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Retirement effects of heavy job demands

von

Golo Henseke

Universität Rostock

Wirtschafts- und Sozialwissenschaftliche Fakultät
Institut für Volkswirtschaftslehre
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Golo Henseke*

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This study focuses on the influence of heavy job demands on retirement, using the available SHARE waves. Heavy job demands may have a direct and health mediated effect on individual retirement. An econometric challenge is the dynamic self-selection of workers into jobs. The main findings indicate: the frequency of heavy job demands is higher among workers with low levels of socioeconomic status. Heavy job demands are associated with on average higher retirement probabilities, once workers become eligible to pension benefits. The effect is driven by long-term exposure to heavy job demands during the career. There are overall no retirement effects in the age bracket 50–58 and thus no indication for strong adverse health effects. A change in the level of current job demands does not influence the subsequent probability of retirement.

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1. Introduction

An increase in labor force participation rates of older workers and thus a raise of average effective retirement age is a declared target of European governments (EUROPEAN COMMISSION, 2010). Early retirement programs have been

*University of Rostock, Institute of Economics, Email: golo.henseke@uni-rostock.de.

ceased and some countries plan to increase or have already increased the normal retirement age. The effectiveness of these measures will depend on the ability of workers to delay retirement.

Previous research, particularly in occupational epidemiology, suggest that certain job attributes contribute to poor health outcomes and therefore lead to early retirement. Especially, heavy job demands are conjectured to have adverse health effects. But the effect is compensable by, for example, rewards, task control, and an individual's intrinsic ability to cope with stressful situations.

The available empirical findings are limited and inconclusive. The extant literature usually supports an association between job demands and early and even disability retirement. But many of the available studies are silent about the influences of dynamic selection of workers into jobs. Selection will bias the results, if heavy job demands correlate with unobserved but retirement relevant characteristics of workers, or if workers choose jobs in order to reach an otherwise determined retirement age.

The aim of this paper is two shed light on the effect of heavy job demands on the retirement decision. Heavy job demands are defined as a combination of constant time pressure and physical efforts. I pursue two related questions: what is the average difference in retirement probability and would a change in job demands in the population at risk of retirement alter the subsequent labor force cessation probability. To address selection bias, I use longitudinal information of workload on the main job, similar to Chirikos and Nestel (1991); Hayward et al. (1998), and, additionally, an instrumental variable approach. The IV strategy is adopted from Friedberg (2003). She investigates the role of computer use on the timing of retirement. Like heavy job demands, computer use is an endogenous explanatory variable in the retirement decision because of selection and unobservable covariates. I follow her strategy and instrument heavy job demands by occupation-specific averages of workload levels. The data set is constructed from the available SHARE waves. SHARE is a large European survey on characteristics and social situations of persons aged 50 and above.

The results indicate limited influences of heavy job demands on retirement. In the age bracket 50–58, neither past nor current exposure to heavy job demands have an effect. However, in the age span 59 till normal retirement age, past exposure is clearly associated with higher retirement probabilities.

The findings are robust to the inclusion of covariates like health status, pension entitlement and early retirement opportunities, and to treatment of the current exposure to heavy job demands as endogenous variable. Thus, it appears that in contrast to previous findings the degree of job demands does not lead to very early labor force cessation, for example, through disability retirement. Instead, workers with an employment background in demanding jobs have a robustly higher retirement probability, once they reach the eligible age span for pension benefits. Conditioned on the employment history, a decrease of workload for those workers, who were exposed to heavy job demands, has no effect on the subsequent probability of labor force cessation.

The remainder of the paper is structured as follows. Section 2 reviews the existing theoretical and empirical literature on the link between job characteristics, particularly job demands, and the retirement decision. The section furthermore describes and highlights the possible sources of selection bias. Section 3 derives the empirical model and discusses the estimation strategies. In section 4 the dataset for the estimation is introduced, the dependent and independent variables are described and corresponding descriptive statistics are presented. The estimations of the effect of heavy job demands on retirement are derived and discussed in section 5. Section 6 summarizes the main results and conclusions of the study.

2. Background

2.1. Job demands and labor force participation

Job demands comprise the degree of physical and psychological efforts on a job. The exposure to high job demands and therefore to high levels of workload can constitute a stressor and thus an antecedent to stress reactions, like fatigue or exhaustion. Consequently, job demands may have adverse health effects.

The idea of a link between job demands and stress reactions is formalized in several models in psychology and occupational epidemiology. A common feature is the potentially adverse influence of job demands on health outcomes that is, however, compensable by an appropriate level of job resources, like decision latitude, the level of rewards and status control, or resources in general. The worst working conditions in terms of health hazards are usually characterized by an imbalance between the level of demands and the resources to cope with the demands. Well established models in this field are the demand-control model (Karasek, 1979) and the effort-reward imbalance model (Siegrist, 1996).

The demand-control approach focuses on job demands and the decision latitude. Decision latitude captures an individual's ability to control his/ her work activities, and the skill usage and development. High control provides learning opportunities, while high demand conditions constitute strains and thus increase stress as well as learning opportunities. Situations of high demand in conjunction with low control, called *job strains*, are hypothesized to exert (strong) negative influences on workers' health and well-being, since the lack of resources makes it difficult to adequately cope with the high demand situation and therefore cause strain reactions (Karasek, 1979). An extension of the basic model includes social supported received from supervisors and colleagues as third dimension. Social support is conjectured to moderate the negative effects of job strains.

The effort-reward imbalance model analyzes the consequences of the perceived imbalance between effort (e. g., work pressure, job demands, motivation) and reward (e. g., earnings, job security, acknowledgment) of a job (Siegrist, 1996). The main argument bases on the concept of reciprocity: A persistent asymmetry between invested efforts and received rewards impose a stressful work environment with adverse effects on well-being and health (Tsutsumi and Kawakami, 2004). Low rewards are assumed to restrict status control and thus efficacy and self-esteem. In combination with high levels of spend efforts they increase the risk of poor health. The model hence focuses on the social implications of working conditions.

Siegrist (1996) argues that many workers, who experience high-effort/ low-control situation have little discretion to decrease their effort level. The usually limited bargaining power of workers in those jobs makes renegotiation of working conditions difficult or impossible. High and hardly reducible effort levels are not restricted to blue collar workers, though. They could, for example, also occur as part of (failed) career tournaments among high skilled white collar worker.

Empirical studies broadly confirm the predictions of the models. Several cross-sectional and longitudinal studies reveal a relation between the exposure to high demand and low control conditions with the prevalence of health problems like cardiovascular disease (van der Doef and Maes, 1998) and poor job-specific and general well-being of individuals (de Lange et al., 2003; van der Doef and Maes, 1999). Also a permanent imbalance between efforts and received rewards contributes to poor health outcomes of workers (Tsutsumi and Kawakami, 2004). Both approaches supplement each other by explaining different dimensions of the working condition-health nexus (Siegrist and Marmot, 2004): poor working conditions defined by high demands, low task-control and a gap between spend effort and received reward jointly correlate with an increased risk of adverse health outcomes and overall reduced individual well-being (Ostry et al., 2003; Tsutsumi and Kawakami, 2004).

Evidence on the path from job demands to retirement is limited, scattered over time, comes from various social sciences, hence relies on different theoretical backgrounds, definitions, data set and covariates. Nonetheless, physical and environmental demands appear to increase both the risk of early retirement (Filer and Petri, 1988; Hayward et al., 1989) and disability retirement (Blekesaune and Solem, 2005; Chirikos and Nestel, 1991; Hayward et al., 1998; Krause et al., 1997). However, findings are not unambiguous, the effect on the retirement decision might be spurious and could disappear once one controls carefully for workers' characteristics, occupational pension plans and further working conditions like the ability to alter working hours or the common retirement age (Hurd and McGarry, 1993).

In addition, retirement appears to be contingent upon coping resources, like task control. Lower levels of control are associated with earlier anticipated age of retirement (Siegrist et al., 2006), actual early retirement, and even disability retirement (Blekesaune and Solem, 2005). Furthermore, Hayward et al. (1998); Hayward and Grady (1986); Hayward et al. (1989) confirm a positive relationship between a construct called "substantive complexity" (factor capturing training intensity, mental aptitudes, and high control—comparable to high demand and high control) and actual transition rates out of the labor force; workers in complex jobs retire later.

However, the effort-reward imbalance hypothesis receives mixed support in the context of retirement decisions. There is some evidence from European data (SHARE) that the anticipates retirement age declines with an imbalance between effort and reward at work (Siegrist et al., 2006). However, the same data reveals no statistical dependency between effort-reward imbalances and the observed retirement pattern in the subsequent period, neither for men nor for women (Schmalzenberger et al., 2008).

In sum, previous research broadly supports the idea of job demand effects on the retirement decision. But most of the evidence comes from cross-sectional data. Two studies, Hurd and McGarry (1993); Siegrist et al. (2006) use intended instead of the observed retirement as dependent variable. In other cases, Blekesaune and Solem (2005); Filer and Petri (1988), working environment attributes are measured at the occupational level, which raises the question whether occupational attributes are able to capture an individual's experience. An overall almost neglected topic are the consequences of dynamic matching process of workers and jobs in the labor market and structural differences between workers across job types. The revealed relations are thus best viewed as associations.

2.2. Selection bias and the influence of job demands

Workers are not randomly assigned to jobs, but choose them based on individual characteristics, preferences, job attributes, and available information (e. g., Blau et al., 1956; Ham et al., 2009; Polachek, 1981). Job choice and job turnover are dynamic processes. In other words, workers continue to change jobs over their working life, for example, as part of job ladders, the arrival of new information about job match quality, demand shifts, or in response to health shocks.

Assuming that each worker has a non-degenerated distribution of productivity across jobs, there will be a distribution of differently productive workers for every given job. Both market sides, workers and employers, should be in pursuit of an optimal match under imperfect information. The quality of a match may be unknown ex ante but is revealed over time with the duration of the job. Poor quality matches will be resolved early, while separation probability declines as the confidence in the match grows over time (Jovanovic, 1979; Moscarini, 2005). On the workers' side, match quality might translate into overall job satisfaction levels (Clark, 2001). The quality of the job-worker match is most likely associated with the retirement decision and at the same time related with job demands (Rogerson et al., 2005). Furthermore, match quality may also summarize the individual's ability to cope with working conditions and thus influence possible strain reactions.

As consequence of matching processes, workers will not only differ by job-specific productivity but also by sociodemographic and socioeconomic characteristics. Highly demanding jobs are more frequent among workers with low socioeconomic status (Rahkonen et al., 2006). But socioeconomic status is itself associated with individual wealth, health outcomes, lifestyle in general, and health related behavior in particular (Borg and Kristensen, 2000; Contoyannis and Jones, 2004). Jobs with heavy demands will be an attractive alternative, if they pay a wage premium that compensates workers for the health risks of strenuous working conditions (Viscusi and Aldy, 2003). The structural differences between workers will contribute to selection bias if these shared characteristics are omitted from the analysis, while influencing the timing of retirement.

Closely related to general job-matching is the labor market behavior of workers after or in anticipation of future productivity shocks, like deteriorating health. Workers must not necessarily leave the labor force, but could instead change into jobs with less adverse working conditions in order to reach an otherwise determined retirement age. Lets for example assume that there is a 'true' negative effect of job demands on health. Frail workers might change over the course of their career into less demanding jobs. Consequently, while a positive selected group remains in demanding jobs, the average frailty in less demanding working environments might increase as a cohort of workers approaches retirement ages. A standard regression framework would in this case underestimate the 'true' effect of job demands.

Selection bias could therefore result from two related sources: matching processes that influence the individual response to the degree of job demands. As side-effect of matching, workers with similar characteristics could cluster within jobs with similar degrees of job demands. This selection will generally take place independently of the retirement decision but could bias estimates because covariates of treatment choice might relate to retirement as well. The other source of selection bias is reverse causality. Observed job demands could be the outcome of an otherwise determined retirement age. The consequence would be a dependency between job demands and potential retirement outcomes. The relevance of the bias will depend on the job mobility costs, foregone earnings and the eligibility rules for alternatives outside of the labor market like early or disability retirement.

The bias from self-selection has hardly been (explicitly) addressed in the aforementioned studies on the working conditions, health and retirement nexus.

The vast majority of research relies on cross-sectional data, does not attempt to instrument the degree of observed job demands nor includes information on individuals' work history, which would help to control for time invariant individual effects and past career patterns. Inference relies almost exclusively on information on the last job held prior to retirement conditioned on a limited set of observed covariates (education, health, job characteristics). Job-match quality is generally not included as regressor. Therefore, measured effects are likely to be a mixture of influence from current working conditions, individual sorting, and accumulated effects from past exposure.

Chirikos and Nestel (1991); Hayward et al. (1998) are two exceptions. Based on US data, they can show that working conditions on the longest held job and the last job prior to labor force exit have distinct effects on the retirement decision. The findings are however not conclusive. While Hayward et al. (1998) report that high demand and low control jobs at higher ages raise the probability to retire conditioned on covariate information on past working conditions. The effect of long-term exposure to adverse working conditions seem to manifest mainly in poor health and therefore influences labor force exit indirectly. Chirikos and Nestel (1991) instead find a direct effect of physically and environmentally demanding working conditions during earlier stages of careers on the transition probability particularly into disability but also non-disability retirement. Characteristics of the current job have less clear effects in their study.

3. Empirical model and estimation strategy

Individuals retire if the expected present value from future pension benefits exceeds the present value of utility from labor earnings and the option value to retire at a later, more beneficial, point in time (Börsch-Supan et al., 2004; Lumsdaine and Mitchell, 1999; Stock and Wise, 1990). The present value of utility is a function of the indirect utility from net earnings till retirement and the indirect utility from pension benefits both discounted by the time preference rate and the survival rate. The individual timing of retirement is therefore mainly dependent on the pension plan and the earning stream till retirement. Retirement pension plans are defined by social security, occupational pensions, private provisions, hence the national statuary framework. Earning streams depend mostly on job security, the development of an individual's productivity over age on a given job and features of the employment contract, like deferred payment and fringe benefits.

Poor health is the other main antecedent of the retirement decision and constitute the major push factors. Health influences individual productivity and earnings (budget constraint), might affect and change the utility from leisure and consumption (preferences), and finally should directly influence the timing of retirement through its impact on the life expectancy (Dwyer and Mitchell, 1999; Lumsdaine and Mitchell, 1999). Poor health severely reduces the work capacity of individuals and can lead to disability retirement. Studies largely confirm that poor heath and adverse health shocks increase the likelihood of retirement (Bound et al., 1999; Disney et al., 2006) even in the presence of limited financial resources (Bound et al., 2010). Generally, poor health appears to dwarfs the effects of financial retirement incentives (Dwyer and Mitchell, 1999; McGarry, 2004).

Job demands may affect the incentives to retire directly and indirectly. The direct effects works through the budget constraint and the marginal disutility of work. Filer and Petri (1988) note that the effect of marginal changes of working conditions (e. g., as consequence of individual aging) on the retirement decision, depends on the implied changes in the ratio of old-age productivity to lifetime productivity and the ratio of old-age disutility to lifetime disutility from work. If the change of the former were larger than of the latter, a change of working conditions would lead to delayed retirement and vice versa. A part of the effect of job demands will however be mediated by health and therefore influence the timing of retirement indirectly.

Let D_i be a binary indicator that describes whether a worker i is engaged in a job with highly demanding working conditions ($D_i = 1$), or not ($D_i = 0$). R_i is the outcome variable and captures the transition into retirement of worker i within a subsequent period of time. Since workers are not randomly assigned to jobs but chose them as they chose the timing of retirement, it is necessary to include a set of covariates X_i that relate to job choice and the retirement decision, like the level of education, pension entitlements, and job match-quality. Differences in job demands will then have a ceteris paribus effect on the retirement decision:

$$R_i = E[R_i \mid X, D] + \vartheta_i \tag{1}$$

The expression summarizes the conjectured causal relationship of job demands on an individual's retirement decision holding other influences constant. The term ϑ_i subsumes unobserved individual effects that are independent of treatment and the observed covariates.

Lets assume one could observe a worker i under both regimes (treated and not treated) with the corresponding potential outcome.

$$R_i = \begin{cases} R_{1i} = E[R_{1i} \mid X] + \vartheta_{1i} & \text{if } D = 1, \\ R_{0i} = E[R_{0i} \mid X] + \vartheta_{0i} & \text{if } D = 0. \end{cases}$$

The actual retirement outcome R_i is a combination of the potential outcomes.

$$R_i = R_{0i} + (R_{1i} - R_{0i})D \tag{2}$$

The individual *causal effect* of high job demands (treatment) is $(R_{1i} - R_{0i})$. Individuals however either work or do not work in jobs with demanding working conditions and are thus only observed in one state. The unobserved outcome is counterfactual.

From a policy point of view it would be beneficial to have more knowledge on the potential delay in retirement caused by a reduction of job demands for those working under demanding conditions. The naive comparison of group-specific differences will generally not suffice to provide this piece of information, because:

$$\begin{aligned} & E[R_i \mid D_i = 1] - E[R_i \mid D_i = 0] \\ \text{ATT:} \quad & = E[R_{1i} - R_{0i} \mid D_i = 1] \\ \text{Selection bias:} \quad & + E[R_{0i} \mid D = 1] - E[R_{0i} \mid D = 0] \end{aligned} \tag{3}$$

The fist term, ATT, measures the *average treatment effect on the treated*, which is the potential differences in retirement outcomes had the workers in highly demanding jobs (the treated) worked in less demanding jobs instead and hence the figure of interest. The second term, *selection bias*, captures structural differences in the average retirement probability between the treated and non-treated workers that are not caused by treatment. On one hand, if there is positive selection, for example workers in highly demanding jobs share a lifestyle with adverse health effects, the naive difference will overestimated the ATT. On the other, selection bias will be negative if frail workers select into less demanding jobs. The term thus clouds the true effect of job demands on the retirement decision.

The key to identify the average treatment effect on the treated is the conditional independence assumption, which states that conditioned on a set of covariates, treatment is as good as randomly assigned. In other words, conditioned on observables the choice of treatment is independent of potential outcomes and therefore exogenous. In mathematical terms:

$$\{R_{1i}, R_{0i}\} \perp\!\!\!\perp D_i \mid X_i$$

Given the assumption holds, selection bias will vanish and the potential outcome R_{0i} of the treatment group can be correctly inferred from the outcome of the non-treated workers. Lets assume that the conditional expectation of the control outcome is linear in covariates and that the effect of job demands is constant across workers, then

$$R_{0i} = X_i'\beta + \vartheta_{0i} \quad (4)$$

$$R_{1i} = R_{0i} + \rho \quad (5)$$

Plugging the expressions into Eq. (2), yields

$$R_i = X_i'\beta + \rho D_i + \vartheta_{0i} \quad (6)$$

Under conditional independence, $E[\vartheta_{0i} \mid X_i, D_i] = 0$, the causal parameter ρ can be estimated by linear regression. Selection on observables is however a strong assumption. Labor market outcomes are in most cases the result of individual choice. It is not clear that all determinants can be generally observed. Moreover, choice of treatment might depend on potential outcomes. Violation of the conditional independence assumption would imply omitted variable bias.

Therefore, the study pursues two empirical strategy: Firstly, a regression based approach to estimate the differences between the treatment and non-treatment group. This approach uncovers the association between job demands in the last job prior to retirement and the incidence of retirement. By successive addition of covariates it is possible to give information about the robustness of the association.

A minor difficulty arises from the binary nature of the dependent variable. The conditional expectation function equals in this case a probability with values between zero and one. A linear probability model (LPM) will give consistent estimates of the coefficients, but might generate implausible fitted values. If the model is not saturated, the conditional expectation function will be generally not linear in parameters. However, a LPM will still give the best linear approximation. Especially if the explanatory variables are dummies and the analysis focuses on average effects, LPM can be an adequate estimation machinery (Angrist and Pischke, 2009; Wooldridge, 2002).

Based on the causal model Eq. (6), the LPM is:

$$P(R_i = 1) = X_i'\beta_0 + \beta_1 \cdot D_i + e_i \tag{7}$$

Since the dependent variable is Bernoulli distributed, the variance is a function of the covariates and thus heteroscedastic.

If the nonlinearity of the conditional expectation function is explicitly taken into account, the estimation model becomes

$$P(R_i = 1) = \Phi\left(\frac{X_i'\beta_0^* + \beta_1^* \cdot D_i}{\sigma_\tau}\right) \tag{8}$$

with τ_i as latent error term, which is by assumption distributed $N(0, \sigma_\tau^2)$. The average effect of heavy job demands on the retirement probability of treated workers is then equal to

$$E\left[\Phi\left(\frac{X_i'\beta_0^* + \beta_1^*}{\sigma_\tau}\right) - \Phi\left(\frac{X_i'\beta_0^*}{\sigma_\tau}\right) \middle| D_i = 1\right]$$

This contrast with the corresponding standard error is estimated with the help of the user written STATA program *margeff* (Bartus, 2005).

The second estimation approach relies on longitudinal data and, additionally, on an instrumental variable strategy. The level of job demands could be correlated with ϑ_i, if there are for example omitted variables like anticipated health shocks, past work experience, and past exposure to heavy job demands that affect selection into treatment. Moreover, the level of job demands is overall determined by the job tasks, but workers should have at least limited discretion about individual efforts. It is possible and even likely that selection into jobs over the career and change in individual efforts are dependent on potential retirement age. The level of job choice could hence be an endogenous variable in the retirement context, which implies that conditional independence assumption cannot hold.

A very similar problem is described in Friedberg (2003). The author tries to identify the effect of computer use on the probability to retire. Like heavy job demands, computer use, on the one hand, influences retirement, but on the other, may itself depend on the planned retirement age. Computer skills and their application are in other words not independent of potential outcomes. Friedberg develops an instrumental variable strategy to exogenously shift computer use. She suggests that industry and occupation specific means of computer usage among prime-age workers can be appropriate instruments, because these variables correlate, according to her, with individual computer use but are, conditional on the other covariates, unrelated with potential outcomes and unobserved individual characteristics. The effect of computer use on the retirement probability is then estimated by 2SLS.

This study adopts the strategy for the problem at hand, but additionally takes advantage of the availability of longitudinal information on respondents' main job characteristics. The information allows to capture unobserved individual characteristics related to job choice. The inclusion of information of heavy job demands on the main job holds past work experience constant and would therefore give information on the difference in retirement by workers with similar background but currently varying job demands. In other words, heavy job demands on the main job can be interpreted to measure the long run influence of high workload on the retirement probability, while the treatment variable will represent the retirement effect of deviations from the mean workload. The strategy is very similar to an within estimator, where the mean captures time invariant unobserved individual preferences and characteristics between workers and the current degree of job demand the influence of shifts within an individual holding unobserved characteristics constant. The level of job demands on the main job should per se be exogenous in the retirement decision, but probably correlated with individual, not totally observable behavior.

Workload prior to retirement might, however, be related to the desired retirement age. An appropriate instrumental variable must be redundant in the structural equation conditioned on the exogenous covariates. The instrument's influence on the outcome should conditional on other covariates only stem from its association with treatment. An IV strategy overcomes the selection on unobservable problem, by exogenously shifting the treatment variable. Similar to Friedberg (2003), I construct possible instrumental variables from the industry- and occupation-specific means of heavy job demand from persons, whose labor market outcomes should not yet reflect retirement plans. The information comes form respondents, who describe the job characteristics and workload on their first job during the SHARELIFE interview, but are not part of the analyses because they are either not selected into the analyzed sample or have missing data in basic covariates. The idea is that average workload on the industry or occupational level describe the task 'production function' of jobs and therefore the 'technology' induced level of workload that is required to perform the specific set of tasks.

However, without the constant effect assumption, IV uncovers only the effect of treatment for those whose treatment status is changed by the instrument. The constant effect assumption can technically not be true in limited depend variable models. And unlike OLS, the commonly used 2SLS estimation does not per se provide the best linear approximation to the underlying nonlinear conditional expectation (Abadie, 2003; Angrist, 2001). Nonetheless, 2SLS appears to produce estimates that are generally close to the average treatment effect also in the case of limited dependent variable (Angrist and Pischke, 2009).

4. Dataset, variables, and descriptive statistics

The analysis bases on the *Survey of Health, Ageing and Retirement in Europe* (SHARE). SHARE is a large probability sample that contains comprehensive and cross-nationally comparable data on the health status, socioeconomic and sociodemographic characteristics, and the social networks of individuals born in or before 1954 and their partners independently of age (Börsch-Supan et al., 2005). SHARE offers unique chances to investigate the retirement decision in a broad context. Firstly, it provides a rich set of information on individual characteristics, working conditions, health, and the labor market status of older individuals. Secondly, the availability of two successive waves and life history data from SHARELIFE allows to observe transition into retirement and job changes contingent upon past work experiences. And thirdly, the cross-national variation in the cultural and institutional setting makes it possible to assess the effect of job demands under distinct yet not completely different retirement and pension systems.

The first wave of SHARE was conducted in twelve countries in the years 2004 and 2005: Austria, Belgium, Denmark, France, Greece, Germany, Italy, the Netherlands, Sweden, Switzerland, Spain, and later Israel. Longitudinal information for the original eleven countries and additional data from the Czech Republic, Ireland, and Poland became available with the release of the second wave that was fielded 2 years later in 2006/2007. The third wave, SHARELIFE, was made public in November 2010. It supplements the collected information with life history data of the respondents prior to the first SHARE interview.

This study focuses on persons aged 50 and older of either gender, who are employed and have not yet reached the country and gender-specific normal retirement age at the time of the first interview. It is assumed that persons aged 50 and older are *at risk of retirement.* In most countries, the selected workers belong to the age group 50–64. Retirement is defined as an absorbing state. The normal retirement ages were taken from Kalwij and Vermeulen (2008) and updated if necessary by information from the Social Security Programs Throughout the World – Project (Social Security Administration, 2006); see Appendix A for detailed values.

Information on the treatment and control variables from 2004 is used to explain labor force exit cessation within the following two years. The variables are therefore predetermined in the subsequent retirement decision. The approach also provides a well defined counterfactual, namely economic activity or inactivity, respectively. The higher data requirements limit the number of observations to roughly $4,500$ individuals in the analysis.

The decision to retire is in most countries analyzed over an age bracket of 15 years. Many European pension system have however been subject to reforms in the last two decade, for example, to eliminate early retirement incentives. Workers who are currently in their 50es experience or will experience other conditions and eligibility rules than older cohorts. The frame of the retirement decision differs. Thus, the question arises to what extent estimated effects among ‘older’ old workers can predict behavior of ‘younger’ old workers, and vice versa. The likelihood of retirement will grow considerably as workers approach the national early retirement thresholds (Zamarro et al., 2008). In other words, retirement before age 60 is likely to be the exemption, while retirement after age 60 is the rule. Therefore, I estimate the model in the total sample, but also separately for workers aged 59 and older and workers below 59.

Transition into retirement is the dependent variable and defined as the change in individual labor market status from employed (including self-employment) to economic inactivity between the two consecutive interviews. Economic inactivity comprises retirement, disability retirement, and homemaker. For simplicity, I will refer to these different states as retirement. The average transition rate is about 17 percent in the total sample. There is however strong variation across age groups: while the transition rate is about 11 percent in the age group 50–58, it reaches around 43 percent at ages 59 and older.

Exposure to *heavy job demands* on the primary job in 2004 constitutes the treatment variable. SHARE includes two questions about job demands: the degree of physical workload and the experience of constant time pressure in the respondent's primary job. Responses are coded on a 4-level Likert scale from one "strongly agree" to four "strongly disagree". A sum score of two or three is defined as heavy job demands. In other words, heavy job demands are the sum of high physical and psychological workloads. The measure does not directly describe hazardous environments, nor the risk of work injuries in general, instead it focuses on the exposure to stressors and unfavorable working conditions that can have adverse health consequences and may alter the preference for leisure and consumption. According to this definition, around 20 percent of workers in the sample are exposed to heavy job demands.

Effects of job demands, for example on health, might accumulate over the career and the degree of job demands in 2004 will most likely depend on the past levels of workload. The data on *heavy job demand on the main job* is taken from SHARELIFE. The dataset allows to identify the main job in workers' careers and to assess the degree of workload based on the same items as in standard SHARE. The main job is either directly derived from the response to the corresponding item or, if not available (still working), defined as the job with the longest duration (lasting at least five years) during the employment history till 2004. Main job and primary job in 2004 must not be distinct from each other. In fact, only slightly more than a quarter of the population at risk of retirement has stopped to work in the main job by 2004. Again around 20 percent of the workers report exposure to heavy job demands. It is clear that heavy job demands on the main job increase the frequency of reported heavy job demands on the last job.

The explanatory power of the estimated effect of heavy job demands depends on the included control variables. Covariates should simultaneously have an influence on the probability of treatment and the retirement decision. Their realization should be determined before treatment status is selected. Firstly, a set of *birth year* dummies ranging from 1940 to 1954, *country* dummies, and a *gender* dummy variable are included in the regression. The variables capture the systematic differences in the retirement dynamics. These variables are mainly meant to increase the precision of the estimates. However, they may also capture differences in the probability of treatment, for example, as result of national variation in the industry structure, gender-specificities in the average exposure to heavy job demands, or shifts in the degree of job demands over birth cohorts as a consequence of structural change. Distribution of gender and birth year does not differ by treatment status. But there are country differences: The fraction of Italian, Danish, and Greek workers reporting heavy job demands is significantly above the values in the control group. Older workers from the Netherlands, Spain, France, and Switzerland report on the contrary a lower frequency of heavy job demands (Table 1).

Secondly, the level of *educational achievement* grouped into broad ISCED categories capture differences in potential earnings, health and related behavior, and therefore general socioeconomic status. Educational achievement differentiates between no formal education, primary or lower secondary (low), secondary or upper secondary (medium), and tertiary (high) level of education. It is exogenously given in the retirement decision and helps to disentangle the influence of heavy job demands from individual background. Heavy job demands are significantly more prevalent among workers with lower educational achievement (Table 1).

Thirdly, selection into treatment and retirement will correlate with characteristic of the employment relation. Employers, for example, could have an interest to provide different retirement schemes depending on the degree of job demands. On the one hand, if heavy job demands influence health and work capacity, employers might provide means to facilitate the transition into retirement like occupational pensions and early retirement schemes, also as

Table 1: Descriptive statistics of covariates by treatment status (Source: SHARE, own calculations)

	$D_i = 0$ ($N = 3,081$)		$D_i = 1$ ($N = 751$)		diff.	
Year of birth	1948.7	(3.652)	1948.9	(3.706)	−0.195	[0.149]
Female	0.447	(0.497)	0.434	(0.496)	0.013	[0.020]
Austria	0.044	(0.205)	0.056	(0.230)	−0.012	[0.009]
Germany	0.097	(0.296)	0.116	(0.320)	−0.019	[0.012]
Sweden	0.191	(0.394)	0.164	(0.370)	0.028*	[0.016]
Netherlands	0.103	(0.304)	0.052	(0.222)	0.051***	[0.012]
Spain	0.049	(0.215)	0.025	(0.157)	0.023***	[0.008]
Italy	0.056	(0.230)	0.088	(0.283)	−0.032***	[0.010]
France	0.108	(0.311)	0.083	(0.275)	0.026**	[0.012]
Denmark	0.101	(0.301)	0.136	(0.343)	−0.035***	[0.013]
Greece	0.057	(0.232)	0.095	(0.293)	−0.037***	[0.010]
Switzerland	0.066	(0.249)	0.045	(0.208)	0.021**	[0.010]
Belgium	0.127	(0.333)	0.141	(0.348)	−0.014	[0.014]
ISCED (none)	0.011	(0.103)	0.021	(0.144)	−0.011**	[0.005]
ISCED (low)	0.275	(0.447)	0.352	(0.478)	−0.077***	[0.018]
ISCED (medium)	0.366	(0.482)	0.362	(0.481)	0.004	[0.020]
ISCED (high)	0.344	(0.475)	0.258	(0.438)	0.085***	[0.019]
Privat pension	0.597	(0.491)	0.529	(0.500)	0.068***	[0.020]
Early ret. possibility	0.587	(0.492)	0.491	(0.500)	0.096***	[0.020]
Job satisfaction	0.942	(0.233)	0.877	(0.328)	0.065***	[0.010]
Self employed	0.139	(0.346)	0.236	(0.425)	−0.097***	[0.015]
Excellent h.	0.203	(0.402)	0.184	(0.388)	0.019	[0.016]
Very good h.	0.306	(0.461)	0.256	(0.437)	0.050***	[0.019]
Good h.	0.388	(0.487)	0.426	(0.495)	−0.039*	(0.020)
Fair h.	0.093	(0.291)	0.115	(0.319)	−0.0214*	[0.012]
Poor h.	0.011	(0.104)	0.020	(0.140)	−0.009*	[0.005]

Note: The sample includes all SHARE respondents who were aged 50 and older and employed at the first interview, with a valid observation on employment status in the second wave. Std. dev in(), std. errors in [], * p<0.10, ** p<0.05, *** p<0.01.

part of the compensation scheme (Filer and Petri, 1988). On the other, delayed payment contracts typically found among higher and lower services bias retirement incentives (Lazear, 1979). Occupational pension schemes and early retirement windows could be an attractive option for both sides to promote retirement in this case. Therefore measure of entitlements to *private pension* including occupation pension and *early retirement opportunities* might relate to treatment and observed retirement behavior. In fact, more than half of the workers in both groups report to have private pension claims and still around the half has the opportunity to retire early, that is before a 'normal' age. Both fractions are clearly higher among workers in less demanding jobs (Table 1).

The quality of job match and the availability of resources to cope with heavy job demands are further potentially important pieces of information and are approximated by *job satisfaction.* A workers who is satisfied with his or her job despite strenuous working conditions is conjectured to be able to compensate adverse influences. SHARE covers overall satisfaction with the primary job by a single 4-level Likert item. The response categories are dichotomized. The dummy variable takes the value one if the respondent agrees or strongly agrees with the statement "All things considered I am satisfied with my job". The information is available for the job held in 2004. Average job satisfaction is high (Table 1); around 94 percent of workers in the control group and 88 percent of workers in jobs with heavy demands are satisfied with their job. It might indicates that either only high quality matches survive or that only high quality matches are formed. The reported difference in the average frequency of satisfied workers is highly significantly.

Independently of other covariate, self-employment is generally found to be associated with delayed retirement. The data additionally reveals that the frequency of heavy job demands is significantly higher among self-employed workers than among employees (Table 1). Self-employment appears to be an attractive alternative to retirement (Fuchs, 1982) and at same time may be associated with non-pecuniary rewards (Hamilton, 2000), decision latitude and other resources to successfully counteract high levels of workload.

Individual *health* is a further main determinant of retirement, which may at the same time possibly correlate with the treatment variable. Health status is conjectured to be contingent upon the degree of job demands. Controlling for health status would thus close a channels through which heavy job demands might influence the retirement decision. However, seeing as health is best defined as stock, a change in working conditions is unlikely to reveal short-term influences but will impact health over the long run. Therefore, conditioning on health would lead to an estimate of the short term influence of treatment. Self-assessed health status is measured on a cardinal scale ranging in five steps from 'excellent' to 'poor'. Slightly more than 10 percent of respondents in the investigated subsample report poor or fair health status (Table 1). Excellent and very good health status is much more common, about 50 percent of workers in less demanding jobs and 44 percent in the treatment group report a very good health status or better. Overall, treated workers have a slightly higher chance to report less than very good health. But looking at single levels, only the contrast in very good health status turns out to be clearly statistically significant.

Fourthly, there might be general occupation and industry specific effects on treatment probability and retirement patterns, such as job stability, decision autonomy, and other specificities of the work environment, but also differences in socioeconomic status. *Occupations* are organized into major ISCO88 groups. The list of *industry* bases on the NACE coding schema. The two sets of dummy variables will measure general differences in retirement and treatment selection between individuals. By holding occupation and industry constant in the estimation, the coefficient of heavy job demands will pick up the effect *within* an industry-occupation cell. In other words, treatment receipts are compared to non-treated workers within the same cell. It is furthermore crucial to include occupational and industry level dummies in the estimation, because the instrumental variables capture job demands on the same level of aggregation. Statistically significant influences of the industry and occupation dummies in the main equation may indicate a direct aggregate workload effects and hence violation of the redundancy assumption.

Heavy job demands occur across the whole range of industries and occupations. But the frequency clearly differs: Workers in agriculture, construction and low skilled services like transport, storage and communication, and health and social work are significantly more likely to work in jobs with heavy demands. Overall, it appears to be a contrast between on the one side (high) skilled white collar workers who tend to report lower levels of job demands, and blue collar and low skilled white collar workers with a higher frequency of strenuous job demands

Table 2: Industry and occupation dummies by treatment (Source: SHARE, own calculations)

	$D_i = 0$		$D_i = 1$		diff.	
Agriculture and fishing	0.0058	(0.0762)	0.028	(0.165)	−0.0221***	[0.004]
Mining	0.0036	(0.0597)	0.0067	(0.0814)	−0.0031	[0.003]
Manufacturing	0.156	(0.363)	0.136	(0.343)	0.0203	[0.015]
Electricity, gas, water	0.0094	(0.0966)	0.0067	(0.0814)	0.0028	[0.004]
Construction	0.0523	(0.223)	0.101	(0.302)	−0.0489***	[0.010]
Wholesale and retail	0.0682	(0.252)	0.0812	(0.273)	−0.0131	[0.010]
Hotels and restaurants	0.0140	(0.117)	0.0280	(0.165)	−0.0140***	[0.005]
Transport, storage, communication	0.0510	(0.220)	0.0692	(0.254)	−0.0183**	[0.009]
Financial intermediation	0.0373	(0.190)	0.0107	(0.103)	0.0267***	[0.007]
Real estate, renting, business activities	0.0730	(0.260)	0.0439	(0.205)	0.0291***	[0.010]
Public administration and defense	0.107	(0.309)	0.0599	(0.237)	0.0472***	[0.012]
Education	0.132	(0.339)	0.0759	(0.265)	0.0562***	[0.013]
Health and social work	0.137	(0.344)	0.198	(0.399)	−0.0611***	[0.015]
Other community, social and personal services	0.0474	(0.213)	0.0386	(0.193)	0.0088	[0.009]
Other or Missing	0.105	(0.307)	0.116	(0.320)	−0.0104	[0.013]
Legislators, senior officials, and	0.134	(0.340)	0.125	(0.331)	0.0086	[0.014]
Professionals	0.216	(0.412)	0.128	(0.334)	0.0883***	[0.016]
Technicians and associate professionals	0.191	(0.394)	0.148	(0.355)	0.0437***	[0.016]
Clerks	0.122	(0.327)	0.0506	(0.219)	0.0714***	[0.013]
Services and sales workers	0.0951	(0.293)	0.129	(0.336)	−0.0341***	[0.012]
Skilled agricultural and fishery workers	0.0204	(0.142)	0.0692	(0.254)	−0.0488***	[0.007]
Craft and related workers	0.0675	(0.251)	0.146	(0.354)	−0.0790***	[0.011]
Plant and machine operators and ass	0.0545	(0.227)	0.0692	(0.254)	−0.0147	[0.009]
Elementary occupations	0.0649	(0.246)	0.0999	(0.300)	−0.0350***	[0.011]
Other or Missing	0.0341	(0.181)	0.0346	(0.183)	−0.0005	[0.007]

Note: The sample includes all SHARE respondents who were aged 50 and older and employed at the first interview, with a valid observation on employment status in the second wave. Std. dev in(), std. errors in [], * p<0.10, ** p<0.05, *** p<0.01.

Table 3: Measurement quality of the treatment variable (Source: SHARE, own calculations)

	$D_i = 0$ ($N = 3,858$)		$D_i = 1$ ($N = 984$)		diff.	
Functional lim.	0.266	(0.442)	0.339	(0.474)	-0.075^{***}	[0.016]
Health limits	0.234	(0.423)	0.455	(0.498)	-0.221^{***}	[0.016]
Retirement asap	0.426	(0.495)	0.575	(0.495)	-0.149^{***}	[0.018]

Rounded to three decimal places. Std. dev in (), s.e. in [], * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

on the other side (Table 2).

5. Results

5.1. Heavy job demands: Does it measure what it is supposed to measure?

For starters, it would be helpful to know whether, the variable of interest actually relates to outcomes that are generally associated with heavy job demands. The demand-control and effort-reward imbalance models suggest that heavy job demands should be negatively associated with health outcomes, work capacity, and lastly retirement intentions. To assess the quality of the defined treatment variable, I test if it can capture those differences in the data.

The prevalence of functional limitations (disability), the fear health limits the ability to work till regular retirement on the given job, and the stated preference for retirement as soon as possible are all significantly lower in the control-group than among treatment receipts (Table 3). Noteworthy, almost half of the workers with heavy job demands fear health is limiting their ability to work till regular retirement on the current job, compared to a fraction of not even a quarter in the control group. The results overall indicate a clear association of the defined treatment variable with usual outcomes of heavy job demands.

Table 4: Retirement by treatment status and age group. (Source: SHARE, own calculations)

	$D_i = 0$		$D_i = 1$		diff.	
Total ($N = 4,836$)	0.167	(0.373)	0.190	(0.392)	-0.023^{*}	[0.0135]
≤58 ($N = 3,891$)	0.109	(0.311)	0.114	(0.319)	-0.006	[0.0124]
>58 ($N = 945$)	0.404	(0.491)	0.514	(0.501)	-0.110^{***}	[0.0404]

Std. dev in (), s.e. in [], * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

5.2. Heavy job demands and the incidence of retirement

Table 4 summarizes the simple difference between retirement probabilities across treatment and age stratified samples. Overall, the average difference in retirement probability is negligible in the total sample as well as in the younger subsample. But, there is a significant difference in average retirement probability by treatment among the older workers in the conjectured direction across European countries.

The findings reveal a mixed picture of the association between heavy job demands and retirement. The probability of very early retirement, possibly driven by poor health, does not differ by treatment status. However, it seems that as workers become eligible to regular pension benefits, the retirement probabilities jump up particularly among workers in jobs with a high workload. Around a half of the workers in this group had retired within the following two years; about 11 percentage points more than in the control group. Remarkably, the observed probability of retirement in the age group 59 and older closely coincide with the stated preference for retirement as early as possible in Table 3. The question in the following is, what of the univariate (lack of) differences is due to selection bias and what reflects the causal influence of heavy job demands.

Estimation results of the regression Eq. (7) and the probit model Eq. (8) are displayed in Table 5. Apparently, the basic findings remain intact: there is a statistically significant correlation between heavy job and the average retirement probability in European countries, but only in the older age-group. The estimated contrast in the LPM is about 9 percentage point independently of model specification, which is below but sill close to the simple difference in means between both groups.

In the younger and total sample, there is overall no conclusive statistical evidence for a relationship between heavy job demands and retirement (first and second panel in Table 5). Just with the basic set of covariates, the estimated coefficient in the total sample turns out to be statistically significant at the 10 percent level. Still, the confidence level of a positive relationship between heavy job demands is 96%. However, by successive inclusion of covariates, the point estimates decline in the total and younger sample, while standard errors hardly change. If heavy job demands had strong adverse health effects, one would expect to observe clearer differences in the retirement probability also among workers aged 58 and below. But it might as well be possible that because of sample size limitations, there were just not sufficient transitions from work to (disability) retirement below age 59 to precisely estimate the difference.

The estimated coefficient in the older subsample is roughly constant across model specifications (third panel in Table 5). The included covariates either do not strongly correlate with treatment status or have only a weak influence on retirement. Still, there are subtle variations. Especially the inclusion of dummy variables for educational levels, industry, and occupation reduce the magnitude of the estimated contrast (LPM-3). Thus a part of the effect of heavy job demands stems from differences between educational levels, occupation and industry. But there is still substantial variation in heavy job demand and retirement behavior within education-industry-occupation cells.

Adding the entitlements to private pensions, early retirement opportunities, job satisfaction, self-employment status, and health slightly increase the point estimate. The explanation is as follows. Private pension claims as well as early retirement opportunities are negatively correlated with treatment status, but contribute to a raised probability of retirement (positive correlation). Their inclusion must hence increase the estimated coefficient of heavy job demands. Self-employment status has a similar 'inflating' influence on the influence of treatment, but for opposite reasons: it is more prevalent among workers with heavy job demands (positive correlation), and associated with lower retirement probabilities (negative correlation). Job satisfaction and health status, on the other hand, are on average lower in the treated than in the control group (negative correlation) and at the same time associated with a lower transition

Table 5: Association of heavy job demands with retirement. (Source: SHARE, own calculations)

Heavy job demands	LPM-1	LPM-2	LPM-3	LPM-4	Probit
Total	0.022^{*}	0.016	0.017	0.012	0.011
	(0.012)	(0.012)	(0.013)	(0.014)	(0.015)
N	4,836	4,836	4,836	3,832	3,816
R^2	0.21	0.22	0.23	0.25	
$\leq$ **58**	0.007	0.001	−0.001	−0.010	−0.008
	(0.012)	(0.012)	(0.012)	(0.014)	(0.014)
N	3,891	3,891	3,891	3,049	3,033
R^2	0.09	0.09	0.10	0.12	
$>$ **58**	0.093^{**}	0.088^{**}	0.087^{**}	0.091^{**}	0.094^{**}
	(0.038)	(0.038)	(0.040)	(0.046)	(0.042)
N	945	945	945	783	783
R^2	0.23	0.23	0.26	0.29	
Covariates:					
Birth year, country, gender	√	√	√	√	√
Educational level		√	√	√	√
Industry, Occupation			√	√	√
Pension claims, job satisfaction, health, self-employment				√	√

Std. errors in (); * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
See Appendix B for detailed results.

rate into retirement (negative correlation). They would thus each ceteris paribus narrow the gap in the retirement probability between both groups. Apparently, the correlation of the pension variables and self-employment with retirement and heavy job demands overcompensates the influence of job satisfaction and health in the older age group.

The difference between LPM-3 and LPM-4 is that in the former specification a worker within a given education-industry-occupation cell is assumed to change not only the degree of job demands but also associated attributes (improved pension scheme, lower probability of self-employment, becomes more satisfied and healthier), while in the latter case job characteristics and health are held constant. The comparison in LPM-4 is hence based on identically healthy workers in similar 'lousy' jobs. However, at health status and job satisfaction might change over the long run, if the degree of job demands were altered. The coefficient in LPM-4 is thus best viewed as short term influence. But since the relationship is only significant in the older age-group and cessation of labor force participation will most certainly occur within a rather short time period, it seems plausible to concentrate on LPM-4 for inference.

Since neither of the models is saturated, the LPM only approximates the underlying conditional expectation function. Results of RESET tests clearly indicate the presence of neglected nonlinearities. To check the reliability of the findings, the fully specified model is re-estimated by probit using Eq. (8).[1] Results are reported as average discrete effects (probit column in Table 5). They give, like in the LPM case, the average difference in retirement probabilities by treatment status. The estimated contrasts are virtually identical to results of LPM-4 even in the younger subsample with its very low retirement rate. The simple linear model appears to approximate the effect of interest reasonably well.

The previous estimates represent associations, in other words the difference in retirement probability between workers in jobs with heavy workload and less strenuous working conditions prior to retirement. The findings largely mirror the results in the extant literature, with the exemption of the clear age gradient of the retirement contrast. But observed differences must not necessarily reflect

[1] A discrete choice model has the additional advantage to resemble a special type of duration model in this context.

the average effect of heavy job demands per se, but could result from other unobserved but correlated influences like accumulated work experiences, past exposure to heavy job demands, or expectation concerning the development of individual work capacity and well-being. Thus, they do not answer the question how would the retirement decision change, if a worker changed from heavy to lower job demands.

5.3. Alleviated job demands – delayed retirement?

The question is tackled in two steps: firstly, exposure to heavy job demands on the main job is included as covariate in the estimation of Eq. (7). Depending on the result, one or both of the instrumental variables are chosen to, secondly, treat the current level of job demand as endogenous. The IV estimation is performed by two stage least squares (2SLS). In the first stage, the current level of job demand is regressed on the exogenous variables. The fitted values are used in the second stage to replace the possible endogenous explanatory variable in the structural equation.

According to the data, heavy job demands on the main job strongly correlate with the job demands in the current position (Table 6). The difference between treatment receipts and non-receipts in the frequency of high workload levels on the main job is substantial, above 30 percentage points, and highly significant. Note the reduced number of observations, which results from panel attrition and item non-response. The potential instruments show the anticipated pattern, the frequency of heavy job demands are significantly higher in the treatment group. The variability of the potential instrumental variables is limited, since they are defined at a high level of aggregation, which may have adverse influences on the precision of the 2SLS standard errors (Angrist and Pischke, 2009).

The inclusion of heavy job demands on the main job in the estimation supports, on one hand, previous findings: workload matters in the older subsample, but not among the younger fraction of workers at the risk of retirement. Additionally inclusion of covariates reduces the effect of workload in the total sample, whereas the point estimate increases in the older subsample. But on the other hand, the results reveal that rather than the workload level prior to retirement, long-run exposure over the career to heavy job demands affects the retirement probability (Table 7).

Table 6: Distribution of past and average job demands by treatment status. (Source: SHARE, own calculations)

	$D_i = 0$		$D_i = 1$		diff.
Heavy demands, main job, ($D_0 = 2,137 \,/\, D_1 = 577$)	0.126	(0.332)	0.437	(0.496)	-0.311^{***} [0.018]
IV: heavy job demands – average (ISCO88 1digit), ($D_0 = 3,773 \,/\, D_1 = 945$)	0.209	(0.103)	0.262	(0.116)	-0.053^{***} [0.004]
IV: heavy job demands – average (NACE 1digit), ($D_0 = 3,491 \,/\, D_1 = 852$)	0.195	(0.0861)	0.235	(0.0988)	-0.040^{***} [0.003]

Std. dev in (), s.e. in []; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Conditioned on the workload on the main job, i. e. average exposure to heavy job demands over the career, workload prior to retirement, i. e. the deviation from the average, has no effect on the retirement probability. Workers who were exposed to heavy job demands on the main job have a 14–15 percentage point higher probability of retirement. There is however no indication of increased disability retirement or very early labor force cessation as response to heavy job demands. Furthermore, high workload on the current job does not matter in the subsequent retirement decision. A reduction of workload of treated workers in the population at risk of retirement would, in other words, not lead to a change of the retirement probability on the average.

As previously mentioned, the current level of heavy job demand may be endogenous. Seeing as heavy workload is indeed associated with higher transition rates into retirement, workers could decide to either change job or lower work effort to reach an otherwise determined retirement age.

The potential instruments vary on the level of one digit industry and occupation classification. It is therefore important to have information on the industry and occupation-specific influences on individual retirement (Friedberg, 2003). Independent of age bracket sample and included covariates, the set of industry dummies is jointly significant at confidence levels above 99%. It is therefore impossible to rule out a direct influence of industry-specific workload averages

Table 7: The retirement effects of current and past levels of job demands. (Source: SHARE, SHARELIFE, own calculations)

	LPM-5	LPM-6	2SLS-1	2SLS-2
Total				
Heavy job demands (current)	-0.001	0.001	0.040	-0.091
	(0.018)	(0.021)	(0.138)	(0.172)
Heavy job demands (main)	0.033^{*}	0.029	0.019	0.051
	(0.019)	(0.021)	(0.044)	(0.055)
N	2,708	2,151	2,640	2,116
R-sq	0.24	0.27	0.24	0.26
F-value (1st stage)			55.32	35.57
$\leq$ **58**				
Heavy job demands (current)	-0.020	-0.019	0.092	-0.091
	(0.018)	(0.021)	(0.147)	(0.185)
Heavy job demands (main)	0.013	-0.001	-0.019	0.010
	(0.019)	(0.022)	(0.045)	(0.054)
N	2,076	1,624	2,017	1,595
R-sq	0.13	0.15	0.11	0.15
1st F-value			43.28	25.97
$>$ **58**				
Heavy job demands (current)	0.053	0.052	-0.372	-0.475
	(0.050)	(0.057)	(0.376)	(0.511)
Heavy job demands (main)	0.137^{***}	0.148^{**}	0.283^{*}	0.359^{*}
	(0.052)	(0.062)	(0.150)	(0.217)
N	632	527	623	521
R-sq	0.29	0.34	0.19	0.20
1st F-value			10.87	6.71
Instrument:			Average workload	
Covariates:				
Birth year, country, gender	√	√	√	√
Educational level	√	√	√	√
Industry dummies	√	√	√	√
Occupation dummies	√	√		
Pension claims, Health, job satisfaction, self-employment		√		√

Std. dev in (), s.e. in []; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
See Appendix B for detailed results.

on the individual retirement decision. The set of occupation dummies is, on the contrary, jointly significant at confidence levels below 50%—again independent of sample and included set of covariates. Aggregate occupation effects can thus be excluded from the structural equation.

Instrumental variable estimates are reported in Table 7. Column 2SLS-1 includes basic demographic covariates, education and industry dummies as exogenous covariates, whereas 2SLS-2 extends the list to pension scheme characteristics, health, job satisfaction, and self-employment status. Firstly, there is in every specification a valid first stage; the instrument is able to explain a significant fraction of variation in individual heavy job demand. Secondly, compared to LPM-5 and LPM-6 findings, there is again no statistical significant effect of heavy workload, past or current, on overall retirement behavior and very early retirement. OLS and 2SLS results are not distinct from one an other. Thus the lack of an association in the previous section is not driven by selection bias but by the absence of an underlying effect. A fraction of workers between age 50 and 58 in the dataset in fact retires, but for other reasons than heavy workload.

Thirdly, the picture remains different in the older subsample. Still, current treatment has like in LPM-6 and LPM-5 no effect on retirement. The point estimates drastically drop to negative values in fact, but the standard errors are too large to draw further conclusions. However, the effect of past workload is still weakly significant but with an escalated estimated coefficient compared to OLS. Based on 2SLS-1, heavy job demands on the main job rise the retirement probability by 28 percentage points. Treating current heavy job demand as endogenous has a clear influence on the estimated coefficient of 'average' workload. The reason might be the strong correlation between both variables, i. e. the attributed influence of one variable determines the influence, which is left over for the other. Holding other important covariates like retirement scheme, self-employment and job-satisfaction fix at their levels prior to retirement, the effect of past workload even increases to almost 36 percentage point (2SLS-2).

The instability of the point estimates between 2SLS-1 and 2SLS-2 indicates a undesirable sensitivity of the instrument to the included covariate. The instrument is not randomly assigned to workers and does thus not constitutes a 'quasi-experiment'. It describes features of the task production function in broad occupational groups and therefore the limits of individual discretion over job demands within occupations. Its validity hinges on the ability to conditioning out all confounding influences, i. e. there should be no omitted variables. This suggests that 2SLS-2 is more reliable as it includes additional covariates which are obviously associated with the instrument. Still, the IV estimates confirm the longitudinal OLS findings.

6. Conclusions

Growth of labor force participation at older ages is a current political goal in the EU. The effectiveness of achievement will depend among other things on the ability of workers to delay retirement.

Previous research suggests that heavy job demands are stressors with potential adverse health effects. Adequate resources on the job may however mitigate the negative influence of stressful situations. Resources refer, for example, to task control, pecuniary and non-pecuniary rewards, and job-match quality. The study tackles two questions: Is there a negative influence of heavy job demands on delayed retirement and if there is an effect, would a reduction lead to lower retirement probability among those who are exposed to heavy workload. To answer the questions, I use the available waves of SHARE. SHARE collects data in several European countries and allows thus to investigate the effect of heavy job demands conditional on different public pension systems. Heavy job demands are defined as the combination of permanent physical efforts and constant time pressure.

The results indicate the following. Firstly, around 20% of the workers are exposed to heavy job demands. But the probability of heavy job demands is not equally distributed. Workers with low levels of education, in blue and low skilled white collar occupations are more likely to report high levels of workload. Furthermore, heavy job demands is positively related to functional limitations, the fear that health will limit the ability to work till the normal retirement age, and the intention to retire as soon as one becomes eligible to pension benefits. Secondly, there are significant differences in the observed retirement patterns, but only among workers aged 59 and older. Retirement in the age bracket 50–58 is not associated heavy job demands. Multivariate regression support this findings.

However, workers may select into less demanding jobs or reduce efforts on a give job to lower workload and reach a desired retirement age. On the one hand, selection may lead to an overestimation of true workload effects, if high workload is associated with individual characteristics that favor early retirement. On the other, selection may contribute to an underestimation of the true effect, if for example frail workers will choose to change into jobs with lower levels of workload. Observed workload may thus be an endogenous variable in the retirement decision.

To disentangle the effect of heavy workload from selection process, I use, thirdly, an instrumental variable strategy and include additional available information on the degree of job demands on a respondent's main job. Job demands on the main job can be interpreted as mean workload over the career, which correlates with time invariant unobserved individual characteristics, while current job demands capture the effect of deviations from this mean. The instrumental variable is defined as average heavy job demand across broad occupational groups. OLS and 2SLS results are very similar. They indicate that neither current nor past exposure to heavy job demands has a retirement effect in the age group 50–58. However, in the age-group 59 and older, past exposure has a clear average effect on retirement. It seems, that once workers become eligible to pension benefits long-term exposure to heavy job demands and the associated individual characteristics lead to a higher probability of labor force cessation. A reduction in workload prior to retirement has generally no effect.

In terms of the political agenda, the results are not conclusive. On the one hand, they indicate that heavy job demands are neither related to very early retirement, nor disability retirement, and most of the effect in the older subsample is independent of health. On the other hand, workers with a employment history in demanding jobs have on average a higher retirement probability, once they reach the eligibility age for (old age and early) retirement. A reduction in workload prior to retirement does not reduce the probability of labor force cessation in the subsequent period. A job change or a reduction of workload on a given job thus yields no short-term benefits in terms of delayed retirement.

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A. Appendix: Retirement ages

Normal retirement ages men(women) : Austria 65(60), Belgium 65(64), Denmark 65(65), France 60(60), Germany 65(65), Greece 65(60), Italy 65(60), the Netherlands 65(65), Spain 65(65), Sweden 65(65), and Switzerland 65(64).

B. Appendix: Detailed estimation results

Table 8: Total sample – OLS

	(1) LPM-1	(2) LPM-2	(3) LPM-3	(4) LPM-4	(5) Probit (margeff)
Heavy job demands	0.022*	0.016	0.017	0.012	0.011
	(0.012)	(0.012)	(0.013)	(0.014)	(0.015)
1940	0.552***	0.550***	0.555***	0.586***	0.572***
	(0.052)	(0.052)	(0.052)	(0.053)	(0.039)
1941	0.558***	0.556***	0.560***	0.552***	0.540***
	(0.048)	(0.048)	(0.047)	(0.054)	(0.041)
1942	0.219***	0.215***	0.214***	0.237***	0.269***
	(0.046)	(0.046)	(0.045)	(0.051)	(0.051)
1943	0.074*	0.074*	0.078*	0.082*	0.119**
	(0.042)	(0.043)	(0.042)	(0.047)	(0.050)
1944	0.034	0.033	0.038	0.008	0.030
	(0.038)	(0.038)	(0.038)	(0.041)	(0.046)
1945	0.074**	0.072**	0.074**	0.077*	0.080*
	(0.036)	(0.036)	(0.036)	(0.040)	(0.043)

1947	−0.095***	−0.095***	−0.091***	−0.095***	−0.101***
	(0.030)	(0.030)	(0.030)	(0.033)	(0.032)
1948	−0.147***	−0.147***	−0.144***	−0.153***	−0.165***
	(0.028)	(0.028)	(0.028)	(0.032)	(0.027)
1949	−0.137***	−0.135***	−0.132***	−0.153***	−0.163***
	(0.029)	(0.028)	(0.028)	(0.032)	(0.027)
1950	−0.197***	−0.198***	−0.196***	−0.212***	−0.225***
	(0.026)	(0.026)	(0.026)	(0.029)	(0.022)
1951	−0.209***	−0.209***	−0.208***	−0.228***	−0.244***
	(0.026)	(0.026)	(0.025)	(0.028)	(0.021)
1952	−0.243***	−0.242***	−0.236***	−0.262***	−0.274***
	(0.025)	(0.025)	(0.025)	(0.028)	(0.019)
1953	−0.255***	−0.255***	−0.253***	−0.266***	−0.274***
	(0.024)	(0.024)	(0.024)	(0.028)	(0.018)
1954	−0.233***	−0.231***	−0.228***	−0.248***	−0.261***
	(0.026)	(0.026)	(0.026)	(0.029)	(0.020)
Austria	0.200***	0.206***	0.190***	0.218***	0.265***
	(0.030)	(0.030)	(0.030)	(0.036)	(0.047)
Germany	0.081***	0.089***	0.085***	0.095***	0.100***
	(0.020)	(0.020)	(0.020)	(0.024)	(0.032)
Netherlands	0.145***	0.145***	0.151***	0.169***	0.160***
	(0.020)	(0.020)	(0.020)	(0.025)	(0.029)
Spain	0.086***	0.076***	0.067***	0.057*	0.043
	(0.024)	(0.024)	(0.025)	(0.032)	(0.030)
Italy	0.182***	0.174***	0.169***	0.185***	0.178***
	(0.027)	(0.027)	(0.027)	(0.033)	(0.037)
France	0.115***	0.121***	0.118***	0.122***	0.123***
	(0.019)	(0.019)	(0.020)	(0.023)	(0.029)
Denmark	0.067***	0.078***	0.072***	0.088***	0.071***
	(0.019)	(0.019)	(0.019)	(0.022)	(0.025)
Greece	0.006	0.005	0.011	0.024	−0.009
	(0.017)	(0.017)	(0.018)	(0.028)	(0.025)
Switzerland	−0.002	−0.010	−0.011	0.003	−0.001
	(0.021)	(0.021)	(0.022)	(0.024)	(0.021)
Belgium	0.131***	0.132***	0.123***	0.146***	0.148***
	(0.018)	(0.018)	(0.018)	(0.024)	(0.030)
Female	0.026***	0.027***	0.042***	0.035***	0.039***
	(0.010)	(0.010)	(0.011)	(0.013)	(0.014)
No formal education		−0.041	−0.046	−0.043	−0.044
		(0.040)	(0.041)	(0.046)	(0.044)
Primary or lower secondary education		0.021*	0.019	0.031**	0.034**
		(0.013)	(0.013)	(0.015)	(0.016)
Tertiary education		−0.034***	−0.028**	−0.021	−0.027*
		(0.011)	(0.012)	(0.014)	(0.014)
Agriculture and fishing			0.039	0.045	0.032
			(0.063)	(0.068)	(0.067)
Mining			−0.179***	−0.151***	
			(0.024)	(0.021)	

Electricity, gas, water	0.118*	0.131*	0.120*
	(0.062)	(0.067)	(0.073)
Construction	−0.033	−0.003	0.002
	(0.026)	(0.028)	(0.027)
Wholesale and retail	−0.054**	−0.049*	−0.055**
	(0.022)	(0.025)	(0.023)
Hotels and restaurants	−0.094**	−0.050	−0.052
	(0.037)	(0.046)	(0.041)
Transport, storage, communication	−0.003	0.007	0.016
	(0.027)	(0.030)	(0.029)
Financial intermediation	0.097***	0.095**	0.092**
	(0.037)	(0.039)	(0.041)
Real estate, renting, business activities	−0.015	−0.015	−0.013
	(0.024)	(0.027)	(0.026)
Public administration and defense	−0.025	−0.032	−0.028
	(0.022)	(0.024)	(0.022)
Education	−0.017	−0.028	−0.029
	(0.022)	(0.023)	(0.024)
Health and social work	−0.038*	−0.036	−0.034
	(0.020)	(0.022)	(0.021)
Other community, social and personal services	−0.055**	−0.035	−0.035
	(0.026)	(0.029)	(0.028)
Other	−0.060**	−0.039	−0.050
	(0.031)	(0.042)	(0.043)
Missing	−0.022	−0.010	−0.004
	(0.024)	(0.028)	(0.030)
Legislators, senior officials, and managers	0.014	0.015	0.006
	(0.018)	(0.020)	(0.023)
Technicians and associate professionals	0.008	−0.003	−0.009
	(0.016)	(0.018)	(0.020)
Clerks	0.007	−0.007	−0.011
	(0.021)	(0.023)	(0.023)
Services and sales workers	−0.000	−0.009	−0.016
	(0.021)	(0.024)	(0.024)
Skilled agricultural and fishery workers	0.054	0.051	0.038
	(0.037)	(0.044)	(0.047)
Craft and related workers	0.044*	0.005	0.001
	(0.024)	(0.027)	(0.027)
Plant and machine operators and assemblers	0.023	−0.014	−0.014
	(0.028)	(0.032)	(0.028)
Elementary occupations	0.026	−0.009	−0.017
	(0.024)	(0.028)	(0.026)
Other	0.109**	0.074	0.067
	(0.048)	(0.054)	(0.052)
Missing	−0.015	−0.022	−0.014
	(0.034)	(0.047)	(0.051)
Private pension		0.015	0.008
		(0.016)	(0.015)

Early ret. possibility				0.013	0.010
				(0.013)	(0.013)
Satisfied with job - (strongly) agree				−0.059**	−0.059***
				(0.024)	(0.020)
Self employed				−0.039**	−0.035**
				(0.018)	(0.016)
Excellent h.				−0.027*	−0.026*
				(0.015)	(0.015)
Very good h.				−0.028**	−0.028**
				(0.013)	(0.013)
Fair h.				0.040*	0.039*
				(0.023)	(0.021)
Poor h.				0.049	0.054
				(0.056)	(0.053)
Constant	0.182***	0.186***	0.186***	0.248***	
	(0.024)	(0.025)	(0.032)	(0.046)	
Observations	4836	4836	4836	3832	3816
R^2	0.21	0.22	0.23	0.25	

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9: ≤ 58 – OLS

	(1) LPM-1	(2) LPM-2	(3) LPM-3	(4) LPM-4	(5) Probit (margeff)
Heavy job demands	0.007	0.001	−0.001	−0.010	−0.008
	(0.012)	(0.012)	(0.012)	(0.014)	(0.014)
1947	−0.095***	−0.094***	−0.092***	−0.093***	−0.099***
	(0.030)	(0.030)	(0.030)	(0.034)	(0.031)
1948	−0.144***	−0.144***	−0.143***	−0.146***	−0.156***
	(0.028)	(0.028)	(0.028)	(0.032)	(0.027)
1949	−0.134***	−0.131***	−0.128***	−0.146***	−0.158***
	(0.028)	(0.028)	(0.028)	(0.032)	(0.026)
1950	−0.196***	−0.197***	−0.196***	−0.209***	−0.219***
	(0.026)	(0.026)	(0.026)	(0.029)	(0.022)
1951	−0.210***	−0.208***	−0.209***	−0.228***	−0.239***
	(0.026)	(0.026)	(0.026)	(0.028)	(0.021)
1952	−0.241***	−0.239***	−0.235***	−0.256***	−0.265***
	(0.025)	(0.025)	(0.025)	(0.028)	(0.021)
1953	−0.253***	−0.252***	−0.252***	−0.261***	−0.266***
	(0.024)	(0.024)	(0.024)	(0.028)	(0.021)
1954	−0.232***	−0.229***	−0.228***	−0.246***	−0.254***
	(0.026)	(0.026)	(0.026)	(0.029)	(0.021)
Austria	0.161***	0.166***	0.152***	0.159***	0.199***
	(0.030)	(0.030)	(0.031)	(0.037)	(0.053)
Germany	0.033*	0.042**	0.038**	0.036	0.045

	(0.019)	(0.019)	(0.019)	(0.023)	(0.033)
Netherlands	0.092***	0.091***	0.097***	0.105***	0.105***
	(0.020)	(0.020)	(0.020)	(0.025)	(0.032)
Spain	0.054**	0.041*	0.036	0.015	0.017
	(0.024)	(0.024)	(0.025)	(0.031)	(0.029)
Italy	0.187***	0.176***	0.169***	0.161***	0.149***
	(0.028)	(0.028)	(0.028)	(0.034)	(0.043)
France	0.087***	0.091***	0.088***	0.081***	0.083***
	(0.019)	(0.019)	(0.019)	(0.023)	(0.029)
Denmark	0.005	0.014	0.008	0.016	0.002
	(0.016)	(0.016)	(0.017)	(0.020)	(0.021)
Greece	0.018	0.017	0.016	0.011	−0.004
	(0.016)	(0.016)	(0.017)	(0.027)	(0.023)
Switzerland	0.013	0.003	0.005	0.009	0.005
	(0.021)	(0.021)	(0.021)	(0.024)	(0.024)
Belgium	0.112***	0.111***	0.105***	0.109***	0.112***
	(0.018)	(0.018)	(0.018)	(0.024)	(0.033)
Female	0.025**	0.026***	0.042***	0.033**	0.032**
	(0.010)	(0.010)	(0.011)	(0.013)	(0.014)
No formal education		−0.027	−0.037	−0.038	−0.035
		(0.040)	(0.041)	(0.044)	(0.037)
Primary or lower secondary education		0.028**	0.023*	0.037**	0.035**
		(0.013)	(0.014)	(0.016)	(0.017)
Tertiary education		−0.036***	−0.028**	−0.026*	−0.027**
		(0.011)	(0.012)	(0.014)	(0.012)
Agriculture and fishing			0.042	0.051	0.023
			(0.068)	(0.071)	(0.071)
Mining			−0.165***	−0.126***	
			(0.022)	(0.021)	
Electricity, gas, water			0.074	0.118	0.106
			(0.070)	(0.079)	(0.076)
Construction			−0.022	0.009	0.013
			(0.026)	(0.030)	(0.029)
Wholesale and retail			−0.028	−0.040*	−0.042*
			(0.022)	(0.023)	(0.022)
Hotels and restaurants			−0.051	−0.031	−0.024
			(0.034)	(0.044)	(0.040)
Transport, storage, communication			0.014	0.024	0.031
			(0.028)	(0.032)	(0.030)
Financial intermediation			0.059	0.050	0.050
			(0.037)	(0.040)	(0.039)
Real estate, renting, business activities			−0.011	−0.016	−0.012
			(0.023)	(0.026)	(0.025)
Public administration and defense			−0.019	−0.025	−0.021
			(0.022)	(0.024)	(0.020)
Education			−0.032	−0.035	−0.033
			(0.021)	(0.023)	(0.021)
Health and social work			−0.030	−0.020	−0.015

			(0.020)	(0.022)	(0.021)
Other community, social and personal services			−0.041*	−0.025	−0.025
			(0.025)	(0.028)	(0.028)
Other			−0.064**	−0.050	−0.051
			(0.027)	(0.039)	(0.034)
Missing			−0.015	−0.010	−0.006
			(0.024)	(0.028)	(0.029)
(1) Legislators, senior officials, and managers			−0.018	−0.022	−0.029
			(0.017)	(0.020)	(0.019)
(3) Technicians and associate professionals			−0.011	−0.020	−0.026
			(0.016)	(0.018)	(0.017)
(4) Clerks			−0.006	−0.014	−0.017
			(0.021)	(0.023)	(0.020)
(5) Services and sales workers			−0.026	−0.032	−0.033
			(0.021)	(0.024)	(0.020)
(6) Skilled agricultural and fishery workers			0.033	0.021	0.002
			(0.040)	(0.046)	(0.043)
(7) Craft and related workers			0.039	−0.004	−0.011
			(0.025)	(0.027)	(0.025)
(8) Plant and machine operators and assemblers			0.018	−0.025	−0.024
			(0.028)	(0.032)	(0.025)
(9) Elementary occupations			0.007	−0.017	−0.024
			(0.024)	(0.028)	(0.023)
Other			0.064	0.033	0.028
			(0.050)	(0.055)	(0.049)
Missing			−0.003	0.006	0.008
			(0.033)	(0.046)	(0.049)
Private pension				0.000	−0.004
				(0.016)	(0.013)
Early ret. possibility				0.005	0.002
				(0.013)	(0.012)
Satisfied with job - (strongly) agree				−0.057**	−0.053***
				(0.024)	(0.018)
Self employed				0.005	0.010
				(0.018)	(0.018)
Excellent h.				−0.015	−0.011
				(0.015)	(0.015)
Very good h.				−0.027**	−0.027**
				(0.013)	(0.012)
Fair h.				0.045*	0.040*
				(0.024)	(0.021)
Poor h.				0.031	0.040
				(0.057)	(0.055)
Constant	0.206***	0.210***	0.222***	0.299***	
	(0.024)	(0.025)	(0.031)	(0.046)	
Observations	3891	3891	3891	3049	3033
R^2	0.09	0.09	0.10	0.12	

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 10: > 58 – OLS

	(1) LPM-1	(2) LPM-2	(3) LPM-3	(4) LPM-4	(5) Probit (margeff)
Heavy job demands	0.093**	0.088**	0.087**	0.091**	0.094**
	(0.038)	(0.038)	(0.040)	(0.046)	(0.042)
1940	0.012	0.012	0.022	0.044	0.040
	(0.062)	(0.063)	(0.063)	(0.067)	(0.042)
1942	−0.328***	−0.330***	−0.333***	−0.310***	−0.258***
	(0.059)	(0.059)	(0.059)	(0.066)	(0.074)
1943	−0.464***	−0.463***	−0.467***	−0.474***	−0.429***
	(0.057)	(0.057)	(0.056)	(0.063)	(0.076)
1944	−0.531***	−0.531***	−0.532***	−0.571***	−0.543***
	(0.053)	(0.053)	(0.053)	(0.058)	(0.069)
1945	−0.491***	−0.492***	−0.488***	−0.511***	−0.476***
	(0.052)	(0.052)	(0.053)	(0.059)	(0.073)
Austria	0.403***	0.411***	0.390***	0.516***	0.382***
	(0.113)	(0.115)	(0.107)	(0.115)	(0.055)
Germany	0.206***	0.213***	0.217***	0.261***	0.237***
	(0.051)	(0.053)	(0.055)	(0.073)	(0.056)
Netherlands	0.338***	0.338***	0.344***	0.416***	0.358***
	(0.059)	(0.059)	(0.061)	(0.067)	(0.053)
Spain	0.150**	0.146**	0.135**	0.201**	0.191**
	(0.059)	(0.061)	(0.063)	(0.088)	(0.075)
Italy	0.025	0.024	0.037	0.139	0.151
	(0.077)	(0.077)	(0.078)	(0.094)	(0.092)
France	0.292**	0.309***	0.293**	0.355***	0.304***
	(0.114)	(0.115)	(0.121)	(0.132)	(0.083)
Denmark	0.233***	0.243***	0.255***	0.313***	0.276***
	(0.055)	(0.056)	(0.056)	(0.064)	(0.055)
Greece	−0.148***	−0.150***	−0.077	0.060	0.035
	(0.052)	(0.052)	(0.059)	(0.093)	(0.092)
Switzerland	−0.048	−0.051	−0.059	0.015	0.010
	(0.049)	(0.049)	(0.049)	(0.052)	(0.060)
Belgium	0.143**	0.151**	0.132**	0.239***	0.228***
	(0.065)	(0.065)	(0.067)	(0.083)	(0.072)
Female	0.018	0.018	0.035	0.033	0.030
	(0.032)	(0.032)	(0.037)	(0.040)	(0.038)
No formal education		−0.084	−0.081	0.031	0.034
		(0.141)	(0.149)	(0.197)	(0.190)
Primary or lower secondary education		0.015	0.019	0.031	0.032
		(0.037)	(0.038)	(0.042)	(0.040)
Tertiary education		−0.021	−0.032	−0.012	−0.005

	(0.037)	(0.040)	(0.044)	(0.044)
Agriculture and fishing		0.098	0.097	0.070
		(0.131)	(0.146)	(0.140)
Mining		−0.138		
		(0.122)		
Electricity, gas, water		0.206	0.099	0.080
		(0.132)	(0.123)	(0.172)
Construction		−0.070	−0.063	−0.065
		(0.069)	(0.072)	(0.068)
Wholesale and retail		−0.167**	−0.131*	−0.136*
		(0.069)	(0.078)	(0.072)
Hotels and restaurants		−0.300**	−0.141	−0.129
		(0.151)	(0.183)	(0.126)
Transport, storage, communication		−0.110	−0.089	−0.079
		(0.077)	(0.086)	(0.085)
Financial intermediation		0.279***	0.320***	0.231***
		(0.107)	(0.118)	(0.078)
Real estate, renting, business activities		−0.040	−0.042	−0.044
		(0.082)	(0.085)	(0.077)
Public administration and defense		−0.052	−0.088	−0.081
		(0.067)	(0.071)	(0.067)
Education		0.045	−0.026	−0.025
		(0.069)	(0.070)	(0.069)
Health and social work		−0.051	−0.104	−0.098
		(0.064)	(0.067)	(0.067)
Other community, social and personal services		−0.072	−0.052	−0.036
		(0.075)	(0.082)	(0.078)
Other		−0.091	−0.033	−0.004
		(0.144)	(0.185)	(0.130)
Missing		−0.041	0.028	0.027
		(0.070)	(0.081)	(0.081)
(1) Legislators, senior officials, and managers		0.125**	0.118**	0.122**
		(0.053)	(0.057)	(0.057)
(3) Technicians and associate professionals		0.064	0.038	0.041
		(0.049)	(0.051)	(0.054)
(4) Clerks		0.049	−0.003	−0.004
		(0.064)	(0.068)	(0.070)
(5) Services and sales workers		0.079	0.076	0.074
		(0.061)	(0.063)	(0.066)
(6) Skilled agricultural and fishery workers		0.119	0.104	0.106
		(0.093)	(0.107)	(0.102)
(7) Craft and related workers		0.037	0.013	0.009
		(0.072)	(0.075)	(0.077)
(8) Plant and machine operators and assemblers		0.050	0.003	0.003
		(0.085)	(0.092)	(0.085)
(9) Elementary occupations		0.053	−0.040	−0.041
		(0.069)	(0.079)	(0.077)
Other		0.296**	0.218*	0.186*

	(1)	(2)	(3)	(4)	(5)
			(0.123)	(0.128)	(0.113)
Missing			−0.180*	−0.284*	
			(0.095)	(0.148)	
Private pension				0.081*	0.077*
				(0.048)	(0.044)
Early ret. possibility				0.053	0.051
				(0.039)	(0.040)
Satisfied with job - (strongly) agree				−0.082	−0.094
				(0.088)	(0.072)
Self employed				−0.194***	−0.209***
				(0.050)	(0.046)
Excellent h.				−0.046	−0.044
				(0.044)	(0.045)
Very good h.				0.002	0.004
				(0.039)	(0.038)
Fair h.				0.029	0.026
				(0.064)	(0.056)
Poor h.				0.203	0.162
				(0.142)	(0.117)
Constant	0.687***	0.687***	0.656***	0.674***	
	(0.051)	(0.055)	(0.080)	(0.129)	
Observations	945	945	945	783	774
R^2	0.23	0.23	0.26	0.30	

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 11: Total – Long & IV

	(1) LPM-5	(2) LPM-6	(3) 2SLS-1	(4) 2SLS-2
Heavy job demands 1.0000	−0.001	0.001	0.040	−0.091
	(0.018)	(0.021)	(0.138)	(0.172)
Heavy job demands (main)	0.033*	0.029	0.019	0.051
	(0.019)	(0.021)	(0.044)	(0.055)
1940	0.561***	0.577***	0.558***	0.586***
	(0.057)	(0.059)	(0.058)	(0.062)
1941	0.531***	0.517***	0.538***	0.529***
	(0.058)	(0.065)	(0.058)	(0.065)
1942	0.170***	0.177***	0.182***	0.186***
	(0.057)	(0.063)	(0.058)	(0.063)
1943	0.045	0.043	0.055	0.053
	(0.051)	(0.057)	(0.052)	(0.058)
1944	0.022	−0.011	0.030	0.009
	(0.048)	(0.052)	(0.050)	(0.054)
1945	0.045	0.038	0.051	0.044
	(0.048)	(0.052)	(0.048)	(0.052)

1947	−0.108***	−0.125***	−0.108***	−0.124***
	(0.040)	(0.045)	(0.041)	(0.045)
1948	−0.155***	−0.183***	−0.150***	−0.169***
	(0.039)	(0.044)	(0.040)	(0.045)
1949	−0.154***	−0.183***	−0.154***	−0.178***
	(0.039)	(0.044)	(0.040)	(0.044)
1950	−0.221***	−0.249***	−0.218***	−0.244***
	(0.036)	(0.040)	(0.036)	(0.040)
1951	−0.221***	−0.254***	−0.220***	−0.245***
	(0.036)	(0.040)	(0.037)	(0.040)
1952	−0.290***	−0.334***	−0.289***	−0.322***
	(0.034)	(0.038)	(0.035)	(0.039)
1953	−0.290***	−0.322***	−0.290***	−0.313***
	(0.034)	(0.038)	(0.034)	(0.039)
1954	−0.263***	−0.302***	−0.258***	−0.294***
	(0.035)	(0.040)	(0.036)	(0.039)
Austria	0.227***	0.268***	0.234***	0.270***
	(0.049)	(0.057)	(0.049)	(0.056)
Germany	0.099***	0.109***	0.103***	0.119***
	(0.029)	(0.034)	(0.033)	(0.036)
Netherlands	0.201***	0.216***	0.203***	0.219***
	(0.031)	(0.037)	(0.031)	(0.038)
Spain	0.078**	0.080*	0.087**	0.071
	(0.035)	(0.044)	(0.036)	(0.047)
Italy	0.189***	0.213***	0.194***	0.210***
	(0.035)	(0.042)	(0.035)	(0.041)
France	0.150***	0.171***	0.158***	0.173***
	(0.030)	(0.035)	(0.030)	(0.035)
Denmark	0.110***	0.133***	0.112***	0.138***
	(0.030)	(0.034)	(0.032)	(0.035)
Greece	0.010	0.013	0.014	0.016
	(0.026)	(0.038)	(0.027)	(0.038)
Switzerland	−0.001	0.025	0.003	0.032
	(0.033)	(0.036)	(0.033)	(0.035)
Belgium	0.138***	0.177***	0.145***	0.185***
	(0.026)	(0.034)	(0.027)	(0.034)
Female	0.024	0.016	0.024	0.014
	(0.016)	(0.019)	(0.016)	(0.018)
No formal education	−0.079	−0.106*	−0.073	−0.107*
	(0.053)	(0.061)	(0.057)	(0.062)
Primary or lower secondary education	0.024	0.047**	0.024	0.044*
	(0.019)	(0.022)	(0.021)	(0.023)
Tertiary education	−0.016	−0.008	−0.021	−0.005
	(0.018)	(0.020)	(0.018)	(0.019)
Agriculture and fishing	0.043	0.060	0.040	0.092
	(0.075)	(0.081)	(0.079)	(0.088)
Mining	−0.206***	−0.179***	−0.188***	−0.150***
	(0.033)	(0.032)	(0.031)	(0.046)

Electricity, gas, water	0.128	0.118	0.138	0.117
	(0.088)	(0.098)	(0.085)	(0.098)
Construction	−0.043	−0.007	−0.025	0.007
	(0.037)	(0.040)	(0.037)	(0.041)
Wholesale and retail	−0.082**	−0.060	−0.080***	−0.061*
	(0.034)	(0.041)	(0.029)	(0.036)
Hotels and restaurants	−0.109*	−0.029	−0.126*	−0.034
	(0.062)	(0.072)	(0.065)	(0.071)
Transport, storage, communication	0.001	0.006	−0.001	0.002
	(0.038)	(0.043)	(0.034)	(0.040)
Financial intermediation	0.094*	0.089*	0.101**	0.085*
	(0.050)	(0.053)	(0.048)	(0.051)
Real estate, renting, business activities	−0.023	−0.026	−0.024	−0.035
	(0.036)	(0.041)	(0.032)	(0.037)
Public administration and defense	−0.014	−0.019	−0.011	−0.022
	(0.032)	(0.035)	(0.029)	(0.031)
Education	−0.015	−0.030	−0.025	−0.038
	(0.032)	(0.035)	(0.027)	(0.029)
Health and social work	−0.057*	−0.061*	−0.069**	−0.062*
	(0.030)	(0.033)	(0.028)	(0.036)
Other community, social and personal services	−0.084**	−0.081*	−0.084**	−0.093**
	(0.038)	(0.044)	(0.036)	(0.041)
Other	−0.069	−0.029	−0.069*	−0.049
	(0.043)	(0.058)	(0.040)	(0.058)
Missing	−0.025	0.005		
	(0.037)	(0.042)		
(1) Legislators, senior officials, and managers	0.026	0.030		
	(0.026)	(0.030)		
(3) Technicians and associate professionals	0.015	−0.008		
	(0.023)	(0.025)		
(4) Clerks	0.041	0.018		
	(0.031)	(0.035)		
(5) Services and sales workers	−0.004	−0.036		
	(0.031)	(0.035)		
(6) Skilled agricultural and fishery workers	0.037	0.032		
	(0.051)	(0.058)		
(7) Craft and related workers	0.072**	0.010		
	(0.036)	(0.039)		
(8) Plant and machine operators and assemblers	0.007	−0.040		
	(0.040)	(0.045)		
(9) Elementary occupations	0.029	−0.033		
	(0.036)	(0.040)		
Other	0.053	0.045		
	(0.070)	(0.078)		
Missing	−0.013	−0.040		
	(0.047)	(0.068)		
Private pension		0.023		0.024
		(0.022)		(0.022)

	(1)	(2)	(3)	(4)
Early pension		0.002		−0.002
		(0.018)		(0.020)
Satisfied with job - (strongly) agree		−0.056		−0.073*
		(0.034)		(0.041)
Self employed		−0.069***		−0.048*
		(0.026)		(0.028)
Excellent h.		−0.031		−0.034
		(0.021)		(0.021)
Very good h.		−0.042**		−0.042**
		(0.018)		(0.019)
Fair h.		0.045		0.044
		(0.033)		(0.033)
Poor h.		0.125		0.119
		(0.078)		(0.076)
Constant	0.206***	0.283***	0.215***	0.303***
	(0.046)	(0.068)	(0.040)	(0.073)
Observations	2708	2151	2640	2116
R^2	0.24	0.27	0.24	0.26

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 12: ≤ 58 – Long & IV

	(1) LPM-5	(2) LPM-6	(3) 2SLS-1	(4) 2SLS-2
Heavy job demands	−0.020	−0.020	0.092	−0.091
	(0.018)	(0.021)	(0.147)	(0.185)
Heavy job demands (main)	0.013	−0.001	−0.019	0.010
	(0.019)	(0.022)	(0.045)	(0.054)
1947	−0.109***	−0.125***	−0.107***	−0.122***
	(0.040)	(0.045)	(0.041)	(0.045)
1948	−0.152***	−0.174***	−0.149***	−0.160***
	(0.040)	(0.044)	(0.040)	(0.045)
1949	−0.152***	−0.175***	−0.154***	−0.170***
	(0.039)	(0.044)	(0.040)	(0.044)
1950	−0.223***	−0.249***	−0.218***	−0.242***
	(0.036)	(0.040)	(0.037)	(0.040)
1951	−0.223***	−0.254***	−0.224***	−0.245***
	(0.036)	(0.040)	(0.037)	(0.041)
1952	−0.291***	−0.330***	−0.295***	−0.320***
	(0.034)	(0.038)	(0.035)	(0.040)
1953	−0.295***	−0.320***	−0.295***	−0.311***
	(0.034)	(0.039)	(0.035)	(0.039)
1954	−0.266***	−0.302***	−0.262***	−0.295***
	(0.035)	(0.039)	(0.036)	(0.039)
Austria	0.197***	0.207***	0.198***	0.208***

	(0.051)	(0.061)	(0.050)	(0.059)
Germany	0.050*	0.043	0.043	0.052
	(0.029)	(0.034)	(0.035)	(0.039)
Netherlands	0.139***	0.140***	0.139***	0.137***
	(0.032)	(0.039)	(0.034)	(0.040)
Spain	0.057	0.023	0.071*	0.015
	(0.037)	(0.045)	(0.038)	(0.047)
Italy	0.198***	0.185***	0.197***	0.181***
	(0.037)	(0.045)	(0.036)	(0.044)
France	0.120***	0.120***	0.125***	0.120***
	(0.031)	(0.036)	(0.031)	(0.036)
Denmark	0.022	0.025	0.014	0.029
	(0.027)	(0.032)	(0.029)	(0.034)
Greece	0.027	0.001	0.024	−0.008
	(0.026)	(0.039)	(0.027)	(0.038)
Switzerland	0.005	0.005	0.011	0.000
	(0.035)	(0.039)	(0.037)	(0.041)
Belgium	0.128***	0.136***	0.126***	0.140***
	(0.027)	(0.036)	(0.028)	(0.036)
Female	0.028*	0.023	0.027*	0.025
	(0.017)	(0.019)	(0.016)	(0.018)
No formal education	−0.071	−0.086	−0.059	−0.069
	(0.052)	(0.062)	(0.060)	(0.063)
Primary or lower secondary education	0.030	0.054**	0.029	0.052**
	(0.021)	(0.024)	(0.022)	(0.023)
Tertiary education	−0.018	−0.015	−0.025	−0.016
	(0.018)	(0.021)	(0.018)	(0.020)
Agriculture and fishing	0.020	0.048	0.007	0.087
	(0.080)	(0.085)	(0.084)	(0.095)
Mining	−0.194***	−0.160***	−0.190***	−0.134***
	(0.032)	(0.032)	(0.033)	(0.047)
Electricity, gas, water	0.024	0.046	0.043	0.048
	(0.098)	(0.111)	(0.092)	(0.109)
Construction	−0.024	0.005	−0.017	0.025
	(0.039)	(0.043)	(0.040)	(0.047)
Wholesale and retail	−0.038	−0.037	−0.047	−0.031
	(0.035)	(0.040)	(0.030)	(0.036)
Hotels and restaurants	−0.091	−0.085	−0.123**	−0.080
	(0.056)	(0.071)	(0.058)	(0.069)
Transport, storage, communication	0.012	0.009	0.007	0.015
	(0.041)	(0.047)	(0.037)	(0.043)
Financial intermediation	0.062	0.041	0.066	0.042
	(0.052)	(0.054)	(0.050)	(0.052)
Real estate, renting, business activities	−0.002	−0.024	−0.009	−0.026
	(0.037)	(0.042)	(0.034)	(0.038)
Public administration and defense	−0.003	−0.016	−0.001	−0.014
	(0.034)	(0.038)	(0.032)	(0.034)
Education	−0.030	−0.043	−0.039	−0.042

	(0.033)	(0.037)	(0.027)	(0.030)
Health and social work	−0.044	−0.054	−0.067**	−0.051
	(0.031)	(0.035)	(0.029)	(0.036)
Other community, social and personal services	−0.068*	−0.067	−0.073**	−0.068*
	(0.037)	(0.042)	(0.034)	(0.038)
Other	−0.083**	−0.080	−0.083**	−0.092*
	(0.038)	(0.052)	(0.037)	(0.051)
Missing	−0.025	−0.012		
	(0.038)	(0.044)		
(1) Legislators, senior officials, and managers	0.007	−0.001		
	(0.027)	(0.031)		
(3) Technicians and associate professionals	−0.002	−0.019		
	(0.023)	(0.026)		
(4) Clerks	0.035	0.019		
	(0.033)	(0.037)		
(5) Services and sales workers	0.004	−0.009		
	(0.033)	(0.038)		
(6) Skilled agricultural and fishery workers	0.061	0.030		
	(0.056)	(0.063)		
(7) Craft and related workers	0.079**	0.010		
	(0.038)	(0.042)		
(8) Plant and machine operators and assemblers	0.030	−0.024		
	(0.040)	(0.046)		
(9) Elementary occupations	0.017	−0.028		
	(0.038)	(0.042)		
Other	0.067	0.050		
	(0.077)	(0.087)		
Missing	0.010	0.010		
	(0.049)	(0.075)		
Private pension		0.008		0.008
		(0.023)		(0.023)
Early ret. possibility		−0.006		−0.009
		(0.019)		(0.021)
Satisfied with job - (strongly) agree		−0.061*		−0.072*
		(0.035)		(0.043)
Self employed		−0.017		−0.006
		(0.026)		(0.028)
Excellent h.		−0.024		−0.027
		(0.022)		(0.022)
Very good h.		−0.035*		−0.035*
		(0.019)		(0.019)
Fair h.		0.050		0.050
		(0.035)		(0.035)
Poor h.		0.071		0.057
		(0.087)		(0.086)
Constant	0.230***	0.344***	0.237***	0.353***
	(0.048)	(0.071)	(0.042)	(0.075)

Observations	2076	1624	2017	1595
R^2	0.13	0.15	0.11	0.15

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 13: > 58 – Long & IV

	(1) LPM-5	(2) LPM-6	(3) 2SLS-1	(4) 2SLS-2
Heavy job demands	0.053	0.052	-0.372	-0.475
	(0.050)	(0.057)	(0.376)	(0.511)
Heavy job demands (main)	0.137***	0.148**	0.283*	0.359*
	(0.052)	(0.062)	(0.150)	(0.217)
1940	0.548***	0.578***	0.576***	0.631***
	(0.065)	(0.069)	(0.075)	(0.091)
1941	0.505***	0.505***	0.512***	0.521***
	(0.067)	(0.073)	(0.068)	(0.073)
1942	0.143**	0.168**	0.126**	0.160**
	(0.062)	(0.068)	(0.063)	(0.068)
1943	0.030	0.023	0.014	0.007
	(0.058)	(0.063)	(0.060)	(0.068)
1944	-0.002	-0.036	0.027	0.005
	(0.055)	(0.058)	(0.063)	(0.072)
Austria	0.282**	0.336**	0.287*	0.316*
	(0.134)	(0.147)	(0.156)	(0.168)
Germany	0.213***	0.221**	0.254***	0.220***
	(0.068)	(0.087)	(0.074)	(0.084)
Netherlands	0.360***	0.389***	0.384***	0.406***
	(0.074)	(0.087)	(0.076)	(0.093)
Spain	0.103	0.214**	0.075	0.144
	(0.080)	(0.105)	(0.082)	(0.130)
Italy	-0.002	0.074	0.035	0.057
	(0.089)	(0.106)	(0.099)	(0.110)
France	0.316**	0.335**	0.279*	0.263
	(0.146)	(0.155)	(0.144)	(0.168)
Denmark	0.287***	0.342***	0.330***	0.368***
	(0.068)	(0.078)	(0.078)	(0.087)
Greece	-0.135*	-0.030	-0.149*	-0.031
	(0.076)	(0.116)	(0.086)	(0.136)
Switzerland	-0.041	0.026	0.025	0.110
	(0.065)	(0.069)	(0.078)	(0.090)
Belgium	0.080	0.196*	0.076	0.170
	(0.078)	(0.101)	(0.076)	(0.107)
Female	-0.001	-0.040	-0.028	-0.064
	(0.049)	(0.053)	(0.048)	(0.054)
No formal education	0.000	-0.017	-0.004	-0.004

	(0.200)	(0.181)	(0.171)	(0.171)
Primary or lower secondary education	0.044	0.045	0.064	0.061
	(0.048)	(0.052)	(0.063)	(0.067)
Tertiary education	0.018	0.024	0.013	0.053
	(0.049)	(0.055)	(0.049)	(0.055)
Agriculture and fishing	0.165	0.145	0.259	0.150
	(0.143)	(0.174)	(0.163)	(0.173)
Mining	-0.186		-0.471**	
	(0.166)		(0.236)	
Electricity, gas, water	0.440***	0.397***	0.451***	0.397***
	(0.096)	(0.103)	(0.106)	(0.103)
Construction	-0.088	-0.037	-0.031	-0.009
	(0.084)	(0.086)	(0.085)	(0.098)
Wholesale and retail	-0.204**	-0.132	-0.140*	-0.107
	(0.084)	(0.097)	(0.072)	(0.094)
Hotels and restaurants	-0.082	0.322	0.107	0.406*
	(0.199)	(0.225)	(0.209)	(0.241)
Transport, storage, communication	-0.067	-0.043	-0.051	-0.034
	(0.097)	(0.105)	(0.095)	(0.116)
Financial intermediation	0.262**	0.366***	0.298**	0.394***
	(0.130)	(0.141)	(0.126)	(0.146)
Real estate, renting, business activities	-0.152	-0.098	-0.121	-0.124
	(0.097)	(0.102)	(0.095)	(0.104)
Public administration and defense	-0.077	-0.060	-0.063	-0.056
	(0.079)	(0.084)	(0.072)	(0.080)
Education	0.023	-0.007	0.029	-0.024
	(0.083)	(0.084)	(0.071)	(0.075)
Health and social work	-0.086	-0.064	0.000	0.024
	(0.079)	(0.084)	(0.088)	(0.134)
Other community, social and personal services	-0.095	-0.064	-0.109	-0.120
	(0.093)	(0.102)	(0.089)	(0.096)
Other	-0.042	0.127	0.019	0.059
	(0.156)	(0.193)	(0.160)	(0.229)
Missing	-0.023	0.069		
	(0.099)	(0.114)		
(1) Legislators, senior officials, and managers	0.065	0.074		
	(0.062)	(0.067)		
(3) Technicians and associate professionals	0.051	0.011		
	(0.059)	(0.061)		
(4) Clerks	0.022	-0.004		
	(0.081)	(0.085)		
(5) Services and sales workers	-0.045	-0.091		
	(0.076)	(0.080)		
(6) Skilled agricultural and fishery workers	-0.069	-0.058		
	(0.128)	(0.144)		
(7) Craft and related workers	-0.017	-0.055		
	(0.088)	(0.094)		
(8) Plant and machine operators and assemblers	-0.093	-0.111		

	(0.113)	(0.120)		
(9) Elementary occupations	-0.009	-0.092		
	(0.088)	(0.102)		
Other	0.017	0.024		
	(0.170)	(0.180)		
Missing	-0.150	-0.147		
	(0.113)	(0.147)		
Private pension		0.078		0.094
		(0.058)		(0.058)
Early ret. possibility		0.020		0.007
		(0.049)		(0.059)
Satisfied with job - (strongly) agree		-0.059		-0.110
		(0.102)		(0.122)
Self employed		-0.189***		-0.126
		(0.065)		(0.078)
Excellent h.		-0.017		-0.070
		(0.056)		(0.075)
Very good h.		-0.026		-0.072
		(0.046)		(0.065)
Fair h.		0.045		0.053
		(0.081)		(0.088)
Poor h.		0.327*		0.411**
		(0.167)		(0.180)
Constant	0.209**	0.200	0.228***	0.284
	(0.085)	(0.146)	(0.074)	(0.175)
Observations	632	527	623	521
R^2	0.29	0.34	0.19	0.20

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$