Occupational Pensions and Job to Job Transitions in the UK. A Discrete Time Duration Analysis.

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1 Introduction

Over the last three decades portability of employer provided pension rights has been a matter of public policy concern in countries whose pension systems rely heavily on funded defined benefit (DB) private sector schemes. Among them, the United Kingdom (UK) has been one of the most active in enacting legislation aimed at improving portability of occupational pension rights. This has been achieved through a series of measures that have made occupational pension schemes membership voluntary, given additional rights to early leavers, required schemes to provide adequate information to members, and introduced personal pension schemes as an alternative to occupational schemes. However, portability losses are still substantial for workers leaving DB plans before retirement. Reforming pension portability policies involves efficiency and equity issues which should be carefully evaluated in the light of country specific labour and pension market structures. An important aspect of such an evaluation process is to obtain empirical measures of the effects of country specific portability regulation on labour mobility choices. In this respect, few empirical studies are available for the UK. Moreover, the evidence provided is mixed and mostly based on cross-sectional data from the 1980s.

In the UK, the main argument advanced for pension portability reform has usually been an efficiency one, implicitly claiming a causal relationship between pension porta-

bility losses and labour mobility[1]. The 1986 Social Security Act allowed employees to contract-out into money purchase (COMPS) defined contribution (DC) plans and into approved personal pension plans (APP) and was expected to enhance labour market flexibility while at the same time expanding supplementary pension coverage. These expectations have not yet been tested.

In this paper we use the first eight waves of the British Panel Households Survey (BHPS) to estimate discrete time single and competing risks models of job to job transitions. The data report occupational pension coverage and participation as well as personal pension participation, although not providing any detail on occupational pension plan characteristics. On the basis of this information we are able to classify private sector workers in five pension participation categories and to test the effect of belonging to each of these categories on different hazard rates.

The paper is organized as follows. The next section describes the structure of the UK pension system, focusing on the second pillar of pension provision. Section 3 outlines pension portability issues in the UK and the related empirical literature. Section 4 discuss the empirical model. Section 5 presents the data and some descriptive statistics. Section 6 illustrates the results. Section 7 concludes.

[1] Efficiency arguments have been recently fostered by the European Union (EU) recommendations to remove any portability impedement in order to improve labour mobility within the EU area. See Andrietti (2001a).

2 Occupational Pensions in the United Kingdom

The current UK pension system has a three tiered structure. The first tier is provided by the state, and consists of a basic flat-rate pension as well as a means-tested benefit. The second tier of mandatory pension provision is split between state provision, in the form of the State Earnings Related Pension Scheme (SERPS)[2], and private provision, in the form of occupational and personal pensions. Finally, there is a third tier of voluntary private retirement saving. The wide variety of pension plans currently offered in the UK is the result of a number of reforms undertaken over the last 25 years, whose main aim was to endow individuals with a choice of retirement pension vehicles provided by the state, by companies, and by private sector financial institutions. Central to this strategy was the "contracting-out" mechanism, introduced originally in 1978 to integrate existing occupational pension schemes into the new SERPS, set up to supplement the basic flat rate public pension[3]. The terms and conditions of contracting-out have been modified over the years. While employees with earnings in excess of a lower earning limit (LEL)

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[2]SERPS is set to be replaced by the State Second Pension - which will be a flat rate top up to the basic state pension and hence more redistributive towards lower earners. In addition the government is introducing a "stakeholder pension" which is essentially a personal pension with a heavily regulated charging structure, including an overall cap on charges. All employers will have to designate a scheme to their employees and allow individuals to make contributions direct from their wages. They will not, however, have to make any contribution on their employees' behalf.

[3]SERPS was introduced by the 1975 Social Security Act. Originally SERPS was paying benefits calculated as 25 percent of earnings averaged from the best twenty working years. The Social Security Act of 1986 reduced the generosity of SERPS benefits to 20 percent of earnings averaged over the entire lifetime.

were automatically enrolled into SERPS, they were also given the choice of contracting-out into an approved DB occupational pension scheme provided by their employer. In return, the employer would have paid a lower combined rate of employee and employer National Insurance contributions. The approval status of the occupational pension scheme was conditional on providing employees with a Guaranteed Minimum Pension corresponding to the SERPS pension[4].

A major innovation in pension policy occurred in 1988, as a result of the 1986 Social Security Act. Personal pensions were introduced as a further individual retirement savings instrument, while employees and employers were given wider contracting-out choices. Approved DC plans were allowed to contract out of SERPS, conditional on providing guaranteed minimum contributions equivalent to the contracted-out rebate. Moreover, any contractual requirement for an employee to join the employer's scheme was abolished, while employees were allowed to "opt-out" from an occupational plan in order to join an approved personal pension. Further elements of choice typical of the current UK pension system are that there is no obligation on employers to operate or to contract out their own occupational pension scheme[5]. On the other side, employees can also decide to remain in the SERPS or to later reenter it from a contracted-out scheme, while they can eventually top up their occupational or personal pension with

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[4]This requirement was abolished by the 1995 *Pensions Act*.

[5]Contracted-in occupational pension schemes provide a pension which is additional to the SERPS and basic state ones.

additional voluntary contributions or free-standing additional voluntary contributions (up to the limits permitted by the Island Revenue)[6].

Currently most occupational pension covered workers participate contracted out salary related schemes (COSR), while a minority of workers participate to contracted-out money purchase (COMP) schemes. There is also a minority of workers participating to contracted-in salary related (CISR) and money purchase (CIMP) schemes. Of the private pension schemes, COMPs and APPs are DC, COSR are DB, COMPs and COSRs are employer-provided, and APPs are usually provided by financial institutions[7]. Official statistics[8] reported in Table ?? show that 35 percent of private sector employees participate to an occupational pension plan, while 80 percent of participants belong to a DB plan.

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[6]Individuals can be members of occupational schemes and have personal pensions only if the following circumstances:

- the occupational scheme is contracted-into SERPS and provides benefits in addition to those of SERPS but an approved personal pension scheme, based only on minimum contributions, is used to replace SERPS benefits only; or

- members of occupational pension schemes can use personal pension schemes for the purpose of receiving transfer payments from previous schemes (in the case where the receiving scheme will not convert the transfer payment into an equivalent number of added years in the receiving scheme);

- individuals can be members of personal pension schemes while retaining deferred pensions in former occupational schemes.

[7]An employer can organise as well a group personal pension plan, but this is simply a collection of individual APPs placed with one provider.

[8]Government Actuary's Department (2000).

3   Pension Portability Issues in the UK

Pension regulation usually defines the standard portability options available to a worker leaving an occupational pension plan before retirement age. According to this general framework, pension portability rules in a pension plan define the rights of early leavers. Typically, these rules provide that an individual is entitled to join a pension plan only upon satisfaction of some eligibility condition (related to service, age or employment status). Once eligible, workers joining an occupational pension plan are usually required to complete a further vesting period before being entitled to any pension rights' accrual. Eligibility conditions and vesting periods apply to occupational pension plans independently of their DB/DC nature. However, they are neither the only nor the most important element to consider in evaluating the portability of occupational pensions. While mobility restrictions implied by vesting rules have been usually found to be insignificant in explaining workers' mobility behaviour[9], more relevant mobility constraints could arise from the very nature of DB plans. The typical DB plan promises a retirement pension annuity related to the length of stay in the plan and to the final salary. In case a separation occurs before retirement vested workers are entitled to a deferred pension based on the last salary received upon leaving the firm. If deferred benefits are not indexed to inflation and to productivity growth a worker moving to a

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[9]See, for example, Allen, Clark and McDermeed (1988, 1993).

different job with a similar pension plan and wage profile will accumulate a lower total pension benefits than the one he/she had accumulated remaining with the same firm throughout his/her career. Such a shortfall of actual retirement benefits constitutes a portability loss and is computed as an opportunity cost[10].

In contrast, workers covered by DC schemes have a legal claim on the individual pension account in which all pension contributions have been invested. If the funds remain in the account after the worker leaves the firm, the account will continue to grow by the accumulated returns on invested assets. Alternatively, the funds can be transferred to a different occupational or personal pension plan. In either case, DC plans can be defined as fully portable, given that a job mover retains the full value of the pension funds.

In the UK, a number of legislative changes have contributed to improve the situation of early leavers over the last 25 years. Before 1975, early leavers had no legal right to transfer their accrued pension entitlements to a new scheme or even to have a deferred pension from their old scheme. Under the current rules, the vesting period is set at two years of pension plan membership. In particular, vested early leavers from DB plans can have their accrued rights preserved as deferred benefits and revalued until retirement in line with the Retail Price Index, up to a maximum of 5 percent. Alternatively they can take a tax free transfer value to a different occupational pension scheme or to an

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[10]See Andrietti (2001) for a detailed exposition of the pension loss computation methodology.

approved personal pension or purchase a retirement annuity.

The possible consequences of the lack of portability of DB plans on individual job mobility choices have been widely investigated in the US pension literature. The major explanations advanced to explain the usual finding of a negative relationship between DB pension coverage and turnover include, in addition to portability losses, the compensation premiums accruing to pension covered workers[11] or the "self-selection" of immobile workers into pension covered jobs[12]. Available evidence relative to the UK is essentially limited to four previous studies. McCormick and Hughes (1984) use the 1974 General Household Survey (GHS) to estimate logit equations expressing "intentions to quit" and turnover. Their specification includes a pension coverage dummy and its interaction with job tenure to capture the shape of pension portability losses. They find that pension covered workers are significantly less likely to move, while the negative and significant size of the interaction term may suggest that tenure matters only in pensionable jobs. Henley, Disney and Carruth (1994) use 1985 GHS data to analyze the role of pension coverage in a job duration framework. Estimating hazard rates of exit from jobs without distinguishing between the exit route, they find that occupational pension scheme membership significantly decreases the hazard, while reported transferability of pension rights increases it (on the basis of observed completed

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[11] Gustman and Steinmeier (1993).

[12] Allen, Clark and McDermed (1993), Ippolito (1997).

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spells) relative to simple pension scheme membership. They also find that the effect on the hazard rate of membership interacted with time (duration) and time squared is superior to a simple dummy, confirming the McCormick-Hughes proposition that the loss function is time dependent and possibly non-linear. Mealli and Pudney (1996) use the 1988-89 Retirement Survey to analyze the role of unobserved heterogeneity in explaining the relationship between pension coverage status and labor force transitions. Estimating a random-effects competing risks model for transitions between pensionable jobs, non pensionable jobs and other three market states, they find a significant positive association between job tenure lenght and pension coverage status but no evidence of sorting on unobservables. In an recent paper[13], we use the European Community Household Panel (ECHP) survey to analyze the effect of occupational pensions and pension portability rules on interfirm job mobility in a sample of european countries. Estimating a structural probit equation derived from a switching regression model we find that in the UK pension covered workers are significantly less likely to move while pension portability losses are not a significant determinant of job mobility choices. The finding of positive wage premiums accruing to pension covered workers is rather consistent with the view that individuals are less likely to leave "good" jobs. While the evidence provided does not usually lead to a uniform interpretation of the pension-mobility relationship, most of the studies reviewed above use cross-sectional data from

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[13] Andrietti (2001).

the 1980s. In this paper we use more recent data and discrete time hazard rate models that allow us to exploit their panel structure.

4 Estimation Method

We are interested in modelling the length of the employment spell for individuals with their current employer. Duration models are typically estimated using spells that start over some period of time, which can be thought of as a random sample of spells. In a panel data framework spells that begin before the panel window are typically discarded and not used in estimation. In many applications this is a necessity since spells are left censored, that is the starting date of the spells in not known. In the BHPS, retrospective data are collected on the length of current employment spells in progress at the start of the panel window, which is potentially very valuable information. However, when spell data are gathered retrospectively, the sample is no longer random. The problem is that long spells are more likely to be in progress at the time when we sampled the data, and so will be over-sampled relative to their frequency among new spells. In order to use retrospective information, we need to condition the analysis on survival until the start of the panel window. We select a random sample of full-time private sector employees interviewed in wave one. The individuals in the sample are indexed by $i = 1, ..., n$, and the passage of calendar time is set in integer years. Year $t = 1$ is the year in which the respondent started working with the current employer (and is before the sample

selection year) while $t = \tau$ index the sample selection year. Each of the respondent is then interviewed approximatively one year later. If the individual subsequently moves we denote the length of the current spell by s_i, so $t = \tau + s_i$ is the calendar time of the spell end. Otherwise s_i denotes the censoring point at the end of the observation period. We have an unbalanced panel in that we follow individuals until they are no more observed in their "current employer" spell, either because they experience a job to job transition or because they drop out from the survey, or because they experience a transition to another state (e.g. unemployment, out of the labour force). While respondents experiencing an employer transition between the sample selection date and one of the following interviews contribute completed duration data, all the others respondents contribute censored duration data, with censoring immediately before the end of the interval between two consecutive waves. However, observations censored only because they remained in the current employer are still at risk of experincing a transition during the period of observation. Estimation is performed using a discrete-time duration approach as described in Allison (1982) and Jenkins (1995). Following Jenkins (1995), we define $\delta_i = 1$ for individuals with completed spells and $\delta_i = 0$ for censored ones. Let $t = \tau + s_i$ index the year in which the current employer spell finishes (where $s_i = 1, 2, ..., 8$) if $\delta_i = 1$ and index the interview year if $\delta_i = 0$. Each respondent i contributes s_i years of spell data from the interval between sample selection and interview. The discrete-time hazard rate - the probability that the current employment

spell ends at t conditional on lasting until that point - is denoted by:

$$h_{it} = prob(T_i = t | T_i \geq t; \mathbf{X}_{it}),$$ (1)

where T_i is a discrete random variable describing the spell end time, and $\mathbf{X}_{it}$ is a vector of covariates which may be time-varying. The unconditional probabilities of having a spell duration of t or surviving to t can be defined respectively as follows:

$$prob(T_i = t) = h_{it} \prod_{k=1}^{t-1} (1 - h_{ik}) = \frac{h_{it}}{(1 - h_{it})} \prod_{k=1}^{t} (1 - h_{ik}),$$ (2)

$$prob(T_i > t) = \prod_{k=1}^{t} (1 - h_{ik}).$$ (3)

Jenkins (1995) shows that these unconditional survivor probability has to be modified in order to take into account that the data have been derived from a stock sample rather that from a random population sample. On the basis of the above formulas, the probability of surviving t periods with the current employer, conditional on the duration of the current employer spell when the individual is selected in the sample, depends only on hazard rates and data for the years at risk between sample selection and the following interviews. The conditional survival probability is given by:

$$prob(T_i > t + s_i | T_i > \tau - 1) = \prod_{t=\tau}^{t+s_i} (1 - h_{it}),$$ (4)

while the hazard rate is given by:

$$prob(T_i = t + s_i | T_i > \tau - 1) = \frac{h_{i\tau+s_i}}{(1 - h_{i\tau+s_i})} \prod_{t=\tau}^{t+s_i} (1 - h_{it}).$$ (5)

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We can then write the likelihood function:

$$L = \prod_{i=1}^{n} \left[\frac{h_{i\tau+s_i}}{(1 - h_{i\tau+s_i})} \prod_{t=\tau}^{t+s_i}(1 - h_{it}) \right]^{\delta_i} \left[\prod_{t=\tau}^{t+s_i}(1 - h_{it}) \right]^{(1-\delta_i)}, \qquad (6)$$

and the corresponding log-likelihood function:

$$\log L = \sum_{i=1}^{n} \delta_i \log \left[\frac{h_{i\tau+s_i}}{(1 - h_{i\tau+s_i})} \right] + \sum_{i=1}^{n}\sum_{t=\tau}^{t+s_i} \log(1 - h_{it}). \qquad (7)$$

Defining an indicator variable y_{it} which assumes value $y_{it} = 1$ if $t = \tau + s_i$ and the current spell ends and $y_{it} = 0$ otherwise, the log likelihood function can be rewritten as:

$$\log L = \sum_{i=1}^{n}\sum_{t=\tau}^{\tau+s_i} y_{it} \log[h_{it}\frac{1}{(1 - h_{it})}] + \sum_{i=1}^{n}\sum_{t=\tau}^{\tau+s_i} \log(1 - h_{it}). \qquad (8)$$

This likelihood function has the same form as for a binary dependent variable model. The basic idea is to "stack" the data, so that each observation consists of a person-year. For example, a person who has been with the current employer for five years at the beginning of the panel window, and leaves just after finishing a second year will contribute one person-year to the panel. Her five pre-panel years contribute nothing to the estimation, since she was not in the risk set for those years. That is, if she had left after three years, she would have never been observed.

If h_{it} is determined as a discrete time counterpart to an underlying continuous time proportional hazards model:

$$h_{it}(t) = h_0(t) \exp(\mathbf{X}_{it}'\boldsymbol{\beta}), \qquad (9)$$

where $h_0(t)$ denotes the baseline hazards, $\mathbf{X}_{it}$ is a vector of time variant/invariant explanatory variables, and $\boldsymbol{\beta}$ is a vector of parameters, then the appropriate functional form is complementary log-log (extreme value)[14]:

$$h_{it} = 1 - \exp\left\{-\exp[h_0(t) + \boldsymbol{\beta}\mathbf{X}_{it}\right\}. \tag{10}$$

So far we have assumed the hazard relates to the single risk of the spell. We also estimate the competing risks of leaving the current employer spell separately for quits and layoffs and, among quits, for the transitions to occupational pension covered/not covered jobs. While estimating the competing risk model the exit states which are not under study are considered as right censored.

5 Data

The data used in the analysis are from wave 1-8 of the British Hosehold Panel Survey (BHPS). The first wave, carried out in the autumn of 1991, covered a nationally representative random sample of the UK consisting of about 5.500 households and 10.000 individuals. The original respondents, as well as any adult co-residents, were then followed over time through annual interviews usually conducted from September to December of each year. For the aims of our analysis we have selected a stock sample of private - non agricultural sector full time employees at the first interview

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[14]A common non-proportional alternative is to assume a logistic function for h_{it}. The complementary log-log function was adopted because its likelihood values were higher.

(1991). We track these workers until they separate from their current employer: our analysis is therefore limited to single spell. The event of interest is a job to job transition: we record complete job durations for individuals experiencing a similar event. A transition is allowed to be either to a private sector job or to a public sector job. Individuals experiencing a transition have a completed duration spell, and they exit the study. Alternatively, workers remaining with the same employer for the whole observation period contribute uncompleted job tenures. Individuals exiting their employment spells towards non-employment status as well as individuals not interviewed dropping out from the survey are recorded as censored and contribute uncompleted job tenure spells[15]. In order to observe these transitions we keep individuals interviewed at least for the first two waves. The BHPS collects detailed information on individuals' employment and their socio-economic characteristics. Working age individuals are asked to complete an employment history each year looking back over the previous year, and from these histories it is possible to identify the end of employment spells and the destination at the end of the spell. The employment histories also record employer

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[15] It is assumed here that the stochastic process underlying job to job transitions is independent from those governing other types of labour market behaviour behaviour and participation in the panel survey. If these assumptions are correct, then attrition from the panel before the duration is completed or exit to a non-employee state can be treated as right censored. However, it can also be true that panel survey participants who have a relatively higher probability to find a different job and to exit to non employment states also have a higher probability of dropping out of the paneñ. It that is true then the above procedure underestimates the rate at which the individuals change job. For an empirical analysis of the consequences of attrition in panel data see Van den Berg, Lindeboom and Ridder (1994).

changes and allow to distinguish the motivations underlying a job separation. For the purposes of our analysis we define a quit as a job separation motivated by the take up of a better job with a different employer as well as by other personal related reasons, conditional of not having experienced a spell of unemployment before taking up a new job. Layoffs are consequently defined as a residual category, containing individuals dismissed from their job, or completing a temporary contract or experiencing a spell of unemployment between jobs. Workers covered by an occupational pension scheme usually have to leave their current scheme while changing employer. The BHPS contains a number of questions about employees' pension arrangements. The survey asks employees if their present employer run a pension scheme for which they are eligible and if they participate to it. In addition, from the second wave onwards all respondents are asked questions about their personal pension arrangements and the start date of such arrangements. The latter question allows us to define personal pension participation in the first wave as well for individuals covered in the second wave and starting their personal pension before 1992. Moreover, respondents are also asked whether they have made any additional contributions, over and above the contracted out rebate.

Table 2 reports occupational and personal pension participation rates of our analysis sample. The stock sample of full time private sector non agricultural employees drawn in 1991 has a 41.5 percent occupational pension coverage. This figure seems to be consistent with the 35 percent participation rate reported in the official statistics,

provided that the latters include part-time and agricultural employees, which have a substantially lower participation rate. Of the 71 percent employees offered an occupational plan in 1991, 29,5 percent did not join the plan: 19.4 percent choose to opt-out for a personal pension plan, while the others remained into SERPS. Of the 29 percent of private sector employees not offered an occupational plan, 12.5 percent contracted out a personal pension, while the remaining remained into SERPS.

The random variable whose distribution is under study in our analysis is the duration of the employment relationship with the current employer. We measure job tenure in years from the starting of a job until the interview date. Job tenure in the current job is also considered to be a proxy of pensionable service used to calculate potential portability losses suffered by.workers covered by DB plans. A limitation of the data is that no detail is provided on pension plan characteristics, included the DB/DC distinction. The calculation of pension portability losses is therefore based on the typical UK private sector DB plan characteristics[16] and on a set of actuarial assumptions reported in Table 3. These assumptions seem to be a reasonable approximation, given the low proportion of workers covered by DC, and given the fact that the tight legal and administrative regulation of occupational pension plans as well as the competition between pension funds has led to a considerable degree of similarity between the features of most DB plan in the UK. BHPS data allow to identify a maximum of 8 observations on pension

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[16] See Government Actuary's Department (2000).

coverage and 7 observation on transitions. Table 4 summarizes job to job transitions between waves for various categories of pension coverage, distinguishing between layoffs and quits. The raw data show that workers enrolled in occupational pension plans have lower overall turnover and quit rates .

6   Results

6.1   Single Risks Models

Table 1 reports results, for males and females, from the estimation of a single risk proportional hazard models for job to job transitions. The hazard rate is conditioned on time constant and time varying covariates which can be grouped in four categories:

- personal and household characteristics include marital status, age at the first interview, number of children, household size and income, health status (reference: health), three education dummies (degree, a-level, o-level, reference: lower education), 5 region dummies (London, East, West-North, Wales, Scotland, reference: South), 2 house ownership dummies (private rental, public rental, reference: house ownership), employment status of the spouse;

- job specific characteristics include experience, experience squared, gross hourly wage, temporary contract, 2 occupation dummies (manager and professional, white collar worker, reference: blue collar worker), 2 worker's occupational skills dummies (high skills, medium skills, reference: low skills), a manifacturing industry

dummy, travel time to work, job satisfaction, additional job, union coverage, firm size dummies (large, medium, reference: small), 2 supervisory status dummies (manager, supervisor, reference: not supervising), 3 employer provided training dummies (general and specific training, general training, firm specific training, reference: no training);

- pension variables include a pension portability loss variable computed for workers enrolled in an occupational defined benefit plan, and 4 dummies indicating the different possible workers' pension coverage status (joined an occupational pension plan, did not join the occupational plan provided by the employer and opted out for a personal pension, did not join the occupational plan provided by the employer and remained into SERPS, was not offered an occupational plan and contracted out from SERPS for a personal pension, reference: was not offered an occupational plan and remained into SERPS);

- local market variables, such as annual unemployment rate ad vacancies to unemployment ratios. In order to obtain these local market informations we have matched the BHPS data with data from the National Online (NOMIS) by date of interview and travel to work data[17].

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[17] I wish to thank Francesco Devicienti for kindly providing the NOMIS data.

We report only the coefficients for the variable of primary interest in our analysis[18].
We find that female workers in temporary contracts and females workers with children
are significantly more likely to experience a job to job transition. Consistently with
the predictions of previous literature, employer sizes and affect negatively the hazard
rate, although not at standard significant levels. Union membership as well as labour
market variables have not a significant explanatory power.

Importantly, we find that male workers who have contracted-out an occupational
pension plan are significantly less likely to move and that pension portability losses play
a significant negative role in explaining job to job transitions. We also find that male
workers opted out from an occupational to a personal pension plan as well as workers
not offered a plan but joining a personal pension plan are significantly less likely to
move. This results is surprising given that tpersonal pension plans are not linked to a
particular employer and are therefore portable. However it may be the case that workers
contributing for their pensions are "savers" and that this characteristic is strictly tied
to their mobility preferences[19]. Pension variable do not seem to have any significant
explanatory power in explaining job to job transitions of female workjers. We have
assumed a flexible "semiparametric" piece-wise form for the baseline hazard. Duration
dependence is captured through yearly duration time intercepts; durations over 10 years

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[18]The complete set of estimated coefficients are available upon request from the author.

[19]See Ippolito (1997).

are grouped in a single dummy. The baseline hazard shows a non-monotonic shape, although the fact that the hazard is significantly decreasing for most of the job tenure interval indicate a significant negative duration dependence.

6.2 Competing Risks Models

The quit- layoff distinction is particularly important to our analysis. The negative link between pensions and voluntary moves is a well established finding in the empirical pension literature, although the causes of such a relationship, including the role of pension portability losses, self-selection and wage premiums, are still debated[20]. Moreover, some empirical studies for the US[21] have also documented a negative relationship between employer provided pensions and layoffs, motivating it by the fact that the implicit nature of the pension contract acts as a firing constraint for the firm, imposing reputational costs in case the firm breaks the contract.

Table 5 reports the main results from estimation of a competing risks model where job to job transitions are divided into quits and layoffs. Our results show that participating to an occupational pension plan and pension portability losses have a significant negative effect on both quits and layoffs for males. Once again we find that male workers who opted out to a personal pension or were not offered an occupational plan but contributed to a personal pension plan are significantly less likely to quit.

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[20] See Dorsey (1995) for a review of this literature.

[21] Allen, Clark and McDermed (1988, 1993) and Dorsey, Cornwell and Mehrzad (1993).

Finally, Table 6 reports the estimates of a second competing risks model focused on quits that distinguishes between transitions to occupational pension versus non occupational pension jobs. In this case male and female workers participating to an occupational pension plan as well as male workers who opted out to a personal pension plan or were not offered a pension plan but joined a personal pension plan are significant less likely to experience a voluntary transition to a job not covered by an occupational pension.

7 Conclusions

This paper analyzes the factors affecting the job to job transitions of private sector employees in the UK. We focus on the impact of various forms of second pillar pension arrangements. Estimating discrete time hazard rate models of job to job transition we find that workers participating to an occupational pension are significantly less mobile compared to those contracted into SERPS and not offered an occupational plan. We also find that portability losses have a significant negative impact on job to job transitions of male workers participating to occupational pension plans. However, unexpectedly we also find that workers who are offered an occupational pension plan but who choose either to remain into SERPS or to opt-out for a personal pension are significantly less likely to move. This results is surprising given that personal pension plans are not linked to a particular employer and therefore enjoy full portability. Estimating a competing

risk model of quits and layoff we find that participating to an occupational pension or having opted out to a personal pension have a significant negative effect on both quits and layoffs for males and for quits only in the whole sample, while being not significant in the female sample. Finally, estimating a second competing risk model which focuses on quits and distinguishes between an occupational pension/non occupational pension job as destinations, we find that male and female workers participating to an occupational pension plan as well as male workers who opted out to a personal pension are significant less likely to experience transition to a non pension job. The effect of pension portability losses is however no more significant at standard levels. While the pension loss argument is weakened by the latter results, there are two argument which are consistent with the above results, although we do not directly test them in the data. The first argument indicate that jobs offering an occupational pension plan in the UK are good jobs and pay an efficiency wage premium. The second argument, provided by Ippolito (1997) claims that workers contributing for a private/occupational pension are savers and that this characteristic is strictly tied to lower mobility preferences.

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Table 1: Occupational Pension Coverage by Plan Type - 1995

Occupational Pension Plans	c-out	Number	%	1995 Participants c-out (.000)	no c-out (.000)	% of private sector employees (17.3 millions)
	COSR	20.500		4.115	20	23.9
	CISR	17.480		-	575	3.32
DB Plans		**37.980**	**89.3**	**4.115**	**595**	**27.22**
	COMP	460		460	70	3.06
	CIMP	530		-	530	3.06
DC Plans		**990**	**2.3**	**460**	**600**	**6.12**
	c-out	1.980		255	30	1.66
	c-in	1.600		-	5	0.0
Hybrid Plans		**3.580**	**8.4**	**255**	**35**	**1.66**
Total		**42.550**	**100**	**4.830**	**1.255**	**35**

Base: All Private Sector Employees

Source: Government Actuary's Department (2000)

Table 2: Pension Coverage by Survey Year

	1991	1992	1993	1994	1995	1996	1997	Pooling
Offered OP	**71**	**74.6**	**77.9**	**77.8**	**79.6**	**82.3**	**83.8**	**76.2**
Offered OP-joined	41.5	45.1	47.6	49.5	56.8	62.1	63.8	48.7
Offered OP-not joined	29.5	29.5	30.3	28.4	22.8	20.2	20	27.5
Offered OP-not joined- PP	19.4	19.7	20.9	19.5	17.9	16.3	17.2	19.2
Offered OP-not joined- SERPS	10	9.9	9.4	8.9	4.9	3.9	2.8	8.3
Personal Pension (PP)	**31.9**	**31.8**	**32.7**	**32.7**	**29.6**	**27.7**	**28.6**	**31.3**
Not Offered OP	**29**	**25.4**	**22.1**	**22.2**	**20.4**	**17.7**	**16.2**	**23.8**
Not Offered OP- PP	12.5	12.2	11.8	13.2	11.7	11.4	11.4	12.2
Not Offered OP- SERPS	16.5	13.2	10.3	9	8.8	6.3	4.8	11.6
Sample Size	**1.658**	**1.356**	**965**	**737**	**591**	**491**	**394**	**6.191**

Sample: full-time private sector employees aged 20-54

Source: Our elaboration on BHPS data.

Table 3: Assumptions for Portability Loss Computation

Annual Accrual Rate	1/60
Pensionable Wage	Final Wage
Normal Retirement Age	60
Expected Inflation Rate	3%
Expected Nominal Wage Growth Rate	5%
Post-Retirement Indexation	3%
Early Leavers' Indexation	3%
Nominal Discount Rate	5%
Inflation Adjusted Discount Rate	2%

Table 4:   Job Mobility Rates by Pension Coverage and Survey Year

	1991-92		1992-93		1993-94		1994-95		1995-96		1996-97		1997-98	
	Layoff	Quit	Layoff	Quit	Layoff	Quit	Layoff	Quit	Layoff	Quit	Layoff	Quit	Layoff	Quit
OOP-joined	3.8	3.6	4.8	2.5	2.7	4.2	3.1	2.3	2.5	0.8	4	3.1	1.1	2.2
OOP-PP	6.5	5.2	7.2	2.6	7.6	4.2	2.7	1.8	1.3	3.8	1.7	3.3	0	3.8
OOP-SERPS	14.1	3.5	7.5	1.5	5.8	9.6	0	7.9	0	0	9.1	18.2	0	0
NOOP-PP	10	6.4	12	2.6	2.6	6.4	1.6	6.6	9.3	11.6	0	9.1	3.3	3.3
NOOP-SERPS	15.2	12	8.3	10.7	10.2	12.2	15.2	9.1	8.3	20.8	0	8.3	0	20
Sample Size	1.658		1.356		965		737		591		492		394	

Sample: full-time private sector employees aged 20-54

Table 5: Estimated Hazard Rates for Job to Job Transitions

	Male	Female
Children	0.000	0.397
	(0.01)	(2.90)**
Temporary Contract	0.555	0.888
	(1.72)	(2.70)**
Union Member	0.071	0.108
	(0.54)	(0.55)
Medium Firm	-0.168	-0.077
	(1.26)	(0.45)
Large Firm	-0.298	-0.017
	(1.72)	(0.07)
Public Rental	0.296	0.205
	(1.56)	(0.83)
Private Rental	-0.058	0.062
	(0.30)	(0.26)
OP Member	-0.742	-0.116
	(3.82)**	(0.46)
OP-No joined-PP	-0.821	-0.176
	(4.60)**	(0.68)
OP-No joined-SERPS	-0.542	0.217
	(2.53)*	(0.90)
Not offered OP - PP	-0.426	0.344
	(2.42)*	(1.49)
Pension Portability Loss	-0.153	0.038
	(2.23)*	(0.26)
Annual Unemp. Rate	-0.026	-0.042
	(1.07)	(1.25)
Unemp.-Vacancy Ratio	0.011	-0.004
	(1.83)	(0.51)
d1	0.871	1.274
	(3.82)**	(3.63)**
d2	0.711	1.257
	(3.14)**	(3.68)**
d3	0.475	0.408
	(2.11)*	(1.10)
d4	0.247	0.466
	(1.06)	(1.32)
d5	0.206	0.679
	(0.89)	(2.06)*
d6	0.165	-0.039
	(0.70)	(0.10)
d7	0.142	-0.119
	(0.59)	(0.31)
d8	-0.031	-0.083
	(0.11)	(0.20)
d9	-0.237	-0.028
	(0.69)	(0.06)
d10 +	0.005	0.051
	(0.02)	(0.10)
Log Likelihood	-1.155	-649
Spells Ended From Risk	380	236
Observations	4.122	2.069

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Table 6: Estimated Hazard Rates for Voluntary and Involuntary Job to Job Transitions

	Males		Females	
	Quit	Layoff	Quit	Layoff
Children	0.017	-0.008	0.211	.777
	(0.13)	(0.06)	(1.21)	(3.32)**
Temporary Contract	0.509	0.494	0.723	0.964
	(0.93)	(1.23)	(1.75)	(1.76)
Union Member	0.220	-0.018	0.049	0.272
	(1.13)	(0.10)	(0.19)	(0.93)
Medium Firm	-0.399	-0.008	0.072	-0.361
	(1.97)*	(0.04)	(0.34)	(1.26)
Large Firm	-0.414	-0.160	-0.213	0.082
	(1.58)	(0.68)	(0.65)	(0.23)
Public Rental	0.052	0.423	-0.128	0.693
	(0.17)	(1.74)	(0.36)	(1.88)
Private Rental	-0.074	-0.097	-0.099	0.370
	(0.25)	(0.38)	(0.32)	(0.97)
OP member	-0.820	-0.638	-0.295	0.540
	(2.85)**	(2.40)*	(0.87)	(1.30)
OP-no joined-PP	-1.194	-0.485	-0.265	0.037
	(4.52)**	(1.97)*	(0.86)	(0.08)
OP -no joined - SERPS	-0.764	-0.368	0.050	0.681
	(2.48)*	(1.25)	(0.17)	(1.53)
Not offered OP-PP	-0.714	-0.228	0.255	0.257
	(2.80)**	(0.93)	(0.97)	(0.53)
Portability Loss	-0.294	-0.051	-0.304	0.276
	(2.50)*	(0.58)	(1.20)	(1.41)
Annual Unemp. Rate	-0.002	-0.056	-0.040	-0.067
	(0.04)	(1.69)	(0.96)	(1.15)
Unemp-Vacancies Ratio	-0.016	0.025	-0.017	0.016
	(1.58)	(3.88)**	(1.57)	(1.46)
d1	0.754	0.878	1.182	1.458
	(1.94)	(3.08)**	(2.39)*	(2.79)**
d2	0.784	0.677	1.422	1.117
	(2.07)*	(2.39)*	(2.98)**	(2.13)*
d3	1.046	-0.057	0.994	-1.085
	(3.02)**	(0.18)	(2.05)*	(1.30)
d4	0.619	-0.075	0.687	0.241
	(1.74)	(0.23)	(1.41)	(0.44)
d5	0.341	0.119	1.110	-0.223
	(0.93)	(0.39)	(2.52)*	(0.38)
d6	0.591	-0.338	0.311	-0.646
	(1.73)	(0.94)	(0.63)	(0.95)
d7	0.281	-0.062	0.275	-1.011
	(0.77)	(0.19)	(0.57)	(1.28)
d8	0.584	-1.145	0.099	-0.285
	(1.59)	(1.91)	(0.18)	(0.43)
d9	-0.164	-0.292	0.254	-0.381
	(0.30)	(0.66)	(0.42)	(0.49)
d10 +	0.728	-0.832	-0.209	0.331
	(1.65)	(1.39)	(0.26)	(0.50)
Log L	-637.8	-735.1	-469.4	-290.45
Spells ended from risk	178	202	155	81
Observations	4.122		2.069	

Table 7: Estimated Hazard Rates for Voluntary Transitions to OP/Non OP Jobs

	Males		Females	
	Quit OP	Quit NOP	Quit OP	Quit NOP
Children	-0.022	0.064	0.361	0.168
	(0.10)	(0.40)	(1.39)	(0.68)
Temporary Contract	1.253	-0.505	1.024	0.705
	(1.65)	(0.62)	(1.72)	(1.24)
Union Member	0.187	0.303	-0.418	0.841
	(0.70)	(1.03)	(1.16)	(2.05)*
Medium Firm	-0.419	-0.359	0.141	-0.177
	(1.54)	(1.17)	(0.48)	(0.54)
Large Firm	-0.418	-0.373	-0.232	-0.576
	(1.27)	(0.82)	(0.56)	(0.98)
Public Rental	-1.094	0.446	-0.177	-0.165
	(1.48)	(1.17)	(0.35)	(0.32)
Private Rental	-0.430	0.251	-0.145	-0.170
	(0.89)	(0.66)	(0.33)	(0.39)
OP Member	0.198	-1.625	0.967	-2.278
	(0.45)	(3.62)**	(2.08)*	(3.15)**
OP-no joined-PP	-0.043	-2.278	0.359	-0.638
	(0.11)	(5.26)**	(0.78)	(1.46)
Offered OP-no joined-SERPS	0.184	-1.369	0.753	-0.490
	(0.39)	(3.10)**	(1.74)	(1.13)
Not Offered OP-PP	-0.905	-0.705	0.370	0.018
	(1.73)	(2.31)*	(0.84)	(0.05)
Portability Loss	-0.258	-0.361	-0.362	-0.058
	(1.72)	(1.74)	(1.22)	(0.11)
Annual Unemp. Rate	-0.142	0.126	-0.102	-0.011
	(2.71)**	(2.40)*	(1.70)	(0.20)
Unemp.-Vacancies Ratio	-0.002	-0.022	-0.004	-0.020
	(0.12)	(1.46)	(0.29)	(1.27)
d1	0.171	1.364	0.887	1.403
	(0.29)	(2.37)*	(1.34)	(1.79)
d2	0.509	1.037	0.925	1.894
	(0.94)	(1.82)	(1.43)	(2.54)*
d3	1.175	0.877	1.044	0.760
	(2.54)*	(1.60)	(1.67)	(0.93)
d4	0.584	0.745	0.558	0.809
	(1.18)	(1.38)	(0.88)	(1.03)
d5	0.547	0.219	-0.168	1.946
	(1.14)	(0.37)	(0.24)	(2.89)**
d6	-0.068	1.098	-0.358	0.947
	(0.12)	(2.25)*	(0.48)	(1.29)
d7	0.302	0.277	0.179	0.317
	(0.65)	(0.46)	(0.30)	(0.38)
d8	0.014	1.054	-1.075	0.920
	(0.03)	(2.03)*	(0.99)	(1.21)
d9	-0.395	0.115	0.369	-0.018
	(0.52)	(0.14)	(0.51)	(0.02)
d10+	1.067	-0.231	-0.561	0.344
	(2.15)*	(0.21)	(0.52)	(0.29)
Log-Likelihood	-380.6	-332.5	-288.2	-253.3
Spells Ended From Risk	86	92	78	77
Observations	4.122		2.069	