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Accounting for the bias against the life-cycle hypothesis in survey data: An example for Russia ☆

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ABSTRACT

Using household data from the Russian Longitudinal Monitoring Survey, this paper assesses how aging affects saving. To overcome a systematic bias against the life-cycle hypothesis of survey data, the paper estimates how the age profile of saving changes when the micro data are corrected to account for the contribution to pensions (as additional saving) and receipt of benefits from pensions (as dissaving). With these corrections, the Russian data support the life-cycle hypothesis. A small decline in the aggregate saving rate, because of aging, can thus be expected. However, since aggregate saving rates result from a combination of age and cohort effects, this decline may not be significant. When extrapolating the rising trends of the cohort effect, the fact that younger generations are earning and saving more than older generations at the same age, the projection shows a growing aggregate saving rate. Changes in saving of future cohorts, for example because of changes in the growth rate of the economy or because of reforms in pension systems and entitlements, can affect the aggregate saving rate even more than aging.

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Introduction

Russia is aging. The share of the population over 60 years old more than doubled from 7.7 percent in 1950 to 18 percent in 2010, while the share of very old people (80 or more) increased almost fivefold, from 0.6 to 2.9 percent. This process of population aging, closely reflecting regional demographic trends of falling birth rates and somewhat lengthening life spans (Bussolo et al., 2015),[1] is expected to continue over the next decades, "eventually leading to a convergence in the proportion of older people in the countries of Eastern and Western Europe" (Gavrilova and Gavrilov, 2009: 113).

This graying of the Russian population poses concerns in terms of a potential reduction of households' saving. In its simplest version, the life-cycle theory (Modigliani and Brumberg, 1954) posits that, to smooth their consumption over time, people save very little or even borrow when young, save and build up assets throughout their working lives, and draw down wealth (or dissave) in old age. For individuals, the age profile of the saving rate has thus a hump, or inverted U, shape. At the aggregate level, the macroeconomic saving rate is negatively influenced by aging. An increase of the share of the elderly – by raising the proportion of those who dissave in the population – is associated with a contraction in savings.

Numerous empirical studies have tested this basic prediction using both macroeconomic and microeconomic data (for a recent survey see Attanasio and Weber (2010)). This literature highlights several limitations of both macro and micro data. In particular, in a series of papers Deaton and Paxson[2] pointed out that using households' surveys data to infer saving behavior incurs two main problems. The first is that the life-cycle theory considers individual

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[1] One of the specific features of the aging process in the Russian Federation and in other Eastern European countries is that it is mainly driven by fertility reductions. Old age mortality has not improved as much as in other parts of the world. This has led to a situation where the Russian society is aging but individuals are not.

[2] Deaton (1997, 2005), Deaton and Paxson (1994, 2000a,b).

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saving decisions; but, in most surveys, savings are measured at the household, not at the individual level. Household' saving choices cannot be straightforwardly linked – as in the theory – to the age of an individual. The age of the head of the household is often used but since household composition changes there is not a one-to-one correspondence between the age of the head of the household and the average age of the household members. A second problem originates from how data are collected and classified in surveys. Pension benefits are normally recorded as income flows, even when a large fraction of these benefits represents drawing down of assets (Deaton, 2005: 98; UN, 2009: 182). In addition, young and middle aged workers typically do not account the contributions made by their employers to their pensions as part of their saving. The surveys' under-reporting of both dissaving at older ages and saving at younger ages generates a systematic bias against the life-cycle hypothesis.

Using the Russian Longitudinal Monitoring Survey (RLMS), this paper assesses how aging affects household saving in the case of the Russian Federation and attempts to overcome the second of the problems just mentioned. Specifically, it estimates how the age profile of saving changes when the micro data are adjusted to account for pensions' contributions and receipts. The adjustment consists of treating pensions received by retirees and recorded in the RLMS data as dissaving, and, at the same time, imputing pension contributions, which are not included in the data, to the saving of workers. Since not all pension received are linked to contribution histories and given that the pension system runs a deficit, variants of the simple adjustment just mentioned are tested.

The results show that Russian survey data support the life cycle hypothesis, and only in the extreme case where the entire value of all pension types received by retirees is considered a transfer the inverted U shape of saving-age profile disappears. That is, when pensions' contributions and receipts are, even in a small proportion, accounted for as additional saving and dissaving, the RLMS data show the expected hump-shaped saving-age profile: a rise of the saving rate during middle-age working years and a decline after retirement. However, the same survey data, without any adjustment for how pension contributions and benefits are treated, misleadingly show that savings rates increase with age throughout the life cycle. In particular, elderly households appear to have the highest saving rates.[3] Similar to the findings by Munnell (1976), Edwards (1996), Dayal-Gulati and Thimann (1997), and Bosworth and Burtless (2004), this pronounced difference in life-cycle patterns suggests that public pension schemes tend to substitute for private old-age provision.

The estimated saving-age profile is then used in combination with demographic projections up to the year 2050 to gauge the potential impact of future aging on aggregate saving rates. The exercise shows a declining trend of savings rates due to aging. However, this decline may not be as disruptive to the Russian economy as sometimes assumed. This is because future saving will result from a combination of an age effect and a cohort effect. The micro data shows that younger generations (or cohorts) tend to save more than their parents at the same age, and this cohort effect counterbalances the negative age effect.

In fact, from 1998 onwards, after a sharp decline in the early transition period, the national saving rate (calculated from the survey data) begun a significant rise. This is primarily explained by a positive cohort effect, as younger Russian cohorts save a larger fraction of their income than did prior generations. These higher savings rates of younger cohorts may be associated with higher rates of economic growth and increasing real per capita incomes (see Loayza et al. (2000), Ang (2009)). This positive cohort effect can also be tied to rising life expectancy and to the enhanced probabilities of child survival, which encourages saving for bequests, or to the erosion of the pre-transition social protection systems.

Projections of future saving rates are thus influenced by assumptions on population aging and on the sign and magnitude of the cohort effect. If the increasing role (i.e. a positive, growing cohort effect) of younger generations will continue to 2050, a strong increase in the aggregate household saving rate is projected. However, when assuming the trend to halt, i.e. when assigning the cohort effect of the last observed cohort to all future new-born generations and when pension fund contributions and receipts are assumed to form part of the saving aggregate, the estimated run-down of assets in old-age causes the forecast of the macroeconomic saving rate to also be hump-shaped. Under this scenario, an increase in aggregate household saving rate up to approximately 2035 is projected, followed by a contraction in subsequent years.

These results are discussed in detail in the last part of the paper, where more complex adjustments of the micro data are presented, and caveats and limitation are described. Robustness checks take into account that the pension system is running large deficits and therefore a significant share of pension payments to retirees comes from transfers rather than drawdowns of saving wealth. Another adjustment considers that, irrespective of contribution histories, old people are eligible for a basic pension. The standard identification restrictions that are used to separate the age from the cohort and year effects are also altered to gauge the sensitivity of the results. Importantly, the main finding, namely of the hump-shape of the age-saving profile, appears to be robust to these changes. Finally the paper warns that household savings rates calculated from the survey data are well below those calculated from the macro data. Besides not only the levels but also the trends in the micro and macro saving diverge, although the difference in the trends decreases after 2000. One reason for these differences is that household surveys tend to under-sample very rich individuals and thus underestimate total savings and their rate of change. A brief analysis of the saving rates along the income distribution shows that indeed the richest segment of the Russian population – at least for that surveyed by the RLMS – holds a very large share of total savings. But full reconciliation with the macro saving rates is not attempted and is left for future research.

The remainder of the paper is structured as follows. Section "Data description and pension adjustments issues" presents the data and discusses different approaches and caveats when estimating patterns in household saving from RLMS microdata. The approach of the estimation of the relationship between savings and aging, and the regression results, are presented in Section "Est imating a model of savings behavior". These results are then used to project future trends in the aggregate household saving rate up to 2050 under different demographic scenarios, which are presented in Section "The impact of Future Demographic Changes on the aggregate savings rate". Section "Discussion: Caveats and Robustness" discusses caveats and presents robustness analysis, finally S ection "Conclusions" summarizes the results and concludes.

Data description and pension adjustments issues

The principal data source for this case study is the second phase of the Russian Longitudinal Monitoring Survey (RLMS), the first nationally representative randomly selected household sample for Russia.[4] Data were collected in 17 annual waves between 1994

[3] This result is consistent with the findings by Chamon and Prasad (2010) and Belke et al. (2014), who argue that older households tend to increase their savings due to bequest motives and due to the risk of high medical expenses in old age.

[4] For information on the weights in RLMS data please refer to <http://www.cpc.unc.edu/projects/rlms-hse/project/samprep>. Adding a fourth post-stratification step, the analysis weights were rescaled using UN population data so that the sum of weights within each 5-year birth cohort matches the corresponding census proportion.

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