The nature of self-employment towards retirement: necessity or opportunity? Revealed preference evidence from an unemployment insurance reform in the Netherlands [*]

Jim Been [†]   Marike Knoef [‡]

Preliminary version October 2012

Abstract

This paper analyzes labor market dynamics of persons aged 50-63 in the Netherlands during the period 1989-2009. More explicitly, the paper analyzes state dependence and mobility between self-employment, paid-employment, unemployment (UI), and other non-employment using a dynamic multinomial logit model with unobserved heterogeneity. The paper focuses on substitution between self-employment and unemployment and exploits an exogenous age-specific UI reform in 2004 to analyze whether self-employment before retirement is chosen out of necessity or opportunity. The results provide evidence that at the end of people's working life necessity plays a larger role in the choice for self-employment than the opportunity to reduce working hours gradually.

JEL codes: H55, J14 and J26
Keywords: Labor mobility, retirement, self-employment, unemployment insurance reform

1 Introduction

In virtually all OECD countries, labor force participation rates of the 50+ population decreased in the period from the 1960s to the mid-1990s (OECD, 2011). Among others, Blondal and Scarpetta (1999) argue that this was partially due to generous early retirement possibilities, provided by social insurance schemes such as unemployment- and disability insurance. The Netherlands was not an exception to this phenomenon and since the mid-1990s social insurance reforms have been undertaken to increase the labor force participation of the 50+ population. As a result, participation rates of the 50+ population increased from 40% in 1996 to 60% in 2011 thereby increasing the number of 50+ persons being active in both paid-employment and self-employment.

In several countries, it has been found that social insurance reforms resulted in substitution effects between unemployment insurance, disability insurance, early retirement and paid-employment.[1] With regard to self-employment, substitution with unemployment insurance has been found by Carrasco (1999), Moore and Mueller (2002), Martinez-Granado (2002) and Parker and Robson (2004), indicating that less generous unemployment insurance, in terms of benefits, duration and eligibility, make self-employment a more attractive alternative. These results suggest that the recent increase in self-employment among Dutch older persons (Van Es and Van Vuuren, 2010) may, at least partially, be explained by recent policy reforms that have made self-employment relatively more attractive compared to social insurance schemes. Self-employment may then be chosen as an alternative opportunity to reduce working hours and enhance gradual retirement (e.g. Quinn, 1980; Quinn and Kozy, 1996; Gustman and Steinmeier, 1984; Ruhm, 1990; Bruce et al., 2000; Kim and DeVaney, 2005; Ruhm, 2006; Parker and Rougier, 2007; Giandrea et al., 2008; Gu, 2009; Maestas and Zissimopoulos, 2010).[2] On the other hand, self-employment may be chosen out of necessity, when people lack adequate opportunities.

This paper focuses on an age-specific unemployment insurance reform introduced in 2004 in the Netherlands, which implied an exogenous shock in the attractiveness of unemployment as a pathway to retirement. The reform introduced job-search requirements for the unemployed

---

[1]E.g. (Hassink et al., 1995; Kapteyn and De Vos, 1997; Riphahn, 1997; Autor and Duggan, 2003; Koning and Van Vuuren, 2010; Bratsberg et al., 2010; De Vos et al., forthcoming; Bloemen et al., 2011; De Jong et al., 2011).

[2]Older workers generally tend to reduce working hours substantially before complete withdrawal from the labor market (Gordon and Blinder, 1980; Gustman and Steinmeier, 1983, 1984; Quinn and Kozy, 1996; Ekerdt et al., 1996; Ghent and Clark, 2001; Ruhm, 1990; Morris and Millier, 2003; Cahill et al., 2006; Kantarci and Van Soest, 2008). The flexible working hours for self-employed may also result in later withdrawals from the labor market, as suggested by Fuchs (1982), Hochguertel (2010) and Zissimopoulos et al. (2007).

between the age of 57.5 and 63,[3] to discourage older workers to use unemployment insurance as a way to retire early. Persons who started their own business, however, were excluded from job search requirements. Bloemen et al. (2011) and Hullegie and Van Ours (2012) found that this 2004 UI reform has significantly increased exits from unemployment to paid-employment as well as exits from unemployment to disability insurance. Compared to these studies this paper also pays attention to self-employment. Moreover, the reform allows us to draw conclusions on whether self-employment at later ages is chosen out of necessity or opportunity.

Self-employment out of necessity is especially relevant for older workers, since they often face difficulties finding a job (Chan and Stevens, 1999, 2001; Maestas and Li, 2006; Walker and Webster, 2007). It has been found that flows from unemployment to self-employment are relatively high such that self-employment provides an option to avoid unemployment (e.g. Tapia, 2008; Martinez-Granado, 2002; Carrasco, 1999; Falter, 2001; Taylor, 1999; Reize, 2000; Rissman, 2003; Glocker and Steiner, 2007).[4] Furthermore, Benedict (2008), for example, finds a positive relation between the unemployment rate and self-employment (known as the *recession push* hypothesis). However, the recession push hypothesis has not been confirmed by Moore and Mueller (2002) and Tapia (2008). Furthermore, Carrasco (1999) finds that self-employment becomes more attractive when the economic situation improves (the *recession pull* hypothesis).[5]

Our papers contribution to the empirical literature is threefold. First, we estimate the effect of job search requirements for unemployed individuals at the end of their working life on transitions to self-employment, using a Dutch UI reform in 2004. As far as we know, there are no other studies that investigated the effect of job search requirements on substitution between unemployment and self-employment as an exit route to retirement.[6] Second, whereas Bloemen et al. (2011) and Hullegie and Van Ours (2012) thoroughly investigated the effect of job search requirements for older workers on the outflow from unemployment, this paper also analyzes whether and to what degree the inflow from paid employment to unemployment has decreased. This is reasonable since the introduction of search requirements for older people has made unemployment a less attractive exit route to retirement for people in paid employment.

---

[3]65 is the statutory retirement age and persons aged 64 are excluded from the reform.

[4]A remark here, is that it is found that flowing from unemployment to self-employment also reduces the probability of success of the business.

[5]For an overview of the discussion regarding the necessity and opportunity of self-employment before 1991, see Meager (1992).

[6]For an overview of the literature regarding the effects of search requirements in unemployment, see Fredriksson and Holmlund (2006). Section 4.3 of that paper focuses on the empirical studies analyzing the effects of search requirements and shows that the bulk of the literature is focused on the effects of exiting unemployment. Little attention has been paid to the effect of search requirements on the labor market state after the unemployment spell.

Finally, this study contributes to the literature on push and pull factors to self-employment, by investigating the pathways through which people enter self-employment and by estimating the effects of the unemployment rate. Previous research found ambiguous results. We focus on push and pull factors for people at the end of their working life, for whom the decision to become self-employed is incomparable to people at a younger age. That is because people at the end of their working life may prefer flexibility in working hours as a way to retire partially and for unemployed older people it is relatively difficult to find a paid job.

The methodology used in this paper is related to previous research by Cappellari et al. (2010), who model employment transitions of men and women of age 50-63 in the UK. Transitions are modeled in a dynamic multinomial logit framework[7] correcting for unobserved heterogeneity to estimate probabilities between mutually exclusive labor market states. Estimating a dynamic multinomial logit model avoids a possible sample selection bias, which may occur when considering binomial estimates for a transition. Whereas Cappellari et al. consider higher-order transitions, we introduce self-employment as a separate state in the model similar to Emmanoulidi and Kyriazidou (2012) and Zucchelli et al. (2012). However, unlike most other studies, which distinguish paid-employment, self-employment and unemployment (which generally includes all non-employed people), we separately distinguish paid-employment, self-employment, unemployment (indicated by receiving UI benefits) and other non-employment (hereafter called 'inactivity').[8] To estimate the effects of the 2004 UI reform we use a difference-in-difference approach. Finally, the paper takes advantage of the long panel dimension of the Dutch Income Panel data (1989-2009), where repeated observations of the same individuals allow us to take into account unobserved heterogeneity.

Our main finding is that older persons who chose a period of self-employment before retirement tend to do this out of necessity, e.g. to avoid or end a spell of unemployment. Even after correcting for observed and unobserved characteristics, most people enter self-employment from unemployment and unemployed individuals at the end of their working life have a higher probability to enter self-employment than paid employment. Introducing job search requirements among unemployed individuals at the end of their working life increases exits to both paid-employment and self-employment in a similar degree. This means that job search requirements for the unemployed of age 57.5-63 increased self-employment at the expense of unemployment,

---

[7]This approach is also used by Constant and Zimmerman (2004), Caliendo and Uhlendorff (2008) and Martinez-Granado (2002).

[8]E.g. people in social assistance, disability, early retirement or people without a personal income. Most of the people in 'inactivity' receive early retirement benefits or disability benefits.

4

but self-employment has not acted as an alternative opportunity to reduce working hours gradually. For older workers in paid employment the reform made unemployment a less attractive exit route to retirement and we indeed find that transitions to unemployment declined. As an alternative, women more often move to inactivity (e.g. early retirement or disability), while men stay in paid employment, despite the flexible character of self-employment.

The structure of the paper is as follows. The next section describes the system of unemployment insurance in the Netherlands. Consequently, section 3 describes the model we use to analyze labor market dynamics of older workers as well as the identification of the reform. Section 4 addresses the data and presents summary statistics on labor market statuses and transitions of older workers, after which section 5 presents the estimation results. Finally, section 6 discusses the results and 7 concludes.

2   Unemployment insurance towards retirement

In the Netherlands individuals receive public pension benefits as from the statutory retirement age of 65. Several routes can be taken to reach retirement, namely through paid employment, self-employment, early retirement, disability, unemployment, and other non-employment. In the 1990s the use of UI benefits expanded since generous arrangements and easy eligibility rules made unemployment attractive to bridge employment and retirement for older workers (Kapteyn and De Vos, 1997; Huynen et al., 2004; Bloemen et al., 2011).[9] Despite high inflows in unemployment and low outflows, little reforms were made during the 1990s, except for some small revisions in eligibility requirements. For example, in 1999 a reform introduced mandatory intake meetings and the obligation to accept a suitable[10] job-offer for persons aged 57.5 and over. An other reform introduced in 2001 made UI less favorable as a retirement route by making the employer pay part of the UI benefits if a worker aged 57.5 or older is laid off.

Since 1995, roughly three types of UI benefits have existed in the Netherlands. *Short-term UI benefits* guarantee a payment of 70% of minimum wage or 70% of previous wage whichever is lower with a duration of 6 months.[11] The eligibility requirement is that people do not quit

---

[9]For an extensive description of the Dutch social security system before 1990, see Aarts and Jong (1990).

[10]'Suitable' job offers are defined by the UI agencies, taking into account previous occupation, education, and earnings. After some time in unemployment, the definition of a suitable job shifts more to temporary work and lower wages.

[11]UI benefits are only granted up to a maximum amount of money that changes every year with approximately the same rate as the minimum wage (about 0.64% in 2010 and 0.60% in 2011). In 2010, this maximum amounted 187.77 euro (gross) a day.

voluntarily and have worked at least 26-out-of-39 weeks. *Wage-related UI benefits* guarantee a payment of 70% of previous wage for a duration of 6 months to 5 years dependent on age.[12] An additional eligibility requirement compared to short-term UI benefits is that persons should have worked for at least 4-out-of-5 years. *Follow-up UI benefits* guarantee a payment of 70% of minimum wage or 70% of previous wage whichever is lower. Eligibility requirements are similar to wage-related benefits. The duration of receiving follow-up UI benefits is 2 years if a person's age is below 57.5 and 3.5 years after this age.

From August 2003, follow-up UI benefits were abolished. However, persons of age 50 and over could still receive extended benefits, in principal until the age of 65. However, these extended benefits are now means tested with a threshold of household income of 70% of the minimum wage. Since 2005, the UI duration no longer depends on age but on the actual employment history, while the maximum duration was reduced from 60 to 38 months in October 2006. Additionally, this reform implemented an increase in benefits from 70 to 75% in the first two months and the 26-out-of-39 weeks criterium became 26-out-of-36 weeks.

Exhaustion of UI benefits, however, does not imply abject poverty and persons may receive follow-up benefits: low-wealth households can opt for a means tested social assistance (SA) benefit consisting of an income that is 70% of minimum wage. For low-income people with a low wealth level, benefits from SA are as generous as the UI benefits and SA has been an important route towards retirement for people that were laid off at older ages as such[13] (Kapteyn and De Vos, 1997; Huynen et al., 2004; Bloemen et al., 2011; De Vos et al., forthcoming). Although differences in UI generosity between older and younger workers have largely disappeared due to aforementioned reforms, older workers still favor some extra possibilities to complement or extend their income when unemployed. Persons aged 50-64 can opt for an *IOAW-insurance* that complements (family) income up to subsistence level and is independent of wealth. Persons receiving IOAW have similar obligations as person in UI and have an extra eligibility requirement of being less than 80% disabled (until December 2005) and less than 35% thereafter, accordingly to developments in the disability insurance scheme. Since the first of December 2009, persons aged 60 years and over who become unemployed can also opt for the *IOW-insurance* in addition to unemployment or disability insurance. The IOW was specifically introduced because of older workers rarely finding new jobs. IOW-insurance recipients may retain their benefits up to the

---

[12]For our age categories of interest these age related benefit durations were 3.5, 4 and 5 years for people aged 50-54, 55-59 and 60-64 respectively. (http://www.st-ab.nl/g1/1-86566ks03-ww.htm)

[13]SA is means tested with respect to personal wealth, while UI is not. UI benefits, however, depend on former income while SA does not.

age of 65. Advantage of the IOW compared to the IOAW is that personal income, instead of household income, is complemented up to subsistence level, such that a partner's income is not taken into account in the IOW.

This paper focusses on a reform started on January 1st 2004, which implied that unemployed persons older than 57.5 years were no longer exempted from the requirement to search actively for a job. Before 2004, only persons younger than 57.5 years old faced search requirements to be eligible for UI benefits. Such search requirements imply that persons in unemployment 1) have a mandatory intake meeting at the unemployment office (UWV) where individual criteria are made regarding the expected activities undertaken during unemployment that are *ex post* testable,[14] 2) have the obligation to accept suitable job-offers, 3) have a sufficient number of applications,[15] where sufficiency is individually determined and related to the labor market, the number of available vacancies and personal health, 4) have the possibility to receive extra requirements such as mandatory educational programs and job-search assistance,[16] and 5) have regular report meetings every 4-6 weeks in addition to the mandatory intake meeting and the follow-up to explain the further procedures.

The baseline from which individual arrangements are made is the requirement of applying for a job once a week on average. An automatic exception is made for individuals starting their own business. Exceptions are also made for persons participating in care or volunteering for at least 20 hours per week for a period of at most six months, individuals taking part in an educational program, people aged 64-65, or persons older than 62 years and 2 months who already received UI benefits for at least a year in 2004. People can reasonably assumed to be complying with the search requirements due to the risk of substantial financial sanctions otherwise (Verveen et al., 2005).

As from 2006, starting self-employment from unemployment is especially attractive: irrespective of age, 26 weeks of unemployment benefits can be received in advance without any further job-search requirements if a person tries to start a business from unemployment. Evidence from Germany suggests that such programs tend to be an effective way of stimulating people to enter self-employment from unemployment (Baumgartner and Caliendo, 2008). However, there is no evidence on the long-term effectiveness, e.g. sustained self-employment or

---

[14]The employability of an individual is determined by objective characteristics such as profession, education, age and experience as well as the subjective impression of the caseworker during the interview.

[15]The following options are considered to be an application: letter, e-mail, phone call or nuncupative contact with a company, registering at an agency, having a job interview and doing an assessment.

[16]An individual who is assumed to be able to find work within six months does not receive assistance. Other individuals receive job search assistance from the unemployment office.

re-entry of unemployment, of these programs. Self-employment may, at least, act as a step-pingstone to paid-employment (CPB-ROA, 2011). Income from self-employment is deducted *ex post* from the unemployment benefits.

3 Model

3.1 Labor market transitions before retirement

This section describes the model we use to investigate labor market transitions of individuals in the age group 50-63. The exit route to retirement can be seen as the outcome of a maximization process, in which individuals reevaluate their optimal labor market status each period, given their preferences and the constraints that coincide with each labor market state. They compare utility streams associated with different exit routes and choose the alternative with the highest utility stream. More specifically, we define the inter-temporal utility of individual i as follows:

$$U_\tau = \sum_{t=\tau}^{T} (1+\rho)^{\tau-t} u_t(c_{it}, l_{it}, j_{it}; s_{it}, v_{it}) \qquad (1)$$

where c_{it} and l_{it} denote consumption and leisure time of individual i in time period t, respectively. ρ is the discount factor and T the time horizon of the individual (life expectancy). In our model we distinguish between four mutually exclusive labor market states: paid-employment (j=1), self-employment (j=2), unemployment insurance (j=3), and other non-employment (j=4). Each labor market status is associated with it's own consumption and leisure possibilities, but labor market status itself may also influence the utility function directly. E.g. conditional on leisure and consumption, some people receive a higher utility from self-employment than from paid employment, due to characteristics of self-employment such as the independence and flexibility that self-employment provides. These preferences for labor market statuses, but also for consumption and leisure may differ between demographic groups. After the age of 65, unemployment disappears from the set of labor market statuses.

Social security rules s_{it} that hold for individual i in period t also influence the exit route to retirement. The search requirements of the 2004 Dutch UI reform, for example, decrease the amount of leisure associated with the exit route through unemployment. Observed and unobserved characteristics v_{it} influence the utility function indirectly through preferences. For example, the number of children in the household (observed) and education (unobserved) influence the utility perceived from consumption and leisure.

Equation 1 provides a guideline for the empirical specification of the model. It shows that individuals choose the exit route that maximizes their utility over consumption, leisure, and

their labor market status. Furthermore, individual characteristics and social security rules affect current and future labor market statuses. For the empirical implementation of the problem, like Blau (1998) and Mastrogiacomo et al. (2004), we approximate the value function U_τ for individual i who chooses labor market status j at time τ with a linear function:

$$V_{ij}(\tau) = X_{i\tau}\beta_j + Z_{i\tau-1}\gamma_j + UE_\tau Z_{i\tau-1}\theta_j + D_{ij\tau} + \mu_{ij} + \epsilon_{ij\tau}, \tag{2}$$

where $X_{i\tau}$ is a vector with personal and household characteristics that influence preferences as shown in (1). $Z_{i\tau-1}$ is a vector of dummy variables indicating the lagged labor market status and UE_τ is the unemployment rate at time τ, which we interact with $Z_{i\tau-1}$ to take into account that the unemployment rate may affect individuals with various previous employment states differently. The treatment variables function D contains variables and interactions that we use to identify the effect of the 2004 UI reform. We will explain D in more detail in the next section. Finally, the terms μ_{ij} describe individual specific unobserved heterogeneity and $\epsilon_{ij\tau}$ are i.i.d. error terms, which we assume to be independent of the explanatory variables and to follow a Type I extreme value distribution. Hence, the probability for individual i to have labor market status j at time $\tau > 0$ can be written as

$$P(j|X_{i\tau}, Z_{i\tau-1}, UE_\tau, D_{ij\tau}, \mu_{i1}, ..., \mu_{iJ}) = \frac{\exp(X_{i\tau}\beta_j + Z_{i\tau-1}\gamma_j + UE_\tau Z_{i\tau-1}\theta_j + D_{ij\tau} + \mu_{ij})}{\sum_{k=1}^{J} \exp(X_{i\tau}\beta_k + Z_{i\tau-1}\gamma_k + UE_\tau Z_{i\tau-1}\theta_k + D_{ij\tau} + \mu_{ik})}, \tag{3}$$

where J denotes the number of mutually exclusive labor market states distinguished in the model. To identify the model, $\beta_1, \gamma_1, \theta_1$ and μ_{i1} are normalized to zero. The unobserved heterogeneity or random effects $\mu_i = (\mu_{i2}, \mu_{i3}, \mu_{i4})'$ are assumed to follow a multivariate normal distribution with mean zero and variance Σ_μ. In other words,

$$\begin{pmatrix} \mu_{i2} \\ \mu_{i3} \\ \mu_{i4} \end{pmatrix} = L \begin{pmatrix} \eta_{i2} \\ \eta_{i3} \\ \eta_{i4} \end{pmatrix} \quad \text{with} \quad \begin{pmatrix} \eta_{i2} \\ \eta_{i3} \\ \eta_{i4} \end{pmatrix} \sim N \left(\begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}, \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} \right), \tag{4}$$

where L is the Choleski matrix of Σ_μ which has to be estimated (the unique lower triangular matrix such that $LL' = \Sigma_\mu$). This dynamic multinomial logit model with unobserved heterogeneity (random effects) has the advantage that the irrelevance of independent alternatives (IIA) property of the multinomial logit model is avoided. Furthermore, allowing for unobserved heterogeneity between choice possibilities will give true, instead of spurious, state dependence in the model.

The initial labor market status Z_{i0} is not fixed or exogenous and, as in most papers, we do not have the entire history of the process generating individual's employment dynamics available. Therefore, the initial conditions problem arises, which is discussed in Heckman (1981). To

deal with this problem Heckman (1981) proposes to estimate a static multinomial logit model for the initial state with different slope parameters and without lagged labor market status, simultaneously with the dynamic model. Several studies investigating transitions between multiple states have used this method, e.g. Gong et al. (2000), Uhlendorff (2006) and Cappellari et al. (2010). However, the number of parameters increases a lot with this method and with a lot of observations this becomes computationally unattractive. To take into account the initial conditions problem Wooldridge (2005) proposed an alternative approach, which has been used in several studies, such as Devicienti and Poggi (2011), Michaud and Tatsiramos (2011), Haan and Wrohlich (2011), Buddelmeyer et al. (2010) and Christelis and Sanz-de Galdeano (2011). Akay (2011) studied the performance of the Wooldridge method, compared to for example the Heckman method. He found that for moderately long panels (5-8 periods) the Wooldridge method works well and that all methods perform equally well for panels of long duration (longer than 15-20 periods). Since we have a long panel available and our large sample makes the Heckman method computationally unattractive, we use the Wooldridge method, in which individual specific heterogeneity term is modeled conditional on the initial condition and the individual mean of time-varying covariates assuming

$$\mu_{ij} = \alpha_{0j} + Z_{i0}\alpha_{1j} + X_i\alpha_{2j} + a_{ij} \tag{5}$$

where Z_{i0} is the vector of initial conditions and X_i the vector of the individual mean of time-varying covariates. a_i (the remaining stochastic element) follows a multivariate normal distribution with mean zero and variance Σ_α. This implies that applying the Wooldridge correction for initial conditions automatically results in a Mundlak random effects estimation (Mundlak, 1978). Applying the Mundlak random effects regression has the advantage of allowing for correlation between the observed- and unobserved heterogeneity similar to a fixed effects model. We estimate the model parameters using maximum likelihood. The likelihood contribution of and individual i with observed labor market states $j_1, ..., j_M$ is

$$L_i(j_1, ..., j_M | X, Z, UE, D, a_i; \alpha_1, \alpha_2, \beta, \gamma, \theta) =$$
$$\prod_{t=1}^{M} \frac{\exp(X_{it}\beta_{j(t)} + Z_{it-1}\gamma_{j(t)} + UE_t Z_{it-1}\theta_{j(t)} + D_{ijt} + Z_{i0}\alpha_{1j(t)} + X_i\alpha_{2j(t)} + a_{ij})}{\sum_{k=1}^{J} \exp(X_{it}\beta_{k(t)} + X_i\lambda_{k(t)} + Z_{it-1}\gamma_{k(t)} + Z_{i0}\alpha_{1k(t)} + D_{ikt} + UE_t Z_{it-1}\theta_{k(t)} + a_{ik})} \tag{6}$$

We do not observe the individual specific effects a_i. This term has to be integrated out, such that the likelihood contribution becomes

$$L_i(j_1, ..., j_M | X, Z, UE, D; \alpha_1, \alpha_2, \beta, \gamma, \theta) = \int_{-\infty}^{\infty} L_i(j_1, ..., j_M | X, Z, UE, D, a_i; \beta, \gamma, \theta) da_i \tag{7}$$

10

We evaluate the integral using Maximum Simulated Likelihood (for details, see Gourieroux and Monfort (1993) and Hajivassiliou and Ruud (1994)) applying Halton Sequences.[17]

A last note with respect to the empirical implementation of the model is that we exclude variables indicating a transition from self-employment to unemployment as well as a transition from inactivity to unemployment. We do this exclusion both on a theoretical basis (self-employed and inactive persons are not allowed to make use of unemployment insurance in the Netherlands) and on an empirical basis (the number of observations in these flows are negligible). This is due to the fact that UI benefits are financed from employer- and employee contributions.

3.2 The effect of job search requirements

The 2004 reform in UI, where persons aged 57.5+ are no longer exempted from job-search requirements, provides an exogenous source of variability in the data introduced on the first of January 2004. To exploit the exogeneity of the reform and infer a causal relationship between job search requirements among older unemployed and labor market mobility, we apply a *differences-in-differences* framework. In this framework we compare labor market transitions before and after the reform, for the 57.5+ population (for whom job search requirements were no longer exempted) relative to those younger than 57.5 (for whom nothing changed). We assume that in absence of the reform there should not be a discontinuous change in labor market transitions for 57.5+ individuals relative to those younger than 57.5 after the reform.

Formally, the difference-in-difference framework is implemented in (2) using the treatment variable function D which is given by

$$D_{ijt} = Z^*_{it-1} \otimes [G_{it} \quad P_{it} \quad G_{it} \cdot P_{it}]\delta \tag{8}$$

where G_{it} is a dummy variables indicating the treatment group, which is equal to one if a person is aged 58-63 and zero otherwise.[18] P_{it} indicates the treatment period (2004-2009) and $G_{it} \cdot P_{it}$ refers to the interaction term that captures the treatment effect of the policy reform. Due to a transitional regime, persons older than 62 years and 2 months who were already unemployed for a minimum of one year at the time the reform was implemented were not affected by the reform. For these individuals the treatment effect is set to zero. Furthermore we assume that the effect of the reform is similar for 58+ individuals already unemployed during the reform and those

---

[17]Results of models applying Haltons draws instead of random draws are found to give more precise estimation results (Train, 2000; Bhat, 2001).

[18]Since we have yearly data we cannot distinguish people as from the age of 57.5. Instead, our treatment group includes all individuals as from the age of 58, such that we are sure that they are being treated as from the introduction of the reform (1st of January 2004).

who became unemployed after the reform. Finally, by interacting the treatment variables with the mobility variables, we explicitly model the effects of the reform on the inflow to and outflow from unemployment to other labor market states. The asterisk in Z^*_{it-1} indicates that we do not interact the treatment group, the treatment period and the interaction of the treatment group and the treatment period with all previous labor market states. For example, those who are self-employed or inactive in the previous period are not influenced by the reform. Z^*_{it-1} therefore only contains unemployment in the previous period (they are confronted with the UI reform) and paid employment in the previous period (due to the reform unemployment has become a less attractive exit route for them).

Anticipation effects may disturb our analysis. If before 2004 unemployed individuals who were close to 57.5 were already reducing their search capacity in anticipation of the removal of the search requirement after the age of 57.5, the labor market transitions of those younger than 57.5 are also affected by the reform. Hullegie and Van Ours (2012), however, find no strong evidence that UI recipients who were getting close to the age of 57.5 reduced their search intensity.

Bloemen et al. (2011) notice that anticipation of the policy change can result in selective inflow into unemployment around the time the policy was initiated, but found no evidence of this. Probably, since none of the individuals flowing into UI in 2003 were exempted from the new rules, speeding up the firing procedure could not prevent them from the new search requirements after the age of 57.5.

To correctly measure the effect of the 2004 UI reform we have to take into account other age-specific reforms that took place during our observation period. Especially the 1999 reform, that introduced mandatory intake meetings and the obligation to accept a suitable job offer for persons aged 57.5 and over. We will take this reform into account in the next version of the paper. For now, we already estimated the model with these corrections, but only without taking into account unobserved heterogeneity. This did almost not effect the treatment effects that we find for the 2004 UI reform and that are described below.

4 Data

4.1 Data and definitions

Data are taken from the Dutch Income Panel Study 1989-2009 of Statistics Netherlands (IPO, Inkomens Panel Onderzoek, CBS (2009)) using the years 1989-2009. IPO is a representative sample of the population in the Netherlands and consists of administrative data most partic-

ularly from the tax office. About 95,000 individuals are selected and followed over time. This selection takes place on persons' national security number. A major advantage of having administrative data is the high level of representativeness. It is a well-known fact that the rich and the poor are often underrepresented in surveys, but also that self-employed individuals are often underrepresented.

Another advantage of IPO is that we have a long time span available (21 years) and that we have no endogenous panel attrition, since panel attrition only occurs as a result of emigration or death. IPO contains detailed information on income (gross, net, taxable), wealth, gender, age, marital status, children, ethnicity, homeownership and labor market status.

In this paper we analyze men and women of age 50-63,[19] who are followed over time until emigration or death. Men and women are analyzed separately, because their retirement routes may be quite different (as suggested by Huynen et al., 2004).

To indicate whether someone is paid-employed, self-employed, unemployed or inactive we use an individuals's *main source of income* during a year of observation. Only for self-employment, we also indicate someone to be self-employed when he has a negative profit (i.e. a loss) while income from wealth is larger than any other component that year. This, for example, also allows us to take into account start-ups. Income from self-employment denotes income from profit, freelancing or from being a director/major shareholder. Income from paid employment include all wages earned in the private or public sector and *Unemployment* income includes all regular unemployment insurance benefits. The remaining category *inactivity* includes all other people, who are for example in disability, early retirement, social assistance or out of the labor force.

Additional published data of Statistics Netherlands about the macroeconomic unemployment rate and the consumer price index (CPI) are used in the analysis. Using the CPI we express all financial variables in 2010 euro's.

4.2   Descriptive analysis

Table 1 describes background characteristics before and after the reform for individuals of age 50-57 and individuals of age 58-63. The table shows that group specific characteristics are highly similar before and after the reform. Homeownership has increased a bit, reflecting higher homeownership rates among younger generations. As expected the number of children in the household is higher in the 50-57 age group than in the 58-63 age group. Between 1989-2003 and 2004-2009 the number of children in the 50-57 age group has increased, which may

---

[19]We exclude persons of age 64, since they are excluded from the UI reform that we investigate and they are different from the age group 50-57, for whom job search requirements also do not change.

be related to children living at their parents' house somewhat longer. We do not observe wealth for all years of observations, but we do observe income from wealth and use this to identify relative wealth differences between individuals. Since labor market states influence wealth (e.g. wealth may decline in a period of unemployment), we show wealth in the initial period. Regarding labor market states, substantial differences in the pre- and post-reform period can be observed. Paid-employment rose for both age groups among both men and women, although the rise is more substantial among the group of age 58-63. Increases in self-employment seem to be marginal, however. The largest changes in participation rates are observed among women in the age group 58-63. This may be explained by cohort effects, as has been found by Euwals et al. (2011). Substantial declines in inactivity are observed in all groups. Finally, table 1 shows the prevalence of individuals combining self-employment or unemployment with a (part-time) paid job. The incidence of these combinations is small, which reassures us that we do not have to worry that we only take into account the main income source in the model. Transition matrices in tables 2 to 5 present labor market transitions for both men and women during the period 1989-2003 and 2004-2009 (the control and treatment period). We distinguish between the age groups 50-57 and 58-63 (the control and treatment group). The diagonals of tables 2 and 3 for men show that year to year transitions out of paid employment, self-employment and inactivity diminished between 1989-2003 and 2004-2009 for both age groups. Only, yearly transitions out of unemployment increased between the 1989-2003 and 2004-2009 period. Whereas in 1989-2003 65% of the unemployed men aged 50-57 were still unemployed in the next period, this declined to 54% during the 2004-2009 period. In the age group it people stay in unemployment more often, but also there the number of people that continued to be unemployed from one year to the other declined 7.5%-points, from 80.6% in 1989-2003 to 73.1% in 2004-2009. More transitions out of unemployment led to more transitions into paid employment and self-employment. For individuals of age 50-57 transitions from unemployment to paid employment increased from 16.2% to 26.6% and transitions to self-employment increased from 1.8% to 3.9%. For individuals aged 58-63 transition rates from unemployment to employment are much lower, probably because it is more difficult for them to find a job. However, when we compare the period 1989-2003 with 2004-2009 transitions rates from unemployment to paid employment and self-employment increased from 1.8% to 4.7% and from 0.6% to 1.3% for paid employment and self-employment, respectively. Regarding self-employment we find that among the employed individuals the prevalence of self-employment is higher in the age group 58-63 than in the age group 50-57. This may be due to necessity

14

reasons (it is generally more difficult for them to find a job), but also preferences may play a role (gradual retirement through self-employment). Furthermore, in the higher age group the share of self-employment in total employment decreased between 1989-2003 and 2004-2009. Among other things, this may be due to early retirement plans that have become less generous for the paid employed, which stimulates paid employed individuals to also work longer. Transitions from paid-employment to self-employment do not change that much but we do observe a decline in the share of employed people moving to unemployment, especially in the age group 58-63 who were confronted with the 2004 UI reform discussed before, which made unemployment less attractive as an exit route to retirement because of search requirements. For men of age 58-63 we find that the share of individuals moving from paid employment to unemployment declined from 2.5% to 1.4%, compared to a decline only from 1.30% to 1.21% for the younger age group that was not confronted with the reform.

For women the same patterns emerges. Only, compared to men relatively more women are inactive. Transitions in tables 2 to 5 are not conditional on observed and unobserved characteristics. Therefore, information on state dependence may be spurious and may contain information of both observed and unobserved heterogeneity.

[Insert Table 2 here]

[Insert Table 3 here]

[Insert Table 4 here]

[Insert Table 5 here]

5   Estimation results

Tables 6 and 7 present parameter estimates of our baseline model for men and women, respectively. As we pointed out earlier, we try to explain why older persons tend to choose for a period of self-employment (necessity or opportunity). Our empirical specification allows us to measure the role of necessity-driven factors by analyzing the previous labor market status of people that become self-employed and, from a macroeconomic perspective, how the unemployment rate affects inflow into self-employment.

The estimates of the mobility parameters in tables 6 and 7 indicate that there is true state dependence for all labor market states and that state dependence is higher for men than for women. State dependence is higher for self-employment than for unemployment, and as expected, state dependence is highest for the inactive state. The inactive state contains retired and disabled individuals, which are often irreversible states. Interestingly, the mobility parameters show that, after correcting for observed and unobserved characteristics, self-employed individuals have a higher probability to come from unemployment than from paid employment. Furthermore, it appears that unemployed elderly individuals have a higher probability to flow to self-employment than to paid employment. This indicates that transitions into self-employment are probably in large part driven by necessity.

As expected, the coefficient of the unemployment rate shows that transitions from paid employment to unemployment occur more often when the unemployment rate is high. However, individuals in paid employment also move more often to self-employment when the unemployment level is high (indicating that the *pull theory* exceeds the *push theory*). A high unemployment rate reduces the chances of both men and women to flow out of unemployment, while it does not significantly influence transitions from unemployment to self-employment.

Our sample includes individuals aged 50-63. In tables 6 and 7 we distinguish three age categories, that show us how mobility develops with age. The reference category consists of individuals in the age group 50-53. The other two age groups are 54-57 and 58-63. The coefficients show that state dependence in unemployment increases with age. Probably, it is more difficult to find a job at older ages and also, before the 2004 UI reform, individuals in the age group 58-63 were exempted from job search requirements. Transitions to inactivity and state dependence in inactivity increase with age. This can be explained by retirement and disability becoming more important and more irreversible when people are older. The probability that inactive individuals move to paid employment decreases with age, however,

when inactive men and women age, their probability to flow to self-employment increases, compared to paid employment. This may be out of necessity (e.g. people who were disabled may have difficulty finding a regular job) but opportunity driven factors may also play a role. Finally, for unemployed women, transitions to self-employment increase with age compared to transitions to paid employment.

[To do: include more period dummies.] Compared to the years 1989-2003, state dependence for unemployed men was significantly lower during the years 2004-2009.

Regarding the treatment effects we find, in line with Bloemen et al. (2011) and Hullegie and Van Ours (2012), that job search requirements among unemployed individuals of age 58-63 have increased transitions out of unemployment. People flowing out of unemployment move to paid employment and self-employment in the same way as before (no significant difference between paid employment and self-employment). Individuals that are confronted with search requirements after the reform are (at least partly) able to find a job. For women we even find a decline in the transition rate from UI to inactivity suggesting that fewer women exhaust their UI benefits and flow into inactivity afterwards. The results show that, for people in unemployment, for whom unemployment has become less attractive because of the job search requirements, self-employment has not been evaluated to be more attractive compared to paid-employment despite the flexibility in working hours associated with self-employment (opportunity hypothesis).

Table 6 shows that because of the job search requirements of the 2004 UI reform fewer men in the age group 58-63 made transitions from paid-employment to unemployment. Probably because the reform made unemployment less attractive as an exit route to retirement. As an alternative for the unemployment route, men stayed in paid employment. We do not find evidence that transitions from paid employment to self-employment or inactivity have increased after the reform. So, for men in paid employment, when unemployment became less attractive, men did not choose self-employment above paid employment, despite the flexibility in working hours associated with self-employment. Among paid employed women transitions to inactivity increased, indicating substitution effects between retirement pathways as suggested by, among others, Koning and Van Vuuren (2010) and Bloemen et al. (2011). However, for women the inflow from paid employment to unemployment did not decrease significantly compared to staying in paid employment.

The last part of the table shows the variances and covariances of the random effects. The estimates show that the random effect for self-employment plays a significant role and is more important than the idiosyncratic error term (which have a variance of $\phi^2/6$, by normalization).

This means that, compared to paid employment, time invariant unobserved characteristics play a substantial role in the choice for self-employment. The random effects for unemployment and inactivity are significant, but are less important than the idiosyncratic error terms, indicating that time invariant unobserved characteristics do not play a large role for unemployment and inactivity. Compared to the multinomial logit model where unobserved heterogeneity is not taking into account, taking into account the initial condition and including unobserved heterogeneity increases the likelihood and, as expected, reduces the coefficients that reflect the probability of people remaining in the same state as in the previous period.

[To do: average partial effects]

6 Discussion

Although the results of the model are clear cut and suggest that later-age self-employment is primarily chosen out of necessity, a few points remain for discussion. An explanation why the out of necessity reason seems to outweigh opportunity reasons may be that part-time employment is available to retire gradually. Our descriptive statistics suggest that combinations of part-time employment with self-employment or unemployment are not that common, though, we have not formally corrected the model by including an extra option for part-time employment. Results of Emmanoulidi and Kyriazidou (2012), however, suggest that including part-time employment does not alter the main conclusion of the paper regarding self-employment. Emmanoulidi and Kyriazidou (2012) find that part-time paid-employment is more often used as an exit route from paid-employment while self-employment is more regularly chosen as an exit from inactivity thereby also suggesting the necessity of choosing self-employment to bridge retirement.

Another explanation for necessity reasons outweighing opportunity reasons is because moving to self-employment may have a negative effect on the accumulation of occupational pension rights. On the other hand, pension accumulation considerations are fare less important for transition from unemployment to self-employment since occupational pensions are generally not accumulated during unemployment. This explanation is supported by the results of Moore and Mueller (2002) and Zissimopoulos and Karoly (2007).

A consequence of our annual data is that we do not observe within year transitions. For example, when someone moves from paid-employment to unemployment to self-employment within a year, we observe a transition from paid-employment to self-employment. Nevertheless, when we include a variable that is equal to one if a person received both income from paid-employment and unemployment in period $t - 1$ as a robustness check, we find that this does

not affect transition to self-employment relative to paid employment. Moreover, this variable does not change the main results of the baseline regression model.

Similar robustness checks have been carried out regarding the importance of personal wealth. Among others, Johansson (2000) find strong positive effects of personal wealth on the probability of self-employment. Although we do not observe personal wealth for all years under consideration we do observe income from wealth and use this as a proxy for the relative amount of wealth that an individual has at one's disposal. Tables 8 and 9 show that higher wealth levels are positively correlated with the probability of self-employment compared to paid-employment for men, but does does not have a strong association with self-employment for women. As expected, we also find that risky assets are correlated with self-employment. We cannot draw causal conclusions about these financial variables, however, it is reassuring that the inclusion of these variables do not change our main conclusion with respect to the necessity of self-employment.

Replacement rates for transitions to unemployment are different for high and low income individuals. In the Netherlands replacement rates of UI benefits are lower for high income individuals; a 70% replacement rate is only guaranteed up to a maximum (e.g. 47,802 euro in 2009). For high income individuals unemployment may therefore be less attractive than for low income individuals. The results show that, conditional on income (we have to check this with new specification!), having labor income above the threshold is associated with lower transition rates to unemployment and inactivity and a higher transition rate to self-employment, compared to paid employment. Again, the inclusion of these variables does not change the other results.

Another remark should be made regarding the findings of, among others, Rees and Shah (1986) and De Wit and Van Winden (1989) who suggest that persons tend to choose self-employment out of monetary considerations. There is, however, generally no robust empirical support for the effect of financial incentives on becoming self-employed Berkhout et al. (2011). Hamilton (2000) even concludes that nonpecuniary benefits are most important since the self-employed earn, on average, less than paid-employed. These results would also imply that the effect of substantial tax advantages of the self-employed over the paid-employment may be small. Clearly, our analysis does not correct for tax differences between self-employment and paid-employment, although Schuetze (2000) argues that the tax environment partially accounts for trends in self-employment. Tax differences may well be an incentive to become self-employed, but are out of the scope of this paper. For future research it would be interesting to investigate what labor market transitions at older age do with income and compare income for those who move from unemployment to self-employment versus those who move from employment to self-

employment. Another interesting point is whether the search requirements of the 2004 UI reform have induced more low paid jobs for those that are now making the transition from unemployment to employment.

A final point of discussion is the absence of education and health characteristics in the analysis. The unobserved heterogeneity term can correct for the unobserved levels of education. The unobserved heterogeneity term is, however, unable to correct for health shocks. Zucchelli et al. (2012) show that ill-health and health shocks do not increase the probability of using self-employment as retirement mechanism, however. Instead, health seems to be an important determinant for retiring early. Therefore, including health indicators in the analysis will likely be relevant for transitions to and from inactivity, but probably does not affect our conclusions about the nature of choosing self-employment as an exit route to retirement. All the more because in the Netherlands those who are in bad health are selected into the disability insurance program, which is financially more attractive than unemployment insurance or early retirement schemes (De Vos et al., forthcoming).

7 Conclusion

This paper examines whether individuals at the end of their working lives make transitions to self-employment out of necessity or out of opportunity. For this purpose we model transitions between labor market states for people aged 50-63 using a dynamic multinomial logit model with unobserved heterogeneity. By examining mobility and state dependence we investigate from which labor market state people enter self-employment. Furthermore, we investigate how the unemployment rate affects transitions to and from self-employment. Finally, a Dutch unemployment reform in 2004 provides an exogenous downward shock in the attractiveness of unemployment as an exit route to retirement. We use this reform in a difference-in-difference framework to study substitution between unemployment and self-employment.

The main empirical findings can be summarized as follows. After correcting for observed and unobserved heterogeneity, the largest flow of individuals entering self-employment do so from unemployment and inactivity. At the same time, mobility from paid employment to self-employment is relatively low. This provides evidence that self-employment is often chosen out of necessity. Regarding the unemployment rate the results show evidence for the pull hypothesis; people in paid employment are more likely to enter self-employment when unemployment is high. Job search requirements implemented in 2004 among people aged 57.5-63 have induced people to exit unemployment. These people flowing out of unemployment enter paid employment and self-

employment. Because of the reform people substituted unemployment with self-employment, however, the reform did not increase transitions to self-employment relative to paid employment. As we assume that the reform did not increase the necessity of self-employment (the UI reform did not change benefits or the duration of the benefits), this indicates that people did not use self-employment as an opportunity to reduce working hours and enhance gradual retirement. People aged 58-63 confronted with job search requirement were able to find paid jobs. Not related to self-employment, but interesting in itself is that the reform did not only increase transitions out of unemployment, but also decreased transitions from paid employment to unemployment for men, probably since the job search requirements made unemployment a less attractive exit route.

Taken together, we do not find evidence that self-employment acts as an attractive alternative for unemployment to reduce working hours and enhance gradual retirement. Instead, our findings suggest that at the end of working life necessity plays a large role in the decision to become self-employed.

References

Aarts, L., Jong, d. P., 1990. Economic aspects of disability behavior. Erasmus University Rotterdam Dissertation.

Akay, A., 2011. Finite-sample comparison of alternative methods for estimating dynamic panel data models. Journal of Applied EconometricsOnline version.

Autor, D., Duggan, M., 2003. The rise in the disability rolls and the decline in unemployment. The Quarterly Journal of Economics 118, 157–205.

Baumgartner, H., Caliendo, M., 2008. Turning unemployment into self-employment: effectiveness of two start-up programmes. Oxford Bulletin of Economics and Statistics 70 (3), 347–373.

Benedict, M.E., H. I., 2008. Regional self-employment: the effect of state push and pull factors. Politics & Policy 36 (2), 268–286.

Berkhout, P., Hartog, J., Van Praag, M., 2011. It's the oppertunity cost, stupid! How self-employment responds to financial incentives of return, risk and skew, IZA discussion paper series, No. 6166.

Bhat, C., 2001. Quasi-random maximum simulated likelihood estimation of the mixed multinomial logit model. Transportation Research B 35, 677–693.

Blau, D., 1998. Labour force dynamics of married older couples. Journal of Labor Economics 16 (3), 595–629.

Bloemen, H., Hochguertel, S., Lammers, M., 2011. Job search requirements for older unemployed: transitions to employment, early retirement and disability benefits, IZA discussion paper series, No. 5442.

Blondal, S., Scarpetta, S., 1999. The retirement decision in OECD countries, OECD economics department working paper, No. 202.

Bratsberg, B., Fevang, E., Røed, K., 2010. Disability in the welfare state: An unemployment problem in disguise?, IZA discussion paper No. 4897.

Bruce, D., Holtz-Eakin, D., Quinn, J., 2000. Selfemployment and labour market transitions at older ages, Center for Retirement Research working paper series, No. 2000-12.

Buddelmeyer, H., Lee, W., Wooden, M., 2010. Low-paid employment and unemployment dynamics in Australia. Economic Record 86 (272), 28–48.

Cahill, K., Giandrea, M., Quinn, J., 2006. Retirement patterns from career employment. The Gerontologist 46 (4), 514–523.

Caliendo, M., Uhlendorff, A., 2008. Self-employment dynamics, cross-mobility patterns and true state dependence, IZA discussion paper series, No. 3900.

Cappellari, L., Dorsett, R., Haile, G., 2010. State dependence and unobserved heterogeneity in the employment transitions of the over-50s. Empirical Economics 38 (3), 523–554.

Carrasco, R., 1999. Transitions to and from self-employment in Spain: an empirical analysis. Oxford Bulletin of Economics and Statistics 61, 315–341.

CBS, 2009. Documentatierapport Inkomenspanel onderzoek (IPO). Centraal Bureau voor de Statistiek, Voorburg.

Chan, S., Stevens, A., 1999. Employment and retirement following a late-career job loss. American Economic Review 89, 211–216.

Chan, S., Stevens, A., 2001. Job loss and employment patterns of older workers. Journal of Labor Economics 9 (2), 186–205.

Christelis, D., Sanz-de Galdeano, A., 2011. Smoking persistence across countries: an analysis using semi-parametric dynamic panel data models with selectivity. Journal of Health Economics 30 (5), 1077–1093.

Constant, A., Zimmerman, K., 2004. Self-employment dynamics across the business cycle: migrant versus natives, CEPR discussion paper 4754.

CPB-ROA, 2011. Labour market flexibility in the Netherlands, Netherlands Bureau for Economic Policy Analysis and The Research Centre for Education and the Labour Market.

De Jong, P., Lindeboom, M., Van der Klaauw, B., 2011. Screening disability insurance applications. Journal of the European Economic Association 9 (1).

De Vos, K., Kalwij, A., Kapteyn, A., forthcoming. Social Security and Retirement around the World. Chicago University Press, Ch. Disability insurance and labor market exit routes of older workers in the Netherlands.

De Wit, G., Van Winden, F., 1989. An empirical analysis of self-employment in the Netherlands. Small Business Economics 1, 263–272.

Devicienti, F., Poggi, A., 2011. Poverty and social exclusion: two sides of the same coin or dynamically interrelated processes? Applied Economics 43, 3549–3571.

Ekerdt, D., DeViney, S., Kosloski, K., 1996. Profiling plans for retirement. Journal of Gerontology 51B (3).

Emmanoulidi, E., Kyriazidou, E., 2012. Employment transitions of older persons in Britain: state dependence and long-run determinants, paper prepared for the European Society for Population Economics, Bern 2012.

Euwals, R., Knoef, M., Van Vuuren, D., 2011. The trend in female labour force participation. What to expect for the future? Empirical Economics 40 (3), 729–753.

Falter, J., 2001. Self-employment entry and duration in Switzerland, mimeo.

Fredriksson, P., Holmlund, B., 2006. Improving incentives in unemployment insurance: a review of recent research. Journal of Economic Surveys 20 (3).

Fuchs, V., 1982. Selfemployment and labor force participation of older males. Journal of Human Resources 17, 339–357.

Ghent, L., Clark, R., 2001. The impact of a new phased retirement option on faculty retirement decisions. Research on Aging 23 (6).

Giandrea, M., Cahill, K., Quinn, J., 2008. Self-employment transitions among older American workers with career jobs, BLS Working Papers, No. 418.

Glocker, D., Steiner, V., 2007. Self-employment: a way to end unemployment? Empirical evidence from German pseudo-panel data, IZA discussion paper series, No. 2561.

Gong, X., Van Soest, A., Villagomez, E., 2000. Mobility in the urban labor market: a panel data analysis for Mexico, IZA discussion paper series, No. 213.

Gordon, R., Blinder, A., 1980. Market wages, reservation wages and retirement decisions. Journal of Public Economics 14, 277–308.

Gourieroux, C., Monfort, A., 1993. Simulation-based inference: A survey with special reference to panel data models. Journal of Econometrics 59, 5–33.

Gu, Q., 2009. Self-employment among older workers. RAND Graduate School Dissertation.

Gustman, A., Steinmeier, T., 1983. Retirement flows, NBER Working Paper, No. 1069.

Gustman, A., Steinmeier, T., 1984. Partial retirement and the analysis of retirement behavior. Industrial and Labor Relations Review 37, 403–415.

Haan, P., Wrohlich, K., 2011. Can child care policy encourage employment and fertility?: Evidence from a structural model. Labour Economics 18 (4).

Hajivassiliou, V., Ruud, P., 1994. Classical estimation methods for LDV models using simulation. In: Engle, R., McFadden, D. (Eds.), Handbook of Econometrics. Elsevier, Amsterdam, North Holland, Netherlands, pp. 2383–2441.

Hamilton, B., 2000. Does entrepreneurship pay? An empirical analysis of the return to self-employment. Journal of Political Economy 108, 604–631.

Hassink, W., Van Ours, J., Ridder, G., 1995. Dismissal through disability, ALERT Research Memorandum, No. 1995-36.

Heckman, J., 1981. The incidental parameters problem and the problem of initial conditions in estimating a discrete time-discrete data stochastic process and some Monte Carlo evidence.

In: Manski, C., McFadden, D. (Eds.), Structural Analysis of Discrete Data with Econometric Application. The MIT Press, Cambridge, pp. 2383–2441.

Hochguertel, S., 2010. Self-employment around retirement age, Tinbergen Institute discussion paper, No. 2010-067/3.

Hullegie, P., Van Ours, J., 2012. Seek and ye shall find: The effect of removing search requirements during unemployment, paper prepared for the EEA Malaga 2012.

Huynen, B., Fouarge, D., Schils, T., 2004. Vervroegd uittreden of doorwerken? Sociaal-economische trends 3e kwartaal.

Johansson, E., 2000. Self-employment and liquidity constraints: evidence from Finland. Scandinavian Journal of Economics 102 (1).

Kantarci, T., Van Soest, A., 2008. Gradual retirement: preferences and limitations. De Economist 156, 113–144.

Kapteyn, A., De Vos, K., 1997. Social security and retirement in the Netherlands, NBER working paper series, No. 6135.

Kim, H., DeVaney, S., 2005. The selection of partial or full retirement by older workers. Journal of Family and Economic Issues 26 (3).

Koning, P., Van Vuuren, D., 2010. Disability insurance and unemployment insurance as substitute pathways. Applied Economics 42, 575–588.

Maestas, N., Li, X., 2006. Discouraged workers? Job search outcomes of older workers, Michigan Retirement Research Center Working Paper, No. 2006-133.

Maestas, N., Zissimopoulos, J., 2010. How longer work lives ease the crunch of population aging. Journal of Economic Perspectives 24 (1).

Martinez-Granado, M., 2002. Self-employment and labour market transitions: a multiple state model, CEPR Discussion Paper, No. 3661.

Mastrogiacomo, M., Alessie, R., Lindeboom, M., 2004. Retirement behaviour of Dutch elderly households. Journal of Applied Econometrics 19, 777–793.

Meager, N., 1992. Does unemployment lead to self-employment? Small Business Economics 4, 87–103.

Michaud, P., Tatsiramos, K., 2011. Fertility and female employment dynamics in Europe: the effect of using alternative econometric modeling assumptions. Journal of Applied Econometrics 26, 641–668.

Moore, C., Mueller, R., 2002. The transition from paid to self-employment in Canada: the importance of push factors. Applied Economics 34, 791–801.

Morris, D., Millier, T., 2003. Employment of older people in the european union. Labour 17 (4), 623–648.

Mundlak, Y., 1978. On the pooling of time series and cross section data. Econometrica 46 (1), 69–85.

OECD, 2011. Pensions at a glance 2011: Retirement-income systems in OECD and G20 countries, OECD publishing, www.oecd.org/els/social/pensions/PAG.

Parker, S., Robson, M., 2004. Explaining international variations in entrepreneurship: Evidence from a panel of OECD countries. Southern Economic Journal 71, 287–301.

Parker, S., Rougier, J., 2007. The retirement behaviour of the self-employed in Britain. Applied Economics 39, 697–713.

Quinn, J., 1980. Labor-force participation patterns of older self-employed workers. Social Security Bulletin 43 (4).

Quinn, J., Kozy, M., 1996. The role of bridge jobs in the retirement decision: Gender, race and ethnicity. The Gerontologist 15 (3).

Rees, H., Shah, A., 1986. The determinants of self employment in the UK. Journal of Applied Econometrics 1, 95–108.

Reize, F., 2000. Leaving unemployment for self-employment, ZEW Discussion Paper, No. 00-26.

Riphahn, R., 1997. Disability retirement and unemployment substitute pathways for labour force exit? An empirical test for the case of germany. Applied Economics 29 (5).

Rissman, E., 2003. Self-employment as an alternative to unemployment, Federal Reserve Bank of Chicago Working Paper, No. 2003-34.

Ruhm, C., 1990. Bridges to retirement: Older workers in a changing labor market. Vol. 5. Ithaca, New York, Ch. Career jobs, bridge employment, and retirement.

Ruhm, C., 2006. Bridge jobs and partial retirement. Journal of Labor Economics 8 (4).

Schuetze, H., 2000. Taxes, economic conditions and recent trends in male self-employment: a CanadaUS comparison. Labour Economics 7, 471–507.

Tapia, J., 2008. Self-employment: a microeconometric approach. Universidad de Huelva Dissertation.

Taylor, M., 1999. Earnings, independence or unemployment: why become self-employed? Economic Journal 109, C140–C155.

Train, K., 2000. Halton sequences for mixed logit, Economics Working Papers E00-278, University of California at Berkeley.

Uhlendorff, A., 2006. From no pay to low pay and back again? A multi-state model of low pay dynamics, IZA discussion paper series, No. 2482.

Van Es, F., Van Vuuren, D., 2010. A decomposition of the growth in self-employment, CPB discussion paper, No. 145.

Verveen, E., Zuidam, M., Engelen, M., 2005. Quick scan sollicitatieplicht ouderen, research voor Beleid.

Walker, E., Webster, B., 2007. Gender, age and self-employment: some things change, some stay the same. Women In Management Review 22 (2).

Wooldridge, J., 2005. Simple solutions to the initial conditions problem in dynamic, nonlinear panel data models with unobserved heterogeneity. Journal of Applied Econometrics 20 (1), 39–54.

Zissimopoulos, J., Karoly, L., 2007. Transitions to self-employment at older ages: the role of wealth, health, health insurance and other factors.

Zissimopoulos, J., Maestas, N., Karoly, L., 2007. The effect of retirement incentives on retirement behavior: Evidence from the self-employed in the United States and England, Michigan Retirement Research Center Working Paper, No. 2007-155.

Zucchelli, E., Harris, M., Zhao, X., 2012. Ill-health and transitions to part-time work and self-employment among older workers, Health, Econometrics and Data Group Working Paper, 12/04.

8 Tables and Figures

Table 1: Descriptive statistics

	1989-2003				2004-2009			
	50-57		58-63		50-57		58-63	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Men								
Personal								
Birth year	1943.17	4.82	1935.40	4.82	1952.96	2.88	1945.79	2.50
Immigrant	0.08	0.27	0.07	0.25	0.10	0.29	0.08	0.27
Homeowner (t=0)	0.56	0.50	0.46	0.50	0.61	0.49	0.61	0.49
Household								
Head	0.95	0.21	0.96	0.19	0.89	0.32	0.90	0.30
Partner	0.88	0.33	0.97	0.18	0.79	0.40	0.94	0.23
Partner labor income	0.37	0.48	0.32	0.47	0.38	0.49	0.30	0.46
Number of children	0.27	0.68	0.07	0.38	0.34	0.73	0.07	0.36
Age youngest child	12.43	4.51	10.75	5.56	12.29	4.31	11.14	5.39
Financial variables								
Net income from non-housing wealth (t=0)[a]	571.74	8111.28	731.12	5682.25	1091.48	12747.79	505.47	7150.31
Net income from housing wealth (t=0)[b]	-327.92	5812.05	516.18	4779.90	-2612.28	6325.17	-541.59	5930.81
Risky assets (t=0)[c]	1.75	73.09	1.06	96.47	3.85	145.10	1.88	54.24
Mortgage (t=0)[d]	73.73	136.53	42.92	100.39	164.38	240.69	80.93	132.16
Labor market status								
Paid-employment (PE)	0.65	0.48	0.27	0.44	0.70	0.46	0.38	0.49
Self-employment (SE)	0.12	0.33	0.09	0.28	0.13	0.33	0.10	0.30
Unemployment (UI)	0.02	0.14	0.06	0.23	0.02	0.15	0.04	0.19
Inactive (IA)	0.20	0.40	0.59	0.49	0.14	0.35	0.48	0.50
Partial paid-employment								
Partial SE[e]	0.07	0.25	0.04	0.19	0.07	0.25	0.06	0.23
Partial UI[f]	0.04	0.2	0.03	0.17	0.07	0.26	0.06	0.24
Observations	68604		45411		30267		25366	
Women								
Personal								
Birth year	1943.76	4.75	1935.68	4.84	1953.17	2.90	1945.96	2.52
Immigrant	0.08	0.28	0.08	0.27	0.10	0.30	0.08	0.28
Homeowner (t=0)	0.13	0.34	0.15	0.35	0.18	0.38	0.14	0.35
Household								
Head	0.35	0.48	0.51	0.50	0.39	0.49	0.45	0.50
Partner	0.94	0.24	0.99	0.09	0.85	0.36	0.98	0.13
Partner labor income	0.57	0.49	0.38	0.49	0.46	0.50	0.29	0.45
Number of children	0.12	0.44	0.03	0.26	0.17	0.51	0.03	0.23
Age youngest child	13.40	4.22	8.69	6.01	13.48	3.89	8.98	6.48
Financial variables								
Net income from non-housing wealth (t=0)[a]	352.91	7690.37	495.38	2899.58	499.60	10786.25	319.00	6961.49
Net income from housing wealth (t=0)[b]	55.93	2516.47	325.09	2361.02	-570.31	3440.97	-0.23	2503.59
Risky assets (t=0)[c]	0.48	41.41	0.98	37.27	0.54	75.77	0.66	38.02
Mortgage (t=0)[d]	15.35	85.30	10.56	87.70	43.50	141.60	17.89	105.40
Labor market status								
Paid-employment (PE)	0.52	0.50	0.19	0.39	0.64	0.48	0.31	0.46
Self-employment (SE)	0.11	0.31	0.06	0.24	0.11	0.32	0.10	0.30
Unemployment (UI)	0.03	0.16	0.03	0.17	0.02	0.14	0.03	0.17
Inactive (IA)	0.34	0.47	0.72	0.45	0.22	0.42	0.56	0.50
Partial paid-employment								
Partial SE[e]	0.03	0.18	0.01	0.12	0.06	0.23	0.03	0.16
Partial UI[f]	0.04	0.2	0.02	0.13	0.06	0.24	0.03	0.18
Observations	42931		25563		24365		16934	

[a] 'Net income from non-housing wealth' is the sum of dividends, income from bonds and received interest minus interest payments from other debt than mortgages.

[b] 'Net income from housing wealth' is the income a person received from housing and other property minus the interest payments from mortgages.

[c] 'Risky assets' shows the percentage of income from total wealth that is generated by stocks and bonds.

[d] 'Mortgage' shows the mortgage interest payments divided by the rental value of the house (this information gives some idea about the loan to value).

[e] 'Partial SE' shows the percentage of persons receiving income from both paid-employment and self-employment.

[f] 'Partial UI' shows the percentage of persons receiving income from both paid-employment and unemployment.

Table 2: Average year-to-year transitions 1989-2003 (men)

Year $t-1$	Year t									
	Age 50-57					Age 58-63				
	PE	SE	UI	IA	Total	PE	SE	UI	IA	Total
PE	94.71	1.12	1.30	2.87	100	73.66	0.98	2.50	22.86	100
SE	5.96	87.34	0.13	6.58	100	3.64	82.44	0.04	13.88	100
UI	16.15	1.78	64.69	17.37	100	1.80	0.55	80.63	17.02	100
IA	4.17	3.16	0.80	91.87	100	1.71	1.13	0.35	96.81	100
Total	64.96	12.32	2.28	20.44	100	24.68	8.59	5.87	60.86	100

Table 3: Average year-to-year transitions 2004-2009 (men)

Year $t-1$	Year t									
	Age 50-57					Age 58-63				
	PE	SE	UI	IA	Total	PE	SE	UI	IA	Total
PE	96.13	0.95	1.21	1.71	100	81.21	0.92	1.42	16.45	100
SE	3.45	92.48	0.04	4.03	100	3.12	85.76	0.29	10.83	100
UI	26.61	3.91	53.82	15.66	100	4.74	1.26	73.14	20.85	100
IA	3.48	2.70	1.12	92.70	100	1.23	1.49	0.58	96.71	100
Total	70.15	12.84	2.29	14.72	100	38.32	10.30	3.85	47.53	100

Table 4: Average year-to-year transitions 1989-2003 (women)

Year $t-1$	Year t									
	Age 50-57					Age 58-63				
	PE	SE	UI	IA	Total	PE	SE	UI	IA	Total
PE	92.94	1.64	1.45	3.97	100	75.52	2.16	2.22	20.10	100
SE	7.35	88.24	0.16	4.25	100	5.77	80.35	0.20	13.69	100
UI	16.98	1.99	69.32	11.71	100	2.48	0.95	83.02	13.55	100
IA	2.81	0.93	0.45	95.81	100	1.06	0.58	0.13	98.22	100
Total	51.11	10.96	2.68	35.25	100	18.05	5.88	3.23	72.85	100

Table 5: Average year-to-year transitions 2004-2009 (women)

Year $t-1$	Year t									
	Age 50-57					Age 58-63				
	PE	SE	UI	IA	Total	PE	SE	UI	IA	Total
PE	95.67	1.21	1.07	2.05	100	82.80	1.50	1.10	14.60	100
SE	5.46	91.84	0.10	2.60	100	3.54	89.74	0.09	6.62	100
UI	21.59	4.26	57.39	16.76	100	6.61	1.50	75.08	16.82	100
IA	3.13	1.27	1.09	94.52	100	0.95	0.82	0.29	97.94	100
Total	63.93	11.36	2.11	22.60	100	30.78	10.27	2.96	56.00	100

Table 6: Estimation results baseline model (men)

	Self-employment		Unemployment		Inactivity	
Effects relative to paid-employment						
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Personal characteristics						
Birth year (/100)	0.00	0.01	-0.05***	0.01	-0.12***	0.01
Immigrant	-0.65***	0.16	0.21**	0.10	-0.07	0.06
Homeowner$_{t=0}$	0.23***	0.08	-0.33***	0.06	-0.09***	0.03
Household characteristics						
Head	-0.10	0.10	-0.79***	0.10	-0.94***	0.06
Partner	0.15	0.12	0.35***	0.11	0.34***	0.06
Partner labor income	-0.42***	0.07	-0.33***	0.06	-0.25***	0.03
Number of children	0.11	0.07	0.02	0.07	0.11***	0.04
Age youngest child	0.00	0.01	-0.03***	0.01	-0.02***	0.01
Mobility						
SE$_{t-1}$	5.22***	0.24			4.11***	0.21
UI$_{t-1}$	2.29***	0.83	3.63***	0.31	3.24***	0.31
IA$_{t-1}$	3.62***	0.29			5.97***	0.14
Age groups						
PE$_{t-1}$·Age 58-63	-0.15	0.17	0.13	0.12	1.40***	0.08
SE$_{t-1}$·Age 58-63	-0.17	0.15			0.64***	0.15
UI$_{t-1}$·Age 58-63	0.82	0.66	3.05***	0.23	1.76***	0.24
IA$_{t-1}$·Age 58-63	0.49***	0.18			1.09***	0.10
PE$_{t-1}$·Age 54-57	-0.19	0.12	-0.31***	0.09	-0.01	0.07
SE$_{t-1}$·Age 54-57	0.00	0.13			0.22	0.15
UI$_{t-1}$·Age 54-57	0.40	0.49	1.26***	0.17	0.59***	0.20
IA$_{t-1}$·Age 54-57	0.85***	0.18			0.53***	0.10
Reform years						
PE$_{t-1}$·Year 04-09	0.00	0.15	0.03	0.11	0.25***	0.08
UI$_{t-1}$·Year 04-09	0.41	0.50	-0.43**	0.18	-0.29	0.20
Treatment						
PE$_{t-1}$· Treatment	-0.26	0.24	-0.38**	0.15	0.04	0.08
UI$_{t-1}$·Treatment	0.32	0.79	-0.48*	0.29	-0.11	0.32
Unemployment						
Unemployment rate (UR)	0.20***	0.03	0.23***	0.03	0.04**	0.02
SE$_{t-1}$ · UR	-0.25***	0.04			-0.16***	0.04
UI$_{t-1}$ · UR	-0.21	0.15	0.05	0.05	-0.01	0.05
IA$_{t-1}$ · UR	-0.24***	0.05			-0.16***	0.02
Constant	-12.87	19.39	93.81***	20.02	232.31***	11.19
Random effects						
σ^2_{se}	4.65***	0.34				
$\sigma_{se,ui}$	0.58***	0.21				
$\sigma_{se,ia}$	-0.56***	0.09				
σ^2_{ui}	0.34***	0.15				
$\sigma_{ui,ia}$	-0.04	0.05				
σ^2_{ia}	0.09***	0.03				
Inital conditions correction	Yes					
Random sample	70%					
Halton draws	50					
Observations	106902					
Persons						
Log likelihood	-32600.73					
Adj. R^2						

* Significant at the 0.10 level; ** at the 0.05 level; *** at the 0.01 level

Table 7: Estimation results baseline model (women)

Effects relative to paid-employment	Self-employment		Unemployment		Inactivity	
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Personal						
Birth year (/100)	-0.01	0.01	-0.03***	0.01	-0.08***	0.01
Immigrant	-0.32**	0.15	0.24**	0.12	-0.02	0.08
Homeowner$_{t=0}$	0.01	0.11	-0.37***	0.11	-0.10	0.06
Household						
Head	-1.22***	0.15	-0.38***	0.12	0.14**	0.07
Partner	0.17	0.14	0.68***	0.17	0.94***	0.11
Partner labor income	-0.41***	0.07	-0.41***	0.08	-0.70***	0.04
Number of children	0.11	0.11	0.00	0.16	0.17**	0.08
Age youngest child	-0.01	0.01	-0.04**	0.02	-0.02*	0.01
Mobility						
SE$_{t-1}$	4.63***	0.23			2.92***	0.25
UI$_{t-1}$	1.66**	0.68	2.35***	0.31	1.93***	0.36
IA$_{t-1}$	2.14***	0.31			5.10***	0.15
Age groups						
PE$_{t-1}$·Age 58-63	0.26	0.17	-0.10	0.15	1.33***	0.09
SE$_{t-1}$·Age 58-63	0.32**	0.16			1.35***	0.20
UI$_{t-1}$·Age 58-63	1.88***	0.60	3.02***	0.29	2.25***	0.31
IA$_{t-1}$·Age 58-63	0.71***	0.21			1.42***	0.11
PE$_{t-1}$·Age 54-57	-0.09	0.11	-0.32***	0.10	0.10	0.07
SE$_{t-1}$·Age 54-57	0.02	0.12			0.43**	0.18
UI$_{t-1}$·Age 54-57	1.12**	0.44	1.06***	0.19	0.47**	0.23
IA$_{t-1}$·Age 54-57	0.27	0.20			0.40***	0.09
Reform years						
PE$_{t-1}$·Year 04-09	-0.32**	0.13	-0.21	0.13	0.03	0.09
UI$_{t-1}$·Year 04-09	0.39	0.43	0.36*	0.21	1.08***	0.24
Treatment						
PE$_{t-1}$·Treatment	0.00	0.21	-0.14	0.19	0.23**	0.10
UI$_{t-1}$·Treatment	-0.99	0.75	-0.84**	0.35	-1.19***	0.40
Unemployment						
Unemployment rate (UR)	0.16***	0.03	0.12***	0.03	-0.07***	0.02
SE$_{t-1}$·UR	-0.17***	0.04			-0.19***	0.05
UI$_{t-1}$·UR	-0.15	0.13	0.22***	0.06	0.11*	0.06
IA$_{t-1}$·UR	-0.02	0.06			-0.04	0.03
Constant	15.84	19.00	56.79**	23.14	152.36***	12.65
Random effects						
σ^2_{se}	3.24***	0.28				
$\sigma_{se,ui}$	0.58***	0.21				
$\sigma_{se,ia}$	-0.05	0.21				
σ^2_{ui}	1.08***	0.19				
$\sigma_{ui,ia}$	0.01	0.11				
σ^2_{ia}	1.15***	0.10				
Initial conditions correction	Yes					
Random sample	100%					
Halton draws	50					
Observations	98,052					
Persons						
Log likelihood	-26,400.21					
Adj. R^2						

* Significant at the 0.10 level; ** at the 0.05 level; *** at the 0.01 level

Table 8: Estimation results with financial variables (men)

	Self-employment		Unemployment		Inactivity	
Effects relative to paid-employment						
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Treatment						
$PE_{t-1} \cdot$Treatment	-0.23	0.25	-0.37**	0.15	0.02	0.08
$UI_{t-1} \cdot$Treatment	0.34	0.79	-0.48	0.29	-0.12	0.32
Financial variables						
Liquid wealth$_{t=0}$/100	0.68***	0.21	-0.71	0.46	0.07	0.02
Fixed wealth$_{t=0}$/100	1.18*	0.62	0.24	0.63	0.24	0.29
Risky assets$_{t=0}$/100	0.21***	0.08	0.00	0.05	-0.02**	0.01
Mortgage$_{t=0}$/100	0.07**	0.03	0.02	0.03	-0.04**	0.02
Including variables baseline	Yes					
Random effects	Yes					
Inital conditions correction	Yes					
Random sample	70%					
Halton draws	50					
Observations	106902					
Persons						
Log likelihood	-32,578.31					
Adj. R^2						

* Significant at the 0.10 level; ** at the 0.05 level; *** at the 0.01 level
$Liquid wealth_{t=0}$ is the income a person received from interest, dividend, stocks, bonds minus interest payments from other debt than mortgages in the initial period observed. $Fixed wealth_{t=0}$ is the income a person received from housing and other property minus the interest payments from mortgages in the initial period observed. $Risky assets_{t=0}$ is defined as the percentage of income from risky assets in the income received from the total of wealth in the initial period. $Mortgage_{t=0}$ is defined as the interest payments from mortgage divided by the rental value of the house (an approximation of the value of the house in the tax system).

Table 9: Estimation results with financial variables (women)

	Self-employment		Unemployment		Inactivity	
Effects relative to paid-employment						
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Treatment						
$PE_{t-1} \cdot$Treatment	0.00	0.21	-0.14	0.19	0.22**	0.10
$UI_{t-1} \cdot$Treatment	-1.00	0.75	-0.85**	0.35	-1.20***	0.40
Financial variables						
Liquid wealth$_{t=0}$/100	0.37	0.34	-0.27	0.63	-0.28	0.22
Fixed wealth$_{t=0}$/100	-3.33*	1.80	-2.80	1.97	0.14	1.02
Risky assets$_{t=0}$/100	0.11	0.23	0.10	0.20	-0.02	0.05
Mortgage$_{t=0}$/100	-0.05	0.06	-0.08	0.08	-0.08*	0.04
Including variables baseline	Yes					
Random effects	Yes					
Inital conditions correction	Yes					
Random sample	100%					
Halton draws	50					
Observations	98052					
Persons						
Log likelihood	-26,391.86					
Adj. R^2						

* Significant at the 0.10 level; ** at the 0.05 level; *** at the 0.01 level
$Liquid wealth_{t=0}$ is the income a person received from interest, dividend, stocks, bonds minus interest payments from other debt than mortgages in the initial period observed. $Fixed wealth_{t=0}$ is the income a person received from housing and other property minus the interest payments from mortgages in the initial period observed. $Risky assets_{t=0}$ is defined as the percentage of income from risky assets in the income received from the total of wealth in the initial period. $Mortgage_{t=0}$ is defined as the interest payments from mortgage divided by the rental value of the house (an approximation of the value of the house in the tax system).

Table 10: T: Robustness check Halton Draws (women)

	Self-employment		Unemployment		Inactivity	
Effects relative to paid-employment						
	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
		50 Halton draws				
Treatment						
$PE_{t-1} \cdot Treatment$	0.00	0.21	-0.14	0.19	0.23**	0.10
$UI_{t-1} \cdot Treatment$	-0.99	0.75	-0.84**	0.35	-1.19***	0.40
Random effects						
σ^2_{se}	3.24***	0.28				
$\sigma_{se,ui}$	0.58***	0.21				
$\sigma_{se,ia}$	-0.05	0.21				
σ^2_{ui}	1.08***	0.19				
$\sigma_{ui,ia}$	0.01	0.11				
σ^2_{ia}	1.15***	0.10				
Including variables baseline	Yes					
Inital conditions correction	Yes					
		100 Halton draws				
Treatment						
$PE_{t-1} \cdot Treatment$	0.02	0.21	-0.14	0.19	0.22**	0.10
$UI_{t-1} \cdot Treatment$	-0.85	0.75	-0.84**	0.35	-1.17***	0.40
Random effects						
σ^2_{se}	3.37***	0.29				
$\sigma_{se,ui}$	0.46**	0.21				
$\sigma_{se,ia}$	-0.24	0.18				
σ^2_{ui}	1.31***	0.20				
$\sigma_{ui,ia}$	0.23	0.12				
σ^2_{ia}	1.22***	0.11				
Including variables baseline	Yes					
Inital conditions correction	Yes					
		200 Halton draws				
Treatment						
$PE_{t-1} \cdot Treatment$	0.01	0.21	-0.15	0.19	0.22**	0.10
$UI_{t-1} \cdot Treatment$	-0.88	0.75	-0.83**	0.35	-1.18***	0.40
Random effects						
σ^2_{se}	3.26***	0.28				
$\sigma_{se,ui}$	0.53**	0.21				
$\sigma_{se,ia}$	-0.13	0.16				
σ^2_{ui}	1.33***	0.20				
$\sigma_{ui,ia}$	0.10	0.10				
σ^2_{ia}	1.28***	0.11				
Including variables baseline	Yes					
Inital conditions correction	Yes					

* Significant at the 0.10 level; ** at the 0.05 level; *** at the 0.01 level