

The short-term relationship between unemployment and home ownership

Dominik Stroukal

University of Finance and Administration, Prague

Abstract

This work focuses on the Oswald hypothesis and answers the question about what the relationship is between changes in home ownership and unemployment on an individual level in the Czech Republic. The first and main hypothesis is that a transition to home ownership reduces the probability of unemployment in the following year. Data from EU-SILC proves that this hypothesis holds true, but only for men and not for women. With this in mind, we present a second hypothesis that argues that the relationship between homeownership and unemployment on an individual level varies over time in relation to the lower and higher probability of unemployment. The primary reason for this is the “mortgage effect”, which is later outweighed by the migration effect. The research shows that the transition to unemployment does not affect the possibility of a transition to home ownership in the following year, neither for men nor women. For the third hypothesis, the expectation was that there would be a significant difference between men and women. This was confirmed because the first hypothesis holds true only for men and not for women.

Keywords: Home ownership, unemployment, Oswald.

Introduction

The interaction between the labour market and the housing market has raised a number of fundamental questions among economists over the last two decades. Oswald (1996, 1999) claims that the growth in the unemployment rate is connected to the growth in the home ownership rate. He estimated this relationship and found that the unemployment rate increases by two percentage points if the home ownership rate in a region increases by ten percentage points. The relationship was confirmed across European countries, US states and even in regions within particular countries. Canada, Norway, and a few other countries, were the exceptions to the rule.

A number of papers appeared in reaction to the Oswald hypothesis. These can be divided into two groups. The first group analyses the micro level (individuals) and the second the macro level (countries or regions).

The majority of the conducted research confirms the Oswald hypothesis on the micro level. Nickell (1997, 1998) was among the first. Green and Hendershott (2001) also confirmed it, albeit with some limitations for the United States. In contrast, Flatau et al. (2002) found only a weak confirmation of the hypothesis on the basis of Australian data. In Germany, Lerbs (2010) was able to confirm the hypothesis on the basis of panel data, however, achieved the opposite result when utilizing cross-sectional data. Laamanen (2013) confirmed the Oswald hypothesis in a controlled experiment in Finland. Finally, Oswald himself officially confirmed his hypothesis almost twenty years after first proposing it (Blanchflower and Oswald 2013).

However, the results are disputable on the level of individuals and households. Against expectations, Coulson and Fisher (2002) or Munch, Rosholm and Svarer (2006) for example, convincingly show that home owners achieve better results on the labour market than tenants. The question remains therefore: How is it possible that the relationship is positive on the micro level, but the reverse when aggregated to the macro level. The solution to this “puzzle” requires a closer look.

Another reason why this topic deserves the attention of economists is the political impact of government subsidies for home owners. In 2009, government subsidies for home ownership were CZK 13.3 billion (€ 502.9 million) (Řežábek 2011, p. 39). There may be some positive externalities pertaining to home ownership (see e.g. Glaeser and Shapiro 2002) which may be grounds for the government to justifying subsidizing homeowners. This topic requires further research. It is important to note, that further evidence that home ownership disturbs the labour market might serve as a strong counterargument to government subsidies for home ownership and might lead to a better use of public funds.

In the Czech Republic, this phenomenon was first analysed, to a certain degree, by Lux and Sunega (2011). They found that home ownership may have an influence on migration planning. The Oswald hypothesis itself was tested on a regional level by Konečný and Stroukal (2015) and on an individual level by Stroukal and Šťastný (2015).

This paper is a continuation of the research on the individual level and seeks to answer the causal relationship between individual unemployment and home ownership over time.

Theories and hypotheses

The labour market and housing market are connected through a number of factors, especially migration. The reason why regional unemployment is higher in regions with a higher home ownership rate was explained by Oswald (1996). One of the most discussed reasons is the lower mobility of home owners (Isebaert 2013). At a regional

level, the home ownership market can be more rigid than the labour market (De Graff, Van Leuvensteijn and Van Ewijk 2009). This means that because of the transaction costs connected to buying or renting real estate, it is difficult to move from regions with high unemployment to regions with lower unemployment. An interesting and little researched hypothesis is the influence of the NIMBY (Not In My Backyard) effect (Fishel 2001). Fishel argues that in areas with a higher rate of home ownership, the owners are more likely to be against new industrial buildings and entrepreneurial projects which could bring job opportunities on the one hand, whilst on the other hand, they could reduce other, especially non-monetary, benefits from living in the particular location. Oswald also discusses the possibility that home owners are more likely to go to work by car, thereby causing traffic jams, which adds to employee costs and therefore results in increases in unemployment. Farber (2012) shows that the business cycle may also have an influence on the issue, although this could not be confirmed on the basis of data for the United States because the economic crisis hit all states in the same way.

At an individual level it is assumed that home owners are less likely to be unemployed and that this relationship will also show over time, but only over the predictable short-term. A person is more likely to become a home owner if they have job certainty. Banks and mortgage companies even require proof that the debtor will be able to repay their loan i.e. that in most cases they are employed. Over the short-term, the effect is assumed to be positive and that the transition to home ownership is connected to the lower probability of unemployment in the following year. However, over the long-term, the effect of migration materializes and people are less likely to move house, even after losing their job. The difference between the short-term and long-term should therefore be observable.

If an economically active person, or a person in a joint household with them, becomes a home owner, the probability that they will be unemployed in the future increases. In the first year, this effect will be the opposite, but it will gradually begin to change in the following years. Due to the fact that only sufficient data is available to confirm the change within one year, the hypothesis is formulated as follows:

H1: In the first year after the transition to home ownership, the probability of the owner being unemployed will be lower.

The reverse relationship is also discussed, i.e. from unemployment to home ownership. Even the relationship between the change in employment status to the change in home ownership status should be in accordance with the H1 hypothesis. If a person becomes unemployed, it is more likely that they will not buy a home – irrespective of the fact that they have their own money to do so. At that point in time, the purchase would have a higher opportunity cost due the risk of lower long-term income or, which is probably more often the case, for the reason that they were denied a mortgage because of being unemployed, which contravenes the stable income requirements of banks. On this basis, we can formulate the second hypothesis as follows:

H2: The probability that an economically active person, or a person in a joint household with them, becomes a future home owner is smaller for the recently unemployed. This effect will be immediately evident in the following year, as opposed to H1.

Stroukal and Štastný (2015) confirm the substantial differences in the relationship between unemployment and home ownership in separate estimates for men and for women. Although according to Hoffman and Averett (2010), the long-term positions of men and women in the labour market equalize, there are a number of studies which show that substantial differences still exist. For the purposes of this research it is assumed that the relationship between unemployment and home ownership will be weaker for men. In other words, women will be more prone to unemployment after the transition to home ownership. In a joint household, it is more likely for women to be unemployed if the man has a job. In contrast, men will find it easier to change jobs even when their wife is employed. In other words, the household is more likely to move if the man loses his job than if the wife loses hers. The reason for this is not purely the patriarchal relationships (Goldberg 1999), it is also in part due to the different preferences of men and women - men demonstrably prefer having a career more than women, whilst women prefer family more than men do (Brožová and Stroukal 2015). Felmler (1995) discusses more differences. On this basis, we can formulate the third hypothesis as follows:

H3: The probability that a home owner will be unemployed in the first year after their transition to home ownership will be lower for men than for women.

Models

A binary probit model was used to confirm or refute the aforementioned hypotheses. It was formed in a standard form

$$P(Y_i = 1|X_i) = \Phi(X_i'\beta),$$

where Y represents the zero-one variable, P probability, X the vector of independent variables, and Φ the cumulative distribution function for normal distribution.

To confirm the H1 hypothesis, it was appropriate to use differences to find whether the change from rental housing to home ownership led to a change in employment. On the basis of the expectation that the process is not immediate, and in order to approach causation, the variable tracking of the status of home ownership was lagged by one year. The model was subsequently cleared of the variables that influence unemployment in order to achieve the closest possible estimate of the influence of home ownership. The dependent variable *New_Unemployed* was equal to 1 if the respondent lost their job in a given year as opposed to the previous year. For these purposes, the estimated model can be presented in this form:

$$P(\text{New_Unemployed}_i = 1|x) = \beta_0 + \beta_1 \text{New_Homeowner_lag_} + \beta_2 \text{Age 17-40}_i + \beta_3 \log(\text{HH net income PP})_i + \beta_4 \text{Education upper secondary}_i + \beta_5 \text{Education post secondary}_i + \beta_6 \text{Education tertiary}_i + \beta_7 \text{Children} + \beta_8 \text{Married} + \text{time control variables} + \text{geography control variables} + u_i$$

The H2 hypothesis also required confirmation. This time, however, the dependent variable was *New_Homeowner*, $s = 1$ for those respondents who became home owners in a given year. The estimated model can therefore be presented as follows:

$$P(\text{New_Homeowner}_i = 1|x) = \beta_0 + \beta_1 \text{New_Unemployed_lag_} + \beta_2 \text{Age 61_more}_i + \beta_3 \log(\text{HH net income PP})_i + \beta_4 \text{Education upper secondary}_i + \beta_5 \text{Married}_i + \beta_6 \text{Good health}_i + \beta_7 \text{Bad health} + \text{time control variables} + \text{geography control variables} + u_i$$

In order to confirm the H3 hypothesis, all the models were estimated separately for men and for women.

Data

The three aforementioned hypotheses were confirmed or refuted using data sourced from Eurostat research in “European Union Statistics on Income and Living Conditions.” This data contains individual representative data for the Czech Republic for the period 2008 – 2011. It represent the largest and best-quality research that could be used to confirm or refute the hypotheses.

The data contains 7,106 observations where the observed unit is an economically active resident of the Czech Republic. Only those respondents who answered that they were employed (or self-employed) or unemployed were considered economically active. Of the total 15,636 observations, retired respondents (25.3% of observations) and other economically inactive respondents (29.2%), mainly children and students, were discarded.

For the purposes of this paper, and in contrast to the referenced research herein, the observed unit is an economically active resident, not a household or income unit. In the past, this approach was only taken by Van Leuvensteijn and Koning (2004), Stroukal and Šťastný (2015), and a few others. In spite of this fact, it is a logical choice because when using income units or households, unemployment would be particularly biased against those earning less, of whom it was assumed women would be prevalent. Furthermore, it was considered probable that the differences between men and women and their mutual interaction in households might have a large influence on the explanation of the Oswald paradox between the regional and individual levels.

A home owner was defined as = 1 if they responded in the questionnaire that they were the direct owner of the real estate they lived in or lived in a joint household with the owner. Real estate covered by a mortgage was considered as ownership. For both genders, just over 80% are owners. However, in reality there are fewer owners because those who live in a household with the owner fall under our definition.

8.7% of women and 6.7% of men were unemployed, making the total 7.6%.

The other variables had averages that were in line with expectations. The average age in dataset, irrespective of gender, was approximately 42 years, whereby women were of a slightly higher age. 73% of women and 77% of men had a secondary education, and 17% of women and 16% of men a tertiary education. Approximately 60% of respondents were married. Most of the respondents considered their health to be good, however women felt more often that their health was worse than that of the men.

The data is summarized in the following table:

Table 1 - Descriptive statistics - average values

Variable	Population (n=7104)	Women (n=3163)	Men (n=3941)
Unemployed	0.07592 (0.2508)	0.0873 (0.2771)	0.0665 (0.2266)
Homeowner	0.8147 (0.3713)	0.8129 (0.3716)	0.8163 (0.3712)
Age	42.1756 (12.1199)	42.4679 (11.0832)	41.9344 (12.8721)
Education upper secondary	0.7517 (0.4270)	0.7259 (0.4390)	0.7731 (0.4165)
Education post-secondary	0.0136 (0.1262)	0.0187 (0.1408)	0.0094 (0.1130)
Education tertiary	0.1642 (0.3614)	0.1690 (0.3616)	0.1604 (0.3612)
Married	0.6034 (0.4788)	0.6013 (0.4777)	0.6050 (0.4797)
Children	0.5479 (0.4977)	0.60544 (0.4888)	0.5016 (0.5001)
HH net income PP	11846 (7049)	11869 (7441)	11828 (6720)

standard errors in brackets

Results and discussion

The models introduced above were estimated using the available data. The results of the first two models, which confirm the H1 and H3 hypotheses, are presented in Table 2. Using robust standard errors did not change any of the conclusions. Due to the number of covariate patterns in the Pearson goodness of fit tests for both models being close to the number of observations, the Hosmer–Lemeshow test with 10 groups was used, the results of which indicate that the model fits the data well (p-values 0.2911 and 0.3435).

Table 2 – The influence of home ownership on unemployment

Dependent variable – Unemployment (Newly unemployed = 1)				
Independent variable	Model 1	Marginal effects	Model 2	Marginal effects
	(Women) <i>Probit</i>		(Men) <i>Probit</i>	
Constant	0.9950 (1.6292)		0.5333*** (0.1604)	
New homeowner t-1	-0.2835 (0.3661)	-0.0184	-0.6349* (0.3712)	-0.0754
Age 17-40	0.7617*** (0.1908)	0.0494	0.1789 (0.1774)	0.0210
HH net income PP (log)	-0.5584** (0.1952)	-0.0362	-0.9697*** (0.2008)	-0.0114
Education upper secondary	0.3388 (0.2300)	0.0220	0.4381* (0.2369)	0.0514
Education post-secondary	1.2162* (0.5541)	0.0788	0.3172 (0.8437)	0.0372
Education tertiary	-0.0063 (0.3531)	-0.0004	-0.1426 (0.3719)	-0.0167
Children	0.5279** (0.1914)	0.0342	-0.1537 (0.2062)	-0.0180
Married	-0.2413 (0.1851)	-0.0158	-0.8321*** (0.2173)	-0.0976
Time variables	Yes		Yes	
Geographic variables	Yes		Yes	
McFR ²	0.1213		0.1422	

n = 3163 (model 1), 3941 (model 2)

McFR² is the McFadden determination coefficient

standard errors in brackets

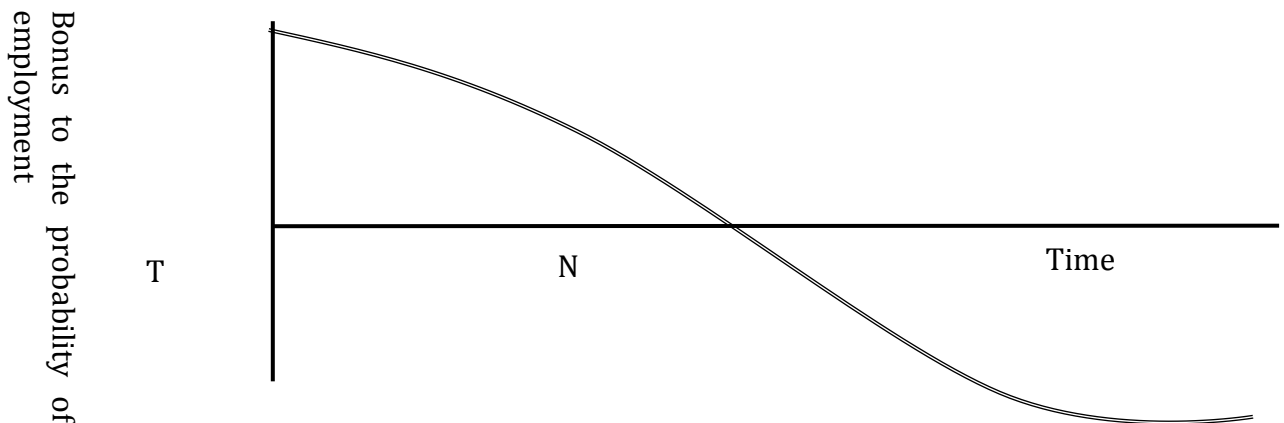
* p < 0.10; ** p < 0.05; *** p < 0.01

The results confirm the H1 and H3 hypotheses. The results show that for men, the transition to home ownership in a given year reduces the probability that the respondent will be unemployed by 8 percent. No such effect was observed in women, in accordance with expectations.

The other variables mostly followed the expected direction of influence. Higher age, higher income, higher education, for men marital status, and for women childlessness, correlated with a lower probability of transitioning to unemployment.

On the basis of the above, a hypothesis can be put forward that states that those people who are more certain about the future of their jobs become home owners and that their forecast of future employment strongly correlates with reality. However, to confirm this hypothesis it would be necessary to gather new data on whether respondents expect to be unemployed over a given time horizon. Baert, Heylen and Isebaert (2014) gave an insight into this when they suggested that people with mortgages have shorter unemployment periods than direct home owners. They explain this by saying that the mortgage commitment motivates people to search for a new job more intensively.

A problem that could not be solved with the available data was the short time horizon. It is possible to assume that the transition to home ownership will at first have a positive relationship with employment. However, as time goes by it can be similarly assumed that higher migration costs and a reduced ability to forecast future employment will prevail in the years ahead and that the transition to home ownership will be affected negatively. On this basis, another hypothesis can be put forward for future research, namely, that the relationship between unemployment and home ownership on an individual level varies over time: the bonus to the probability that the respondent will not lose their job decreases over time to the point of becoming a bonus to the probability that they will lose their job and will not find a new one in the given year. Over a longer time horizon, it would be possible to estimate the average year when this break happens. Oswald himself in his last piece of work encourages researches to look for this (Blanchflower and Oswald 2013).

Graph 1 – Bonus to the probability of employment over time

The hypothetical relationship is illustrated in the graph above. A person becomes a home owner over time T . In this paper, it was confirmed that such a person would benefit from an increased probability of employment in the following year, compared to the rest of the population. On the basis of the confirmed existence of the migration effect, that is home owners migrate less to jobs (Lux and Sunega 2011), it can be assumed that it will prevail over time when the "mortgage effect", i.e. the higher probability of employment in the years following a house purchase, decreases. In time $T+N$, the migration effect prevails and the bonus becomes a penalty to the probability of employment. It would be interesting to confirm this hypothesis, but there is insufficient data available for the Czech Republic. Of similar interest would be an international or inter-regional comparison of N .

It is clear that the "mortgage effect" is not caused by the real estate purchase itself; the particular person would have the same job certainty even if they had not bought the real estate. However, it demonstrates an effect that at this point in time cannot be measured on the basis of the data that is currently available. If it were feasible to introduce such a variable into the model so as to measure the expected probability of employment (either subjectively asked or objectively measured), the graph above, on the basis of the set hypothesis, could be redrawn with only negative values because the migration effect would work in isolation (and other negative relationships described above).

This research also confirmed the relationship between a lagged change in employment and a change in home ownership. The results are shown in Table 3.

Table 3 – The influence of employment on home ownership

Dependent variable– Home ownership (difference)				
Independent variable	Model 3	Marginal effects	Model 4	Marginal effects
	(Women) <i>Probit</i>		(Men) <i>Probit</i>	
Constant	-0.3364** (0.1547)		-0.6098** (0.1933)	
Newly unemployed t-1	0.2892 (0.3231)	0.0509	-0.4416 (0.4225)	-0.1132
Age 61+	-0.2390* (0.0912)	-0.0420	-0.2278 (0.2220)	-0.0584
HH net income PP (log)	0.0777 (0.1673)	0.0137	0.3080 (0.1936)	0.0790
Education upper secondary	0.2093* (0.0910)	0.0368	0.2708 (0.2243)	0.0694
Married	-0.3426** (0.1543)	-0.0603	-0.2207 (0.1799)	-0.0566
Good Health	0.0189 (0.1746)	0.0033	0.6327** (0.3210)	0.1622
Bad Health	0.1762 (0.2134)	0.0310	-0.9983*** (0.3543)	-0.2559
Time variables	Yes		Yes	
Geographic variables	Yes		Yes	
McFR ²	0.0825		0.0914	

n = 3163 (model 3), 3941 (model 4)

McFR² is the McFadden determination coefficient

standard errors in brackets

* p < 0.10; ** p < 0.05; *** p < 0.01

In contrast to the first models, the results here do not confirm the hypothesis. The transition to unemployment in one year does not have an influence on the probability that the respondent will become a home owner. The influence was not found for either men or women. The results suggest that the influence is stronger for men and that the direction is in line with expectations, but the estimate is statistically not significant.

The results for the other variables are, like for the previous models, in accordance with expectations. Women, less educated women, married women and men in poorer health are less likely to become home owners.

The results are especially interesting with regards to the arguments in favour of the state's housing policy. The Czech state receives four to five times less revenue from property taxes compared to the OECD average (Vítek and Pavel 2004). As a result, it is highly probable that a debate will take place in the future about either the implementation of new taxes for home ownership or an increase in current tax rates (Stephens 2011), although it is widely recognized that this will be politically difficult to enact (O'Sullivan and Gibb 2012). Such taxes should increase the cost of home ownership and thus decrease the regional rate of home ownership, which would in turn reduce regional unemployment. On the other hand, as Konečný and Stroukal (2015) found, the policy briefs to support home ownership lack any discussion on the support's effects on unemployment.

Conclusion

The Oswald hypothesis is one of the most studied hypotheses in current research into the functioning of the labour market. Current available data seemingly confirms the hypothesis with ease. However, a deeper analysis of a number of various economies on a regional and on an individual level, raises new questions and the need for the formulation of additional hypotheses. This paper focused on one of those and answered the question to what extent the relationship between a change in home ownership or unemployment has on an individual level in the Czech Republic one year after a change in one of these variables.

Our first and main hypothesis was that a transition to home ownership decreases the probability of unemployment for the respondent in the following year. After estimating large panel data, the hypothesis was found to hold true for men, but not for women. It is the opinion of the authors that the explanation should not be sought in a direct causal relationship, but rather in the "mortgage effect", i.e. a person is more likely to become a home owner if they have job certainty. On an individual level, the reason for this is the fear that they may not be able to repay the mortgage, or alternatively, because the mortgage provider requires some assurances on their employment. On this basis, a new hypothesis was introduced. The hypothesis states that the relationship between home ownership and unemployment on an individual level changes over time when the probability of unemployment transitions from low to high. The reason for this is at first the "mortgage effect", which is later outweighed by the migration effect. To confirm this, it would be appropriate to use a longer time series and differentiate new home owners with a mortgage from those new home owners without a mortgage.

The second hypothesis was refuted. The expectation was that a transition to unemployment would negatively influence the possibility of transitioning to home

ownership in the following year. However, this relationship was refuted for men and women alike.

The third hypothesis assumed that there would be a significant difference between men and women. This was duly confirmed. The first hypothesis held true for men and not for women. This paper proves that it is appropriate to analyse the Oswald hypothesis for women and men separately.

The logic behind the Oswald hypothesis stems from the spatial nature of both the labour and housing markets. Selling a home is expensive, as is the cost of moving in cases where an individual loses their job. People also face coordination problems where a household consist of more persons. The inflexibility of rental prices, the NIMBY effect, and job-worker mismatches are among the other important reasons. Although all of these are described in literature, this work present important findings about the relationship between the rate of unemployment and the rate of home ownership over time, as well as about the significant differences between men and women. It is also one of the first works to describe the relationship in the Czech Republic.

The Oswald hypothesis requires further detailed research across other countries. The housing market makes an important contribution to GDP, forms an important part of household expenses, and is sensitive to inflation and the business cycle, which in turn has an influence on the labour market. A good understanding of the mechanisms between the housing market and the labour market would provide an impetus for better economic policies, in particular the withdrawal of existing policies or the prevention of the introduction of new ones only aimed at reducing unemployment.

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Contact address of the author(s):

Mgr. Ing. Dominik Stroukal, University of Finance and Administration, Department of Economics and International Relations, Estonská 500, 101 00 Prague 10, Czech Republic, e-mail: dominik@stroukal.cz

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