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FROM RENTAL HOUSING MARKET DEREGULATION

Jani-Petri Laamanen

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Home-ownership and the Labour Market: Evidence from Rental Housing Market Deregulation *

Jani-Petri Laamanen[†]

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Abstract

Perhaps the most common finding relating housing to the labour market is that high home-ownership rates are associated with higher unemployment. In contrast, recent micro-evidence suggests that home-owners have relatively favourable labour market outcomes. We explore the effect of home-ownership on unemployment exploiting a rental housing market deregulation reform which created exogenous variation in home-ownership across regions, allowing us to avoid the endogeneity problem in earlier studies. While home-owners are less likely to experience unemployment, an increase in the home-ownership rate causes unemployment to rise. Externalities arising from consumption reductions and increased job competition may explain the conflicting evidence.

Keywords: Home-ownership, Unemployment

JEL codes: J64, R31

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[†]FI-33014 University of Tampere, Finland E-mail: jani-petri.laamanen@uta.fi
Phone: +358 50 318 5993 Fax: +358 3 2599 008

1 Introduction

The roles of housing markets and household credit in the economy have received increased attention after the onset of recent economic crisis. It seems that the role of housing and mortgage markets may play a more important role in macroeconomic fluctuations than previously thought (see e.g. the discussion in Mian and Sufi, 2010). However, not much is known about the relationships between the housing and mortgage markets and macroeconomic outcomes. Even less is known about the mechanisms underlying these relationships. One of the earliest and most often observed relationships is the positive correlation between the rate of home-ownership and unemployment. Since Oswald's (1996) influential paper documenting this relationship, several studies have either replicated Oswald's empirical analyses with other datasets or tested related theoretical hypotheses using micro-economic data. Several studies using regional or cross-country data lend some support to the claim that a higher regional home-ownership rate leads to a higher rate of unemployment (Blanchflower and Oswald, 2013; Coulson and Fisher, 2009; Costain and Reiter, 2008; Munch *et al.*, 2006; Di Tella and MacCulloch, 2005; Green and Hendershott, 2001; Nickell, 1998). Oswald (1996) hypothesises that this is caused by lesser geographical mobility of home-owners relative to renters. Indeed, Battu, Ma and Phimister (2008) find that home-owners in the UK are less likely to experience a job change associated with a non-local residential move than renters. Munch *et al.* (2008) find that Danish home-owners have less local and non-local job-to-job changes than renters.

The evidence on negative mobility effects of home-ownership is in line with Oswald's (1996) hypothesis. However, several studies show that despite being less mobile home-owners have more favourable labour market outcomes than renters. Owning one's home is found to be associated with lower unemployment probability (Coulson and Fisher, 2009), smaller risk to become unemployed (van Leuvensteijn and Koning, 2004; Munch *et al.*, 2008), shorter unemployment duration (Munch *et al.*, 2006; Flatau *et al.*, 2003) and higher wage (Munch *et al.*, 2008). All of the aforementioned individual-level results

are obtained when correcting for the presumed endogeneity of housing tenure status. Therefore, the findings of the micro-level studies seem to be in conflict with Oswald's empirical results and the results of the other papers that use aggregate data. Since the labour market outcomes of home-owners are generally more favourable than those of renters, regions with higher home-ownership rates should experience lower unemployment rates. This is generally not true, which means that there might be some other mechanisms at work than those found by the studies thus far.

In this paper, we use Finnish individual-level data to study the effects of home-ownership on unemployment and the labour market more generally. We allow home-ownership to have external labour market effects. More specifically, we allow labour market outcomes of individuals to be affected by the overall home-ownership rate in their region. Relevant recent research findings are taken into account to test new hypotheses on the mechanisms underlying the externalities. To identify the causal effect of regional home-ownership on individual labour market outcomes, we exploit a rental housing market deregulation reform in the early 1990's. The reform produced a natural experiment that provides regional and time variation in home-ownership. Our results show that home-ownership has a significant positive external effect on unemployment, whereas at the same time, home-owners are less likely to be unemployed than non-owners. Our results are thus consistent with both the harmful and the beneficial labour market effects of home-ownership found in the earlier literature. In the light of the additional analyses, it seems probable that debt-financed home-ownership hurts the local labour market by causing reductions in consumption demand. Although home-ownership has the potential to boost labour supply of home-owners, the positive effects may be at least partly offset by displacement effects in the short-run.

2 Econometric Model and Data

Most of the earlier studies on the association between home-ownership and unemployment have used either aggregate or individual-level data. We combine

an individual-level dataset with region-level information on home-ownership to estimate probit models for whether an individual experienced unemployment during the year. The key explanatory variable is the regional rate of home-ownership. Further, we control for various individual characteristics. Importantly, these include a dummy variable for living in an owner-occupied dwelling and a dummy for a mortgage loan to capture the impact of individual housing tenure¹. We also include year dummies as well as region dummies.

By including regional-level home-ownership in our model, we allow the regional home-ownership to have an effect on unemployment probability of an individual *given* her own housing tenure. Although the origin of this external effect is unclear, there may be several different reasons for it. After first identifying the externality, we discuss the possible interpretations for it and perform analyses that shed some light on the mechanisms involved². Since we are interested in the causal effect of regional home-ownership on unemployment, we need to take into account possible endogeneity of regional home-ownership. The results in Oswald (1996) come from simple regional-level regressions, and the author argues that his coefficient estimates may understate the causal effects. Assuming exogeneous regional home-ownership would yield similarly biased estimates in our study as well. This is because there may be a regional component in the model's error term that is positively correlated with the home-ownership rate. Theoretically, regional home-ownership depends on demand and supply for owner-occupied housing. Endogeneity of the home-ownership rate mostly arises because regional demand for owner-occupied housing depends positively on employment of individuals residing in the region. Regional labour demand and supply shocks are thus likely to induce a negative association between home-ownership and unemployment. Controlling for labour demand and supply factors would alleviate the endo-

¹Since the data does not include mortgage loan information, mortgage dummy equals one if individual has claimed mortgage interest deduction and zero otherwise.

²Attempts to empirically identify externalities have been made in the literature on the effects of education (see e.g. Acemoglu and Angrist 2000). Externalities in the labour market have been discussed and estimated by Crépon *et al.* (2013) and Blundell *et al.* (2004).

geneity problem and reduce the downward bias in the coefficient of regional home-ownership. Thus, it is not surprising that many of the earlier studies that include a broad range of regressors in their unemployment equation estimate a positive coefficient on the home-ownership variable (Costain and Reiter, 2008; Di Tella and MacCulloch, 2005; Nickell, 1998). However, as Oswald (1996) points out, instrumental variables are needed to obtain an unbiased estimate of the causal effect. Appropriate instruments for home-ownership are rare and therefore it is likely that the earlier literature has been unable to identify the causal effect reliably³. To our knowledge, our paper is the first to use a policy reform to identify the causal effect of regional home-ownership on unemployment. We first estimate a model assuming exogenous regional home-ownership rates. We then proceed and relax this assumption and use the rental housing market deregulation reform to construct instrumental variables to deal with endogeneity.

We employ a Finnish register-based dataset augmented with information on regional housing markets and the rental housing market deregulation reform. The individual-level dataset used is a service file of annual Income Distribution Statistics (IDS) for years 1990-1992, which includes a rich set of register and survey variables on more than 30 000 individuals in over 11 000 households per year. IDS contains information on individuals' labour market outcomes during the year. Specifically, we know the number of unemployment and employment months reported by the individual. The data includes information on individuals' housing tenure and important control variables such as sex, education, age and household composition. Information on the place of residence is included for each respondent, which allows us to match regional-level home-ownership rates to the data.

³To our knowledge, the paper by Coulson and Fisher (2009) using data from the United States is the only study that uses instrumental variables. Their instruments are the state marginal tax rate that is applied to mortgage interest deduction and the percentage of households living in multifamily housing.

3 Empirical Analysis and Results

3.1 Descriptive Analysis

To conduct a descriptive analysis, we first estimate the unemployment model for the years 1990-1992 using county-level home-ownership as an explanatory variable. To reflect the average home-ownership, the rate of home-ownership is calculated as the average of year-end value and the value of previous year-end. We have restricted the sample to include individuals in the working age (from 15 to 64 years old) only. County dummies and year dummies as well as individual-level control variables are included in the model. Results of this exercise are presented in Table 1. Because the model includes an aggregate-level regressor, we need to account for the possibility that there may be correlation between the error terms of individuals within a county. We use robust standard errors that allow for such correlation (see Moulton, 1986).

The coefficient for regional home-ownership is positive and statistically significant, and thus we are able to replicate Oswald's (1996) results using individual-level data and controlling for characteristics of individuals. It appears that regional home-ownership is positively associated with unemployment while owner-occupiers, especially those with a mortgage loan, are less likely to be unemployed than other individuals⁴. The estimated coefficient of regional home-ownership might seem to be relatively large since a one percentage point increase in the rate of home-ownership is associated with about 4 percentage point increase unemployment. However, our dependent variable is a measure of unemployment experience (from 1 to 12 months) during the year and thus the coefficient estimate cannot be interpreted as the effect on the unemployment rate. We have tried estimating our models using different definitions of the dependent variable. It appears that the overall effect mostly comes from short-term or occasional unemployment i.e. probability of experiencing small number of months of unemployment. The result on the

⁴Our mortgage variable is at individual level and the owner-occupancy variable at the household level. We also constructed a variable indicating a mortgage by another household member but it was not statistically significant in the regressions.

association between having a mortgage loan and being less likely to experience unemployment is in line with results by Flatau *et al.* (2003), who find that home-owners with mortgage experience shorter unemployment spells than home-owners without mortgage and individuals in other tenures.

3.2 The Rental Housing Market Deregulation Reform

To investigate whether causality runs from regional home-ownership to unemployment, we use a rental housing market deregulation reform to estimate instrumental variables models of unemployment. The Finnish rental housing market was deregulated in the early 90's. Most important feature of the reform was that rent-ceilings and the exact limits on rent increases were removed. In addition, eviction without specifying the grounds was made easier. There was a serious shortage of rental housing in the country, and the goal of the reform was to encourage supply in the private rented sector. The opposition was worried that the reform would lead to significant price increases and therefore the government wanted to experiment with deregulation in parts of the country first. Specifically, the bill was a proposal to relax some of the existing rental housing market regulations in regions where "demand and supply of rental housing are in approximate balance". The 7 counties of northern and central Finland were chosen as the experiment region. To exclude regions of large supply deficiency in the rental housing market, all university cities were left out of the experiment. However, the opposition argued that there were at least some localities that suffered from shortage of rental housing in the experiment region and that the regulations were therefore at least partly binding. Theoretically the reform had an increasing effect on supply of rental housing and, thus, decreased the rate of home-ownership. This is because the regulations had constrained the income accrued to landlords and made eviction relatively difficult. Thus, deregulation increased the supply of rental dwellings by making renting more profitable for landlords. As we later demonstrate, the reform had a negative effect on home-ownership rates of the reform regions during our sample period.

Table 1. Model of Unemployment Experience^[1].

<i>Regional home-ownership</i>		
County home-ownership rate	4.17***	(1.53)
<i>Personal characteristics</i>		
Mortgage	-0.0443***	(.006)
Owner-occupier	-0.0393***	(.004)
Male	0.0402***	(.005)
Age	0.0094***	(.001)
Age squared	-0.0001***	(.000)
<i>Marital status</i>		
Single	-0.0294***	(.010)
Married	-0.0616***	(.009)
Separated	-0.0172	(.026)
Divorced	-0.0236	(.015)
Unknown	-0.0151	(.013)
Household size	0.0047*	(.002)
Number of children	-0.0198***	(.003)
<i>Education</i>		
Basic or no degree	0.0620***	(.015)
Lower secondary	0.0926***	(.015)
Higher secondary	0.0581***	(.014)
Vocational college	0.0218	(.019)
Higher University	-0.0170	(.018)
Graduate school	-0.1102*	(.057)
<i>Type of municipality</i>		
Capital region	-0.0284	(.018)
Urban	-0.0084	(.006)
Semi-urban	-0.0047	(.007)

^[1]Marginal effects calculated at sample means from a probit regression including county dummies and year dummies. N = 30,316. Robust clustered (county-year) standard errors in parentheses. (*) denotes significance at 10% level, (**) at 5% level and (***) at 1% level. The omitted category is widowed females with a lower university degree residing in a rural region.

Data source: IDS and Statistics Finland municipality-level time-series on households by housing tenure.

The reform was implemented during the years 1991-1994 and the market was deregulated gradually. Different buildings and rental contracts were subject to deregulation in different years and, importantly for our identification strategy, the timing of the first phase of the reform differed between geographical areas. In the 'target regions', the 7 counties in the northern and central Finland, excluding the 6 largest cities, markets were deregulated earlier than in the 5 remaining counties. In the first phase, in the beginning of year 1991, new apartments and houses in the target regions were subject to deregulation. Second change in the legislation, effective on the 1st of February 1992, deregulated all new contracts for private rental dwellings in the whole country. Finally, in the beginning of the year 1994, all rental contracts were deregulated. Thus, dwellings constructed and rented between the 1st of January 1991 and the 1st of February 1992 were freed from the regulations in the target region but not in other regions. This means that, in the target region only, a part of the dwellings were free from the regulations for 13 months. In the end of the year 1991, dwellings constructed during that year constituted approximately 2.3 percent of the housing stock in the country.

To serve as a relevant instrument, the reform needs to have an effect on regional home-ownership. To give an idea of the effect, we have calculated time series of home-ownership rates from aggregate housing data. Comparisons between the development of home-ownership in the target regions and elsewhere reveals that the reform decreased home-ownership. Figure 1. plots aggregate home-ownership rates in reform regions and other regions four years prior to and four years after the reform. The vertical line indicates the reform in the beginning of the year 1991. Since the target regions comprised of municipalities with less than 15 415 dwelling units, we have excluded municipalities larger than this from the calculation of home-ownership rate of the other regions as well. In 1991 when the reform was implemented in the target regions only, home-ownership rate of these regions decreased relative to home-ownership rate elsewhere. Both before and after the year 1991 the home-ownership rates of the two regions followed an approximately similar trend.

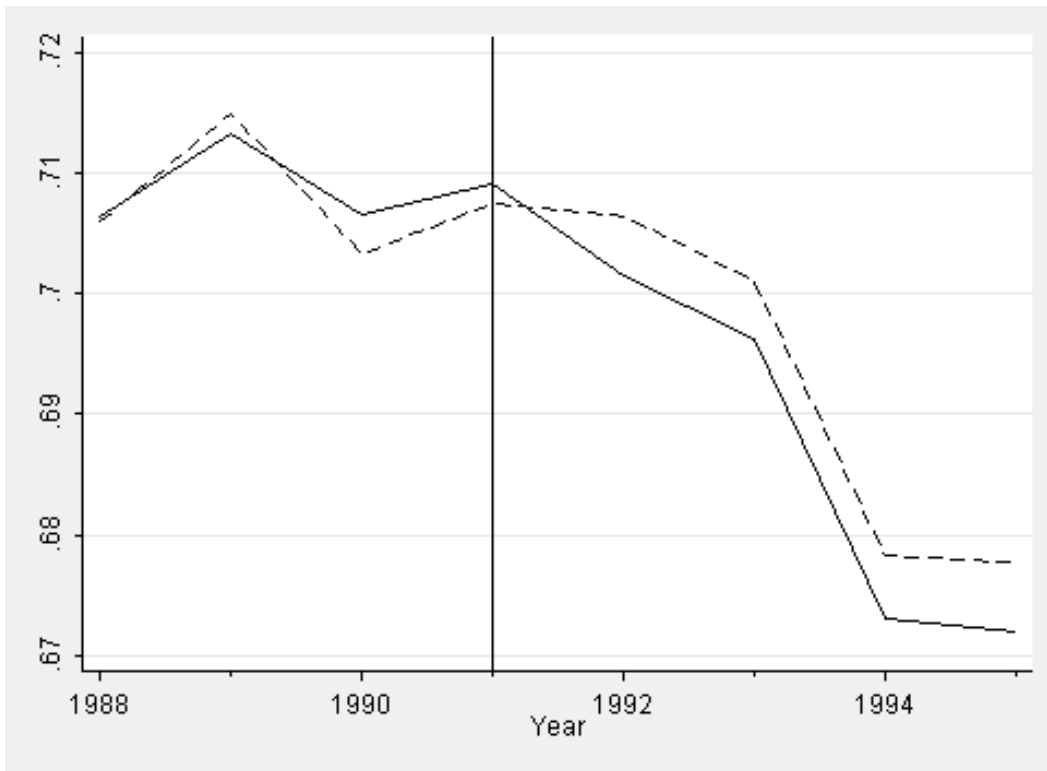


Figure 1: Trends in home-ownership in reform (solid line) and other (dashed line) regions

Source: Author's calculations from Statistics Finland municipality-level time-series on households by housing tenure.

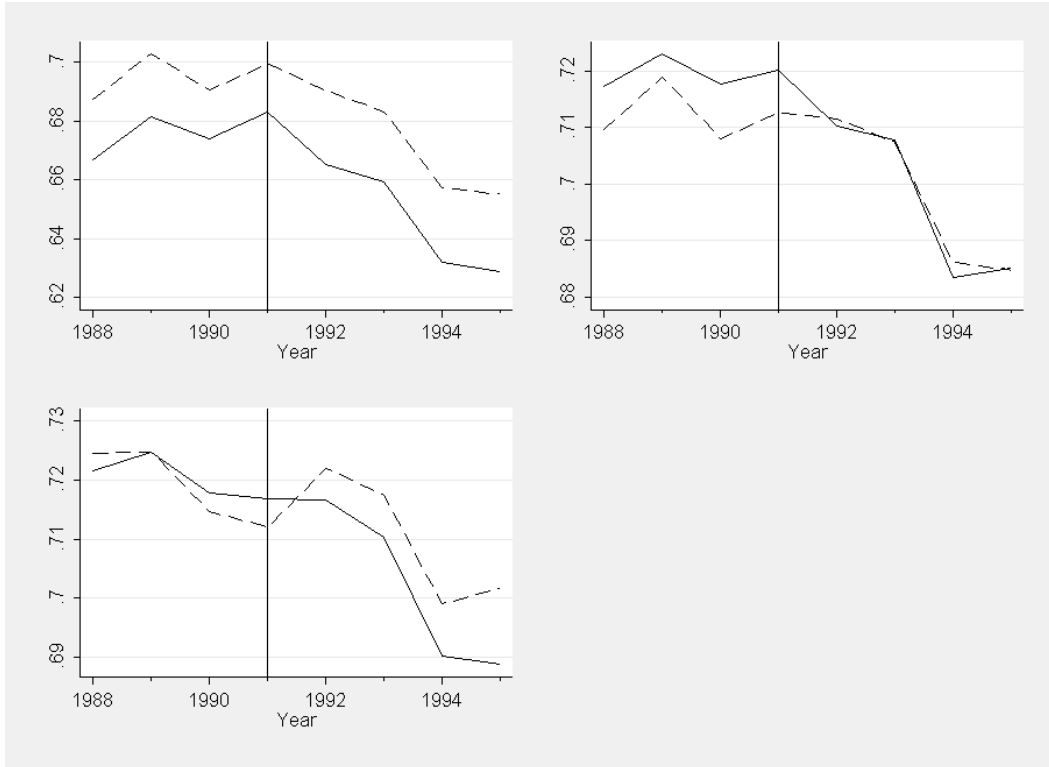


Figure 2: Trends in home-ownership in reform (solid line) and other (dashed line) regions by municipality type (top left: urban, top right: semi-urban, bottom: rural)

Source: Author's calculations from Statistics Finland municipality-level time-series on households by housing tenure; Statistics Finland municipality classification.

Although the reform seems to have had an effect on home-ownership, this effect is admittedly rather small. A closer look at the home-ownership rates of the regions reveals that the effect varies between municipalities of different types and sizes⁵. Figure 2. plots the home-ownership rates by municipality type. It can be seen that the effect is most pronounced in rural municipalities although there is a visible effect in all municipality groups. During 1991-1992, rural municipalities in the reform area experienced a 0.6 percentage point fall in home-ownership whereas in other rural municipalities, home-ownership rate increased by 0.5 percentage points. Clearly, the reform had an effect on the home-ownership differential between the two groups of regions. It seems that the change in the differential was persistent. These findings increase confidence in the identifying variation in home-ownership created by the reform.

As can be seen from the above figures, the trends in home-ownership in target regions and elsewhere before the reform were very similar. However, it is also important for our analysis that the choice of the target regions was independent of the labour market prospects of the regions. It appears from the bill and the preceding committee report that the choice of regions was based on rental housing market conditions only. References to labour markets are virtually absent from these documents. This might be because the labour market was not a concern due to very low unemployment after the strong economic growth in the 1980's. As mentioned above, the government wanted to experiment with deregulation in regions where rental housing markets were in approximate balance. This strategy was probably chosen because it would reduce the magnitude of unwanted consequences (rental price increases). However, neither a systematic analysis of regional markets was done nor did the committee suggest choosing any specific regions or any choice criteria. The government may have wanted to choose a set of administrative regions (counties) that constitute a single contiguous area. Based on the presumption that the housing markets were closer to equilibrium in the north than in the south,

⁵In our instrumental variables analysis, we exploit the fact that it was only the new housing stock that was subject to the reform and thus there were larger changes in the areas with more new dwellings.

northern and central counties (excluding the university cities) were chosen. In the light of the above discussion, it seems clear that the choice of the reform regions was not related to labour market concerns.

3.3 Instrumental Variables Analyses

In constructing the instruments for regional home-ownership variable, we take into account the fact that two separate phases (1991 and 1992) of the rental housing market reform took place during the period of investigation. Further, in 6 counties the reform excluded the largest cities whereas in one county all municipalities were included. We construct four dummies that reflect the two phases and two different scales of the reform. The first dummy (A) is for the county that was fully exposed by the reform in 1991. The second dummy (B) is for this county in 1992. The third dummy (C) is for the other 6 reform counties where largest cities were excluded in 1991. The fourth dummy (D) is for these counties in 1992. Separate dummies are constructed for years 1991 and 1992 because of different phases of the reform but also because we wish to allow for the effects of the reform on home-ownership to evolve over time (see the previous section). Since only new dwellings were deregulated in the reform, the dummies are interacted with the share of deregulated multifamily dwellings in the county⁶. Since we use a mid-year measure of the home-ownership rate, the relevant new housing stocks are half the number of dwellings constructed in 1991 and dwellings constructed in January 1992 for the instruments of years 1991 and 1992, respectively⁷. We expect that each of the instruments has a negative effect on regional home-ownership.

⁶Interacting with the share of multifamily (rather than all) dwellings improves the strength of instruments because renting single-family houses is rare. We also estimated models with dummy instruments and dummies interacted with all new dwellings. These alternative instruments appeared to have satisfactory explanatory power as well and the qualitative results did not differ from those presented here.

⁷Our dwelling data is annual but we have quarterly data on buildings by building type. The number of dwellings constructed in January 1992 is measured as one third of the share of buildings constructed in the first quarter multiplied by dwellings constructed during the whole year. The exact way of measuring the new housing stock has only minor impacts on the estimates and does not influence the qualitative results.

Table 2. IV Model of Unemployment Experience^[1].

<i>Regional home-ownership</i>		
County home-ownership rate	9.51***	(3.14)
<i>Personal characteristics</i>		
Mortgage	-0.0443***	(.006)
Owner-occupier	-0.0393***	(.004)
Male	0.0403***	(.005)
Age	0.0094***	(.001)
Age squared	-0.0001***	(.000)
Marital status		
Single	-0.0296***	(.010)
Married	-0.0616***	(.009)
Separated	-0.0171	(.026)
Divorced	-0.0228	(.015)
Unknown	-0.0153	(.013)
Household size	0.0048*	(.002)
Number of children	-0.0198***	(.003)
Education		
Basic or no degree	0.0624***	(.015)
Lower secondary	0.0928***	(.016)
Higher secondary	0.0582***	(.014)
Vocational college	0.0222	(.019)
Higher University	-0.0166	(.018)
Graduate school	-0.1104*	(.057)
Type of municipality		
Capital region	-0.0282	(.018)
Urban	-0.0081	(.006)
Semi-urban	-0.0046	(.007)
First-stage results: Excluded instruments		
Instrument A	-0.1661***	(.043)
Instrument B	-0.6135***	(.188)
Instrument C	-0.1821***	(.021)
Instrument D	-0.4877***	(.119)

^[1]Marginal effects calculated at sample means from a probit regression including county dummies and year dummies. N = 30,316. Robust clustered (county-year) standard errors in parentheses. (*) denotes significance at 10% level, (**) at 5% level and (***) at 1% level. The omitted category is widowed females with a lower university degree residing in a rural region.

Data source: IDS and Statistics Finland municipality-level time-series on households by housing tenure.

Table 2. presents the results from estimating an instrumental variables probit model of unemployment. The first stage results indicate that the reform indeed had a decreasing effect on home-ownership in the target regions. The effect of regional home-ownership on unemployment is positive and statistically significant. This finding confirms the result of the descriptive analysis in Table 1. As expected, the estimated coefficient is much larger when instrumental variables are used. This is because the estimate in Table 1. is contaminated by endogenous variation in the rate of home-ownership. Our results are consistent both with earlier results obtained by using microdata and the results of Oswald (1996) and other studies using aggregate data. Home-ownership seems to be positively associated with individual owner-occupiers' labour market outcomes and, at the same time, increase the overall unemployment.

Although the main aim of our analysis is to study the causal effect of home-ownership on unemployment, our data also permits us to explore some possible mechanisms through which the effect might work. Oswald (1999) and Blanchflower and Oswald (2013) discuss various potential labour market effects of home-ownership, some of which involve external impacts. The externalities are related to labour immobility and not-in-my-backyard (NIMBY) behaviour. Immobility of home-owners makes it more difficult for other people to locate close to ideal jobs as well and the labour market as a whole becomes less efficient. NIMBYism and less job creation may follow from home-ownership if home-owners try to prevent businesses from locating to their home-region. Blanchflower and Oswald (2013) find evidence in favour of the aforementioned mechanisms in longer run. Indeed, these mechanisms are more likely to be more relevant in longer run while we focus on the immediate effects of home-ownership. In what follows, we conduct analyses that shed some light on the relevance of two new hypotheses based on the idea that households' decisions about labour supply and consumption may be linked to changes in their housing tenure. This is because most home purchases, typically financed by mortgage loans, are associated with increased housing expenditures⁸. Our two

⁸Scanlon and Whitehead (2004) have documented that the average expenditures on housing have been higher for owners than for renters in most countries both in the 1990's and

hypotheses are the ones that might be relevant in the light of recent research and can be tested using our data but we do not claim that there are no other (positive or negative, short-run or long-run) impacts of home-ownership on the labour market.

It has been argued by some authors that home-owners' favourable labour market outcomes are due to their lower reservation wages and relatively active local job search, which arise from the need to meet high mortgage payments and reluctance to move to another region (e.g. Munch *et al.*, 2006 and Flatau *et al.*, 2001). Recent research on displacement effects suggests that this may produce negative externalities in the local labour market. As one group of individuals increases their labour supply and working, other individuals may be displaced from jobs as a result. This is especially likely in the short-run, since labour demand can be assumed to be less elastic in the short-run than in the long-run. Crépon *et al.* (2013) and Blundell *et al.* (2004) have studied displacement effects associated with labour market programmes. The literature review by Abbring and Heckman (2007) includes a thorough discussion on displacement and various other types of external effects in the labour market. Since, in theory, displacement may be associated with any increase in labour supply, we argue that high job search intensity and low reservation wages of new home-owners may lead to displacement of other workers in the same region. In sum, our displacement hypothesis is that higher home-ownership leads to higher job search intensity and lower reservation wages which, under the assumption of less than perfectly elastic labour demand, leads to externalities that are captured by the estimated effect of regional home-ownership.

In addition to boosting home-owners' labour supply, mortgage loans associated with home purchases may also affect consumption. Some recent studies have examined the effects of household credit on consumption behaviour. It has been argued that credit-constrained households with debt are forced to cut back on spending when house prices are declining (Mian *et al.*, 2013 and Mian and Sufi, 2010; Dynan, 2012). However, debt may, under some circumstances, be negatively linked to consumption even in the absence of unexpected changes

in the 2000's.

in asset values. Stephens (2008) show that repayment of a vehicle loan leads to an increase in nondurable consumption. Coulibaly and Li (2006) examine the effect of final mortgage payment and find that it is associated with an increase in durable consumption (house furnishings and entertainment equipment). Although the credit-constraint explanation of these results does not imply that individuals would cut back on consumption when they become borrowers, the possibility that home buying and associated mortgage borrowing decrease consumption can not be ruled out *a priori*⁹. For example, one can imagine reasons for which households do not want or are unable to save as much before they buy their home as after the purchase. Many countries have policies that favour home-ownership and make it a relatively profitable method of saving. Thus, it may be optimal for households to start saving more (and consume less) after a home purchase. Another possible mechanism that would lead to decreased consumption is related to self-control problems that prevent individuals from saving as much as they would like to. Laibson (1997) has studied self-control problems and has mentioned mortgage contracts as an example of commitment devices that help individuals to force themselves to save more¹⁰. A recent study by Mian and Sufi (2012) links consumption decreases due to house price reductions to decreases in local employment. Similarly, if an increase in home-ownership and associated mortgage borrowing leads to a reduction in household spending, this may be negatively reflected in the local labour market. Our consumption hypothesis thus is that higher home-ownership leads to less spending which, through lower aggregate demand, leads to externalities that are captured by the estimated effect of regional home-ownership.

Both the displacement hypothesis and the consumption hypothesis lead to empirically testable predictions about the labour market externalities of home-ownership. In Table 3., we start by presenting coefficient estimates on

⁹Notice also that labour supply and consumption choices are both part of consumer's optimisation problem. Thus, if there is a change in the amount of labour supplied due to a change in housing tenure, consumption is likely to change as well and *vice versa*. Thus, the claim that housing tenure affects consumption is closely linked to the claim that housing tenure affects labour supply.

¹⁰Ashraf *et al.* (2006) find empirical support for the claim that individuals are willing to use commitment devices to be able to save more.

regional home-ownership separately for home-owners with mortgages, owner-occupiers who do not have a mortgage loan and non-owners. It appears that only home-owners with mortgage are not affected by the external impacts and the effect is larger for non-owners than for owner-occupiers. In the light of the displacement story, non-owners may be more likely to be displaced than owners. This is because their job search is not intensified and their reservation wages are not lowered by their housing tenure, which can be argued to make them more vulnerable to changes in local competition for jobs¹¹.

We next see if results in line with the displacement hypothesis can be found. Clearly, displacement is strongest for the individuals whose labour is a close substitute to the labour of individuals who recently bought their homes and, as a result, increased their labour supply. As a simple test, we estimate the unemployment model separately for individuals whose personal characteristics are similar to those of recent buyers and for individuals who are dissimilar to them. To do this, we first estimate a probit model for the sample individuals of having bought a home. The explanatory variables are the same personal characteristics as in our unemployment model (gender, age, age squared, marital status, household size, number of children and education). We then divide the sample in two based on the predicted probability of being a buyer. This gives us one group with personal characteristics similar to buyers and another group with characteristics less similar to buyers. Estimating the unemployment model for the individuals who are similar to buyers yields a large and significant estimate whereas the estimate for the dissimilar half of the sample is much smaller and not statistically significant¹². Although the result is in line with the displacement hypothesis, it may be that it is a mere coincidence

¹¹In analyses not presented here, we also found that the effect is more pronounced on groups whose labour market attachment is likely to be weak and who therefore are more likely to be affected by job competition. These groups include students, mothers of pre-school children and individuals younger than 25 years old. The results are available on request.

¹²We lose some observations in the sample of individuals similar to buyers because graduate schooling predicts non-unemployment perfectly in this sub-sample. We have tried combining the two highest educational categories and including all observations and the results did not change.

that the individuals who are similar to new home-owners are largely affected by regional home-ownership.

Next, we perform another analysis related to displacement. Crépon *et al.* (2013) note that the more there are individuals whose job search is positively affected in a market, the larger the displacement among the job seekers in that market is likely to be. We do not have data on job search, but we know the sector of all sample individuals who work. Applying the idea of Crépon *et al.* (2013) to our case implies that the more there are buyers working in a given sector, the less there are employment opportunities in that sector for other workers. We thus calculate from our sample the number of buyers working in each sector and, based on this figure, divide sectors in two groups with both representing about half of the total employment. It should be noted that displacement may be due to both intensive margin and extensive margin changes in the labour supply of buyers. Number of buyers is a proxy for the total displacement potential in a sector because it includes both the number of individuals who started working in that sector and the number of individuals who already worked in that sector and may have increased their working hours. In Table 3., we first present the overall effect of regional home-ownership on the probability of working during the year and then estimate the model separately for working in the two groups of sectors. The overall effect of regional home-ownership on employment is negative and thus in line with the estimated effect on unemployment. We find a negative employment effect in sectors where a large number of buyers are working ('Buyers' sectors') whereas the estimated effect is not statistically significantly different from zero for sectors with relatively few buyers ('Other sectors'). This result is in line with the displacement hypothesis and it seems that individuals whose labour supply is increased due to home purchase may displace other workers in sectors where they work.

The two tests that we have performed seem to support the displacement hypothesis. We next turn to the externality mechanism that works through consumption reduction resulting from home-ownership. Mian and Sufi (2012) argue that the employment changes that are due to consumption changes can

be identified by examining employment changes separately in non-tradable and tradable sectors. Tradable sectors produce goods that can be consumed outside the region where they are produced. Non-tradable goods, in turn, are consumed locally. Therefore, a local change in consumption demand has local impacts on producers of non-tradable goods but the impacts on tradable sectors are spread over regions. This makes it possible to infer whether employment changes are due to consumption changes. We use a similar strategy as Mian and Sufi (2012) and test whether the local employment effect of region's home-ownership differs between non-tradable and tradable sectors. We classify a sector as non-tradable if it mostly produces goods that are consumed locally¹³. Other sectors are classified as tradable. The results presented in Table 3. show that home-ownership has a negative effect on employment in non-tradable sectors but has no effect on employment in tradable sectors. These results are in line with the idea that home-ownership decreases employment by decreasing consumption. The advantage of the test is that it is hard to imagine any other mechanism that would result in similarly differential effects on non-tradable and tradable sectors (Mian and Sufi, 2012).

It is not possible to reliably disentangle the displacement effect and the consumption effect with our data. We perform one more test to shed some light on which of the two effects is likely to be of more importance. We divide the sectors to four groups based on the two classifications above. If there was displacement but no consumption effect, we would find an effect only for sectors with large number of buyers (non-tradable/buyers' and tradable/buyers'). If instead there was only the consumption effect but no displacement, we would find an effect only for non-tradable sectors (non-tradable/buyers' and non-

¹³The sectors classified as non-tradable include retail and wholesale, restaurants, bars, canteens and catering, taxis, motion picture and video production and distribution, motion picture projection, arts performances, concerts and artistic creation and interpretation, libraries, archives, museums and exhibitions, sporting activities and operation of sport arenas and stadiums, dance halls and dancing schools, gambling, circus, amusement parks, other recreational activities, hairdressers, beauty salons, photo portraits, day care, funerals and other personal and household services. As Mian and Sufi (2012) point out, there are sectors that could be classified as either non-tradable or tradable. We tried different classifications and the results were qualitatively similar.

tradable/other). Finding an effect for all groups of sectors except the tradable/other group would indicate coexistence of the two effects. The results in Table 3. indicate that there is only the consumption effect. However, the effect on tradable/buyers' sectors is very close to significance. Based on these analyses, it would be safe to conclude that home-ownership might influence employment through both displacement and consumption effects.

It should be noted that the displacement effect would have to be very large for it alone to generate a positive relationship between the rate of home-ownership and the unemployment rate. It would require that more than one worker become unemployed by every newly employed home-owner. This would only be possible if home-owners worked longer hours than the workers who are displaced. We do not think that it is a credible claim that each home-owner displaces more than one other worker. Since our dependent variables measure any experience of unemployment and employment, from one month to twelve months, more than one-to-one displacement is more likely. It appears from additional analyses (not presented here) that the unemployment effects on experiencing only a few months of unemployment or employment are more pronounced while the effects on full-year unemployment and employment are smaller or negligible. Home-owners with mortgage and those who bought their homes in our data are less likely to experience small numbers of unemployment or employment months. Thus, many displacements are likely to involve a permanent job resulting in a loss of many short-term jobs. In the extreme, a displacement in our data may mean a displacement of twelve one-month jobs by one 12-month job.

There are no obvious bounds on the magnitude of the consumption effect since it depends on the reduction in money spent and on its effect on employment. It should be noted that based on the estimated effect of home-ownership on non-tradable sectors' employment, not much can be said about its total employment effect. This is because home-ownership may result in differential changes in consumption of different goods. For example, if home buying is not only associated with a reduction in spending on non-tradable goods but also with an increase in spending on tradable goods, the effect on employment is

Table 3. IV Models of Unemployment Experience and Employment Experience^[1].

<i>Effect on sub-group unemployment</i>			
Home-owners with mortgage	2.49	(3.79)	N = 6,682
Owner-occupiers, no mortgage	9.89***	(3.77)	N = 17,625
Non-owners	15.99***	(3.17)	N = 5,998
Similar to buyers	14.59***	(3.99)	N = 15,140
Dissimilar to buyers	4.43	(2.88)	N = 15,157
<i>Effect on employment</i>			
All employment	-6.21***	(1.79)	N = 30,316
Employment in			
buyers' sectors	-4.61**	(2.02)	N = 30,316
other sectors	1.60	(3.16)	N = 30,316
Employment in			
non-tradable sectors	-4.58**	(2.02)	N = 30,316
tradable sectors	1.33	(3.13)	N = 30,316
Employment in			
non-tradable & buyers' sectors	-1.33*	(.805)	N = 30,316
non-tradable & other sectors	-3.00*	(1.60)	N = 30,316
tradable & buyers' sectors	-3.13	(1.91)	N = 30,316
tradable & other sectors	4.78	(3.70)	N = 30,316

^[1]Marginal effects calculated at sample means from IV probit regressions including county dummies and year dummies. Robust clustered (county-year) standard errors in parentheses. (*) denotes significance at 10% level, (**) at 5% level and (***) at 1% level. Control variables as in Tables 1. and 2.

Data source: IDS and Statistics Finland municipality-level time-series on households by housing tenure.

negative locally but may even be positive globally. On the other hand, the estimated effect on the local labour market understates the global effect if there is a reduction in consumption of tradable goods as well. Further, there may be differences between employment effects of demand changes between sectors¹⁴. Thus, further research on the effects of housing tenure on total consumption and consumption of different goods is needed to shed light on the consumption effect of home-ownership. We feel, however, that the negative local effect on non-tradable sectors is very unlikely to be fully compensated by a positive global effect on other sectors. In such a case consumption would simply shift from non-tradable to tradable goods. The positive relationship between home-ownership and unemployment can often be found using cross-country data and it does not seem likely that home-ownership would merely cause a shift from domestic products to imported products.

A final note should be made about the consumption effect. During our period of analysis, house prices were rapidly falling and interest rates were rising in the wake of a major economic crisis. These developments were likely to cause a reduction in household spending due to unexpected household balance sheet changes and increases in mortgage payments¹⁵. Although more home-ownership means that there are more households susceptible to the changes and thus more households which cut back on consumption, we believe that this may only have a small (positive) effect on our estimates. This is because we study the immediate effects of changes in home-ownership. It is unlikely that there was sufficient time for the house price and interest rate shocks to affect the consumption decisions of households which had bought their homes the same year.

¹⁴Mian and Sufi (2012) use theoretical assumptions that allow them to extrapolate the employment changes in non-tradable sectors to other sectors.

¹⁵Most mortgages in Finland were, and still are, variable-rate mortgages.

4 Conclusions

Various policies influence individual housing tenure choices. Earlier evidence on the labour market effects of these policies is partly mixed. In particular, many studies have found that higher prevalence of home-ownership is associated with higher aggregate unemployment, whereas studies using microdata suggest that home-owners have relatively favourable labour market outcomes. We find that, in addition to the latter result, home-ownership has effects above and beyond the direct effects on individuals. Namely, while home-owners are less likely to experience unemployment, significant externalities counteract the positive effects of home-ownership at the aggregate geographical level. The external effects may be due to consumption reductions and increased local job competition caused by home purchases, especially if the purchases are financed by debt. More theoretical and empirical research is needed to better understand the mechanisms at work.

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