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Joachim Merz

DIW SOEP

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Are Retirees More Satisfied?
Anticipation and Adaptation Effects of Retirement on Subjective Well-Being: A Panel Analysis for Germany

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September 2018

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Abstract
Quality of life and satisfaction with life are of particular importance for individuals as well as for society concerning the "demographic change" with now longer retirement periods. This study will contribute to the life satisfaction discussion and quantifies life satisfaction and pattern of explanation before and after such a prominent life cycle event, the entrance into retirement. In particular, with the individual longitudinal data and 33 waves of the Socio-Economic Panel (SOEP) and the appropriate microeconometric causal fixed effects robust panel methods we ask and quantify if actual life satisfaction indeed is decreasing before retirement, is increasing at the entrance into retirement, and is decreasing then after certain periods back to a foregoing level. Thus, we ask if such an anticipation and adaptation pattern– as known from other prominent events – is also to discover for life satisfaction before and after retirement in Germany.

Main result: Individual and family situation lift life satisfaction after retirement for many years, the (former) occupational situation, however, absorbs this effect both for pensioners and civil service pensioners. It remains only one period of improvement with close anticipation and adaptation at entering retirement but no furthermore significant change compared to pre-retirement life satisfaction. This holds for pensioners (German pension insurance, GRV) but there is no significant effect at all for civil service pensioners.

JEL: I31, J26, J14, J17, A13, C23

Keywords: *Retirement, **l**ife-satisfaction, happiness, retirement, anticipation and adaptation effects, fixed-effect regression, Socio-Economic Panel (SOEP), Germany*

Zusammenfassung
Lebensqualität und Lebenszufriedenheit ist für den Einzelnen wie aber auch für die Gesellschaft insgesamt vor dem Hintergrund des demographischen Wandels mit nun länger andauernder Phase nach dem Eintritt in den Ruhestand von besonderer Bedeutung. Die vorliegende Studie will zur Diskussion der Lebenszufriedenheit einen empirisch fundierten Beitrag leisten insbesondere die Lebenszufriedenheit vor und nach einem markanten Ereignis, dem Renteneintritt, quantifizieren und dafür Erklärungsmuster finden. Vor allem wird mit den individuellen Verlaufsdaten und 33 Wellen des Sozio-ökonomischen Panels (SOEP) und der mikroökonometrischen kausalen fixed effects robusten Panelanalyse analysiert, ob die individuelle Lebenszufriedenheit tatsächlich vor dem Renteneintritt absinkt, der Renteneintritt sie hochschnellen lässt und sie nach einer gewissen Zeit wieder auf das vorherige Niveau der Lebenszufriedenheit absinkt. Zu klären wird also zu sein, ob sich ein solches Muster herausschält und wie bedeutend Antizipation und Adaption – bekannt von anderen markanten Ereignissen – für die Lebenszufriedenheit vor und nach dem Renteneintritt in Deutschland sind.

Hauptergebnis: Individuelle und familiäre Faktoren erhöhen die Lebenszufriedenheit nach dem Renteneintritt für viele Jahre. Allerdings absorbiert die (vormalige) Arbeitssituation diesen Effekt sowohl für GRV Rentner als auch für Pensionäre (Beamte). Es verbleibt nur eine Periode der Verbesserung mit Antizipation und Adaption nahe dem Renteneintritt aber keine signifikante längere Änderung im Vergleich zur Lebenszufriedenheit vor dem Renteneintritt. Dies gilt für GRV Rentner, für Pensionäre wird kein signifikanter Effekt überhaupt feststellbar.

JEL: I31, J26, J14, J17, A13, C23

Schlagwörter: *Renteneintritt, Lebenszufriedenheit, Antizipations- und Adaptionseffekte, Fixed-Effects-Regression, Sozio-oekonomisches Panel (SOEP), Deutschland*

1 Introduction

Retirement and a longer individual life as a consequence of 'demographic change' have meant increasing attention in public discussions and economic and social sciences. So the average life expectancy has risen in Germany for example for men from 65 to 77 years since the 1960s and for women from 70 to around 82 years[1]. For the individual as well as for society the question as to the quality of life and life satisfaction in the longer period of life after retirement is one of special importance, a question we pursue in this study. And, there is a close correlation between life satisfaction and a longer life: "Older people who enjoy life stay in better shape longer" is a summary of the results of a recent British study by Steptoe et al. 2014. Thus, the life satisfaction and retirement topic requires particular attention.

This study contributes to the life satisfaction research by quantifying the individual life satisfaction situation before and after entry into retirement in Germany. In particular, individual longitudinal data of the Socio-Economic Panel (SOEP) and a corresponding causal microeconometric fixed effect robust panel analysis are used to analyze whether individual life satisfaction actually decreases before retirement as a result for instance of fatigue brought about by work, then almost as a release it soars in retirement, but after a certain period of time to drop back to the previous level of life satisfaction. We will investigate whether there is such a pattern of life satisfaction anticipation and adaptation, a pattern which is found in other situations of change, and how anticipation and adaptation are important to individual life satisfaction before and after entry into retirement in Germany.

Why is this question of anticipation and adaptation event effects, being temporary in nature, important? Because answers will help to qualify the design and the analysis of policy programs and purposes in general. In particular, with respect to retirement it will shed light on the so-called growing third phase of life which will be longer individually and larger by number of silver agers in society. In case and in particular if subjective well-being will not adapt or even will slow down then the individual living conditions of the elderly should require more political and individual attention than now. In addition to the policy argument: when anticipation is not controlled for in a regression type model then a large life satisfaction (say) gap between the period(s) before and becoming retired (say) may overestimate the event effect. Without controlling for adaptation a shorter adaptation process might be covered by a longer lasting average effect.

The current paper adds empirical findings to the existing literature on retirement and life satisfaction/subjective well-being by providing detailed anticipation and adaptation results with four pre-retirement periods and in particular with a long period after retirement with up to nine years and more distinct period information.[2]

The reminder of the study emblazes the background (chapter 2), discusses the empirical strategy (chapter 3) including the large data set of the Socio-economic Panel with 33 waves and the microeconometric causal model fixed effect robust specification and estimation, presents the

[1] Statistisches Bundesamt 2014, Bundesinstitut für Bevölkerungsforschung 2014

[2] This paper expands Merz 2015 among others by separately pension GRV and civil service pension estimates, more SOEP waves and enhancing post-retirement period effects.

results (chapter 4) and discusses and summarizes the findings with an concluding outlook (chapter 5).

2 Background and Motivation

Although subjective well-being/life satisfaction/happiness in welfare measurement is receiving increasing political attention [3] with a growing field of research, [4] there are only few German and international empirical studies on life satisfaction and retirement. Yet international studies include Calasanti 1996, who investigates gender-specific influence on life satisfaction in retirement in America and discusses theoretical approaches such as crisis and continuity theories. Nimrod 2007 pronounces four explanations for the relationship between life satisfaction and retirement: "reducers, concentrators, diffusers and expanders" and finds in Israel that the expanders and the concentrators enjoyed a significantly higher life satisfaction. Calvo et al. 2014 study gradual retirement (restricted to one year before and after) and its effect on happiness in the USA and find that transition as chosen or forced matters. Horner 2014 compares the relationship between retirement and subjective well-being for 14 Western European countries, the United Kingdom and the USA. Her causal evaluation with cross-sectional data shows a positive subjective well-being effect that fades over a few years. Horner (2014, 126-128) also provides further theories and evidence on subjective well-being and retirement.[5]

In Germany Börsch-Supan and Jorges 2006 indeed find a relationship between early retirement and subjective well-being. Retirement as a gain in happiness or crisis is the topic of Mayring 2000 in a study based on 329 standardized interviews. The result: retirement in general is positive but shows inter-individual differences. Another approach measuring retirement influence on the standard of living provide Dudel et al. 2013. They raise the question how much retirement income is needed in order to maintain one's living standard at old age. With data of the German Socio-Economic Panel (SOEP) they obtain a required net replacement rate of about 87% for the year of entry into retirement with a slightly decline over the retirement period.

Other current studies on life satisfaction in Germany do not focus on retirement but are connected with: Heidl et al 2012 for example have analysed general life satisfaction in Western Germany with cross-sectional SOEP data, or Baetschmann 2012, who also used SOEP data to investigate life satisfaction over the human lifecycle. Subjective well-being of the elderly is the focus of institutional studies like the Generali old age study (e.g. 2013) in Germany.

The analysis in our study on life satisfaction retirement effects focuses on a possible anticipation before and adaptation effect after. Anticipation describes changes in the behaviour in the light of a coming event. Adaptation describes a situation where an event only produces a contemporaneous and not lasting effect progressively dropping back to the pre-event situation.

[3] See Layard 2006 and his article "Happiness and Public Policy" or the work of the Enquete Commission of the German Federal Parliament "Growth, Wellbeing and Quality of Life" 2013.

[4] Diener et al. 1999 with an overview of the last 30 years on subjective welfare, Easterlin 2001 on the relationship of income and subjective well-being; see also Clark and Oswald 1995 and Diener and Biswas-Diener 2002, and recently Clark 2018 about four decades of the economics of happiness.

[5] That retirement also might have impact to others, is shown by Bertoni and Brunello 2014, for example, about causal effects of husband's retirement on the mental health of wives in Japan ("Retired Husband Syndrom").

An *anticipation* effect before an event is well documented in labour market research and is known there as the Ashenfelter dip (Ashenfelter 1978): Neglecting a decline in earnings before a training program on earnings leads to an overestimation of the job training effect. The role of anticipation and adaptation concerning job satisfaction has been demonstrated by for example Hanglberger 2013 and Hanglberger and Merz 2015. Hanglberger's 2013 results among others show strong anticipation effects for temporary employment effects and a strong negative effect on job satisfaction. There is no adaptation to rotating shift work, little adaptation to temporary employment, but full adaptation to flextime regulations in Germany. With respect to job satisfaction when changed to self-employment Hanglberger and Merz 2015 find besides the pre-event period no further anticipation effect of becoming self-employed but a weak positive effect of self-employment with adaptation to job satisfaction before. According to their results: previous studies at least overestimate possible positive effects of self-employment on job satisfaction.

The literature refers the phenomenon of *adaptation* to a "hedonic treadmill model" (Brickman and Campbell 1971, Diener, Kahnemann and Schwarz 1999, Diener et al. 2006), in which after a rise in life satisfaction it sinks to the previous pre-event level as a result of disillusionment in everyday life. In a recent survey Clark 2018 (and 2016) summarized empirical results concerning adaptation and anticipation and found these processes and particular for adaptation with respect to marriage, children, divorce, widowhood and others; see also the job satisfaction adaptation results above. But there are other events like unemployment or disability where adaptation is not visible. Clark's conclusion: "The evidence so far suggests that adaptation is not a universal truth" (Clark 2018, p. 256). Concerning retirement, anticipation and adaptation the previously mentioned studies and in particular the study by Horner 2014 confirm adaptation to the initial situation. Regarding the discussion about a higher retirement age, a later retirement would be relatively neutral concerning the subjective well-being over the long term (Horner 2014).

In summary, though there are studies about our topic the question remains still open if and what kind of anticipation and adaptation of life satisfaction in retirement is revealing. With the following detailed analysis we provide an empirically based answer in Germany.

3 Empirical Strategy

Dataset: The Socio-Economic Panel

Our data base is the German Socio-Economic Panel (SOEP), a wide-ranging representative longitudinal study of private households, located at the German Institute for Economic Research, DIW Berlin. Every year in Germany around 30,000 respondents in nearly 11,000 households are interviewed now by Kantar Public Germany.

The data provides information on all household members, consisting of Germans living in the Old and New German States, foreigners, and recent immigrants to Germany. The Panel was started in 1984 (www.diw.de/soep, Goebel et al. 2018).

Our panel analysis refers to the years 1984 to 2016 with 33 waves as SOEP-long data and thus includes information on both the new and the old federal states.[6]

In particular the SOEP asks about satisfaction in relation to a number of specific topics, such as income, as well as about more general questions concerning life satisfaction. We use information about general life satisfaction that is collected from all respondents with a scale from 0 (completely dissatisfied) to 10 (completely satisfied).[7] Such a question and its operationalization are broadly applied in the happiness/satisfaction literature (e.g. Clark et al. 2008, Frey and Stutzer 2005).

The SOEP questionnaire information about German retirement/pension payments encompasses current summarized retirement/pension payments as well as detailed payments to different insurance situations. We focus on the detailed payments in the SOEP long data set which allows separate analyses of compulsory old age security pension from the German Pension Insurance (Gesetzliche Rentenversicherung, GRV) as well as of the civil service pension scheme (Beamtenversorgung).[8] The detailed retirement/pension information, however, refers to the survey year before. With the intention to correspond the survey years' pension with the life satisfaction and socio-economic control information we transformed pension information by one survey period. Now all life satisfaction and control information in period t (2014, say) refers to the lagged pension information of period t+1 (2015, say). Though the survey and socio-economic situation of period t+1 (2015) might be different to period t (2014, because of e.g. attrition, deaths etc. with the effect of losing data, however the subjective well-being information now corresponds to all socio-economics and its pension information that year.

[6] Socio-Economic Panel (SOEP), data for years 1984-2016, version 33, SOEP, 2017, doi:10.5684/soep.v33.

[7] SOEP Questionnaire: "In conclusion, we would like to ask you about your satisfaction with your life in general. Please answer on a scale from 0 to 10, where 0 means completely dissatisfied and 10 means completely satisfied."

[8] SOEP Questionnaire 2013: "Who pays your retirement / pension and what were the monthly payments in 2012? Please state the gross amount, excluding taxes. If you receive more than one pension, please mark each that applies. If you do not know the exact amount, please estimate:"
SOEP long variable plc0223, German Pension Insurance (Deutsche Rentenversicherung, formerly LVA, BfA, Knappschaft), own retirement/pension.
SOEP long variable plc0236, civil service pension scheme (Beamtenversorgung).
Thus "pension" is used in our study for old age security payment by the German Pension Insurance, and civil service pension for a payment as a civil servant pensioner.

Though the SOEP data in general starts with 1984, retirement/pension information is only available 1986 and later. Together with the delayed pension information from all available 33 SOEP waves (1984-2016) there remains 31 waves (1985-2015) in the further microanalyses.

Model specification

In our study we are investigating whether the hypothesis of a permanently positive/negative retirement effect on life satisfaction would be still supported when anticipation and adaptation effects on subjective well-being are also included. We are testing the empirical relevance of two main questions:

- Is there an anticipation effect that influences the assessment of life satisfaction in retirement and
- Is there a long-term retirement effect on general life satisfaction, or does general life satisfaction adapt to the level before retirement?

Illustration of anticipation and adaptation

Figure 1 illustrates retirement effects on life satisfaction without and with anticipation and adaptation. As long as there is no anticipation or adaptation (Figure 1a) ΔS_{fe} will measure the long-term retirement effect in a regression type model between the before $\overline{S}_0$ and after $\overline{S}_1$ retirement life satisfaction level. Most empirical analyses based on cross sections or using fixed-effects models are interested in this difference between $\overline{S}_0$ to $\overline{S}_2$, the permanent or long term change in satisfaction caused by an certain incentive.
The situation is different when temporary effects of anticipation and adaptation are considered. Figure 1b shows negative anticipation and a temporary positive effect after retirement.[9] In this scenario a negative *anticipation* effect lowers average satisfaction prior to T (begin of retirement) from $\overline{S}_0$ to $\overline{S}_1$ and the estimated coefficient underestimates the absolute value of the change in satisfaction to $\overline{S}_{min}$. At the same time, neglecting this decline anticipation would lead to an overestimation of the absolute retirement effect. If we observe a*daptation,* analogue the anticipation case the estimation will result in comparing satisfaction levels $\overline{S}_2$ and $\overline{S}_0$ with an underestimation of the absolute value of the change in satisfaction to $\overline{S}_{max}$. $\overline{S}_1$ and $\overline{S}_2$ are mixtures of short-term effects and the long-term baseline satisfaction level $\overline{S}_0$. Thus the estimation will yield a positive value for ΔS_{fe} when retirement does not cause long-term changes in satisfaction.

[9] Furthermore graphic illustrations of different anticipation and adaptation paths can be found in Hanglberger 1012, 139 pp.

Figure 1: Illustration of retirement estimation effects

Figure 1a: Estimation without anticipation and adaptation

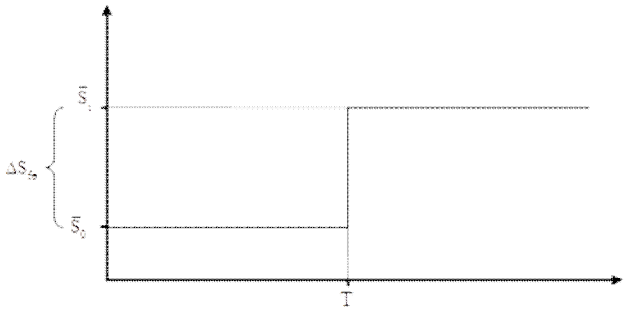
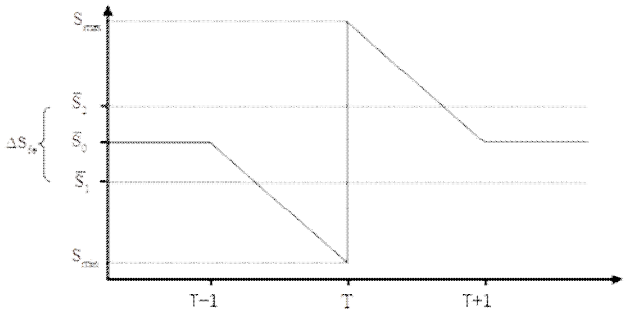


Figure 1b: Estimation with negative anticipation and full adaptation



Source: Hanglberger 2013, 140 and Hanglberger and Merz 2015, 290; x-coordinate: time; y-coordinate: life satisfaction.

Hence, even panel analyses yield distorted results when anticipation and adaptation effects exist but are not explicitly accounted for. Studies of causal effects on satisfaction or other outcomes of that kind should therefore always test for anticipation and adaptation.

Modelling anticipation and adaptation

Modelling anticipation and adaptation effects we use lag and lead variables in the specification of the following microeconomic model. *Lag variables* indicate if and since when an individual is in retirement; the data even allows for a 9 and more years in retirement with 0-1 year, 1-2 years, 2-3 years, 3-4 years, and so on till 9 years or more (dummy variables: $f_{it,T}$, $f_{it,T+1}$, $f_{it,T+2}$, $f_{it,T+3}$, and so on till $f_{it,T+9+}$).

Lead variables describe if a person will retire with pension benefits in 0-1 year, 1-2 years, 2-3 years or 3-4 years (dummy variables: $f_{it,T-1}$, $f_{it,T-2}$, $f_{it,T-3}$, $f_{it,T-4}$) ahead. The dummy variable $f_{it,T-2}$ for example would receive the value 1 (otherwise 0) if the individual will retire in two years. Similarly, $f_{it,T+2}$ stands for the situation two years after retirement. The estimated regression coefficients then quantify each of the two effects,[10] which will allow us to capture all possible paths of life satisfaction before and after retirement.

[10] This model specification is also successfully used in Frijters et al. 2011, Clark et al. 2008 or Hanglberger 2013, Hangelberger and Merz 2015.

As already mentioned we use an 11-point satisfaction scale as an approach to measuring subjective well-being. This is an ordinal scale that largely fits (generalized) ordered logit or ordered probit models (Greene and Henscher 2010, Long and Freese 2006) but not traditional linear regression models. A further problem is the interpersonal (non) comparability with individual well-being (utility), which could be socially conditioned or of genetic nature (De Neve et al. 2010, Hamermesh 2004). Furthermore problems arise when explanatory factors are not observable or not available (such as genetic factors) and are not part of a regression model but influence both the other factors as well as the dependent variable (omitted variable bias). This also holds for the problem of self-selection and causality, which in our case could be a cohort-specific underlying attitude to work and retirement.

Consequences for our model specification

Interpersonal comparability and unobserved effects, such as genetic factors, can be at least partially if not wholly accounted for by means of fixed-effects regression models which are based on intra-individual rather than inter-individual differences like in cross-section models. That is, the same person's history explains the development over time.

Under the causality/program evaluation perspective (e.g. Heckman, Lalonde and Smith 1999, Angrist and Pischke 2009) with becoming retired is interpreted as the treatment effect, the fixed effects regression approach solves the selection/omitted variable bias problem by including time invariant unobserved individual heterogeneity. Since retirement (the treatment) with respect to the public pension setting here is exogeneous and not self-selected, the selectivity bias, however, should not be important.

A plausible solution to the ordinality problem in the context of fixed-effect regression models would be an ordered probit fixed-effect model, which however leads to biased results (Greene 2002). A probit-adapted ordinary least squares model (van Praag and Ferrer-i-Carbonell 2008) also requires additional assumptions. Since Ferrer-i-Carbonell and Frijters 2004 have also only found minimal differences in measuring well-being cardinally or ordinally, we use linear fixed-effects models for the panel estimation (e.g. Wooldridge 2002).

Microeconometric specification and estimation

With the panel-specific fixed-effects approach we now analyze four models that are based on two basic models: estimation of the effect of retirement on general life satisfaction with and without further socio-economic explanatory factors (control variables). Without the control variables the general effect of retirement, so to speak, is measured. With the control variables the person-specific effects on life satisfaction are controlled for and quantified with the possibility that these factors might even relativize retirement as the dominant explanation for life satisfaction.

Model I without anticipation and adaptation effects

The basic fixed-effects panel regression model is formulated using

$$S_{it} = f_{it}\,\gamma + \mathbf{x}_{it}^{'}\boldsymbol{\beta} + a_i + \varepsilon_{it} \qquad \text{(I)}$$

with S_{it} being subjective satisfaction of individual i at time t. f_{it} is the dummy variable for retirement (f_{it}=1) and the phase before (f_{it}=0). γ is the estimated regression coefficient that measures the average retirement effect on life satisfaction. $\boldsymbol{x}_{it}$ is the vector of the socio-economic control variables and $\boldsymbol{\beta}$ the estimated coefficient vector of the strength of the respective influence variables. a_i is the time invariant individual effect (individual heterogeneity) and ε_{it} is the error term.

Model Ia then is the only one to have the retirement dummy and measures the general retirement effect. Model Ib includes the control variables as specified in Model I.

Model II with anticipation and adaptation effects

Model II includes anticipation and adaptation effects and is formulated using

$$\begin{aligned} S_{it} = {} & f_{it,T-4}\gamma_{T-4} + f_{it,T-3}\gamma_{T-3} + f_{it,T-2}\gamma_{T-2} + f_{it,T-1}\gamma_{T-1} + f_{it,T}\gamma_{T} \\ & + f_{it,T+1}\gamma_{T+1} + f_{it,T+2}\gamma_{T+2} + f_{it,T+3}\gamma_{T+3} + f_{it,T+4}\gamma_{T+4} + f_{it,T+5}\gamma_{T+5} \\ & + f_{it,T+6}\gamma_{T+6} + f_{it,T+7}\gamma_{T+7} + f_{it,T+8}\gamma_{T+8} + f_{it,T+9+}\gamma_{T+9+} + \mathbf{x}_{it}'\boldsymbol{\beta} + a_i + \varepsilon_{it} \end{aligned} \qquad \text{(II)}$$

with $f_{it,T-4}$ to $f_{it,T+9+}$ being dummy variables (0,1), whereby 1 shows that a person is in retirement, how long (s)he has been in retirement or how many years until (s)he retires. Anticipation is shown by $f_{it,T-1}$, $f_{it,T-2}$, $f_{it,T-3}$ and $f_{it,T-4}$ and adaptation by $f_{it,T+1}$, $f_{it,T+2}$, $f_{it,T+3}$, etc. till $f_{it,T+9+}$. The dummies are constructed that only one of the dummies can be 1; all of the others are 0. If a person is neither in retirement nor retiring within the next four years, then all of the dummies are 0. This allows the regression coefficients to be interpreted with reference to those years in which a person is not in retirement or is not planning on retiring in the next four years. The estimated coefficient, for example γ_T is ceteris paribus the average difference of the life satisfaction of persons who are in the first year of retirement in comparison to the time when they were not retired or planning on retiring in the next four years.
As in Model I, Model IIa is the model without and Model IIb is the model with socio-economic control variables. Table 1 gives an overview of the estimated regression models.

Table 1: Overview of the estimated regression models

Model	Retirement	Control
Ia	dummy	–
Ib	dummy	yes
IIa	anticipation and adaptation	–
IIb	anticipation and adaptation	yes

Note: See Appendix 1 for the list of socio-economic control variables

4 Results

Retirement and pension GRV scheme

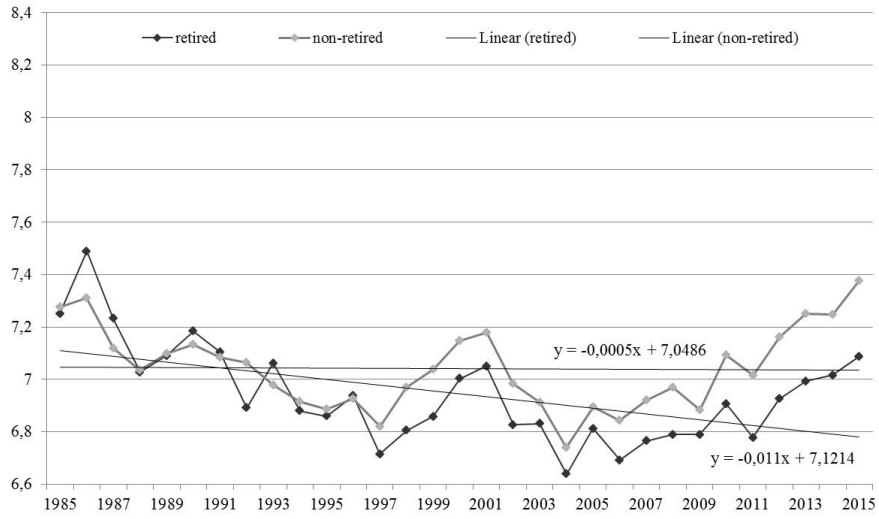
Pensioners under the GRV scheme – compared to civil service pensioners – face different work-life conditions and old age security systems in Germany. The question therefore arises if there are also different life satisfaction consequences for these two important groups of retirees. We analyze both groups separately and first discuss results for GRV pensioners followed by results for civil service pensioners.

Description – German Pension Insurance (GRV) and life satisfaction aggregated

Let us start with the description of the overall life satisfaction situation and its development with respect to pension out of the German Pension Insurance (GRV). Surprisingly, pensioners are significantly *less* satisfied with their life situation altogether from the mid 1980ies to 2015 than non-pensioners (mean/std. deviation: pensioners: 6,914/1,951; non-pensioners: 7,035/1,804.

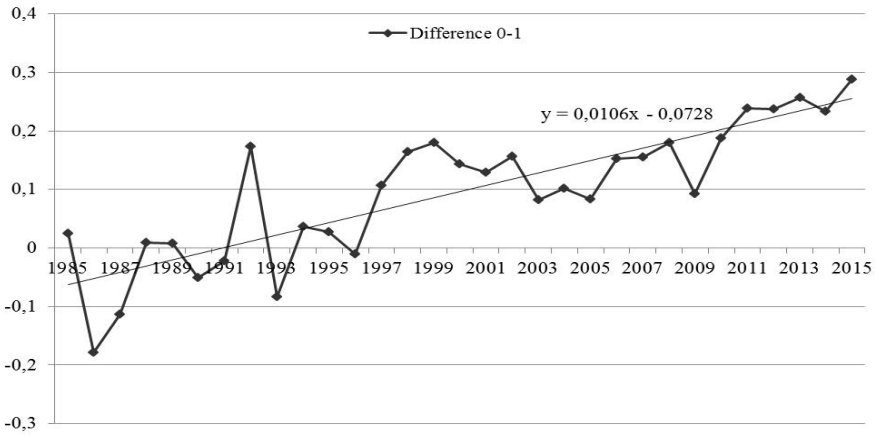
A closer look to its timely development (Figure 2) shows some u-shaped relationship but where at the expected u-shaped "valley" around 2001 there is a "hill" descending then till 2004 and an increasing branch from there on. Though the general development in its ups and downs is similar for pensioners and non-pensioners over all periods, there are distinct periods. From 1985 till 1997 we find positive and negative life satisfaction differences with no specific pattern. However, starting 1997 pensioners are less satisfied in all following years where the gap to non-pensioners' life satisfaction remarkably is significantly growing (gap regression, $p<0.001$, Figure 3).

Figure 2: Average life satisfaction retired (with pension GRV) and non-retired (no pension GRV), Germany 1985 to 2015



Source: SOEP Socio-Economic Panel data 1985-2015; weighted data.

Figure 3: Difference of average life satisfaction between retired (with pension GRV) and non-retired (no pension GRV), Germany 1985 to 2015



Source: SOEP Socio-Economic Panel data 1985-2015; weighted data.

The growing life satisfaction gap is interrupted only by the financial and economic crisis 2007/2008 which strucks the non pensioners in particular.

Life satisfaction before and after retirement is the focus of our study. Figure 4 shows aggregated averages of life satisfaction for each pre-retirement and post-retirement period under invstigation. Sill global, a certain anticipation effect with decreasing mean satisfaction levels before retirement, an increasing effect after retirement followed by some adaptation later on is already indicated.

Figure 4: Average life satisfaction before and after retirement (pension GRV), Germany 1985 to 2015

Source: SOEP Socio-Economic Panel data 1985-2015; weighted data.

So far the aggregated descriptive picture; the individual life satisfaction retirement paths is the focus of our analysis now.

Socio-economic controls

The question whether entering retirement permanently increases life satisfaction or whether the discussed anticipation and especial adaptation effects lead to the previous level of life satisfaction is likely to be related to strongly varying personal circumstances, material resources acquired, degree of life change, individual psychological factors such as previous experience with important life transitions, previous work life and leisure time activities, physical and mental health, marital status and many other socio-economic factors (cf. for example Beehr 1986, Kim and Moen 2001, Szinovacz, 2003, Wang and Shultz 2008).

We determine whether such an adaptation and anticipation process is complete or partial by a quantitative microeconomic analysis with the models outlined above including a large number of socio-economic influence factors to account for individual life circumstances.

The individual life circumstances in this study will be covered by the following control variable domains: personal, education, occupation, job, social participation, household and region which follow mainly used variables in labour supply and retirement studies. In addition, we incorporate general personal characteristics measured by the so-called Big 5 personal traits as basic drivers behind otherwise revealed behavior. Big 5 items encompass openness, conscientiousness, extraversion, agreeableness, and neuroticism (OCEAN)[11]. Since the SOEP data provide Big 5 information in 3 years (2005, 2009, 2013) only we imputed regression based Big 5 estimates into all waves 1985 till 2015 to allow some more item variance.

Obviously the available data restricts the use of further interesting variables like more social participation or previous work conditions. Though the SOEP data offers those information like activities with neighbors and friends, or kind of work life conditions/impairment, however, because available only in some years their incorporation into the model estimation either restricts the usable number of observations and/or produces omitted variables. Details about the socio-economic controls under investigation can be found in the Appendix.[12]

Model I without anticipation and adaptation effects

Let us begin with the findings of the Models Ia and Ib, which provide a general analysis of retirement effects – measured as the receiving pension (GRV retirement benefits) – not as aggregates but based on individual panel data.

The microeconometric resulting robust estimated coefficients of the fixed-effects models again can be interpreted as medium high/low life satisfaction of the identical person in retirement in comparison to that person's situation before retirement.

[11] Digman 1989 and Lang and Lüdtke 2005 with an overview related to empirical based surveys. See Gerlitz and Schupp 2005 for a detailed description of the Big 5 based personal traits within SOEP.

[12] Correlation results between life satisfaction in general and socio-economic factors like age, sex, health, marital status, education and environment and its mixed results are reported in the four decade survey of the economics of happiness by Clark 2018.

The result (Table 2 and Figure 5): The general retirement effect on life satisfaction is negative with -.156 points on the 11-point satisfaction scale (Model Ia) and is highly statistically significant (α=0.001, n=482,289 observations). Thus, pensioners are less satisfied in the long run, a result which on the individual level confirms the above aggregate descriptive findings.

As to this model specification retirement decreases current life satisfaction regardless of how long a person is in retirement.[13] A value -.156 may seem small but if it is considered that with a median of 7 and a standard deviation of 1.857 points more than 60 % of all recorded values of life satisfaction are in the median +- one standard deviation interval[14], then this and other comparable coefficients are not only statistically but also economically significant.

Model I with socio-economic control

Surprisingly, accounting for socio-economic control variables the retirement dummy coefficient is still negative -.017, however, *not* significant (p-value=0,544). Thus, retirement on average does not lead to any significant change in life satisfaction (Table 2). Therefore, the individual socio-economic life circumstances thus have by far a greater effect than the pure negative retirement status and emphasize the importance of the individual life situation.

Table 2 shows which socio-economic factors make an important contribution to the resulting life satisfaction. We can see that age (decreasing nonlinear), marital status (if married increasing; if widowed decreasing) and especially the health variables, current health and the number of physician visits, strongly influence and reduce current life satisfaction.

We did not consider further the available subjective health satisfaction information (11 point scale 0-10) because of possible endogeneity problems with common latent variables when subjective variables are explained by subjective variables likewise (Hamermesh 2004). Nevertheless, we respect the rougher subjective current health indicator (very good … bad, 5 items) because subjective current health might indeed be connected with the economic situation (despite insurance) which is in line with Hamermesh's critical discussion. In addition, we respect the number of physician visits which seems to be a more objective health indicator showing a negative significant effect.

Education yields a negative significant coefficient but with diminishing negative influence on life satisfaction with longer education. As to the labour supply literature one might expect that education produces greater earnings and is positively correlated with life satisfaction. Clark (2018, 249) offers the explanation that a rise in outcomes relative to that in expectation might not match and diminish subjective well-being.

Big 5 factors indeed influence the life satisfaction level. Openness to experience (inventive/curious vs. consistent/cautious) and agreeableness (friendly/compassionate vs. analytical/detached) attract attention by their high significance and negative signs of the estimated

[13] For simplicity's sake we use the term retirement synonymously with retirement status and receiving pension.

[14] And in addition, 50% of all observations are found in between 6 and 8 of the life satisfaction scale; weighted data; from 42,921 unweighted observations of pensioners and 333,705 observations of non-pensioners (1985-2015).

coefficients, and extraversion (outgoing/energetic vs. solitary/reserved) by a positive and significant influence.

Compared to non-employment all single occupation (self-employment in a liberal profession or as a business owner, blue- and white-collar worker, civil servant) decreases life satisfaction. Thus, a strong influence of the respective work situation has to be recorded. As expected, (former) unemployment significantly decreases current life satisfy.

Work intensity, as measured by weekly working hours, shows that life satisfaction increases and is diminished with an increase in the number of working hours. One might expect a decrease because of the working burden. However, this might already be a hint for an overall importance of a structuring work-life. The significant influence of (former) personal work income as well as the pension amount and the residual household income (monthly household net income minus individual work income and pension income) is positive nonlinear and confirms the well-known Easterlin 2001 paradox, according to which a higher income is not proportional to greater life satisfaction. Recreational activities with social participation reference like hobbies (significantly) as well as participating in voluntary work, in political parties or citizen initiatives (not significantly) increase life satisfaction.

People usually do not act on an island but live and act with others. The closest social partners are the household/family members which will play a role in one's life satisfaction. We characterize the household/family situation by the household size and its number of children under 19 years old. Both variables are significant but of opposite signs: children rise but increasing household size (e.g. by other family members) reduces life satisfaction. Person(s) needing care in the household might stress its members which results in a negative significant sign of the estimated influence on life satisfaction.

Finally, to take into account the specific regional situation of East and West Germany we catch the situation roughly by a respective dummy variable. The not significance coefficient refer to diminished differences so far.

A comment should be made on the availability and selection of explanatory socio-economic variables. In principle, the variables were chosen that were shown to have an effect in previous studies on life satisfaction and retirement. The Socio-Economic Panel provided other interesting variables for our topic, such as physical and other forms of mental stress at work as well as further variables on the work situation, or personal circumstances including leisure activities. There is also further information about social participation, neighbors and friends, which could possibly influence life satisfaction before and after retirement. As mentioned, unfortunately data on these and other variables are collected either at greater intervals or have only been recently collected so that the remaining data, even as an unbalanced panel, are restricted for the final estimation in particular for lagged influences in the next discussed Model type II.

Taken together, the results of Model I show that the individual personal, occupation and family/household circumstances are particularly important both substantively and statistically for current life satisfaction and even dominate a general negative retirement effect and strength the particular importance of individual living characteristics.

Table 2: The effect of retirement (pension GRV) on life satisfaction in fixed-effects regression models with and without accounting for anticipation and adaptation – Regression results, Germany 1985 to 2015

	Model Ia		Model Ib		Model IIa		Model IIb	
	coefficient	p-value	coefficient	p-value	coefficient	p-value	coefficient	p-value
Life satisfaction								
RETIREMENT								
Retirement	-0.156***	0.000	-0.0171	0.544				
Retirement T-4					-0.118**	0.001	-0.000598	0.987
Retirement T-3					-0.208***	0.000	0.00656	0.866
Retirement T-2					-0.218***	0.000	0.0567	0.185
Retirement T-1					-0.228***	0.000	0.140**	0.002
Retirement T					-0.266***	0.000	-0.0293	0.689
Retirement T+1					-0.117**	0.009	0.0776	0.288
Retirement T+2					-0.140**	0.002	0.0239	0.751
Retirement T+3					-0.128**	0.008	0.0762	0.331
Retirement T+4					-0.197***	0.000	-0.00390	0.961
Retirement T+5					-0.252***	0.000	-0.0207	0.804
Retirement T+6					-0.170**	0.001	0.0633	0.461
Retirement T+7					-0.257***	0.000	0.0525	0.548
Retirement T+8					-0.285***	0.000	0.00443	0.961
Retirement T+9+					-0.448***	0.000	-0.0646	0.495
PERSONAL DATA								
Age			-0.0528***	0.000			-0.0431	0.203

Age²	0.00348	0.545	-0.00627	0.694
Married	0.0999***	0.000	0.0754*	0.024
Widowed	-0.214***	0.000	-0.318***	0.000
Health	-0.482***	0.000	-0.472***	0.000
Physician visits	-0.00995***	0.000	-0.0126***	0.000
Education	-0.743***	0.000	-0.597	0.185
Education²	0.0271***	0.000	0.0242	0.139
Big 5: Openness	-1.105***	0.000	-0.651	0.220
Big 5: Conscientiousness	-0.532	0.103	-1.883*	0.020
Big 5: Extraversion	0.997*	0.030	2.300*	0.022
Big 5: Agreeableness	-1.640***	0.000	-1373	0.230
Big 5: Neuroticism	-0.370	0.117	-0.346	0.608
OCCUPATION				
Freelancer	-0.0926**	0.009	-0.126	0.172
Entrepreneur	-0.101***	0.000	-0.109+	0.084
Blue collar worker	-0.0639***	0.000	-0.0867+	0.052
White collar worker	-0.0753***	0.000	-0.132**	0.002
Civil servant (*Beamter*)	-0.187***	0.000	-0.248**	0.003
Unemployed (registered)	-0.549***	0.000	-0.434***	0.000
JOB				
Working hours	0.00554***	0.000	0.00779**	0.001
Working hours²/100	-0.00892***	0.000	-0.00971**	0.002
Earned income	0.000130***	0.000	0.000237***	0.000
Earned income²/1000	-0.00000111**	0.007	-0.00000749+	0.091

Pension GRV amount			0.000239***	0.000			0.000269**	0.009
Pension GRV amount²/1000			-0.0000176**	0.005			-0.0000406	0.254
SOCIAL PARICIPATION								
Hobbies			0.00594**	0.003			0.0127**	0.002
Volunteer/Political			0.000108	0.990			-0.00203	0.906
HOUSEHOLD / FAMILY								
Care			-0.442***	0.000			-0.342***	0.000
Household size			-0.0375***	0.000			-0.0380**	0.005
No. of Children (<19 years)			0.0288***	0.000			0.0478**	0.003
Residual income			0.0000767***	0.000			0.000112***	0.000
Residual income²/10000			- 0.0000042***	0.000			-0.0000466***	0.000
REGION								
East			-0.0334	0.411			0.158+	0.070
Constant	7.089***	0.000	29.08***	0.000	6.941***	0.000	25.40*	0.047
R2 within	0.000708		0.0860		0.00280		0.0809	
F-Test	111.67***		3.24***		8.32***		2.62***	
avg. observations	9.5		9.7		8.1		7.7	
max. observations	31		22		17		15	
Persons/groups	51024		30689		11006		10342	
Observations	482289		296674		89200		79308	

Note: t statistics based on robust standard errors in parentheses; + p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001
Source: Results of fixed-effects regression Models Ia,b and IIa,b with SOEP Socio-Economic Panel data 1985-2015.

Model II with anticipation and adaptation effects

While in the last section the general retirement effect for all years before and after retirement was in focus, we will now test our hypothesis whether shorter lasting periods of anticipation of an upcoming retirement and adaptation after retirement play a role in explaining life satisfaction

Model II without socio-economic control

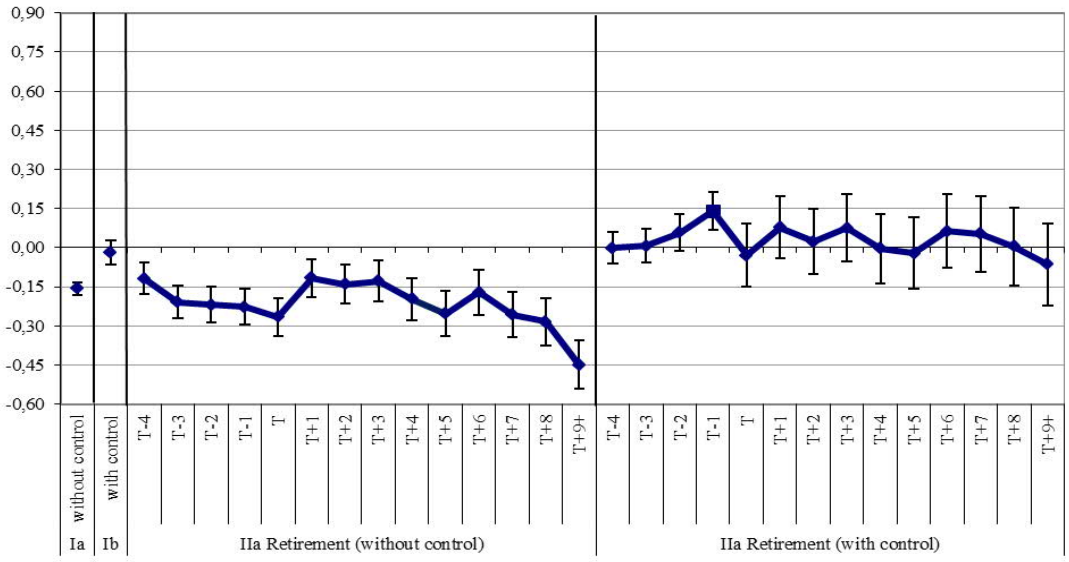
Let us look first at the general anticipation and adaptation effect *without control variables* (Model IIa), as seen in the results from Table 2 and Figure 5.

The result: Firstly, all lead and lag coefficients are *negative and significant.* All 14 distinct periods around the individual retirement period at T, four periods before and nine and more periods after retirement, confirm the overall less satisfied picture of the pensioners compared to all others. Secondly, and of specific importance for our topic: we face a clear *anticipation effect* with falling life satisfaction till the retirement start, a rise in life satisfaction in the first retirement year and then an *adaptation effect* shortly interrupted only in period T+6; a sad picture with respect to a longer retirement perspective.

Model II with socio-economic control

Model IIb adds *socio-economic control variables* to the before and after retirement period specific dummies just discussed. The result of Model IIb (*with socio economic control variables*): there is a *significant anticipation effect* now with growing life satisfaction till the pre-

Figure 5: The effect of retirement (pension, GRV) on life satisfaction in fixed-effects regression models with and without accounting for anticipation and adaptation, Germany 1985 to 2015



Source: Results of fixed-effects regression Models Ia,b and IIa,b with SOEP Socio-Economic Panel data 1985-2015; 95% confidence intervals (robust standard errors); detailed regression results can be found in Table 2

retirement period (T-1). This is in line with anticipation in Model IIa (without control variables). Life satisfaction declines in the retirement period T, with some ups and downs and diminishes from T+8 on. However, all the effects from the retirement period T till T+9+ are not significant any more and detect "no effect on life satisfaction". What remains is only one significant positive effect in the pre-retirement period T-1.

If we inspect the single influence of the control variables, compared to Model I in principle all the discussed explanatory domains - personal, education, occupation, job, social participation, household and region - remain in Model II by magnitude, sign and significance with the exemption of age, education, two of five Big 5 variables and occupation as being self-employed.

In total, the socio-economic control factors compensate all the not controlled negative and significant period effects of retirement on life satisfaction. Again, only one significant short term positive effect in the pre-retirement period T-1 remains.

Modell II and alternative socio-economic control

The above result astonishes. What are the driving factors which lift the without picture of negative anticipation and adaptation and vanishes all 14 period significant life satisfaction effects around individual retirement? Figure 6 summarizes some alternative Model llb specifications and estimation results to answer this question with the following embracing domains:

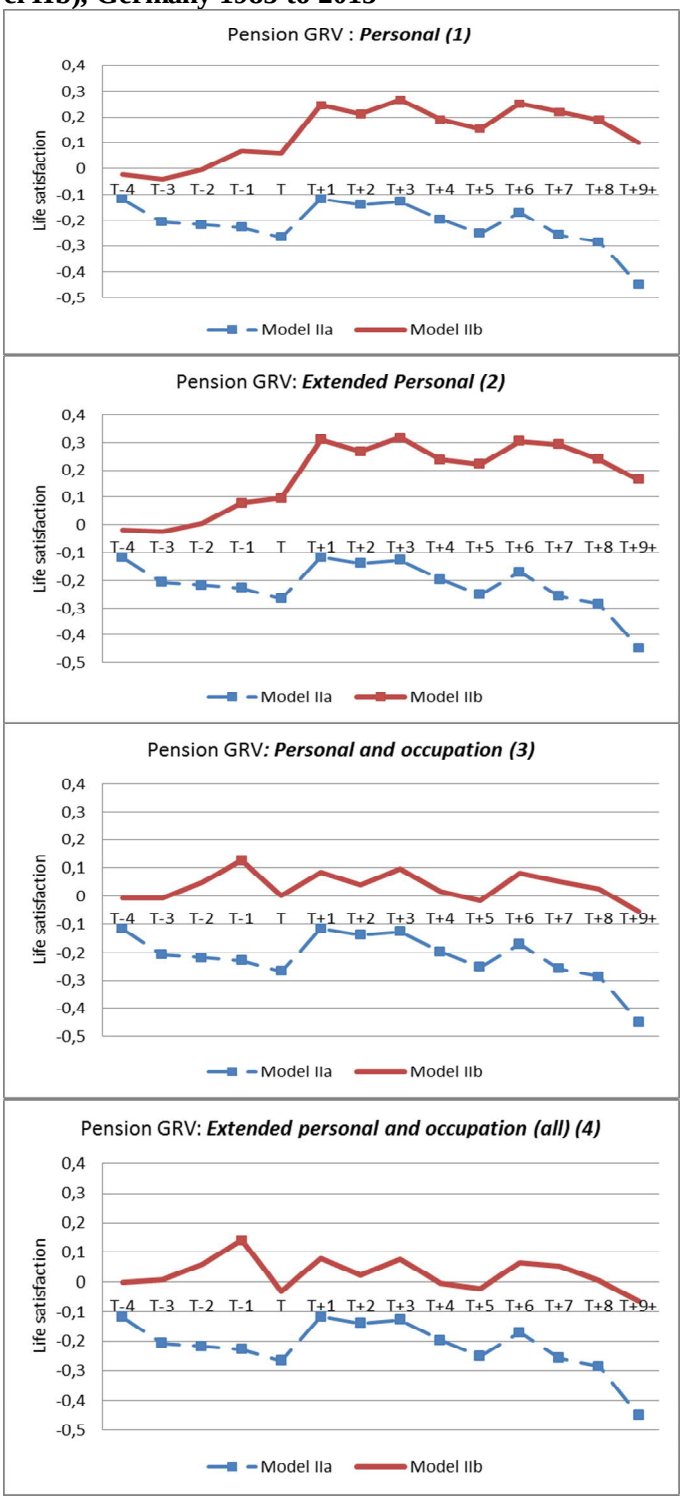
1. ***Personal (1)***: close personal (age, married, widowed, health, physicians visits), education, Big 5,
2. ***Extended Personal (2)***: *personal (1),* social participation (hobbies, voluntary work, active in political parties or citizen initiatives), care, household size, number of children,
3. ***Personal and occupation (3)****: Personal (1),* occupational status, job (weekly working hours),
4. ***Extended Personal and occupation (all) (4):*** *Extended Personal (2)****,*** occupational status, job (weekly working hours).

In addition to the above domains all scenario estimations include income variables as personal work and pension income respectively, residual income (household net income minus work and pension income respectively) and the regional dummy for East Germany.

Figure 6 provides the graphical answer of domain effects: ***Personal (1)*** and ***Extended Personal (2)*** both in particular lift the negative single period effects of Model IIa (without controls) into even positive and significant eight respectively eleven retirement effects on life satisfaction. There is anticipation up to the first post-retirement period T+1, then some fluctuations around that significant level and there is adaptation from period T+6 with falling life satisfaction.

Remarkably, when ***occupation*** (occupational status and job variable) is added, then occupation strongly diminishes the personal lift effect (***Personal (1) and Extended Personal (2))*** and only one significant period remains overall (***Personal and occupation (3)***. The positive shape of the development remains. Yet, the strong absorbing occupation effect could not be hindered by the extended personal factors (***Extended Personal and occupation (all) (4***). We come back to this remarkable result in the discussion section below.

Figure 6: The effect of retirement (pension, GRV) on life satisfaction in alternative socio-economic control domains when accounting for anticipation and adaptation (Model IIb), Germany 1985 to 2015



Source: Fixed-effects regression Models IIa (without controls) and Model IIb (with controls), SOEP Socio-Economic Panel data 1985-2015; dots mark significant influence (with robust standard errors) with at least 10% significance.

All the above estimation results are based on fixed-effects regression model specifications which explicitly account for individual unobserved heterogeneity. An alternative formulation and estimation as a random-effects model (not shown), which can only generally account for heterogeneity through its variance, confirms the results found and indicates robustness of our results.

Retirement and civil service pension scheme

We now discuss the results and question if civil service pensioners – compared to pensioners GRV – with their different background of work-life conditions and old age security systems in Germany differ in their retirement life satisfaction.

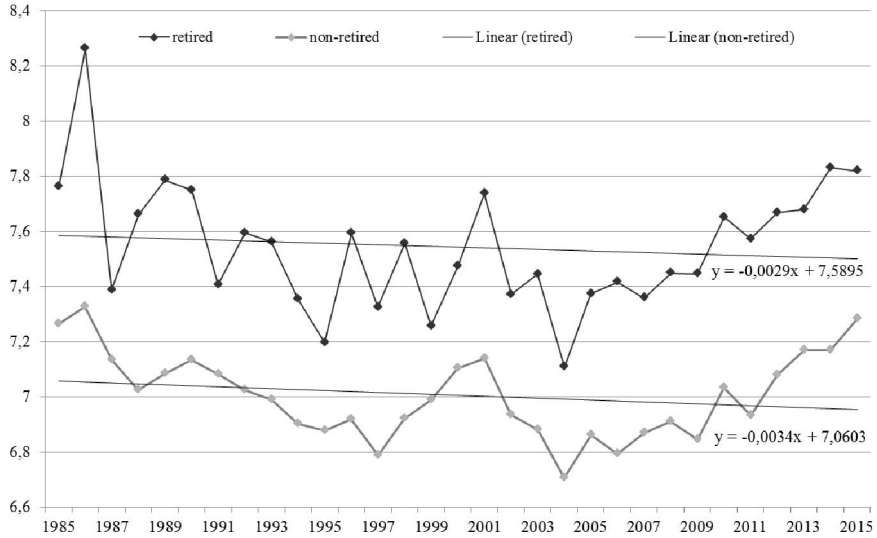
Description – Civil Service Pension and life satisfaction aggregated

Whereas the majority of old age pensioners in Germany are insured by the above discussed German pension insurance (GRV) by far less retirees as civil servants are covered by the civil service pension scheme (as to our SOEP database (1985 till 2015) there are 94,967 pension and only 8,147 pension information with 8.1% (of both pensioner groups) being civil service pensioners 2015).

Surprisingly, in contrast to the pension (GRV) situation above: civil service pensioners on average (1985 till 2015) are significantly *more* satisfied than non-civil service pensioners (mean/std. deviation civil service pensioners: 7.543/1.839; non-civil service pen-sioners: 6.998/1.790). A simple explanation at hand will be the respective pension amounts which on average is considerable higher for civil service pensioners (2,201.87 €/month) than for pensioners (GRV, 802.45 €/month).

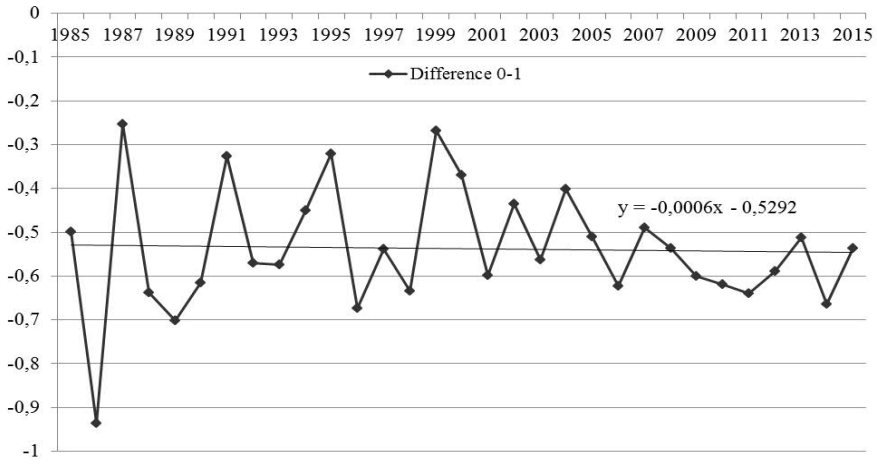
With respect to the development of yearly average life satisfaction the aggregate picture of civil service pensioners (see Figures 7 and 8) is more erratic than that of the non-civil

Figure 7: Average life satisfaction retired (with civil service pension) and non-retired (no civil service pension), Germany 1985 to 2015



Source: SOEP Socio-Economic Panel data 1985-2015; weighted data.

Figure 8: Difference of average life satisfaction between retired (with civil service pension) and non-retired (no civil service pension), Germany 1985 to 2015



Source: SOEP Socio-Economic Panel data 1985-2015; weighted data.

service pensioners. Life satisfaction is growing for both groups since 2004 but here (compared to pension GRV) with no visible trend of growing differences.

Again, the financial and economic crisis 2007/2008 strucks the non civil service pensioners in particular.

Figure 9 shows average life satisfaction in the single pre- and after retirement periods for civil service pensioners. Compared to the pension GRV situation the picture is less definite. Yet, a certain anticipation effect followed by ups and downs after retirement and later on some adaptation is visible.

Figure 9 Average life satisfaction before and after retirement (civil service pension), Germany 1985 to 2015

Source: SOEP Socio-Economic Panel data 1985-2015; weighted data.

Civil service pension model results

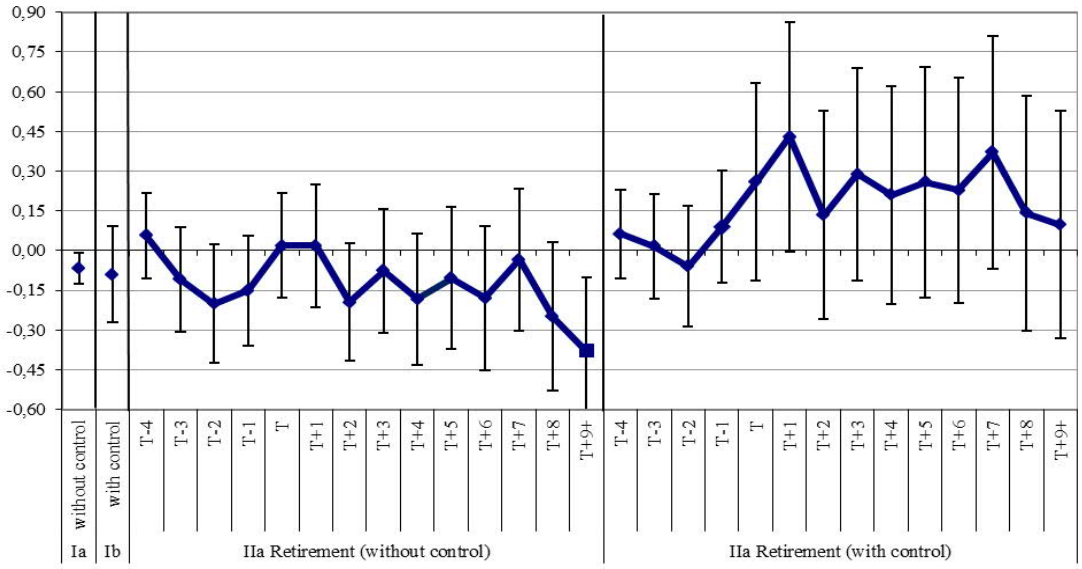
The model analysis for civil service pensioners is based on the same model specification without and with socio-economic controls as for the above pensioners (GRV) and again are estimated by fixed effects robust regression. The results are summarized in Figure 10 and Table 3.

Surprisingly, neither without nor with control all single pre-retirement and post-retirement indicators are significant different to zero (Models IIa and IIb). The only one exemption in Model IIa: the negative significant T+9+ coefficient which indicates a furthermore fall in life satisfaction (Modell Ib). This long run life satisfaction indicator is also the reason for the low significant negative all over coefficient in Model Ia.

Thus, no significant anticipation and no distinct adaptation (but with falling life satisfaction in the long run T+9+ in Model IIa) has to be recorded for civil service pensioners in Germany 1985 till 2015.

Table 3 (Appendix) shows the influence of the socio-economic control factors in the estimation of life satisfaction. As to the sign as well as to the significance of the estimated coefficients the picture is widely similar to that of explaining pension GRV. However, whereas in the pension GRV estimates the pension GRV amount was significant in (non-linear) rising life satisfaction (Model IIb), civil service pension amount is not significant. The general higher pension amount of civil service pensioners might be an explanation.

Figure 10: The effect of retirement (civil service pension) on life satisfaction in fixed-effects regression models with and without accounting for anticipation and adaptation, Germany 1985 to 2015



Source: Results of fixed-effects regression Models Ia,b and IIa,b with SOEP Socio-Economic Panel data 1985-2015; 95% confidence intervals (robust standard errors); detailed regression results can be found in Table 3

Civil service pension Modell II and alternative socio-economic control

The question arises if single control domains are responsible for this no-effect result in a similar manner as to the pension GRV situation?

With the above discussed domains Figure 11 provides the results of some alternative Model llb specifications and its estimates to answer this question for civil service pensioners.

Personal (1) and ***Extended Personal (2)*** both in particular lift the non-significant single period effects of Model IIa (without controls) into even positive and significant eight respectively ten retirement effects on life satisfaction. There is anticipation up to the first post-retirement period T+1, then some fluctuations around that significant level and there is adaptation from period T+6 with falling life satisfaction.

Again remarkably, when occupation is added, then occupation strongly diminishes the personal lift effect (***Personal (1) and Extended Personal (2))*** and *no* significant ex-post period remains overall (***Personal and occupation (3)***. The general positive shape of the development remains. Yet, the strong absorbing occupation effect could not be hindered by the extended personal factors (***Extended Personal and occupation (all) (4*****)**.

Thus, the inclusion of different socio-economic control domains act in the same manner for both pension systems, pension GRV and civil service pension: the individual *occupational* background absorbs (almost) all positive furthermore significant individual socio-economic effects of retirement on life satisfaction.

5 Discussion, summary and outlook

The present study examines the influence of an individual's retirement on general life satisfaction. A potentially comprehensive reorientation of an individual's life after the end of a phase of gainful employment might lead to changes in his or her subjectively perceived current life satisfaction.

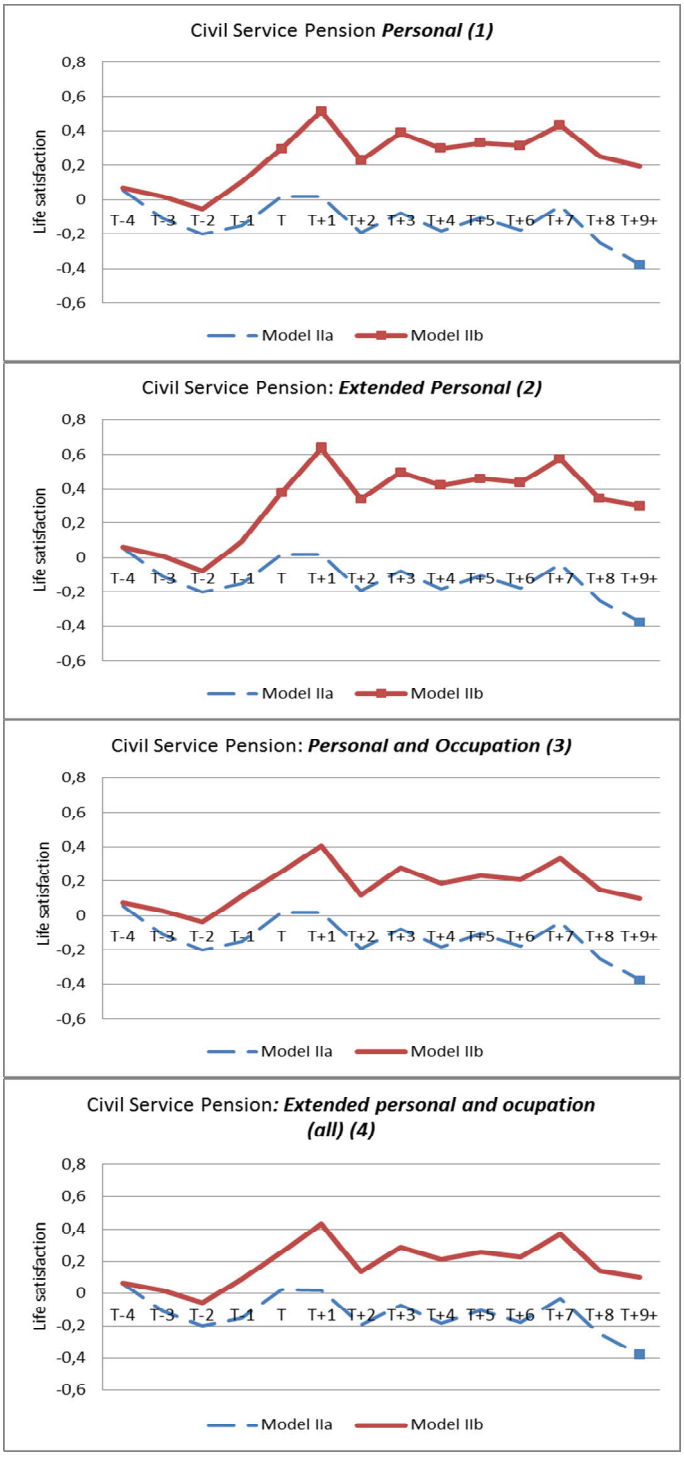
Alongside the question of the general retirement effect on life satisfaction, this study examines in particular the importance of anticipation and adaptation effects on life satisfaction in the years before (four years) and after retirement (in detail nine years and longer). With a fixed-effects panel model and robust estimation we quantify, in addition to the general retirement effect (models Ia and IIa), the influence of socio-economic control variables in relation to the general retirement, anticipation, and adaptation effects (Models Ib and IIb). The dataset is the individual longitudinal information of the Socio- Economic Panel from 1985 to 2015 with 31 waves (out of the actual 33 waves 1984 till 2016).

Overall, the panel analysis that includes individual current life satisfaction over a period of 31 years has led to new results that had not previously been detected:

Key finding results without socio-economic controls

The very global average descriptive 31 years perspective 1985 till 2015 shows that pensioners (GRV) are less satisfied than non-pensioners (GRV). Our more detailed microeconometric

Figure 11: The effect of retirement (civil service pension) on life satisfaction in alternative socio-economic control domains when accounting for anticipation and adaptation (Model IIb), Germany 1985 to 2015



Source: Fixed-effects regression Models IIa (without controls) and Model IIb (with controls), SOEP Socio-Economic Panel data 1985-2015; dots mark significant influence (with robust standard errors) with at least 10% significance.

occupational background absorbs (almost) all positive furthermore significant individual socio-economic effects of retirement on life satisfaction.

analysis as well refutes the thesis that retirement increases life satisfaction over the long term. Yet, there is a strong general negative retirement impact shown by Model Ia (only one retirement dummy) and Model IIa (pre- and post-retirement dummies of anticipation and adaptation) for pensioners (GRV). Though negative, this is not as strong for civil service pensioners in general (Model Ia) and no more significant in Model IIa for them.

Key finding results with socio-economic controls

Surprisingly, once socio-economic controls are incorporated in the model specifications the negative retirement life satisfaction effect is absorbed in the individual 4 pre- and 9+ post-retirement periods. This holds both for pensioners (GRV) as well as for civil service pensioners.

When a wide range of socio-economic variables is respected in alternative model specifications, which describes the individual *personal* living conditions, and bundled in

> ***Personal (1)***: close personal (age, married, widowed, health, physicians visits), education, Big 5,
>
> ***Extended Personal (2)***: *personal (1),* hobbies, voluntary work, in political parties or citizen initiatives; care, household size, number of children,

an *anticipation effect* is evident with growing satisfaction till the first post-retirement period which suggests a positive expectation of a "better life" when retired. Then there is a *6 periods phase of satisfied living* roughly around that first post-retirement period level of satisfaction. Then, *after 6 periods* an *adaptation process starts* with the tendency to furthermore falling satisfaction.

However, the significance of personal characteristic effects vanishes when the (former) occupational situation enter the socio-economic controls with

> ***Personal and occupation (3)****: Personal (1),* occupational status, job (weekly working hours),
>
> ***Extended Personal and occupation (all) (4):*** *Extended Personal (2)****,*** occupational status, job (weekly working hours).

The inclusion of different socio-economic control domains act in the same manner for both pension groups, pension GRV and civil service pension: the individual *occupational background* absorbs (almost) all positive significant individual socio-economic effects of retirement on life satisfaction, a remarkable result.

But beyond this joint result there are differences: firstly, in the global descriptive figure, where pensioners (GRV) are *less* but civil service pensioners are *more* satisfied than their respective counterparts; secondly, in the shorter term around the retirement period, single pre- and post-retirement anticipation and adaptation processes captured by respective dummies only (Modell IIa) are significant for pensioners (GRV, negative coefficients) but no more significant for civil service pensioners.

Since our study explicitly respects shorter and mid termed effects than global termed retirement effects and is based on a large set of individual panel data with 31 years of individual reported information, our results can hardly be compared to other empirical studies with other or

more restricted data bases. But, to a certain extent, the study by Horner 2014 could be drawn on. She finds that in the time surrounding retirement, people experience a large improvement in their subjective well-being, and, that a few years after retirement, subjective well-being declines rapidly with a later neutral effect in terms of subjective well-being (Horner 2014, 141).

Anticipation and adaptation

With respect to *anticipation* we find a significant positive pre-retirement period effect with socio-economic controls to T-1 as well as without controls to T. The positive anticipation is like a honeymoon effect expecting the paradise without working any more (Atchley (1976) and confirm the scenario in the introduction.

With respect to *adaptation* (see our introduction and Clark 2018), pension GRV retirement and life satisfaction adaptation is significant straight after the pre-retirement-period improvement with a later neutral effect; a result similar to the above mentioned Horner 2014 study for 14 Western European countries, the United Kingdom and the USA. Socio-economic controls (in particular (former) occupational circumstances) drive the ex-post retirement neutral situation whereas socio-economic controls without occupation shows later adaptation starting T+6. Without socio-economic controls all (ex-ante and) ex-post retirement period effects are negative and significant and adaptation is visible in a longer perspective (more than 6 Periods after retirement).

There is no significant anticipation and adaptation for civil service pensioners neither with nor without controls.

Thus, the believe in a positive effect of retirement on life satisfaction in general can result in an erroneous conclusion and is misleading if not short and middle term pre- and post-retirement circumstances are considered.

The general result: Though the individual and family situation lift life satisfaction after retirement for many years, the (former) occupational situation, however, absorbs this effect both for pensioners and civil service pensioners. It remains only one period of improvement with close anticipation and adaptation at entering retirement but no furthermore significant change compared to pre-retirement life satisfaction. This holds for pensioners (German pension insurance, GRV) but there is no significant effect at all for civil service pensioners.

In all, our results offer the following narrative: it is the individual's personal and family life situation, social participation with its personal traits behind, its experience and expectations which overcomes a pure retirement effect. Though many personal circumstances even increases life satisfaction for some periods, yet the (former) work life conditions and experience in particular seems to be the constitutive dimension, so that all in all the positive effect vanishes. So it seems that work life for many is the (only) center of life which is structuring the living conditions at all. Retirement then will tear the anchor and sense of life so far. So, the lesson from this study will be: the more you could be free from the (former) job circumstances the more satisfied you will be when retired.

Appendix 1: Variables and Definitions

Variable	Definition
DEPENDENT VARIABLE	
Current life satisfaction	11-point scale: 0=completely dissatisfied, 10=completely satisfied
RETIREMENT	
Retirement	Dummy (0=Not retired, 1=Retired; Retirement=Receipt of pension benefits)
Retirement T-4	Dummy; Upcoming retirement in 4-5 years
Retirement T-3	Dummy; Upcoming retirement in 3-4 years
Retirement T-2	Dummy; Upcoming retirement in 2-3 years
Retirement T-1	Dummy; Upcoming retirement in 1-2 years
Retirement T	Dummy; Retirement began during the last year
Retirement T+1	Dummy; Retirement began 1-2 years ago and still retired
Retirement T+2	Dummy; Retirement began 2-3 years ago and still retired
Retirement T+3	Dummy; Retirement began 3-4 years ago and still retired
Retirement T+4	Dummy; Retirement began 4-5 years ago and still retired
Retirement T+5	Dummy; Retirement began 5-6 years ago and still retired
Retirement T+6	Dummy; Retirement began 6-7 years ago and still retired
Retirement T+7	Dummy; Retirement began 7-8 years ago and still retired
Retirement T+8	Dummy; Retirement began 8-9 years ago and still retired
Retirement T+9+	Dummy; Retirement began over 9 years ago and still retired
PERSONAL DATA	
Age	Age in years
Age²	Age in years²
Married	Dummy (0=no, 1=yes)
Widowed	Dummy (0=no, 1=yes)
Health	Current state of health 1=very good, 5=poor
Physician visits	Number of visits of all physicians within the last three months
Education	Years of school
Big 5: Openness	Openness (three variables mean) 1=does not apply, 7=applies fully
Big 5: Conscientiousness	Conscientiousness (three variables mean) 1=does not apply, 7=applies fully
Big 5: Extraversion	Extraversion (three variables mean) 1=does not apply, 7=applies fully
Big 5: Agreeableness	Agreeableness (three variables mean) 1=does not apply, 7=applies fully
Big 5: Neuroticism	Neuroticism (three variables mean) 1=does not apply, 7=applies fully
OCCUPATION	
Freelancer (Liberal profession)	Dummy (0=no, 1=yes)
Entrepreneur	Dummy (0=no, 1=yes)
Blue collar worker	Dummy (0=no, 1=yes)
White collar worker	Dummy (0=no, 1=yes)
Civil servant (*Beamter*)	Dummy (0=no, 1=yes)
Unemployed (registered)	Dummy (0=no, 1=yes)
JOB	
Working hours	Actual weekly working hours
Working time²	Working hours²
Earned income	Personal net earned income, monthly
Earned income²	Earned income²
SOCIAL PARTICIPATION	
Hobbies	Hours a normal day , normally)
Volunteer/Political	Active as a volunteer or political active (0=no,1=yes)
HOUSEHOLD	
Care	Nursing care of those in need within the household (0=no, 1=yes)
Household size	Household size
No. of children	Total number of children (<19 years old)
Residual income	Household net income – personal earned income – pension income

Residual income²	Residual income²
REGION	
East	Germany (0=old federal states (west), 1=new federal states (east))

Source: Own compilation from the variables in the Socio-Economic Panel (long version) 1984-2016

Appendix Table 3: The effect of retirement (civil service pension) on life satisfaction in fixed-effects regression models with and without accounting for anticipation and adaptation – Regression results, Germany 1985 to 2015

	Model Ia coefficient	p-value	Model Ib coefficient	p-value	Model IIa coefficient	p-value	Model IIb coefficient	p-value
Life satisfaction								
RETIREMENT								
Retirement	-0.0670+	0.067	-0.0902	0.413				
Retirement T-4					0.0571	0.563	0.0625	0.538
Retirement T-3					-0.109	0.369	0.0161	0.894
Retirement T-2					-0.200	0.144	-0.0600	0.665
Retirement T-1					-0.150	0.234	0.0905	0.484
Retirement T					0.0198	0.869	0.258	0.255
Retirement T+1					0.0183	0.897	0.431	0.102
Retirement T+2					-0.194	0.152	0.134	0.575
Retirement T+3					-0.0761	0.592	0.289	0.237
Retirement T+4					-0.183	0.225	0.211	0.400
Retirement T+5					-0.103	0.529	0.258	0.329
Retirement T+6					-0.179	0.282	0.228	0.378
Retirement T+7					-0.0337	0.836	0.371	0.165
Retirement T+8					-0.250	0.143	0.141	0.599
Retirement T+9+					-0.377*	0.024	0.0982	0.707
PERSONAL DATA								
Age			-0.0497***	0.000			-0.0268	0.422

Age²	0.00418	0.466	-0.0131	0.392
Married	0.0988***	0.000	0.0751*	0.024
Widowed	-0.218***	0.000	-0.324***	0.000
Health	-0.483***	0.000	-0.473***	0.000
Physicion visits	-0.01000***	0.000	-0.0127***	0.000
Education	-0.643***	0.000	-0.382	0.394
Education²	0.0236***	0.000	0.0163	0.317
Big 5: Openness	-1.083***	0.000	-0.580	0.274
Big 5: Conscientiousness	-0.517	0.109	-1.765*	0.029
Big 5: Extraversion	0.808+	0.076	1.918+	0.053
Big 5: Agreeableness	-1.381***	0.000	-0.783	0.491
Big 5: Neuroticism	-0.391+	0.098	-0.294	0.659
OCCUPATION				
Freelancer	-0.0897*	0.012	-0.126	0.170
Entrepreneur	-0.0987***	0.000	-0.109+	0.083
Blue collar worker	-0.0685***	0.000	-0.0926*	0.038
White collar worker	-0.0810***	0.000	-0.142**	0.001
Civil servant (*Beamter*)	-0.117**	0.002	-0.159+	0.083
Unemployed (registered)	-0.582***	0.000	-0.475***	0.000
JOB				
Working hours	0.00469***	0.000	0.00634**	0.008
Working hours²/100	-0.00820***	0.000	-0.00851**	0.007
Earned income	0.000126***	0.000	0.000236***	0.000
Earned income²/1000	-0.00000106**	0.010	-0.00000770+	0.079

Pension amount			0.000180**	0.010			0.0000928	0.509
Pension amount²/1000			-0.0000111	0.267			-0.0000153	0.501
SOCIAL PARICIPATION								
Hobbies			0.00655**	0.001			0.0136***	0.001
Volunteer/Political			0.000288	0.973			-0.00373	0.827
HOUSEHOLD / FAMILY								
Care			-0.442***	0.000			-0.343***	0.000
Household size			-0.0397***	0.000			-0.0427**	0.002
No. of Children (<19 years)			0.0309***	0.000			0.0493**	0.002
Residual income			0.0000772***	0.000			0.000111***	0.000
Residual income²/1000			-0.000000422***	0.000			-0.00000467***	0.000
REGION								
East			-0.0329	0.420			0.161+	0.064
Constant	7.060***	0.000	27.70	0.000	6.855***	0.000	20.88+	0.099
R2 within	0.0000129		0.0857		0.000246		0.0805	
F-Test	3.85+		342.59***		1.29		66.36***	
avg. observations	9.5		9.7		8.1		7.7	
max. observations	31		22		18		17	
Persons/groups	51038		30704		11043		10362	
Observations	482764		296817		89627		79551	

Note: t statistics based on robust standard errors in parentheses; + p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001
Source: Results of fixed-effects regression Models Ia,b and IIa,b with SOEP Socio-Economic Panel data 1985-2015.

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