The effects of youth unemployment on late life well-being and health in Europe

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Abstract

Since the start of the Great Recession many European countries have been witnessing unprecedented growth in unemployment rate, with youth being hit the hardest. This trend has raised concerns about the long-term consequences of unemployment and labour market insecurity while young on various outcomes. This paper exploits a unique opportunity provided by the retrospective module of the Survey of Health, Aging and Retirement in Europe to investigate the impact of involuntary job loss experienced at young age on physical and mental health as well as on reported wellbeing measures at age 50 and beyond. We find that early career involuntary has a long-lasting negative effects on both wellbeing, mental health and physical health, both in terms of levels and age trajectories. Partially, this effect can be attributed to changes in health-affecting behaviours – higher levels of BMI and lower levels of physical activity.

Introduction

Numerous studies have documented a negative association of job loss and unemployment with well-being and health (see McKee-Ryan et al. 2005, Paul and Moser 2009, Wanberg 2012 for recent reviews and meta-analyses; see Voßemer and Eunicke 2015 for a review focusing on youth). However, most of these studies have examined the direct consequences of unemployment for well-being and health, leaving open the question whether or not the negative effects are transitory or persistent. In contrast, this paper investigates the long-term consequences of youth unemployment for well-being and health in late life. This focus is not only indicated by youth's increasing exposure to unemployment over the last years, but also by concerns that young people are particularly affected by job loss and unemployment, because youth represents a critical or sensitive period in life and young people may have less

resources and/or experience to cope with the consequences of unemployment (e.g., Brydsten et al. 2015, Strandh et al. 2014).

The few studies that have examined whether job loss or unemployment have sustained effects on well-being and health mostly concern the general population or investigate medium-term instead of long-term effects. For example, the seminal study by Clark et al. (2001), using the German Socio-Economic Panel (GSOEP, 1984-1994), shows that past unemployment is negatively associated with current life satisfaction, at least for men aged 25-55 years. However, their measure of past unemployment only concerns the last three years, meaning that they do not focus on the question whether or not unemployment really scars individuals' subjective well-being.[1] Similarly, using a sample of unemployed youth, aged 16-24 years, in the county of Stockholm, Sweden (1981-1985), Korpi (1997) finds mixed evidence for an effect of past unemployment on subjective well-being. In a cross-sectional analysis, he shows that the number of months in unemployment since the end of compulsory education is negatively associated with subjective well-being. However, in longitudinal analyses, controlling for baseline subjective well-being or individual fixed effects, the number of months unemployed between the two interviews in 1981 and 1982, has no effect on subjective well-being.[2]

Gallo et al. (2006) examine the effects of involuntary job loss (i.e., plant closure, lay-off) on depressive symptoms. Using the first four waves of the biennially administered Health and Retirement Survey (HRS, 1992-1998), United States, they find that late-career involuntary job loss between wave 1 and 2 is positively associated with depressive symptoms at wave 3 (about 2-4 years after job loss) and wave 4 (about 4-6 years after job loss) after controlling for baseline depressive symptoms. However, this finding only pertains to workers with below-median baseline wealth.

Studies that really investigate the long-term consequences of unemployment mostly use one of the two longitudinal cohort studies: the National Child Development Survey (NCDS), following a sample of persons born in 1958 in Great Britain or the Northern Swedish Cohort (NSC, 1981, age 16 to 2007, age 42), following all pupils in their last year of compulsory school in a medium-sized industrial town in Sweden in 1981. These data have the advantage that they cover a long period of time and also include measures of childhood socio-economic status and health.

Using the NCDS, Wadsworth et al. (1999) find that the cumulative months of unemployment between the ages 16 and 33 years are negatively associated with an index of health capital at age 33 years, after controlling for childhood socio-economic status, intelligence, and health.[3] Also using the NCDS, Daly and Delaney (2013) show that the cumulative years of unemployment between ages 16 and 50 years are positively associated with psychological distress at age 50 years controlling for childhood psychological factors at age 11 years (i.e.,

[1] Specifically, Clark et al. (2001) divide the number of month unemployed in the last three years by the number of month active in the labor force in the past three years. Using the GSOEP (1984- 2005), Knabe and Rätzel (2011) replicate the results of Clark et al. (2001) and show that the effect of past unemployment is mainly explained by expectations about future unemployment.

[2] The results of the longitudinal analyses may not only differ from those of the cross-sectional analysis, because they control for baseline subjective well-being or individual fixed effects, but also because the definition of past unemployment varies.

[3] The index of health capital is based on measures of body-mass index, exercising, eating fresh fruit, and smoking.

behavioural and emotional problems as well as intelligence) and psychological distress at age 23 years.[4]

Three studies used the NSC to examine whether youth unemployment leaves scars with respect to mid-career health (Brydsten et al. 2015, Hammarström and Janlert 2002, Strandh et al. 2014). Controlling for the respective baseline outcome at age 16 years as well as socio-economic status, Hammarström and Janlert (2002) find that cumulative unemployment of 6 months or longer between ages 16 and 21 years is positively associated with daily smoking and psychological symptoms (i.e., nervous and depressive symptoms, sleeping problems) at age 30 years, but not with excessive alcohol consumption. The positive association between early-career unemployment and later somatic symptoms is, however, only statistically significant for men.[5]

Strandh et al. (2014) use the same data to relate unemployment (i.e., 6 months or more) between the ages 18-21, 21-30, and 30-42 years to changes in mental health (i.e., nervous and depressive symptoms, sleeping problems) at ages 21, 30, and 42 years. Exposure to youth unemployment (ages 18-21 years) was positively associated with deteriorating mental health from ages 16 to 30 and 16 to 42 years. Brydsten et al. (2015) is the latest study using the NSC to examine the long-term effects of youth unemployment. They find that, controlling for baseline outcomes and other confounders, cumulative unemployment in months between the ages 16 to 21 years was positively associated with somatic symptoms at age 42, but only for men (see footnote 5).

Two further studies have examined the long-term effects of unemployment on health using other longitudinal data that cover a long period of time. Mossakowski (2009) uses the National Longitudinal Survey of Youth (NLSY, 1979-1994), United States, and shows that cumulative unemployment in years between 1979 (ages 14 to 22 years) and 1993 is positively associated with depressive symptoms in 1994 (ages 27 to 39 years). Besides a number of confounding variables, she also controls for “prior” depressive symptoms measured in 1992 (see footnote 4).

Schröder (2013) uses the Survey of Health, Ageing, and Retirement in Europe (SHARE, 11 countries) and combines information from a retrospective survey about respondents’ work histories (SHARELIFE 2008) with prospectively collected panel data on their late life health (wave 1-2, 2004-2006). He compares persons who have experienced job loss due to plant closures and lay-off with persons who have never experienced involuntary job loss throughout their career. Using eleven different health measures and controlling for childhood socio-economic status and health, he finds that involuntary job loss negatively affects health even after 25 years and longer.

Most recent work by Voßemer et al. (2018) also explores SHARE data in conjunction with the respondents’ work histories. They show that an early-career involuntary job loss due to a layoff

[4] Similar to most of the other studies reviewed (see Schröder 2013 for an exception), Daly and Delaney control for variables that lie on the causal pathway from past unemployment to psychological distress at age 50 (e.g., psychological distress at age 23, employment status at age 50, income at age 50) meaning that they do not estimate the total effect of past unemployment and likely understate its long-term repercussions.

[5] The authors, however, do not test whether the effects for men and women are statistically significantly different.

or plant closure which occurred in the first 10 years after the labour market entry increases the probability of fair or poor self-rated health in late life by about 6 percentage points, and only a small share of this effect is explained by the subsequent unemployment risks and employment instability.

This paper contributes to this literature in three ways. First of all, it explores not only the one-off effect of early-career job loss on later life outcomes, but allows for capturing of the dynamic effects on the health and wellbeing trajectories from age 50 onwards. Second, it focuses on the experience of involuntary job loss due to a lay-off or plant closure between the ages 14-29 years, which addresses the issue of possible endogeneity with respect to education if one was to enrol into college or university because of the poor employment prospects or indeed a job loss. Fourth, we explore a number of outcomes – from wellbeing (CASP index), to mental health (EuroD index), to self-perceived health, as we believe that the persistence or transitivity of the long-term effect of early career job loss will be different across these three outcomes. Finally, we explore the behavioural mechanisms via which the effect on physical health is manifested – BMI, alcohol and tobacco consumption and physical activity.

Research Design

Measures

The key independent variable is an early-career involuntary job loss due to layoff or plant closure between the ages 14 and 29 years. The other reasons for separation either reflected voluntary job changes (i.e. resignation) or ambiguous situations (i.e. mutual agreement, temporary job completion, other).

The key dependent variables are well-being and health. Well-being is measured with the CASP-12 scale. It is based on the CASP-19 scale which was specifically designed to assess the quality of life (QoL) in early old age (Hyde et al. 2003). The CASP-19 scale adapts a need satisfaction approach that comprises four domains of need: control, autonomy, self-realization, and pleasure. These domains are also reflected in the short-form adopted by SHARE (see Borrat-Besson et al. 2015 for a critical psychometric assessment of the CASP-12 scale).[6] Higher values of CASP-12 scale indicate higher levels of wellbeing.

Mental health is measured with the validated EURO-D scale which is an increasing scale. Usually EURO-D score greater than 3 is defined as clinical depression which requires therapeutic intervention.

Self-rated health is measured using the following question: “Would you say your health now is …”. The answers range from 1 “Excellent” to 5 “Poor”. For self-reported health, research has repeatedly shown that it is an independent predictor of mortality even after adjusting for a number of specific health measures and other covariates known to be relevant (e.g., Idler and Benyamini 1997, Jylhä 2009).

[6] The items of the SHARE CASP-12 scale are: Control: “My age prevents me from doing the things I would like to do”, “I feel that what happens to me is out of my control”, “I feel left out of things”; Autonomy: “I can do the things I want to do”, “Family responsibilities prevent me from doing the things I want to do”, “Shortage of money stops me from doing things I want to do”; Pleasure: “I look forward to each day”, “I feel that my life has meaning”, “On balance, I look back on my life with a sense of happiness”; Self-realization: “I feel full of energy these days”, “I feel that life is full of opportunities”, “I feel that the future looks good for me”. Answers range from 1 “Often” to 4 “Never” on a four-point scale.

We estimate models for males and females separately, because health and well-being may have different determinants and dynamics depending on gender. In our models, we control for age, childhood health, socio-economic background at age 10, whether or not an individual was a child or youth during the war times, and country of residence. Childhood health is measured by three variables: a binary variable indicating fair or poor self-perceived health in childhood, a binary variable indicating whether or not the individual stayed in a hospital for one month or longer during childhood, and a binary variable for having an illness from the list of serious childhood diseases[7]. These variables are considered important controls for early health problems which could have affected both individuals' labour market performance as well as their late life health. Socio-economic background refers to the period when the respondent was 10 years old and include the following variables: the number of persons per room (categorical variable less than one, from one to two, and more than two), the number of accommodation facilities (the sum of points for each of the following: fixed bath, cold running water, hot running water, inside toilet and central heating), the number of books at home at age 10 and skill occupation of the breadwinner. Parents' health behaviour includes dummies for smoking and drinking heavily, and a dummy whether parents had mental health problems. As for learning abilities we use relative position in math and language in class at age 10.

Instead of restricting the sample to individuals who entered the job market after World War II, we use two control variables. The first indicates whether an individual was aged 13 years or younger during the World War I or World War II and the second indicates whether an individual was 14-29 years old during the same periods.

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Methods

First, we use pooled cross-sectional data on individuals in conjunction with the data from the SHARELIFE interview to estimate the effect of involuntary job loss during youth years on health and wellbeing outcomes, as well as measures of health-affecting behaviours.

Second, following the findings about the importance of the dynamic nature of health in the epidemiological (Haas 2008, Kim and Durden 2007) and economics literature (Case et al. 2002), we investigate the effect of early life exposure to involuntary job loss on health and well-being age trajectories, allowing for their individual heterogeneity. To do this, we introduce a series of mixed effect models (growth curve models, random coefficients models) allowing for non-linearities via a quadratic function in age. So, an outcome H_{it} is determined by the following equation:

$$H_{it} = \beta_{i0} + \beta_{i1} age_{it} + \beta_{i2} age_{it}^2 + X\beta_3 + u_{i0} + u_{i1} age_{it} + u_{i2} age_{it}^2 + \epsilon_{it} \qquad (1)$$

[7] Infectious diseases (e.g. measles, rubella, chickenpox, mumps, tubercolosis, diphtheria, scarlet fever), polio, asthma, respiratory problems other than asthma, allergies (other than asthma), severe diarrhea, meningitis/encephalitis, chronic ear problems, speech impairment, difficulty seeing even with eyeglasses, severe headaches or migraines, epilepsy, fits or seizures, emotional, nervous, or psychiatric problem, broken bones, fractures, appendicitis, childhood diabetes or high blood sugar, heart trouble, leukaemia or lymphoma, cancer or malignant tumour (excluding minor skin cancers).

With this approach, we test whether age trajectories of health, wellbeing and health affecting behaviours are heterogeneous across individuals, i.e. $u_{i0} \neq 0;\ u_{i1} \neq 0;\ u_{i2} \neq 0$ (Hypothesis 1). Introducing further the mechanism for the effect of the involuntary job loss

$$\beta_{ik} = \alpha_{0k} + \alpha_{1k} InvJobLoss_i \quad \forall \quad k = \overline{0,2} \qquad (2)$$

we test whether involuntary job loss has a detrimental effect on the level of health/wellbeing irrespective of age, i.e. $\alpha_{10} < 0$ (Hypothesis 2). Finally, Hypothesis 3 tests whether involuntary job loss changes not only the level of health/wellbeing but also the health-age trajectory, i.e. $\alpha_{11} \neq 0, \alpha_{12} \neq 0$.

In equations (1)-(2), H_{it} represents either health or well-being of an individual i at time t, u_{i0} and u_{i1} reflect individual heterogeneity in the intercept and slope coefficient on age respectively and ϵ_{it} is the idiosyncratic error. The use of the above model provides us with two valuable advantages. First, it allows us to measure not only the effect of early career involuntary job loss on the levels of health and well-being but also on their dynamics. Second, it allows accounting for heterogeneity in individual health/wellbeing trajectories.

Data

We draw on data from the Survey of Health, Ageing, and Retirement in Europe (SHARE 2002-2013: Börsch-Supan (2016))[8]. SHARE is a multidisciplinary and cross-national panel study that includes five waves of data and provides information about 157,000 individuals of age 50 years and over from 20 European countries (including Israel). SHARE offers a detailed picture of the socio-economic situation, well-being, and health of elderly Europeans (see Börsch-Supran et al. 2013 for a detailed overview).

In the third wave (2008-2009), the SHARELIFE survey collected retrospective life histories of about 28,000 individuals from 14 European countries. Based on these, SHARE provides the so-called Job Episodes Panel (JEP) (see Brugiavini et al. 2013 and Antonova et al. 2014 for details on the JEP) that covers detailed information about individuals' work histories up to the year of the interview. Firstly, by combining the life history data (SHARELIFE, JEP) with those from wave 1 and 2 (SHARE), we are able to examine the long-term effects of youth and early-

[8] This paper uses data from SHARE Waves 1, 2, 3 (SHARELIFE), 4 and 5 (DOIs: 10.6103/SHARE.w1.500, 10.6103/SHARE.w2.500, 10.6103/SHARE.w3.500, 10.6103/SHARE.w4.500, 10.6103/SHARE.w5.500), see Börsch-Supan et al. (2013) for methodological details.
The SHARE data collection has been primarily funded by the European Commission through FP5 (QLK6-CT-2001-00360), FP6 (SHARE-I3: RII-CT-2006-062193, COMPARE: CIT5-CT-2005-028857, SHARELIFE: CIT4-CT-2006-028812) and FP7 (SHARE-PREP: N°211909, SHARE-LEAP: N°227822, SHARE M4: N°261982). Additional funding from the German Ministry of Education and Research, the U.S. National Institute on Aging (U01_AG09740-13S2, P01_AG005842, P01_AG08291, P30_AG12815, R21_AG025169, Y1-AG-4553-01, IAG_BSR06-11, OGHA_04-064) and from various national funding sources is gratefully acknowledged (see www.share-project.org).

career unemployment on well-being and health in late life. Secondly, we incorporate all five waves of SHARE data to investigate age trajectories of health and well-being.

For the analyses, we restricted the sample to individuals aged 50 years and over, excluding people who never worked or was self-employed at age 15-29 as well as those who retired or left job due to health conditions at age 15-29. Finally, we limit our sample to those who had 3 or more interviews, which is necessary for the estimation of the growth curve models. The average age is 66 years for males and 65.5 for females. Instead of imposing any other sample restrictions, for example, by focusing only on individuals who entered the labour market after World War II, we define control variables to take account of these issues (see below). Focusing on complete cases only, we have a sample of 13,305 males and 17,070 females from 11 European countries for whom the well-being and health measure analysed are available.

Table 1 offer comparison of the means of outcomes under study between groups with an without involuntary job loss at age 14-29, separately for men and women. As can be seen, for both genders, those who experience early career involuntary job loss are reporting worse self-perceived health, are worse off on both depression (EURO-D) and wellbeing (CASP) scales. They also have higher BMI, are less likely to engage in physical activity and more likely to smoke. However, there is no documented difference in drinking frequency. Summary statistics for the variable of interest and control variables are presented in Table 2. In the sample used in the analysis, 10% of men and 9% of women experience an involuntary job loss when 14-29 years old.

Results

Figure 1 offers a non-parametric kernel density estimation to compare the age trajectories of the outcomes of interest – self-perceived health, depression and wellbeing. As can be seen, exposure to early career involuntary job loss shifts the health-age depression-age trajectories upwards for both men and women and the wellbeing trajectory downwards, pointing towards negative long-run effects. However, the confidence intervals often intersect making it difficult to judge the effect. Tables 1 and 2 present the results from estimating different models – OLS and mixed effects – for the self-perceived health for men and women respectively. Interestingly, the effects for most control variables change very little across the models. From the comparison across the models, we find that control variables, where significant, have expected direction of the effect. For men, respondents with worse childhood health have worse health when 50 years old and older, crowded living conditions have no effect, after controlling for the number of convenience in the accommodation. The effect of the latter is only present in the OLS model. Number of books significantly improves health, while lower occupation of the breadwinner has a health deteriorating effect. Among parental behaviours, only heavy drinking and mental health problems, but not smoking, have a health deteriorating effects. Ranking worse in math and languages at age 10 is also linked to worse health in later life. Interestingly, having war experience either in childhood or while a teenager, is associated with better health in later life. This seems to be driven by the survivor effect – those with worse health were unlikely to survive the war hardships and live to age 50 to be represented in the survey. For women, results are quite similar qualitatively with several notable differences – crowded accommodation measured by the number of persons per room at age 10 does have a health deteriorating effect, as well as the number of convenience across all specifications,

at the same time only relative position in language but not in math has a health improving effect. With regards to the variable of interest, we find that early career involuntary job loss is associated with worse health in later life and it is approximately equal to half of the effect of having parents with mental health problems for men and slightly larger than that for women. Comparing models in Columns (1)-(3) to those in Columns (4)-(6), we see that involuntary job loss does not have a significant effect on the shape of the health-age trajectory. Moreover, we find no evidence of individual heterogeneity in the effect of age for men (see significance of the standard deviation for age in Columns (3) and (6)), but there is individual heterogeneity in the age trajectories for women. However, this more sophisticated specification does not change neither the magnitude nor the significance of the variable of interest.

Although analysis presented in Tables 3-4 indicates towards Column (2) as preferred specification, we recognise that this may not hold for all outcomes, and, therefore, present all mixed effect models specifications for all the outcomes in Table 5. For men, we document statistically significant effect on self-perceived health, depression and wellbeing at age 50. However, only in the case of wellbeing, there is a statistically significant effect on the shape of the age trajectory. For women, qualitatively the effects are very similar. However, for both depression and wellbeing measures there is a significant effect of involuntary job loss on the shape of the age trajectories. We find significant effect of involuntary job loss on BMI for women at age 50, but not for men, and only as a level effect. At the same time, we find no effect on drinking behaviour for men, and significant effect on drinking-age trajectory for women. The effect on physical activity is negative for men, and, although negative, but not statistically significant for women. Despite the correspondence to the actual regression coefficients, the results in the tables are difficult to interpret because of the interaction terms. Therefore, we turn to the graphical representation of the findings based on the most flexible specification in Columns (4) and (8) of Table 5.

Figures 2-13 illustrate these findings presenting the outcome-age trajectories in the upper part of the graph for those with and without early career involuntary job loss, and the marginal effect of involuntary job loss in the lower part, with the corresponding confidence intervals. As can be seen, there is a statistically significant health deteriorating effect at age 55-70 for men and at age 55-75 for women. The effect on depression is only statistically significant prior to age 50 for men and prior to age 60 for women, and is indistinguishable from the trajectories of those without involuntary job loss experience in early career later on. The wellbeing as measured by CASP index is negatively affected from age 55 to 72 for men and 50 to 68 for women. The effect on BMI is much more pronounced for women up to the age 80, and it is significantly higher for those with an involuntary job loss at young age around 55-65 age period for men. We do not find statistically significant effect on alcohol drinking behaviour. However, we see that physical activity levels are lower over the 55-78 years period for men only. Although the estimates for physical activity are not statistically significant at 5% level, it is significant at 10% level and points to the expected direction. The analysis of smoking behaviour faced a computational difficulty and the model has not converged, which can be a sign of absence of individual heterogeneity and requires further investigation.

Overall, our findings regarding the long-term effects of youth unemployment demonstrate that early-career job loss does shift age trajectories of health and well-being to more negative results. The precision of the estimated effect does change with age with more pronounced effects being documented for 55-70 year olds. However, lack of the statistically significant effect beyond age 80 may be driven by fewer observations in this age period, not by the true absence of the effect.

Conclusions

Employing unique retrospective data from the SHARELIFE survey, in this paper we investigate the total long-term effect of youth unemployment on health and well-being, controlling for individual's childhood health and potential war effects. Our methodological approach of estimating the effect separately by gender and a stepwise exploration of more sophisticated hypotheses allows us to uncover several regularities. First of all, there exists individual heterogeneity in well-being – age and depression – age trajectories, which confirms Hypothesis 1 and points towards a need to incorporate this in methodological design for future research. However, this does not hold with regards to self-perceived health. Second, once the individual heterogeneity is accounted for, there is a significant negative effect of youth unemployment on health and well-being 35+ years later for both males and females. Finally, exposure to unemployment while young does shift both health and well-being age trajectories towards more negative outcomes and it does change the shape of these trajectories. In other words, involuntary job loss experienced when young does reduce health and wellbeing throughout the life cycle and changes the nature of the life-cycle dynamics in these outcomes. We also find that partially the effect on health and wellbeing can be explained by the effect on health affecting behaviours – higher BMI levels and lower levels of physical activity among affected individuals.

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Tables

Table 1 Summary statistics of outcomes by involuntary job loss

	Males Involuntary job loss at age 15-29		Females Involuntary job loss at age 15-29	
	no	yes	no	yes
Self perceived ill health (1..5)	2.874***	2.992***	2.950***	3.057***
	(1.049)	(1.026)	(1.042)	(1.022)
EuroD index (0..12)	1.667***	1.930***	2.456***	2.774***
	(1.815)	(1.907)	(2.137)	(2.259)
CASP index (12..48)	39.040***	38.119***	38.709***	37.948***
	(5.535)	(5.798)	(5.816)	(6.166)
BMI	26.897***	27.193***	26.163***	27.122***
	(3.830)	(4.105)	(4.755)	(5.060)
Drinking frequency (0..6)	3.627	3.542	2.439	2.463
	(2.130)	(2.190)	(2.081)	(2.144)
Physical activity (yes/no)	0.834***	0.780***	0.805***	0.774***
	(0.372)	(0.415)	(0.397)	(0.418)
Currently smokes (yes/no)	0.191***	0.232***	0.157***	0.222***
	(0.393)	(0.422)	(0.364)	(0.416)

Notes: Self-perceived ill health is measured from 1 – Excellent to 5 – Poor.
Standard deviations in parentheses:* significant at 10%; ** 5%; *** 1%

Table 2 Summary statistics of independent variables

	Males		Females	
Involuntary job loss (yes/no)	0.10		0.09	
Age	66.04	(8.81)	65.47	(9.25)
Fair poor self-perceived childhood health	0.08		0.10	
Childhood: In hospital for 1 month or longer	0.08		0.10	
Having illness from the list	0.88		0.92	
Persons per room when 10	1.88	(0.70)	1.87	(0.69)
Accommodation conveniences when 10	2.22	(1.76)	2.29	(1.74)
Number of books when 10	2.11	(1.09)	2.23	(1.09)
Occupation of the breadwinner when 10	4.00	(1.04)	4.01	(1.03)
Parents smoked	0.68		0.64	
Parents drank havily	0.09		0.10	
Parents had mental problems	0.02		0.03	
Relative position in math when 10	2.58	(0.85)	2.72	(0.83)
Relative position in language when 10	2.75	(0.85)	2.54	(0.84)
Aged 0-13 during the world wars	0.55		0.50	
Aged 14-29 during the world wars (but not 0-13)	0.03		0.04	
Austria	0.04		0.05	
Germany	0.08		0.09	
Sweden	0.11		0.10	
Netherlands	0.12		0.14	
Spain	0.06		0.05	
Italy	0.12		0.08	
France	0.11		0.11	
Denmark	0.12		0.12	
Switzerland	0.07		0.09	
Belgium	0.15		0.13	
Czech Republic	0.03		0.05	
Number of observations	13305		17070	

Table 3 The impact of youth involuntary job loss on self-perceived health, males

	OLS	Mixed effects	Mixed effects, random age effect	OLS	Mixed effects	Mixed effects, random age effect
	(1)	(2)	(3)	(4)	(5)	(6)
(Age-50)/10	0.226**	0.258**	0.257**	0.226**	0.250**	0.248**
	(0.048)	(0.038)	(0.038)	(0.050)	(0.041)	(0.041)
((Age-50)/10) ^{2}	0.012	0.024*	0.024*	0.013	0.027*	0.028*
	(0.013)	(0.010)	(0.010)	(0.013)	(0.011)	(0.011)
Involuntary job loss (yes/no)	0.098*	0.092*	0.092*	0.133	0.096	0.095
	(0.039)	(0.042)	(0.042)	(0.101)	(0.087)	(0.087)
Involuntary job loss x ((Age-50)/10)				0.027	0.067	0.068
				(0.123)	(0.101)	(0.101)
Involuntary job loss x ((Age-50)/10) ^{2}				-0.024	-0.033	-0.033
				(0.032)	(0.028)	(0.028)
Fair poor self-perceived childhood	0.201**	0.201**	0.202**	0.202**	0.203**	0.204**
	(0.047)	(0.047)	(0.047)	(0.047)	(0.047)	(0.047)
Childhood: In hospital for 1 month or	0.119*	0.119*	0.119*	0.119*	0.119*	0.119*
longer	(0.053)	(0.050)	(0.050)	(0.053)	(0.050)	(0.050)
Having illness from the list	-0.030	-0.028	-0.028	-0.029	-0.027	-0.027
	(0.041)	(0.040)	(0.040)	(0.041)	(0.040)	(0.040)
Persons per room when 10	0.023	0.029	0.029	0.023	0.029	0.029
	(0.021)	(0.020)	(0.020)	(0.021)	(0.020)	(0.020)
Accommodation conveniences when 10	-0.017+	-0.014	-0.014	-0.017+	-0.014	-0.014
	(0.010)	(0.009)	(0.009)	(0.010)	(0.009)	(0.009)
Number of books when 10	-0.053**	-0.054**	-0.054**	-0.053**	-0.054**	-0.054**
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Occupation of the breadwinner when 10	0.039**	0.040**	0.040**	0.040**	0.040**	0.040**
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Parents smoked	0.021	0.023	0.023	0.021	0.024	0.023
	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)
Parents drank heavily	0.158**	0.158**	0.157**	0.157**	0.157**	0.157**
	(0.047)	(0.046)	(0.046)	(0.047)	(0.046)	(0.046)
Parents had mental problems	0.179*	0.182*	0.181*	0.179*	0.183*	0.181*
	(0.078)	(0.083)	(0.083)	(0.078)	(0.083)	(0.083)
Relative position in math when 10	0.061**	0.062**	0.062**	0.061**	0.062**	0.062**
	(0.017)	(0.016)	(0.016)	(0.017)	(0.016)	(0.016)
Relative position in language when 10	0.031+	0.033*	0.033*	0.032+	0.033*	0.033*
	(0.017)	(0.016)	(0.016)	(0.017)	(0.016)	(0.016)
Aged 0-13 during the world wars	-0.133**	-0.217**	-0.217**	-0.133**	-0.216**	-0.216**
	(0.037)	(0.034)	(0.034)	(0.037)	(0.034)	(0.034)
Aged 14-29 during the world wars	-0.187*	-0.399**	-0.400**	-0.177+	-0.389**	-0.391**
(but not 0-13)	(0.090)	(0.086)	(0.087)	(0.090)	(0.086)	(0.087)
Constant	2.251**	2.208**	2.209**	2.241**	2.205**	2.207**
	(0.131)	(0.127)	(0.127)	(0.132)	(0.127)	(0.127)
R2	0.134			0.134		
Observations	13,305	13,305	13,305	13,305	13,305	13,305
Number of groups						
Standard deviation of age: significance			-			-
Standard deviation of intercept:		+	+		+	+
Standard deviation of residual		+	+		+	+
LR test vs. linear regression:						
chibar2(01)		3251	3251		3250	3250
Prob >= chibar2		0.0000	0.0000		0.0000	0.0000

Standard errors in parentheses
** p<0.01, * p<0.05, + p<0.1

Table 4 The impact of youth involuntary job loss on self-perceived health, females

	OLS	Mixed effects	Mixed effects, random age effect	OLS	Mixed effects	Mixed effects, random age effect
	(1)	(2)	(3)	(4)	(5)	(6)
(Age-50)/10	0.133**	0.124**	0.124**	0.140**	0.111**	0.111**
	(0.041)	(0.030)	(0.030)	(0.043)	(0.032)	(0.032)
((Age-50)/10) ^{2}	0.038**	0.050**	0.050**	0.036**	0.053**	0.053**
	(0.011)	(0.008)	(0.008)	(0.011)	(0.009)	(0.009)
Involuntary job loss (yes/no)	0.089*	0.103**	0.103**	0.136	0.030	0.030
	(0.040)	(0.038)	(0.038)	(0.093)	(0.074)	(0.074)
Involuntary job loss x ((Age-50)/10)				-0.059	0.110	0.110
				(0.117)	(0.088)	(0.088)
Involuntary job loss x ((Age-50)/10) ^				0.013	-0.028	-0.028
				(0.031)	(0.025)	(0.025)
Fair poor self-perceived childhood	0.418**	0.406**	0.406**	0.418**	0.406**	0.406**
	(0.038)	(0.038)	(0.038)	(0.037)	(0.038)	(0.038)
Childhood: In hospital for 1 month longer	0.048	0.052	0.052	0.048	0.052	0.052
	(0.045)	(0.045)	(0.045)	(0.045)	(0.045)	(0.045)
Having illness from the list	0.002	0.004	0.004	0.002	0.004	0.004
	(0.041)	(0.042)	(0.042)	(0.041)	(0.042)	(0.042)
Persons per room when 10	0.042*	0.042*	0.042*	0.042*	0.041*	0.041*
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
Accommodation conveniences ^	-0.034**	-0.033**	-0.033**	-0.034**	-0.033**	-0.033**
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Number of books when 10	-0.040**	-0.038**	-0.038**	-0.040**	-0.039**	-0.039**
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Occupation of the breadwinner	0.051**	0.053**	0.053**	0.052**	0.053**	0.053**
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Parents smoked	0.005	0.001	0.001	0.005	0.001	0.001
	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
Parents drank heavily	0.117**	0.114**	0.114**	0.118**	0.114**	0.114**
	(0.042)	(0.038)	(0.038)	(0.042)	(0.038)	(0.038)
Parents had mental problems	0.151*	0.174**	0.174**	0.151*	0.174**	0.174**
	(0.074)	(0.063)	(0.063)	(0.074)	(0.063)	(0.063)
Relative position in math when 10	0.023	0.023	0.023	0.023	0.023	0.023
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Relative position in language when	0.041**	0.046**	0.046**	0.041**	0.046**	0.046**
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Aged 0-13 during the world wars	-0.093**	-0.125**	-0.125**	-0.093**	-0.125**	-0.125**
	(0.033)	(0.029)	(0.029)	(0.033)	(0.029)	(0.029)
Aged 14-29 during the world wars (but not 0-13)	-0.266**	-0.381**	-0.381**	-0.265**	-0.381**	-0.381**
	(0.073)	(0.071)	(0.071)	(0.072)	(0.071)	(0.071)
Constant	2.283**	2.264**	2.264**	2.277**	2.273**	2.273**
	(0.111)	(0.109)	(0.109)	(0.112)	(0.109)	(0.109)
R2	0.161			0.161		
Observations	17,070	17,070	17,070	17,070	17,070	17,070
Number of groups		5,111	5,111		5,111	5,111
Standard deviation of age:			+			+
Standard deviation of intercept:		+	+		+	+
Standard deviation of residual		+	+		+	+
LR test vs. linear regression: chibar2(01)		4784	4784		4785	4785
Prob >= chibar2		0.0000	0.0000		0.0000	0.0000

Standard errors in parentheses
** p<0.01, * p<0.05, + p<0.1

Table 5 The impact of youth involuntary job loss on various outcomes

	Males				Females			
	Mixed effects	Mixed effects, random age effect	Mixed effects	Mixed effects, random age effect	Mixed effects	Mixed effects, random age effect	Mixed effects	Mixed effects, random age effect
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Self-perceived health (1..5)								
IJL (yes/no)	0.092*	0.092*	0.096	0.095	0.103**	0.103**	0.030	0.030
	(0.042)	(0.042)	(0.087)	(0.087)	(0.038)	(0.038)	(0.074)	(0.074)
IJL x ((Age-50)/10)			0.067	0.068			0.110	0.110
			(0.101)	(0.101)			(0.088)	(0.088)
IJL x ((Age-50)/10) [2]			-0.033	-0.033			-0.028	-0.028
			(0.028)	(0.028)			(0.025)	(0.025)
SD(age): significance		-		-		+		+
EuroD index (0..12)								
IJL (yes/no)	0.158*	0.162*	0.249	0.243	0.215**	0.220**	0.571**	0.574**
	(0.073)	(0.072)	(0.159)	(0.152)	(0.079)	(0.078)	(0.162)	(0.159)
IJL x ((Age-50)/10)			-0.115	-0.107			-0.482*	-0.489*
			(0.189)	(0.191)			(0.198)	(0.200)
IJL x ((Age-50)/10) [2]			0.026	0.024			0.111*	0.113*
			(0.052)	(0.055)			(0.055)	(0.057)
SD(age): significance		+		+		+		+
CASP index (12..48)								
IJL (yes/no)	-0.476*	-0.517*	-0.174	-0.103	-0.471*	-0.550*	-0.831+	-0.834*
	(0.222)	(0.219)	(0.483)	(0.462)	(0.217)	(0.215)	(0.432)	(0.420)
IJL x ((Age-50)/10)			-0.863	-1.056+			-0.387	-0.386
			(0.564)	(0.570)			(0.513)	(0.519)
IJL x ((Age-50)/10) [2]			0.311*	0.385*			0.309*	0.313*
			(0.154)	(0.163)			(0.143)	(0.149)
SD(age): significance		+		+		+		+
BMI								
IJL (yes/no)	0.293	0.326	0.402	0.389	1.003**	1.010**	1.082**	1.078**
	(0.208)	(0.210)	(0.327)	(0.318)	(0.240)	(0.240)	(0.350)	(0.348)
IJL x ((Age-50)/10)			0.161	0.169			0.222	0.221
			(0.312)	(0.315)			(0.323)	(0.324)
IJL x ((Age-50)/10) [2]			-0.108	-0.112			-0.132	-0.131
			(0.085)	(0.089)			(0.089)	(0.090)
SD(age): significance		+		+		+		+
Drinking frequency (0..6)								
IJL (yes/no)	-0.061	-0.066	-0.096	-0.085	-0.044	-0.050	0.119	0.125
	(0.095)	(0.094)	(0.179)	(0.174)	(0.083)	(0.083)	(0.147)	(0.143)
IJL x ((Age-50)/10)			-0.035	-0.052			-0.342*	-0.352*
			(0.199)	(0.201)			(0.166)	(0.167)
IJL x ((Age-50)/10) [2]			0.028	0.033			0.110*	0.113*
			(0.055)	(0.057)			(0.047)	(0.049)
SD(age): significance		+		+		+		+
Physical activity (yes/no)								
IJL (yes/no)	-0.039**	-0.039**	-0.043**	-0.040**	-0.017	-0.017	-0.022+	-0.017
(marginal effect)	(0.014)	(0.014)	(0.015)	(0.015)	(0.013)	(0.013)	(0.013)	(0.013)
SD(age): significance		-		-		-		-

Standard errors in parentheses

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

Notes:

[1] Significance of the standard deviation for age, „+" means parameter is singificant, „-" means parameter is not significant

[2] Marginal effects from mixed effects logistic regression are reported for binary dependant variable physical activity. Model also contains interaction term of involuntary job loss and age, and involuntary job loss and age squared, though they are not observed in this table because marginal effects are reported.

Graphs

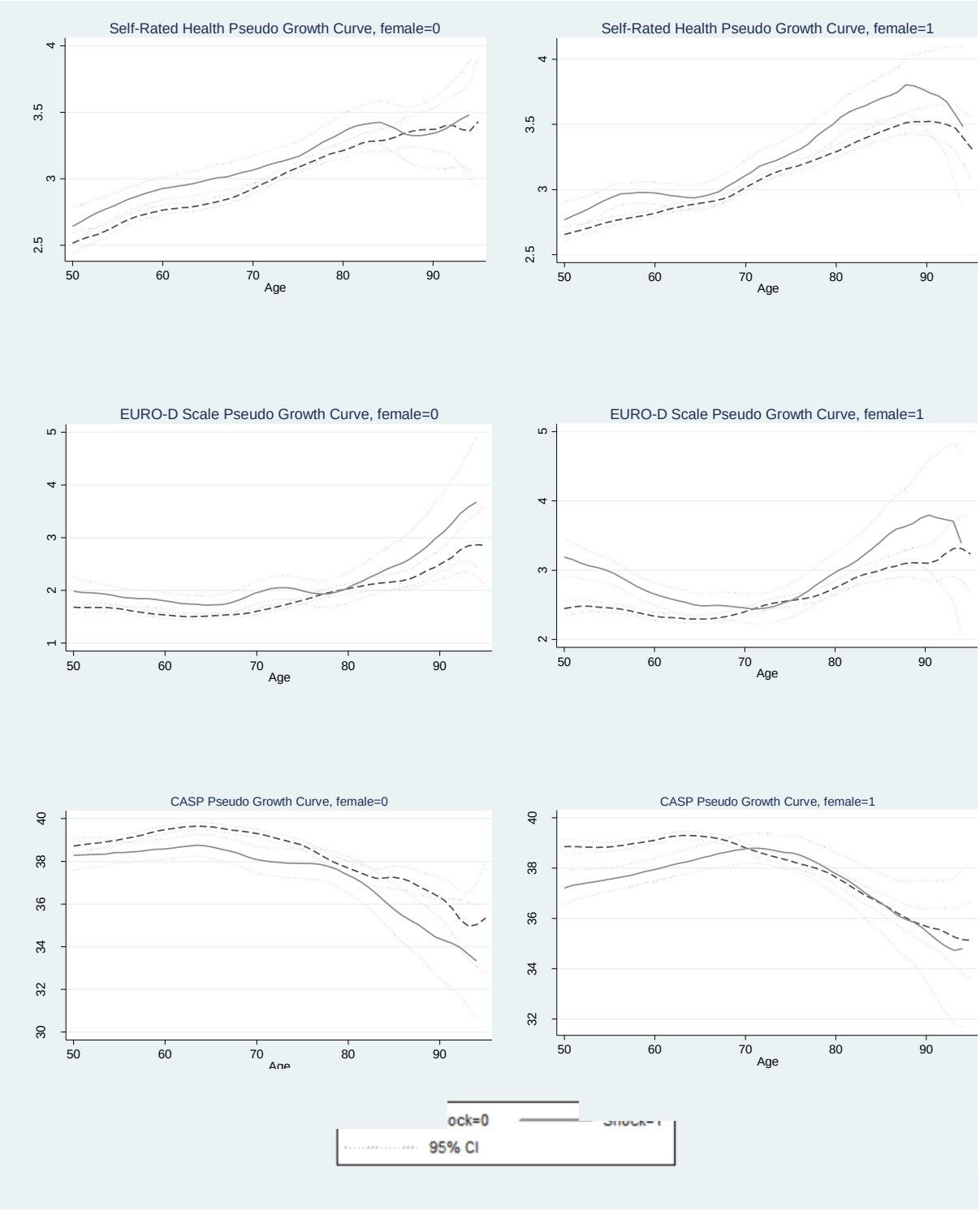

Figure 1: Pseudo Growth Curves

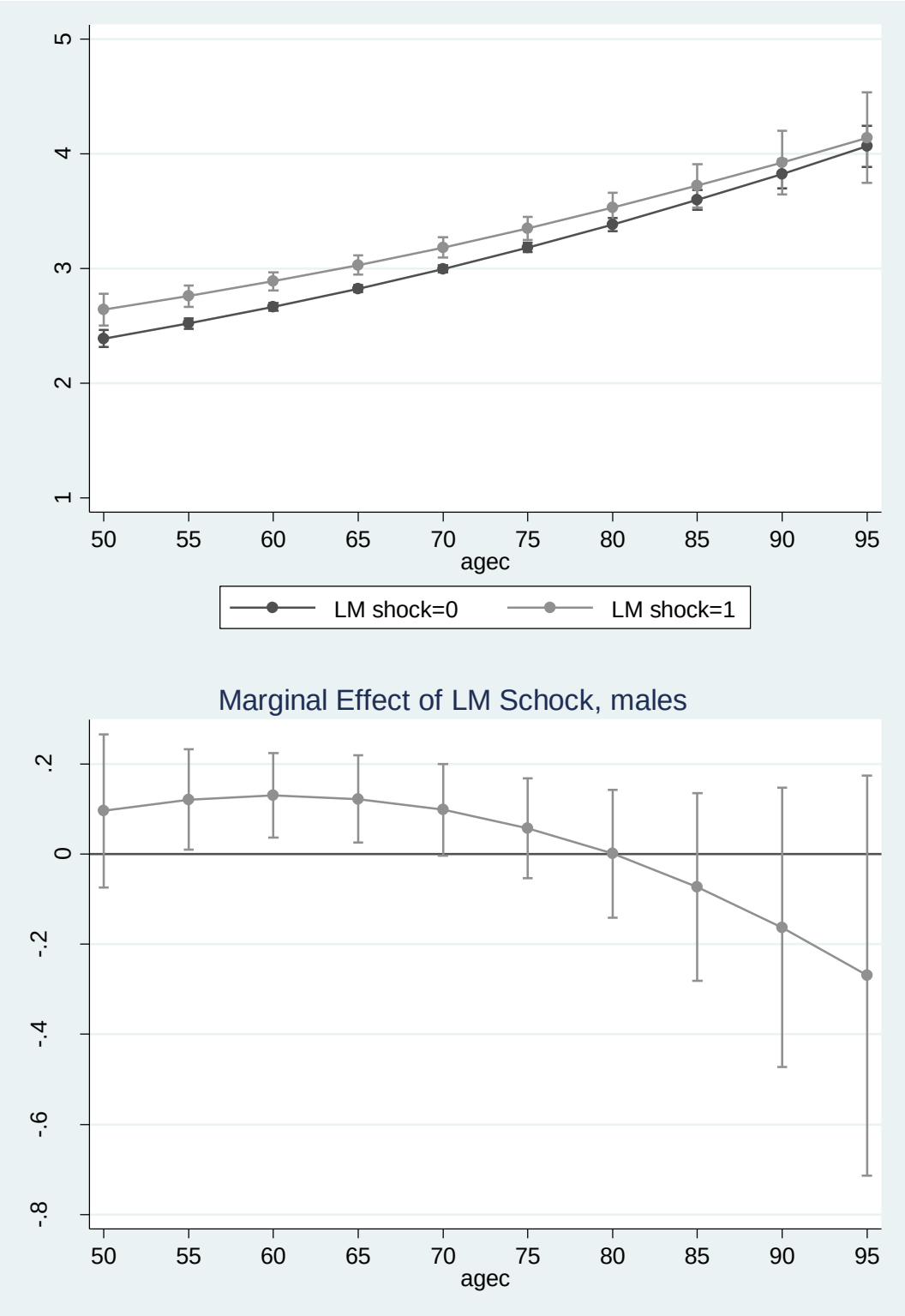

Figure 2: The impact of youth involuntary job loss on self-perceived health, males

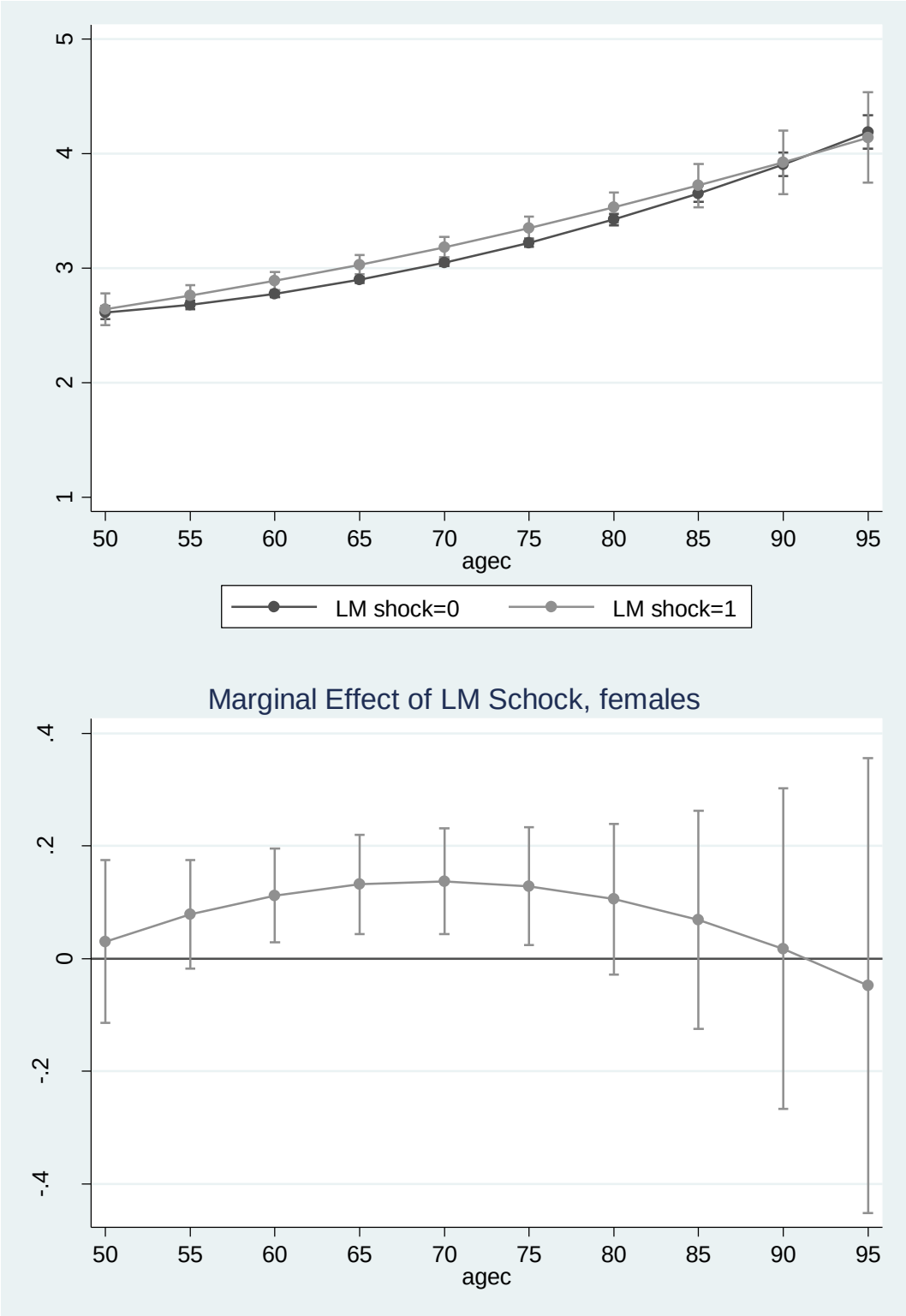

Figure 3: The impact of youth involuntary job loss on self-perceived health, females

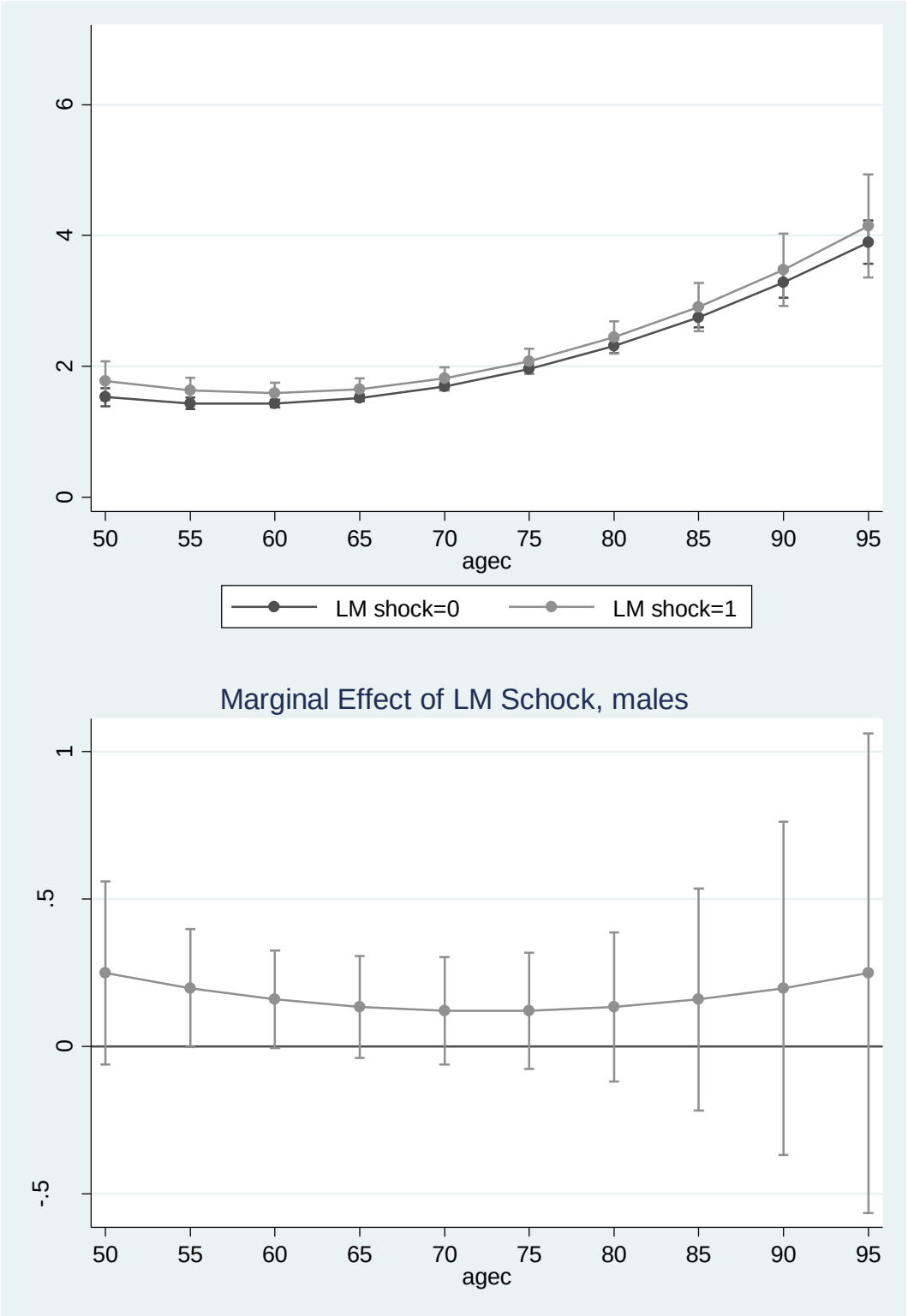

Figure 4: The impact of youth involuntary job loss on EuroD index, males

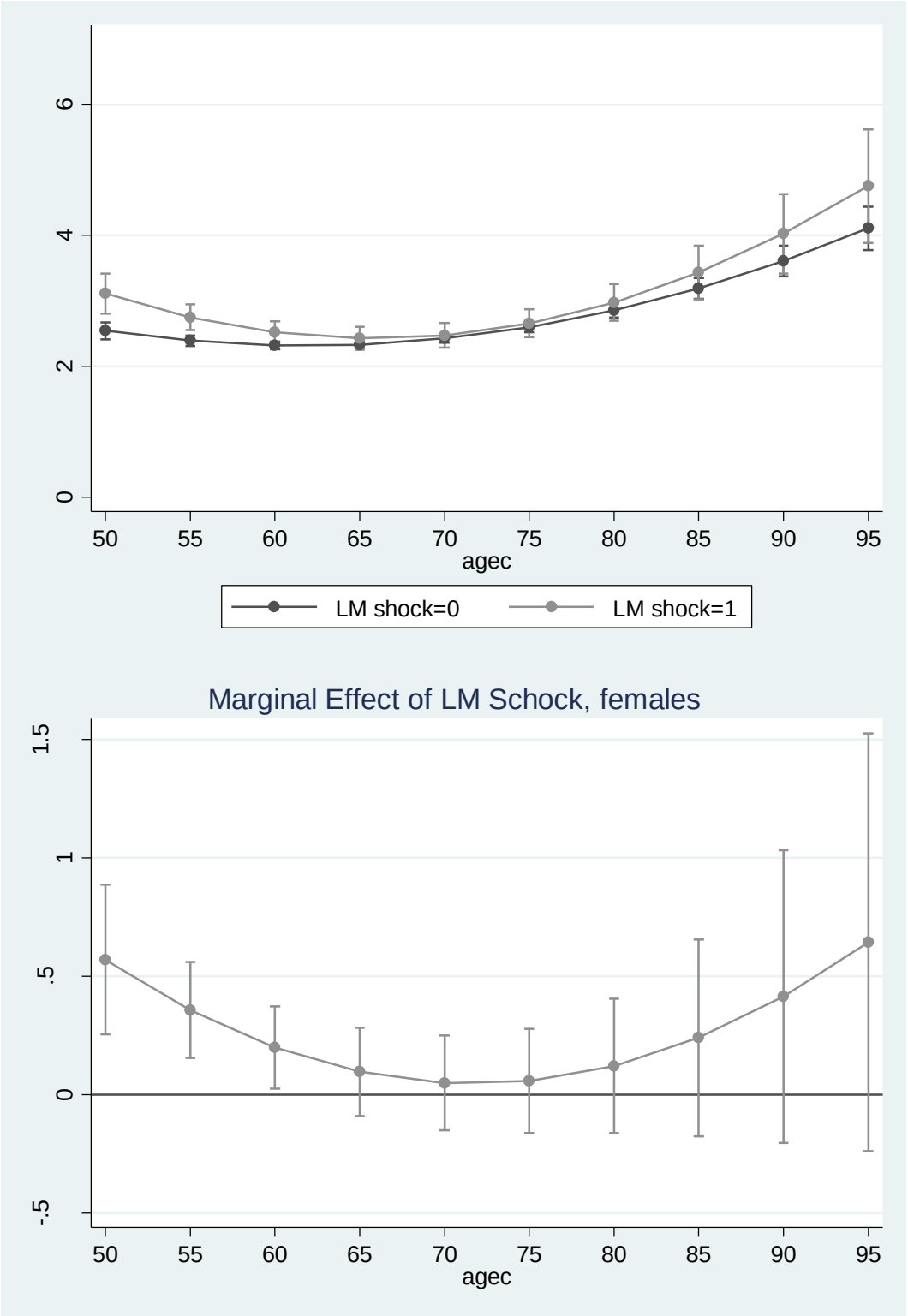

Figure 5: The impact of youth involuntary job loss on EuroD index, females

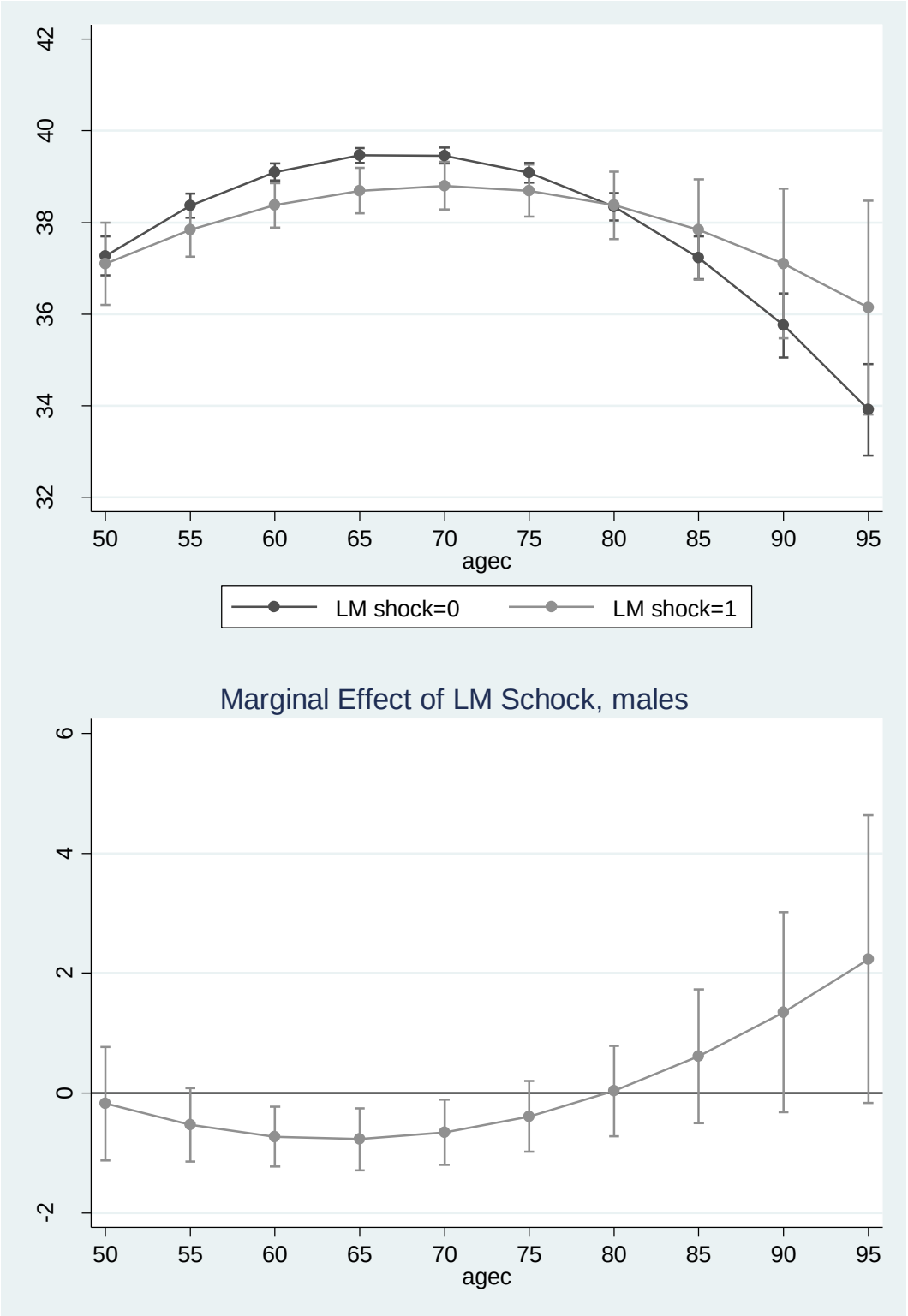

Figure 6: The impact of youth involuntary job loss on CASP index, males

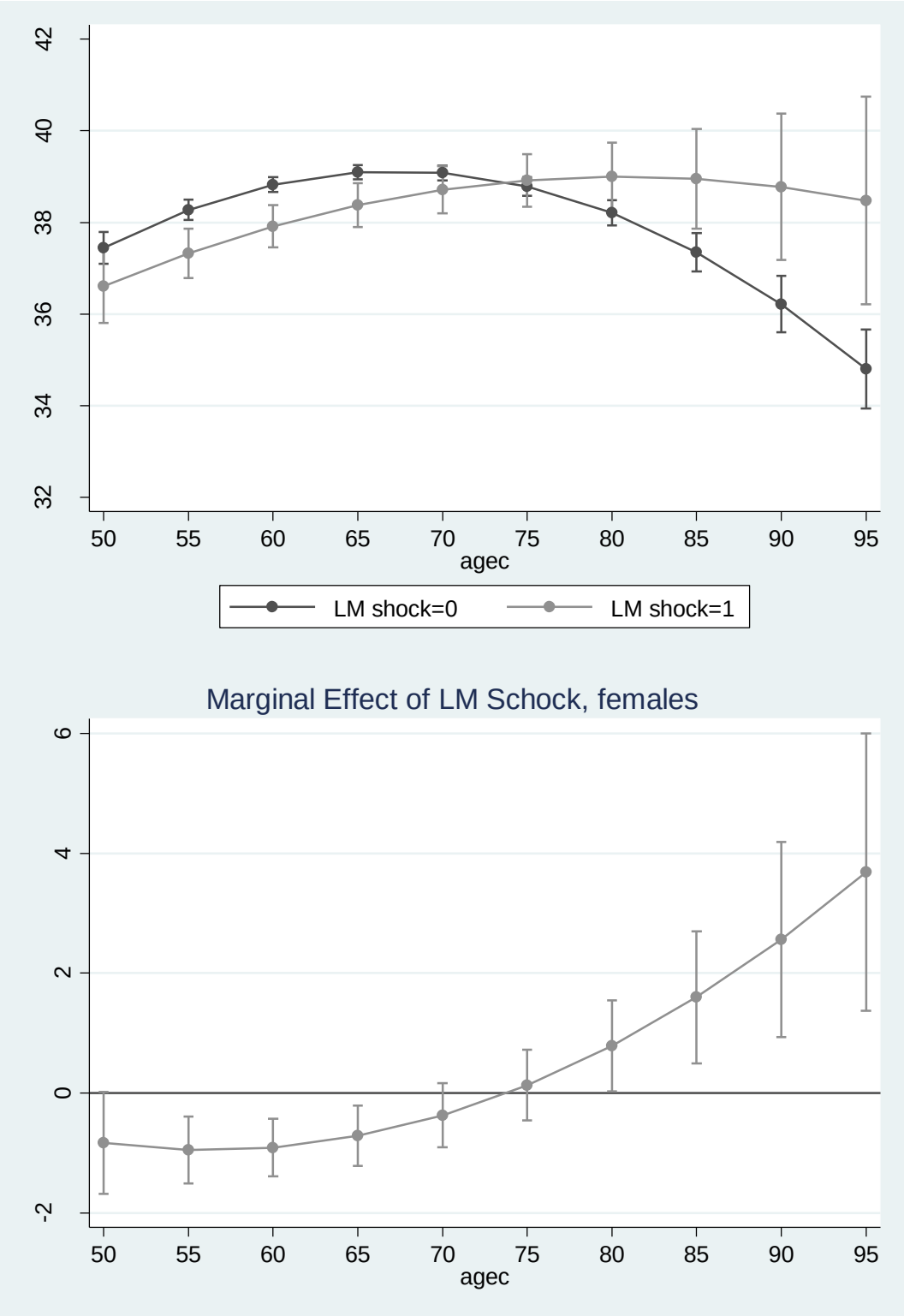

Figure 7: The impact of youth involuntary job loss on CASP index, females

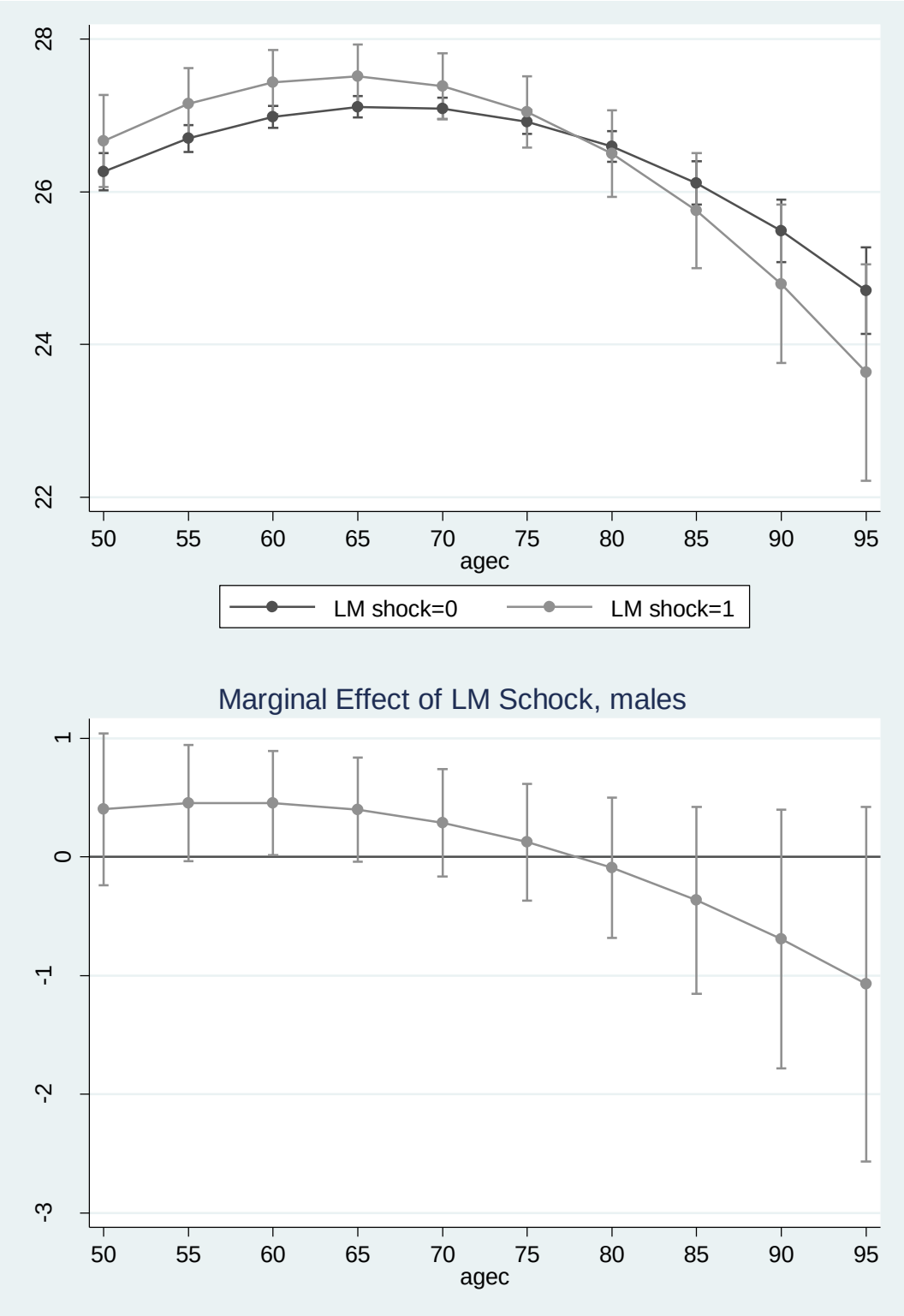

Figure 8: The impact of youth involuntary job loss on BMI, males

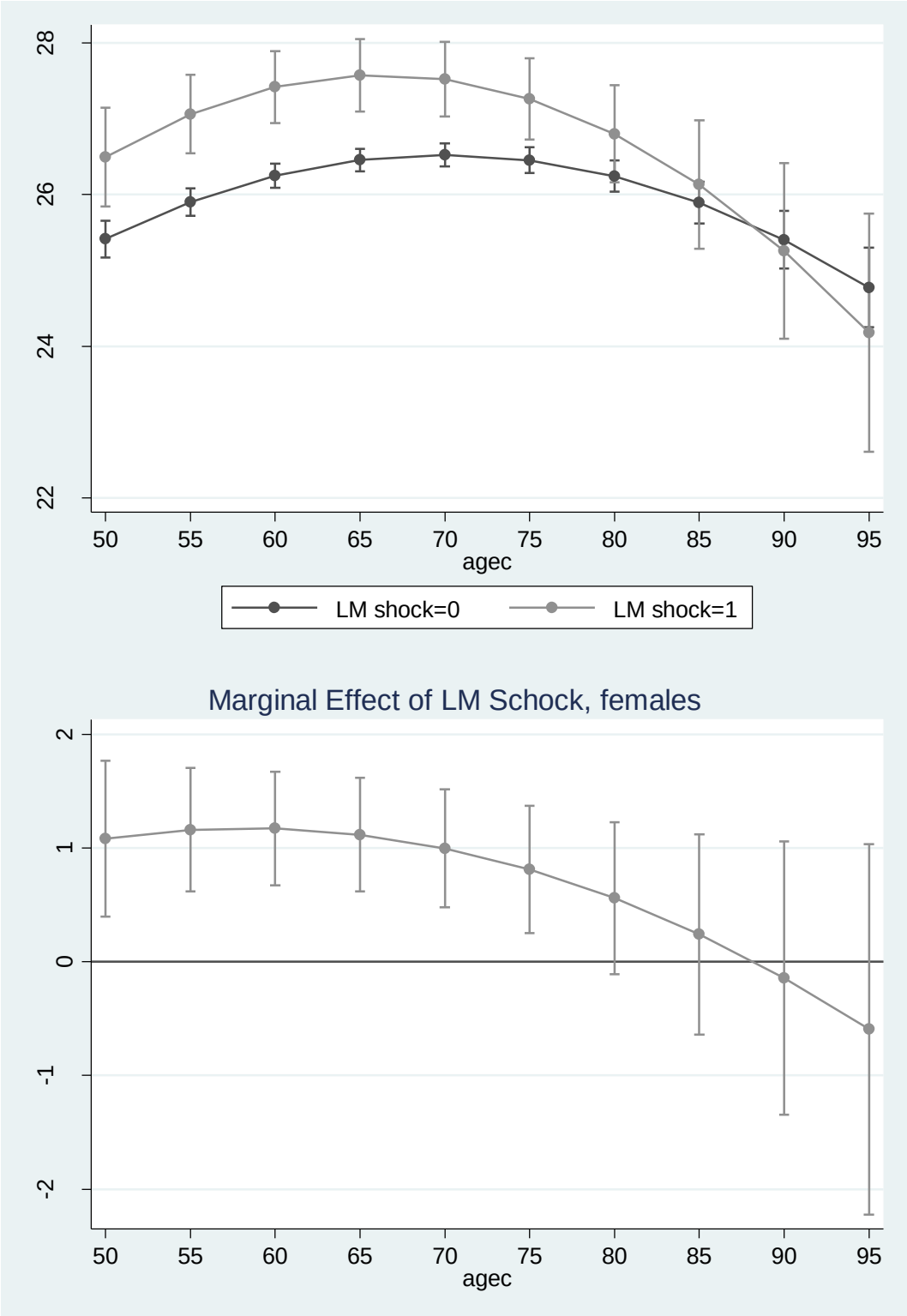

Figure 9: The impact of youth involuntary job loss on BMI, females

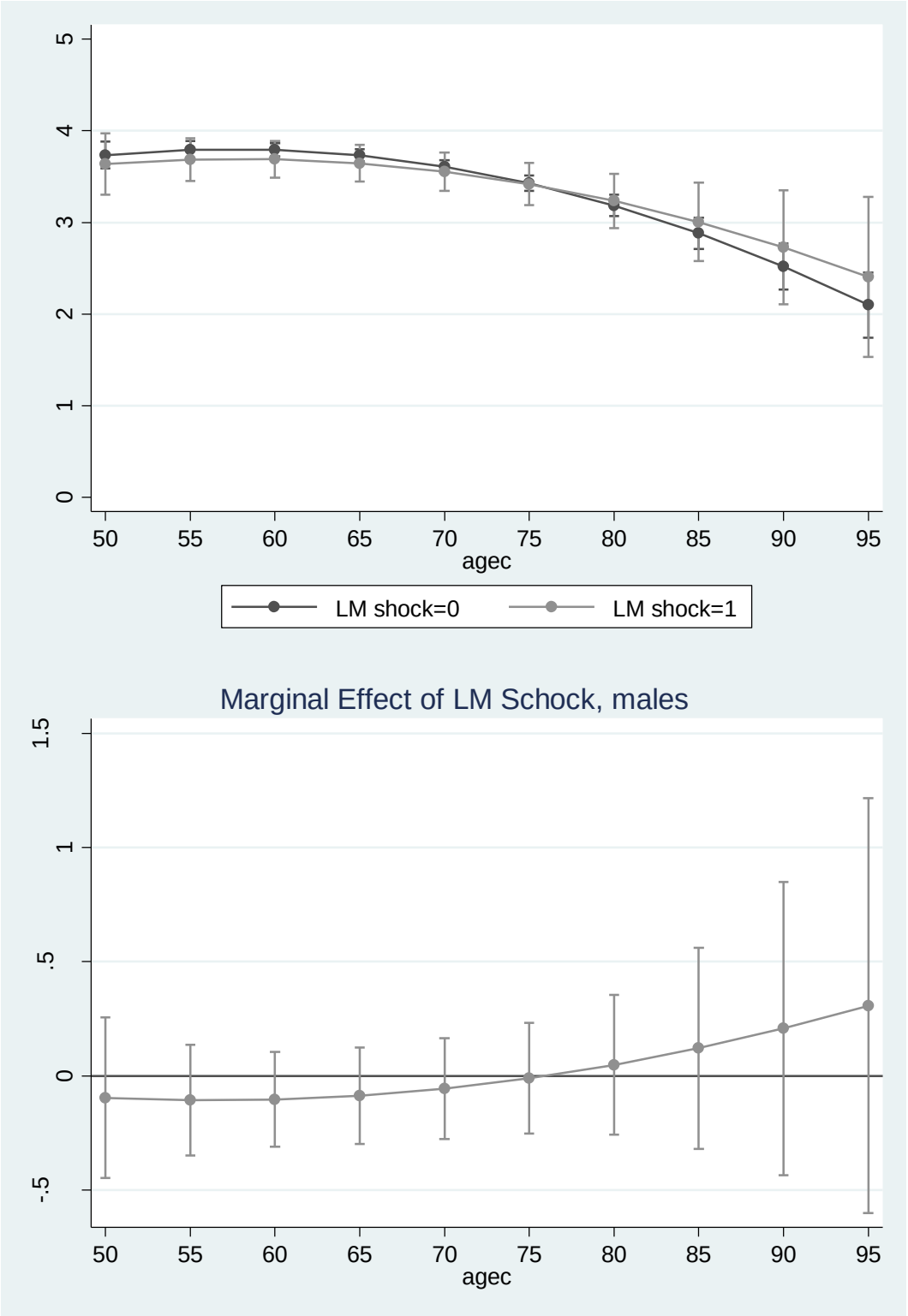

Figure 10: The impact of youth involuntary job loss on drinking frequency, males

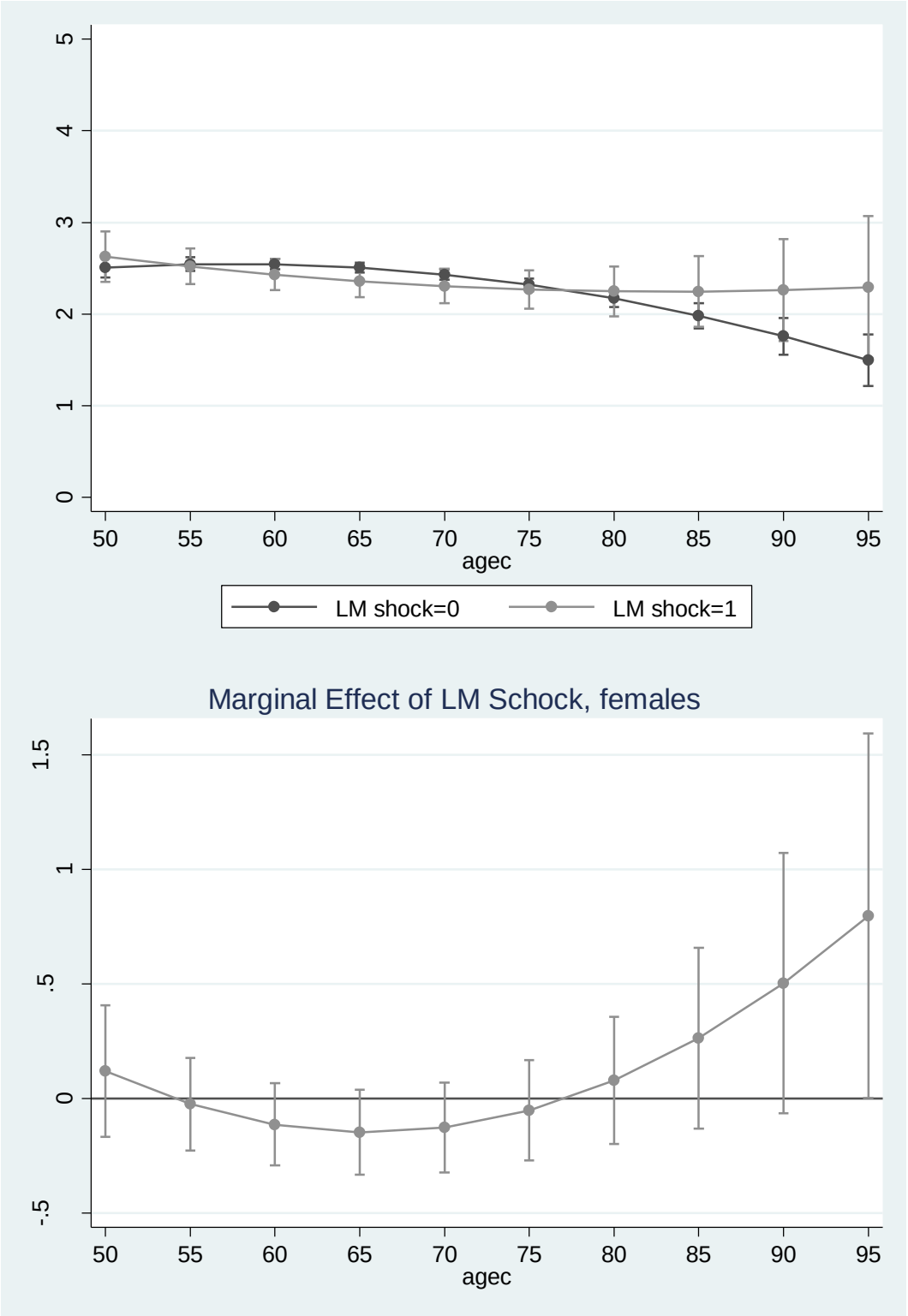

Figure 11: The impact of youth involuntary job loss on drinking frequency, females

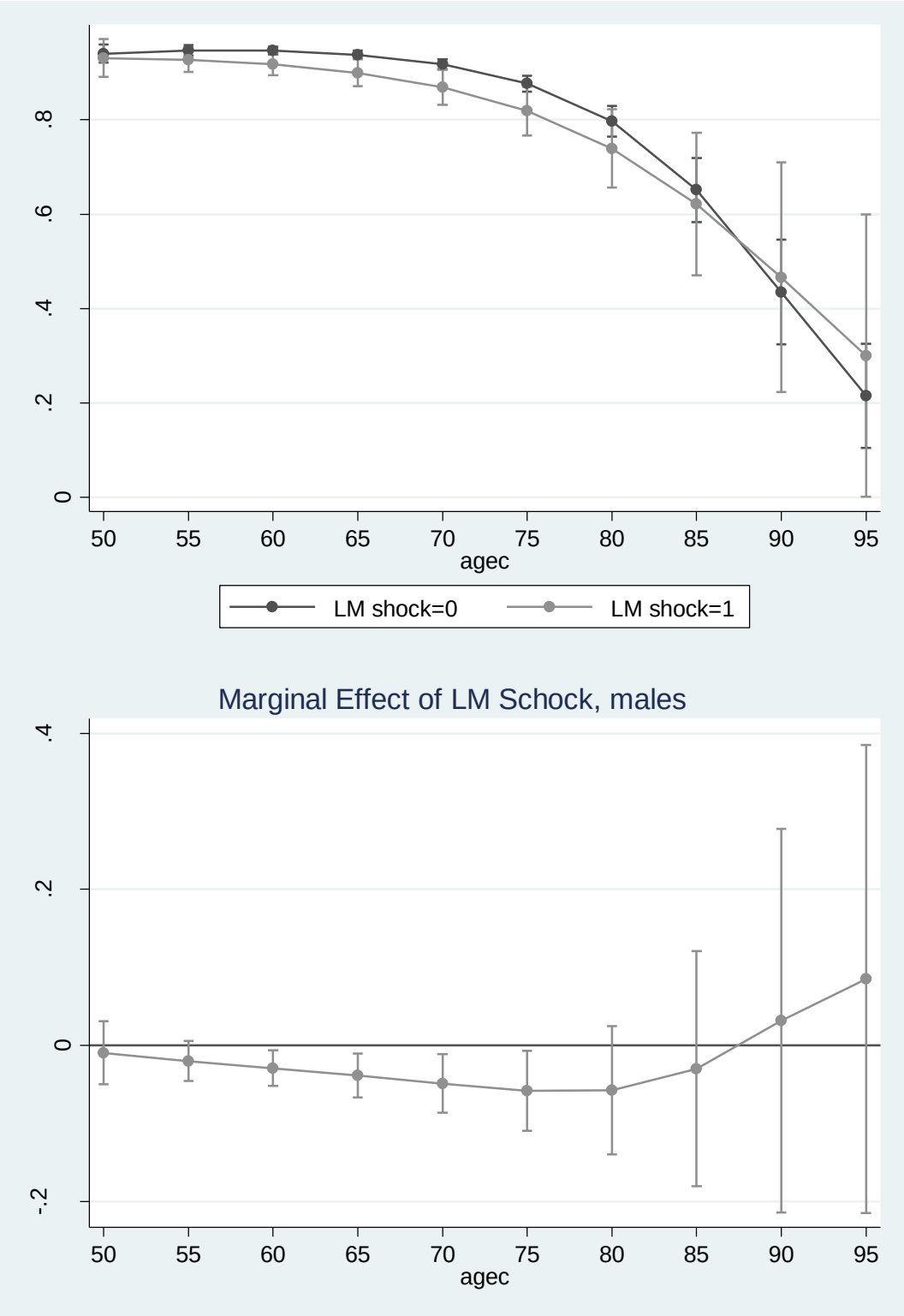

Figure 12: The impact of youth involuntary job loss on physical activity, males

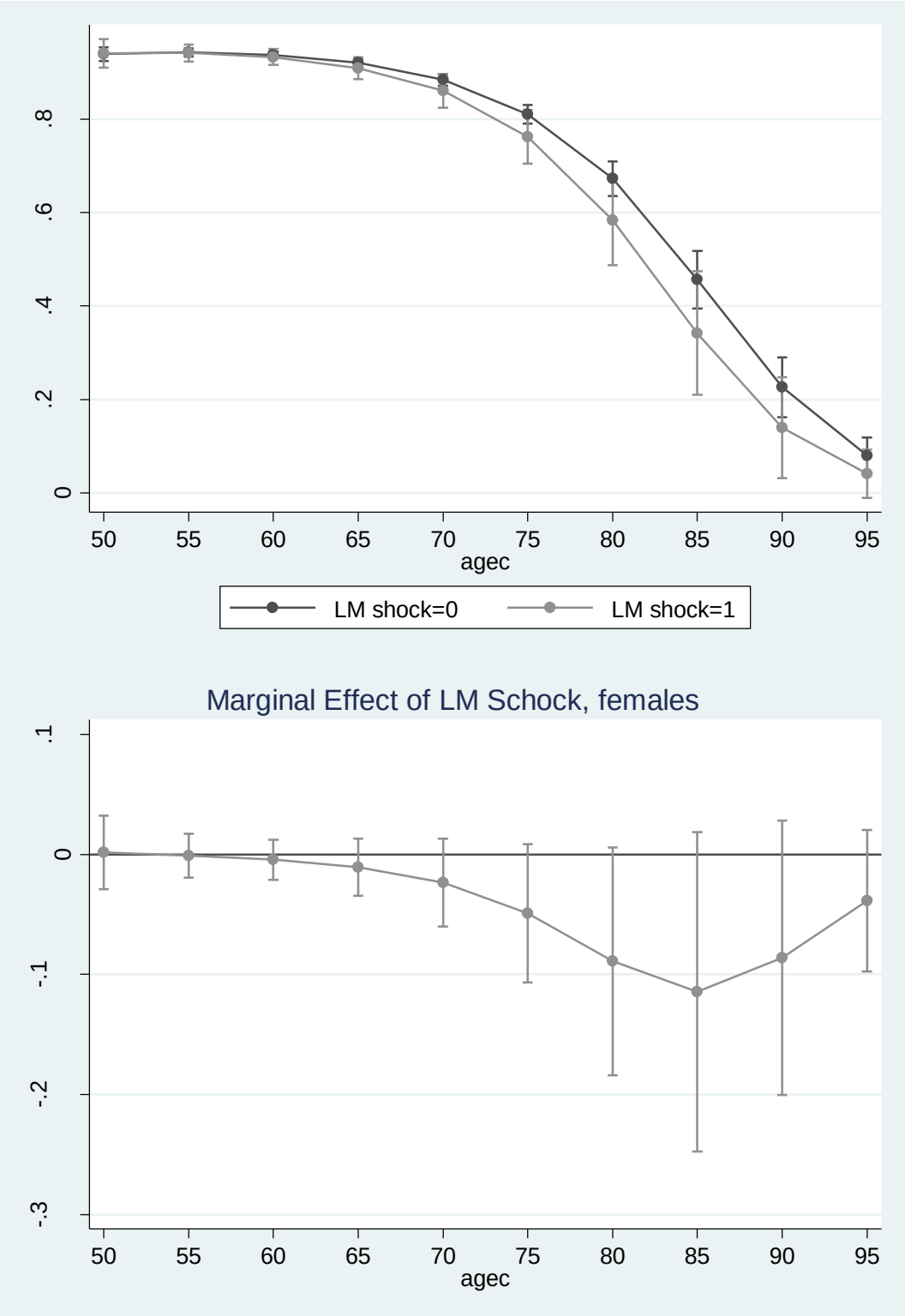

Figure 13: The impact of youth involuntary job loss on physical activity, females