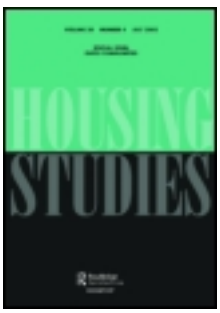

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Tenure Choice and Labour Market Outcomes

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ABSTRACT *In a series of papers Andrew Oswald has suggested that since home owners are relatively less mobile across geographic locations than renters, regional home ownership rates are positively correlated with regional unemployment rates. This paper examines this hypothesis at the individual level. Search theory suggests that when a subset of the population is less mobile than others, this less mobile group (that is, owners) will have lower probability of employment, longer spells of unemployment and lower wages than more mobile renters. These hypotheses on inferior labour market outcomes for owners were tested using US Current Population Survey data as well as data from the Panel Survey of Income Dynamics. The empirical model suggests that these hypotheses are not supported by any of the tests. Home owners, conditionally or unconditionally, have better labour market outcomes than renters.*

KEY WORDS: tenure choice, unemployment, search theory

Introduction

In a series of papers Andrew Oswald (1996, 1997, 1999 *inter alia*) has argued that home ownership is damaging to individual labour market outcomes. The argument centres on immobility; that because of the high degree of fixed costs involved in the acquisition of property, home owners are tied to their location to a greater extent than are renters, so that they are more likely to suffer demand shocks to their location or sector. Home owners who lose their jobs are less likely to change residence in the face of job loss and are more likely to 'wait out' the effects of the downturn in their current location. There is evidence that home ownership does indeed constrain mobility. Gardner *et al.* (2000) present evidence on labour mobility on the UK which shows that owners are less mobile. Chan (2001) describes the rather substantial effects that 'negative equity' can have on mobility in the US. This is, nevertheless, a different issue than the labour market outcomes issue discussed in this paper. At higher levels of aggregation this immobility is putatively translated into a positive correlation between an area's home ownership rate and its unemployment rate.

This idea is rather contrary to much analyses of home ownership which suggests that there is a positive link between opportunity (both in the labour market and elsewhere) and ownership. Indeed, the stability of home owners and

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their associated neighbourhoods is perhaps a benefit rather than a detriment, and to the extent that neighbourhoods matter in the creation of labour market opportunity, then home ownership can be seen as a way of creating such opportunity, and therefore positive labour market outcomes.

Thus it would seem important to test the hypothesis that ownership has a negative impact on labour market outcomes. The theory can confront the data at two levels, the individual and the aggregate, but most tests of the hypothesis have come at more aggregated levels. Most prominently, Oswald (1997, 1999) presents evidence consistent with this correlation in the aggregate across OECD countries and across European countries as well. He also provides evidence that *changes* in the home ownership rate are positively correlated with *changes* in the unemployment rate, across US states and across Swiss cantons. Green & Hendershott (1999) also present state-level evidence that is congruent with this hypothesis. However, little evidence has been presented which tests this hypothesis at the individual level. Moreover, much (although not all) of the evidence from the above papers is bivariate—that is, it examines the correlation between unemployment and tenure choice without considering other factors which may influence both of these variables.

In light of the above research, the primary purpose of this paper is to examine, using US data, the labour market outcomes of individuals using multivariate models. The second section proposes that these hypotheses arise from the decreased ability of home owners to search and match with employers, and hypotheses are developed that are suggested by this framework. The third section presents the data and empirical tests, which lead to the unambiguous conclusion that the hypotheses are completely unsupported by individual level data.

The next section speculates on some reasons why this is the case. In effect, the model of the second section ignores behaviours by other actors in the economy so that the decreased search and matching ability of home owners in the end has no effect.

The Consequences of Reduced Mobility

The idea that home ownership should lead to inferior labour market outcomes must arise from the idea that home owners are less able to change residence than home owners. This in turn presumably is a consequence of the substantial fixed costs that are incurred in the process of becoming a home owner. A home owner is then tied to his location and would incur substantial exit costs if a change of residence were to be accomplished.

So the story goes something like this. A negative demand shock hits some prominent basic industry in a local area. Local unemployment ensues, either in the basic sector, or because of multiplier effects, in local-serving industries. The unemployed need to look for new jobs, but the prospects are not good in the local economy. It is at this point that the prospects for renters may appear to be better than those of owners, because renters can more easily change residential location and therefore have a wider range of locations to sample, in order to find suitable employment, as opposed to the home owner who does not have such a range because the next job he finds must be within reasonable commuting distance of his current residence.

This is interpreted as an example in the tradition of well-known search models

of the type described by Diamond (1984), Pissarides (1985) and Laing *et al.* (1995) and applied to urban labour markets in Coulson *et al.* (1999). In such models, workers search and attempt to match with firms, who likewise must undertake search and matching with workers. Search is costly, in the sense that not every worker matches with a worker, nor vice-versa. The key insight is that renters have higher matching rates than owners. Imagine that there are two labour markets (in the current context this might be the 'home town' and 'elsewhere'). The current renter can potentially match with firms from either of the two markets while owners can only do so in the market in which they live, the home town.

In any given period of time, unemployed workers search for jobs. Since search is costly in both time and money, only a limited amount can take place. Firms must search for suitable workers, and search is costly for them too. Given both these limitations, search may be unsuccessful, and a worker-employer match may not occur. Let the probability that a match takes place in the home town during a given time period be given by p_h. If the probability that workers over the same length of time lose their current jobs is d, then in the steady state the probability that a homeowner is unemployed is given by $d/(d + p_h)$. The steady state assumes equal inflows and outflows into unemployment, and allows for the simple calculation of unemployment rates. More complicated assumptions about the dynamics of inflows and outflows would still lead to correlations similar to those discussed.

Renters, however, move where the jobs are. In the event of a job loss in their current location they can search over both their home town and elsewhere. The probability of a successful match in at least one of the two locations is $1 - (1 - p_h)(1 - p_e)$, where p_e is the probability of a successful match elsewhere. This expression can be approximated by the simpler $p_h + p_e$, and this will be done henceforth. In that event the steady-state probability of unemployment for renters is $d/(d + p_h + p_e)$. (This also assumes for simplicity that the probability of job loss is the same in the two areas.) Therefore the probability of being unemployed is higher for owners than for renters. Our empirical tests will focus in part on the difference between unemployment probabilities for individual owners and renters. The law of large numbers then suggests the correlations found by the empirical tests discussed in the introduction; a high rate of ownership will be correlated with high rates of unemployment in the aggregate.

The assumption of steady state flows into and out of states of unemployment and employment allows the calculation of the expected duration of the unemployment. This is merely the reciprocal of the matching probabilities described above. Thus home owners face an expected duration of unemployment of $1/p_h$ periods, while renters can expect to be without work for $1/(p_h + p_e)$ periods. Thus, however long a 'period' is, a renter can expect a shorter duration of unemployment than an owner, because of their wider search.

Third, this model of the differing labour market experiences of owners and renters has implications for the determination of wages. In a search framework, wages cannot be determined by supply and demand, for both worker and employer enjoy some measure of market power. Search is costly, and so, other things being equal, both the firm and the applicant would prefer not to have to engage in further search. The relative amounts of market power depend, naturally enough, on the next best alternatives available to the two parties. For workers, this alternative is whatever value there is to being unemployed for one

more period, and for the firms it is the value of leaving the position vacant for one more period. In the case where there are lots of unemployed workers and only a few firms with vacancies, the firms do not lose much by leaving the position open since the probability of matching in the subsequent period is very high. Workers, on the other hand, will in this instance have little to gain by waiting since their probability of match is very low. They would have very little market power.

Bargaining theory suggests that in such a circumstance, that the agreed-upon wage should be lower as well. For example, the *Nash Bargaining solution* suggests that the two parties will agree to a wage that equalises the gains from trade over and above the next best alternative. Thus when the expected duration of future unemployment is higher, the value of the next best alternative is smaller and the wage falls as a result. Therefore, if the probability and duration of unemployment are higher for home owners than renters, employers will take advantage of that fact when bargaining over the wage and the wage for home owners will be lower than those for renters.

So, when home owners are constrained in their search because the costs of relocation are high, we see that this can be manifested in three ways:

- Home owners have a greater probability of being unemployed.
- Unemployed home owners experience longer spells of unemployment than unemployed renters.
- The wages of home owners will be lower than those of renters.

Empirical Evidence

Empirical evidence is provided here on these three aspects of the model, aspects that are based on individual-specific comparisons of home owners and renters. An examination is made as to whether (a) renters have lower unemployment probabilities than owners; (b) unemployed renters have a shorter duration of unemployment than owners; and (c) renters have higher wages than owners. Two sets of data were used: the March 2000 wave of the Current Population Survey and the 1993 wave of the Panel Survey of Income Dynamics. The latter was needed particularly in order to test proposition (b) which cannot be tested in a simple cross-section.

Tests Using the CPS

For purposes of sample homogeneity, the sample was limited to males between the ages of 25 and 65, and from the CPS a sample of 29 753 individuals was gathered, which included information on both their housing and labour market experiences as well as the usual demographic characteristics. (Tables with means and standard deviations for all samples have been removed due to space constraints. They are available from the authors.) The sample had characteristics not dissimilar to the population at large, when one considers the filters applied to the data: 71 per cent were home owners, and roughly 3 per cent were unemployed. The average individual earnings from employment were just above $42 000 per year, while total household income was around $70 000. Thus the sample was slightly wealthier, more employed and more often home owners than the population as a whole. Only 7.9 per cent were black, which is less than

the proportion for the US population as a whole. The relative preponderance of female-headed households among black households is presumably the explanation for this.

Table 1 presents regression results to test the hypothesis that home owners are more likely to be unemployed than renters. The probit model is used—the dependent variable is a dummy variable which equals one if the individual is unemployed. Column 1 provides the unconditional test of the 'inferior-home owner-outcome' hypothesis, with home ownership as the only right-hand side variable in the model. As can be seen there, the coefficient on home ownership is *negative* and highly significant, so that home owners have significantly lower probabilities of unemployment. The hypothesis is therefore overwhelmingly rejected in this unconditional sense. However, it is obviously the case that home ownership is correlated with other demographic factors which might tend to lower the probability of unemployment, and so a model which conditions on these covariates would provide a fairer test of the hypothesis.

Column 2 of Table 1 presents a model with perhaps the most important of these. One is AGE (in years)—older people are not only much more likely to be home owners (Coulson, 1999; Goodman, 1990) they are less likely to be unemployed (Shimer, 1998) and have higher wages on average (Willis, 1989). Binary variables for race and ethnicity are also included in this model, BLACK, HISP, and ASIAN, while whites are the omitted category. While there has been convergence in white and black wages for several decades, black wages remain below white wages (Donohoe & Heckman, 1991), while at the same time black home ownership rates remain well below white home ownership rates even accounting for other demographic and income differences (Wachter & Megbolugbe, 1992). For Hispanics, on the other hand, Trejo's (1997) estimates for Mexican-American workers suggest that after accounting for demographic differences, especially immigration experiences, there are no differences in wages between Whites and Mexican-Americans. However, this may not hold for other ethnic groups included in the Hispanic category. With regard to home ownership probabilities, Coulson (1999) arrived at much the same conclusion, that for Mexican-American households there is little conditional difference in tenure choice, although again, the evidence presented there is less persuasive for other Hispanic groups. There is little evidence about Asian-Americans, but Coulson (1999) suggests that there is no significant *conditional* difference in home ownership between this ethnic group and white households. In any case it seems that controlling for both ethnicity and age is vital.

Despite the inclusion of these variables, column 2 again demonstrates that home owners have lower unemployment rates than renters. The coefficient is negative and significant. Note that the other coefficients are all of the expected sign, although AGE is surprisingly insignificant, as is ASIAN. The insignificance of AGE will change in the models to come.

In column 3 a large number of other covariates are added. These include three binary variables that represent the level of education obtained: HSED (high school graduate), BACHED (four-year college graduate), and HIGHED (education beyond the four-year college degree). The omitted category is therefore those who do not obtain a high-school degree. Those who have less than four years of college or associate degrees are in the HSED category. Again, the level of education is thought to be a significant determinant of both home ownership (Coulson, 1999) and unemployment (Shimer, 1998) probabilities. Other variables

Table 1. Dependent variable: unemployment

	CPS Data Set				
	1	2	3	4	5
Intercept	−1.62594**	−1.64244**	−1.33272**	−1.28113**	−1.26097**
Home owner	−0.34162**	−0.30208**	−0.23057**	−0.23252**	−0.26316**
Age of head		−0.00129	0.005115**	0.005088**	0.005114**
High school education			−0.222**	−0.21714**	−0.2166**
College education			−0.3076**	−0.29754**	−0.29646**
Higher degree			−0.21194**	−0.19772**	−0.19772**
Married			−0.44861**	−0.45344**	−0.45252**
Separated			−0.15699**	−0.15872**	−0.16005**
Hispanic		0.12361**	−0.06777	−0.0437	−0.04266
Black		0.20187**	0.10449**	0.1204**	0.11954**
Asian		0.02721	0.10168	0.12797	0.12697
Number in household			0.03376**	0.03678**	0.03607**
Number of children/household			0.01018	0.006907	0.007207
Professional			−0.52979**	−0.51591**	−0.51639**
Service profession			−0.37202**	−0.363**	−0.36332**
Central city				−0.08958**	−0.14017**
Balance of MSA				−0.06708**	−0.07016**
Home owner × Central City					0.10131
Home owner × MSA					0.004506
n	29753	29753	29753	29753	29753
Log likelihood	−4193.99	−4180.51	−3951.29	−3943.86	−3942.87

Notes: * significant at the 10%. level
** significant at the 5% level.

that are included are two indicators of marital status, MARRIED and SEPARATED, as well as the number of individuals in the household and the number of children, and two indicators of employee type, PROFESSIONAL and SERVICE PROFESSION. (The omitted employee-type category is blue-collar workers.)

These variables all have significant coefficients, with the exception of the variable representing the number of children, and HISP (which has switched signs and is now negative) and (again) ASIAN. Even with the far greater explanatory power of the model (as measured by the value of the likelihood function) and the far lower likelihood of omitted variable bias, the coefficient on home ownership is still negative and significant. It should be noted that controlling for all of these covariates is of some importance since the coefficient on home ownership is reduced in absolute value by about a quarter.

Column 4 adds two locational variables, CENTRAL CITY, and BALANCE OF MSA which signal residence in the indicated part of a metropolitan area. The omitted category is residence outside an MSA. The idea here is not only that location plays a role in tenure choice but that it affects the matching ability of workers as well, as those in more densely populated areas (like MSAs or perhaps more so, central cities) will match more easily. Adding these to the model does have a significant impact. Having controlled for the other demographic characteristics, it is clear that MSA residents have lower unemployment than those in rural areas, and those in central cities are even less likely to be without jobs. However the sign, value, and significance of the home ownership coefficient are completely unaffected.

In the final column of Table 1, these two location variables are interacted with the home ownership dummy, to see if such thick market effects are more observable with home owners than with renters. Presumably a home owner who loses a job in a city will have less problems rematching than one in an isolated area and the comparative disadvantage that a home owner faces *vis-à-vis* a renter is reduced. In fact both the interactive effects are positive, which suggests that the effect on unemployment probability of home ownership is worse when labour markets are thicker, but the suggestion is basically without merit as neither of these coefficients has any statistical significance at all. Overall, it would certainly seem that being in a smaller labour market does not increase the costs of immobility for home owners.

In Table 2 the CPS sample is used to test the hypothesis that wages are lower for home owners. The method is ordinary least squares. Column 1 gives the result for the unconditional test, and as one might have expected, home owners have significantly higher earnings than renters. The coefficient indicates that owners earn about $17 000 per year more than renters. As before, there are a number of demographic attributes that could be correlated with both wages and home ownership and so column 2 adds age and race variables, which are probably important in this respect. The home ownership coefficient drops to around $12 500 when these two variables are added to the model but the coefficient remains highly significant. The added variables produce coefficients that indicate that older workers earn higher wages, and that Hispanic and black workers earn significantly less than whites, who earn a bit less than Asian-Americans.

The home owner coefficient drops to just under $8000 when the other covariates, including the two location variables, are added in column 3, but once

Table 2. Dependent variable: wages

	CPS Data Set			
	1	2	3	4
Intercept	30169**	22438**	−708.401	1554.92
Home owner	17364**	12545**	7943.985**	4962.583**
Age of head		339.4939**	226.7933**	227.581**
High school education			7646.422**	7623.394**
College education			20104**	20035**
Higher degree			36144**	36051**
Married			9465.885**	9475.562**
Separated			4490.406**	4461.951**
Hispanic		−13832**	−6385.32**	−6196.45**
Black		−10014**	−5502.19**	−5447.26**
Asian		2133.009*	−4968.8**	−4838.54**
Number in household			−723.562**	−726.135**
Number of children in household			2155.47**	2131.956**
Professional			16520**	16530**
Service Profession			3761.137**	3778.961**
Central city			5283.656**	3105.658**
Balance of MSA			4600.939**	2326.08**
Home owner × Central city				2744.776**
Home owner × MSA				2978.68**
n	29753	29753	29753	29753
Adj R-Sq	0.0407	0.07	0.2451	0.2458

Notes: * significant at the 10% level.
** significant at the 5% level.

more it retains sufficient precision to reject the null hypothesis of no difference. The next column adds the interaction terms discussed above. These coefficients are, unlike their counterparts in the unemployment model, significant. The positive sign could be indicative of the increased bargaining power that owner-workers might have in a thicker labour market due to increased matching rates (and so might be supportive of the framework described in the second section) but no control has been added for the higher cost of living in metropolitan areas compared to rural areas and this might be the cause of the higher coefficients.

The data thus indicate that home owners have higher wages and lower unemployment probabilities. The CPS data is not supportive of the hypothesis that owners have inferior labour market outcomes, at least with respect to these two dimensions of labour market activity. Because the hypothesis cannot be tested on spell length using a simple cross-section, and to provide a further check on the results, a second data set will be looked at, the Panel Survey of Income Dynamics (PSID).

Tests Using the PSID

For purposes of examining spells of unemployment, the longitudinal data from the Panel Survey of Income Dynamics was used. More will be discussed about this later. However, it proved convenient to test the hypotheses on unemployment and wages using the PSID as well, and so for completeness, this was also done. A sample of 5125 individuals was drawn from the 1992 wave. Because the sample was smaller than that for the CPS, it was not restricted to male

heads of households, so that almost 20 per cent of the sample were females. The sample had more renters than the CPS; only 55 per cent of the individuals were home owners, and the PSID people were younger and had lower incomes (even accounting for price level differences between 1992 and 2000). They were less well-educated, 79 per cent stopped their education at high school, as opposed to 55 per cent of the CPS sample. Blacks were over-represented in the PSID; 28 per cent of the sample was black, but no adjustment was made for this, since ethnicity was one of the conditioning variables. The family structure variables were roughly the same as in the CPS although there are some differences.

Table 3 provides the coefficients for the probit model of unemployment using the PSID data. Again in column 1 the unconditional test is given, and as in the CPS data, the coefficient on home ownership is negative and highly significant. This significance is not altered in column 2 by the addition of the age and ethnicity variables. Again, age is a negative determinant of unemployment probability, although the coefficient is insignificant (and in contrast to the CPS model sequence, it stays insignificant in later models). Both black and Hispanic labour market participants are more likely to be unemployed. The large negative, but insignificant, coefficient on ASIAN is accounted for by the fact that there were only 20 Asian-Americans in the sample.

A large number of covariates are added to the model in Column 3, and a number of them are significant, including the binary variable for female, the education indicators and the marital status variables, all of which decrease the unemployment probability. However the profession and household size variables turn out not to be significant. The addition of all of these variables still does not change the basic result that home ownership is still a significant negative indicator for unemployment.

The PSID reports for each individual in the sample, the 'rurality' indicator of the individual's location. This is a county-specific classification used by the Department of Agriculture, which rates counties on a scale of 1 to 9 according to their location (i.e. in, or contiguous to, a Metropolitan Statistical Area) and population. These are used instead of location in central city or the balance of MSAs and are aggregated up to define two dummy variables for residence in counties with population greater than 250 000 and counties with greater than 20 000 (and less than 250 000) population and insert these into the model in column 4. As can be seen neither of these are significant, nor are they significant when interacted with the home owner dummy.

In Table 4, the PSID sample is used to test the wage hypothesis. The results are similar to those obtained in the CPS sample. In the unconditional model (column 1) it is seen that home owner earnings are far greater (almost $15 000 greater) than those for renters. The differential declines in column 2 as the age and ethnicity variables are added but is still significant. It declines even further as education, demographic and locational variables are added, and declines yet again as the interactive terms are added. But it remains positive and significant in all of the model specifications. Home owners earn more than renters.

There will now be an examination of the length of unemployment spells. As noted by Kiefer (1988) the use of the Current Population Survey (or any purely cross-sectional sample) to examine duration models is flawed. While those in the state of unemployment are observed as is time spent in that state up to the completed spells of unemployment, completed spells of unemployment are not observed. Longitudinal data are required, and the PSID is used for this.

Table 3. Dependent variable: unemployment

	Full PSID Data Set				
	1	2	3	4	5
Intercept	−1.22398**	−1.26496**	−0.87077**	−0.94565**	−0.96982**
Home owner	−0.62195**	−0.53678**	−0.43515**	−0.42486**	−0.37318**
Age of head		−0.00378	−0.00112	−0.00141	−0.00142
Female			−0.20048**	−0.2046**	−0.20508**
High school education			−0.27714**	−0.28349**	−0.28309**
College education			−0.22762**	−0.23257**	−0.23135**
Higher degree			−0.53995**	−0.53616**	−0.53555**
Married			−0.44431**	−0.43901**	−0.43856**
Separated			−0.15314*	−0.14567*	−0.14477*
Hispanic		0.27727**	0.13637*	0.09933	0.09922
Black		0.25622**	0.15036**	0.13067*	0.13002*
Asian		−4.99444	−4.8587	−4.86308	−4.86567
Number in family unit			0.02462	0.02412	0.02441
Children in family unit			0.01765	0.01963	0.01929
Professional			−0.01754	−0.03376	−0.03432
Service profession			−0.0095	−0.02489	−0.02604
>250 000 population				0.13925	0.16686
>20 000 population				−0.02283	−0.0064
Home owner × large pop.					−0.06199
Home owner × med. pop.					−0.03589
n	5125	5125	5119	5119	5119
Log likelihood	−1201.68	−1188.71	−1156.97	−1154.79	−1154.73

Notes: * significant at the 10% level.
** significant at the 5% level.

Table 4. Dependent variable: wages

	Full PSID Data Set			
	1	2	3	4
Intercept	19555**	24096**	3916.767**	6612.674**
Home owner	14839**	11867**	7597.379**	3436.909*
Age of head		50.83543	98.83282**	100.2925**
Female			−6554.37**	−6507.37**
High school education			6565.974**	6555.311**
College education			9732.748**	9674.261**
Higher degree			25792**	25717**
Married			3865.616**	3790.82**
Separated			1021	920.4479
Hispanic		−9521.33**	−5423.7**	−5375.1**
Black		−10628**	−4961.19**	−4935.48**
Asian		3154.266	−6810.81	−6914.96
Number in family unit			−381.874	−413.961
Children in family unit			1321.795**	1358.005**
Professional			7560.172**	7550.362**
Service profession			−353.185	−274.023
>250 000 population			1622.278	−346.046
>20 000 population			8726.116**	5616.15**
Home owner × large pop.				3162.477
Home owner × med. pop.				5027.597**
n	5125	5125	5125	5125
Adj R-Sq	0.0866	0.1257	0.3047	0.3055

Notes: * significant at the 10% level.
** significant at the 5% level.

First, the heads of households who were unemployed in 1992 were identified. If the head of household was also unemployed at the time of interview in 1993, the spell of unemployment was set equal to the number of weeks reported in a question from the 1993 interview that asked how long the head had been looking for work, assuming that he/she had been looking for employment in the last four weeks. These spells were considered to be right censored. If the head was employed at the time of interview in 1993, completed (and some censored) spells of unemployment were identified by using the date and employment status of the head at the 1992 interview, the date the current 1993 employment began, and the date the last employment ended. If the head reported having more than one other employer (beside the current employer) in 1992, the observation was deleted. If the head started with the present employer prior to 1992, then the period of unemployment in 1992 was considered to be a lay-off and the observation was deleted from the sample. Demographic information was taken from 1991 interviews.

This resulted in 204 observations of unemployed workers of which 50 had completed spells. The average spell length was just under six months. This is unsurprising (and a standard finding) since unemployment benefits are available for 26 weeks after a job loss.

Unemployment spells are modelled assuming that the length of spells has a Weibull distribution. Kiefer (1988) and Devine & Kiefer (1991) provide an overview of the mechanics of this model. The likelihood function is the sum of the likelihoods for completed and right-censored (incomplete) spells. The

assumption of the Weibull density provides a convenient parametric form, for both. The parameter governing the density, λ, is assumed to be a linear index of the covariates. It does restrict the hazard rate (i.e. the probability of leaving unemployment) to be monotonic in the length of the spell, conditional on the covariates.

The results are presented in Table 5. Column 1 of the Table presents the unconditional model, and it can be seen that home ownership exerts a negative influence on the length of the spell as the coefficient is negative and significant. The sign and significance remain the same when age and ethnic variables are added. In fact, the coefficient gets larger, implying longer spells are expected after these added variables are taken into account. Black unemployed workers have significantly longer spells than searchers from other ethnic groups. However, adding the further covariates in Model 3 and 4 eliminates the significance of this coefficient, and age is now significant, with older workers having longer spells. The additional variables in this column are of the expected signs and do not remove the significance of home ownership. Neither the location variables in column 5, nor the addition of unemployment insurance benefits in column 6 are significant, and neither do they reverse the sign or significance of the home ownership variable. This aspect of the model is not upheld.

Conclusion

The chain of reasoning that says: (a) home owners are less mobile than renters; so (b) home owners have worse labour market outcomes than renters; (c) which creates negative external effects in economies with high home ownership rates; so that (d) the subsidisation of home ownership in the US and elsewhere is a mistaken policy, is predicated not on the evident truth of (a) but the step from (a) to (b) at the individual level. This paper has tested the hypothesis that home owners do in fact have worse labour market outcomes than renters using US data, and found no evidence that this is the case. Home owners, to the contrary, have lower unemployment probabilities, shorter spells of unemployment, and higher wages than renters, both unconditionally and after accounting for a large set of covariates.

Why is the theory of inferior labour market outcomes not supported in the data? The theory outlined in the second section does not take into account several factors, any one of which could serve to equalise the labour market outcomes of owners and renters:

The mobility of renters. If renters are mobile, then they will migrate to the location that offers the best job prospects. Other things being equal, this will cause them to migrate to those areas that have the lowest unemployment rates, which will in turn cause unemployment rates to equalise across areas, regardless of the behaviour of home owners. In that event, the owner unemployment rates will the same as those of renters.

Pooling. If wages for *otherwise identical* owners and renters are different, then wages cannot have been determined in a competitive market. So that while they are presumably the outcome of a bargaining process as described above in the second section, it must be the case that firms are aware of the tenure status and limited mobility of owners. This may not be the case. It may be that tenure status

Table 5. Dependent variable: unemployment spell

	1	2	3	4	5	6
Intercept	4.8976**	3.8861**	4.7212**	4.65212**	4.7212**	4.7505**
Home owner	−0.5221*	−0.5837*	−0.7049**	−0.65777*	−0.7049**	−0.7437**
Age of head		0.0230	0.0424**	0.03738**	0.0424**	0.0410**
Female			−0.4985	−0.55879	−0.4985	−0.5978
Wages of head			−2.9E-06	−8.07E-06	−2.9E-06	−3.0E-06
High school education			−0.4599	−0.39282	−0.4599	−0.4058
College education			−0.0582	0.002768	−0.0582	−0.1501
Higher degree			−0.5093	−0.1514	−0.5093	−0.2476
Married			−0.5965	−0.40796	−0.5965	−0.5553
Separated			−0.4038	−0.31531	−0.4038	−0.4525
Hispanic		−0.0579	−0.0138	−0.18392	−0.0138	0.0479
Black		0.7857*	0.6169	0.50549	0.6169	0.7325
Asian		21.9985	20.0447	20.20079	20.0447	20.3544
Number in family				−0.1181	−0.1015	−0.1718
Children in family				0.11832	0.1126	0.2106
Professional				−0.32921	−0.3376	−0.4375
Service prof.				0.00571	0.0333	0.0765
>250 000 pop.					−0.4348	−0.5655
>20 000 pop.					0.2952	0.1881
Unemp. Comp.						0.0001
Log likelihood	−154.1189	−150.9253	−146.2013	−147.3833	−146.2013	−144.9015

Notes: * significant at the 10% level.
** significant at the 5% level.

is not observable by the firms and view renters and owners as pooled into a single labour market.

Firm migration. If home ownership creates unemployment and lower wages, then firms have an incentive to enter a labour market where home ownership is high and search for workers. The firm would have a higher probability of matching and could bargain for a lower wage. Firms would enter each labour market until the force of competition drives profits to zero. Thus a high degree of home ownership in a labour market, and its concomitant stock of immobile labour, might be at *attractive* to firms in search of low wages. Thus increased home ownership in a labour market might *raise* wages. Simulations of a theoretical search model that we have constructed suggest that this might actually occur, although the wages of renters would still be above those of home owners. (A theoretical model of search and matching behaviour by firms, renters and owners, and some limited simulation of the effect of increased aggregate home ownership is contained in a separate paper, available from the authors.)

Relocation costs of owners and renters may not be that different. The presumption of the theoretical discussion in the second section is that renters have far lower relocation costs than do owners. This claim is perhaps exaggerated and may lead to our empirical rejection of the hypotheses generated in the second section. Much of a potential migrant's relocation cost may be emotional. Ties to family, friends, neighbourhood, or region may limit the locational flexibility of both owners and renters. Moreover, mere ownership may not be as limiting a factor as has been suggested. Owner occupiers can exercise the option to rent their own dwellings and move to another market even in those cases where housing markets are severely depressed and owners experience negative equity.

The behaviour of home owners. In the full knowledge of the high transactions costs of home ownership, potential owners recognise the long-run nature of the ownership decision and on that account only make the decision to become home owners when their job and/or wage security is high enough. In such an event, the observed correlation between home ownership and (say) employment and wages might be positive. This, then is perhaps the most compelling of the objections because it is the only one that would provide an explanation for the empirical results that we actually obtain (of superior labour market outcomes for owners). Owners become owners because they are in jobs where the risk of unemployment is low. The role of cause and effect becomes reversed.

The idea that home ownership causes unemployment through reduced mobility is an important one; it would on that account create "thin-market externalities" of the type described in Diamond (1984) and on that account home ownership ought to be discouraged for efficiency reasons. To the contrary, ownership *is* subsidised in the US and elsewhere, and at fairly high levels, and presumably this is because home owners are thought to confer some external benefits on their neighbours. There is some evidence to suggest that this is the case (DiPasquale & Glaeser (1999), Haurin *et al.* (2000)) and so a proper accounting of the desirability of home ownership subsidisation would balance the external marginal benefits and costs. The current results suggest that the external costs of home ownership are minimal.

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