

# Research Memorandum

**No 173**

**The effects of Home-ownership on Labour Mobility  
in The Netherlands: Oswald's theses revisited**

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## 1 Introduction\*

The European labour market is often characterised by its low mobility, both within as well as between countries. Since the introduction of EMU, this problem has become more prominent, as the mobility of labour is one of the few short-term adjustment mechanisms that are still left. One reason for the low labour mobility in Europe is that there are cultural and linguistic barriers. This, however, does not explain the differences in interregional mobility within a country or changes in labour mobility through time. In a series of papers, Oswald (1997,1999) has proposed the idea that home-owners are less willing to move in order to find a job than renters. This is due to the high transaction and moving costs involved (especially the real estate sales taxes). With aggregated regional data Oswald shows that unemployment is negatively correlated with home-ownership. Oswald's theory is based on micro-economic assumptions. Most of the studies testing the Oswald thesis, however, use macro- or mesoeconomic data. These data are aggregated and do not reveal the underlying microeconomic relationships. Instead of using macro- or mesoeconomic data, we will therefore use microeconomic data to correct for spurious relationships and identify Oswald's effect.

In this paper a model will be estimated with micro-panel data for the Netherlands. With these data, both movements on the housing market and on the labour market are followed in order to address the following questions:

- 1) Is the probability of job-transition lower for home-owners than for renters?
- 2) Is the probability of becoming unemployed higher for home-owners than for renters?

For the above mentioned model we use a panel-data set that is collected by the Dutch tax department (Income Panel Research data (IPR); for 1989-1998). In the IPR, about 75 thousand individuals are followed over time. These individuals can change between jobs, between unemployment and employment, between houses and between regions. The IPR-data allow us to model three transition processes that may be mutually dependent: (1) transitions between jobs, (2) transitions in and out of unemployment and (3) transitions on the housing market. In modeling these transitions, several variables in the IPR may be useful: age, income, the number of children, gender, whether some one has received disability benefits, home-ownership, job tenure, and benefit or housing

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duration. With this information, we will measure the effect of home-ownership while correcting for other characteristics.

The structure of the paper will be as follows. Paragraph 2 will describe the literature on the relationship between the housing market and labour mobility. Paragraph 3 will give the model. The data will be presented in paragraph 4. In paragraph 5, the results and conclusions are presented.

## **2 Theory and Review**

Most contributions in the field of labour migration use the Harris Todaro model as a starting point. In Harris and Todaro (1970) a neo-classical model is developed in which (international) migration is caused by geographic differences in the supply and demand for labour. Regions with a relatively limited supply of labour in relation to capital will generally have a relatively higher wage that will attract a large inflow of labour from low wage regions. This inflow of labour is mirrored by an outflow of capital.

Oswald (1999) analyses also in a macroeconomic framework the interrelation between employment, the structure of the housing market and commuting activities. In a theoretical model he shows that home-owners are less likely to migrate (to move) if a negative demand shock occurs in his region. They will prefer to commute to another region, instead of moving or become unemployed. So ownership of a house results into a less flexible response to low regional demand for labour. There are four hypotheses that result from this theory:

- I) Employed home-owners are less likely to move than renters.
- II) Unemployed home-owners are less likely to move than unemployed renters.
- III ) Home-owners are less likely to move to another job than renters, because they are not willing to leave the region.
- IV ) Home-owners are more likely to become unemployed than renters.

From this, it follows that regions with a relatively high percentage of home-owners will have less migration than other regions.

Harris and Todaro created a macroeconomic model based on microeconomic assumptions described in Borjas (1990). In the model by Borjas, migrants compare the cost of moving to alternative locations while maximizing the expected discounted net return over a certain time horizon. The difference between the net expected earnings

corresponds to individual skills in the region of origin compared to the region of destination. The expected earnings in the region of destination are found by multiplying this difference with the probability of finding a job. By subtracting the expected costs of moving, one may find the expected net return of migration. The outcome of the microeconomic model differs slightly from that of the macroeconomic model. The main difference is that movements between regions depend both on the differentials in wages and in unemployment rates. This last factor determines the probability of finding a job. Another difference is that high skilled workers are expected to move more than low skilled workers do.

Various authors have tested these theories empirically. Most of them use a macroeconomic setting, for example Oswald (1999), who analyzes the relationship between home-ownership and unemployment using panel data of 19 OECD countries from 1960 to 1990. With these data, Oswald shows that unemployment is positively correlated with home-ownership, with an elasticity equal to 0,2. This means that a rise of home-ownership with 10 percent point results in an increase in unemployment of 2% point. This relationship is not only found between countries, but also between the regions of France, Italy, Sweden, Switzerland, the United Kingdom and the United States. The explanatory power of these univariate regressions were, however, quite small for France, Italy and the United States.

Hassink and Curvers (1999) show for the Netherlands that Oswald theses are not supported when tested on a mesoeconomic level. They estimate the relation between unemployment rate and home-ownership for 348 regions for the period 1990-1998. They find that home-ownership has a negative effect on unemployment, implicating that home-ownership diminishes instead of increasing unemployment. Probably, there exists simultaneity between unemployment and house-ownership. Unemployment has a negative effect on home-ownership. Apparently, this is picked up by the estimations.

If we focus on the relationship between labour mobility and the developments in the housing market from a microeconomic perspective, several empirical contributions have been made. Using microeconomic panel data (British Household Panel Survey), Henley (1998) finds for the United Kingdom that unemployed people have lower probability to move than working people. Boeheim and Taylor (2000) come to a different result. Using probit-models with pooled data for the United Kingdom, they find that unemployment in a region increases the probability to move. In accordance with Oswald's theses, they find that home-owners change less from jobs than renters.

For the Netherlands, Van Ommeren (1996) estimates a search model for job movers

based on a retrospective panel data set from the beginning of the nineties. He focuses only on job movers and finds that owners are less likely to move to another house than renters are. He concludes that no significant evidence exists that job and residential moves are mutually related.

### **3 Model**

In this paper we use hazard rate or, stated differently, duration models to examine the job duration and residential tenures. The hazard rate is defined as the rate at which an event takes place over a short period of time, given that this event has not occurred. In the context of our model, this event may concern labour market or housing market transitions.

Given a certain state, for example that of being an employee at a specific job, several types of transitions may take place: that into another job, becoming unemployed, or becoming nonparticipant. Therefore, the hazard rate out of employment is modeled into three possible ‘competing risks’. The impact of several exogenous variables, like age, sex or income, may vary with respect to these risks. For movements on the housing market, the competing risks are: movement to an owned house, to a rental house, or to other house types like housing for the elderly or living at home with family (see also appendix I for an explanation of a hazard rate model) .

In our model, we try to correct for as many exogenous variables that we have. Obviously, not all relevant variables for describing house movements and labour market mutations are available in the data set. Examples of variables, that are probably relevant but not presented in the data set, are education and ethnical background. Due to these unobserved characteristics the individuals are not homogeneous, some so called unobservable heterogeneity will remain. As a result, estimates, for example the one describing the impact of home-ownership on job-to-job mobility, may be biased.

Within the context of duration models, several methods have been developed to correct for unobserved heterogeneity. To minimize the impact of distributional assumptions, we adopt a nonparametric method introduced by Heckman and Singer (1984). They assume that a sample consists of two (or more) subsamples with different levels of unobservable effects. Then, for all subsamples the concerning weights are estimated, as well as the impact of unobserved differences on the hazard.

In the hazard rate models presented below most characteristics do not vary over time, but are defined at the beginning of the duration spell. The most relevant variables however do vary over time: these variables describe the labour market characteristics and the housing market characteristics. In this way we can take into account that, for example, a job mover may not change from house. Further, we have to be aware that the variables that change overtime only do so on a calendar-year base. So residential transitions coincide with a job movement within a calendar year, whereas the exact sequence of events is unknown.

#### **4 Data**

The IPR (Income Panel Research) database consists of a sample of about 75000 individuals that are followed yearly, over the period 1989-1998 by tax authorities. A number of possible housing states and labour market states are distinguished. The states for the labour market are based on individual income states like social assistance (SA) benefits, unemployment insurance (UI) benefits, income and no income. From these income states, one can derive the data at which a person becomes unemployed (SA or UI-benefit), or nonparticipant (no income or disability benefit). Further, since we know the identity of the employer, it is possible to keep track of job-to-job changes. Moving behaviour can be derived from address changes. The states of the housing market consist of rental housing or owner-housing or other types. Other house types are, for example, housing for the elderly. For each individual, we observe a complete or incomplete unemployment spell, together with various individual characteristics. For each of the populations examined (home-owners, renters and employees), a random sample was drawn of 10 % of the total sample. In the estimations the spells of the different individuals are used. It is possible that one individual with several spells is several times represented in the sample.

##### *Operationalization of the model*

Given the IPR, the following variables are used in the empirical analysis:

- (1) Age at time of moment of entry of the house or of the working force.
- (2) High education. This (proxy) dummy variable indicates whether a person has received a scholarship for university education.
- (3) Receiving child support, or not.
- (4) Having a partner who earns income, or not.
- (5) Marital status. Being Married or not.

- (6) Gender.
- (7) A 'health-dummy'. This dummy indicates whether a person has received disability benefits in the past. Here, it should be mentioned that not all the disability beneficiaries in the IPR database could be properly identified.
- 8) Wage in logs.

*Table 1 Description of variables (mean and standard deviation)  
(End of 1998)*

	Home owners		Renters		Employees	
	Mean	Standard Deviation of Mean	Mean	Standard Deviation of Mean	Mean	Standard Deviation of Mean
	fractions*					
Housing duration (censored) (in days)	2503.28	42.65	2437.82	21.99		
Job duration (censored) (in days)					1393.86	20.61
Female	0.51	0.0085	0.54	0.0088	0.41	0.0081
Working partner	0.48	0.0085	0.15	0.0064	0.37	0.0080
Children	0.20	0.0068	0.11	0.0057	0.33	0.0078
High Education	0.01	0.0016	0.07	0.0046	0.11	0.0051
Disabled	0.02	0.0026	0.03	0.0030	0.01	0.0016
Age (years)	40.01	0.2176	42.07	0.32	31.81	0.17
Married	0.74	0.0074	0.47	0.0088	0.47	0.0082
Wage					1.81	0.0064
Job mutation	0.09	0.0050	0.11	0.0056		
Employed	0.54	0.0085	0.31	0.0082		
Unemployed	0.02	0.0026	0.12	0.0057		
Nonparticipant	0.44	0.0085	0.57	0.0088		
Home-owners					0.52	0.0082
Renters					0.31	0.0076
Other housetypes					0.17	0.0062

\* unless defined otherwise

In Table 1, the characteristics of three samples are described, namely that of home-owners, renters and employees. Renters and home-owners may be employed, unemployed or nonparticipant. Employees may live in a rental or owned house, or in other types of housing like student colleges and homes for the elderly. From Table 1 it appears, that home-owners are less often unemployed, more often employed, and less often nonparticipant than renters are. Remarkably, the percentage of people that change from job is almost the same for renters and home-owners. Home-owners move less often than renters (see the average duration period). In the next paragraph, we will analyze whether this is a true, or a spurious effect. Home-owners have more often a working partner and children, and are more often married compared to renters. Of the employees, the percentage for men is higher than for woman, 37 % has a working partner and 33 % have children, 11% have studied recently. The average age of starting a new job is close to 32 years. Since both young people and the elderly have a preference of renting a house the average age is around 42 years.

## **5 Estimation results**

Basically, the predictions made by Oswald can be divided in two groups. Two theses are about the effect of labour market states on the housing mobility and housing types, whereas the other two are about the effect of the housing type on the labour market. We first discuss the impact of labour market states on housing mobility (see Table 2):

With respect to the different labour market states, we distinguish between employed workers, unemployed workers and nonparticipants. A further distinction is made between employed workers that stay in their job, and those that have moved to another job in a particular year. First, let us consider the housing mobility of employed workers that have stayed in their jobs. According to Oswald's theory, these workers are less likely to move if they own a house. Clearly, our results lend credence to this hypothesis. However, from this finding alone we cannot conclude that home-ownership hampers mobility, e.g. mobility that is needed to reduce commuting time. Instead, it may be that the causality between home-ownership and job commitment runs the other way around.

*Table 2 A hazard rate model for housing durations of renters and house-owners: the impact of the labour market on moving behaviour*

Parameter	Estimates	Standard Error
Reference group	- 1.9292	0.0521
Job mutation	0.2298	0.0650
Unemployed	- 0.5676	0.0535
Nonparticipant	- 0.6696	0.0402
Job mutation+owner	0.2255	0.1123
Unemployed+owner	0.5098	0.0819
Nonparticipant+owner	0.6469	0.0657
Job+owner	- 0.7569	0.0411
Age 25-35 years	- 0.1137	0.0476
Age 35-45 years	- 0.3488	0.0527
Age>45 years	- 0.0547	0.0508
Women	- 0.0288	0.0294
Children	0.0957	0.0212
Working partner	0.0043	0.0348
Married	0.0247	0.0268
High education	- 0.0698	0.0883
Mean log-likelihood	- 1.57495	
Number of cases	12333	

The need for mobility may be more relevant for workers that have moved to other jobs. Our results indicate that these transitions are associated with higher mobility on the housing market, both for home-owners and renters. However, here we also find home-owners to be more mobile than renters, which is at odds with Oswald's theory. Finally, unemployed workers and nonparticipants that rent a house are found to be less mobile than employed workers. For home-owners, such an effect cannot be detected, which is at odds with Oswald's theory. Thus, home-owners that loose their job seem to be more mobile than renters are. There may be several reasons for this:

- First, unemployed home-owners may adjust their cost of living – in particular their housing costs -- by moving to another house. This may be a rental house, as it may be easier to obtain than another owned house. In this context, it is important to note

that, in the nineties, there has not been a major downswing in the housing market. Obviously, Oswald's theory is more relevant in such periods, when home-owners that move to another area are faced with high losses, due to a depressed housing market. This will discourage them to move in order to find a job.

- Second, in the Netherlands unemployed home-owners are not entitled to social assistance if they have too much own capital. Thus, home-owners can be forced to spend this capital, and have a strong incentive to find a job.
- Third, house renters are insured against loss of income by means of rent subsidies. This mechanism lowers the incentive to find jobs.

Next to the labour market states, we included some more variables that may explain housing mobility. Housing mobility decreases until individuals have reached the age of 45, and increases again for older groups. Next to this, we only find the impact of having children to be significant, and positive. The low explanatory power of most of the (other) coefficients can be explained by the fact that these characteristics affect the choice between the rental sector or the house owned sector and to a lesser extent the decision to move.

If we focus on the effect of the housing market on the labour market, Oswald's theory predicts that home-owners are less inclined to change from jobs and (therefore) are more vulnerable for unemployment. From Table 3, we conclude that home-owners indeed experience fewer job-to-job transitions, but they also have a smaller risk of becoming either nonparticipant, or unemployed. This result is found both for the model with and without unobserved heterogeneity. This result can be explained in two ways:

*Table 3 A competing risk model of job durations: the effects of housing market characteristics (with and without unobserved heterogeneity)*

	Estimates	Std. Err.	Estimates	Std. err.
<i>Parameters</i>				
<i>Job mutation</i>				
Reference group	- 1.0528	0.0285	- 1.6376	0.0544
Home- owner	- 0.2518	0.0299	- 0.1871	0.0352
Other housetypes	- 0.0392	0.0314	- 0.169	0.0376
Age 25- 35 years	- 0.1611	0.0323	- 0.2214	0.0411
Age 35- 45 years	- 0.4459	0.0423	- 0.5491	0.0526
Age>45 years	- 0.6434	0.0549	- 0.8075	0.0653
Women	- 0.158	0.0233	- 0.1302	0.0295
Children	0.0092	0.0143	0.0199	0.0173
Working partner	0.0667	0.0301	0.017	0.0375
Disability	- 0.0946	0.1502	- 0.1386	0.1778
High education	0.379	0.0312	0.3169	0.0414
Married	- 0.3093	0.0116	- 0.2959	0.0147
Wage	- 0.2518	0.0347	- 0.3231	0.0431
<i>Nonparticipant</i>				
Reference group	- 1.6843	0.0404	- 2.2063	0.0649
Home- owner	- 0.2963	0.042	- 0.2576	0.0461
Other housetypes	- 0.0217	0.042	- 0.1475	0.047
Age 25- 35 years	- 0.3854	0.0511	- 0.4183	0.0572
Age 35- 45 years	- 0.5731	0.0612	- 0.6429	0.0687
Age>45 years	0.1104	0.0595	0.0129	0.0704
Women	- 0.0313	0.0301	- 0.0122	0.035
Children	0.1008	0.0156	0.1194	0.0185
Working partner	- 0.1364	0.0445	- 0.1648	0.0498
Disability	0.1149	0.1834	0.0793	0.2085
High education	0.2756	0.0407	0.2203	0.0481
Married	- 0.5525	0.0121	- 0.5634	0.0154
Wage	0.031	0.0498	- 0.0516	0.0566

	Estimates	Std. Err.	Estimates	Std. err.
<i>Unemployed</i>				
Reference group	- 2.5068	0.0627	- 4.024	0.1795
Home- owner	- 0.8474	0.0676	- 0.7883	0.0733
Other housetypes	- 0.4517	0.0697	- 0.6392	0.0773
Age 25- 35 years	0.1326	0.0693	0.0268	0.0797
Age 35- 45 years	- 0.1577	0.0868	- 0.32	0.0975
Age>45 years	0.092	0.0973	- 0.1601	0.1111
Women	- 0.0141	0.0528	0.0455	0.0597
Children	0.0911	0.0331	0.0953	0.037
Working partner	- 0.1441	0.0678	- 0.2105	0.0759
Disability	0.4845	0.22	0.4007	0.2617
High education	0.1965	0.0798	0.096	0.0922
Married	- 0.1947	0.0313	- 0.153	0.0353
Wage	- 0.2849	0.0719	- 0.3813	0.0813
$\ln(P/(1-P))$			- 0.2775	0.086
$\ln(v_1)$			1.4184	0.0472
$\ln(v_2)$			1.2908	0.0637
$\ln(v_3)$			2.6963	0.174
Mean loglikelihood	- 1.99864		- 1.96243	
Number of cases	17071		17071	

$\chi_2(4) = 1236,282$ , the  $H_0$ -hypothesis of no unobserved heterogeneity is rejected

On the one hand, the current model may be too restrictive to take into account the interaction effects between housing type and labour market transitions. Obviously, the decision of buying a house and the commitment to work are interrelated. There may be unobserved heterogeneity that is correlated both with housing types and the competing risks in the duration model, which results in biased estimates. In our job duration model, we tested for the presence of unobserved heterogeneity. A Likelihood Ratio test shows that the inclusion of such unobserved heterogeneity improves the fit of our duration model substantially (see the appendix for details). This suggests that unobserved heterogeneity is important. Suppose that this heterogeneity is correlated with the decision process of buying a house, then the estimated coefficient of home-ownership is spurious. Thus, more thorough estimation methods, in which the housing type as well as the hazard rate are modeled jointly, are needed to investigate the possible impact of such heterogeneity. This will be the subject of future research.

On the other hand, if the effect of home-ownership is not spurious, our results indicate that home-ownership is an incentive to have more job commitment and to make specific investments in jobs. This reinforces the job position of workers, rather than that it weakens it by a worsening of outside opportunities. As a result, at this point we reject Oswald's theory. Also, from this result we cannot conclude whether job commitment – and home-ownership in particular – can be judged positively or negatively. From the perspective of the employed workers, more commitment is associated with higher income and a lower risk of becoming unemployed. For the society as a whole, it is however unclear whether these advantages outweigh the inflexibility – i.e. a lower job-to-job mobility – which is accompanied by it.

In the job duration model, we correct for several influences that relate to the characteristics of individuals. These are: age, gender, having children, having a working partner, being married or not, high education, disability and wage income. The reference group consists out of working men, without children or a working partner, in the age of 16-24 years, renting a home, unmarried, not high educated, not disabled and earning an average wage. Most of the estimated coefficients of these variables are in line with economic intuition. For example, having a working partner decreases the risk of becoming unemployed or becoming non-participant. Having children gives an incentive to withdraw from the labour market, since more value is attached to household activities.

## **6 Conclusions**

All in all, we find evidence for the Oswald theory in two cases: employed home-owners are less likely to move than renters are, and employed home-owners are less likely to

change jobs than renters are. However, from this alone we cannot conclude that employed workers that own a house have worse labour market positions than renters. Instead, their commitment to jobs makes them less vulnerable for unemployment. Also, Oswald's theory does not seem to hold for unemployed workers or nonparticipants. Instead, unemployed home-owners are even more inclined to move than renters.

### Appendix: Specification of the hazard

In the context of our model, the so called hazard rate or risk measures the rate at which for example house-owners or renter move to an owned, rental house or house of another type. This rate,  $\theta$ , measures the probability of leaving an owned house or rental house over a specific (small) time interval  $[T, T+dt]$ , given that one has lived in that house up to  $T$ :

$$(1) \quad \theta = \Pr ( T < t < T+dt / t \geq T )$$

In the housing and job duration model, the time interval  $dt$  are normalized to one year, and one month, respectively. The hazards or ‘competing risks’ have a *proportional* (or *log-linear*) structure. Thus, the specification can be described as:

$$(2) \quad \theta_{b,i}(t) = \exp[ a x_{it} + \beta x_i ]$$

in which vector  $x_i$  describes time invariant individual differences, whereas  $x_{it}$  represents individual differences of characteristics that change over time.  $b$  denotes the index of the competing risk ( $b = 1, 2, \dots, B$ ). For example, employees have three competing risks ( $b = 1, 2, 3$ ): that into another job, unemployment and out of the labour market.

In the equations presented in table 2 and 3 we estimate the model according to equation (2). The parameters describe proportional differences and can therefore easily be interpreted. For example in table 2, Renters of 25 to 35 year old have a hazard to move that is, *ceteris paribus*, only 90% ( $\exp(-0,1137)$ ) of that of young people under 25 years of age. The same description of the hazard rate model holds for table 3, that describes transitions to different labour market states.

#### *Unobserved heterogeneity*

The IPR data we use provide us with a limited number of administrative individual characteristics. Obviously, more characteristics may be relevant in explaining differences in e.g. the risk of unemployment, or that of moving to another house. The more important the impact of such unobserved heterogeneity, the larger the potential biasing impact of selection effects.

To test for the presence of unobserved heterogeneity, we extend the specification of the risks (with index  $b$ ) to a so called Mixed Proportional Hazard (MPH) structure:

$$(3) \quad \theta_{b,i}(t) = \exp[ a x_{it} + \beta x_i + v_b ]$$

with

$$\Pr ( v_b=0 ) = P$$

$$\Pr ( v_b=v_b^* ) = 1 - P$$

In this specification, the presence of unobserved effects is modeled as two mass points with different levels of  $v$ , with probability weights  $P$  and  $1-P$ . Thus, the values of  $v_b$  of an individual  $i$  are equal to  $\{0,0 \dots 0\}$  with probability  $P$ , or equal to  $\{v_1, v_2 \dots v_B\}$  with probability  $1-P$ . To test for the presence of unobserved heterogeneity, a Likelihood Ratio test can be performed on the estimated parameters  $\{v_1, v_2 \dots v_B\}$ , together with  $P$ . We performed this test on the job duration model (see table 3).

It should be noted, that the current specification is restrictive, in the sense that we only allow for two mass points, and there are only two combinations of unobserved effects for the competing risks (thus the risks are fully correlated). To make the analysis less restrictive, it is possible to estimate two mass point and two probability masses of each risk separately.



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**Abstract**

This paper examines the hypotheses presented by Oswald (1999) for the Netherlands. These are: I) Home-owners are less likely to move than renters, II) Unemployed home-owners are less likely to move than unemployed renters, III) Owners of houses are less likely to move to another job, because they are not willing to leave the region and IV) Owners of houses are more likely to become unemployed. Using individual data of a panel of labour market and housing market histories for the period 1989-1998, we estimate a hazard rate models, that explain transitions on these markets. We find evidence for the Oswald theory in two cases: employed home-owners are less likely to move than renters are, and employed home-owners are less likely to change jobs than renters are. However, from this alone we cannot conclude that employed workers that own a house have worse labour market positions than renters. Instead, their commitment to jobs makes them less vulnerable for unemployment. Also, Oswald's theory does not seem to hold for unemployed workers or nonparticipants. Instead, unemployed home-owners are even more inclined to move than renters.