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# Homeownership and labour-market behaviour: interpreting the evidence

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**Abstract.** This paper attempts to explain the repeated empirical finding that homeowners have shorter unemployment durations than tenants, even though Oswald's hypothesis predicts longer unemployment durations for homeowners. The search models that have been proposed to motivate Oswald's thesis have difficulties in providing an explanation for the reverse of the Oswald effect. The model proposed in this paper is close to the ones proposed earlier, in that it also studies search behaviour, but contains a richer set of effects of homeownership on search behaviour. In our model, homeowners may have a higher intensity of job search (and hence shorter unemployment durations) when their housing expenses are—all other things being equal—higher than those of tenants. Some studies have indeed found that the shorter unemployment durations occur especially among highly leveraged homeowners. We show that, in the Netherlands, many homeowners have higher housing costs than otherwise comparable tenants. The model developed in this paper is therefore able to explain the existing evidence of shorter unemployment durations for Dutch homeowners.

## 1 Introduction

Although owner-occupied housing is generally regarded as the preferred tenure type by policy makers—who stimulate it through mortgage interest deductibility, tax exemption of capital gains, and other measures—there have also been more critical voices. Among economists, the most prominent of these is probably Oswald (1996; 1999). His thesis states that there is a causal relationship between dwelling tenure choice and high unemployment. He finds that a 10% increase in the rate of homeownership is associated with 2% more unemployment. If this indeed signals a causal effect, then the increase in homeownership in many European countries in the second half of the 20th century would be an important reason behind the increase in structural unemployment. Oswald suggested that there are a number of reasons—one of them being the higher transaction costs associated with moving house—why exit rates from unemployment should be expected to be much lower among owner-occupiers than among tenants, or at least of tenants in the private (unregulated) part of the housing market.

Although homeownership increases with income, and workers with high incomes have in general more human capital and a lower risk of becoming unemployed, the possibility remains that the probability of finding a new job after becoming unemployed is substantially lower for homeowners than for tenants. Indeed, the hypothesis that the higher costs of moving for homeowners hamper residential mobility for job reasons seems a priori quite plausible, and the negative effect on unemployment appears to be a natural consequence. Oswald's thesis therefore directed attention towards a potentially important and until then neglected effect of an increase in homeownership.

It is therefore no surprise that Oswald's (1996, 1997) papers quickly triggered additional research: for instance, Pehkonen (1997) and Partridge and Rickman (1997). In their contribution to the *Handbook of Labour Economics*, Nickell and Layard (1999) considered the correlation between unemployment and the share of homeownership for OECD countries (see also Nickell, 1997; 1998). In their regression analyses, while controlling for other variables, they find a significant coefficient for the share of

homeownership on the total unemployment rate and short-term unemployment, but not on long-term unemployment. They also find a significant coefficient for the share of homeownership on the employment to population ratio of the whole working-age population and working-age males, but not of working-age women. The authors express some doubt as to whether these relationships are due to the mobility barrier effect proposed by Oswald, since they find no correlation between the share of homeownership and regional mobility in OECD countries.

Later studies are less favourable to Oswald's thesis. For instance, Green and Hendershott (2001), who reconsidered Oswald's evidence for the US, find that homeownership hardly restricts the mobility of heads of households. They argue that household heads have no choice other than to move to a better region when the local labour-market situation deteriorates, thus implying that, for this group, the thesis is invalid. However, when their partners become unemployed, staying in the region and hoping for better times may be preferred. A second example is Barrios García and Rodríguez Hernández (2004), who take a closer look at Spain and reach a conclusion that is the complete opposite of Oswald's earlier findings: "Spanish provinces with ownership rates that are 10 percentage points higher have an unemployment rate that is roughly 2.2 percentage points lower" (page 573). More recent studies (some of which are discussed in the next section) have tested Oswald's thesis on microdata. Sometimes these analyses confirm Oswald's thesis for small groups of owner-occupiers, but the typical result is that no evidence in favour of the thesis can be found for the majority of the workers. This state of affairs is puzzling. On the one hand, there is strong empirical evidence that the geographical mobility of homeowners is substantially below that of tenants. So the conclusion that homeowners will therefore experience more difficulties in finding a job when unemployed appears to be a straightforward consequence of this finding. On the other hand, empirical analysis contradicts this conclusion. As we will discuss in more detail in section 2, the existing evidence points to two potentially important aspects of this paradox. First, it has been found that homeowners with mortgages have shorter unemployment durations than others, which suggests a causal chain from high committed housing expenditures through increased pressure to find a job to higher escape rates from unemployment. Second, homeowners more often accept a job on the local labour market than tenants, and therefore appear to concentrate their search activities on different areas than tenants. The second aspect has been incorporated into theoretical search models, but until now a theoretical underpinning of the effect of mortgage debt service on unemployment durations does not seem to have been provided. It is the purpose of this paper to present a model that is able to explain these two aspects of job-search behaviour of homeowners in a simple search model. We do so by developing a model in which job seekers can direct their search efforts to the labour market in which they reside, as well as to other labour markets. A concave utility function implies that the combination of high committed housing expenditure and liquidity constraints provides a strong incentive for higher search intensity, and this may cause Oswald's thesis to fail. In this way, the model provides an explanation for the empirical evidence that found homeowners to have shorter unemployment durations than tenants if they have higher housing expenditure. Earlier research has shown that Dutch homeowners have shorter employment durations than tenants, and we provide empirical evidence that most homeowners in the Netherlands do indeed have higher housing expenditure than tenants with otherwise comparable characteristics, as is suggested by our model.

The paper is organized as follows. Next, in section 2 we review empirical studies that investigate the validity of Oswald's thesis on microdata. Then in section 3 we propose a search model that is consistent with much of the evidence provided by these

studies and discuss several features of the model. Section 4 provides empirical evidence on out-of-pocket housing expenditure of homeowners versus tenants in the Netherlands. Section 5 concludes.

## 2 Evidence on the housing tenure – unemployment relationship

### 2.1 Unemployment and homeownership at the microlevel

Studies using microdata demonstrate that unemployed persons are more reluctant to accept jobs at a greater distance from their current locations (see, for instance, Van den Berg and Gorter, 1996), and that this is particularly the case when they are owner-occupiers (see Van den Berg and van Vuuren, 1998). Even though this provides strong a priori endorsement of Oswald's thesis, studies focusing on unemployment durations of homeowners and tenants have repeatedly found results that contradict it. These unexpected findings are related to two aspects: high mortgage debt service and local versus nonlocal labour-market search.

For instance, Goss and Phillips (1997) found that the duration of unemployment was *shorter* for owner-occupiers, especially when a mortgage loan was present. They suggest that homeowners with weak equity positions have lower reservation wages or a higher search intensity than tenants or outright owners with comparable labour-market characteristics. The probable explanation is that unemployment is more inconvenient for homeowners with (large) mortgage payments, and provides a strong incentive for them to search for another job.

Flatau et al (2003) considered a role of leverage in the duration of homeowners in greater detail. Using Australian data, they conclude that outright owners have lower exit rates from unemployment than private tenants, as hypothesized by Oswald, especially when they are female. However, the larger group of leveraged homeowners have significantly shorter unemployment durations than private tenants, which contradicts Oswald's thesis. High mortgage payments thus have a similar effect to low replacement ratios. The rather striking implication is that workers who are least mobile on the housing market (see Henley, 1998) have the shortest unemployment durations, which is an exact reversal of Oswald's thesis.

The importance of the distinction between local and nonlocal job search was highlighted by Munch et al (2006), using Danish microdata. Their findings confirm that homeownership hampers the propensity to move residence for job reasons. Their data show that homeowners have better chances than tenants of finding a job on the local labour when they become unemployed, and this counteracts the negative effect of immobility on the housing market. The net result is a negative correlation between homeownership and unemployment duration. These findings have recently been confirmed for the Netherlands by Van Vuuren (2008).

The authors of the studies just mentioned have attempted to control for unobserved heterogeneity among workers that causes correlation between homeownership and the chance to find a new job when becoming unemployed, and the typical finding is that a strong effect of homeownership on unemployment duration remains. This suggests that the intensive search efforts of the unemployed homeowners, usually modelled as a willingness to accept jobs at lower wages, are the major determinant of their lower unemployment rate.[(1)] However, some doubts remain as to whether the research strategies that have been employed are really successful in isolating the causal effect of homeownership on unemployment duration. For instance, Van Vuuren (2008) points out

[(1)] A working paper by Brunet and Lesueur (2003) confirms this. They estimate a duration model and find that homeowners have lower exit rates from unemployment when controls for search intensity are included. The coefficients for the indicators of search intensity are highly significant.

that the desire to become a homeowner is likely to be related to one's labour-market prospects, which are also taken into account by mortgage lenders who have to facilitate this intention. Researchers, however, have only imperfect information about this issue.

### 2.2 Conclusion

The microstudies discussed in the previous subsection reject the Oswald thesis for some or all of the groups of workers they consider. Even though the idea that homeownership decreases mobility on the housing market is confirmed by all studies, the—at first sight very plausible—corollary that this has negative implications for unemployment duration could only be confirmed for specific subgroups of homeowners at best.

The empirical evidence for the reverse of the Oswald effect calls for an explanation in terms of worker behaviour. However, the formulation of a theoretical underpinning of Oswald's thesis seem to have received little attention. Although the logic behind Oswald's thesis is straightforward and does not need a theoretical model to be understood, such a model may also be useful to provide clues about the possibility for the thesis to fail. Munch et al (2006) develop a search-theoretic model and show that it implies that homeowners have a reservation wage for local job offers that lies below that for tenants, whereas their reservation wage for nonlocal job offers is higher than that for tenants. However, Van Vuuren (2008) shows that in their model the hazard rate to leave unemployment for homeowners is always lower than that for tenants.[2] This implies that the search model developed by Munch et al (2006) explains Oswald's thesis, but not the shorter unemployment durations of homeowners observed by these researchers.

Van Vuuren (2008) develops a model that differs from that of Munch et al (2006) in that he assumes that homeowners who remain unemployed for a long time have to sell their house because they run out of liquid assets. This introduces nonstationarity into the model, which makes it more difficult to handle. He also extends the model to include the decision to own a home. But this is not an unqualified success because, counterintuitively, his model predicts that, if homeowners can have unemployment benefit for an indefinite period.[3] a higher arrival rate of job offers (which means: better employment opportunities) makes it less likely that a worker will become a homeowner. Since, in this case, the difference between Van Vuuren's model and that of Munch et al is eliminated, this result probably also holds for the latter model. However, Van Vuuren shows that, with unemployment benefit exhaustion, this unexpected result disappears when the unemployment benefit is sufficiently high.

Since the two models just discussed do not consider mortgage payments, they are unable to explain the relationship between high mortgage payments and short unemployment durations that has been observed by other authors. Apparently, a theoretical model explaining this phenomenon has not been presented in the literature. In an attempt to fill this gap, in the next section we present a job-search model that explicitly takes housing costs into account.

## 3 An umbrella search model for labour market and tenure choice interactions

In this section we develop a model in which the intensity of job search is endogenous. More specifically, we assume that searchers can affect the arrival rate of local and nonlocal job offers—within certain limits—by their search efforts. For instance, they may decide to direct all their search activities to the local labour market. However, the more fundamental difference with the models just discussed is that we explicitly

[2] See their proposition 4 (page 22). The proof requires log-concavity of the wage offer distribution.
[3] In reality, unemployed workers are not in this situation, but in a stationary search model they are.

introduce housing costs into the model. The difference between the wage and housing costs is available for nondurable consumption, and utility is determined by this amount. The concavity of the utility function implies that higher housing costs make unemployment more of a problem. All things being equal, workers with high housing costs therefore have a stronger incentive to search when unemployed. If homeowners have higher housing costs than tenants (for instance, because they are highly leveraged), the model predicts that they will increase their intensity of job search. This explains the shorter unemployment durations of homeowners with high mortgage costs that were empirically observed by Goss and Phillips (1997) and Flatau et al (2003). In this way, the model provides a theoretical underpinning for a number of empirical findings discussed in this section.

### 3.1 Preliminaries

A household has a utility function $u = \mathrm{v}(c, o, s, m)$, whose value depends on consumption of a composite good $c$; on homeownership $o$ that is equal to 1 if the household owns the home in which it lives, and equal to 0 otherwise; job-search activities $s$; and on being a recent mover to the present residential area as indicated by the variable $m$ that equals 1 if there has been a recent move between local labour markets, and 0 otherwise. This utility should be interpreted as instantaneous utility, or the flow of utility realized at a particular point in time. Below, we will refer to the lifetime utility of workers as $U$.

We assume that utility is additively separable in its arguments:

$$u = \mathrm{u}(c) + \mathrm{A}(o) - \mathrm{C}(q) - \mathrm{M}(m)\,, \tag{1}$$

with u an increasing concave function. The function A represents the benefits of homeownership: $\mathrm{A}(o) = 0$ when $o = 0$, and $\mathrm{A}(1) = A > 0$ is therefore the utility associated with ownership.[4] These benefits may be interpreted as a better quality of owner-occupied housing or the freedom to change the colour of the house or the bathroom according to one's own wishes. The function $\mathrm{C}(q)$ denotes the cost of generating arrival rate $q$ and has $\mathrm{C}(0) = 0$. This function will be further specified below, but it may be already noted here that the incorporation of these costs in the utility function implies that we do not interpret them as a monetary cost, but as a cost in terms of effort. The function M represents the loss in utility associated with having to get acquainted with a new geographical environment. We assume $\mathrm{M}(1) > \mathrm{M}(0) = 0$.

Each household has one worker, who is either employed or unemployed. Unemployment implies that income equals the unemployment benefit $b$. The budget constraint is $b = c + \mathrm{h}(o)$, where $\mathrm{h}(o)$ denotes housing cost, which implies that we have: $c = b - \mathrm{h}(o)$. Employment implies a (unique) wage $w$, and, through the budget constraint, consumption of the composite good equals $w - \mathrm{h}(o)$.

### 3.2 Job search

We consider a spatial labour market that is geographically subdivided into a number of local labour markets. Workers can accept jobs in the local labour market in which they reside without having to move, but accepting a job outside this local labour market implies the necessity of moving. The utility associated with being employed is therefore different for those who have accepted a job in the local labour market (that is, without a residential move) and those who have accepted a job elsewhere. We denote the former as $u_{\mathrm{wl}}$, and the latter as $u_{\mathrm{wn}}$:

$$u_{\mathrm{wl}} = \mathrm{u}[w - \mathrm{h}(o)] + \mathrm{A}(o), \qquad u_{\mathrm{wn}} = \mathrm{u}[w - \mathrm{h}(o)] + \mathrm{A}(o) - \mathrm{M}(m)\,. \tag{2}$$

[4] Although it is possible to consider the demand for housing services explicitly, we have simplified the model as much as possible and concentrate only on ownership.

Since there is a unique wage for each worker, there are no gains from on-the-job search, and for this reason we have suppressed the search-cost term in equation (2).

The utility of being unemployed will be denoted as $u_u$:

$$u_u = u[b - h(o)] + A(o) - C(s). \tag{3}$$

We assume that the only reason for moving is acceptance of a job outside the region of residence, and for this reason the moving cost term does not appear in equation (3).

We distinguish between search activities in the local labour market, resulting in an arrival rate of local job offers, $q_l$, and search elsewhere, resulting in an arrival rate $q_n$, and assume that search costs are quadratic in these two activities. We adopt the simple specification:

$$C(s) = \gamma_l q_l^2 + \gamma_n q_n^2, \tag{4}$$

with $\gamma_l \leqslant \gamma_n$, implying that search outside the local labour market is at least as expensive as local search.

We can now rewrite equation (3) as:

$$u_u = u[b - h(o)] + A(o) - \gamma_l q_l^2 - \gamma_n q_n^2. \tag{5}$$

Finally, we assume that the separation rate is equal to a constant $\sigma$ for all jobs.

We are interested in the search behaviour of unemployed workers, conditional upon their homeownership status. The unemployed worker chooses his or her search efforts (and therefore the arrival rates of job offers) in such a way that lifetime utility is maximized. To find this lifetime utility, we use the asset evaluation (Bellman) equations:

$$\rho U = u_u + q_l(W_l - U) + q_n(W_n - U), \tag{6a}$$

$$\rho W_l = u_{wl} + \sigma(U - W_l), \tag{6b}$$

$$\rho W_n = u_{wn} + \sigma(U - W_n). \tag{6c}$$

In these equations, $U$ denotes the value of unemployment (that is, the expected value of lifetime utility for a worker who is currently unemployed, conditional upon the values of the arrival rates); and $W_l$ and $W_n$ the value of accepting a job on the local labour market or elsewhere, respectively (these values have a similar interpretation to that of unemployment). For simplicity of notation, we have suppressed the arguments of the (instantaneous) utilities associated with the various states.

Solving equations (6) for $U$ gives:

$$U = \frac{1}{\rho}\left[\frac{(\rho + \sigma)u_u + q_l u_{wl} + q_n u_{wn}}{\rho + \sigma + q_l + q_n}\right]. \tag{7}$$

The worker chooses his or her search intensities in such a way that $U$ is maximized. Assuming that the optimal values of both arrival rates are positive, the first-order conditions can be written as:

$$q_l = \frac{u_{wl} - \rho U}{2\gamma_l(\rho + \sigma)}, \qquad q_n = \frac{u_{wn} - \rho U}{2\gamma_n(\rho + \sigma)}. \tag{8}$$

Equation (7) implies that $\rho U$ (the expression in square brackets) is a weighted average of $u_u$, $u_{wl}$, and $u_{wn}$. If $w > b$, we can be sure that $u_{wl} > u_u$, and a comparison of the two equations (2) shows that $u_{wl} > u_{wn}$. We can therefore be sure that $u_{wl} > \rho U$, and therefore that $q_l$ will be positive. However, our assumptions do not guarantee that

$$u_{wn} > \rho U, \tag{9}$$

and if this condition is not satisfied, it is optimal to set $q_n = 0$. It may be observed [from equation (2) and the previous discussion] that condition (9) is easier to satisfy when $M$ is small.

When both arrival rates are positive, elaboration of equations (8) allows the derivation of the following expression:

$$q_n = \frac{\gamma_l}{\gamma_n} q_l - \frac{u_{wl} - u_{wn}}{2\gamma_n(\rho + \sigma)}. \tag{10}$$

This shows that the unemployed worker searches in such a way that the arrival rate of local job offers is larger than that of job offers from elsewhere in the economy. There are two reasons for this effect: it is at least as costly to search elsewhere ($\gamma_n \geqslant \gamma_l$), and utility will be higher after accepting a job in the local labour market ($u_{wl} > u_{wn}$).

### 3.3 Effects of homeownership

In the model we developed above, housing enters in three ways: through housing costs $h$, the utility of ownership $A$, and the cost of moving $M$. We will consider the implication of changes in the value of each of these on the optimal search strategy.

It is easiest to start with $A$, the utility premium associated with homeownership. Because of the additive character of this effect, the numerator on the left-hand side of equation (8) will not change, and therefore the optimal search strategy will also remain unchanged. This means that tenure status in itself has no effect on the optimal search strategy.

According to Oswald's thesis, homeowners are more vulnerable to unemployment risks because of their higher moving costs. We have already noted above that higher moving costs $M$ may induce a searcher to abstain from searching outside the local labour market. Let us now consider the effect of a marginal change in $M$ for the optimal strategy of a searcher with positive arrival rates of local and other job offers. Making use of the envelope theorem, it is not difficult to verify from equations (7) and (8) that:

$$\frac{dq_l}{dM} = \frac{1}{2\gamma_l} \frac{q_n}{\rho + \sigma + q_l + q_n} > 0, \qquad \frac{dq_n}{dM} = -\frac{1}{2\gamma_n} \frac{\rho + \sigma + q_l}{\rho + \sigma + q_l + q_n} < 0. \tag{11}$$

The second of these equations shows that higher moving costs result in owners making less effort to find a job outside the local labour market. We refer to this conclusion as the 'Oswald effect'. If this were the only effect of homeownership on job search, Oswald's thesis—interpreted either as saying that homeowners have longer unemployment spells, as is done in much of the microeconomic literature, or as saying that homeowners have higher unemployment rates—would be a prediction of our model.

However, the first of equations (11) shows that there is another effect of higher moving costs: it will induce a searcher to search more intensively in the local labour market (see Munch et al, 2006). The total (net) effect of the higher moving costs on the total arrival rate of job offers $d(q_l + q_n)/dM$ can be found by adding two equations (11). Using equation (10), it is found that this effect is negative. This implies that the Oswald effect dominates the total effect of higher moving cost on the arrival rate of job offers and therefore on unemployment. This means that our model implies the main element of Oswald's thesis: although homeowners more often accept local jobs, the net effect of their higher moving costs on unemployment durations is positive. In this respect our model is similar to that developed by Munch et al (2006).

However, it must be noted that in our model this is not necessarily the end of the story, because there is a third possibility for homeownership to affect search behaviour. If housing costs are different for owners and tenants, a change in housing tenure

may result in different search behaviour. To investigate this effect, we consider the consequences of a marginal change in housing cost $h$ on optimal search behaviour. Using the same procedure as for moving costs, we find:

$$\frac{\mathrm{d}q_{\mathrm{l}}}{\mathrm{d}h} = \frac{1}{2\gamma_{\mathrm{l}}}\frac{\mathrm{u}'(b-h)-\mathrm{u}'(w-h)}{\rho+\sigma+q_{\mathrm{l}}+q_{\mathrm{n}}} > 0, \qquad \frac{\mathrm{d}q_{\mathrm{n}}}{\mathrm{d}h} = \frac{1}{2\gamma_{\mathrm{n}}}\frac{\mathrm{u}'(b-h)-\mathrm{u}'(w-h)}{\rho+\sigma+q_{\mathrm{l}}+q_{\mathrm{n}}} > 0. \tag{12}$$

In these equations $\mathrm{u}'_{\mathrm{u}} = \mathrm{du}(b-h)/\mathrm{d}h$ and $\mathrm{u}'_{\mathrm{w}} = \mathrm{du}(w-h)/\mathrm{d}h$. The sign of the two total derivatives is determined because of the concavity of the function $\mathrm{u}(c)$. Intuitively, higher housing costs imply that the difference between the utilities associated with employment and unemployment increases, and this raises the gains from search.

If homeowners have lower housing costs than tenants, the model developed here implies that the housing-cost effect in equations (12) reinforces the Oswald effect, and counteracts the positive effect of higher moving costs on local job search. The net effect will be a strengthening of Oswald's thesis. However, if homeowners have higher housing costs than tenants, the Oswald effect is counteracted by the effect of the higher housing costs. The net result of the higher moving costs and the higher housing costs may be that homeowners realize higher arrival rates for local job offers, and lower arrival rates for job offers from elsewhere, whereas the net effect of homeownership on the total arrival rate of job offers is positive, as was empirically found by Munch et al (2006).

The question whether homeowners have higher housing costs than tenants is an empirical one, and we will consider it in the next section. However, it may already be observed that the results just derived provide a possible explanation for Goss and Phillip's (1997) and Flatau et al's (2003) finding that homeowners with a large amount of mortgage debt (and therefore high out-of-pocket housing expenditures) have low unemployment rates in comparison with tenants and outright homeowners.

### 3.4 Housing tenure choice

To study housing tenure choice, we compare the values of $U$ for tenants and owners. We rewrite equation (7) as:

$$\mathrm{U}(o) = \frac{1}{\rho}\left\langle \frac{(\rho+\sigma)\{\mathrm{u}([b-\mathrm{h}(o)]-\gamma_{\mathrm{l}}q_{\mathrm{l}}(o)^2-\gamma_o q_o(o)^2\}}{\rho+\sigma+q_{\mathrm{l}}(o)+q_{\mathrm{n}}(o)} + \frac{q_{\mathrm{l}}(o)\mathrm{u}[w-\mathrm{h}(o)]+q_{\mathrm{n}}(o)\{\mathrm{u}[w-\mathrm{h}(o)]-\mathrm{M}(o)\}}{\rho+\sigma+q_{\mathrm{l}}(o)+q_{\mathrm{n}}(o)} + \mathrm{A}(o)\right\rangle. \tag{13}$$

This equation indicates which variables depend on ownership status ($o = 1$ for owners and $o = 0$ for tenants). A switch from renting to owning has the following effects: housing costs $h$ change; the cost of mobility $M$ increases; the variable $A$ becomes positive; and the arrival rates $q_{\mathrm{l}}$ and $q_{\mathrm{n}}$ change due to changes in the intensity of search induced by the tenure status.[5] In the appendix it is shown that the signs of the corresponding partial effects on $U$ can be determined if $\rho+\sigma<2$, that is, if the sum of the discount rate and the separation rate is not too large. This seems to be a mild and, in practice, unrestrictive assumption. Making this assumption, it can be shown that housing and mobility costs affect $U$ negatively, whereas $A$, the utility derived from homeownership as such, has a positive effect (see the appendix). When the cost of owning exceeds the rent, the preference for ownership has therefore to be sufficiently high to overcome the negative effects of higher housing and mobility costs.

[5] It is possible to solve for $U$ by substituting equation (8) into equation (13) and solving the resulting quadratic equation. However, the resulting equation is so complicated that it is easier to use the total differential approach.

Consider a worker who is indifferent between the two tenure types [U(1) = U(0)]. Since $A$ is positive for owners, the sum of the first two terms in square brackets in equation (13) must be smaller when this worker buys a house. In the case on which we focus, this is not only caused by higher mobility in the case of acceptance of a job outside the local labour market, but also by the higher (out-of-pocket) housing costs. To see how labour-market characteristics affect homeownership, we now analyze the effect of changes in the separation rate and search costs on the tenure choice of this worker who is initially indifferent between owning and renting.

We start with the separation rate. Using the approach discussed in the appendix, we find:

$$\frac{\mathrm{dU}(o)}{\mathrm{d}\sigma} = \frac{\mathrm{u}[b-\mathrm{h}(o)] - \gamma_{\mathrm{l}} q_{\mathrm{l}}(o)^2 - \gamma_{\mathrm{n}} q_{\mathrm{n}}(o)^2 + \mathrm{A}(o) - \rho \mathrm{U}(o)}{\rho(\rho+\sigma) + [2-(\rho+\sigma)][q_{\mathrm{l}}(o) + q_{\mathrm{n}}(o)]}. \tag{14}$$

This expression is negative, since the instantaneous utility of unemployment is lower than $\rho$U. If the housing costs of homeowners are lower, u[$b$ − h(1)] < u[$b$ − h(0)], and we know that for homeowners the arrival rate of local job offers is higher. If homeowners have higher escape rates from unemployment than tenants (as in the empirically relevant case), then the denominator on the right-hand-side of equation (14) is larger for homeowners than for tenants, and the effect of homeownership on $q_{\mathrm{n}}$ is indeterminate. We must therefore conclude that our model does not provide clear predictions with respect to the effect of the separation rate on homeownership decisions: it may well be negative, but we cannot exclude situations in which it is positive.

Now consider the effect of higher local search costs. Using the same approach, we find:

$$\frac{\mathrm{dU}(o)}{\mathrm{d}\gamma_{\mathrm{l}}} = -\frac{[2-(\rho+\sigma)] q_{\mathrm{l}}(o)^2}{\rho(\rho+\sigma) + [2-(\rho+\sigma)][q_{\mathrm{l}}(o) + q_{\mathrm{n}}(o)]}. \tag{15}$$

This effect is clearly negative. For homeowners the arrival rate of local job offers is higher than for tenants, so the numerator is larger for owners. However, the denominator is also larger when the total escape rate from unemployment is higher for owners, which implies that the total effect of higher search costs on homeownership is indeterminate. But the effect of higher search costs outside the local labour market is unambiguously positive for homeownership when the total escape rate from unemployment is higher for homeowners.

The indeterminateness of the effect of general labour-market circumstances on the attractiveness of homeownership is related to the three different and counteractive effects that homeownership has in our model (ie apart from a positive immediate effect on utility, there are negative effects on housing costs and the cost of mobility) and their influences on the search intensity of unemployed workers, and subsequently on the arrival rate of (local and nonlocal) job offers.

Finally, we note that in this model the attractiveness of homeownership depends on the labour-market status of the worker. This implies that it may be optimal for an unemployed tenant to switch to ownership after having accepted a job. In our opinion this is an attractive feature of the model. However, since such behaviour is not of primary interest for the purposes of the present paper, we will not analyze it here.

### 3.5 Discussion

In this subsection we discuss several concerns that can be raised with the model just developed.

A first concern is that we assume that all workers are hand-to-mouth consumers who do not save. Although the bulk of the literature on labour-market search assumes—as we did—that consumers spend their whole income in the period in which

they earn, the life-cycle hypothesis of consumption and savings behaviour suggests that workers attempt to smooth consumption so as to maximize utility. Recently, Lentz and Tranæs (2005) have studied a search model in which consumers are allowed to save. Some aspects of their model are similar to ours. For instance, they assume a utility function that is additively separable in consumption and search, although they do not consider housing costs explicitly. An important result of their model (for the purposes of the present discussion) is that consumers never completely smooth consumption: conditional on wealth, consumption when employed is always strictly greater than when unemployed. In an empirical application of the model, Card et al (2007, page 1511) conclude that actual consumers are closer to rule-of-thumb consumers who spend their income completely in each period than to consumers who perfectly smooth consumption. In particular, they find that "the representative job searcher in our data is about 70% of the way between the permanent income benchmark and credit constrained behaviour in terms of sensitivity to cash-on-hand". We can therefore conclude that a model in which consumption equals income minus committed expenditure, as we developed above, is an approximation of reality that appears to be as good as one that allows for perfect consumption smoothing.

A second concern with the model presented above may be that, because of agency problems, renting a house should, in general, be expected to be more expensive than owning a house with comparable characteristics. This implies that one should expect to observe lower housing costs for homeowners, whereas in our model Oswald's thesis can fail only if homeowners have higher housing costs. One response to this argument could be that it refers to the user cost of housing, whereas actual out-of-pocket expenditures on housing may be much higher for leveraged homeowners. The reason is that most mortgage loans are self-amortizing, which implies that monthly payments include a substantial repayment component. The repayment part of mortgage expenditure is not part of the user cost and may well cause out-of-pocket housing expenditure to exceed the rent of a comparable dwelling.[6] A second response is that owner-occupied housing is usually of a higher quality than rental housing. In the Netherlands, to which our empirical work refers, almost all rental housing is social housing of reasonable quality which is offered at controlled rents that are substantially lower than market levels, whereas higher quality housing is often owner-occupied and available at market-clearing prices. This quality difference is incorporated in our model as a direct effect of homeownership on utility. Empirically, the effect of the quality difference may be more important than that of the repayment.

Another possible concern we mention here is that we have concentrated on the nonmonetary aspects of moving costs and job search. The reason is that, in practice, (potential) employers usually reimburse the monetary expenses made by applicants for job openings (especially travel costs), and, if a worker has to move house, his or her new employer usually pays part of the monetary costs involved. Most of the remaining costs are nonmonetary: the time involved in application procedures, and the disutility associated with searching a suitable neighbourhood in a different region and getting settled there.

The assumption that housing expenditure is fixed and larger for homeowners than for tenants plays a crucial role for the conclusion that homeowners have shorter unemployment durations than tenants. A final concern to be mentioned here is that one may object that workers have the possibility to adjust their housing consumption

[6] It may be added that the most popular mortgage type in the Netherlands—to which our empirical work refers—is an investment mortgage in which the homeowner saves for repayment by taking out a life insurance policy. This means that out-of-pocket housing expenditure is at least equal to interest payment on the complete loan.

when they become unemployed. However, the large transaction costs involved are an important threshold. This is confirmed by research for the US that showed that more than 90% of the workers who become unemployed remain in the same house until they find another job (Gruber, 1998). It appears, therefore, that workers who become unemployed usually consider housing expenditure as fixed. The consequences of such committed expenditure for behaviour have been considered by Chetty in a series of papers. In Chetty (2004), he develops a structural search model for unemployed workers in the presence of such committed expenditure and finds that it makes households substantially more risk averse to small shocks: that is, shocks that do not induce a change in the committed expenditure. This increased risk aversion has consequences for search behaviour in the case of unemployment.[7]

Given its limitations, the model developed in the present section offers a possible explanation for the empirical observation that, despite their lower geographical mobility, homeowners have on average lower unemployment durations than tenants. The model is consistent with Oswald's thesis, in that it predicts that the higher moving costs associated with homeownership in themselves result in a lower search intensity and therefore a longer expected duration of unemployment for homeowners. However, when housing costs of homeowners are higher than those of tenants, this is no longer necessarily the case. This sheds light on the empirical result of Goss and Phillips (1997) and Flatau et al (2003) that highly leveraged homeowners have lower unemployment rates and shorter unemployment duration than outright owners and tenants. The mechanism through which homeowners end unemployment sooner in our model is that their marginal utility of nonhousing consumption is higher than that of otherwise comparable tenants. In combination with the concavity of the utility function, this provides a larger incentive to search.

In the next section we will consider the empirical question whether homeowners do indeed have larger out-of-pocket housing costs than tenants.

## 4 Empirical evidence on housing expenditure from the Netherlands

### 4.1 Out-of-pocket housing costs of owners and tenants

The model we developed in the previous section is able to explain the shorter average duration of unemployment of homeowners, whose geographical mobility is low compared with that of tenants, if their out-of pocket housing expenditures are higher than those of tenants. Recent empirical evidence about the employment durations of homeowners and tenants in the Netherlands is provided in Van Vuuren (2008). He finds that homeowners have shorter average unemployment durations than tenants. This is consistent with the model presented in section 3 if Dutch homeowners have higher housing cost than tenants. The main purpose of this section is to consider whether this is the case. We use the Dutch Housing Needs Survey (abbreviated in Dutch as WBO) for the year 2002. It provides information about the housing situation and a large number of related variables concerning 60 000 Dutch households.

The Netherlands is an interesting case to consider since the tax treatment of housing expenditure reinforces the effect of housing expenditure on search efforts that is central to the model developed above. For homeowners there is unlimited deductibility of mortgage interest paid, which implies a larger gain (tax benefit) when the marginal tax rate is higher. Since the marginal tax rate depends on income, becoming unemployed implies higher out-of-pocket expenditure for homeowners.

[7] Chetty uses a nonstationary search model, and does not measure the effect of differences in committed (housing) expenditure on unemployment durations.

For tenants there is a means-tested benefit that has the opposite effect. This housing allowance enables low-income households to rent decent housing. A lower income implies a larger allowance for the same house. The housing allowance system thus mitigates the effect of becoming unemployed on tenant's nonhousing consumption. These two effects reinforce the difference in incentives for job search between tenants and owners that plays a crucial role in our model. It may be added that moving towards the rental sector after becoming unemployed is difficult because of the highly regulated character of the Dutch rental market. Rents are below market levels and there is severe excess demand for rental housing, especially in the western part of the country. Even if owner-occupiers would like to realize such a move after becoming unemployed, this is virtually impossible because of the long waiting lists.

The WBO database reports the net housing costs of owners and tenants. The net housing costs of owners take into account the mortgage interest deductibility. The net housing costs of tenants take into account the rent allowance. We consider only households in which at least one adult participates in the labour market. Labour-market participation means that the person earns a wage or receives unemployment benefit.

Average out-of-pocket housing expenditure of homeowners is €98 per month higher than for tenants in households where no adults are unemployed (see column 1 of table 1). Controlling for income lowers this figure to €66 which is still not negligible (see column 2).[8] However, there are good reasons to expect that the difference is larger among particular subgroups, especially young homeowners. House prices increased considerably in the Netherlands in the 1990s, and have remained at a high level since then, and young homeowners are likely to be relatively recent buyers who have had to borrow most of the money for financing their house purchase. We therefore extend the model with age and the cross-effect of age and homeownership. The coefficient for homeownership now increases to €409 per month and the coefficient for the cross effect is equal to −€7.4 per month per year of age (see column 3). This means that a 30-year-old homeowner has net out-of-pocket housing expenditure that is on average €188 per month higher than a tenant of the same age. However, this effect decreases with age, and for homeowners of 56 years and older net housing expenditure is on average lower than that of tenants. After introducing additional controls for education, province, and dual earners these results hardly change, as is documented in column 4 of table 1.

**Table 1.** Net housing expenditure of owners and tenants.

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Owner | 98.4 (2.4) | 65.9 (2.4) | 409 (6.9) | 401 (6.9) |
| Gross household income | | 0.019 (0.0004) | 0.017 (0.0004) | (0.011 (0.0004) |
| Age | | | 0.266 (0.09) | 0.539 (0.09) |
| Age × owner | | | −7.38 (0.14) | −7.44 (0.14) |
| Controls for education, province, number of earners | no | no | no | yes |
| Constant | 332 (1.8) | 288 (2.0) | 280 (5.1) | 214 (7.8) |
| $n$ | 62 248 | 62 248 | 62 248 | 62 248 |
| $R^2$ | 0.03 | 0.06 | 0.13 | 0.18 |

Note. Dependent variable: net monthly housing expenditure. Standard errors are reported in parentheses.

[8] We use gross household income as our control variable to avoid noise associated with the effect of mortgage deductibility on net income.

### 4.2 Discussion

As already mentioned, evidence for a relationship between short unemployment durations and high mortgage payment has been provided by Goss and Phillips (1997) for the UK, and by Flatau et al (2003) for Australia. In a recent paper Chetty (2008) finds that the unemployment durations of US workers are more sensitive to the value of the unemployment benefit when they have a mortgage. He interprets this as indicating that workers with a mortgage are often liquidity constrained and therefore close to the hand-to-mouth consumers we modelled in section 3. There seems to be considerable evidence, therefore, that, notwithstanding their lower geographical mobility, homeowners with mortgages are able to shorten their unemployment durations considerably in comparison with tenants and outright owners.

Although we have attributed this phenomenon as being due to the higher marginal utility of consumption of liquidity-constrained unemployed workers with large committed housing expenses, it may be noted that psychological effects may reinforce this mechanism. Taylor et al (2006) provide evidence of significant psychological costs (in terms of mental health) associated with housing payment problems and payment arrears.

## 5 Conclusion

In this paper we have provided a model that explains the paradoxical finding that homeowners have shorter unemployment durations than tenants by taking into account the higher out-of-pocket housing costs and a higher marginal utility of owners. The model we developed is consistent with Oswald's thesis when housing costs of homeowners are lower than those of tenants, as is the case for outright owners. The model predicts a negative effect of the higher moving cost of homeowners on labour-market mobility, as is generally found in empirical work. The main point of the paper is, however, that it is also able to explain the surprising fact that, while homeownership does substantially hamper geographical mobility, its net effect on unemployment durations is to shorten them, at least for the important group of homeowners with a substantial mortgage.

This effect results from the large disutility associated with a situation in which large mortgage payments have to be made from an unemployment benefit that is substantially lower than the homeowner's previous income, while there is no liquid wealth available. However, initial unemployment benefits are in many countries close to the last earned income, and many households have some savings available and are able to postpone the purchase of durables. It is only after being unemployed for some months that liquidity constraints become really biting. Although this may suggest that the analysis of the present paper is especially relevant for those who are in long-term unemployment, it must be realized that for the short-term unemployed the prospect of being unable to find a new job before running out of the available liquid resources and the unemployment benefit decreases is a very real one. The highly leveraged homeowner who becomes unemployed would therefore be expected to be anxious to avoid this situation and act in the way suggested by the proposed model immediately even though short-run unemployment benefits are relatively high. Nevertheless, one would expect an intensification of the search efforts when unemployment lasts longer, liquid resources become exhausted, and the unemployment benefit gets lower. An empirical investigation of this issue would be a good topic for further research.

The analysis of the present paper thus sheds new light on the relationship between the labour market and the housing market. Analysis of the connection between these two markets tends to stress that the functioning of one market puts constraints on that of the other. This results in frictions that might take the form of long commutes, traffic

congestion, and suboptimal allocation of workers to jobs. However, the model developed in this paper suggests that there may well be aspects of the functioning of one market that stimulate, rather than hamper, that of the other market.

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**References**

Barrios García J A, Rodríguez Hernández J E, 2004, "User cost changes, unemployment and home-ownership: evidence from Spain *Urban Studies* **41** 563 – 578

Brunet C, Lesueur J-Y, 2003, "Do homeowners stay unemployed longer? A French microeconomic study", CNRS/GATE working paper, Ecully

Card D, Chetty R, Weber A, 2007, "Cash-on-hand and competing models of intertemporal behavior: new evidence from the labor market" *Quarterly Journal of Economics* **122** 1511 – 1560

Chetty R, 2004, "Consumption commitments, unemployment durations and local risk aversion", WP 10211, National Bureau of Economic Research, Cambridge, MA

Chetty R, 2008, "Moral hazard vs liquidity and optimal unemployment insurance" *Journal of Political Economy* **116** 173 – 234

Flatau P, Forbes M, Hendershott P H, Wood G, 2003, "Homeowership and unemployment: the roles of leverage and public housing", WP 10021, National Bureau of Economic Research, Cambridge, MA

Goss E P, Phillips J M, 1997, "The impact of home ownership on the duration of unemployment" *Review of Regional Studies* **27** 9 – 27

Green R, Hendershott P, 2001, "Homeownership and unemployment in the US" *Urban Studies* **38** 1501 – 1520

Gruber J, 1998, "Unemployment insurance, consumption smoothing, and private insurance: evidence from PSID and CEX" *Research in Employment Policy* **1** 3 – 31

Henley A, 1998, "Residential mobility, housing equity and the labour market" *The Economic Journal* **108** 414 – 427

Lentz R, Tranæs T, 2005, "Job search and savings: wealth effects and duration dependence" *Journal of Labor Economics* **23** 467 – 489

Munch J R, Rosholm M, Svarer M, 2006, "Are home owners really more unemployed?" *Economic Journal* **116** 991 – 1013

Nickell S J, 1997, "Unemployment and labour market rigidities: Europe versus North America" *Journal of Economic Perspectives* **11** 55 – 74

Nickell S J, 1998, "Unemployment: questions and some answers" *Economic Journal* **108** 802 – 816

Nickell S J, Layard R, 1999, "Labour market institutions and economic performance", in *Handbook of Labor Economics, Volume 3* Eds A Ashenfelter, D Card (North-Holland, Amsterdam) pp 3030 – 3084

Oswald A J, 1996, "A conjecture on the explanation for high unemployment in the industrialized nations: Part I", working paper, Economics Department, University of Warwick, Coventry

Oswald A, 1997, "Thoughts on Nairu" *Journal of Economic Perspectives* **11**(1) 227 – 228

Oswald A J, 1999, "The housing market and Europe's unemployment: a non-technical paper", working paper, Economics Department, University of Warwick, Coventry

Partridge M D, Rickman D S, 1997, "The dispersion of US state unemployment rates: the role of market and non-market equilibrium factors" *Regional Studies* **31** 593 – 606

Pehkonen J, 1997, "Unemployment and homeownership" *Applied Economic Letters* **6** 263 – 265

Taylor M P, Pevalin D J, Todd J, 2006, "The psychological cost of unsustainable housing commitments", WP 08, Institute for Social and Economic Research, University of Essex, Colchester

Van den Berg G J, Gorter C, 1996, "Job search and commuting time" *Journal of Business Economics and Statistics* **15** 269 – 281

Van den Berg G J, van Vuuren A, 1998, "Job search and the non-monetary cost of moving to a new residence", unpublished working paper, Free University, Amsterdam

Van Vuuren A, 2008, "The relationship between expectations of labor market status, homeownership and the duration of unemployment", working paper, Free University, Amsterdam

**Appendix**

To derive comparative static results we rewrite equation (13) as:

$$U = \frac{1}{\rho}\frac{N}{D}, \tag{A1}$$

with $D = \rho + \sigma + q_l + q_n$. The definition of $N$ is self-explanatory. For notational simplicity, we suppressed the reference to tenure status. We should take into account that both $N$ and $D$ are functions of $U$ because they depend on the arrival rates [see equation (8)]. We can compute the effect of an arbitrary parameter $\theta$ on $U$ on the basis of the total differential:

$$\begin{aligned} \mathrm{d}U &= \frac{1}{\rho}\frac{N}{D^2}\left[\left(\frac{\partial N}{\partial \theta}\mathrm{d}\theta + \frac{\partial N}{\partial U}\mathrm{d}U\right)D - \left(\frac{\partial D}{\partial \theta}\mathrm{d}\theta + \frac{\partial D}{\partial U}\mathrm{d}U\right)N\right] \\ &= \frac{1}{\rho}\frac{N}{D}\left[\left(\frac{\partial N}{\partial \theta}\mathrm{d}\theta + \frac{\partial N}{\partial U}\mathrm{d}U\right) - \left(\frac{\partial D}{\partial \theta}\mathrm{d}\theta + \frac{\partial D}{\partial U}\mathrm{d}U\right)\rho U\right]. \end{aligned} \tag{A2}$$

Solving this equation gives:

$$\frac{\mathrm{d}U}{\mathrm{d}\theta} = \left(\frac{\partial N}{\partial \theta} - \rho U\frac{\partial D}{\partial U}\right)\Big/\left(\rho D - \frac{\partial N}{\partial U} + \rho U\frac{\partial D}{\partial U}\right). \tag{A3}$$

After some tedious algebra we find:

$$\rho D - \frac{\partial N}{\partial \theta} + \rho U\frac{\partial D}{\partial U} = \rho(\rho + \sigma) + \rho[2 - (\rho + \sigma)](q_l + q_n). \tag{A4}$$

This expression is positive if $\rho + \sigma < 2$, which we assume. This means that the sign of the effect of $\theta$ on $U$ is determined by the sign of the numerator on the right-hand side of equation (A3). Using this result, and the assumption just made, it is not too difficult to verify that:

$$\frac{\mathrm{d}U}{\mathrm{d}h} < 0, \qquad \frac{\mathrm{d}U}{\mathrm{d}M} < 0, \qquad \frac{\mathrm{d}U}{\mathrm{d}A} > 0. \tag{A5}$$