



# HOME OWNERSHIP, MOBILITY AND UNEMPLOYMENT: A RE-EVALUATION OF THE OSWALD THESIS

NICHOLAS HORSEWOOD AND KEES DOL

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*One of the targets of Europe 2020 is “to modernise labour markets by facilitating labour mobility”. In this respect the Oswald thesis suggests that labour mobility, and subsequently employment growth, might be hampered by home ownership in countries. Following consideration of the likely future developments of home ownership sectors across the member states, this paper uses a macroeconomic panel to investigate the role of housing-related factors, specifically the stock of outstanding mortgages market, house price inflation and home ownership, as determinants of unemployment and of long-term unemployment within the European Union. We find that the change in the indebtedness of households acts as a barrier to relocating for employment when economies are hit by adverse shocks. However, future work practices, associated with developments in ICT and remote working, could counter a tenure influence on labour mismatch.*



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# **HOME OWNERSHIP, MOBILITY AND UNEMPLOYMENT. A RE-EVALUATION OF THE OSWALD THESIS**

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## 2 Home ownership, mobility and unemployment

### Introduction

Since the 1970s and the ending of the “Golden age”, countries in Europe have experienced more variable rates of unemployment, with some experiencing relatively high and persistent rates. The cost of such wasted resources is high, ranging from lost output to disillusioned and demoralised workers. Where the causes are not addressed quickly, there is the possibility that the jobless become trapped, leading to the build-up of long-term unemployment and a proportion of the workforce dropping out of the labour market, becoming unemployable due to losing work-related skills and being scarred by gaps in their employment record.

A number of explanations have been proposed for the poor labour market performance of many countries in the European Union when compared to other OECD countries, in particular the USA. The possible determinants range from the over-generous social welfare system to the rigidity of the real wage via the role of the trades unions in the collective bargaining process (see Layard *et al* 2005; Turner 2002; Olson 1996). While supply-side factors are responsible for determining medium-term unemployment, demand has a role to play in the short run. Underlying these explanations is a notion that when European labour markets experience a demand-side shock, they are not sufficiently flexible to adjust to the changes, with unemployment being the outcome.

Contrary to the conventional view of labour economists, Oswald (1996, 1999) hypothesised that high rates of home ownership may be responsible for inferior labour market outcomes, in particular high unemployment. The ‘Oswald hypothesis’ proposed that the housing market was ‘at the heart of the European unemployment problem’ and was accompanied by strong claims that ‘We can put Europe back to work . . . by reducing home ownership’ (Oswald, 1999, p. 1). His conjecture is based on the view that labour mobility is lower for home owners than for renters as the higher transaction costs lead to a disincentive to relocate to areas where jobs are more abundant. As a consequence the housing market is responsible for a location mismatch between vacancies and the unemployed within a country and also between nations.

The initial supporting evidence for the thesis came from macro-level cross-sectional data from the 1960s and the 1990s. The hypothesis has recently been examined using a panel data set of US states over the sample period 1985 to 2011, Blanchflower & Oswald (2013). They found that an increase in home ownership leads to a delayed rise in unemployment, although the exact mechanism involved is difficult to identify.

The continued existence of such a relationship is slightly surprising as casual empiricism suggests that such a barrier has been reduced in magnitude as a consequence of advances in technology that have meant that the link between the worker and the workplace are being eroded, with the increasing possibility in some occupations of working from home. The significance of home ownership in unemployment trends therefore may be weakened by 2013 and even more so by 2025.

The present paper examines whether there is still evidence to support the Oswald hypothesis in the light of developments in both the housing market and the labour market in the 2000s. In doing so, the analysis also covers the economic conditions in the European Union after the financial crisis of 2008, where home ownership declined for the first time in a number of countries. In particular, two of the countries at the heart of the sovereign debt problem and the euro crisis, Spain and Ireland, have experienced a severe contraction of housing demand with concomitant declines in house prices. This research investigates the interaction of the labour markets and the housing systems in EU countries in an attempt to identify the determinants of unemployment and of the proportion of workers without a job for over 12 months. Conventional labour market factors, such as the replacement ratio and trade union power, are considered alongside variables from national housing markets, for example house price inflation and mortgage availability. Rather than simply replicating Oswald by considering home ownership rates alone, however, we will attempt to capture the institutional features of the housing system of each country, including the function of mortgage markets and the taxation system, and examine how they impact on the operation of labour markets.

The examination of unemployment is undertaken within a panel data framework in order to capture cross-country differences within the European Union in labour markets and in housing markets. As the variation of some variables is limited, the analysis will take place using 5-year and 4-year averages over the sample period 1998 to 2011. The three periods used broadly match economic epochs, the great moderation (1998-2002), the credit boom (2003-2007) and the credit crunch (2008-2011). The study, then, investigates whether housing variables influenced unemployment and its duration in European economies over a sample period covering both a boom and a slump.

The next section of the paper provides an overview of housing markets in the EU, with particular focus on home ownership rates, and house price and mortgage market developments, leading to consideration of the drivers of future home ownership rates. This is followed by a review of the existing studies of the role of housing in labour mobility. Section 3 presents the data set, covering 16 EU countries over the period 1998-2011, and a basic economic structure is formulated. Section 4 presents the estimated model for unemployment and for long-term unemployment, and interprets the contribution of the independent variables. The final section considers the main findings and their policy implications in the context of the NEUJOBS agenda.

## **1. Housing markets in the European Union**

Whereas housing markets across the member states have some aspects in common, there are also important variations. This section provides an overview of three key aspects: home ownership rates, house price movements and mortgage market developments.

## 4 Home ownership, mobility and unemployment

### a) Home ownership

Cross-country comparisons of home ownership are problematic because of the absence of a systematically collected and fully harmonized set of data across the EU. Surveys of the housing stock by tenure tend to be undertaken in different years and at irregular intervals in each country. There are also differences between countries as to the exact definition of what constitutes home ownership. For example, Swedish co-operative housing is often recorded as a distinct form of housing tenure, but, in that it is a tradable asset, it could be thought of as a form of home ownership (Stephens 2003). Notwithstanding the data limitations, the general trend is clear. In 1945 the majority of households in each of the 27 countries of the current member states of the European Union rented their home, from either a private or public landlord. Over the subsequent decades there has been a trend towards increasing home ownership rates (Table 1), with the speed varying between nations. By the start of the present century home ownership was the main form of housing tenure in every country, with the exception of Germany, with the trend continuing up to 2008 and the onset of the financial crisis.

**Table 1: The post-war growth of home ownership: % of housing stock**

	1970	1980	1990	2002	2010/2011
Austria	41	48	55	56	57
Belgium	55	59	67	71	78
France	45	51	54	55	58
Germany	-	-	38	42	43
Netherlands	35	42	44	53	56
Denmark	49	52	51	51	54
Finland	59	61	67	58	74*
Norway	53	59	59	77	85
Sweden	35	41	42	42	66*
Greece	-	70	77	83	80
Italy	50	59	67	80	80
Portugal	-	57	58	64	75
Spain	64	73	76	85	85
Ireland	71	76	81	77	75
UK	49	56	68	69	66
Bulgaria	-	-	78	92	87
Estonia	-	-	37	95	-
Latvia	-	-	39	82	84
Lithuania	-	-	-	84	93
Slovenia	-	-	68	82	78
Czech Republic	-	-	62	64	79
Hungary	-	-	89	92	92
Poland	-	-	56	55	81

\*Including Coop housing

Note: dates are approximate

Sources: Catte et al (2004); Scanlon and Whitehead (2004), European Mortgage Federation (2012)

### b) House prices

Accompanying the rise in home ownership rates was a general increase in the price of private dwellings. House price inflation can be viewed as the outcome of an increased

desire to become property owners in a market with a slow response in supply. The demand for a family residence is a combination of the housing services that it provides plus, as a durable asset, the investment potential from its returns via increases in its value. Consequently, the increase in the demand for home ownership witnessed in the EU over the last sixty years was due to a combination of factors. However, in more recent times there was a tendency for the investment demand to come to the fore. While the tax implications of capital gains are dealt with differently in each of the EU countries, in the post-war period home owners made significant profits compared to renters (Johansson 2011).

During the early 2000s speculative demand from both prospective home-owners and those who purely speculated on the perceived windfall gains were most marked in Spain and Ireland, where house prices, in combination with lax spatial planning, ignited an unprecedented construction boom (see Garcia, 2010; Conefrey and Fitzgerald, 2010). In the eight years since the start of the new century, a doubling of the price of dwellings was seen in Belgium, the UK and Spain. Even bigger gains were experienced by many of the new EU members, although their circumstances were different. In Ireland and the UK widely available credit, used for so called Buy-to-let mortgages, also contributed to house price speculation (Kelly and Menton, 2007; Hamnett, 2009).

With the onset of the sub-prime crisis in 2007 the picture of house price inflation has changed. Whereas in most member states prices increased year on year up to 2007, after then they have diverged (Table 2). In a number of the northern countries – Sweden, France and Germany for example – they continued to rise up to 2011, while in the Liberal and Southern countries they generally decreased.

**Table 2: House price developments after 2000, European countries**

	2000	2008	2010	2011
Austria	100	109.1	118.1	-
Belgium	100	210.9	224.5	232.8
France	100	199.9	209.1	213.1
Germany	100	108.7	108.0	110.2
Luxembourg	100	185.8	190.1	197.9
Netherlands	100	148.8	141	136.2
Denmark	100	165.9	163.8	151.4
Sweden	100	186.7	204.6	206.1
Norway	100	172.5	190.3	205.6
Ireland	100	151.8	110.3	91.9
UK	100	202.1	200.1	197.9
Greece	100	190.0	174.4	165.2
Italy	100	169.6	169.1	170.1
Malta	100	167.3	160.6	-
Spain	100	226.0	204.4	190.5
Bulgaria	100	426.7	301.7	-
Czech Republic	100	217.1	-	-
Hungary	100	197.3	174.4	170.8
Slovakia	100	356.6	304.6	

Source: European Mortgage Federation, 2012

### **c) Mortgage markets**

Mortgage markets have expanded substantially across Europe in the period from 2002 to 2008. Before the crisis there was a general trend towards relaxed mortgage lending practices with higher loan-to-values, extended repayment periods or interest-only products (see for example Scanlon *et al.*, 2008). However, these tendencies differed substantially between countries. The global financial crisis led to a credit crunch, with banks reducing the amount of lending and abandoning specific mortgage products, resulting in a levelling off in the growth of the volume of mortgages (see Scanlon *et al.* 2011). Table 3 illustrates that there are still significant differences with regard to the size of national mortgage markets. Although a large majority of Eastern European households are home owners, the mortgage finance markets in new member states are still rather underdeveloped. In Western Europe, national variations in home ownership rates as well as national institutions and regulatory systems sustain the diversity of mortgage systems (Warnock and Warnock, 2008; Stephens, 2003). For



example, the German home ownership rate is the lowest in Europe and mortgage lending practices can be characterised as conservative. In the Netherlands and Denmark, not only did expanding owner-occupied markets play a role, but the generous tax facilities pushed total mortgage debt up to the highest levels in Europe. By 2011 the ratio of mortgage debt to GDP was over 100 per cent in these two countries. In comparison the new member states, excluding Latvia, had a ratio below 30 per cent, which was a level of indebtedness satisfied by only Italy and Austria. In these countries more traditional sources of housing finance were used. There has been some de-territorialization of mortgage finance but overall it remains relatively underdeveloped despite the legislative support for cross-border lending.

**Table 3: Mortgage debt as % of GDP, European countries**

	2002	2008	2011
Austria	16.4	25.5	28.0
Belgium	27.8	39.7	45.6
France	22.7	36.7	41.2
Germany	53.2	46.3	46.5
Luxembourg	27.7	40.2	46.2
Netherlands	80.2	99	106.5
Denmark	74.0	95.3	100.7
Finland	20.4	36.2	42.7
Sweden	46.5	65.7	81.3
Cyprus	7.8	49.7	69.4
Greece	13.6	32.8	35.4
Italy	10.0	17.3	22.7
Malta	19.6	38.2	43.8
Portugal	46.3	61.2	66.3
Spain	35.9	62.0	64.7
Ireland	36.2	82.7	87.1
UK	62.1	80.4	84.5
Bulgaria	0.7	11.2	12.4
Czech Republic	1.9	10.8	12.4
Estonia	7.6	38.2	41.7
Latvia	3.9	31.2	36.2
Lithuania	2.2	18.8	21.7
Poland	3.4	15.6	19.1
Romania	n/a	3.7	5.4
Slovakia	3.9	13.2	16.5
Slovenia	0.8	9.1	13.7

Source: European Mortgage Federation, 2012

**d) *The future of home ownership***

Explanations of the past growth in home ownership across Europe have largely focused on particular economic and political developments at the macro level and have included the impact of: rising incomes and affluence following post-war reconstruction in a number of countries; favourable fiscal treatment (including tax benefits); rising demand and the hedge against inflation provided by property ownership; development of mortgage markets and direct policy intervention such as the policy of Right-to-Buy in the UK, or the various forms of transfer of rental property to owned property seen in some of the transition countries (Doling and Elsinga 2012). Especially because of the onset of the crisis in 2007 and the subsequent financial and economic problems throughout Europe, however, any certainty about the future of home ownership sectors has been eroded. Before continuing to the investigation of the impacts of home ownership sectors on jobs, we consider how those sectors themselves might develop.

**i) *Real economies and demand for home ownership***

There is evidence, for at least some of the member states, that impetus for further growth of home ownership sectors, as evidenced by entry of young, first-time buyers into the sector, was beginning to wane even before 2007 (Heywood 2011; Nielsen and Jensen 2011; Pattison 2010). Attributing this to labour market developments that made it difficult for young people to get a job at all, yet alone one with a relatively secure income, one view is that this is a pan-European trend (IUT 2011). Continuation of the current low, and even negative, rates of economic growth, of low demands for labour with high rates of unemployment especially for younger (below 30 years) people, and of low, or even negative, growth of real incomes, exacerbated by increases in the cost of living, will all have a depressing effect on the ability of individuals to form households separate from their parents let alone to enter home ownership. The issue here is affordability in the senses of both income that is insufficient in size and continuity to meet the regular, ongoing costs of house ownership, and of wealth that is sufficient to meet deposit and transaction costs (Pattison 2010).

**ii) *Housing finance***

The ability of households to enter home ownership is generally enhanced in countries with developed mortgage markets where a large amount of funding, relative to the number of households, is available on terms which allow high loan to value and loan to income ratios. A widely accepted measure of the development of mortgage markets is outstanding mortgage loans as a percentage of GDP. Although, as shown by table 3, the ratio varied considerably across member states, generally it was increasing in the decade or so before the start of the crisis. Subsequently the amount of new mortgage lending has declined in many countries (Doling 2013). This may be partly attributed to a fall in the demand for loans for the purchase of housing, but also to their supply. Many banks continue to have liquidity, capital adequacy and bad debt problems. In some countries such as Spain and Ireland there is a surplus of unsold housing, allied to falling house prices, and expected further falls. In these circumstances many European

financial institutions have been unable and/or unwilling to increase new lending even to 2007 levels.

*iii) House price inflation and housing wealth*

House prices increased in most EU countries over the last quarter of the 20th century, with the doubling of house prices in real terms in countries such as the United Kingdom, the Netherlands and Ireland. Although the long-term returns from stocks and shares were frequently greater, the gains from property ownership were substantial and households viewed houses to be less risky assets. Consequently the general trend towards home ownership partially stemmed from investment demand and the desire to obtain capital gains in the housing market, especially given the special position occupied by housing in terms of taxation. Such a view was pervasive amongst households in the majority of EU members and encouraged the young to step onto the housing ladder at an early stage in their life cycle. There was also a tendency to take out as big a loan as the mortgage company would grant in an attempt to maximise the financial gains from home ownership.

One of the consequences of the appreciation of the value of homes in real terms was that households held a large proportion of their wealth in the form of housing, with the proportion of wealth being around 60 per cent for a home owner. Even though downsizing was an option, households were tempted to hold onto the family residence even after the children had fled the nest due to the extra gains that could be made from owning a more expensive property. In a similar vein households would not consider switching tenure and rent their home after retirement. Such a decision would release housing equity and enable the elderly to have a more comfortable retirement. It was only when the individual became infirm and was no longer able to cope that renting became the most sensible option.

From 2008 house prices fell across Europe as a direct consequence to the global financial crisis (table 2). It had previously been rare for house prices to decline in nominal terms and this led to a re-evaluation of whether the housing market was the most appropriate place to keep household wealth. The European Union was then hit by a second shock, the Euro crisis, which led to further declines in the real value of residential property. As a consequence of the various bailouts, a number of governments undertook austerity measures, either voluntarily or forced, and this impacted on the housing market. The size of the collapse differed from member state to member state, with the decline in house prices in real terms lasting until 2013 in many cases.

The "safe as houses" perception has been questioned over the last five years and there has been a decline in the demand for houses for investment purposes, which naturally means a decrease in home ownership rates. The problem is further compounded as the various crises and subsequent austerity packages have led to households adopting a relatively cautious approach to their holding of assets, particularly as their value has

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been significantly reduced since 2007. Furthermore, they are unsure what is going to be provided by the government in the future, resulting in a further reduction of home ownership rates.

### *iv) Public policies*

At both the European Union and member state levels, public authorities have recognised the need to strengthen regulatory regimes for financial sectors. These regimes are in the process of being negotiated and, as such, their precise form is unknown. However, it may be anticipated that they will require financial institutions to increase their assessment of loan applications and thereby increase the cost of loans (Doling 2013).

In some countries there has been an added recognition that previous practices related to lending against housing collateral had resulted in an undesirable level of risk to households, financial institutions and national economies and that existing practices needed to be accordingly modified. In the Netherlands, for example, the authorities have reduced tax relief on housing loans, and in Poland reduced accessibility to housing loans in foreign denominated currencies (see Doling 2013). Notwithstanding the experience of the role of housing finance in the financial crisis and the consequent attempts by public authorities to modify previous practices, not all governments have acted consistently. For example, the UK government is currently introducing a mortgage guarantee system with the stated aim increasing accessibility to mortgage finance for those who have sufficient income to repay but not sufficient wealth for a deposit.

Low, and even negative, rates of economic growth, allied in some countries, such as Greece, Italy and UK, to austerity packages have also lead to governments to reconsider public expenditure priorities. Some of the consequent expenditure cuts have directly impacted on housing sectors, for example through reductions in social housing construction programmes, in housing allowances for tenants, and reductions in tax breaks for home buyers.

### *v) Demographics and home ownership*

A key factor affecting the demand for home ownership comes from the demographic structure of economies, ranging from age cohort distributions and household formation to the number of immigrants entering the country. The age of leaving the family home and forming a new household is endogenous and for instance will be influenced by the cost of the various forms of housing tenure and the disposable income of the individual. Likewise the size of families is dependent on the financial burden of children and the preference of parents.

At the other end of the age spectrum is the ability of the household to remain in their own property in old age. Most EU countries have witnessed a rise in the number of single person households beyond retirement age. Clearly this depends on a number of

factors, for example the amount of support provided by the state and by the family unit. In many countries in the EU households are encouraged to live independently for as long as possible, mainly because this is the cheapest option. The ability to maintain employment in old age will influence the housing tenure of the household. With the onset of austerity packages, however, there has been a decline in the generosity of support for the elderly and the infirm. Furthermore, the statutory retirement age has been increasing over the last six years. Consequently, the ability to stay in employment, albeit with reduced hours, will assist the elderly to remain in the family home for a longer period of time.

Some countries have seen significant increases in their populations resulting from immigration, mainly facilitated by the free movement of labour from new member states. The causes of the net flow of labour within the European Union are complex including relative wage rates and employment opportunities. In addition to strictly economic factors, it may be that the quality of life is an important determinant to uproot and move to another member state. Government policies may assist in the process by making barriers lower and providing information to potential workers, see De Somer (2012).

*vi) Possible home ownership rates in 2025*

The wider impacts of home ownership sectors on economies and labour markets of the member states are dependent, *inter alia*, on the size of those sectors, as measured by the proportion of national populations or households who hold property rights in the form of homes which they occupy. Critical to our considerations then are the dynamics of home ownership sectors and their likely future development.

On the face of it, trends during the years immediately preceding the onset of the financial crisis in 2007 clearly signposted the direction of change: with the major exceptions of Germany and Finland housing sectors across the member states had experienced a strengthening orientation towards home ownership. By then, some two thirds of EU25 households were home owners and the foundations of sustained growth looked secure.

Yet, behind the trend there were already signs that further growth might not materialise. Firstly, much of the growth especially in the newer member states, which had achieved home ownership sectors in excess of 80 and in some cases 90 per cent, had been the consequence of the once-and-for-all privatisation of state housing. In these circumstances further growth did not seem possible. Secondly, in a number of member states there was evidence, from at least 2000, that the flow of young, first-time entrants to the sector was falling markedly, raising doubts about the long run sustainability of even current levels of home ownership.

The onset of the financial crisis however dramatically exposed the shaky foundations of European housing markets. The availability of mortgage finance, secure employment, rising house price, and pro-owning policies could no longer be assured

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and with that any certainty about expanding home ownership sectors has dissipated. The evidence from some member states is of contraction rather than expansion.

Six or seven years on from the onset of the crisis, then, the continuing uncertainties about economic recovery, the political and economic impact of austerity measures, the existence and nature of the euro, and even of to the European Union - all of which are fundamental to the dynamics of housing markets – present a changed context.

What estimates can be provided, then, of the size of home ownership sectors across the member states by 2025?

In the case of the UK, trend-based projections suggest that the home ownership rate by 2020 could be as low as 60 percent, a reduction from a peak of around 70 per cent, this being largely attributable to an increase in the size of the privately rented sector (Pattison 2010, Heywood 2011). Trend-based projections using Eurostat figures would appear to indicate that the overall EU27 rate will be fairly similar to the pre-crisis one.

On the basis of the likely trajectories of the identified drivers of change, however, the conclusion would be different. Critical here are: there is now little social housing left for further privatisation; the constraints on younger people entering home ownership seem likely to continue; financial institutions do not appear likely to be able (even if they should wish to do so) to increase their lending volumes back to 2007 levels; many governments will continue to face fiscal constraints. On the bases of these trends, then, it appears more likely that, while there will undoubtedly be differences from member state to member state, with some experiencing increasing and some decreasing rates of home ownership, the picture over the EU27 as a whole will be of a decreasing home ownership rate.

## 2. Home ownership and unemployment

Home ownership has been supported by governments in many European countries as it is perceived to have a positive benefit on households, for example home ownership can be thought to be a factor influencing the nature of the neighbourhood. Equally, home ownership is one way through which households may accumulate assets for retirement, which may not have been done as part of a deliberate strategy but may be unplanned with unexpected capital gains viewed as “manna from heaven”. Whatever the process, housing equity forms a major part of the wealth holdings of European households in each EU country (Elsinga and Doling 2012). Home ownership is also widely believed to produce better citizens, who have an attachment to a particular location (DiPasquale and Glaeser 1999). Detailed empirical study indicates that one way in which this has been manifested is through tenure –specific mobility rates with home owners on average moving less frequently than renters (DiPasquale and Glaeser 1999).

The lower propensity of home owners to move provides a basis for linking unemployment to tenure. Unemployment rates differ widely across time and across the European Union (table 4). During the 1990s a number of economies had double digit unemployment rates, in particular Spain and Finland, while others, Austria and Luxembourg for example, had rates below five per cent. The majority of the old EU members experienced a decline in unemployment rates by 2000, only for the rates to increase over the next five years.

**Table 4: Unemployment in the European Union**

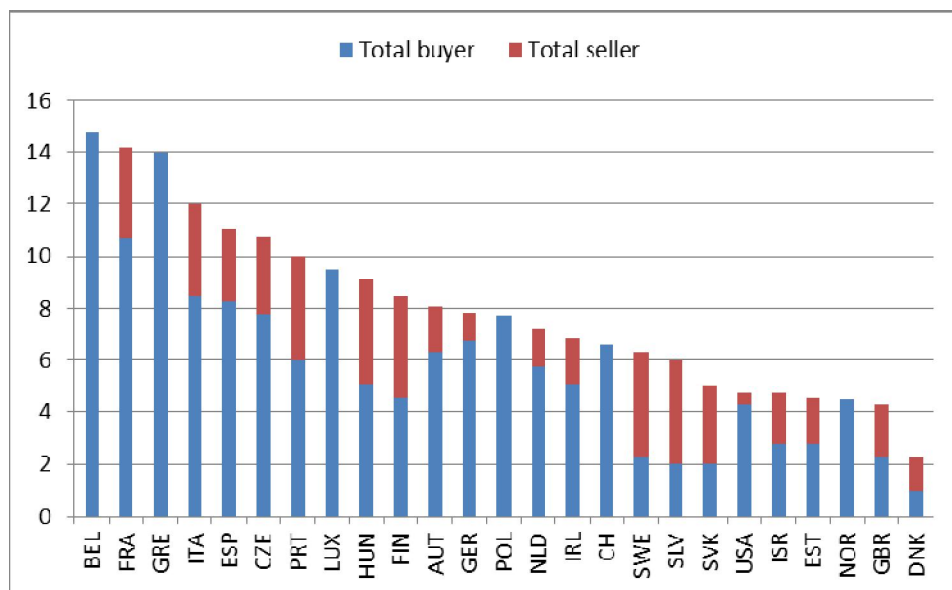
	1995	2000	2005	2010
Austria	3.9	3.6	5.2	4.4
Belgium	9.7	6.9	8.4	8.3
Czech Republic	..	8.7	7.9	7.3
Denmark	6.7	4.3	4.8	7.5
Estonia	..	13.6	7.9	16.9
Finland	15.4	9.8	8.4	8.4
France	10.5	9.0	9.3	9.7
Germany	8.3	8.0	11.3	7.1
Greece	..	11.2	9.9	12.6
Hungary	..	6.3	7.2	11.2
Ireland	12.3	4.2	4.4	13.9
Italy	11.2	10.1	7.7	8.4
Luxembourg	2.9	2.2	4.7	4.6
Netherlands	7.1	3.1	5.3	4.5
Poland	..	16.1	17.9	9.6
Portugal	7.2	4.0	7.7	11.0
Slovak Republic	..	18.9	16.4	14.5
Slovenia	..	6.7	6.5	7.3
Spain	20.0	11.7	9.2	20.1
Sweden	8.8	5.6	7.6	8.4
United Kingdom	8.5	5.4	4.8	7.8
European Union (27 countries)	..	8.8	9.0	9.7

Source: OECD

In theory, cross-country differences in the rates could be reduced by moving the surplus labour to areas where unemployment is lower, which could be regions in the same country or in different countries. In a frictionless world, the incentives for international labour mobility could be high wages and a higher probability of finding

suitable employment in the expanding economy. Whether an unemployed worker is prepared to move and work in another country depends upon the potential benefits and the costs associated with such a decision. The expenses of moving location are numerous, ranging from the search and transaction costs when buying and selling a property to cultural and language barriers. While these costs vary considerably across the member states (figure 1) in general they are higher for home owners than for renters.

**Figure 1 Transaction costs for property purchases, OECD countries, 2009**



Source: Johansson, Å. (2011), "Housing Policies in OECD Countries: Survey-based Data and Implications", OECD Economics Department Working Paper.

In a series of papers, Oswald (1996, 1997a,b and 1999) explicitly linked unemployment to home ownership, arguing that the latter impeded mobility which in turn increased unemployment. An asymmetric demand shock may lead to home owners in an economically-depressed region with a stark choice: either stay in the region but remain unemployed or take another job with a lower wages, or meet the housing transaction cost and move to a more economically-vibrant region. The higher the transaction costs the lower will be the incentive for unemployed home owners to relocate, which leads to an unemployment imbalance. In reduced form, Oswald argues that high rates of owner occupation results in lower equilibrium employment, higher unemployment and higher wages.

There are a number of factors that may augment the general argument. For instance, government policies to encourage owner occupation may undermine a well-functioning rental market and make it harder for renters to search for a suitable property in the other economy (Oswald, 1999). As a consequence, even renters are deterred from moving to secure employment after being made redundant.



Other studies - some directly spawned from Oswald, some independent of it - have also examined the role of housing in contributing to unemployment. Using an imperfectly competitive model of the labour market, Nickell (1998) and Nickell and Layard (1999) incorporate home ownership rates as an additional explanatory variable of medium-term unemployment. The model, based on collective bargaining with price setting and wage setting behaviour, has been able to capture the supply-side factors prevalent in the 1970s and 1980s. The price mark-up by firms, the ratio of the prices to wages, depends upon labour productivity and the degree of product market competition. The real wage demanded by unions, the wage mark-up above the competitive wage, is determined by factors that increase wage pressure in an economy, for example trades union mark-up, tax wedge, the replacement ratio and real import prices. Unemployment changes to reconcile the wage claims of the two sides of the collective bargaining process.

Whereas, according to Oswald, higher home ownership leads to a lower incentive for the unemployed to search for new job opportunities when the economy is hit by a demand shock, resulting in lower labour market mobility. Within the Layard-Nickell model, greater home ownership may lead to greater wage pressure as workers are less worried about the "reserve army of workers" replacing them due to the lower incentive for employees to relocate. A higher wage mark-up causes the wage setting curve to shift upwards, with higher unemployment resulting.

The arguments of Oswald have been modified by Dohmen (2005), which focused on the skill mismatch that may result from home ownership. Workers will only relocate if the wage in the new region exceeds the unemployment benefit and the cost of changing location, which is higher for owner occupiers. However, skilled workers will tend to receive higher wages, which will tend to exceed the relocation cost, so they are more likely to move. In comparisons the low-skilled home owners earn lower wages and are less likely to move and therefore remain unemployed. Hence any cross-country study should include the education level of the workforce in the economy. The positive relationship between home ownership and unemployment needs to control for the education levels in the countries. Above a certain skill level, a positive relationship may not be found.

The Oswald thesis might be undermined by the conjecture of Munch *et al.* (2006), based on the relationship between distance and the reservation wage: while home owners have a higher reservation wage for jobs further away, they also have a lower reservation wage for jobs closer to their current location. Consequently, if workers adjust their wages demands it is possible that countries with high homeownership might have low unemployment. Whether such an outcome is present will depend, *inter alia*, upon regional wage setting.

In a similar vein, unemployed home owners with a mortgage may have a greater incentive to accept a job and avoid their family property being repossessed. The

immobility of home owners may have led them to invest more in the local labour market, especially if detailed knowledge of the immediate locality is highly valued. Furthermore, there is a greater incentive for firms to invest in their workforce by increasing training programmes, increasing firm-specific productivity and making firms less willing to end their employment in a recession. As a consequence home ownership may lead to lower unemployment in the short run. If the adverse demand shock turns out to be permanent then firms will lay off workers and a positive relationship may exist in the medium term and the long run.

Coulson and Fisher (2009) use a search and bargaining framework to assess the Oswald thesis. They posit that home owners experience higher unemployment than renters because, due to the costs of relocating their place of residence, they embark on a narrower search, either geographically or occupationally. Consequently, the bargaining power of workers is reduced, which leads to lower wages and more employment. One important aspect of this model is that lower wages imply that firms make higher profits, encouraging new firms to enter the market. Within a dynamic competitive model, higher home ownership may lead to more jobs via increases in the number of firms in the economy, even though the tenure may lead to labour market rigidity.

The above survey of the theoretical literature on the interaction of home ownership and unemployment does not come to any unambiguous conclusions. The results depend upon the specific assumptions made and the strengths of the differing effects. A similar picture arises for the empirical studies of the Oswald hypothesis, although there is some consensus from the studies using disaggregated data: home owners have better employment prospects compared to renters, which may partially explain why they are home owners in the first place (see *inter alia* Coulson and Fisher, 2002, 2009, for the US; Robson, 2003, for the UK; van Leuvensteijn and Koning, 2004, for the Netherlands; Munch *et al.*, 2006, 2008, for Denmark).

The relationship between owner occupation and unemployment can be considered from a slightly different, but related, perspective by using micro data sets to investigate whether home owners are mobile once they have become unemployed. Results for the UK support the view that, relative to renters, home owners tend not to move in response to relative labour market opportunities, Henley (1998). On the other hand, the Van Leuvensteijn and Koning (2004) results are mixed. They found that the probability of employed homeowners moving is lower than renters and that employed home-owners are less likely to change jobs than renters, both supporting the Oswald conjecture. However, the probability of unemployed home-owners moving is higher than renters, which goes against the Oswald thesis.

In contrast to the studies using disaggregated data, empirical work based on macro datasets tend to confirm the Oswald thesis. As emphasised by Isebaert *et al* (2010), it is possible for there to be a contradiction between the micro results and those based on

macro datasets. Increases in home ownership may lead to negative externalities, for example a shortage of suitable rental properties or increased congestion due to households commuting to neighbouring regions for employment.

Nickell (1998) added owner occupation rate to the general supply-side variables when estimating the determinants of medium-term unemployment. He concluded that union density and a rise in union coverage had the major impact on unemployment, although this effect could be mitigated by an increase in the coordination of unions and employers in discussions (Calmfors and Driffill 1998). The influences of the replacement ratio and the total tax rate on unemployment are of a secondary order of magnitude. However, there was still evidence of home ownership rates influencing medium-term unemployment amongst OECD countries, although the inclusion of conventional labour market determinants reduced its impact.

Oswald (1996, 1999) used within country analysis to obtain evidence supporting his conjecture. This approach spawned a number of country-level studies investigating the link between home ownership and unemployment among regions in an economy (see *inter alia* Pehkonen, 1999; Barrios Garcia and Rodriguez Hernandez, 2004; L'Horty and Sari 2010). One advantage of such an approach is that it removes problems associated with differences between nations of the definitions of the key variables, especially those related to the labour market. However, the drawback from such an approach is that the key housing variables do not display significant regional variation. To overcome this deficiency such analysis tends to be undertaken within a panel framework, with a relatively long time dimension. There is the added complication that spatial econometric techniques should be employed to investigate the Oswald hypothesis using regions within a country.

More recently Oswald had re-ignited the debate and used US state level data, within a panel framework, to analyse the relationship between unemployment and home ownership, Blanchflower and Oswald (2013). Although their procedures are relatively simple, they claim that home ownership has a delayed impact on unemployment but that the long-run elasticity is around 2. The exact mechanism is not clearly identified but home ownership was found to be associated with lower levels of labour mobility, longer times for commuting and lower levels of new business formation. However, numerous criticisms could be levelled at the econometric analysis, particularly the failure to employ non-stationary panel techniques.

From an econometric perspective, the existing macro studies raise a number of methodological issues. Some studies use cross-country datasets and so fail to control for regional or fixed effects. While this can be addressed by using panel data set, care must be taken as some of the housing variables, for example home ownership, do not vary rapidly over time. Furthermore, although it may be difficult to consider the Oswald thesis within a broader framework incorporating other labour market determinants of unemployment, capturing wage pressure in each country, failing to do

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so may open such studies to the criticism of omitted variable bias. Finally, there may be a failure to recognise that a household's choice of tenure is determined by the probability of employment in the future (e.g. Rosen and Rosen, 1980; Henley, 1998; van Leuvensteijn and Koning, 2004). Few studies have endogenised the households' tenure choice by using instrumental variables; Barrios Garcia and Rodriguez Hernandez (2004), Cochrane and Poot (2007) and Coulson and Fisher (2009) appear as exceptions.

### 3. Data and model

The literature survey has identified the main potential explanatory variables of the unemployment rate or the duration of unemployment between countries in the EU. The causes can be categorised into three general factors: the housing market, the labour market and the general economy. Within a panel framework, the basic specification of the unemployment equation can be expressed as

$$U_{it} = \beta_{0i} + \beta_1 HO_{it} + \beta_2 \Delta \ln Ph_{it} + \beta_3 \Delta \ln \left( \frac{M}{Pgdp} \right)_{it} \\ + \beta_4 RR_{it} + \beta_5 Twedge_{it} + \beta_6 LP_{it} + \beta_7 TUD_{it} + \beta_8 \Delta \ln Y_{it} + \beta_9 ALMP_{it} + \varepsilon_{it}$$

where  $U_{it}$  denotes the unemployment rate in country  $i$  at time  $t$ .

The home ownership rate ( $HO_{it}$ ) is included to capture the simplified version of the Oswald hypothesis. However, recognising that the effect of home ownership on unemployment is multi-dimensional, house price inflation ( $\Delta \ln Ph_{it}$ ) and the real stock of mortgages ( $\Delta \ln (M/Pgdp)$ ) have also been included as explanatory variables. Increases in the annual rate of change of house prices could discourage households from moving to secure new employment for two reasons. Firstly, it could suggest that there is a sellers' market and finding an appropriate dwelling would be difficult, with pressure placed on households to make a quick decision. Secondly, higher house price inflation would lead house buyers to increase their wage demands, which for a given level of aggregate demand would lead to higher unemployment. The outstanding mortgage stock is also included as a potential barrier to labour mobility in that high levels of housing debt, and low levels of equity, may make it difficult for households to move for a new job should they have been made redundant.

These three housing variables do not provide direct measures of the costs of moving, which previous research has indicated may be important (see section 2). Information about transaction costs over time are not only patchy but in any case indicate that they have not varied greatly over the sample period. Consequently, they are a time-invariant factor contributing to the coefficient on the fixed effect dummy.

The variables used to capture the state of the labour market and the incentives to find employment are consistent with those identified in the literature: the replacement ratio ( $RR$ ), the tax wedge ( $Twedge$ ), labour productivity ( $LP$ ), trade union density ( $TUD$ ) and active labour market policies ( $ALMP$ ). An increase in the benefit-wage ratio reduces the costs of not having a job, which discourages the search for employment. As a consequence the influence on unemployment is expected to be positive. Likewise an increase in the tax wedge would lead workers to increase their wage demands in a hope to maintain their standard of living, which would lead to higher unemployment.

The impact of labour productivity and of trade union density can be ambiguous. Increases in the growth of output per head will lead to a rise in wage pressure as workers expect to be rewarded for the extra output. At the same time the increase in labour productivity results in a decrease in price-wage mark-up, equivalent to an upward shift of the feasible wage. The net effect on unemployment depends upon the magnitude of the two influences. As far as trade union density is concerned, a rise might signify an increase in union militancy and higher pay demands. Alternatively, an increase in union membership might lead to improved collective bargaining and lower unemployment.

The growth of GDP,  $\Delta \ln Y$ , has been considered as a potential determinant of unemployment. Demand shocks are only usually considered within the Layard-Nickell model. However, as the growth of real house prices could be construed as a demand-side variable, it is sensible to include the growth of real GDP as a measure of economic activity in each member state.

The inclusion of the active labour market policy variable, ALMP, is in recognition that national governments adopt different courses of action that aim to help the unemployed find work. These policies, ranging from training schemes to employment subsidies, vary between the EU economies and may result in different rates of unemployment.

#### 4. Econometric results

Models were estimated using a panel data set comprising 16 countries (Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom) over 3 time periods (1998-2002, 2003-2007 and 2008-2011). The selection of the countries and of the time dimension of the analysis were determined by the availability of consistently measured variables. It is hoped that the cross-country variation in the data will capture the influence of the institutional setting on unemployment, in particular the effect of the home ownership rate. The relative slow movement of certain cultural variables means that the model was estimated over 5-year and 4-year averages.

The analysis is presented in two parts. The first examines the factors explaining medium-term unemployment: the second examines long-term unemployment, that is the proportion of workers without a job for over 12 months. The definition and source of the variables are given in the data appendix. In each part a range of models is presented and, in combination, they indicate the complexity of the relationships between unemployment and the independent variables.

##### a) Unemployment

Following Nickell (1998), versions of the unemployment relationship were estimated using the technique of GLS, an approach which was satisfied by the Hausman test.

Given that the sample size was relatively limited a stepwise methodology was adopted, with the results presented in Table 5. Column 1 provides a pure labour market examination of the factors influencing medium-term unemployment. The coefficients on the replacement ratio ( $RR$ ) and the tax wedge ( $TWEDGE$ ) are correctly signed. However, while the former is significant at the 5% level, the magnitude of the coefficient suggests a relatively small influence on unemployment. As for the conjecture that trade union density ( $TUD$ ) is responsible for the rise in unemployment, according to equation 1 such a view is misplaced as an increase in union density reduces unemployment, although the effect is not statistically significant. One explanation of such a result is that a rise in union membership leads to improved economic coordination and lower unemployment.

**Table 5 : The Determinants of Unemployment**

	1		2		3		4	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Constant	5.36	2.221	-0.346	-0.067	-3.233	-1.116	-3.036	-1.232
$RR_{it}$ (%)	0.02	1.963			-0.02	-0.217	-0.07	-1.191
$TUD_{it}$ (%)	-0.019	-1.028			-0.024	-0.905	-0.027	-1.394
$TWEDGE_{it}$	0.098	1.582			0.113	2.363	0.132	2.574
$\Delta \ln Y_{it}$	-0.763	-3.933	-0.557	-2.228	-0.537	-3.813		
$ALMP_{it}$	-1.114	-1.889						
$HO_{it}$			0.116	1.568	0.12	2.147	0.122	2.04
$\Delta \ln(PH/P)_{it}$			-0.148	-2.466	-0.175	-3.671		
$\Delta \ln(M/P)_{it}$			0.073	0.304	0.131	0.587		
$\Delta \ln(M/Ph)_{it} - \Delta \ln Y_{it}$							0.248	4.25
1998-2002	1.465	1.84	2.613	7.21	2.594	4.563	1.791	2.156
2003-2007	1.097	1.417	1.533	39.742	1.483	3.751	0.637	1.18
Adjusted $R^2$	0.369		0.349		0.462		0.487	
Obs	43		43		43		43	

Unsurprisingly the growth of GDP has a strong influence on the reduction of the unemployment rate in EU countries, suggesting that the supply-side labour market factors have played only a relatively small role in influencing the medium-term rate of unemployment. While there may be concern that growth is an endogenous variable, its inclusion provides a benchmark against which the housing-related versions may be compared.

A version of the unemployment rate model solely with housing-related determinants is presented in Equation 2. Although the goodness of fit is slightly lower than Equation

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1, real house price inflation, the real stock of outstanding mortgage debt and the home ownership rate, along with the growth of GDP, can account for a reasonable proportion of the variation of the unemployment rate among EU countries in the late 1990s and 2000s. The coefficient on the growth rate is reduced once the growth of real house price is included as an explanatory variable, which may indicate that movement in real house prices are partly capturing the demand effects through the possibility of housing equity withdrawal. We are unable to construct a measure of housing equity as there is only an index of house prices, but by considering the growth rates of real house prices and of the stock of real outstanding mortgages, a picture of the growth of real housing equity can be observed. The effect of owner occupation is consistent with the Oswald hypothesis, even if it is not significantly different from zero at conventional levels.

Equation 3 combines both housing and labour market variables. The only supply-side variable that maintains its significance is the tax wedge, with the coefficient increasing slightly in magnitude. Interestingly the effect of the growth of GDP on unemployment is similar in size to that found in the previous versions of the estimated equation but it has become more significant with the inclusion of the conventional factors from the labour market. Home ownership also becomes statistically significant providing support for Oswald. However, the argument needs to be modified slightly as the proportional changes in real house prices will reduce medium-term unemployment in the EU. While the exact mechanism involved cannot be identified, a demand-side effect cannot be ruled out.

In the restricted version of the equation presented in column 4, the key variable is the growth of mortgage debt compared to the growth of income, which captures the burden of housing loans on households. For a given home ownership rate, an increase in the stock of residential loans would appear to limit the ability of households to relocate for employment. Only the tax wedge has a significant impact on medium-term EU unemployment; the coefficients on trade union density and on the replacement ratio are wrongly signed.



### b) Long-term unemployment

Rather than looking at the factors affecting general unemployment, our attention now focuses on long-term unemployment, defined as those workers unemployed for more than 12 months. The results of estimating equations for the duration of unemployment are presented in Table 6. Equation 5 includes only the labour market variables and, of these, the tax wedge variable is the only supply-side factor that is statistically significant. Unsurprisingly, the growth of GDP is found to reduce the duration of unemployment, which indicates growing economies enable those without a job to find a suitable one more quickly.

Comparisons between the different versions of the model of long-term unemployment are difficult due to missing observations for certain variables causing the sample size to vary. However, the model solely comprising housing variables, Equation 6, tended to provide a better explanation of the proportion unemployed for over a year, even though the each variable is individually not statistically significant.

**Table 6: Duration of Long-term Unemployment**

	5		6		7		8	
	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat	Coeff	t-stat
Constant	27.787	12.951	22.03	2.421	15.06	1.383	15.65	1.024
<i>RR</i> (%)	0.007	0.106			-0.023	-2.565	-0.005	-1.11
<i>TWEDGE<sub>it</sub></i>	0.188	2.452			0.057	0.489	0.076	0.423
<i>LPROD<sub>it</sub></i>	-0.640	-0.420			5.578	4.296	3.212	1.770
$\Delta \ln Y_t$	-1.519	-2.214						
<i>ALMP<sub>it</sub></i>	0.450	1.214					-2.456	-1.883
<i>PLMP<sub>it</sub></i>							2.885	1.509
$\Delta \ln(M/P)_{it}$			-0.248	-0.551				
$\Delta \ln(PH/P)_{it}$			-0.159	-1.461				
<i>HO<sub>it</sub></i>			0.171	1.265	0.215	1.408	0.143	0.993
$\Delta \ln(M/Ph \cdot Yn)_{it}$					0.293	16.234	0.095	3.219
1998-2002	8.786	3.505	8.335	30.531	8.823	12.064	6.686	13.23
2003-2007	5.157	2.592	3.298	4.048	3.312	32.102	1.458	10.53
Adjusted <i>R</i> <sup>2</sup>	0.195		0.265		0.282		0.169	
Obs.	40		43		41		37	

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Equation 7 combines the both labour market and housing variables as determinants of long-term unemployment. The growth of the stock of mortgages adjusted for house price inflation and nominal GDP growth tends to be the driving force behind the proportion of unemployed over 12 months. A possible explanation of this finding is that long-term unemployment is higher in countries with high mortgage-to-income ratios as households are less able to move in search of new jobs due to their indebtedness. It indicates that the effects of housing variables on the labour market are multifaceted and constrain the geographical mobility of workers. The simple Oswald's hypothesis stresses the role of home ownership in the EU but this variable does not have a significant effect on the duration of unemployment.

There are some influences from the supply side, with both the replacement ratio and labour productivity being significant. However, the impact of the former variable is incorrectly signed, which may indicate that some benefits are contingent on the unemployed registering at job centres.

Equation 8 attempts to overcome the problems associated with the previous equation by including government measures of active and passive labour market policies, with two important supply-side differences being observed. Firstly, the coefficient on the replacement ratio, although still negative, becomes insignificant. Secondly, the effect of labour productivity is reduced in magnitude which would be consistent if the government spending to reduce unemployment included policies to retrain those not in work. However, the main findings from the housing market still stand and the growth of household indebtedness compared to the growth of income having a strong impact on the duration of unemployment.

### Policy implications and conclusion

In a series of provocative articles, Oswald conjectured that home ownership was at the heart of the unemployment problem in the European Union. The hypothesis spawned a number of studies, using macroeconomic and microeconomic data set, into whether a link between owner occupation and unemployment could be found. At the theoretical level, research has focused on search theory to identify rigidities in regional markets. However, it is difficult to identify a consistent conclusion from surveying the applied literature. Macroeconomic studies have tended to support the Oswald hypothesis whereas findings from more disaggregated data sets have failed to establish a link.

The Oswald hypothesis has been examined using a data set comprising 16 EU countries. It is unfortunate that this excludes 11 member states most of which are newer member states (only Estonia is included). Speculation about the extent to which the results can be generalised to them is further complicated because of the differences within this group, say as between Poland and Cyprus.

On the other hand, with the sample period covering the late 1990s and 2000s, the data set does allow the extension of the original conjecture by including the financial crisis and the recovery years in the sample period.

Examination of the models presented, indicates that although there is evidence that an economy with a high proportion of home owners will have a high unemployment rate, the exact mechanism is considerably more complex. It is possible that there are differences between long-term and short-term effects and the influence of the housing market appears to go through the stock of outstanding mortgages. This could operate in different ways in different countries. But, it is possible that when families take on large mortgages to finance dwellings, they are restricting the location for their employment opportunities. While this may not be a problem when adults are in continuous employment, issues arise when the household needs to relocate for employment. Increases in household indebtedness mean that family units are less able to respond to changing circumstances. Countries where home ownership is the dominant form of tenure will experience higher unemployment for a given demand shock. In this sense we provide some new evidence to the gaps in the knowledge about the impact of mortgage markets, but a more detailed understanding on the micro level about possible differences in mobility between outright and mortgaged owners is needed (see Havet and Penot, 2010).

From this there are important considerations for policy makers. The first concerns the future of mortgage markets. Our data covers the start of the present financial and economic crisis, which among other things has seen, in most member states, a reversal of the former and long-lasting trend of increasing levels of mortgage activity. Even since 2007 the total value of the outstanding mortgage stock has generally increased, albeit at a slower rate. In that our findings indicate that net mortgage indebtedness has a positive impact on the unemployment rate and the duration of unemployment via its influence on labour mobility, a key consideration concerns the extent to which mortgage markets return to their former trajectory. Insofar as they do, and insofar as this increases levels of household indebtedness tied to housing, it suggests that in the future home ownership will impose an even greater barrier on labour mobility and thereby the optimum matching of workers with jobs.

Regarding the state of the housing market in 2025 and its future impact on unemployment, any forecasts are extremely speculative and depend upon how the EU economies fare from the global financial crisis and the euro crisis. It is doubtful that the high home ownership rates seen in 2007 are unlikely to be seen in the next two decades time, partly as they appeared unsustainable at the time. However, it is not envisaged there will be a convergence in rates to an average EU proportion of home owners. There will still be a significant divergence in owner occupation among member states, partly due to the ingrained preferences towards the various housing tenures.

Although the stock of outstanding mortgages will tend to increase over the next 15 years, the rise will not be at the rate experienced in the 1990s and 2000s. However, outstanding mortgages will decline as a proportion of GDP as recapitalisation in the

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housing finance industry will be a long drawn out process and it is unlikely that the lending practices of the early 2000s will be seen again.

From a policy perspective member state governments and their regulatory bodies should monitor the build up of net residential debt and consider imposing limits in relation to income. This might include re-consideration of inducements for households to maximise their mortgage debt and phasing out incentives such as mortgage interest tax relief, which still exist in some EU countries (Van den Noord 2005).

The second concerns the significance of distance. In the past in certain situations, the physical separation between the location of the worker's residence and workplace were critical in matching workers with jobs. The development of means of physical transport that were cheaper and quicker have enabled longer commuting distances thereby reducing the importance of relocating the home in order to relocate the place of work. One issue for governments will be the extent to which they encourage further investment in transport infrastructure.

Perhaps of greater significance however is the increase in remote working. The development of ICT, for example through the use of the internet, has for many organisations and workers broken the previous relationship between home and work. Much productive activity, especially in the service industries is now undertaken at and from the home of the worker, so that travelling daily to the employer's place of work is no longer. Clearly, the greater the extent of such developments in technology and work practices, the less that the location of the home will impact on the ability of the worker to get a job.

**Data appendix**

<b>Variable</b>	<b>Definition</b>	<b>Source</b>
<i>U</i>	Unemployment rate	Eurostat
<i>LTU</i>	Long-term unemployment rate	Eurostat
<i>RR</i>	Replacement ratio Unemployment benefit-wage ratio	OECD
<i>TUD</i>	Trade union density	OECD
<i>LPPROD</i>	Labour productivity	
<i>TWEDGE</i>	Tax wedge	OECD
<i>Y</i>	Real GDP	OECD
<i>Y<sub>n</sub></i>	Nominal GDP	OECD
<i>ALMP</i>	Active labour market policies	OECD
<i>PLMP</i>	Passive labour market policies	
<i>HO</i>	Home ownership	EMF
<i>PH</i>	House price index	EMF
<i>P</i>	GDP deflator	OECD
<i>M</i>	Stock of total outstanding mortgages	EMF

16 countries: Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom.

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