Age-Specific Production Systems and Employment Duration

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We study the relation of age-specific personnel policy programmes at the firm-level on transitions out of employment for older workers. Our interest is to analyse the effects on individual employment exit behaviour when the firm provides age-specific production systems for its employees. These programmes comprise of many different ideas: some firms offer partial retirement plans or part-time work, whereas other firms encourage workers to stay longer by providing special training, specific workplaces or mixed-age teams. For a long time, the prevailing view was that investment in training does not pay off for older workers, since the expected time until employment exit or retirement is short. This may change when firms have to rely more on older workers. While age-specific production systems are often mentioned as suitable personnel management instruments to deal with ageing workforces, previous econometric analysis of their effectiveness is limited. As our focus is on personnel measures and, thus, on particular firm groups, we model exit from the current job, not exit from employment into retirement. Empirically, however, the two transitions most frequently coincide due to the low re-employment probability of older workers (Stevens, 2001; van Ours, 2006; Zwick, 2008).Given the focus on older workers, it is important to separate age effects and effects caused by employment duration dependence from each other. We set up a hazard rate model with simultaneous consideration of duration and age dependencies. We are not aware that simultaneous modelling of duration and age dependence has been done previously in the literature. Employment exits for workers near retirement age have been analysed by Hanel (2009) using a hazard rate model. Our analysis, by contrast, is based on Imbens (1994), who models duration and calendar time effects simultaneously. This model has an obvious application for age effects. Our hazard rate model consists of three parts: a flexible piecewise-constant baseline hazard for age dependence, a parametric part for duration dependence in form of a Weibull distribution, and an explanatory part containing covariates. All three parts enter the hazard rate multiplicatively; the model is estimated by maximum likelihood. In principle it is possible to control for unobserved heterogeneity, as long as there is an analytical solution to the integral of the survival function. One way to circumvent implementation of unobserved heterogeneity into the hazard rate estimator is to exploit the richness of our data by implementing firm dummies. Using German longitudinal employer-employee data, we are able to analyse individual as well as firm-specific characteristics of employment hazards. Individual determinants of employment exit and early retirement considerations have been investigated in the literature (Börsch-Supan, 2000), as well as institutional effects and incentives caused by unemployment benefits (Wilke, 2009). When using linked employer-employee data, a focus on firm-side determinants is feasible since labour supply and labour demand effects can be considered simultaneously. Wübbeke (1999) stresses the importance of firm-side characteristics for employment decisions near retirement age. Steffes (2009) analyse employment hazards for workers of every age with linked employer-employee data. Their main result is that exit rates are strongly influenced by firm characteristics, especially by the presence of works councils. As our interest is in employment conditions for workers aged 50 and above, we wish to sample employment spells with long duration. An inflow sample would not contain spells with long duration at the date of leaving the sample because observation time is relatively short in most panel data sets. With stock sampling, long spells can be sampled, but this sampling scheme has to deal with right- and left-censoring at the same time. In stock samples, long-lasting employment spells are over-represented compared to short spells. Our estimator corrects for length-bias. The correction for stock-sampled spells increases duration dependence and reduces age effects for the elderly, since they are more likely to be in an over-represented long-lasting spell. In our data, long employment spells are also left-censored before 1975, but this only applies to about eight percent of all spells. Sensitivity analysis might show whether it is necessary to correct the estimator for the occurrence of incomplete spell starts. Estimation results show that there is in fact a strong age effect when controlling for duration dependence. Our interest lies in the effects caused by age-specific production systems offered by the employer, such as specific workplaces and reduced working requirements, further training for the elderly, mixed-age teams, and part-time work. About 70 percent of firms in the data apply age-specific personnel policies for older workers. We group firms that apply similar personnel policies and calculate individual employment hazards for each of these groups. Do these programmes work in a way to reduce employment exits for older workers? Our first results suggest positive effectiveness of these measures, as they reduce overall employment hazards for older employees and in particular smooth hazard profiles at certain age thresholds.