Labour Economics 27 (2014) 83–98

Contents lists available at ScienceDirect

Labour Economics

journal homepage: www.elsevier.com/locate/labeco

The effects of savings on reservation wages and search effort ☆

Marloes Lammers *

VU University Amsterdam, SEO Economic Research and Netspar, The Netherlands

HIGHLIGHTS

- Theoretically, wealth has a positive (negative) effect on reservation wages (search).
- Empirically, wealth has a positive effect on reservation wages.
- Empirically, wealth has a negative effect on search effort of household heads.

ARTICLE INFO

Article history:
Received 22 April 2012
Received in revised form 4 March 2014
Accepted 4 March 2014
Available online 12 March 2014

JEL classification:
C30
C36
D01
J64

Keywords:
Search
Reservation wages
Wealth
Consumption smoothing

ABSTRACT

This paper discusses the interrelations among wealth, reservation wages and search effort. A theoretical job search model predicts wealth to affect reservation wages positively, and search effort negatively. Subsequently, reduced form equations for reservation wages and search intensity take these theoretical results to the data. The data used is a Dutch panel, containing detailed information on individual wealth and income, subjective reservation wages and proxies for search effort. The main empirical results show that wealth has a significantly positive effect on reservation wages of both household heads and spouses, and a significantly negative effect on the search effort of household heads.

1. Introduction

With the curtailment of social security systems in most countries, individuals have to rely more and more on their individual savings. In particular, the aging of society is a well-known problem that puts pressure on the welfare state. As individuals see governmental generosity decline, it becomes vital to accrue wealth by themselves, for example in order to save up for early retirement, or to overcome a spell of unemployment. It is therefore of increasing importance to allow for effects of savings in theoretical and empirical models of the labor market. However, job search models usually fail to take the savings decision into account. In a standard job search model there is no need for savings since individuals are assumed to maximize *income*, implying workers to be risk neutral. If instead, as is standard in virtually all other fields in macro- and microeconomics, it is assumed that risk-averse individuals try to smooth consumption over their lives, savings do become an essential part of the job search model.

Danforth (1979) is the first to consider the effect of a savings decision in a model where a utility-maximizing agent engages in costly search. He shows that in the case of a decreasing absolute risk aversion (DARA) utility function, wealthy unemployed individuals have higher reservation wages, thereby decreasing the probability that they are employed the next period. Mortensen (1986) shows that reservation wages decline with time spent in unemployment, as a liquidity constraint becomes more binding. Recently, there have been some advances in studies of search that include a savings decision. These models either focus on the effect of assets on reservation wages (Berloffa and Simmons, 2003; Blundell et al., 1997; Rendon, 2006), or they abstract from a reservation wage decision and focus on the choice of search effort only (Lentz and Tranaes, 2005a). In the latter paper, the negative effect of wealth on the probability of transiting to employment is driven by a decreased willingness to search.

☆ I am grateful for the useful comments from Hans Bloemen, Stefan Hochguertel, Hessel Oosterbeek, and participants of seminars at the ESEM in Barcelona, the EALE in Tallinn, the Tinbergen Institute and VU Amsterdam. I also thank Stefan Hochguertel for providing his code for the cleaning of the data set. The remarks of two anonymous referees and an editor greatly helped to improve the paper. All remaining errors are my own.

* SEO Economic Research, Roetersstraat 29, 1018 WB Amsterdam, The Netherlands. Tel.: +31 20 525 1632.
E-mail address: M.Lammers@seo.nl.

http://dx.doi.org/10.1016/j.labeco.2014.03.001
0927-5371/

Lise (2011) allows individuals to choose both their reservation wage and search effort. However, since in his model the reservation wage is equal to unemployment benefits and therefore assumed constant, there is no scope for any effect of wealth on reservation wages.

In this paper, a theoretical model describes the relations among wealth, search, and reservation wages. The model makes it possible to disentangle the various effects of savings on reservation wages and search intensity: wealth affects reservation wages positively and search effort negatively.

The theoretical predictions are used to guide the empirical analysis in this paper. Specifically, the reduced form empirical models allow wealth to affect both the reservation wage and search effort. The estimation uses survey-data from a Dutch panel of households which contains detailed information on the key variables of the empirical model. A measure of search intensity is available: individuals are asked for the number of job applications they made in the two months prior to answering the questionnaire. Subjective information on reservation wages is available, such that there is no need to rely on theoretical restrictions to generate reservation wages. The results can therefore be interpreted generally. Moreover, detailed information on wealth and income of individuals is documented in the survey. These data therefore provide the means to study the interrelations among wealth, income, reservation wages and search behavior empirically.

The empirical analysis starts by estimating two single equations: one for the reservation wage and one for search effort. Subsequently, a three-equation simultaneous equation model allows for error correlation between wealth, the reservation wage and search effort. The simultaneous estimation does not improve on the single equation estimates, so the single equation estimates are the preferred ones. It is found that wealth has a significantly positive effect on reservation wages for both household heads and spouses. Specifically, at the mean value of wealth a 100% increase in wealth increases reservation wages by around 2.9% for household heads, and 3.7% for spouses. The estimated effect is between the 1.1% (heads) and 7.2% (spouses) found by Bloemen and Stancanelli (2001) who use the Dutch Socio-Economic Panel, but much less than the 12.6% (heads) increase in reservation wages found by Alexopoulos and Gladden (2004) who use U.S. data. The effect of wealth on search effort is negative, but only significant for household heads. At the 10th percentile of the wealth distribution household heads (spouses) on average apply for 4.95 (2.09) jobs in two months, whereas at the 90th percentile heads (spouses) on average apply for 4.33 (1.71) jobs in two months. Alexopoulos and Gladden (2004) also find a negative effect of wealth on search effort, though this effect is insignificant in all of their estimations.

The paper is set up as follows. Section 2 develops the theoretical model and provides a discussion of the sensitivity of the theoretical model's predictions to the model specification. A data-description can be found in Section 3. Section 4 presents an overview of the main estimation results, and Section 5 concludes.

2. Theoretical model

This section presents the theoretical background on which the empirical models in Section 4 are based. Along the same lines as Lentz and Tranaes (2005a) the theoretical model considers a risk averse individual who maximizes lifetime utility, which depends on the choice of consumption c_t and search effort s_t. The utility function $v(c_t,s_t)$ is assumed to be additively separable in its arguments, i.e. $v(c_t,s_t) = u(c_t) - e(s_t)$. In each period, the individual determines the optimal consumption, or equivalently the stock of wealth in the next period A_{t+1}. Savings earn interest at rate r. When unemployed, a worker also chooses optimal search intensity s_t, which influences the probability of getting a job offer that period $\lambda_t s_t$.[1] There is no on-the-job search and jobs are destroyed at an exogenous rate η. Irrespective of the state, a worker receives non-labor income μ. Apart from that, an individual receives unemployment benefits b when unemployed. These benefits include the value of household production and the value of leisure. An employed individual works at wage w, drawn from a wage distribution $f(w)$. This implies that, in contrast to Lentz and Tranaes (2005a) who assume a degenerate wage distribution such that a job offer will always be accepted, the model allows the individual to choose a reservation wage every period.

The formal problem facing the individual is:

$$\max_{\{A_{t+1},s_t\}_{t=0}^{\infty}} E_0\sum_{t=0}^{\infty}\beta^t[u(c_t)-e(s_t)] \tag{1}$$

$$\text{subject to } A_{t+1} = A_t(1+r) + I_U b + I_E w + \mu - c_t \tag{2}$$

and subject to the job offer arrival and job destruction processes. The indicator I_U (I_E) takes on the value 1 if the worker is unemployed (employed) at the beginning of the period. Otherwise, it takes on the value 0. The choice of A_{t+1} is restricted by an upper and lower wealth bound, i.e. $A_{t+1}\in\left[\underline{A},\overline{A}\right]$. This assumption is made only in order to ensure that the problem is bounded. The model further assumes a risk averse individual, i.e. $u'(.) > 0$ and $u''(.) < 0$ and increasing marginal costs of search: $e'(.) > 0$, $e''(.) > 0$ and $e(0) = 0$. The Bellman equation for the value of unemployment at time t can be written as a function of wealth at the beginning of the period:

$$V^U(A_t) = \max_{\{A_{t+1}^U\in[\underline{A},\overline{A}],s_t\}}\left\{\begin{array}{c} u\left(A_t(1+r)+b+\mu-A_{t+1}^U\right)-e(s_t) \\ +\beta\lambda_t s_t\int_0^{\infty} max\left[V^E\left(A_{t+1}^U,w\right),V^U\left(A_{t+1}^U\right)\right]dF(w)+\beta\left(1-\lambda_t s_t\right)V^U\left(A_{t+1}^U\right)\end{array}\right\}. \tag{3}$$

While the Bellman equation for the value of employment reads:

$$V^E(A_t,w) = \max_{\{A_{t+1}^E\in[\underline{A},\overline{A}]\}}\left\{\begin{array}{c} u\left(A_t\left(1+r\right)+w+\mu-A_{t+1}^E\right) \\ +\beta\left[\left(1-\eta\right)V^E\left(A_{t+1}^E,w\right)+\eta V^U\left(A_{t+1}^E\right)\right]\end{array}\right\}. \tag{4}$$

Rewriting and taking first order conditions w.r.t. s_t, A_{t+1}^U and A_{t+1}^E:

$$\begin{aligned} e'(s_t) &= \beta\lambda_t\int_{R_t}^{\infty}\left[V^E\left(A_{t+1,}^U w\right)-V^U\left(A_{t+1}^U\right)\right]f(w)dw, \text{if } s_t^*(A_t,f(w))>0 \\ e'(s_t) &\geq \beta\lambda_t\int_{R_t}^{\infty}\left[V^E\left(A_{t+1,}^U w\right)-V^U\left(A_{t+1}^U\right)\right]f(w)dw, \text{if } s_t^*(A_t,f(w)) = 0 \end{aligned} \tag{5}$$

$$\begin{aligned} u'\left(c_t^U\right) &= \beta\lambda_t s_t\int_{R_t}^{\infty}\left[V^{E'}\left(A_{t+1}^U,w\right)-V^{U'}\left(A_{t+1}^U\right)\right]\ f(w)dw \\ &\quad +\beta V^{U'}\left(A_{t+1}^U\right)+\rho_U \\ \rho_U\left[A_{t+1}^U-\underline{A}\right] &= 0 \end{aligned} \tag{6}$$

$$\begin{aligned} u'\left(c_t^E\right) &= \beta\left[(1-\eta)V^{E'}\left(A_{t+1}^E\right)+\eta V^{U'}\left(A_{t+1}^E\right)\right]+\rho_E \\ \rho_E\left[A_{t+1}^E-\underline{A}\right] &= 0 \end{aligned} \tag{7}$$

where R_t denotes the reservation wage in period t, and ρ_U and ρ_E are the Lagrange multipliers on the constraint that wealth cannot be smaller than a lower bound $\underline{A}$. The model has three state variables, namely current period wealth, the wage (distribution) and employment status. Given the value of these variables, the individual chooses next period wealth $A_{t+1}^E(A_t, w, f(w))$ or $A_{t+1}^U(A_t, f(w))$. An unemployed worker

[1] As in Mortensen (1986), λ_t can be considered a market-determined search efficiency parameter or 'potential' offer arrival rate. In general, λ_t depends on macro-economic conditions and is therefore non-constant.