation in the baseline log-odds across surveys associated with annually measured macroeconomic conditions in order to assess our competing hypotheses.

As for the earnings analysis, we first examine the mean earnings from primary job of those elderly who are employed at the time of each survey, after converting the nominal wages into a constant unit (January 1998 rubles) using price indexes.⁶ We then estimate regression models using the pooled sub-samples of retirement-age respondents where the dependent variable is the natural logarithm of previous month's earnings from primary occupation and the independent variables are standard individual and contextual factors drawn from other studies of earnings in contemporary Russia. The regressions produce a more robust answer to the question of whether the labor market earnings of the elderly changed over time, because the trends in average earnings across temporally-ordered samples of the elderly may reflect differences in sample composition rather than actual trends.

We correct for sample selection bias using Heckman's two-step procedure (1979). Participation of the elderly on the labor market is relatively rare (in comparison with working-age Russians) and not random, which implies that older Russians who work differ in both observable and non-observable ways from those who do not. In theory, the variables that influence the earnings of elderly Russians, including those we do not observe, are also likely to influence whether or they work in the first place, because generally the higher the earnings one can reap from employment the more likely one is to work, and vice versa. Because the sample of the employed differs systematically from a random sample of the elderly, we must take steps to correct for the resulting bias in the estimates of how other variables influence earnings. We do this by first estimating a probit model of selection into the sample of the employed using our preferred specification from our logistic regression models of elderly employment. Then we estimate a model for earnings among those employed which includes the predicted Inverse Mills Ratio, λ , from the first-stage model as a covariate. The coefficient on this term, denoted ρ , represents the correlation between the

⁶Unfortunately, the data do not contain information on the respondents' earnings from second and third jobs. Thus, we limit analysis to earnings from primary job out of necessity. This means that the overall earnings from labor market activity are understated in the data, as some respondents no doubt have multiple jobs.

error terms in the selection model and the earnings regression. In our application the sign of ρ has substantive meaning: a negative ρ implies that pensioners with least unobservable earning power are more likely to work for pay (per Hypothesis 1), while a positive ρ means that those elderly with greater unobserved earning power are more likely to work (per Hypothesis 2).

5.3. Independent variables and empirical tests of hypotheses

5.3.1. Education—We distinguish four levels of educational attainment: university (including those with degrees and those who completed at least 2 years); specialized secondary education (SSUZ), general secondary diploma/some college; lower vocational or less.⁷ Hypothesis 1 implies that labor market participation is more common among the elderly with the fewest resources (who presumably are the most desperate), while Hypothesis 2 implies the opposite (those with most resources are best equipped to exploit emergent opportunities). Education is the best single measure of labor market resources, and Victor Nee's theory of market transition holds that market reforms increase the returns to education (Nee, 1989, 1996). Therefore, a key empirical question is whether education is positively (per Hypothesis 2) or negatively (per Hypothesis 1) related to elderly employment. Moreover, the two hypotheses suggest different trends over time in the effects of education on elderly employment: if desperation is the driving force then we would expect the least educated elderly to have growing employment rates in years when the economy performs especially poorly, while if opportunities are linked to market reforms and economic growth we would expect the most educated elderly to exhibit disproportionately higher participation rates as market transition progresses. To test these ideas, we incorporate cross-level interactions of education with annual measures of economic performance and market reforms.

5.3.2. Residual household income—Hypothesis 1 implies a negative effect of household material standing: if economic desperation pushes the elderly onto the labor market, participation rates should be higher among those from poorer households. Eighteen of our twenty data sets include measures of household income from all sources, which we use to calculate the respondent's per capita "residual" household income (that is, income independent of the respondent's earnings from the labor market).

5.3.3. Types of jobs—We examine patterns in the types of jobs held by the elderly by classifying the occupations of those elderly who are employed at the time of each survey into a simplified schema of seven occupational classes: (1) Managers and professionals; (2) Self-employed; (3) Middle-grade non-manual workers (including technicians, auxiliary professionals, administrative assistants, agents and brokers, upper level clerical staff, wholesale representatives); (4) Lower-grade non-manual (including routine and personal service workers, secretaries, retail salespersons); (5) Skilled manual workers; (6) Unskilled manual workers; and (7) Farm laborers. These categories are derived by collapsing a version of the well-known "Erikson-Goldthorpe" class schema that has been adapted to Russia

⁷We group those who obtained a lower vocational ("PTU") certificate with those who have less than secondary schooling because preliminary analyses indicated no differences between these two education levels with respect to employment or earnings.

(Erikson and Goldthorpe, 1992; Gerber and Hout, 2004). According to Hypothesis 1, we should see an increase over time in the proportion of employed elderly in lower non-manual, unskilled manual, and farm laborer occupations, as these usually involve low-paying jobs that only relatively desperate older workers would probably take. Drawing on queuing theory, Lain (2012) argues that occupational downgrading moves older workers into low-paid (and often part-time) jobs requiring few qualifications, a process that should be accelerated in a general economic contraction. On the other hand, Hypothesis 2 implies an increase over time in the proportion employed as managers/professionals or middle-grade non-manual workers, as such jobs offer better chances of favorable rewards.

5.3.4. Locality—Hypothesis 3 implies that external labor market conditions affect the labor force participation of the elderly. Because labor markets generally offer more opportunities in large urban areas and fewer opportunities in rural areas, we would expect higher participation rates in Moscow and St. Petersburg, with lower participation rates in rural villages.⁸

5.3.5. Change over time—Our hypotheses imply different patterns of temporal change in baseline employment rates. Hypothesis 1 implies higher employment rates under more difficult macroeconomic conditions. Hypothesis 2 implies that the extent of market transition is positively related to elderly employment rates in general and, more specifically, to the employment rates of elderly with higher levels of human capital. Hypothesis 3 implies that employment among the elderly will be inversely related to the annual unemployment rate, because higher unemployment overall would suggest stronger barriers to elderly entry to the labor market. Accordingly, we test our hypotheses by incorporating overall economic performance, extent of market transition, and unemployment as level-2 covariates in models for the survey-specific intercepts in the employment models. We measure these contextual variables with the annual national gross domestic product (GDP), annual percentage of the labor force employed in the private sector, and annual unemployment rate (see Fig. 1) at the time each survey was conducted. We center these annual measures at their 1993 values, to facilitate interpretation. Our specifications of change over time are thus crafted to represent substantively interpretable results rather than secular time trends that are inherently difficult to interpret. We do, however, test the performance of our substantively-scaled time specifications against standard linear and second- and third-order polynomial specifications of calendar year time.

5.3.6. Other covariates—We might expect age, gender, and marital status to influence the chances that an older Russian would be employed in the labor market, as they do in other national contexts (e.g. Raymo et al., 2004; Radl, 2012a). Age should have a negative effect, if only because the frailty and health problems associated with advanced age ought to make many forms of work very difficult. Reports of discrimination by employers against older women workers and cultural norms emphasizing the bread-winning role of men yield the prediction that older women are less likely to work than older men (Bridger and Kay, 1996). The same norms lead us to expect that married men are more likely to work—because they

⁸Regional variations in labor market conditions could also play a role, but only some of our data sets include region identifiers, so we are not able to incorporate regional variations other than the distinction between Moscow, rural villages, and other localities.

presumably feel a responsibility to provide income for their household—while married women should be, if anything, somewhat less likely to work than single women. Consistent with other studies of contemporary Russia (Brainerd, 1998; Gerber and Hout, 1998; Gerber, 2000, 2001; Clarke, 2002), we control for economic branch and private sector employment in our earnings models.

5.4. How distinct are the elderly's patterns of labor market activity?

It is of intrinsic interest whether the trends and determinants of labor market participation and earnings on the part of the elderly are distinctive or simply mirror patterns observed in the working age population. The best way to determine whether reaching retirement age has a definitive impact on Russians' labor market activities is to systematically compare the patterns among the elderly to the patterns among pre-retirement age Russians, since Russians who are nearing retirement are more likely than younger Russians to resemble those who have passed retirement age on unobservable factors like cohort-based living experiences and attitudes, health, family responsibilities, time horizon, and occupation-specific work experience. Moreover, both pre-retirement and elderly workers might be targeted for layoffs by employers due to their relatively high wages in seniority-based pay systems. Only by comparing the employment and earnings of the elderly to those of other Russians can we obtain a sense of whether market transition has had a distinctively adverse or favorable impact on the elderly, and pre-retirement Russians are a more reasonable benchmark group for comparison than, say, 30-year-old workers would be. Finally, we run all models separately for men and women because the effects of many covariates vary by gender and because the different retirement ages would complicate interpretation of age effects in a pooled model.

6. Results

6.1. Descriptive results: Trends in participation, earnings, and job type

Descriptive statistics characterizing the demographic composition of the elderly respondents are presented in Table 1. The overall preponderance of women and the substantially higher rate of marriage among male retirees in the survey samples both reflect well-known characteristics of the elderly population that have resulted from Russia's high and growing gender differential in mortality (Velkoff and Kinsella, 2000). This gives us some confidence that the survey data are representative. The age differences by gender are somewhat misleading, as they reflect the lower retirement age for women according to Russian policy (55 versus 60). The data also show that the older generation of Russians is much less educated than younger generations: in nearly every survey more than half the sample of pensioners did not complete high school. At the same time, cohort replacement produces a gradual upgrading in the educational distribution across the years covered in the surveys.

The employment rate and occupational distributions and earnings of the employed are presented in Table 2, along with the respective annual odds-ratios relative to pre-retirement age respondents. The overall employment rate among the elderly stood at 23% at the outset of the market transition period. It then dropped to 13%. Thus, consistent with Hypothesis 3, market transition led to a rapid decrease in the labor market participation rates of the elderly.

Following the decline in the immediate aftermath of the market reforms, the participation rate of the elderly essentially stabilized, then fell again in the aftermath of the 1998 financial crisis, particularly for women, before picking up again in the 2000s. The strongest effect of the economic contraction in posing obstacles to the labor market participation of the elderly was clearly felt in the earliest phase of the market transition. This is noteworthy because the labor market generally continued to contract throughout the 1990s. Judging by the limited increase in raw participation rates the recovery of the 2000s did not provide much impetus to increase elderly employment.

How unique to the elderly was the pattern of initial decline in participation, followed by relative stability? In fact, a similar pattern prevailed among pre-retirement Russians. The odds ratios show that throughout the period the elderly were much less likely to work than pre-retirement Russians, with little fluctuation and no clear trend. This suggests that the elderly's labor force participation was not *disproportionately* impeded by the immediate fallout from the market reforms introduced in January 1992: instead, elderly employment fluctuated in a fashion parallel to the employment rates of preretirement age Russians.

Turning now to the occupations of the elderly employed, skilled manual workers are the largest class in most periods among men, followed by unskilled manual workers and managerial and professional jobs. Among women, managers and professionals were the most common until 2007, when they were overtaken by unskilled manual occupations. Elderly unskilled manual workers would seem driven to work more by desperation than opportunity. Yet substantial portions of women also worked in middling occupations – skilled manual and middle non-manual. Unskilled farm work, routine non-manual work, and self-employment remained rare throughout the 1990s and 2000s for both sexes.

Contrary to Hypothesis 2, which implies that market transition would bring the elderly more opportunities for relatively high-status jobs as managers or professionals, there are no linear trends in managerial/professional employment, and self-employment was stagnant at best. Among men, there is a slight curvilinear trend of increasing managerial/professional jobs and declining manual jobs during the 1990s, reversing in the 2000s as economic growth resumed. The curvilinear pattern suggests that economic growth and/or the unemployment rate, both of which followed curvilinear trends (see Fig. 1), are more closely related than market transition as such to manager/professional employment for the elderly: economic contraction appears to have squeezed out male elderly workers in manual occupations disproportionately, and when growth resumed in the 2000s their ranks also grew in tandem. There do not appear to be any clear trends in the occupation distribution for women. It is risky to generalize on the basis of the relatively small samples in each period, but these data suggest that among the elderly it was mainly lower-status males who were blocked from the labor market during Russia's pronounced recession.

The average real monthly earnings from primary job of retirement-age workers dipped sharply in the initial transition period, bottomed out after the 1998 financial crisis, then began to recover in the 2000s.⁹ For men, the last observed average earnings are higher than

⁹We report the geometric means for earnings to reduce the influence of extreme values.

at baseline whereas older women by 2007 still had not reached the level of earnings that they had at the beginning of market transition. Here, too, the curvilinear pattern suggests that the earnings of the elderly have been more closely tied to general macro-economic performance than to institutional changes associated with marketization of the economy. However, when we consider the relative primary-job earnings of elderly workers compared to pre-retirement workers, there is a modest (albeit unsteady) tendency for the gap to close, providing some evidence in favor of Hypothesis 2: especially among men, the primary-job earnings of the elderly who do work gained on the primary-job earnings of employed pre-retirement age Russians.

The age-specific employment rates for pre-retirement and retirement-age men and women, calculated by pooling the twenty surveys, show that even though pension payments are not conditioned on exit from employment, there is a steep drop-off in employment rates when Russian men and women reach pension ages (Fig. 2). The fact that employment drops off so sharply after Russians reach retirement age despite the ease of receiving a pension while continuing to work suggests that retirement from employment reflects cultural norms or fatigue with employment as much as or more than economic incentives (Radl, 2012b). Moreover, after retirement age employment rates decline steadily and rapidly for both sexes. At any given age elderly women are less likely to be employed than men of the same age, which shows that the gender gap in employment noted above is not entirely an artifact of the different age compositions of the male and female elderly. Yet 68% of working retirement-age respondents are women: their overall preponderance among those of retirement age (due to their earlier retirement age and to differential mortality) overwhelms the gender gap in the rate of employment.

6.2. Correlates of employment among the elderly

Two “preferred” hierarchical Bernoulli models of the factors influencing the odds of employment among the elderly are presented for each sex in Table 3.¹⁰ The first model in each pair omits the effect of residual household income, because the variable is not available in the February 1991. Because February 1991 is the only pre-transition data point, it is worth presenting Model 1 in order to assess the effects of market transition on the baseline employment rate, net of the other variables.¹¹

Education increases employment among the elderly, and its effects grew in connection with the spread of private property. For men, based on the main effect (which applies to 1993 due to the centering of the interaction effects on that month) the odds of employment among

¹⁰We estimated a series of models with alternative specifications of the effects of age, time, and the time * education interactions. We also tested for change over time in the effects of age, gender, and other levels of education. According to the BIC statistic (Raftery 1995), the models presented in Table 3 best reflect the patterns in the data. This implies that the effects of age, gender, and other levels of education were stable throughout the 1990s and 2000s, and that the functional forms of the effects of age, time, and the cross-level time * education interaction conform to those represented in Table 3. In the interest of space, we do not show the fit statistics for alternative specifications here, but we will provide them to interested readers upon request. In addition, we tested for seasonal variation in employment by incorporating dummy variables for the different seasons. We found no significant seasonal variation, so we omitted these variables from our preferred models.

¹¹The measure of residual household income is also unavailable for the 1995 data set. The exclusion of these two surveys from the analytical samples for the estimates of the second models in each pair explains the reduction in sample size. Strictly speaking the models are not comparable because they are estimated on different samples, but we include the first models in order to verify that the broad pattern of effects in the preferred models is not an artifact of the exclusion of the pre-transition and 1995 data.

university degree holders was roughly three times higher ($e^{1.127} = 3.08$) than the odds among those with a secondary degree who are otherwise similar with respect to the variables included in the model. Among women, university graduates had twice as high odds of working in 1993, compared to secondary graduates. For both sexes, the odds of employment are also higher for graduates of specialized secondary institutions relative to general high school graduates. Those without a secondary degree have significantly lower odds of employment than those with general secondary degrees: for women, this is a stable effect, while for men the least educated lost ground as private property spread.

In general, the education effects provide evidence in favor of Hypothesis 2: it is precisely the elderly with the highest levels of human capital who find the most opportunities for employment in the labor market. Moreover, the interactions between education and percent private employment show that for both men and women the effect of education increased as a result of the market transition: for men, this applies to the gap between those with less than secondary and those with secondary schooling, while for women it applies to the advantaged employment rates of university graduates.¹² By 2007, private employment was 28.2 percentage points higher than its 1993 value, implying that women university graduates had nearly four times higher odds of being employed than secondary school graduates ($e^{771+28.2(.021)} = 3.91$), while for men the odds for those with vocational certificates or less was about 50% the odds for general high school graduates.¹³ The fact that the interaction specifications using percent private employment to model changing education effects over time fit best indicates that the institutional changes embodied in the spread of markets were the driving force behind the growing employment advantages of the better-educated among the elderly. Market transition has indeed enhanced the labor market opportunities available to the most skilled in that age group.¹⁴

With minor exceptions, the results for our control variables confirm our expectations. The net effects of age are strongly negative, linear for men and curvilinear for women. Among elderly men, being married or never married substantially increases the odds of being employed: separated, divorced, and widowed men are substantially less likely to be working. Among women, there is some evidence that those who are currently married have the lowest employment rates, but this effect only applies when we do not control for residual household income. The effect therefore appears to be economic in nature: women who are married are more likely to have income coming into the household via their husbands.¹⁵ As anticipated, and consistent with evidence from a survey of Soviet emigres in the 1980s (Anderson, 1986), elderly residents in Moscow and St. Petersburg are more likely to be gainfully employed, controlling for the other variables; residents in rural areas are much less likely to be.

¹²We treat the cross-level interactions between education and annual percent employment in the private sector as a fixed effect in our preferred models because in all cases there was no statistically significant residual variance (across surveys) in the respective education effects after controlling for the level-2 variable.

¹³Note that the non-significant "main" effect of less than secondary education for men applies only to 1993, because that is the year on which annual percent private employment is centered.

¹⁴As a reviewer noted, it is also possible that part of the education effect reflects the lower probability that those with more education receive hardship pensions. However, if this is the driving force behind the main effect of education it is hard to see why the role of education should increase over the course of market transition.

¹⁵The effect of marriage is significant (and negative) for the subsample analyzed in model 2 once the measure of residual household income is removed from the model.

The best fitting specification of variation across surveys for men shows that their baseline employment rates during this period varied directly with the economy's performance (measured by annual GDP): as the economy shrank, so did employment among elderly men, and both resumed growth in tandem. This temporal trend is consistent with Hypothesis 2, as it implies that economic opportunities connected with growth are what drive baseline elderly employment rates, not desperation driven by worsening macroeconomic conditions (which would imply higher employment in worse macroeconomic conditions). Neither annual unemployment nor private sector size affect the baseline hazard of employment for elderly men. Moreover, net of variation by annual GDP, there is no statistically significant variance in the baseline hazard across surveys.

For women all three approaches to scaling change over time using macro-economic measures have statistically significant net effects. As for men, the employment rates of Russian elderly women are positively related to general economic performance (GDP). However, net of this effect they are also *positively* related to the unemployment rate and negatively related to the size of private sector. Furthermore, the interaction between the private sector measure and university degrees indicates that the drop-off of employment in connection with the growth of the private sector only affects women without university degrees. The positive association between the national unemployment rate and female elderly employment contradicts Hypothesis 3: if elderly women were being blocked from work by unfavorable labor market conditions, the effect of the unemployment rate would be negative. Possibly, this finding reflects informal employment. It may be that the negative association between private sector growth and female elderly employment rates for those without university degrees reflects barriers to female elderly employment in private sector firms (e.g. due to discrimination against elderly women on the part of private sector employers). At any rate, the key point is the lack of evidence for Hypothesis 3.

Model 2 introduces the effects of (logged) residual household income. Consistent with Hypothesis 1, the effect of this variable is highly significant and negative. This testifies to the *push* factor of poor material standing: the wealthier a household absent the employment of the elderly respondent, the less likely the respondent is to take up work in the labor market, and vice versa.¹⁶ It is important to note that inferences about the effects of the other variables, with the sole exception of marital status for women (discussed above), are the same after adding residual household income to the model. This holds despite the fact that the February 1991 survey is not represented in the analysis sample for Model 2 (because household income was not ascertained in that survey).

How strong are the effects identified in Table 3? It can be difficult to interpret the magnitudes of effects in logistic regression models due to the non-linear link function and the unfamiliarity of odds as opposed to probabilities. A more intuitive sense of the impact of key variables such as education and change over time can be obtained by considering sets of expected probabilities associated with different values on these variables holding others

¹⁶This relationship may be partly endogenous: elderly Russians who are employed could receive less support from relatives. It is impossible to assess which direction the causal arrow points most consistently with the given data. But the results are, at any rate, consistent with the view that among the elderly those with the most meager alternative sources of income are more likely to enter employment than those with the most generous alternative sources.

constant. Figs. 3 and 4 present predicted probabilities of employment for male and female elderly (respectively) based on the preferred models in Table 3 using combinations of values that illustrate the effects of education. For “high” and “low” logged residual household income (HHINC), we use annual values of the 90th and 10th percentiles of the variable’s distribution for male and female elderly respondents, calculated from our surveys.

As both figures demonstrate, the probabilities of employment vary widely for both elderly men and elderly women, depending on their education, age, locality, marital status (for men), and residual household income. As any comparison of predicted employment probabilities across education levels within like combinations of other variables will illustrate, throughout the period examined, variation by education was particularly pronounced, and it grew in magnitude for both sexes during the 2000s. For much of the period, both men and women with university (VUZ) degrees and other characteristics favorable to employment (only 2 years past retirement age, Moscow residence and, for men, marriage) have probabilities of employment at or above .50. At the other end, probabilities of employment among those with the lowest education and less favorable values on other variables such as age, locality, and marital status languished around .10.

Change over time was relatively modest, but more evident for better-educated elderly. The only noteworthy decline in employment rates occurred at the very outset of the market transition period (when economic growth declined most precipitously and inflation eroded the real value of residual household earnings). After that initial decline, which affected both sexes, male employment rates remained relatively flat for the rest of the 1990s, they then increased—except for those without even a secondary degree—during the 2000s when growth resumed following the August 1998 financial crisis. The impact of the crisis itself is evident in the short-term peak in 2000 due to the sharp fall in HHINC in that year relative to the pre-crisis 1998 level, which should not obscure the long term increase for better-educated men starting in the 2000s. Among women, employment rates began rising more-or-less steadily for the university educated in the early 1990s. For those without university degrees, they remained flat until the mid-2000s. These figures show the growing disparities of elderly employment rates by education for both men and women during Russia’s transition era.

In sum, the logistic regression results provide support for both “push” and “pull” effects (Hypotheses 1 and 2), but little support for Hypothesis 3. The initial contraction of the labor market in the early years of the transition-era crisis seems to have posed barriers to elderly employment, but from the mid-1990s onward the tendency was stability or gradual growth in employment rates. The employment rate of better educated retirement-age workers grew substantially in connection with the rise of the private sector. The persistent increase in education-based differentials evident for both men and women is compelling evidence in support of Hypothesis 2: in the medium to longer run, Russia’s market transition has improved the relative labor market chances of the elderly who have the highest level of human capital. At the same time, the persistent net effects of residual household income indicate that some elderly—namely, those with fewest other sources of income in their households—are driven to the labor market primarily by desperation (Hypothesis 1). Still, this push factor has not translated into increased overall participation rates.

6.3. Correlates of Primary-Job Earnings among Retirement Age and Pre-Retirement Age Workers

The preferred earnings models with controls for selectivity for retirement-age Russians during the era of market transition are presented in Table 4, along with the equivalent models estimated on the pre-retirement age sample. The selection models for the elderly are specified identically to Model 2 in Table 3, though with a probit rather than a logit link function. We generated preferred selection models for the pre-elderly samples; they are broadly similar to the preferred models predicting elderly employment, but they do not exhibit the same trends of growing education differentials. The original earnings model (not shown) included, in addition to the variables shown, measures of marital status, fuller specifications of industry differentials, and interactions between education and measures of time (similar to those used to capture change over time in the effects of education on elderly employment). We removed the non-significant variables from the earnings models to reduce the inflation of standard errors due to correlation among covariates in the earnings model.¹⁷

The results for retirement-age Russian men are very similar to those for pre-retirement age men. Primary-job earnings decline with age, and they are lower for workers in agriculture, education and related areas, and trade, catering, and personal services (relative to industry and other branches). They are higher for Moscow residents, employees in the private sector, and those with professional/managerial occupations or in self-employment. Baseline earnings from primary job have fluctuated directly with macro-economic performance (GDP). For the elderly, education does not affect earnings once occupation and the other variables are controlled, but education does have net effects for the pre-elderly men. This may be attributable to the stronger magnitudes of the class differentials for the elderly, as well as the significance of the effect of mid-level manual work relative to unskilled manual. The most important difference pertains to the effect of unobserved factors that increase the probability of employment. These factors, captured by the coefficient on λ , negatively affect earnings from primary job for elderly men, but have no significant effect for pre-elderly men. In other words, selection into employment plays no role in the earnings of pre-retirement age male Russians, but it is negatively related to earnings for males who work after reaching retirement age.

There is also a basic similarity between the correlates of primary-job earnings for pre-retirement and retirement-age women: negative effects of age, positive effects of Moscow residence, and similar differences by occupational class. However, the trends in baseline earnings diverge: retirement-age women have seen their primary-job earnings decline in connection with the privatization of the economy and the fall of national unemployment rates during the 2000s, while pre-retirement women have experienced earnings growth in tandem with improvements in GDP. Also, private sector employment does not bring higher

¹⁷Multicollinearity is a concern in models controlling for sample selection bias: to the extent that variables (such as education) appear in both the selection model and the earnings model, the term representing the non-linear transformation of the predicted probability of selection will be correlated with the right-hand side of the earnings equation (Stolzenberg and Relles, 1997). Thus, it is desirable to trim non-significant effects from the earnings model when it is theoretically appropriate to do so. In our case, some of the effects of education on the earnings of the elderly are no doubt mediated by occupation, and the effect of rural residence is adequately captured by the indicators for agricultural sector and farm laborers, so there is little substantive need to retain the full set of education dummies and the rural residence dummy in the earnings model.

earnings for retirement age women, but it does for their pre-retirement age counterparts. As they are for men, the effects of education for elderly women are largely absorbed by the larger occupation effects, though the university degree differential remains statistically significant using a one-tailed test for women. For retired women, too, the λ coefficient on λ is negative and significant; it is positive and significant for pre-retirement women.

The statistical significance of the λ terms in the primary-job earnings regressions for both elderly men and elderly women means that the parameter estimates in the earnings model would be subject to sample selection bias absent the control for the correlation between the residuals in the selection and earnings equations. The negative sign on λ means the unobserved factors that increase the probability that an elderly Russian will enter the workforce negatively affect primary-job earnings. In substantive terms, *net of the other variables in the selection model* elderly individuals with lower earning potential are more likely to work for pay than those with higher earning potential. This finding may seem counter-intuitive, but Raymo and Xie (2000) also found a negative effect of λ in their analysis of the earnings of the elderly in reform-era China. Furthermore, the positive effect of λ for pre-retirement age women and its non-significant effect for pre-retirement men are both consistent with intuition, suggesting that our primary-job earnings specifications and estimation are fundamentally sound.

The negative selection of the elderly into the workforce is in fact consistent with Hypothesis 1, because it implies desperation rather than opportunity is a driving force behind the labor force participation of many elderly. However, the positive effect of education on both participation and earnings (via managerial/professional occupation) suggests that Hypothesis 2 also accounts for much labor market activity by the elderly. Finally, because the model controls for selection bias, the parameter estimates for age can be interpreted as applying to the entire elderly population, not just those who actually do work. This suggests that low (and declining) potential earnings also play a role in diminishing the employment rates of the older elderly relative to the younger elderly.

7. Discussion

Working pensioners were fairly common in the Soviet Union: about 20% of older people were employed during Soviet times (Tchernina and Tchernin, 2002). The rapid erosion of the real value of pensions during the 1990s made work a necessity for many older Russians, but at the same time the contraction of the economy during the 1990s posed barriers that blocked their access to jobs. Eventually, however, market reforms opened opportunities that elderly Russians with high levels of human capital were well-positioned to exploit, especially since the economy began to grow in the 2000s.

Our survey data demonstrate that these forces combined to make the labor market activity of elderly Russians during the course of its market transition a complex, multifaceted phenomenon. We found scant empirical support for the view that the elderly have experienced disproportionate adverse consequences in terms of their labor market activity (Hypothesis 3): after an initial steep decline in their employment rates, which also affected pre-retirement Russians proportionally, they experienced mainly stability (for the less

educated) or growth (for the better educated) in employment as the institutional changes progressed and the economy improved.

Each of the other two hypotheses receives some empirical confirmation, indicating that both push and pull factors have shaped elderly employment and earnings since 1992. The strongest evidence that economic desperation (Hypothesis 1) has indeed pushed some elderly to seek employment for income on the labor market is the substantial negative effect of residual household income on the odds of employment for both men and women and the negative selection effect (which suggests that net of observables elderly workers with *lower* earnings potential are more likely to take jobs). The findings that are consistent with “pull” effects of new opportunities are the strong and increasing positive effects of education on employment and the especially strong earnings returns to professional/managerial work, self-employment, and (for men) middle non-manual occupations among the elderly. The transformation of the Russian labor market has provided distinctive opportunities to elderly Russians with university education.

The analysis also revealed that many of the individual and contextual factors that influence both employment and earnings operate in a similar fashion for the elderly as they do for middle-age Russians. For the most part, the elderly do not exhibit distinctive patterns of labor force participation or earnings on the labor market. Overall, the observable correlates of both employment and earnings have been very similar for retirement-age and pre-retirement age Russians. Reaching the age of retirement does represent an important break in the work careers of most Russians, as overall participation rates decline abruptly at that point for both men and women. This is noteworthy because the Russian pension system does not penalize workers for continuing to work while they receive their pension benefits: apparently, the sharp drop in labor force participation by Russian men and women when they reach retirement age reflects a deep cultural norm supporting retirement rather than economic incentives. Apart from the steep decline in baseline participation when Russians reach retirement age, the factors shaping the participation in employment and wages of pension-eligible Russians are mostly the same as those that influence pre-retirement age Russians. Moreover, there is scant evidence that the transition has disproportionately affected the elderly in terms of their labor market activity and rewards.

There are three main exceptions to the overall picture of similarity. First, among elderly men and women, unobserved factors that favor employment are associated with lower average earnings. This is additional evidence in support of the “push” hypothesis. In contrast, unobserved factors that increase the odds of employment have either no effect on earnings (for men) or a positive effect (for women) among pre-retirement age Russians. Second, retirement-age women have experienced declines in their baseline earnings during the 2000s, while the earnings of pre-retirement age women have increased during that period. Third, retirement-age women do not have higher earnings in the private sector. Evidently, the private sector does not offer many opportunities for elderly workers: only 1% of them in the pooled data work in private firms, compared to 20% of pre-retirement workers. Thus, it does not appear to be new private firms that are generating the new opportunities for the highly-educated elderly.

Among working age Russians in general, the university educated have had lower levels of job mobility than those with lower levels of education (Gerber, 2002), suggesting the market reforms have, in anything, provided fewer new opportunities for those with the most human capital. In contrast, our analyses show that the elderly with university degrees have been best poised to gain new opportunities in the labor market (or at least maintain their footing), despite the overall tendencies of contraction and stagnation that have befallen the Russian economy since the collapse of the Soviet system. Cherkashina (2011) reports a similar finding based on different data. It would thus be inaccurate to depict the labor market situation of the elderly as especially grim. Certain groups of retirement age Russians—most notably, the university-educated—seem to have actually benefitted more from the changes in the Russian labor market than the equivalent groups among middle-age Russians.

Lastly, the earnings of the elderly are affected by negative selectivity into the workforce: contrary to intuitive expectations, older Russians who have the lowest unobserved earning power (controlling for the observed variables in the selection model) are the more likely to enter employment than those with the highest earning power. This negative selectivity, which does not obtain for middle age Russians, might appear implausible, were it not consistent with empirical findings from a study of elderly employment in China (Raymo and Xie, 2000). In fact, the complex patterns of labor market participation and rewards found in the current study closely resemble those found in China. This suggests that a systematic comparative analysis of the impact of market transition on the labor market activities of the elderly in multiple countries may bear interesting results.

Altogether, our empirical evidence points towards a curvilinear association between earnings potential and paid work beyond retirement age in Russia: the highest propensities to remain economically active are found among older workers with low earnings potential (the “desperate”) and among the highly educated (the “opportunistic”). A broadly similar socio-economic profile of working pensioners has been reported for the UK as well as the US (Lain, 2012; Scherger et al., 2012). By contrast, in Germany the education and class effects on post-retirement age employment appear rather linear (Scherger et al., 2012). This could mean that the generosity of public pensions is an important factor determining the labor market participation of low-skilled elderly persons.

One important limitation of our study is our inability to specifically measure the pension status of pre-retirement Russians. The data sets we analyze only provide information on the main activity of respondents, so if respondents are working we do not know if they are receiving pensions at the same time. We can infer that respondents who have reached official retirement age are pension recipients, but it would be useful to analyze whether hardship, special service, and disability pensions affect the employment and earnings of pre-retirement Russians. Moreover, more information about the specific pension status of elderly respondents would permit us to specifically test whether extra pension payments related to hardship, special service, or disability provide additional more incentives to retire than the standard age-based pensions. If we knew the amount of pension payments received by respondents, we could estimate the impact of increased or decreased benefits on labor supply and market earnings. Other data-based limitations of our study include our inability to model

regional variation in elderly labor market participation and earnings and to estimate separate models for formal and informal forms of elderly work.

Overall, the labor market has not been especially unfavorable to the elderly in Russia during the market transition period, and became somewhat more favorable, particular for the better-educated, following the initial transition shock. Both push and pull factors shape the employment and earnings of the elderly, affecting different segments of them. This provides some grounds for optimism that the well-being of the elderly might be maintained via employment, should the Russia government proceed with pension reforms to reduce the cost of public pensions (such as raising the retirement age or prorating based on employment activity).

Appendix A

See Table A1.

Table A1

Survey data sets for income analysis: respondents with non-zero income from primary employment, ages 18 and older.

Survey project	Date	<i>N</i> under retirement age	<i>N</i> retirement age	Total <i>N</i>
Comparative class structure and consciousness project	February 1991	1696	429	2125
ISSP	February 1992	1437	479	1916
Monitoring	March 1993	2957	944	3901
Monitoring	July 1994	2252	650	2902
Monitoring	November 1995	1980	543	2523
Monitoring	January 1996	1800	574	2374
Monitoring	January 1997	1829	577	2406
Survey of employment, income, and attitudes in Russia				
Part 1	January 1998	1771	639	2410
Part 2	March 1998	1806	602	2408
Survey on educational stratification in Russia				
Part 1	September 2000	1667	738	2405
Part 2	November 2000	1722	682	2404
Survey of stratification and migration dynamics in Russia				
Part 1	September 2001	1663	751	2414
Part 2	November 2001	1701	720	2421
Part 3	January 2002	1617	715	2332
Monitoring	October 2001	1681	697	2378
Monitoring	May 2002	1671	723	2394
Monitoring	January 2003	1720	669	2389
Monitoring	July 2004	1737	671	2408

Survey project	Date	<i>N</i> under retirement age	<i>N</i> retirement age	Total <i>N</i>
Monitoring	January 2007	1707	700	2407
Monitoring	March 2007	1607	800	2407
Total		36021	13303	49324

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Fig. 1.

Aggregate economic measures, Russia 1992–2007. Sources: Goskomstat Rossii (1999) and Rosstat (2011).

Employment By Age and Gender, Retirement-Age Russians, 1991-2007

Fig. 2.
Employment by age and gender, retirement-age Russians, 1991–2007.

Expected Probabilities of Employment for Retirement-Age Men, Calculated from Table 3, Model 2, by Education, Age, Marital Status, Residual Household Income, and Time

Fig. 3. Expected probabilities of employment for retirement-age men, calculated from Table 3, Model 2, by education, age, marital status, residual household income, and time.

Expected Probabilities of Employment for Retirement-Age Women, Calculated from Table 3, Model 2, by Locality, Education, Residual Household Income, and Time

Fig. 4. Expected probabilities of employment for retirement-age women, calculated from Table 3, Model 2, by locality, education, residual household income, and time.

Table 1
Demographic characteristics of elderly respondents: 20 Russian surveys spanning 1991–2007.

Years	1991–1992	1993–1995	1996–1998	2000–2002	2003–2004	2007	Total
Total <i>N</i> (unweighted)	4041	9326	9598	16748	4797	4814	49324
Retirement-age respondents							
<i>N</i> (unweighted)	908	2137	2392	5026	1340	1500	13303
Men (%)	28%	33%	33%	36%	34%	34%	34%
Women (%)	72%	67%	67%	64%	66%	66%	66%
Age (arithmetic mean)							
Overall	64.7	65.0	65.8	67.9	68.6	68.6	66.8
Men	66.3	66.6	67.4	68.2	69.0	70.2	67.9
Women	64.1	64.2	65.0	67.8	68.4	67.8	66.3
Married							
Total (%)	56%	53%	53%	45%	47%	43%	49%
Men (%)	84%	78%	77%	70%	73%	67%	74%
Women (%)	47%	41%	41%	31%	33%	31%	36%
Education (%)							
<i>Total</i>							
Low vocational/less than sec.	68%	68%	70%	68%	58%	61%	67%
General secondary	7%	8%	5%	9%	14%	11%	8%
Specialized secondary	18%	16%	15%	15%	18%	16%	16%
University (at least 2 years)	7%	8%	9%	8%	11%	12%	9%
<i>Men</i>							
Low vocational/less than sec.	66%	73%	74%	70%	58%	70%	70%
General secondary	7%	6%	3%	7%	14%	8%	7%
Specialized secondary	19%	13%	13%	12%	16%	12%	13%
University (at least 2 years)	8%	7%	10%	11%	12%	10%	10%
<i>Women</i>							
Low vocational/less than sec.	68%	65%	68%	67%	57%	57%	65%
General secondary	6%	8%	6%	10%	14%	13%	9%
University (at least 2 years)	7%	9%	9%	7%	10%	12%	8%

Note: Poststratification weights for age, gender, education, and locality type are applied. For data sources see Appendix Table A1.

Table 2

Labor market outcomes of elderly and pre-retirement age respondents (weighted).

Years	1991–1992	1993–1995	1996–1998	2000–2002	2003–2004	2007	Total
Employed, retirement age respondents							
Total (%)	23%	13%	12%	9%	12%	13%	12%
Men (%)	24%	12%	11%	11%	14%	11%	12%
Women (%)	22%	13%	13%	7%	11%	14%	12%
Retirement to pre-retirement (ages 45 to retirement age) employment rates (odds ratios)							
Total	.07	.04	.07	.04	.06	.05	.05
Men	.09	.05	.07	.06	.07	.05	.06
Women	.07	.04	.06	.03	.05	.05	.05
Occupational class of employed retirement-age Russians							
<i>Men</i>							
Managers/professionals	21%	25%	38%	26%	24%	13%	22%
Self-employed	3%	4%	3%	2%	1%	0%	2%
Middle non-manual	5%	6%	1%	3%	0%	3%	3%
Lower non-manual	2%	6%	4%	7%	2%	3%	4%
Skilled manual	39%	31%	29%	34%	29%	39%	35%
Unskilled manual	29%	23%	17%	27%	44%	33%	28%
Farm manual	0%	3%	5%	2%	0%	10%	4%
Missing data	1%	2%	3%	0%	0%	0%	1%
<i>Women</i>							
Managers/professionals	22%	34%	30%	33%	45%	25%	28%
Self-employed	0%	1%	2%	1%	0%	0%	1%
Middle non-manual	17%	16%	23%	21%	12%	13%	17%
Lower non-manual	7%	4%	10%	5%	7%	11%	8%
Skilled manual	14%	6%	7%	7%	6%	14%	10%
Unskilled manual	28%	28%	25%	27%	27%	29%	28%
Farm manual	10%	8%	2%	2%	2%	7%	6%
Missing data	1%	4%	2%	2%	0%	1%	1%
Mean monthly earnings from employment, retirement-age (January 1998 rubles, geometric mean)							

Years	1991–1992	1993–1995	1996–1998	2000–2002	2003–2004	2007	Total
Men	730	593	420	450	560	826	538
Women	708	433	386	371	637	656	486
Retirement to pre-retirement geometric mean monthly earnings (ratios)							
Total	.76	.83	.75	.81	.89	.83	.82
Men	.67	.94	.74	.75	.65	.83	.76
Women	.86	.81	.77	.83	1.06	.86	.88

Note: Poststratification weights for age, gender, education, and locality type are applied. For data sources see Appendix Table A1.

Table 3

Parameter estimates, preferred hierarchical Bernoulli models (population average) for employment among retirement-age Russian men and women, 1991–2007.

	Men ages 60 and over				Women ages 55 and over			
	Model 1 (full sample)		Model 2 (limited sample)		Model 1 (full sample)		Model 2 (limited sample)	
	B	SE	B	SE	B	SE	B	SE
Education (complete general secondary)								
Some university +	1.011**	.138	1.127**	.150	.715**	.123	.771**	.152
Specialized sec.	.367**	.132	.463**	.136	.271**	.127	.329**	.137
Vocational/less than secondary	-.160	.143	-.130	.220	-.212**	.101	-.222*	.120
Annual % private sector employment interacted with								
Some university +					.021**	.004	.021**	.006
Vocational/less	-.019**	.007	-.020*	.011				
Age	-.160**	.010	-.159**	.009	-.248**	.018	-.245**	.018
Age squared					.003**	.001	.003**	.001
Married	.637**	.134	.727**	.130	-.160**	.053		
Never married	.651**	.324	.691**	.317				
Place of residence (town, medium city, large city)								
Moscow/St. Pete.	.644**	.123	.722**	.117	.219**	.088	.298**	.064
Rural village	-.877**	.147	-.886**	.157	-.578**	.111	-.749**	.104
Logged residual household income (per capita)			-.481**	.109			-.520**	.093
Residual household income missing			.259	.254			-.078	.188
Constant (intercept)	1.337**	.203	1.300*	.702	-.122	.100	2.583**	.596
... <i>x</i> annual GDP	.006**	.003	.008**	.002	.018**	.005	.022**	.005
... <i>x</i> annual% private sector emp.					-.023**	.006	-.016**	.006
... <i>x</i> annual% unemployed					.074*	.037	.100**	.041
Respondents (level 1)	3753		3487		9550		8884	

	Men ages 60 and over			Women ages 55 and over		
	Model 1 (full sample)		Model 2 (limited sample)	Model 1 (full sample)		Model 2 (limited sample)
	<i>B</i>	<i>SE</i>	<i>B</i> <i>SE</i>	<i>B</i>	<i>SE</i>	<i>B</i> <i>SE</i>
Surveys (level 2)	20		18	20		18
Random effect variance (intercept)	.002		.000	.012		.031 [*]

Note: Respondents are nested in surveys and constants are specified as random effects. Age and age-squared are centered at sample minima (60 for men, 55 for women). Level-2 covariates (annual measures) are centered at their 1993 values. For data sources, see Table A1.

^{*} $p < .05$, one-tailed.
^{**} $p < .05$, two-tailed.

Table 4

Parameter estimates, two step (Heckman) models of primary-job earnings and selection into employment for retirement- and preretirement-age Russian men and women, 1992–2007.

	Men			Women		
	Retirement age (60 and over)		Preretirement age (50–59)	Retirement age (55 and over)		Preretirement age (45–54)
	B	SE	B	SE	B	SE
<i>Earnings</i>						
Age	-.039**	.016	-.035**	.007	-.014**	.006
Age-squared	.002*	.001				
Education (complete general secondary)						
Some university +			.240**	.057	.101*	.054
Specialized sec.			.157**	.048		
Place of residence (town, medium city, large city)						
Moscow/St. Pete.	.248**	.069	.221**	.049	.321**	.046
Rural village			-.178**	.052		
Year of survey, scaled by (centered on 1993 value):						
Annual GDP	.009**	.002	.007**	.001		
Annual% private sector employment					.010**	.001
Annual% unemployed					-.060**	.008
Private sector	.152**	.068	.067*	.039	.014**	.002
Branch (manufacturing, construction, transportation, communications, other)					.115**	.029
Agriculture	-.331**	.110	-.632**	.064	-.358**	.135
Education/Science/Health/Culture	-.224**	.073	-.367**	.066	-.185**	.042
Trade/personal services	-.142*	.086	-.177**	.055		
Occupational class (unskilled manual workers)					-.110**	.035
Managers/profs.	.493**	.073	.220**	.058	.551**	.054
Self-employed	.840**	.194	.654**	.103	.652**	.190
					.601**	.088

	Men			Women		
	Retirement age (60 and over)		Preretirement age (50–59)		Retirement age (55 and over)	
	B	SE	B	SE	B	SE
Middle non-manual	.596**	.148			.321**	.057
Lower non-manual			-.181*	.105		
Skilled manual	.342**	.074	.094**	.045	.429**	.081
Unskilled agriculture					.452**	.179
Intercept	6.485**	.118	6.648**	.059	6.077**	.078
Lambda	-.248**	.085	-.006	.085	-.173**	.061
<i>Selection into employment</i>						
Age	-.084**	.006	-.069**	.010	-.142**	.009
Age squared						
Married	.405**	.083	.642**	.087		
Never married	.441**	.178	-.430**	.172		
Education (complete general secondary)						
Some university +	.628**	.084	.391**	.098	.387**	.106
Specialized sec.	.288**	.092	.206**	.097	.167**	.069
Less than sec/vocat.			-.116	.088	-.130*	.068
Place of residence (town, medium city, large city)						
Moscow/St. Pete.	.425**	.076	.154*	.088	.199**	.051
Rural Village	-.481**	.082	-.256**	.070	-.401**	.056
Annual GDP%, relative to 1993	.006**	.002	.011**	.002	.012**	.003
Year of survey, scaled by (centered on 1993 value)						
% Private sector employment			-.024**	.004	-.008**	.004
% Unemployed						
% Private sector employment (centered 1993) interacted with						
University						

	Men			Women		
	Retirement age (60 and over)		Preretirement age (50–59)	Retirement age (55 and over)		Preretirement age (45–54)
	B	SE	B	SE	B	SE
Vocational/less	–.009**	.004				
Logged residual household income (per capita)	–.293**	.031	–.274**	.023	–.304**	.021
Residual household income missing	.004	.150	–.529	.485	–.188*	.101
Intercept	.729**	.198	2.111**	.177	1.509**	.145
Uncensored Obs.	517		1615		1100	
Censored Obs.	2900		667		7640	
Sigma	.637		.707		.640	

Note: Age and age-squared are centered at sample minima (60 and 50 for men, 55 and 45 for women). Earnings equation includes dummy variables denoting missing value substitutions on sector, branch, and occupation, but estimates of these nuisance parameters are not shown.
For data sources, see Table A1.

* $p < .05$, one-tailed.

** $p < .05$, two-tailed.