OECD Economics Department Working Papers No. 836

Housing Markets and Structural Policies in OECD Countries

Dan Andrews,
Aida Caldera Sánchez,
Åsa Johansson

https://dx.doi.org/10.1787/5kgk8t2k9vf3-en

OECD

Unclassified **ECO/WKP(2011)5**

Organisation de Coopération et de Développement Économiques
Organisation for Economic Co-operation and Development **25-Jan-2011**

English - Or. English

ECONOMICS DEPARTMENT

ECO/WKP(2011)5
Unclassified

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By Dan Andrews, Aida Caldera Sánchez and Åsa Johansson

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JT03295523

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ABSTRACT/RESUMÉ

Housing markets and structural policies in OECD countries

This paper compares a number of housing policies such as housing taxation, land use and rental regulations and social housing policies for OECD countries relying on new data. Based on a range of econometric analyses, it also investigates whether these housing-related policies achieve their objectives in an efficient and equitable way and whether there are any side effects on other aspects of housing markets or on the wider economy. One main finding is that badly-designed policies can have substantial negative effects on the economy, for instance by increasing the level and volatility of real house prices and preventing people from moving easily to follow employment opportunities. The paper makes some recommendations for the design of efficient and equitable housing policies that can improve the functioning of housing markets and contribute to macroeconomic stability and growth.

JEL classification codes: R31; R21; H20; H24; G21; R38; R23.
Key words: Housing markets; mortgage markets; property taxation; land-use and rental regulations; house prices and volatility; residential mobility.

++++++++++++++

Les marchés du logement et les politiques structurelles dans les pays de l'OCDE

Cet article compare un certain nombre de politiques du logement tels que la fiscalité du logement, les règles d'urbanisme et les réglementations du marché locatif, ou de politiques de logement social pour les pays de l'OCDE en s'appuyant sur des données comparatives. Il examine également si ces politiques liées au logement attendent leurs objectifs de manière efficace et équitable et s'il y a des effets secondaires de ces politiques sur d'autres aspects des marchés du logement ou sur l'économie en général. Une conclusion principale est que les politiques mal conçues peuvent avoir des effets négatifs importantes sur l'économie, par exemple en augmentant le niveau et la volatilité des prix réels des logements et en empêchant les gens de se déplacer facilement pour accéder à l'emploi. Le document formule quelques recommandations pour la conception des politiques du logement efficaces et équitables qui peuvent améliorer le fonctionnement des marchés du logement et de contribuer à la stabilité macroéconomique et la croissance.

Codes JEL : R31 ; R21 ; H20 ; H24 ; G21 ; R38 ; R23.
Mots Clés : Marchés du logement; marchés hypothécaires ; l'impôt foncier ; règles d'urbanisme et réglementations du marché locatif ; prix de l'immobilier et volatilité ; mobilité résidentielle.

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HOUSING MARKETS AND STRUCTURAL POLICIES IN OECD COUNTRIES

By Dan Andrews, Aida Caldera Sánchez and Åsa Johansson[1]

1. Summary and main findings

1.1 Introduction

1. Housing warrants attention for several reasons. It is an important element of wealth as well as the single biggest expenditure for a majority of households and, as witnessed by the recent financial and economic crisis, housing market outcomes can have repercussions for the macro economy. A well-functioning housing market supporting geographical mobility is also necessary to ensure efficient labour market outcomes. Housing also deserves attention for social reasons, *inter alia* because adequate housing may enhance children's opportunities for educational achievement and their future employment. A wide range of public policies affect the housing market. Such policies are justified on the basis of repairing market failures, pursuing broader economic efficiency goals and a desire to influence the housing opportunities available to citizens. These interventions include fiscal measures (such as subsidies and taxes), direct provision of social housing (*i.e.* housing let/sold at below-market rents and/or allocated by non-market mechanisms) and regulations aimed at influencing rental markets, as well as the quantity, quality and allocation of dwellings. They also involve public resources being directed to redistribute income by supporting housing consumption (*e.g*. housing allowances).

2. A key policy issue addressed in this study is whether these public policies achieve their objectives in an efficient and equitable way. Another important issue is whether there are any side effects of such policies on other aspects of the housing market or on other markets (*e.g.* the labour market). These issues are explored relying on new comparative data on housing policies and using a variety of empirical approaches based on both macroeconomic time-series and household surveys.

3. The paper is organised as follows. The rest of this section summarizes the main results from the empirical analysis. Section 2 describes cross-country differences in selected housing market outcomes in OECD countries. Section 3 presents a simple framework for analysing the housing market and discusses the empirical approach utilised in the paper. Section 4 assesses the impact of housing and other policies on the owner-occupied housing sector. It draws on new OECD empirical evidence, partly based on member country replies to an ad hoc OECD housing market questionnaire, and existing findings in the literature.[2]

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[1] Corresponding authors are: Dan Andrews (Dan.Andrews@oecd.org), Aida Caldera Sánchez (Aida.CalderaSanchez@oecd.org) and Åsa Johansson (Asa.Johansson@oecd.org) all at the OECD Economics Department. The authors would like to thank Jørgen Elmeskov, Stephen Matthews, Giuseppe Nicoletti, Jean-Luc Schneider and Mark Stephens for their valuable comments and Catherine Chapuis for excellent statistical work, as well as Irene Sinha for excellent editorial support. The views expressed in this paper are those of the authors and do not necessarily reflect those of the OECD or its member countries.

[2] The aim of the OECD Housing Market survey conducted by the Secretariat in the beginning of 2010 was to collect comparable cross-country data on housing policies and to verify the accuracy of information

Section 5 looks at the functioning of rental housing markets in OECD countries, and analyses how policies condition outcomes in the private and social segments. In Section 6, the potential side-effects of housing policies on the wider economy are discussed with a particular focus on house price volatility and residential mobility. In the light of these findings, the final section discusses the implications of the analysis for policy design in the light of housing policy objectives.

1.2 Main findings

4. Despite wide variation in housing market characteristics in OECD countries, the following features of housing demand and supply stand out from the available data:

- The share of household spending on housing rose in most countries during the past decade, partly reflecting increased real house prices. Since the mid-1980s until recently, particularly large price increases were observed in Ireland, Spain, the United Kingdom and the Netherlands, while prices were stable or even declined in Japan, Switzerland and Germany.

- This surge in housing prices was accompanied by booming housing investment in several countries, particularly in Spain and Ireland, and also in some Nordic countries.

- The stock of housing has correspondingly increased, after accounting for changes in household structure, and is currently comparatively large in some southern European countries, while it tends to be lower in Eastern Europe.

- There are large differences in tenure structure across countries. Homeownership ranges from below 40% in Switzerland and Japan to above 90% in some Eastern European countries. Within the rental sector, the relative importance of private *versus* social rentals varies substantially. In a few countries social rentals account for more than 50% of the rental market, while in others they are almost non-existent.

- Despite these large variations in tenures, there has been a trend increase in the share of owner-occupied housing during the past few decades in most OECD countries, carrying possible implications for the labour market (see below). This increase in owner occupancy is only partly explained by changes in household characteristics – such as population ageing – suggesting a potential role for policy factors.

5. Cross-country differences in housing market characteristics depend, in turn, on structural factors that can be related to housing and other public policies. On the supply side:

- Housing supply responsiveness to price changes varies widely across OECD countries, with potential consequences for the nature and speed of the stock-flow adjustment mechanism that characterises housing markets. The long-run response of new housing supply is estimated to be strong in the United States and Nordic countries, while supply is more rigid in some continental European countries and the United Kingdom.

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already available from OECD and other sources (see Johansson (2011)). At the time of writing, 33 member countries responded to the questionnaire. The focus was on policies influencing the supply and demand, both owner-occupancy and rental, of housing. More specifically, indicators and data on four key housing policy areas were generated, namely: the extent of rent regulation, provision of social housing, housing-related taxation and transaction costs in buying and selling a dwelling.

- Low supply responsiveness of new housing has tended to exacerbate the price effect of changes in housing demand (*e.g.* caused by financial and labour market or demographic shocks). For example, in a country with supply responsiveness half a standard deviation below the median OECD country, the increase in house prices linked to a demand shock is roughly 50% larger than if the responsiveness was at the median. Thus, in rigid supply environments, increases in housing demand are much more likely to be capitalised into house prices than to spur increases in the quantity of housing, at least over the medium-term horizon covered by OECD analysis. Supply responsiveness depends not only on geographical and urban characteristics but also on public policies, such as housing market regulations. In particular, cumbersome land use and planning regulations are associated with a less responsive housing supply across countries. Likewise, across US cities supply is less responsive in those with stricter land-use regulations.

- The supply of social housing is one way for governments to support housing for certain categories of households. The delivery mode of social housing can affect the extent to which scarce public resources are allocated efficiently and directed to those most in need, but can also have implications for social mix, labour mobility and associated labour market outcomes. Across OECD countries, two social housing models emerge: one broad-based, where social housing is widely accessible and the other more targeted and means-tested.

- Newly-constructed indicators on regulation of both private and social rental markets capturing the degree of control of rents and tenant-landlord relations show that regulations tend to be relatively strict in some Nordic and continental European countries. Strict rental regulations are associated with lower quantity and quality of housing across countries, with uncertain benefits for tenants: there is no clear evidence that average rents are lower in countries with stricter controls than elsewhere.

6. On the demand side, the following factors are found to be important medium to longer-term determinants of housing spending:

- Economic growth, demographic developments and changes in household structure are likely to be key drivers of the level and structure of demand for housing. For instance, estimates show that population growth caused by net migration tends to initially translate into higher real house prices. Evidence also suggests that household structure influences tenure structure and thereby the demand for various tenures: younger, lower-income and smaller households are more likely to be renters, compared with other household types.

- Among macroeconomic influences, the elasticity of real house prices with respect to households' disposable income is found on average across countries to be close to unity (abstracting from quality improvements). Reductions in structural unemployment (*i.e.* NAIRU), which can reduce the uncertainty surrounding households' future income prospects, are found to increase house prices. Finally, declining interest rates are found to have a positive impact on real house prices after controlling for other demand and supply factors.

- Financial deregulation and mortgage innovations in OECD countries during the past three decades have been associated with a noticeable increase in demand pressures for housing. Estimates show that after accounting for a number of macroeconomic and structural influences, demand pressures stemming from financial deregulation may have translated into increases in house prices by some 30% in an average OECD country over this period, although it is likely that housing markets are still adjusting to this shock. Relaxation of down-payment constraints on mortgage loans is also found to have increased homeownership rates among credit-constrained, lower-income households. Such developments can pose risks for macroeconomic stability if

policy changes trigger a significant relaxation in lending standards and a subsequent increase in non-performing loans without adequate supervision in place.

- The way housing taxation influences housing demand varies across countries. However, a common feature is that owner-occupied housing is often treated favourably relative to other forms of investment through reduced tax rates or tax exemptions for imputed rental income and capital gains. Moreover, despite such exemptions, mortgage interest is often deductible from the income tax base. Such generous tax treatment can have adverse efficiency effects on housing and other markets by distorting the allocation of saving and investment, as well as distributional implications. For example, estimates suggest that interest deductibility of mortgages is generally capitalised into real house prices, thereby redistributing income from new entrants in the housing markets to insiders. Such tax reliefs also tend to be regressive since they are implemented as deductions from the tax bases rather than tax credits and, more generally, the propensity to own a house rises with income

7. Housing markets, and policies affecting them, have spillovers on the macro-economy. The main emphasis of the empirical work in this study is on the implications for macroeconomic stability (through house price volatility) and the labour market.

a) House price volatility can be transmitted into macroeconomic instability, with adverse consequences for welfare. The following housing market features and policies were found to have affected such volatility over the pre-financial crisis period:

- A more responsive housing supply reduces real house price volatility. However, greater responsiveness can translate into more volatile residential investment, with the net effect on overall economic volatility being unclear. Effective prudential banking supervision also contributes to reduce real house price volatility, possibly by reducing the potential for risky lending. Volatility has also been less in countries with greater transaction costs in property markets, perhaps because such costs reduce the gains from speculative trade. However, the effect of transaction cost on volatility appears to be small in comparison to the effect of prudential banking supervision.

- By contrast, greater access to credit has been associated with an increase in real house price volatility. There is also some evidence that mortgage interest deductibility correlates with increased volatility over the estimation period, possibly reflecting the tendency for such policies (and other exemptions) to encourage leverage, by raising the after-tax return from engaging in speculative housing investments.

b) The ease of moving residence geographically (e.g. across regions) has implications for the functioning of the labour market as it affects the job-matching process and the efficient allocation of human resources across the national territory. Data limitations make it difficult to distinguish residential turnover (within the same geographical area) from geographical mobility. However, estimates suggest that in the average OECD country 12% of households change residence over a two-year period. Such mobility is low in southern and Eastern European countries, compared to English-speaking and Nordic countries where households move twice as often. Ideally, housing markets and policies affecting them should not hinder residential mobility. Indeed, some structural and policy features are found to facilitate such mobility:

- Where housing supply is more responsive, residential mobility is higher, possibly because supply responsiveness reduces housing affordability differentials and/or housing inflation gaps across regions, which could potentially discourage mobility. Econometric estimates suggest that

increasing the responsiveness of supply from the lowest to the average level in the OECD would raise households ' mobility rate from 8% to the OECD average of 12%.

- Easier access to credit is also associated with higher household mobility, possibly because it facilitates the financing of moving costs.

8. By contrast, some factors that are found to inhibit mobility are:

- Homeowners and social housing tenants - in particular tenants in highly means-tested social housing systems - tend to be less mobile than private renters. For instance, on average, an owner is estimated to be 11% less likely to move than a private renter. High leverage rates also pose risks to mobility. In circumstances with large declines in house prices in certain areas, households with negative equity holdings may be unable to refinance their home loan or be unwilling to sell their house at a loss in order to move to another region.

- Stricter rent controls and tenant-landlord regulations significantly reduce residential mobility by discouraging the supply of rental housing and by locking-in tenants. Econometric estimates suggest that reducing rent control from the strictest to the average level in the OECD would imply roughly the same magnitude of increase in households' mobility rate as an increase in the responsiveness of housing supply.

- Likewise, high property transaction costs are found to reduce residential mobility, although the estimated effect appears to be modest. Such transaction costs are particularly large in some continental and southern European countries, while they are lower in Nordic countries and the United Kingdom.

2. Broad trends in selected housing outcomes

9. The structure and characteristics of housing markets vary across OECD countries over several dimensions. This section provides background information on key elements documented in the rest of the study: the level and structure of supply and demand for housing, prices and rents and the ease of transition between different segments of the housing market.

Increased housing demand resulted in upwards pressure on house prices…

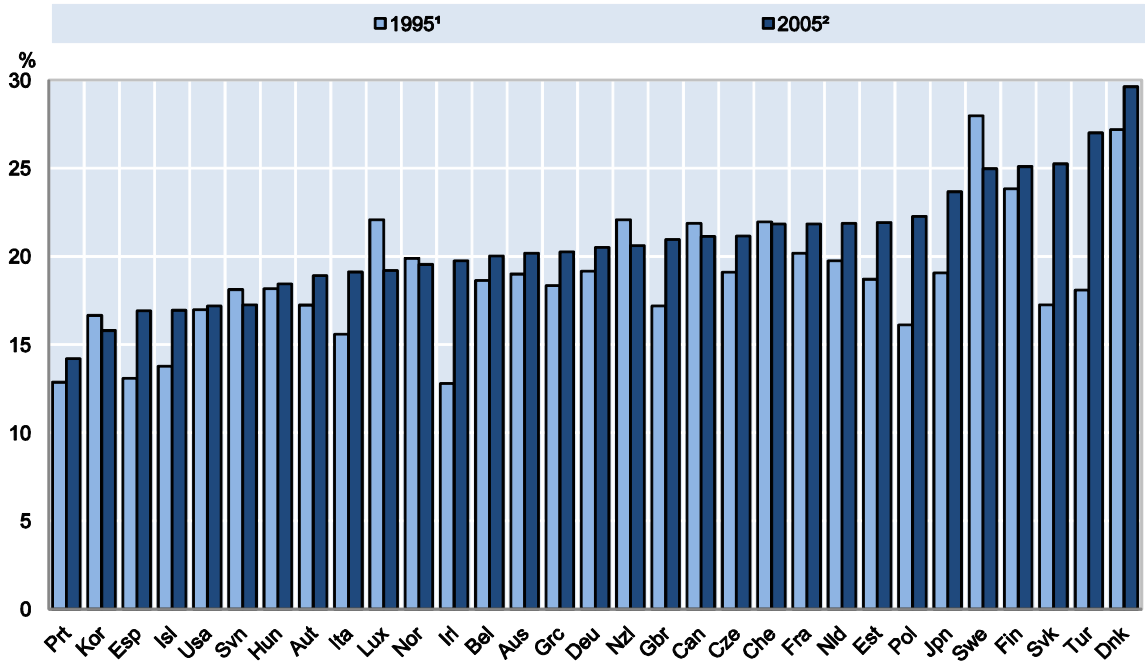
10. Cross-country comparable data on household spending on housing is limited. One readily available source is national accounts data that are to a large extent based on imputed rents. Keeping in mind that methods for assessing such rents may differ across countries, the average OECD household spends a significant share of its disposable income on housing - ranging from 14% in Portugal to 30% in Denmark (Figure 1). During the past decade, such spending share increased in many countries: on average by 3 percentage points since the mid-1990s. Financial deregulation and the concomitant fall in real interest rates made borrowing easier and less costly and resulted in increased demand for owner-occupied housing, which is likely to have played an important role in this trend increase. In turn, the increase in demand partly translated into real house prices which rose strongly in a majority of OECD countries since the mid-1980s (Table 1), although these increases have recently come to an abrupt halt in many of them. In several countries, real prices have increased by more than 90% since the early 1980s (*e.g.* Ireland, Spain, the United Kingdom, the Netherlands, Belgium etc.).[3] However, in a few countries real house prices remained

[3] Part of the increase in house prices is not surprising as productivity gains in the tradable sector is likely to spill over to the non-traded housing sector, particularly in countries experiencing rapid productivity growth in tradable sectors.

stable or even decreased (*e.g.* Japan, Switzerland and Germany etc.). Increases in real rents also added to higher spending on housing, but their contribution is likely to be lower than that of prices as in most countries real rents have grown at a slower pace than real house prices (André, 2010). Currently, rent levels (taking into account differences in the quality of dwellings) are particularly high in Japan and Switzerland (Figure 2).

Figure 1. Household spending on housing

Percent of disposable income



1. 1996 for Japan, 1998 for Turkey, 2000 for Greece, Hungary, Korea, and Slovenia.
2. 2006 for Norway and Portugal.
Source: OECD Outlook No 86 and OECD National Accounts.

Table 1. Change in real house prices[1]

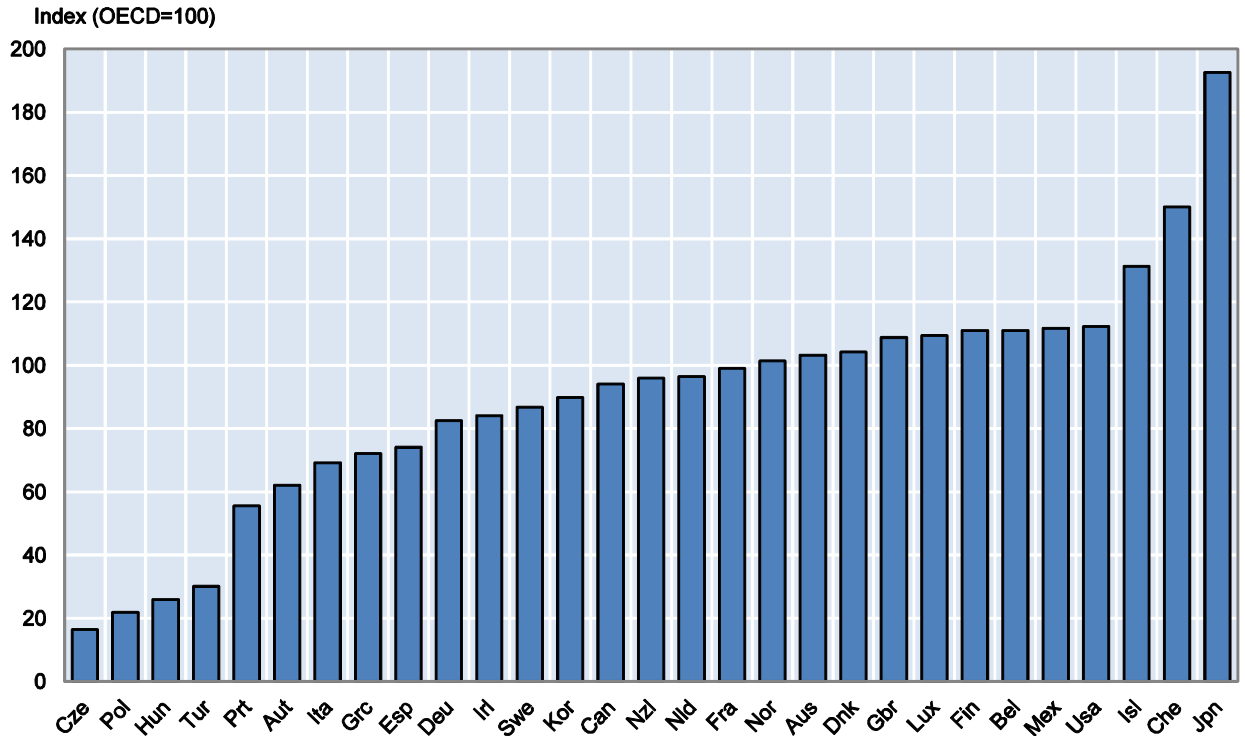
1980 (or earliest year available)-2008

Very large increases (90% or more)	Moderate to large increases (20% to 90%)	Stable or declining (less than 20% increase)
Australia	Austria	Chile
Belgium	Canada	Germany
Finland	Denmark	Hungary
Ireland	France	Israel
Netherlands	Greece	Japan
New Zealand	Italy	Korea
Norway	Slovenia	Portugal
Spain	Sweden	Switzerland
United Kingdom	United States	

1. Nominal prices deflated by the consumer price index.
Source: National sources and OECD Economic Outlook No. 87.

Figure 2. Comparative rent levels[1]

2005



1. Comparative rent levels are defined as the product of purchasing power parities of actual rents times exchange rates. They indicate for a given level of housing the number of units of the common currency needed to buy the same volume of housing services in each country. Rent levels take into account quality differences including differences in dwelling size, number of rooms and availability of central heating.

Source: Calculations based on OECD-Eurostat PPP Database.

… which boosted housing investment…

11. Until recently, the growing demand for housing was accompanied by increased housing investment in several countries (Table 2), although residential investment has collapsed in some countries in concomitance with, or immediately before, the onset of the financial and economic crisis. Between the mid-1990s up until 2006 investment grew rapidly in Spain, Ireland, and the Nordic countries, while it was stagnant - or even declining – in Germany, Switzerland, Japan and Austria. In all countries, new construction constitutes the largest share of housing investment – 80% on average in 2004 in countries for which data are available (UNECE, 2006). Only in Sweden, the United Kingdom and Poland does maintenance and repairs of existing dwellings account for at least 30% of investment, possibly reflecting a relatively old stock of housing in these countries (see below).

Table 2. Change in real residential investment

1995 (or earliest year available) to 2006

Very large increases (90% or more)	Moderate to large increases (30% to 90%)	Stable or declining (less than 30% increase)
Poland	New Zealand	Japan
Greece	France	Germany
Norway	Australia	Austria
Denmark	United Kingdom	Switzerland
Iceland	United States	Korea
Spain	Finland	Belgium
Sweden	Canada	Italy
Ireland		Netherlands

Source: OECD Economic Outlook No. 87.

…and added to the available stock housing

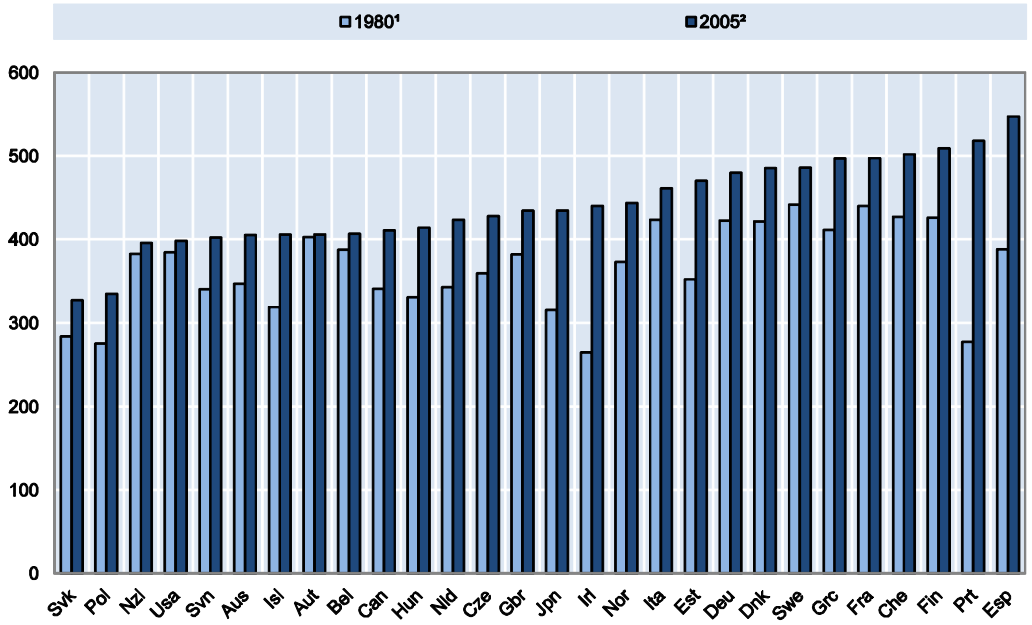
12. As investment increased, the stock of housing per inhabitant grew (Figure 3, Panel A). Currently, the number of dwellings per inhabitant is comparatively high in several continental and, especially, southern European countries (*e.g.* Spain, Portugal), while it is lower in some Eastern European countries (*e.g.* Slovak Republic and Poland). However, this number does not account for household formation patterns and average household size that, while differing across countries, has been diminishing in most countries. Countries with smaller average household size have a greater number of households implying, *all else equal*, that the number of dwellings per household is smaller. The vacancy rate of dwellings also differs across countries, influencing the availability of housing. For example, vacancy rates are high - at least 20% or more in Spain and Italy - reflecting a large share of second homes, demographic factors and regulatory obstacles that encourage owners to keep their property unoccupied (Norris and Shiels, 2004; OECD, 2005). Even after taking these factors into account, the dwelling stock per household is still comparatively large in Spain and Portugal, and also in Ireland (Figure 3, Panel B).

13. The flow of housing services partly depends on the quality of the existing housing stock. To the extent that quality is correlated with age, it is relatively high in Japan, Portugal, Ireland, Finland and Greece, where more than 55% of the stock has been built since 1971 (Figure 4). By contrast, the United Kingdom, France, Spain and Denmark have the oldest dwelling stock, with more than 35% of dwellings having been constructed before 1945.[4] The variation across countries in access to basic facilities is also a key indicator of differences in the quality of housing services, which appear to be wide across OECD countries (Table 3). For example, more than 20% of dwellings lack a kitchen in Poland, Spain, Finland and Greece and more than 30% lack a fixed bath in the Russian Federation, Estonia and Portugal. These cross-country variations in quality partly reflect historical patterns of social development and gains in real income per capita, although differences in housing-related policies can also play a role.

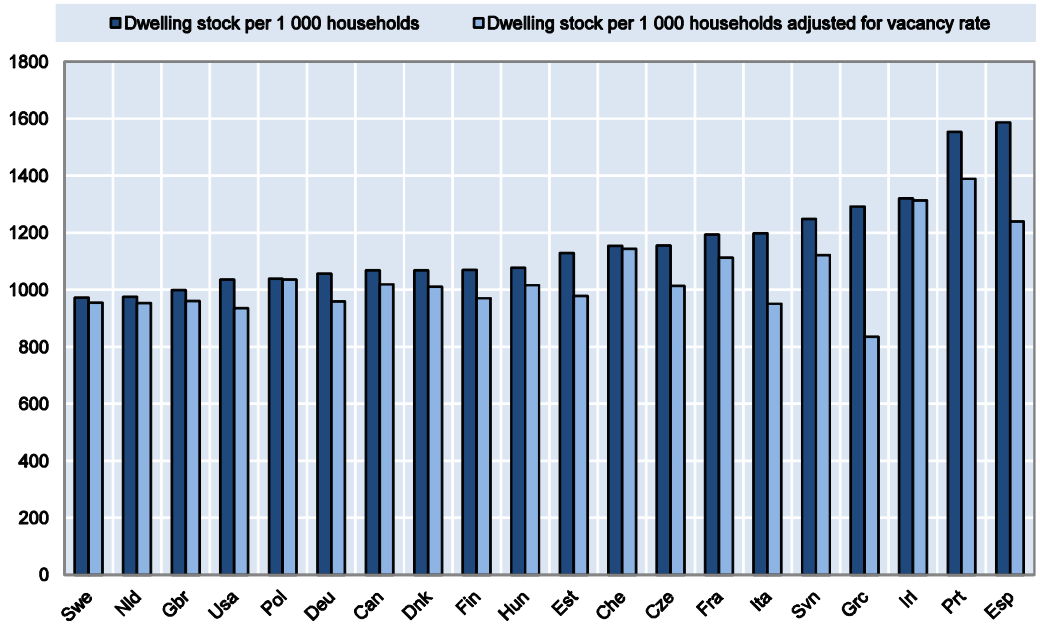
[4] These data, ending in the early 2000s, do not take into account the most recent years of construction which have made the dwelling stock comparatively younger in countries that have seen a rapid increase in housing completions (*e.g.* Spain, Ireland).

Figure 3. Dwelling stock

A. **Number of dwellings per 1 000 inhabitants**



B. **Number of dwellings per 1 000 households³**
2005²



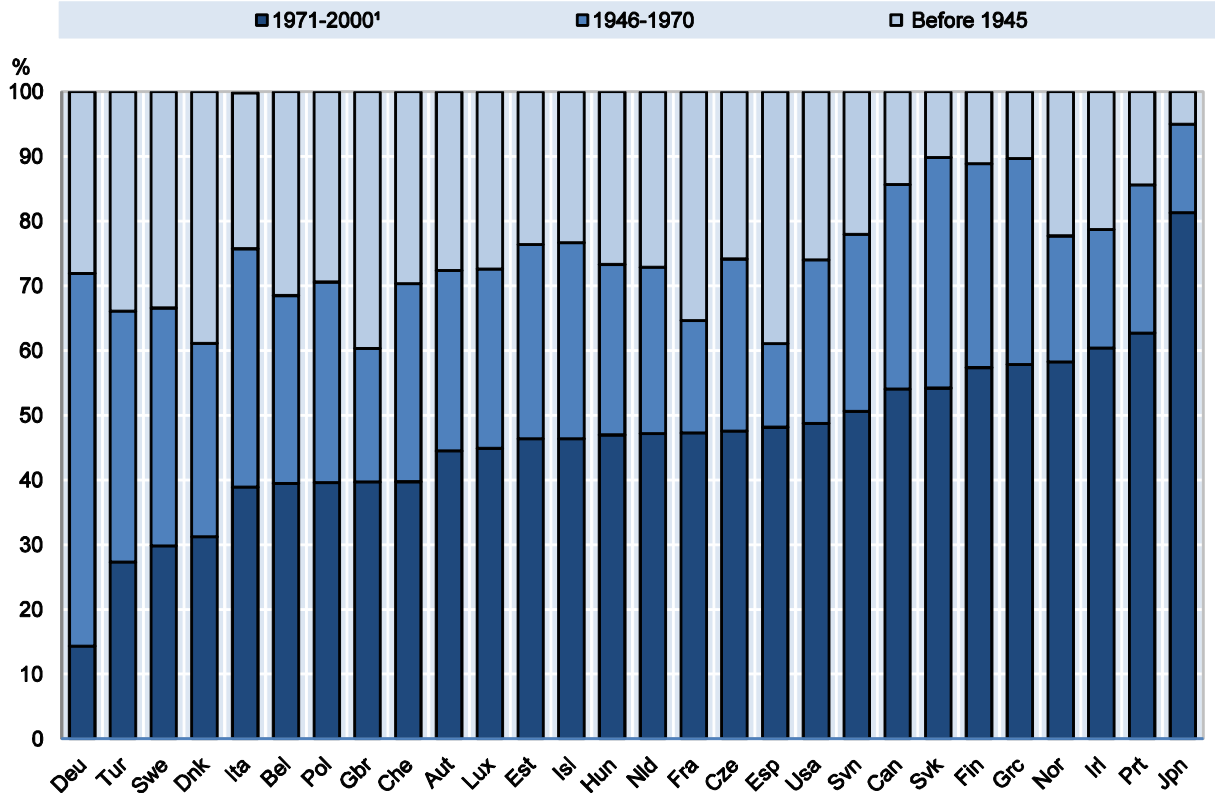
1. 1981 for Australia and Greece, 1982 for France, 1986 for Germany, 1988 for Finland, 1989 for Portugal, 1990 for Italy and Russian Federation, 1991 for Czech Republic, New Zealand and Slovenia.

2. 2001 for Belgium, Czech Republic and Greece, 2002 for Russian Federation, 2003 for Australia and Italy, 2004 for France and Switzerland.

3. Dwelling stock per 1 000 households adjusts the dwelling stock per 1 000 inhabitants with average household size, and the dwelling stock per 1 000 households adjusted for vacancy rate takes into account cross-country differences in the vacancy rate of dwellings.

Source: UNECE, United Nations and national sources.

Figure 4. Age profile of the dwelling stock



1. For countries for which 2000 data are not available, the most recent data are used.

Source: UNECE and Bulletin of housing statistics for Europe and North America, 2006 and Statistics Japan.

Table 3. Dwellings with basic facilities

Latest available year

	Latest year available	Dwelling stock equipped with central heating	Dwelling stock connected to a sewerage system	Dwelling stock with fixed bath or shower inside the dwelling	Dwelling stock with piped water inside the dwelling	Dwelling stock with a kitchen
		In percent of total dwelling stock				
Austria	2003	89.8	85.6[2]	98.3	99.9	100.0
Belgium	2001	73.0	..	96.0	..	..
Czech Republic	2001	64.5	65.6	83.7	86.4	96.3[2]
Denmark	2004	98.4	..	94.6	99.5[3]	97.1
Estonia	2005	58.7	81.4	66.8	84.0	95.9
Finland	2004	92.6	98.7	99.1	98.3	77.7
France	1998	81.8	..	97.0	99.9	88.4
Germany	1998	85.8	..	96.5[3]	..	98.7
Greece	2001	56.3	60.4	92.3	98.1	77.6
Hungary	2004	84.9[4]	91.4	89.3	91.0	93.8[4]
Ireland	2002	59.0	63.0	94.0	97.0	100.0
Italy	2004	94.7	..	99.2	..	..
Luxembourg	2001	92.3	..	94.2	..	..
Netherlands	1998	86.3	..	96.1	..	97.0
Norway	1990	..	..	95.8	..	87.9
Poland	2002	76.7	59.0	85.9	94.9	55.4
Portugal	2001	..	..	64.7	67.5	68.4[5]
Russian Federation	2002	75.0	70.0	70.0	74.0	..
Slovakia	2001	74.3	89.8	90.3	92.2	96.7
Slovenia	2003	78.9	..	92.2	98.5	97.9
Spain	1999	..	..	99.0	..	..
Sweden	2004	100.0	100.0	100.0	100.0	95.8[1]
United Kingdom	2003	86.9	99.9	99.9	99.9	99.9
United States	2003	88.9	79.3	99.7	99.2	95.6

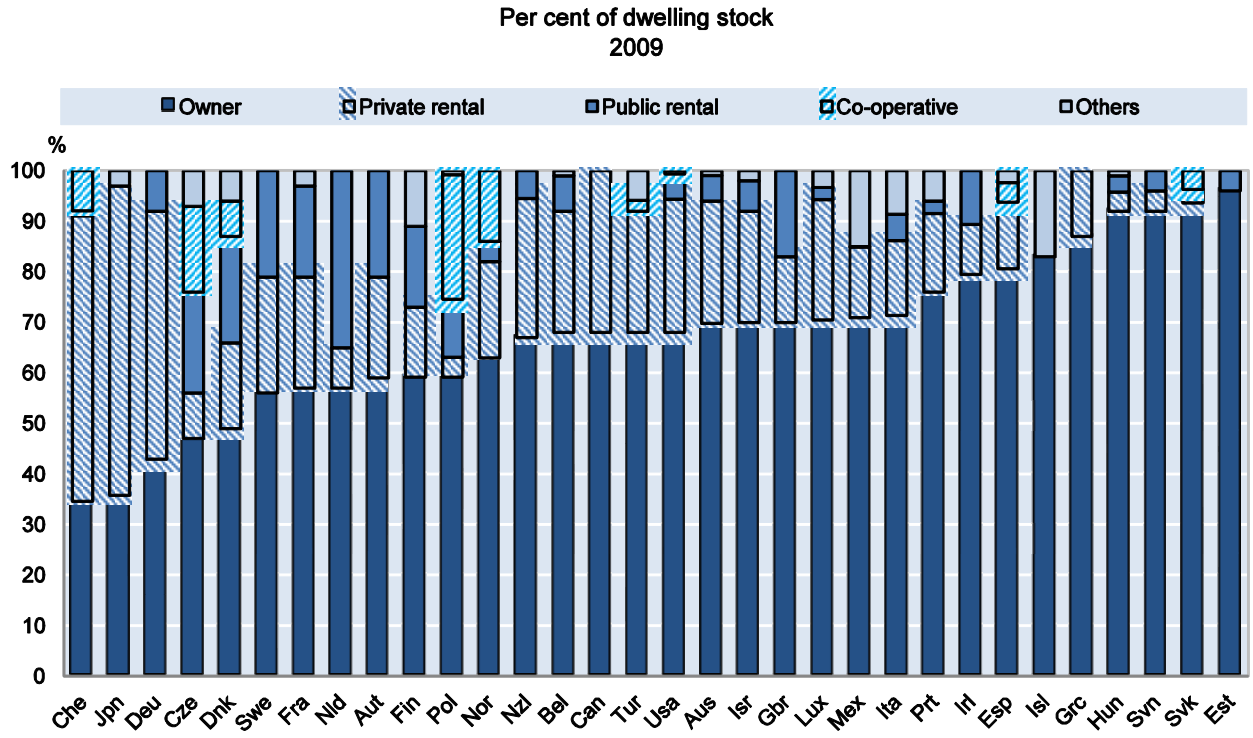
1. 1990.
2. 1991.
3. 1993.
4. 1996.
5. 1998.

Source: UNECE and Bulletin of housing statistics for Europe and North America (2006).

Within the housing stock there are large differences in the composition of tenure types…

14. Within the existing dwelling stock, there are large differences in housing tenure types across countries. Homeownership rates range from less than 40% in Switzerland and Japan to more than 90% in some Eastern European countries (Figure 5). Within the rental sector the importance of private *versus* social rental also differs significantly, where social rentals refers to housing that is let at below-market rents and/or allocated by non-market mechanisms through some administrative procedure.[5] In a number of countries, social housing accounts for the majority of the rental sector (*e.g.* Czech Republic, the Netherlands, Austria, the Nordic countries, the United Kingdom, Ireland and Poland), while in a few others social/public housing only plays a minor role in supplying housing to citizens (*e.g.* Portugal, Hungary, Luxembourg and Switzerland).

Figure 5. Tenure structure across countries



Source: Calculations based on OECD Housing Market questionnaire.

…but one common trend is an increase in owner occupancy…

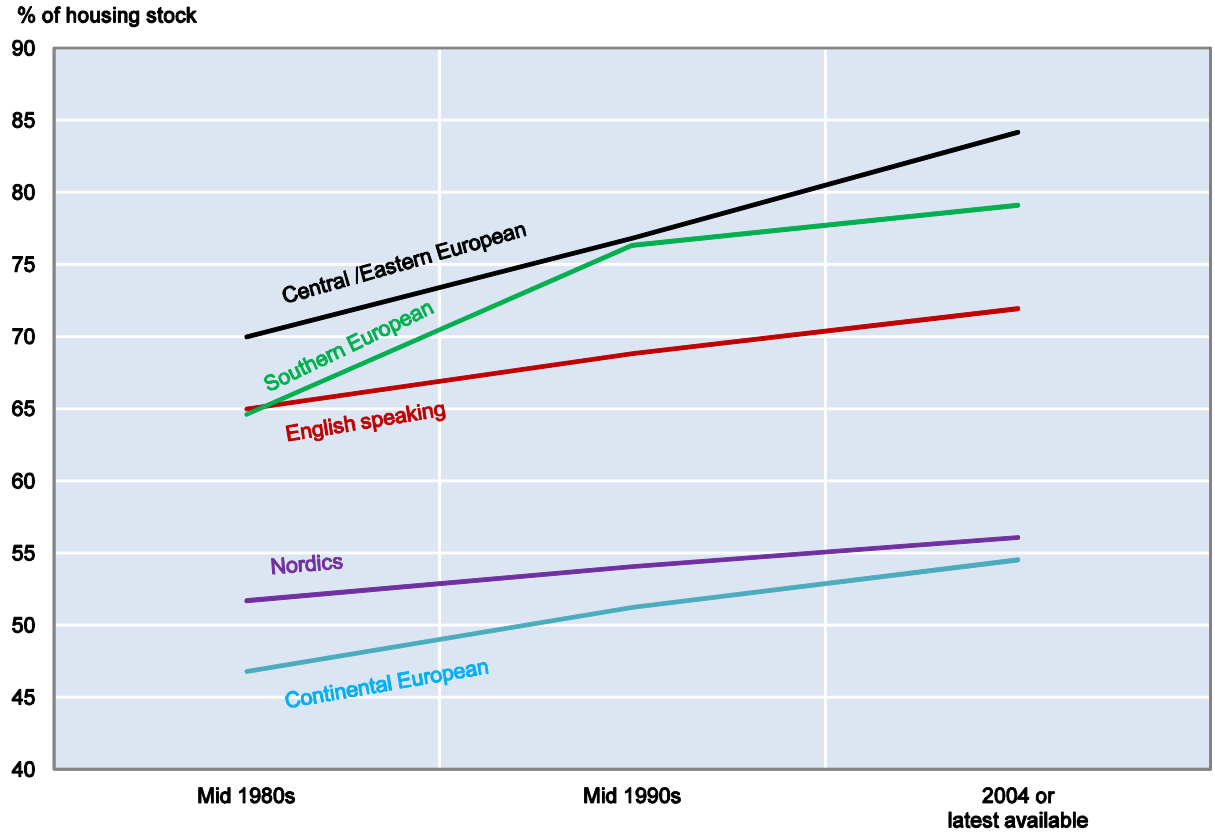
15. Despite large differences in tenure types, one general trend is an increase in homeownership rates in many OECD countries (Figure 6), although this increase has been more modest among younger, low-income households (see Andrews and Caldera Sánchez 2011). The general increase in owner-occupancy partly reflects demographic and/or socio-economic developments, such as population ageing, while the privatisation of the former state-owned dwelling stock has played a role in some Eastern European

5 Social rental housing captures housing which is owned and supplied by the state/municipalities, private owners and independent organisations, such as housing associations.

countries (Clapham *et al*. 1996).[6] Empirical decompositions suggest that changes in household characteristics, such as age and income, can explain some of the observed changes in aggregate homeownership rates. But, a large part remains unexplained (Box 1).

Figure 6. Homeownership rates[1]

mid 1980s-2004



1. Nordics includes Denmark, Norway, Sweden and Finland; English-speaking includes Australia, Canada, the United Kingdom, the United States and Ireland; Continental European includes Austria, Belgium, France, Germany, the Netherlands, Switzerland and Luxembourg; Southern European includes Greece, Spain and Italy; Central/Eastern includes Hungary, Poland and the Russian Federation. The homeownership rates in each group refer to the simple average of the rate in individual countries.

Source: Luxembourg Income Study (LIS).

6 In recent years, sales of municipally-owned dwellings have slowed down, either because further sales have been prohibited (*e.g*. Slovenia) or because of the limited size of the remaining social rental sector (*e.g*. Estonia, Poland, Czech Republic) (Norris and Shiels, 2004).

Box 1. Factors driving changes in homeownership rates in the OECD

Homeownership rates have increased in many OECD economies over recent decades and this increase reflects two main factors. Part of the change reflects a household's preference for homeownership relative to other tenures which, in turn, is influenced by policies that influence households' tenure choice (*e.g.* housing taxation, rental regulations). Another part of this change reflects purely demographic and socio-economic developments. For instance, the probability of homeownership tends to increase with age; thus it is likely that the aggregate homeownership rate would have increased in OECD countries – even if nothing else changed – due to population ageing. This decomposition is somewhat partial and assumes that trends in homeownership rates are demand-driven, but it is nonetheless useful to obtain a rough estimate of the contribution of changing demographics and socio-economic characteristics to aggregate homeownership rates over time. Micro-econometric techniques were, therefore, applied to household survey data to decompose changes in homeownership rates over time into the following parts (see Andrews and Caldera Sánchez 2011).

- **Explained effect:** This effect captures the influence of demographic and socio-economic variables to the change in homeownership. It takes into account the impact of shifts in a number of potentially important variables, such as the age structure, household size and structure (*e.g.* the marital status of the household, presence of children etc.), real household income, education and some possible indicators of socio-economic disadvantage, such as ethnic/migrant status.

- **Unexplained/residual effect:** This effect assesses the extent to which changes in a household's underlying propensity to become a homeowner explain trends in the aggregate homeownership rate, holding demographic and socio-economic variables constant. Since it abstracts from changes in the characteristics of the population, it is more likely to pick up the impact of changes in economic behaviour and housing policies.

Figure 1.1 summarises the results of this decomposition of the change in the aggregate homeownership rate from around the mid-1990s to mid-2000s for twelve OECD countries (data availability precludes a broader coverage of countries). Over the period studied, the aggregate homeownership rate rose in most countries, though to differing extents, and the homeownership rate declined in Australia and Luxembourg.

The decomposition estimates suggests that changes in the characteristics of the population generally placed upward pressure on aggregate homeownership rates:

- Across the 12 OECD countries studied, changes in the age structure boosted the aggregate homeownership rate by an average ¾-1 percentage points, and the effect was somewhat larger in Canada, Denmark, Germany and Switzerland (as indicated by the darker bar in Figure 1.1). While the impact of population ageing was relatively small in absolute terms in Australia and the United States, it nonetheless accounted roughly for all of the explained change in the aggregate homeownership rate. Moreover, the estimates imply that the homeownership rate in Australia and Luxembourg would have declined further over this period, had it not been for changes in age structure. The decomposition estimates indicate that changes in other characteristics, besides age, were also important contributors to the rise in homeownership rates (as indicated by the lighter bar in Figure 1.1). Gains in real household disposable income account for much of the explained increase in Denmark, Finland, Spain, the United Kingdom, while increases in education pushed up homeownership in the United Kingdom.

However, changes in the characteristics of the population can only explain part of the change in homeownership:

- In most countries – particularly in Canada and Italy – there appears to have been an increased propensity for homeownership amongst households, holding their characteristics constant (as indicated by the striped bar in Figure 1.1). This pattern is also evident for the United States.

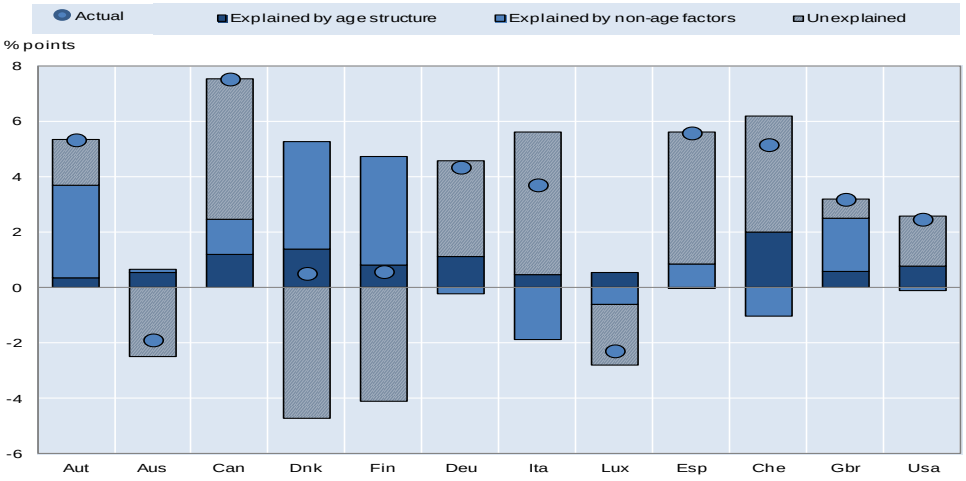
- By contrast, for Australia, Denmark, Finland and Luxembourg, the decomposition highlights a decline in the propensity for homeownership amongst households over this period, signaling a decline in the relative attractiveness of owner-occupation.

The existence of a significant unexplained change in the aggregate homeownership rate in a number of OECD countries suggests a possible role for structural and policy features to influence tenure choice (see Section 3). It also has important implications for residential and labour mobility, given that homeowners tend to be less mobile than renters (see below and Section 6)

.

Figure 1.1 Decomposition of the change in the aggregate homeownership rate[1]

Circa 1995 – 2005; selected OECD countries



1. The dot refers to the actual change in the aggregate homeownership rate over the period studied. This can be decomposed into a part explained by changes in the characteristics of the population, which include age structure and other non-age factors such as household structure, household income, and education. There is also a component which is unexplained by changes in the characteristics of the population.
Source: OECD calculations based on various household data sets. See Andrews and Caldera Sánchez 2011 for details of data sources and estimation techniques.

Residential mobility provides flexibility to housing markets …

16. Residential mobility plays a key function in providing flexibility in housing markets since it facilitates reallocation across different segments of the market (*e.g.* rental and owner-occupied sectors) and regions. Such mobility (measured as the percent of households that changed residence within the last 2 years) is lower in southern and Eastern European countries,[7] compared with English-speaking and Nordic countries, where households move twice as much (Figure 7).[8] The average household's probability of

7 The very low mobility rate observed in Eastern European countries can be accounted for by labour market rigidities (Boeri and Terrell, 2002), but also by the very specific features of housing markets in these countries such as a large share of owner-occupied housing and persistent under-supply of new residential housing (Fidrmuc, 2004; Bloze, 2009).

8 It should be noted that residential mobility is not equal to geographical mobility. A high level of residential mobility can occur in a system operating on short-term tenancies without necessarily leading to high geographical mobility. However, data limitations make it difficult to distinguish residential turnover (within the same geographical area) from residential mobility proper.

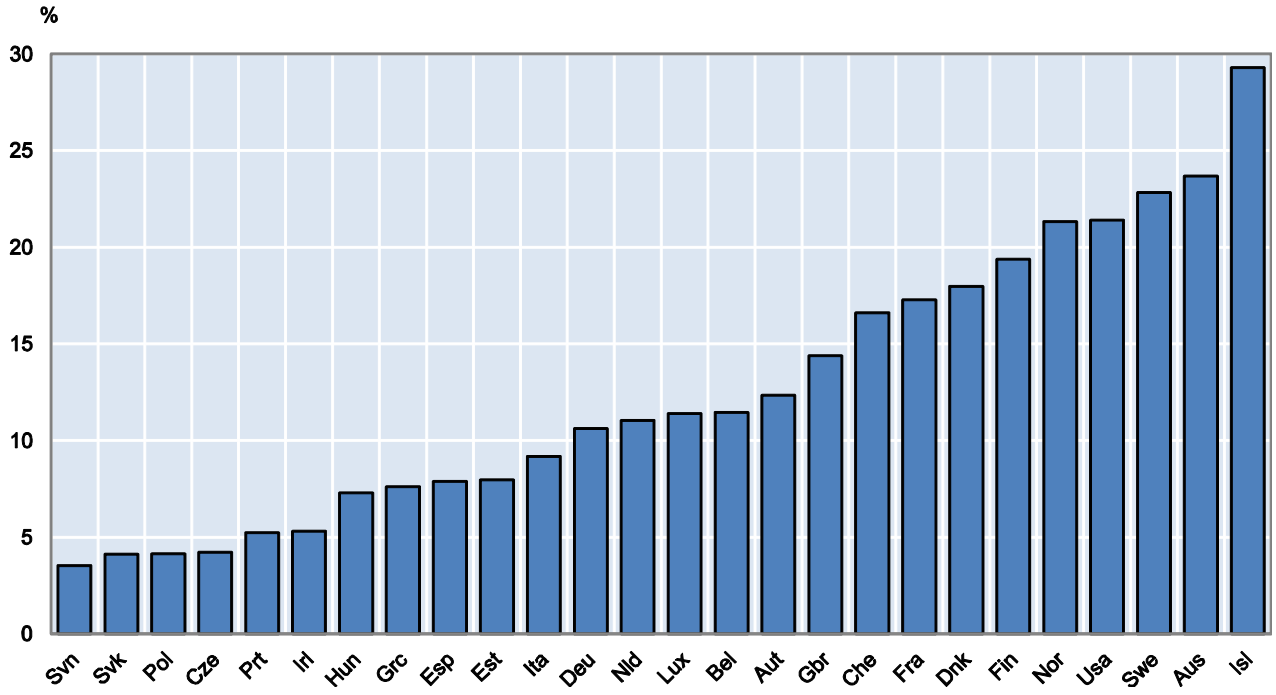
moving within two years is 12%.[9] Households change residence for several reasons, housing and family-related followed by work-related reasons being the most common (Caldera Sánchez and Andrews 2011).[10]

[9] The average refers to a simple average of the mobility rates of the countries included in the analysis, *i.e.* the rates are not weighted by the relative size of each country.

[10] Housing-related reasons include: desire to change tenure status, wanting a new or better apartment, and seeking a better neighbourhood. Family-related reasons relates to a change in the marital or partnership status, establish own household, to follow partner/parents or to obtain better school or care facilities for children or other dependants. Work reasons include: starting a new job, transfer of existing job, looking for work, easier commuting, redundancy or retirement.

Figure 7. Residential mobility in OECD countries, 2007

Percentage of households that changed residence within the last 2 years[1]



1. The low mobility rate in some Eastern European countries (*e.g.* 4% in Slovenia implying a move every 50 years) does not seem reasonable and may reflect problems with the underlying data. However, this is difficult to verify as there is no alternative data source.

Source: OECD calculations based on 2007 EU-SILC Database, on HILDA for Australia, SHP for Switzerland and AHS for the United States.

…and such mobility tends to be lower among homeowners than renters

17. Residential mobility differs between tenure and household types. A common conjecture is that mobility is lower among owner-occupants than renters because owners face higher transaction costs of moving homes and, thus, tend to spend longer spells in their residence in order to spread these costs over a longer time period (*e.g.* Oswald, 1996; Coulson and Fisher, 2009). Also, differences in relative prices between expanding and contracting regions may influence mobility (*e.g.* Saks, 2008 and Section 6.3). These effects may be amplified in cyclical downturns if house prices decline, giving rise to lock-in effects associated with negative equity (Ferreira *et al*. 2008; Green and Hendershott, 2001). Indeed, OECD (country-by-country) estimates suggest that tenure types are associated with different mobility rates, although results should be taken with caution because causation cannot be easily established due to the possibility that households' preferences for mobility influence the choice of tenure (so-called self-selection bias).

18. With this caveat in mind, homeowners are found to be less mobile than private renters after controlling for a number of household characteristics (*e.g.* age, income, and marital, migrant and employment status etc.) (Box 2 and Caldera Sánchez and Andrews 2011).[11] In general, owners without a

[11] It is difficult to reach a clear-cut conclusion on the empirical finding that homeowners are less mobile than tenants as it is possible that there is self-selection into various tenures. For example, some households are inherently less mobile than others (*e.g.* they have a preference for stability) and they are more likely to

mortgage are found to be less mobile than those with a mortgage, with the exception of the United States, the United Kingdom, Norway and Iceland (Figure 8). On average, an outright owner is estimated to be 13% less likely to move than a private renter, while the mobility rate of an owner with a mortgage is some 9 % lower than that of a renter (Figure 8). The lower mobility rate among outright owners may reflect that those with a mortgage have greater incentives to remain employed and/or to become re-employed more quickly because of the requirement to meet mortgage repayments, thereby trying to reduce expected unemployment spells by accepting jobs that require moving residence (Flatau *et al.* 2003).

19. Consistent with existing studies, OECD empirical evidence finds that tenants in social housing are less mobile than private tenants - on average 6% less likely to move - possibly reflecting the reluctance to give up their below-market rents and their generally more secure tenancies (*e.g.* Menard and Sellem, 2010; Flatau *et al*. 2003; Hughes and McCormick, 1981; 1985). This is particularly the case in Australia, the United Kingdom and France, which may possibly reflect that in these countries social housing is highly targeted (see below). However, the causality of this link is again unclear, since households that are inherently less mobile to begin with – possibly due to unobserved characteristics such as cultural and/or social attachment to their local area – may self-select into social housing (Hughes and McCornick, 1997).

3. A simple framework for assessing housing markets

3.1 The stock-flow model of the housing market

20. The functioning of housing markets, both in the owner-occupied and the rental segment, is typically assessed within a stock-flow framework, which is also the approach used in this study (*e.g.* Egebo *et al.* 1990; DiPasquale and Wheaton, 1994; Gabriel and Nothaft, 1988; Meen, 2002; Steiner, 2009). This framework takes into account the dual role of housing as a capital investment and consumption good and distinguishes between the stock of housing and the flow of housing investment. One important feature of the housing market is that the housing stock adjusts slowly to changes in demand: housing investment is lumpy as building takes time and depreciation of the housing stock is slow. Thus, housing markets can clear rapidly only if prices react strongly to tensions between demand and supply. However, the heterogeneity of housing generates search and transaction costs which make it difficult for households to react swiftly to price signals (DiPasquale and Wheaton, 1994). Hence, stock equilibrium is achieved only in the long-run.

21. The quantity of housing demanded in equilibrium (stock equilibrium demand) results from households acting both as consumers of housing services and investors in durable goods. Factors influencing households' demand include demographics, permanent income, and the user cost of housing which, in turn, depends on interest rates, current and future expectations of real house prices, the relative price of owning *versus* renting and policies such as housing taxation. The stock of housing in the long-run is the result of the accumulation of residential investment over time less depreciation of the existing housing stock.

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choose owner occupancy. To account for this problem, a selection model approach is required. This involves estimating the probability of moving conditional on an equation explaining the choice of tenure. An exclusion restriction is needed to obtain credible estimates from this approach, *i.e.* there must be at least one variable that appears in the selection and not in the mobility equation. However, it is difficult to find a variable that would influence the tenure decision but not the decision to move based on economic theory.

Box 2. Residential mobility: country-by-country empirical analysis

Household characteristics and life cycle considerations (such as the timing of household formation) or changes in jobs critically determine a households' propensity to move. The influence of these characteristics on residential mobility was investigated, based on household micro datasets for the year 2007 for 25 OECD countries, containing extensive information on household attributes and residential mobility. Residential mobility was measured as the percent of households that moved residence within the last 2 years.

The following binary probit model of the household decision to move was estimated for each country in the sample:

$$\Pr_i = \Phi(\beta_0 + \beta_1 H_i + \gamma_r + u_i) \qquad (2.1)$$

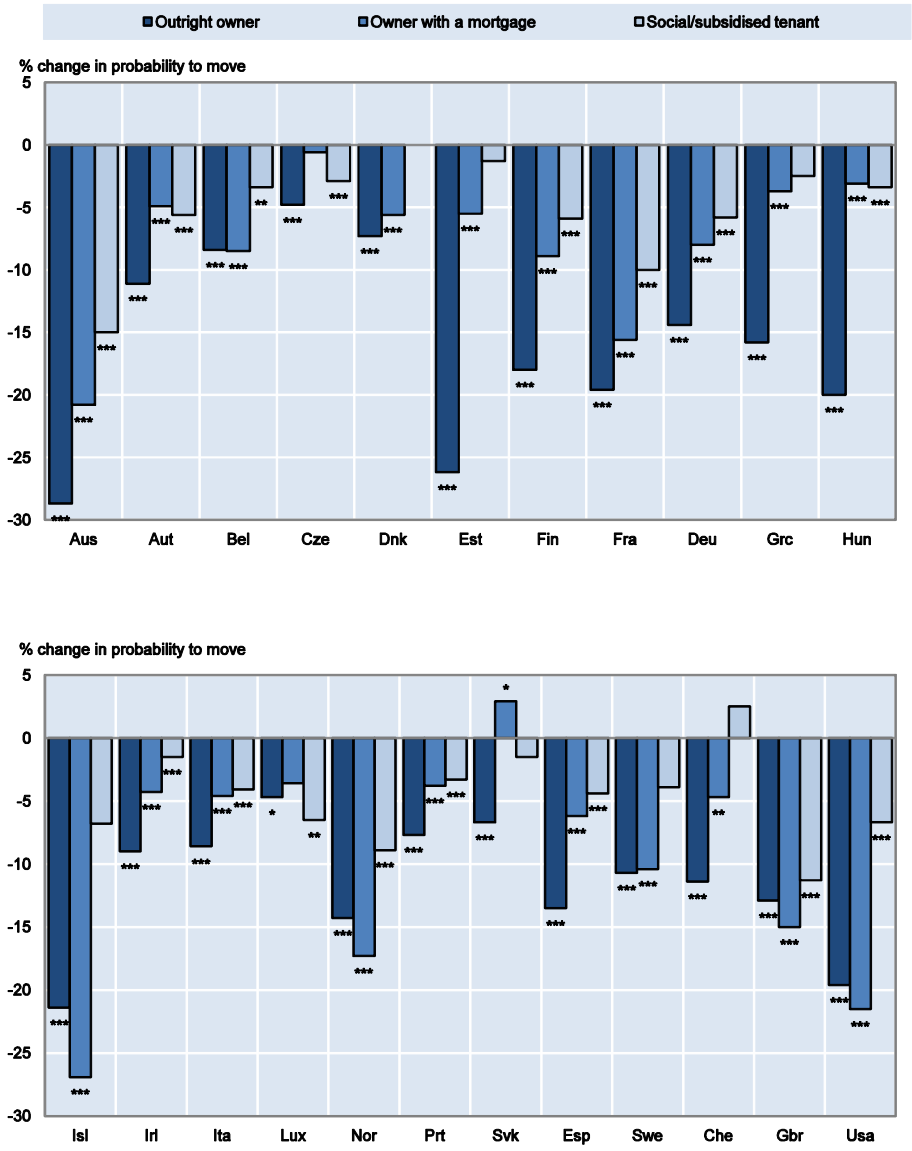
where ϕ is the normal distribution, i denotes household, and Pr_i denotes the probability that the head of the household moves. The vector, H_i, includes demographic and economic household characteristics expected to influence residential mobility, namely: tenure status (categorical variable measuring if the head of the household is owner outright, owner with a mortgage, tenant or social tenant), age category (24-34, 35-44, 45-54, 55-66), education (categorical variable measuring if head of household has low, middle or high education), employment status (1 if unemployed and 0 if employed), marital status (1 if head of household married, 0 otherwise), nationality (1 if foreign citizen and 0 if national), household income (and its square to account for possible non-linear effects), household size, household satisfaction with the dwelling (categorical variable measuring whether household is very dissatisfied, sufficiently dissatisfied, satisfied and very satisfied), and the degree of urbanisation in the area where the household lives.[1] Finally, γ_r are regional fixed effects that account for differences across regions in housing markets and policies; the error tem u_i captures random shocks affecting the individual's decision to move. The results from estimating equation (2.1) are to be interpreted with respect to the excluded household group: young, national, single tenants in the private rental market who are highly educated and dissatisfied with their residence. The estimated effects of tenure are discussed in the main text. Other empirical results related to households characteristics are:

- Younger households are more mobile than older ones.
- More educated households are more mobile than less-educated households, while current income and employment do not generally influence mobility. This result may indicate that the level of education is a more important determinant of the decision to change homes than current economic conditions.
- In some countries, foreign households appear to be more mobile than nationals.
- Larger households and those living in cohabitation are less mobile than smaller and single households.
- Caldera Sánchez and Andrews 2011 provides full details on data and estimations.

1. Households younger than 24 years and older than 66 years were excluded from the analysis to avoid the findings being driven by atypical household behaviour, such as moving for educational reasons, or to homes for the elderly.

Figure 8. Residential mobility and tenure structure[1]

Difference in probability to move relative to tenant in private rental market



1. The figure shows the percent change in the probability to move of each tenure type relative to private tenants. The results are based on the Probit regression of the probability to move as a function of household characteristics estimated country by country. A Wald test of the equality of the coefficients on outright owner, owner with a mortgage and social/subsidised tenant indicates that the parameters are different from each other. *** denotes statistical significance at 1%, ** denotes statistical significance at 5%, * denotes statistical significance at 10%.

Source: OECD calculations based on 2007 EU-SILC Database, on HILDA for Australia, SHP for Switzerland and AHS for the United States.

22. In the short run, due to slow adjustment of the stock of housing to desired demand, prices are determined by the equilibrium between the supply of housing services from a given stock and the demand by households. The mismatch between households' desired demand and the given stock of housing leads to a long-run adjustment in the rate of growth in the housing stock through investment in new housing.

Residential investment (or the flow of housing that adjusts to the stock demanded) is also influenced by construction costs, house prices, demographics and by policies influencing the profitability of housing investment such as investment subsidies (*e.g.* Wigren and Wilhemsson, 2007).

23. The main difference between the owner-occupied and rental segments of the housing market is that the latter focuses on trade in housing services (for a certain duration) rather than the dwelling itself. The stock of rental supply depends on costs, real rents and policies affecting rental supply. Similar to the owner-occupied segment, the stock adjusts gradually through new construction, conversions or demolitions in response to movements in the expected rate of return of investments in rental property. The demand for rentals is affected by a similar set of factors as owner-occupied housing (*e.g.* housing demographics, permanent income, relative cost of renting *versus* owning), but also by policies specifically influencing rental demand. In unregulated markets, the intersection of stock supply and demand for rental housing services would result in equilibrium levels of rent and rental units. In practice, however, rental markets are often regulated and the adjustment of rents is constrained. These regulations as well as market imperfections (*e.g.* search costs) generate frictions that result in rationing and generate a "natural" stock of vacant units.

3.2 Empirical approach to analysing the housing market

24. The empirical approach in this paper is consistent with the stock-flow framework. It shares the following characteristics with other housing market studies: *i)* the focus is on the owner-occupied segment; *ii)* the supply of owner-occupied housing is modelled as investment in housing (*i.e.* the adjustment of the stock) rather than the stock itself; and *iii)* the demand for owner-occupied housing is modelled as an inverse demand (*i.e.* price) equation that takes into account the given stock of housing in each period. These characteristics are mainly determined by data limitations.

25. The empirical analysis is in two steps. First, the long-run price responsiveness of new housing supply is estimated for each OECD country to allow for heterogeneous supply responses across countries (see Box 3). Second, the impact of cross-country differences in housing supply responsiveness and housing tax policies on housing market outcomes is assessed in a cross-country (fixed-effects) estimation framework (see Box 4). The focus here is on average house prices as a proxy for demand tensions and on tenure structure, as reflected in homeownership rates.

26. Since supply responsiveness and housing tax policies are only measured at a single point in time, it is not always possible to identify their direct effect on outcomes (for instance, supply responsiveness is a point estimate based on historical data).[12] Instead, the impact of these policies is identified indirectly through their interaction with demand shocks.[13] Insofar as these interaction effects are significant, consistent with prior expectations and robust across different kinds of demand shocks the results are also likely to provide a good indication of the qualitative effect of policies.

27. The remainder of the paper proceeds as follows. Section 4 discusses the factors influencing supply and demand in the owner-occupied housing market, while Section 5 analyses in a more descriptive way factors affecting supply and demand of rentals. In Section 6, the spillovers from housing markets to the wider economy are considered, while Section 7 draws out some policy implications.

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12 In the case of house prices, a conventional fixed-effects panel estimator is employed. This framework controls for potentially important time-invariant omitted factors – such as cultural attitudes toward housing – but implies that the direct impact of the policy is subsumed in the country-fixed effects.

13 It is possible to estimate the indirect effect of structural factors on house prices by including the interaction between the time invariant structural factor and a demand-side determinant of house prices that varies over time (*e.g.* labour market conditions).

4. Structural and policy influences on the owner-occupied market

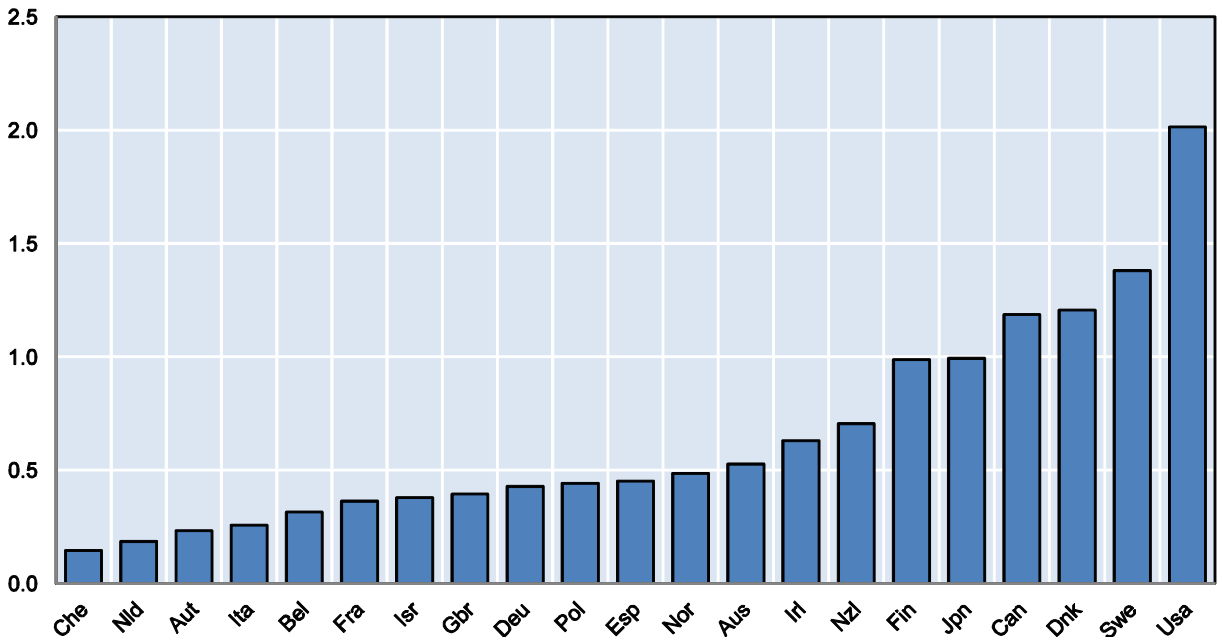
4.1 Supply of housing

Wide variation in the supply responsiveness of new housing…

28. A crucial factor determining the functioning of housing markets is the responsiveness of housing supply to changes in price signals. Despite its importance, very little cross-country empirical evidence exists on such supply responsiveness, partly reflecting data constraints. OECD estimates of the long-run price responsiveness of new housing supply for some 20 countries show that housing responsiveness varies substantially across countries (Box 3 and Caldera Sánchez and Johansson 2011).[14] Housing supply tends to be relatively flexible in North America and some Nordic countries, while it is more rigid in continental European countries and in the United Kingdom (Figure 9). The findings are broadly consistent with the limited existing evidence (*e.g.* Swank *et al.* 2002; Malpezzi and Maclennan, 2001).

Figure 9. Price responsiveness of housing supply: selected countries

Estimates of the long-run price-elasticity of new housing supply[1]



1. Estimates of the long-run price elasticity of new housing supply where new supply is measured by residential investments. All elasticities are significant at least at the 10% level. In the case of Spain, restricting the sample to the period 1995-2007, which would reflect recent developments in housing markets (such as the large stock of unsold houses resulting from the construction boom starting in 2000 and peaking in 2007-09), only slightly increases the estimate of the elasticity of housing supply from 0.45 to 0.58. Estimation period early 1980s to mid 2000s. See Box 3 and Caldera Sánchez and Johansson (2011) for details.

Source: OECD estimates.

14 The dependent variable in the supply equation is real residential investment, which does not allow for a distinction between investment in owner-occupied and rental housing, implying that the estimates can be interpreted as covering both segments of the market. However, it is possible that the response to changes in prices differs between the two segments as in several countries governments intervene and supply social rental housing outside market mechanisms.

…and house prices tend to increase more in rigid supply environments..

29. Differences in supply responsiveness at the aggregate and regional levels are important since they determine the extent to which increases in demand for housing result in higher prices or in more housing investment (Glaser *et al.* 2008; Gyourko, 2009). In the short to medium term, an increase in housing demand (*e.g.* caused by mortgage market deregulation, higher levels of activity and employment or migration inflows) would translate into smaller increases in real house prices if housing supply is more responsive. However, in more flexible-supply countries, housing investment adjusts more rapidly to large changes in demand. It is unclear whether price volatility with concomitant wealth effects on consumption or investment volatility generates more overall macro volatility.

30. Despite this trade-off, in the longer term a more flexible supply of housing is generally desirable as it allows a better match of housing construction to changes in housing demand patterns across the territory. Indeed, cross-country panel estimation confirms that positive housing demand shocks caused by financial and labour market or demographic shocks translate into larger increases in real house prices in countries with more rigid housing supply (Box 4). The magnitude of these effects is reasonably large: if the responsiveness of new supply is half a standard deviation below the median (equivalent to a 0.25 percentage point change among the countries included in the analysis) the increase in house prices associated with an increase in demand is at least 50% larger than what would have occurred if the supply responsiveness was at the median (Figure 10). This is broadly consistent with recent empirical evidence from the United States, which shows that the relaxation of interstate banking regulations resulted in larger increases in house prices in counties with less elastic housing supply (Favara and Imbs, 2009).

Box 3. The importance of housing supply responsiveness: country-by-country empirical estimates

The empirical framework to estimate the long-run price responsiveness of new housing supply builds on a stock-flow model of the housing market (Meen, 2002; McCarthy and Peach, 2002; DiPasquale and Wheaton, 1994). The analysis is macro in nature, essentially treating each country as a single housing market.[1]

Estimation is based on a system of two equations which model the demand and supply of housing in an error correction framework reflecting that the adjustment to equilibrium in the housing market is gradual. The first equation is a long-run (or equilibrium) housing price equation, where the long-run equilibrium captures the effect of fundamental demand drivers, such as income, population, age composition and interest rates, on the level of real house prices. Notice that the housing stock is included in the demand equation since it affects the market clearing price. The second equation relates real housing investment to house prices, construction costs and demographics:

$$p_t = \alpha_0 + \alpha_1 y_t + \alpha_2 R_t + \alpha_3 s_t + \alpha_4 d_t + \gamma_t + ECT^p{}_t \quad (3.1)$$

$$i_t = \beta_0 + \beta_1 cc_{t-1} + \beta_2 p_{t-1} + \beta_3 d_t + \gamma_t + ECT^i{}_t \quad (3.2)$$

where the dependent variable in eq. (3.1) is the average real house price at time t. The explanatory variables include real income, y_t, the real interest rate, R_t,[2] the stock of residential dwellings s_t, and a population variable d_t. All the variables are in logs, except the real interest rate. The dependent variable in eq. (3.2) is real residential investment, i_{ct}, and the explanatory variables are a measure of real construction costs in the residential construction industry cc_{t-1}, real house prices, p_{t-1}, and population, d_t. Both construction costs and real house prices enter as lagged terms in the equation to account for the nature of the construction industry where there is typically a lag between price signals and construction. Both equations include a set of quarterly dummies, γ_t to control for seasonal effects. The system is estimated using the Engle-Granger two-step procedure. In the first step the long-run relationship is estimated, while in the second stage the short-run model given by equations (3.3) and (3.4) is estimated where the error-correction term (*ECT*) is the lagged residual from the long-run relationship. Estimating the long-run relationships rests on the assumption that there exists a co-integrating relationship between the series. The negative and statistically significant coefficient on the error correction term in the short-run relationships indeed suggests that there exits an error correction mechanism.[3] In order to obtain an estimate of the responsiveness of new supply with respect to price – the coefficient β_3 – in equation (3.2), the system is estimated for each country using seemingly unrelated regression techniques (SUR) and quarterly data over the period 1980s to the early 2000s, depending on data availability.

The short-run relationship, which explains the adjustment of the deviations in actual house prices from their long-run

fundamental is given by:

$$\Delta p_t = \phi_0 + \phi_1 \Delta y_t + \phi_2 \Delta R_t + \phi_3 \Delta s_t + \phi_4 \Delta d_t + \gamma_t + \phi_5 ECT^P{}_{t-1} + \varepsilon_t \quad (3.3)$$

$$\Delta i_t = \delta_0 + \delta_1 \Delta cc_{t-1} + \delta_2 \Delta p_{t-1} + \delta_3 \Delta d_t + \gamma_t + \delta_4 ECT^i{}_{t-1} + \upsilon_t \quad (3.4)$$

where Δ represents the first difference operator. The coefficient ϕ_5 captures the speed of price adjustment and is expected to be negative reflecting that when prices move away from equilibrium they adjust back over the next period. Similarly for the short run investment equation the coefficient δ_4 captures the speed of adjustment of investment to equilibrium. Full description on data and estimation are provided in Caldera Sánchez and Johansson 2011.

1. In reality housing markets are typically local or regional in their nature. However, country level estimates of the price-elasticity of housing supply are still useful as they give a sense of the overall responsiveness of housing supply.
2. To the extent that households are short-sighted; the short-term interest rate can influence their decision to buy a house. Thus, the estimates reported in this box refers to the case when the interest rate is measured either by the long-term or short-term real interest rate depending on the predominant type of mortgage interest in each country. The results are, however, generally robust to using either the long-term or the short-term interest rates.
3. Standard Augmented Dickey Fuller test (ADF) unit root tests indicate the series are integrated of order one.

Figure 10. Real house prices, housing demand shocks and housing market settings

The estimates are based on a fixed effects panel regression for 17 OECD countries between 1980 and 2005 (see Box 4). The central estimate shows the impact of a particular demand shock on real house prices when the supply responsiveness and tax relief variables are set equal to the sample median, and all other control variables are set to their sample means.

The upper (lower) bounds show the impact of a given demand shock on real house prices when:
(i) the supply responsiveness is 0.5 standard deviations below (above) the median and tax relief is at the sample median.
(ii) tax relief is 0.5 standard deviations above (below) the median and the supply responsiveness is at the sample median.

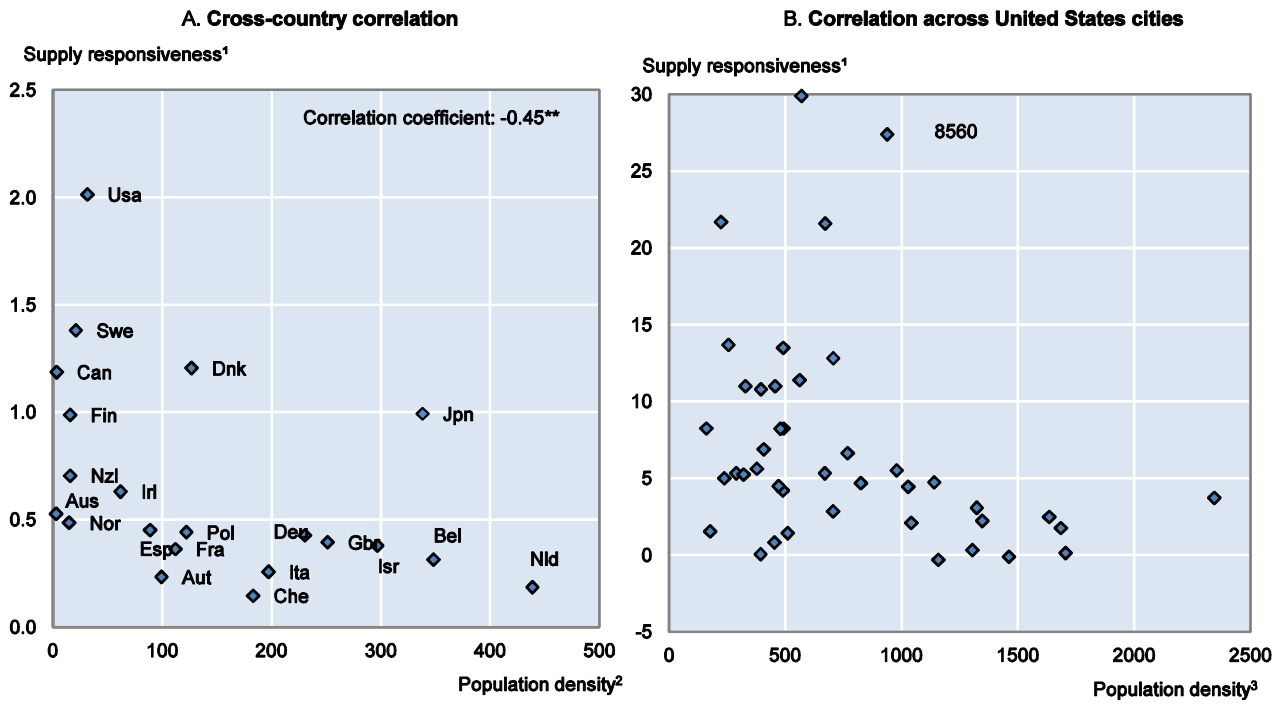
1. The Financial Reform Index ranges between 0 and 1, and is increasing in the degree of liberalisation. The median rise in the index between 1980 and 2005 is about 0.6.
2. In the sample, the median decline in the NAIRU between 1995 and 2005 is around 2 percentage points.

Source: OECD estimates. See Andrews (2010) for details.

Differences in housing supply responsiveness reflect structural conditions …

31. Housing supply may be constrained by both policy and non-policy factors. First, geographical and demographic conditions such as physical limitations on land for development can restrict supply in certain areas and the degree of urbanisation. Indeed, a simple cross-country correlation shows that the estimated housing supply responsiveness is lower in more densely populated countries (Figure 11). The same appears to be true within countries: for instance in the United States, supply is more rigid in cities with a greater population density.

Figure 11. Price responsiveness of supply and scarcity of land



** denotes statistical significant at 5% level.

1. OECD estimates of country-specific supply responsiveness (see Caldera Sánchez and Johansson, 2011) and estimates of supply responsiveness for United States cities taken from Green *et al.* (2005).

2. Population density measured as population per km2.

3. Population density measured as population per square mile.

Source: OECD estimations, the United Nations data as of 2007 and Green *et al.* (2005).

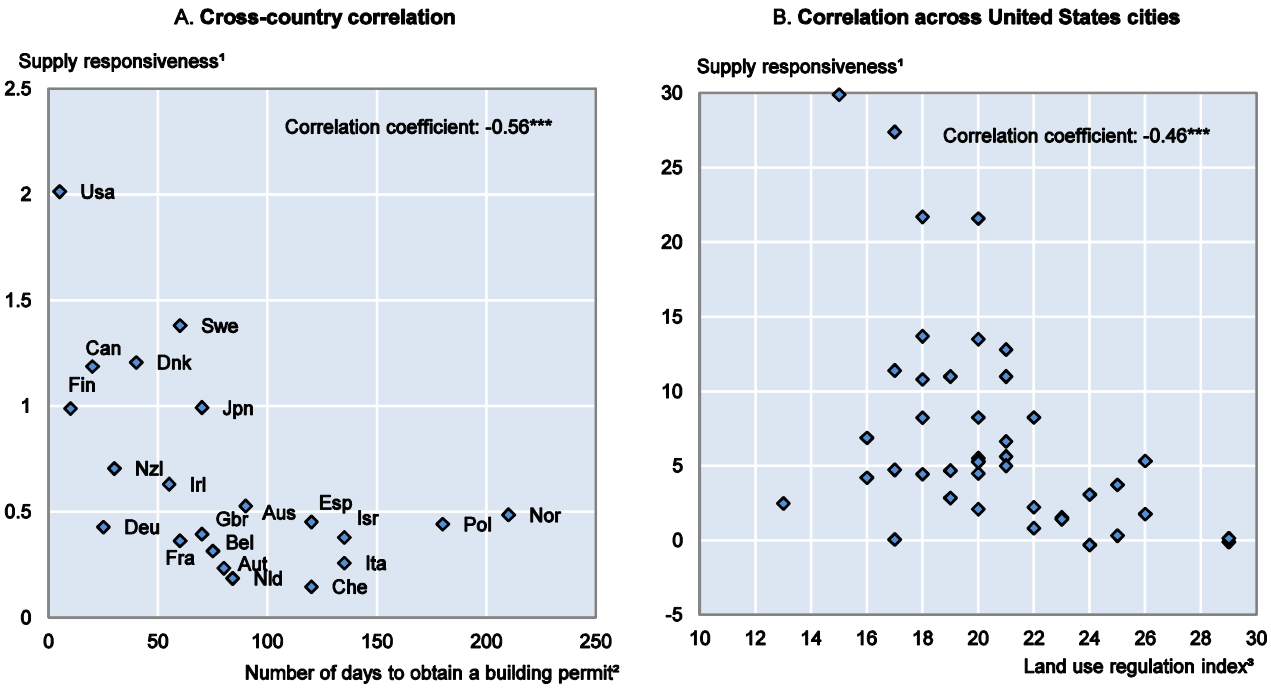
…but also housing policies such as land-use and building regulations matter…

32. But, government policies can also have a bearing on the supply of housing. For instance, land-use and planning policies are intended to reduce negative externalities that can be associated with new house construction, but they may also restrict supply responsiveness.[15] OECD's estimates of new housing supply

[15] New housing development typically imposes external costs on neighbours, such as congestion and pollution, loss of environmental and amenity value. Thus, these costs of increasing housing should be balanced against the benefits of satisfying demand (Barker, 2004).

responsiveness tend to be lower in countries where it takes longer to acquire a building permit, suggesting that an efficient design and enforcement of land-use regulation can make housing supply more responsive to prices (Figure 12).[16] This illustrative finding is also evident across cities in the United States, providing further support for the notion that housing supply responsiveness is influenced by regulations on land-use and planning. However, while there is an emerging consensus that local land-use regulation has become a binding constraint on the supply of new housing units in some countries, there is much less of a consensus on the magnitude of the impact (*e.g.* Gyourko, 2009 for an overview). Apart from regulations on land-use, the provision of infrastructure and other public services complementary to housing, such as road junctions or water drainage, is also likely to influence supply, though hard evidence of this link is not available (*e.g.* Barker, 2008 for a discussion).

Figure 12. Price responsiveness of supply and land-use regulations



*** denotes statistical significant at 1% level.

1. OECD estimates of country specific supply responsiveness (see Caldera Sánchez and Johansson (2011)) and estimates of supply responsiveness for United States taken from Green *et al.* (2005).
2. The number of days to obtain a building permit is obtained from the World Bank Doing Business (2009) indicators.
3. The land-use regulation index captures approval time of building permits, available land for residential housing and access to adequate infrastructure (see Malpezzi 1996).

Source: OECD estimations, World Bank Doing Business (2009), Malpezzi (1996) and Green *et al.* (2005).

…as well as incentives to encourage the usage of underdeveloped land…

33. The conversion of under-used urban land into developed land can be influenced by various public policy incentives to enhance supply responsiveness. For instance, well-designed taxes on vacant properties

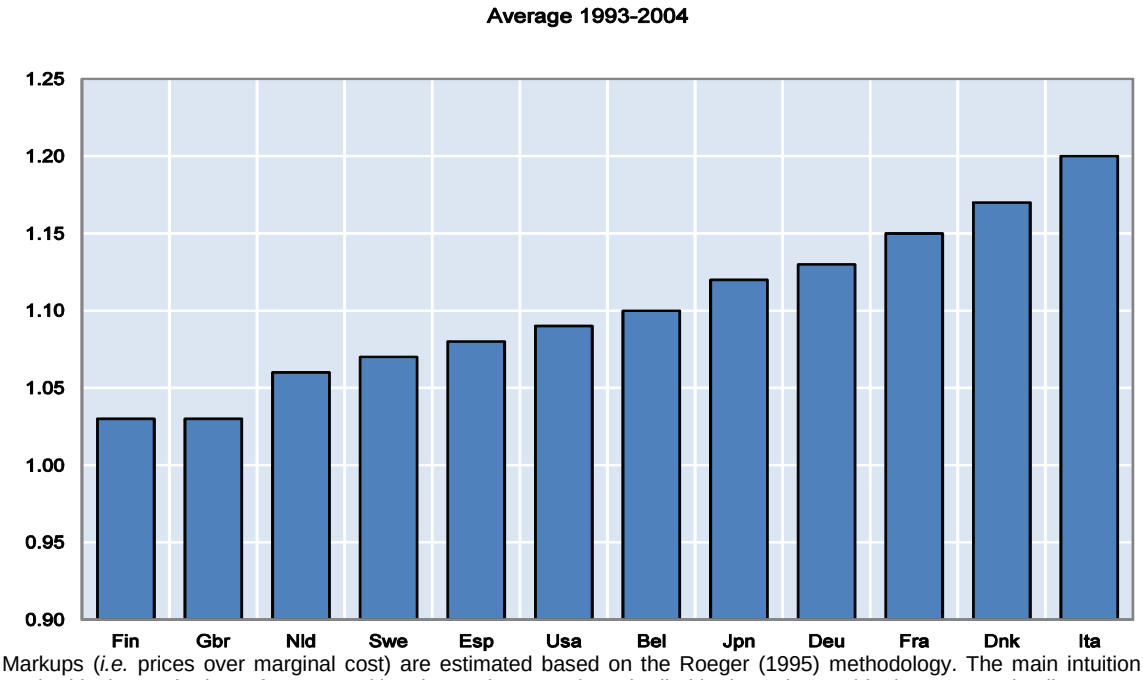
16 This correlation is robust to controlling for scarcity of land in a simple regression explaining the elasticity of supply with land-use regulation and scarcity of land. In addition, the correlation is also evident if the lifespan of building permits are used as a regulatory measure instead of the waiting time for obtaining a building permit.

and undeveloped land can encourage the appropriate utilisation of land for residential and business property in urban areas (*e.g.* Barker, 2004): linking the assessment of property value-for-tax purposes to the market value may increase incentives for developing vacant land as market prices also reflect its development potential (OECD, 2009).

...and competition in the construction industry

34. Housing supply responsiveness is also potentially affected by the degree of competition in the home construction industry (Barker, 2004). Usually, available studies find that average mark-ups in the construction industry are typically low relative to other non-manufacturing industries (Molnar and Bottini, 2010; Bouis and Klein, 2009), although the extent of competition varies across countries (Figure 13).[17] Taken as a whole, the construction industry is typically characterised by a large number of relatively small firms. However, this description may be misleading as only a limited number of contractors are capable of managing large projects. In general, competition is low among large contractors, while it usually tends to be high among smaller sub-contractors (OECD, 2008). In view of the importance of the functioning of the construction industry for supply responsiveness, it is crucial to implement an effective competition policy which, among other things, enforces anti-trust regulation and hinders collusive behaviour.

Figure 13. Mark-ups in the construction sector[1]



1. Markups (*i.e.* prices over marginal cost) are estimated based on the Roeger (1995) methodology. The main intuition of this method is that under imperfect competition the markup term is embodied in the Solow residual. For more details see Bouis and Klein (2009).

Source: Bouis and Klein (2009).

17 However, there is no apparent cross-country correlation between available measures of mark-ups in the construction industry and the estimated supply responsiveness. This may possibly reflect that average estimates of mark-ups are hard to interpret as they disguise large variations between different segments of the market.

4.2 Demand for housing: determinants of housing prices

35. Demand for owner-occupied housing reflects various medium- to long-term determinants, including households' disposable income, demographics, macroeconomic conditions and permanent features of institutions and policies within a country. This section first discusses the role of general macroeconomic conditions and demographics in housing demand before turning to the influence of mortgage markets and housing taxation based on findings obtained from estimating a house-price equation across a panel of OECD countries (Box 4).

Housing demand is influenced by demographics factors…

36. Changes in the size of the population and the number and size of households are important drivers of housing demand and, in turn, of house price developments. Strong population growth has been one factor behind rapid house price growth observed in OECD countries such as Ireland and Spain in the early 2000s (Miles and Pillonca, 2008) and more recently in Australia (Ellis, 2010). While long-run equilibrium in the housing market is likely to be influenced by the rate of natural increase of the population, evidence suggests that changes in population growth stemming from increases in net migration tend to have a greater influence on real house prices in the medium term than natural increases (Box 4). Furthermore, the extent to which housing demand from higher net migration ends up being capitalised into house prices is greater in countries where housing supply is less responsive to price signals, though the magnitude of this effect is fairly modest.

…as well as by macroeconomic conditions

37. General macroeconomic factors also have an important influence on housing demand and prices. House prices tend to increase with households' disposable income as income growth generates more demand for housing and drives up land prices (ECB, 2003). Cross-country panel estimation over two decades shows that on average across countries the elasticity of real house prices with respect to real household disposable income is close to unity (Box 4 and Andrews 2010). Developments in conditions influencing the uncertainty surrounding household's future income prospects are also likely to affect housing demand and house prices. For instance, reductions in unemployment may add to housing demand as lower unemployment increases consumer confidence and reduces income uncertainty. Evidence shows that reductions in structural unemployment, which may lead to an increase in the potential pool of homeowners, tend to result in higher house prices, particularly if supply is rigid (Box 4). The estimates imply that a 2 percentage point decline in the structural unemployment rate (measured by the NAIRU) – roughly equivalent to sample median change between 1995 and 2005 – increased real house prices in the average OECD country by around 8% over the period 1980-2005 (Figure 10B).

38. Interest rate levels affect the debt servicing burden and, in turn, the cost of homeownership. Existing evidence of the strength of the interest rate channel is mixed (*e.g.* Schiller, 2007a,b), although in general a negative relationship between interest rates and house prices has been found (*e.g.* ECB, 2003; IMF, 2005; OECD, 2004). Consistent with this, cross-country panel OECD estimates show that a decline in real interest rates increases real house prices after controlling for other relevant supply and demand factors (Box 4). Unsurprisingly, the short-term interest rate tends to have a stronger impact in countries where variable-rate mortgages prevail, while the long-term rate is relevant in those with mostly fixed-rate mortgages (see Andrews 2010 for details). Furthermore, the estimated impact of a given decline in interest rates on house prices tends to be larger in countries with greater competition in the banking sector.[18] This could reflect greater pass-through of policy to mortgage lending rate in these countries. Overall, the

[18] Competition in banking takes into account regulatory barriers on domestic and foreign entry, restrictions on banking activities and the extent of government ownership (de Serres *et al.* 2007 and Table 4).

estimation results suggest that the average impact of interest rates on real house prices in OECD countries is small. However, this may understate the true effect as the estimation framework is unable to control for the potential simultaneity bias between interest rates and house prices.[19]

Financial market deregulation has eased access to credit and raised demand for housing…

39. Financial and mortgage markets also play a crucial role in housing markets since owner-occupied housing constitutes a household's single largest financial outlay, and generally requires debt financing. Housing finance markets have changed drastically over recent decades, reflecting a wave of financial deregulation motivated by broader economic efficiency goals. There has been considerable cross-country variation in the timing of reform and the extent to which the financial sector was regulated in the earlier period (Abiad *et al.* 2008; Andrews 2010). Thus, significant differences remain in regulatory stance and current housing credit practices across countries (Table 4). These changes in financial market regulation have significantly lowered borrowing costs for housing, resulting in a substantial expansion in the supply of mortgage loans in many countries (ECB, 2009a; Ellis, 2006). Despite cross-country differences, this process has been an important common factor driving developments in the owner-occupancy segment and, thereby, other segments as well of the housing market.

Table 4. Mortgage and financial market features in OECD countries

	Regulatory limits on loan-to value	Prevailing type of interest rate	Typical maturity (years)	Mortgage equity withdrawal	Bank regulation (increasing in strictness)[1]
Australia	100% if insured	Mainly variable	25	Yes	2.89
Austria	..	Fixed (75%); Variable (25%)	25	No	2.49
Belgium	None	Fixed (75%); Mixed (19%); Variable (6%)	20	No	2.18
Canada	95% if insured	Fixed and Mixed (92%); Variable (8%)	25	Yes	2.68
Chile	..	Variable	..	..	..
Czech Republic	..	Fixed (Mixed)	20	..	3.04
Denmark	0.8	Fixed (75%); Mixed (10%); Variable (15%)	30	Yes	2.06
Estonia	..	Variable	30	..	..
Finland	None	Fixed (2%); Variable (97%); Other(1%)	17	Yes	1.95
France	60% to be eligible for mortgage-backed securities	Fixed/Mixed/Other(86%); Variable (14%)	15	No	1.52
Germany	60% to be eligible for mortgage-backed securities	Mainly Fixed and mixed	25	No	1.97
Greece	..	Variable	15	No	2.92
Hungary	..	Variable (Mixed)	11	..	2.70
Iceland	..	..	..	..	3.37
Ireland	80% (only for building societies)	Variable (70%); Rest mainly mixed	20	Limited	0.74
Israel	..	Variable	15; 30 (max)	..	..
Italy	80% (100% if guaranteed)	Fixed (28%); Rest mainly mixed	15	No	2.74
Japan	None	Fixed (36%), Mixed and Variable (64%)	25	No	2.26
Korea	40-60%	Variable	3; 20 (max)	..	3.31
Luxembourg	..	Variable	20 - 25	..	0.00
Mexico	..	Variable	..	..	2.87
Netherlands	None	Fixed (74%), Mixed (19%), Variable (7%)	30	Yes	1.66
New Zealand	..	Mainly fixed	25	..	1.17
Norway	..	Mainly variable	17	Yes	2.45
Poland	..	Variable	5 - 32.5	..	3.32
Portugal	..	Variable	25 - 30	..	2.38
Russian Federation	..	Fixed/ Variable	15 - 20	..	..
Slovak Republic	..	Variable	..	..	4.45
Slovenia	..	Variable	10	..	..
Spain	80% to be eligible for mortgage-backed securities	Variable (75%); Rest mainly mixed	20	Limited	1.78
Sweden	None	Fixed (38%); Mixed (24%); Variable (38%)	25	Yes	2.31
Switzerland	None	Mainly variable	15 - 20	..	2.11
Turkey	..	Variable	10	..	2.70
United Kingdom	100% (only for building societies)	Mixed (28%); Variable (72%)	25	Yes	1.45
United States	90% if guaranteed	Fixed (85%); Mixed (15%)	30	Yes	2.29

1. Measures anticompetitive regulations in banking taking into account regulatory barriers on domestic and foreign entry, restrictions on banking activities and the extent of government ownership (de Serres *et al.* 2007).

Source: ECB (2009b), Catte *et al.* (2004), de Serres *et al.* (2007).

19 This may reflect the potential interdependence between interest rates and house prices. For instance, a positive correlation between the two variables could be observed in instances where interest rates may respond to innovations in house prices, or when interest rates and house prices have responded simultaneously to economic news (see Caldera Sánchez and Andrews 2011).

Box 4. Determinants of real house prices: cross-country panel analysis

To assess the influence of structural and policy features on housing demand, a long-run real house prices equation was estimated in a cross-country panel setting (unlike the country-by-country estimations in Box 3). The extent to which housing market characteristics or policies influence real house prices has been tested using an estimation strategy that focuses on identifying how these factors influence the propagation of different kinds of housing demand shocks onto prices, as opposed to assessing their direct effect on prices. This choice was driven by the fact that data on housing market characteristics or policies are only available at a single point in time. As country-fixed effects are used in the panel estimation to control for potentially important time-invariant influences – such as cultural attitudes toward housing – the direct impact of housing market characteristics or policies cannot be identified separately.[1] The indirect effect of housing market characteristics or policies on house prices is, therefore, estimated by interacting them with determinants of house prices that vary over time. Insofar as these interaction effects are significant, consistent with prior expectations and robust across different kinds of demand shocks the results are also likely to provide a good indication of the qualitative effect of policies.

The estimated equation (4.1) is a long-run relationship between the real house prices (HP), and their potential determinants, in the form of an inverted demand function. As in the country-by-country specifications in Box 3, the demand equation takes into account supply by controlling for the dwelling stock. Given that the estimation is based on relatively short time series and that adjustment in housing markets takes a long time the results should be interpreted as medium-run effects.

$$\begin{aligned} HP_{i,t} &= \alpha + \beta_1 IR_{i,t-1} + \beta_2 IR_{i,t-1} * Bankreg_i + \beta_3 FinD_{i,t-1} + \sum_J \beta_4 FinD_{i,t-1} * Struct_i^j \\ &+ \beta_5 NAIRU_{i,t-1} + \sum_J \beta_6 NAIRU_{i,t-1} * Struct_i^j + \beta_7 Mig_{i,t-1} + \sum_J \beta_8 Mig_{i,t-1} * Struct_i^j \qquad [4.1] \\ &+ \beta_9 Inc_{i,t-1} + \sum_K \beta_{10}^K Z^K{}_{i,t-1} + \rho_i + \eta_t + \varepsilon_{i,t} \end{aligned}$$

Where *i* denotes country and *t* year.

The considered (time varying) demand shocks include financial deregulation, proxied by an index of financial reforms (FinD), structural unemployment, proxied by the NAIRU, and migration rates, measured by net migration (Mig). The propagation of these demand shocks onto prices depends on time invariant country-specific housing market characteristics or policies ($Struct_i$), such as the responsiveness of new housing supply or tax relief on debt financing costs. The responsiveness of new housing supply is obtained from the estimates reported in Box 3, while the tax relief on debt financing cost is described below in the main body text. The total impact of a demand shock, such as financial reform, on house prices is given by ($\beta_3+\beta_4*Struct_i$). In addition, the impact of the real interest rate (IR) on real house prices is allowed to vary with the country-specific regulations of banking services competition (Bankreg)[2], which is captured by a time invariant index of regulations that increases with restrictions to competition.

Other explanatory variables include real household disposable income (Inc) and a vector Z^K including demand determinants of equilibrium housing prices such as real rental costs, consumer price inflation and the natural increase in the population while supply controls include dwelling stock and real construction costs. In general, the qualitative influence of these explanatory variables on real house prices is broadly in line with the estimates reported in Box 3. As already mentioned, the model includes country-fixed (ρ), as well as time-fixed effects (η) to control for common global shocks, such as the decline in macroeconomic risk. To reduce the potential for endogeneity problems, the explanatory variables are included with a one-year lag, while the standard errors are clustered at the country level. All variables are expressed in natural logarithms, apart from the financial reform index, the NAIRU and the time-invariant interaction terms. The model covers up to 19 OECD countries (depending on the specification) over the period *circa* 1980-2005. Full details on data and estimations can be found in Andrews (2010).

Table 4.1 in this box reports the regression results. To aid the interpretation of the total effect of real interest rates and housing demand shocks on house prices, the bottom of Table 4.1 contains an estimate evaluated at the sample median value of each time-invariant policy. In addition, the policy experiments discussed in the main body of the text highlight how estimates of the total impact of a particular housing demand shock on real house prices change when the responsiveness of new housing supply and tax relief on debt financing cost are half a standard deviation above and below their sample median.

Table 4.1 Panel Model of (the log of) real house prices
Annual data over circa 1980-2005

	Fixed effects		
	(1)	(2)	(3)
Log of long term real interest rate	-0.334**	-0.277**	-0.160**
	[0.126]	[0.125]	[0.075]
Log of long term real interest rate * Index of banking regulation	0.155**	0.121*	0.071*
	[0.058]	[0.058]	[0.040]
Housing demand shocks and structural features			
Financial reform index		0.499*	0.603***
		[0.280]	[0.174]
Financial reform index x Supply responsiveness		-1.152***	-1.116***
		[0.370]	[0.312]
Financial reform index x Tax relief on housing		0.559	0.682**
		[0.335]	[0.289]
Non-accelerating inflation rate of unemployment (NAIRU)			-0.038
			[0.042]
NAIRU x Supply responsiveness			0.100**
			[0.035]
NAIRU x Tax relief on housing			-0.080***
			[0.018]
Log of net migration	0.034	0.021	0.046**
	[0.020]	[0.013]	[0.019]
Log of net migration x Supply responsiveness			-0.053*
			[0.028]
Other variables			
Log of real household disposable income	1.157**	1.220***	1.396**
	[0.499]	[0.401]	[0.482]
Log of consumer price inflation	0.036	0.025	0.013
	[0.027]	[0.029]	[0.018]
Log of real construction costs	0.409***	0.435***	0.259***
	[0.068]	[0.068]	[0.073]
Log of dwelling stock	-0.101	-0.054	-0.255
	[0.384]	[0.256]	[0.274]
Log of real rental costs	-0.041	-0.545*	-1.083***
	[0.267]	[0.303]	[0.287]
Log of natural increase of population	0.01	0.028	0.015
	[0.042]	[0.034]	[0.030]
Constant	-1.802	-0.372	3.913
	[3.294]	[2.789]	[3.702]
Overall impact of interacted variables on real house prices evaluated at the median of the structural features (p-values in brackets)			
Total effect of:			
Log of long term real interest rate			-0.02*
			[0.09]
Financial reform index			0.418**
			[0.013]
NAIRU			-0.033***
			[0.0004]
Log of net migration			0.018*
			[0.087]
Other tests (p-values)			
H0: Household Disposable Income Coefficient = 1	0.76	0.59	0.42
Number of observations	322	296	296
Number of countries	19	17	17
R-squared	0.82	0.83	0.87

Standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. Country- and time-fixed effects not shown.
Source: OECD calculations.

1. A Hausman Test rejects random effects in favour of a fixed effects model.

2. Competition in the banking sector is proxied by a time-invariant measure of banking regulation which takes into account regulatory barriers on domestic and foreign entry, restrictions on banking activities and the extent of government ownership (de Serres *et al.* 2007).

.. putting upward pressure on real house prices…

40. The estimates presented in Box 4 imply that financial deregulation – proxied by a country-specific financial reform index[20] – has been associated with a substantial increase in real house prices, after controlling for other relevant supply and demand influences on national housing markets. On these estimates, financial deregulation has increased real house prices by as much as 30% in the average OECD country - pointing to significant demand pressures (Figure 10A). However, to the extent that housing markets are still adjusting to this shock by increasing housing supply, the long-run impact of financial deregulation on real house prices is likely to be somewhat weaker.

…but also increasing owner-occupancy among credit-constrained households

41. Developments in mortgage markets also affected the structure of housing demand. In many OECD countries, mortgage market deregulation significantly reduced deposit requirements, thereby easing the down-payment constraint for many households wishing to become homeowners. While the maximum loan-to-value (LTV) ratio – one key measure of the down-payment constraint – has risen in many OECD countries over recent decades (Figure 14), important cross-country differences remain (Table 4). Regulatory ceilings on LTV ratios have tended to be particularly binding in Germany, while in a few other countries LTVs are effectively capped by lengthy legal procedures in the event of default (Catte *et al.* 2004).[21]

42. The down-payment constraint tends to affect financially-constrained consumers and particularly younger households, to the extent that they have had less time in which to accumulate a deposit. Accordingly, from the late 1970s until the early 1990s, homeownership rates among younger households were found to increase more in those countries where LTV ratios increased (Chiuri and Jappelli, 2003). Likewise, OECD estimation results over a more recent period suggest that a 10 percentage point increase in the maximum LTV is associated with a 12% rise in the homeownership rate of households aged 25-34 years in the second income quartile, while the effect for older households is much smaller (Figure 15 and Andrews and Caldera Sánchez 2011).[22]

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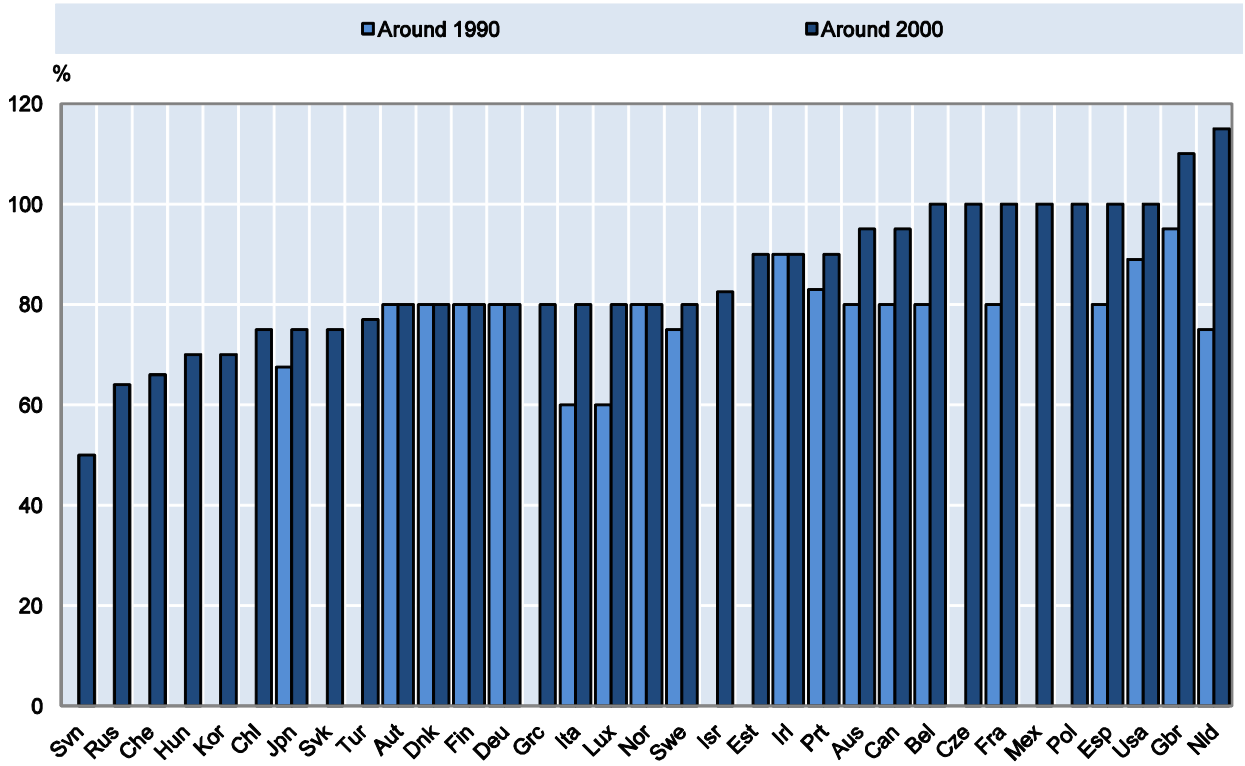
20 The analysis uses the IMF's regulatory index that captures regulations in financial markets and is based on the timing of the removal of a number of restrictions, such as credit and interest rate controls, "excessively high" reserve requirements, entry barriers, state ownership in the banking sector, capital account restrictions, securities market policy (Abiad, *et al.* 2008).

21 Another important factor influencing the cost of financing is the maturity of housing-related loans, with typical contract duration ranging across countries from 5 to 30 years (Table 4). There is a tendency for contract terms to be longer in countries having higher LTV ratios, reflecting that longer repayment periods are needed to keep the debt service-to-income ratios affordable.

22 Overall, these estimates imply that a 10 percentage point increase in the LTV raises the aggregate homeownership rate by 3% from the sample median (this is equivalent to a 0.5 percentage point increase on a median aggregate homeownership rate of 63.6%).

Figure 14. Maximum loan-to-value ratios in OECD countries



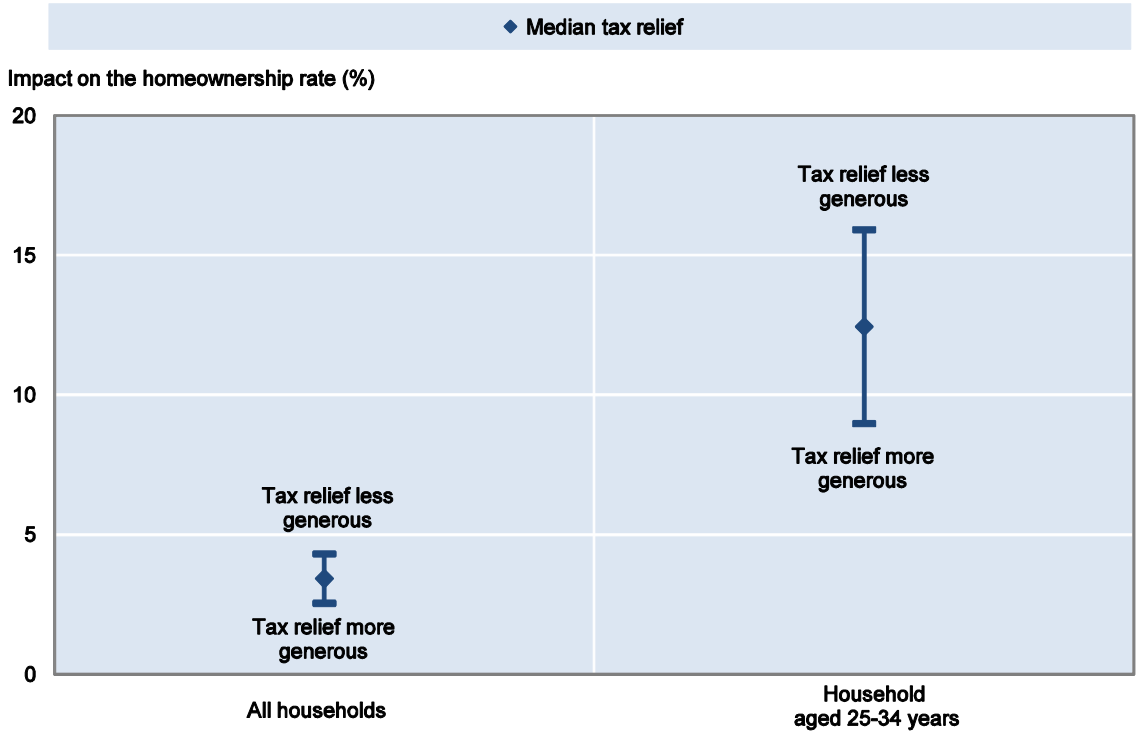
Source: ECB (2009b), Catte *et al.* (2004) and Chiuri and Jappelli (2003).

But the relaxation of lending standards may go too far

43. While an easing of credit constraints is generally desirable, in the absence of adequate regulatory oversight policy changes that trigger a relaxation in lending standards can give rise to an excess in non-performing loans, thereby jeopardising macroeconomic stability. For instance, in the United States, lending standards deteriorated significantly during the housing boom of the past decade. While 8% of purchasers in 2001 had zero down-payment, this figure had risen to 22% by 2007 (American Housing Survey). Although loans with very high LTVs also became more common in other OECD countries, such as in the Netherlands and the United Kingdom, where they generally constituted a much smaller share of the loan pool than in the United States. As house prices continued to rise in the United States the economy-wide share of households in negative equity –*i.e.* the value of the outstanding loan was greater than 100% of the estimated value of the house – was moderate. However, after house prices peaked in 2006 this proportion increased significantly compared to earlier in the decade (Figure 16). It is likely that such deterioration in lending standards could have been prevented by tighter prudential supervision (see Section 6.3).

Figure 15. Homeownership, financial deregulation and tax relief on debt financing costs[1]

Impact of a 10 percentage increase in the maximum loan to value (LTV) ratio on the homeownership rate of households in the second income quartile



1. The estimates are based on a fixed effects regression for 15 OECD countries over the period circa 1985 - 2005. The model allows the impact of LTV on the homeownership rate of the second income quartile to vary with the extent of Tax relief and all other variables set equal to their sample mean. The regressions contain country and time fixed effects and control for real household income, real interest rates, consumer price inflation, house price to rent ratio, real construction costs, the share of population aged 25-44 years and the homeownership rates of other income groups, (for details see Andrews and Caldera Sánchez, 2011).

   The coefficients of interest for each equation are summarised below:

   $HO_{i,t}^{IncQ2} = 0.254 * LTV_{i,t} - 0.190 * (LTV_{i,t} * Taxrelief_i)$

   $HO_{i,t}^{IncQ2_2534} = 0.594 * LTV_{i,t} - 0.471 * (LTV_{i,t} * Taxrelief_i)$

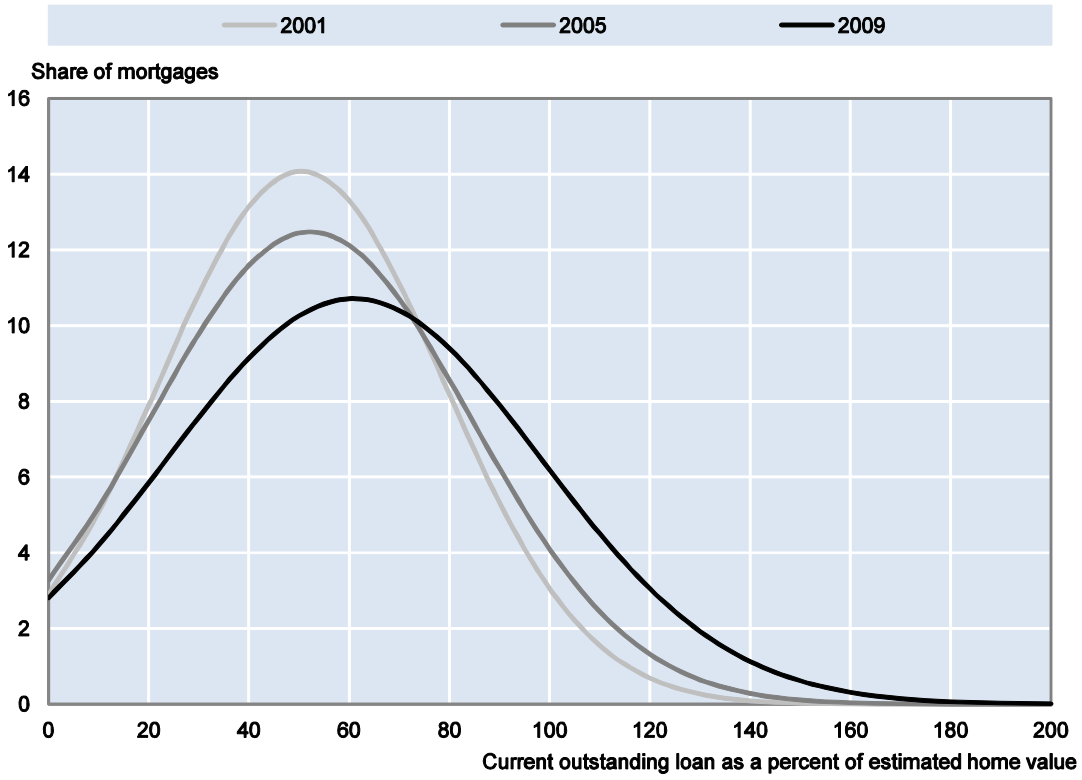
   Where *i* denotes country and *t* year.

   $HO_{i,t}^{IncQ2}$ is the homeownership rate of all households in the second income quartile and

   $HO_{i,t}^{IncQ2_2534}$ is the homeownership rate of households aged 25-34 years in the second income quartile. The LTV terms are jointly significant at the 1% level, while the individual coefficients are significant at a level of at least 10%. When *Tax relief* is set to the sample median, the overall impact coefficient on LTV is 0.19 for all households, and 0.44 for those aged 25-34 years indicated by the dot. Therefore, a 10 percentage point rise in the LTV increases $HO_{i,t}^{IncQ2}$ by 1.9 percentage points, which is equivalent to a 3.4% rise from the sample median of 55.6%.

Source: OECD calculations based on Luxembourg Income Study (LIS).

Figure 16. Housing leverage in the United States, 2001-2009



Source: OECD calculations based on American Housing Survey (AHS).

Housing taxation also has implications for demand

44. Another important policy influence on housing demand is taxation. Typically, owner-occupied housing has favourable tax treatment relative to other forms of capital investment, including the purchase of residential property by private landlords for letting purposes, in many countries.[23] Imputed rental income on principal homes is not subject to income tax, except in a few countries (Iceland, Luxembourg, the Netherlands, Slovenia and Switzerland). Even though most countries levy recurrent taxes on immovable property (see Johansson 2011 for details), these sometimes apply to both owner occupiers and tenants and cannot be considered as a perfect substitute for taxes on imputed rents. In any case, the magnitude of these property taxes appears to be small in most countries, as reflected by their low revenue shares (OECD, 2009). Only a few countries raise substantial revenues from these taxes (*e.g.* the United Kingdom, Korea, the United States and Canada). In addition, the valuation of the property for tax purposes lags well behind the market value in many countries; and even if property values or tax rates are adjusted for general house price inflation, distortions will arise from changes in relative prices. At the same time, mortgage interest payments can be deducted from the personal income tax base in about half of the countries and a few countries have tax credits for owner occupancy.[24] In addition, in most of the OECD countries realised capital gains from the sale of principal homes are tax-exempt, or the taxation of gains is deferred if

[23] Descriptive information on property taxation concerning recurrent taxes on land and buildings, taxes on financial and capital transactions and net wealth and inheritance/gift taxes were obtained from replies to the OECD housing market questionnaire.

[24] Mortgage interest deductibility has been removed in Spain, except for families with gross income below 24000 Euros, as of 1st January 2011 (OECD, 2010b).

reinvested in another principal home. The value of the house is, though, subject to inheritance tax in the majority of countries.

45. This favourable tax treatment of owner occupation is often justified by the specific nature of housing and the positive externalities for society that may be associated with owner occupation. For instance, it is argued that compared to renting, homeownership has positive external effects since owners tend to take more interest in the community than renters (DiPasquale and Glaeser, 1999). However, this favourable tax treatment may crowd out capital from more productive investments than housing, resulting in efficiency losses, and can also have undesirable effects on tenure choice by households (*e.g.* OECD, 2009).

46. Additional demand distortions originate in many countries from transaction taxes on house purchases. High transaction taxes can discourage people from buying and selling houses with implications for the wider economy (see Sections 6.3 and 6.4 below). These taxes lead to an inefficient use of the housing stock. They are also inequitable, since they favour homeowners who stay put. The same revenue can be obtained at a lower distortionary cost (and in a more equitable way) by taxing imputed income (including capital gains) or consumption (*e.g.* consumption of housing services) (OECD, 2009 and Diamond and Mirrlees, 1971).

Tax relief of debt financing costs of housing varies across countries…

47. One, albeit crude, way to assess the tax favouring of owner-occupied housing with respect to debt financing is to look at the difference between the market interest rate and the after-tax debt financing cost of housing (Fukao and Hanazaki, 1986; van den Noord, 2005). This indicator takes into account whether interest payments on mortgages are deductible from taxable income and, if so, any limits on the allowed period of deduction or the deductible amount and whether tax credits for loans are available (see Johansson 2011). Obviously, other features of the tax system (notably recurrent taxes on property and the fiscal treatment of imputed rents) affect the cost of owner-occupancy; however, a more comprehensive indicator is difficult to construct because of data limitations. Even so, this simplified measure gives an indication of the extent of tax favouring of debt-financed homeownership. According to this indicator, the tax relief on debt financing cost is generous in the Netherlands and Czech Republic, less so in Italy and Austria and effectively zero in countries where mortgage loans are not tax-favoured (Figure 17).[25]

..and such mortgage cost reliefs tend to be capitalised into house prices…

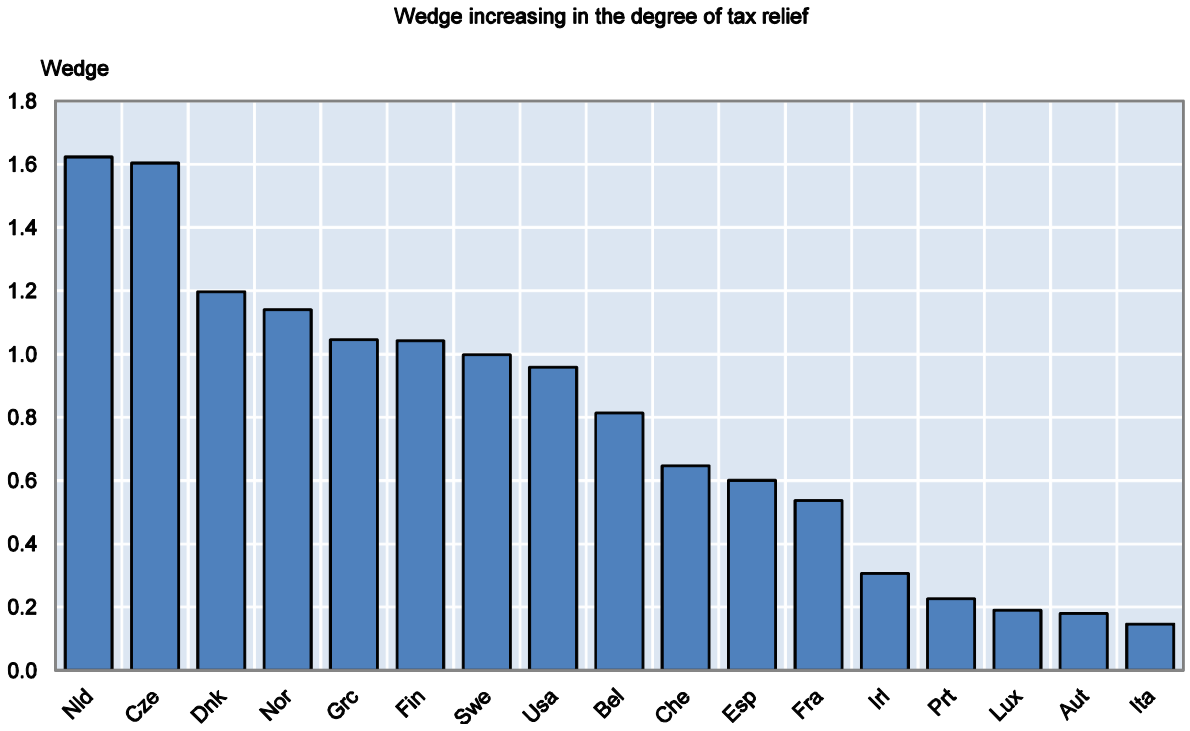
48. Previous studies have showed that tax-favouring of housing tends to encourage excessive leverage and be capitalised into house prices (Capozza *et al*. 1996; Harris, 2010), without necessarily expanding housing opportunities for households. The estimates presented in Box 4 suggest that in countries having more generous housing tax relief on debt financing costs (equivalent to 0.3 percentage point above the sample median), a positive demand shock translates into an increase in house prices that is around 50% larger than in the typical OECD country (Figure 10 and Table 4.1 in Box 4).[26]

---

25 The tax relief on debt financing cost depends on inflation, and it becomes comparatively larger in countries with full deductibility as inflation increases, while it is insensitive to inflation in countries for which the upper limit on tax relief is binding. However, for a small increase in inflation the obtained cross-country pattern remains unchanged.

26 The estimates in Figure 10A suggest that financial deregulation may have boosted real house prices by around 30% in countries with tax relief on debt financing cost at the OECD median, while the estimated impact is 45% in countries with more generous tax relief (defined as half a standard deviation above the median).

Figure 17. Tax relief on debt financing cost of homeownership[1], 2009



1. This indicator takes into account if interest payments on mortgage debt are deductible from taxable income and if there are any limits on the allowed period of deduction or the deductible amount, and if tax credits for loans are available. For countries that have no tax relief on debt financing costs, this indicator takes the value of zero. See Johansson (2011) for details.

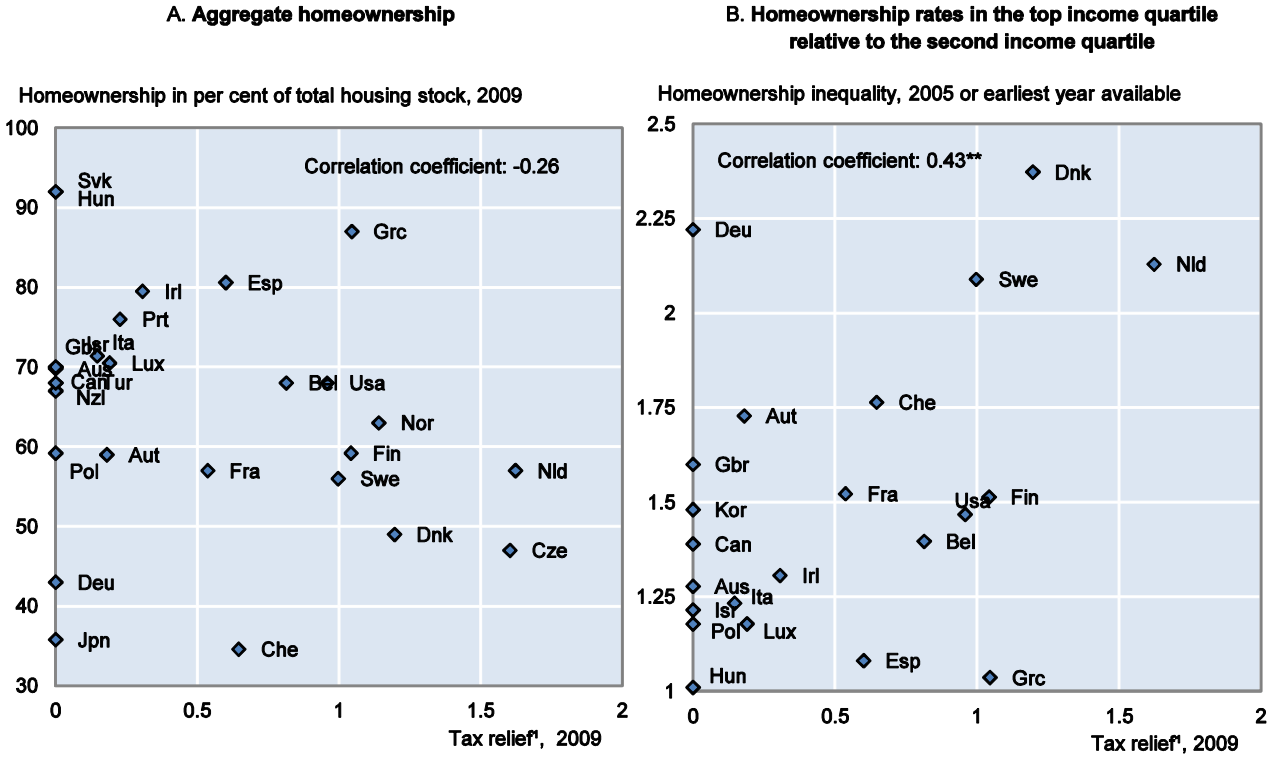
Source: Calculations based on OECD Housing Market questionnaire.

… and tend to be regressive

49. Policies such as mortgage interest deductibility also tend to be regressive, both because higher income households are more likely to be homeowners in the absence of the subsidy and because in most countries, tax relief for debt financing costs is a deduction against earned income and not a credit and, thus, it is worth more to high-income earners. Distributional effects are likely, though, to be complex where there is capitalisation of the effects of tax relief, with first-time home buyers perhaps benefitting less than existing owners. Suggestive evidence shows that there is no clear cross-country relationship between the extent of mortgage deductibility and aggregate homeownership rates. Instead, homeownership inequality – measured by the ratio of the homeownership rate of the top income quartile households to the second income quartile– tends to be higher in countries with more generous housing tax relief on debt financing costs (Figure 18). Moreover, evidence suggests that an increase in house prices crowds-out financially-constrained households from homeownership in countries with more generous housing tax relief on debt financing costs. In countries having more generous tax relief, a reduction in the down-payment constraint (*i.e.* an increase in LTVs) had a much smaller impact on increasing homeownership rates of financially-constrained households, compared to a large positive impact in a country having less generous tax relief (Figure 15 and Andrews and Caldera Sánchez 2011).[27]

[27] The estimates in Figure 15 imply that a 10 percentage point increase in the maximum LTV ratio increased homeownership amongst households aged 25-34 years in the second quartile by 12.4%, when tax relief on debt financing cost is set to the sample median. If the relief is assumed to be the most generous in the

Figure 18. Tax relief on debt financing cost and homeownership, 2009



** denotes statistical significant at 5% level.

1. This indicator takes into account if interest payments on mortgage debt are deductible from taxable income and if there are any limits on the allowed period of deduction or the deductible amount, and if tax credits for loans are available (see Johansson (2011) for details).

Source: Calculations based on OECD Housing Market questionnaire and Luxembourg Income Study (LIS).

Housing should be taxed in the same way as other investment and consumption goods

50. Given that investment in owner-occupied housing delivers much of its return through a household's consumption of housing services, economic distortions due to inappropriate taxation may occur on more than one margin. As a vehicle for household saving and investment, house purchase for owner occupation may compete with a range of other instruments, including buy-for-let investment in property, pension saving, purchase of shares or investment in a small business. In general the difference between pre- and post-tax returns should be the same for housing as for alternative investments and savings. A second margin is whether a household chooses to rent or own its dwelling. In either case the consumption of housing services should be taxed at similar rates. It is likely though to be impracticable to achieve this through the application of a yearly VAT as no transaction takes place in the case of owner occupation. Some countries apply a VAT to the sale of new construction on the basis that the price reflects the present value of the stream of services that housing is expected to yield. A tax on all housing services (rental and owner-occupied) such as the "council tax" in the United Kingdom or the "taxe d'habitation" in France could be applied, although a drawback is that the tax base may be only loosely related to the amount of housing services and such taxes may be capitalised into house prices.

sample, the impact of a 10 percentage point increase in the LTV on the homeownership rate of this group is around 9%.

51. With respect to income taxation, tax neutrality of housing depends on whether housing is seen as an investment or a consumption good.[28] If housing is considered an investment, such investments should be taxed in the same way as those in other assets. This means taxing imputed rental income, less depreciation allowances, while allowing for interest rate deductibility (*i.e.* taxation of net imputed rental income). However, as mentioned above, only a few countries tax imputed rents and those that do often substantially under-estimate the rental value (See Johansson 2011). In these cases combining mortgage interest deductibility with levying of recurrent immovable property taxes at a higher level, consistent with the taxation of financial income is a second-best solution, though local government control over property taxes makes it difficult in many cases to implement this approach in a co-ordinated way. An alternative second best solution would consist in removing mortgage interest deductibility. In any case, property valuations used for tax purposes need to be regularly updated. These updating schemes could include special arrangements to reduce liquidity constraints for people with low incomes and non-liquid assets. This is, however, often politically difficult to implement as property taxes are very unpopular (OECD, 2009).

5. Structural and policy influences on the rental market

5.1 Supply of rental housing

Governments influence rental supply through social housing and other policies

52. The distinction between the provision of private and social rental housing is important for understanding the functioning of the rental market. Social housing captures housing which is owned and supplied by the state/municipalities and independent organisations, such as housing associations. In this study, social rental housing refers to housing that is let at below-market rents and/or allocated by non-market mechanisms through some administrative procedure (see Johansson 2011). By contrast, the supply of private rental housing broadly responds to the same market influences that determine the supply of owner-occupied housing: demand drivers such as demographics and income, factors influencing the profitability of different types of housing and of alternative investment opportunities, as well as housing policies notably rental regulations (see below).

53. Government involvement in the private rental market includes taxation, building and rental regulations and rent allowances. As discussed above, tax incentives for rental housing are relatively few as they tend mostly to benefit owner-occupied housing in OECD countries.[29] Favourable tax treatment of owner-occupancy has likely contributed to the decline in the relative share of housing for private rent compared to owning observed during the past decades in some OECD countries (Whitehead, 1998; Harvard JCHS, 2008).

54. Supply constraints in the form of land use and zoning restrictions that restrict multi-family construction, which is typically dwellings for rent, may also reduce the supply of private rental housing - particularly in the low- to medium- cost segment of the market (Schuetz, 2007). Some countries provide subsidies to increase the profitability of construction for rent or to offset high development costs. For instance, in the United States the Low Income Tax Credit Program provides tax breaks to developers in

[28] In the event that housing is seen as a durable consumption good, to achieve neutrality within income taxation net imputed rents should be exempt from income tax. Moreover, mortgage interest deductibility should only be allowed when interest on other consumption loans is also deductible, which is only the case in a few countries.

[29] However, in France tax credits for new developments exists. A new tax incentive scheme to encourage investment in rental property was launched in 2009, which allows claiming a tax reduction equivalent to 25% of the property purchase price (up to €300 000) for 9 years.

exchange for setting aside units for rent to lower-income households (Harvard JCHS, 2008). However, in most countries supply-side government interventions is linked to the provision of social housing.

The structure of social housing systems differs widely across countries…

55. The structure of social housing systems varies widely across countries in terms of tenure, governance and owners. Among the countries surveyed through the OECD Housing Market Questionnaire, social housing generally consists of rental dwellings, although homeownership is also common in some countries (*e.g.* Italy, Spain and Mexico). In the majority of countries, the governance of social housing is shared between national/federal, and local governments, with national governments responsible for the overall policy priorities and budget, while local governments implement social housing programmes. The social housing stock is predominantly public-owned, directly by local governments or through municipal housing companies. In some countries non-profit organisations own an important part of social dwellings (*e.g.* the Netherlands, Austria, Denmark, the United Kingdom, Ireland and the United States), while private owners are frequent in the United States, France, Spain and Korea.

…with broad-based versus targeted provision being an important distinction

56. Although social housing systems vary along several dimensions, countries can be grouped along two of them: the share of social housing in total housing and the eligibility and/or allocation criteria (*e.g.* Kemeny, 1995; 2006).[30] Based on the information gathered through the OECD questionnaire, two models of social housing emerge, one broad-based and one targeted (including means-testing) (Table 5).[31] In the broad-based system, social housing is open to all citizens without necessarily applying any priority criterion in the allocation of dwellings.[32] A feature of these systems is that social housing operates jointly (integrated) with the private rental sector and social housing has a market-regulating role (Cecodhas, 2007). By contrast, in targeted systems social housing operates separately from the private rental market and only households for which the market is deemed unable to deliver housing will benefit from it. In some countries, housing is allocated to eligible tenants (where eligibility is based on income thresholds) *via* some queuing system with consideration given to the priority rating of tenants, while in other countries greater emphasis is placed on the needs of the most vulnerable households.

57. In the targeted systems, reassessment of eligibility of current tenants takes place in about half of the countries, although the frequency varies from annually up to every fifth year. The most common action if a tenant's eligibility has changed is to increase rents and/or terminate the rental contract, although in a few countries no action is taken. During the past decade, in several countries the number of applicants for social housing has increased (possibly reflecting declines in housing affordability associated with increases in real house prices), while at the same time the relative share of social housing in the overall stock has fallen. This tightening in the social housing sector puts pressure on the effectiveness of the allocation process as queues are likely to build up. Given the potentially rising demand for social housing, frequent reassessment of eligibility with appropriate actions if the household's situation has changed would help to free up social housing for needier households.

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30 Eligibility determines the individuals who may be housed by social landlords, while the allocation process assigns eligible households to dwellings.

31 In the United Kingdom, social housing is not means-tested *per se*, However, the allocation criteria is highly targeted, implying that only households in greatest need qualify for social housing (European Commission, 2010).

32 However, often local governments reserve a number of dwellings for individuals with special needs (*e.g.* Sweden, Netherlands), while at the same time they also exclude the poorest household by denying housing to those falling below certain income thresholds (Fitzpatrick and Stephens, 2007).

Table 5. Types of social housing systems

Based on eligibility and allocation criteria

Size: Percentage of social housing in the total dwelling stock	Broad-based system	Targeted system	
	No income limit: Waiting list	Income limits: Waiting list with some combination of priority groups	Income limits: Needs/priority based allocation
0-5%	Luxembourg	Estonia Korea Mexico Norway Slovak Republic Switzerland United States	Australia Italy Portugal Hungary Greece Slovenia
6-10%		Belgium New Zealand Ireland	Canada Germany Israel
11-20%	Sweden	Poland Spain	Czech Republic Finland France United Kingdom
More than 20%	Denmark Netherlands	Austria	

Source: OECD Housing Market questionnaire.

Trading-off targeting of social housing and residential segregation

58. Allocation and governance of social housing is difficult. One potential advantage of a targeted system which uses greater prioritisation through narrower eligibility criteria is that it can in principle focus on households in greatest need of housing and therefore achieve its goals at a lower cost and entail less deadweight losses than less targeted social housing systems. Moreover, a uniform prioritisation system applied across regions within a country enhances transparency on the requirements for obtaining social housing and should not hamper mobility. However, it is common for highly targeted needs-based systems to be associated with spatial segregation (Fitzpatrick and Stephens, 2007).[33] The location of social housing is in most cases a political decision, although historically social housing has not been spread uniformly

[33] Segregation also occurs in countries with greater socioeconomic mix in the social (public) housing sector. For example, segregation is a feature of the Swedish municipal housing system with the better-off tenants tending to live in the more popular centrally-located properties, while lower-income households tend to live on the less popular peripheral estates (Stephens *et al.* 2002).

across the urban space. Typically it has been concentrated in older industrialised cities and within them in the periphery of cities reflecting difficulties to find low-cost land (*e.g*. Scanlon and Whitehead, 2008). Generally, social housing is equated to rental housing and a concentration of large single tenure areas makes it harder to achieve a social mix of tenants. Such residential segregation can result in significant disparities in the quality and access to education and in employment outcomes as well as in access to transport networks and public services (*e.g.* Galster, 2007). For instance, there is evidence of adverse neighbourhood effects on educational achievement of children through peer group effects (*e.g.* Gibbons, 2002). In any case, there would seem to be a potential trade-off between allocating social rented housing on the basis of need and preventing concentrations of socio-economic disadvantaged groups at the neighbourhood level. Means-tested social housing systems may also potentially reduce job-seeking incentives amongst the unemployed or discourage low-wage workers from seeking higher paid jobs if reassessment of eligibility takes place and social housing is withdrawn or rents increased as earned income increases.

Social housing may crowd out other housing supply

59. Social housing may also crowd-out private investment in housing without necessarily leading to large increases in the overall housing stock, implying that such housing policies may have little effect on housing consumption. Social housing initially increases the supply of housing. Insofar as these units are allocated to households that previously were not able to rent/buy a dwelling on the market there is no effect on private rental demand and long-run supply increases. By contrast, if the new units of social housing are allocated to households that were able to rent/buy in the market, private demand is reduced and long-run supply is affected. Country-specific studies have found that crowding-out effects on private investment of public subsidies to housing is less than complete. Moreover, they tend to be less significant for tenant-based rental assistance than direct provision of housing (*e.g.* Sinai and Waldfogel, 2005).

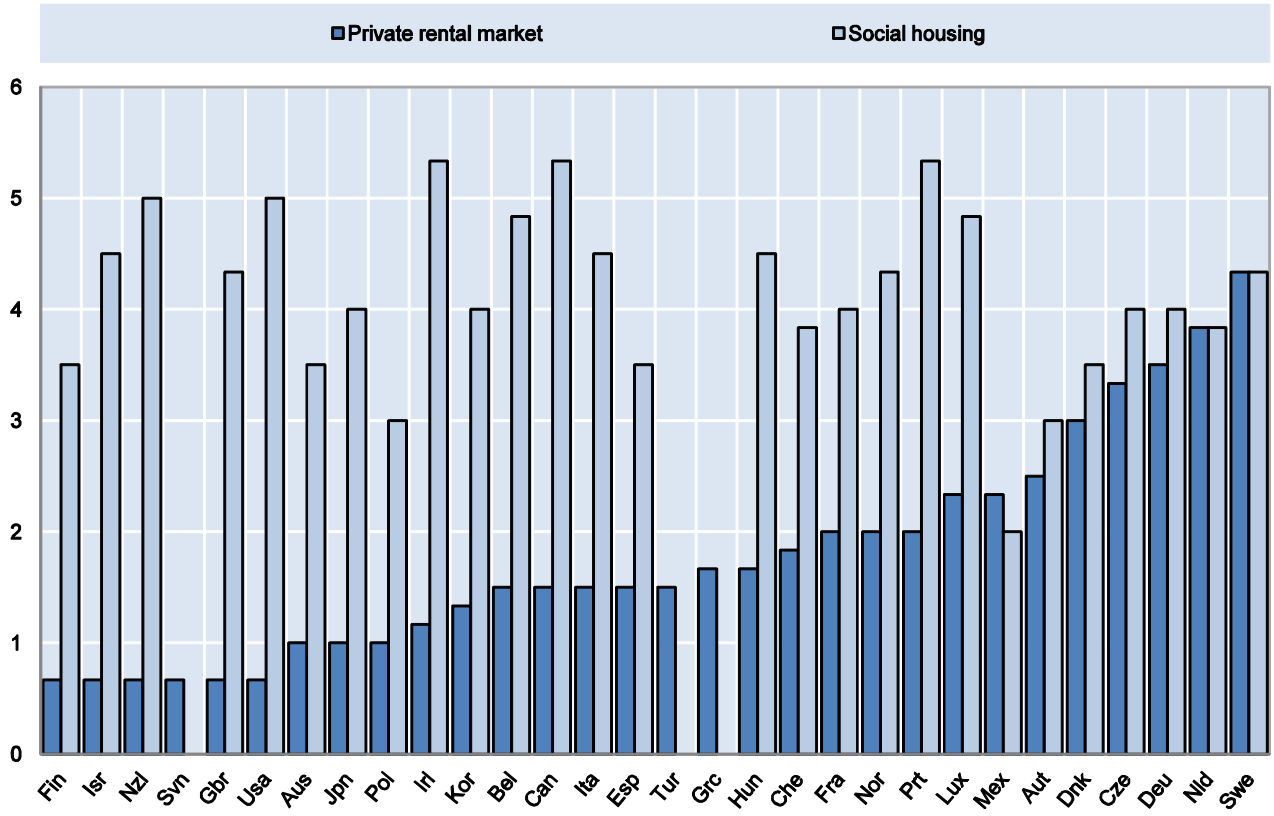
Rental regulations vary across countries influencing rental markets…

60. Rental housing supply is also influenced by a range of regulations covering rents and tenant-landlord relationships, which are often aimed at addressing market imperfections such as asymmetric information and/or unequal bargaining power between landlords and tenants. New indicators based on replies to the OECD Housing Questionnaire suggest that regulations vary substantially across OECD countries (see Box 5). According to the measure of rent control, regulation appears to be comparatively strict in countries with a relatively large rental sector (*e.g.* Sweden, the Netherlands, Germany and Czech Republic) (Figure 19). This may possibly reflect that in countries with large rental sectors the demand for regulations governing its functioning is greater. By contrast, rent control is lax in New Zealand, Finland, Slovenia, the United Kingdom and the United States. Rent control in social housing is generally stricter than in the private sector, consistent with the idea that a key function of social housing is to provide affordable housing. The difference in the degree of regulation of private and social rentals is particularly large in English-speaking countries, while in some Nordic and continental European countries regulations in the two sectors are fairly similar.[34] Rent control that is stricter in social rental housing than for private rentals may unintentionally undermine mobility among social tenants to the extent that moving could involve foregoing rent (and tenure security) advantages relative to the private market (Flatau *et al.* 2003).

[34] In Sweden, rents in the social rental sector are used as a basis for those in the private sector, while in the Netherlands the social rented sector is so large that the private sector cannot act freely – limiting competition in the rental market (*e.g.* UN-Habitat, 2009; Whitehead and Scanlon, 2007).

Figure 19. Rent control,[1] 2009

Scale 0-6: Increasing in degree of control



1. This indicator is a composite indicator of the extent of controls of rents, how increases in rents are determined and the permitted cost pass-through onto rents in each country. Control of rent levels includes information on whether rent levels can be freely negotiated between the landlord and the tenant, coverage of controls on rent levels and the criteria for setting rent levels (market based, utility/cost based, negotiation based or income based). Controls of rent increases includes information on whether rent increases can be freely agreed by the landlord/tenant, whether rent increases are regularly indexed to some cost/price index or if increases are capped or determined through some other administrative procedure, including negotiation between tenant/landlord associations. The pass-through of costs onto rents includes information on whether landlords are allowed to pass on increases in costs onto rents (cost pass-through) and the extent of such pass-through *i.e.* the types of cost that can be passed on. See Johansson (2011) for details.

Source: Calculations based on OECD Housing Market questionnaire.

Box 5. Indicators of rental market regulation

Based on replies to the OECD Housing Questionnaire, indicators were constructed to obtain measures of the extent of rental regulations covering two key areas of rental markets:[1]

Rent control indicator:

- Control of rent levels: Takes into account if initial rent levels can be freely negotiated between the landlord and the tenant, the coverage (*e.g.* sitting tenants, new tenants, new construction) of the controls on initial rent levels and the criteria for setting them.
- Control of rent increases: Takes into account if rent increases within a tenancy contract can be freely agreed upon or not, how rent increases are done (indexation to some cost/price index, caps on rents or negotiation/administrative procedure), the extent to which landlords can pass on cost increases to renters.

Tenant-Landlord relations indicator:

- Ease of tenant eviction: Includes information on valid reasons to evict a tenant beyond failing to pay the rent or breach of contract, time periods when eviction is not permitted, how a tenant-landlord eviction dispute is settled (regular court system or arbitration/specialised court).
- Tenure security: Includes information on whether contract duration can be freely agreed upon between parties, average contract length and required notice period by landlords in case of contract termination.
- Deposit requirements: Includes information on whether the landlord can collect a security deposit and if so the amount.

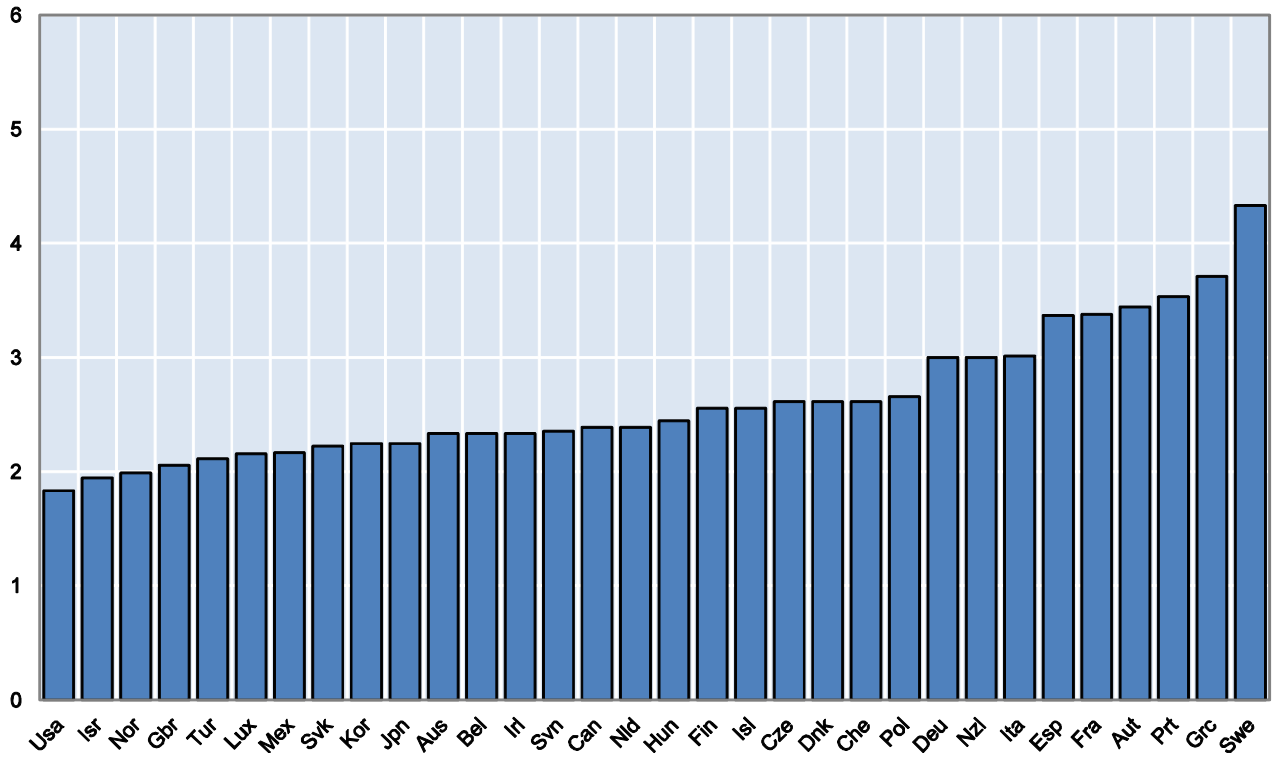
1. Indicators were constructed for both the private and social rental sectors, but the extent of tenant-landlord regulation in the social housing sector was assessed based on a more limited information set. Johansson (2011) provides details on data and indicator construction.

61. Most countries also regulate contractual aspects of tenant-landlord relations. The motivation for restricting freedom of contract is that bargaining between the landlord and tenant is often unbalanced, with either the risk that landlords exploit their market power or that tenants hold-up landlords' property (*e.g.* if sanctions for unpaid rents are not envisaged). Thus, regulation on tenant-landlord relations may be seen as a way to counteract this asymmetry by prescribing a standard form of contract applying to all tenants and landlords. Such regulations governing tenant-landlord relations vary across countries (Figure 20). Tenant-landlord regulation tends to be comparatively strict in many continental European countries. Moreover, tenant-landlord regulations tend to be somewhat stricter in countries with stringent rent control.[35] One probable explanation is that if rent control is not coupled with security of tenure, in regimes where sitting tenants receive relatively more protection against rent increases, landlords may have an incentive to evict tenants in order to raise rents (Arnott, 2003; Ellingsen and Englund, 2003).

35 The rank correlation between rent control and tenant-landlord regulation is 0.42.

Figure 20. Tenant-landlord regulations in the private rental market,[1] 2009

Scale 0-6: Increasing in protection for tenants



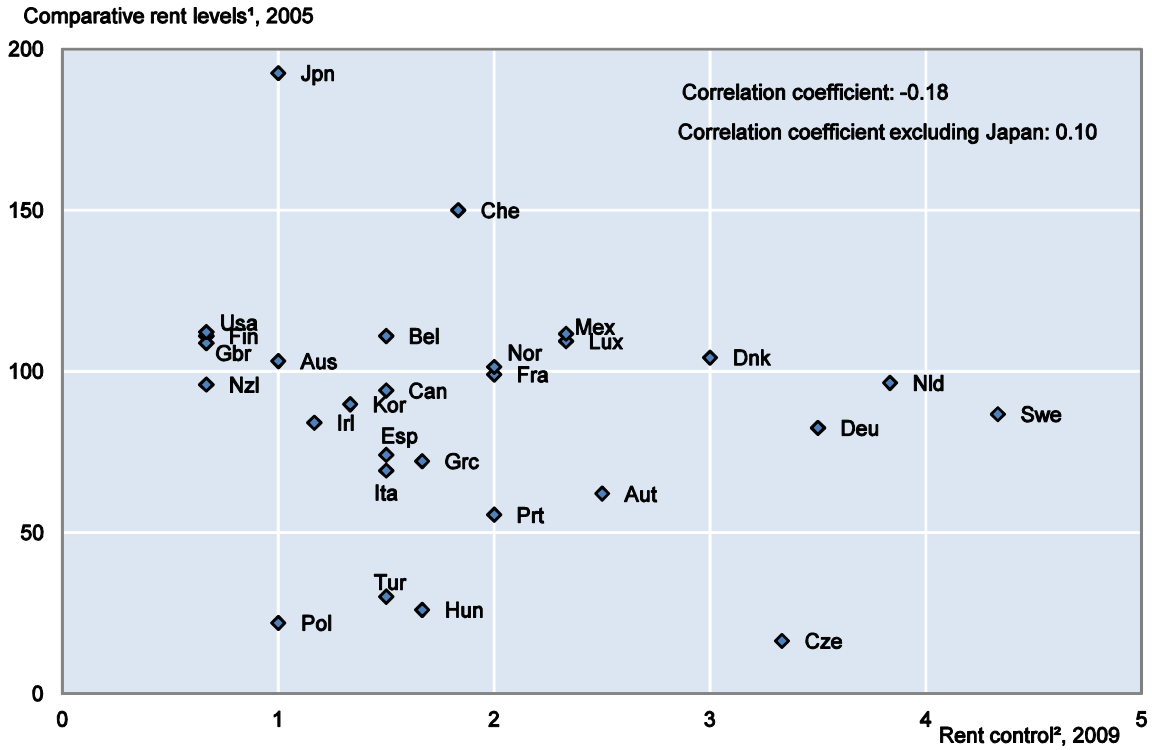
1. The indicator measures the extent of tenant-landlord regulation within a tenancy. It includes the ease of evicting a tenant, degree of tenure security and deposit requirements. See Johansson (2011) for details.

Source: Calculations based on OECD Housing Market questionnaire.

No clear evidence that rent control leads to lower rents across countries..

62. Most of the existing empirical studies into the effects of rent controls are typically country-specific, based on one regional market (often a city in the United States), which makes it difficult to draw general conclusions. Keeping this in mind, studies generally conclude that rent controls tend to generate, on average, small benefits for tenants living in regulated dwellings and that such regulations tend to be poorly targeted (*e.g.* Turner and Malpezzi, 2003; Ellingsen and Englund, 2003). Across the countries covered in this study, there is no clear evidence that comparative average rent levels (taking into account differences in quality of dwellings) are lower in countries with stricter rent controls (Figure 21). Instead, rent regulations may redistribute from new tenants (or tenants with shorter expected duration) to incumbents (or longer-stay tenants) (Basu and Emerson, 2000), reflecting the tendency for landlords to initially set higher rents in order to compensate for the erosion of real rents suffered during occupancy. Thus, rent regulations may cause a divide between established households benefiting from rent-controlled, higher secured tenancies and new households who have to access housing primarily through the unregulated market.

Figure 21. Rent control and comparative rent levels



1. Comparative rent levels are defined as the product of purchasing power parities of actual rents times exchange rates. They indicate for a given level of housing the number of units of the common currency needed to buy the same volume of housing services in each country. Rent levels take into account quality differences including differences in dwelling size, number of rooms and availability of central heating.

2. This indicator includes control of rents, how increases of rents are determined and extent of cost pass-through onto rents. See Johansson (2011) for details.

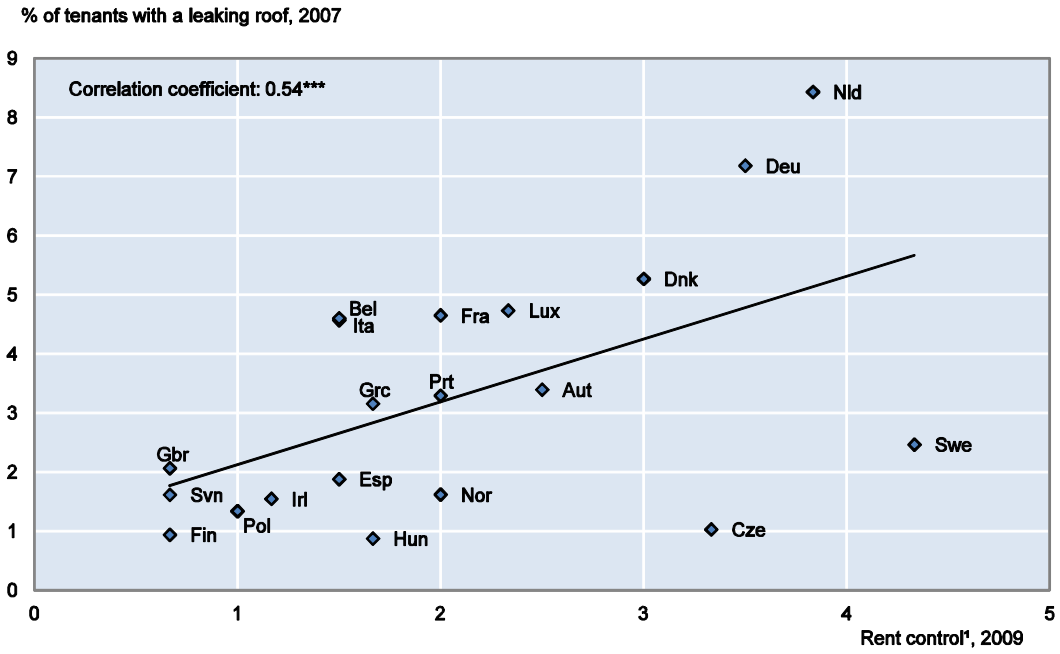
Source: Calculations based on OECD Housing Market questionnaire and OECD-Eurostat PPP Database.

…instead it seems to be associated with lower housing supply.

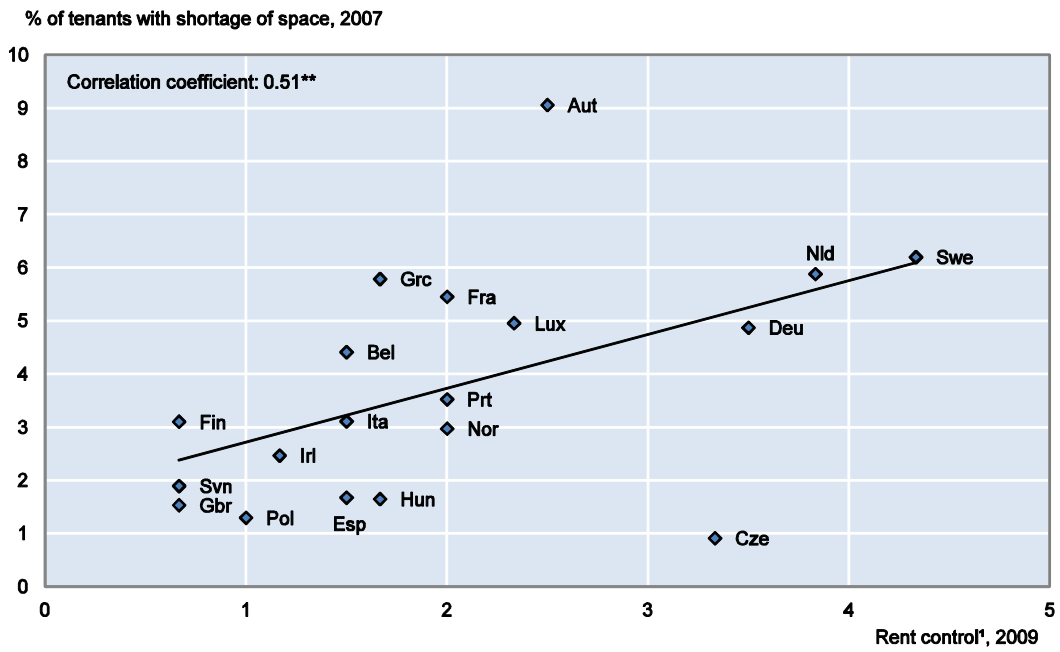
63. A number of studies illustrate the adverse effects of poorly designed rent regulations on various aspects of housing markets (*e.g.* Arnott, 1995; Ellingsen and Englund, 2003). Stringent rent regulations potentially discourage new construction and maintenance by capping the price of rentals, thus lowering the net return on such investments (Sims, 2007; Arnott, 2003). In line with this, an illustrative correlation shows that across countries, stricter rent control tends to be associated with lower quantity and quality of rental housing, as measured by the share of tenants lacking space and those reporting sub-standard housing, in terms of a leaking roof (Figure 22). Below-market rents may also encourage individuals to spend effort and resources on obtaining cheap housing and this can lead to a misallocation of housing (Glaeser and Luttmer, 2003).

Figure 22. Rent control and housing characteristics

A. **Quality measured as percent of tenants with a leaking roof**



B. **Quantity measured as percent of tenants with shortage of space**



1. This indicator includes control of rents, how increases of rents are determined and extent of cost pass-through onto rents. See Johansson (2011) for details.

Source: Calculations based on OECD Housing Market questionnaire and EU-SILC Database.

64. Overall, rent regulations appear to achieve little benefits in terms of average rents, while they may possibly, unintentionally, redistribute among different categories of tenants. Even so, in the presence of fixed costs of moving and lack of available insurance against a sharp, un-anticipated rent increase, well-designed rent control can be welfare-improving (Arnott, 1995; 2003). On the one hand, absence of rent regulations can lead landlords to hold up tenants by unexpectedly raising rents, since moving costs make renters less mobile. On the other hand, excessively strict rental regulations (such as cumbersome eviction rules) can lead tenants to hold up landlords' property. Thus, rental regulations should strike a balance between landlords' and tenants' interests, create security of tenure and avoid market segmentation between sitting and new tenants. Alternatively, or as a complement to rental regulations, properly designed insurance schemes (public or private) addressing contractual aspects of renting, such as responsibilities of maintenance and upkeep and non-payment of rent, may increase the supply of rental dwellings.[36]

5.2 Demand for rental housing

Households' characteristics drive the demand for rental housing…

65. Households' tenure decisions and, as a result, the demand for rental housing, are driven by their characteristics and socio-economic situation (*e.g.* Bourassa, 1995). OECD empirical analysis based on cross-section household data shows that renters, in both the private and the social sectors, are more likely to have lower incomes and to be younger than owners.[37] The ageing population in most countries may imply, all else equal, a reduced demand for rental housing (or an increase in owner occupation, see Box 1). Renters are also less likely to have higher levels of education, be employed, have larger household size and live in a multi-person household. The trend decline in average household size that has taken place in most countries may, therefore, put upward pressure on the demand for rental housing.

..and the relative price of renting versus owning also matter

66. The demand for rental housing is also influenced by the relative cost of renting *versus* owning a house, and developments in house prices affect households' tenure choice (*e.g*. Bourassa, 1995). For instance, when house prices are too high relative to rents, potential buyers may find it more advantageous to rent. Of course, households are also likely to take into account other factors – such as the interest rate, differences in risk, tax benefits, transaction costs, property taxes, depreciation and maintenance costs, and any anticipated capital gains from owning the house.

Greater security of tenure may enhance demand for renting

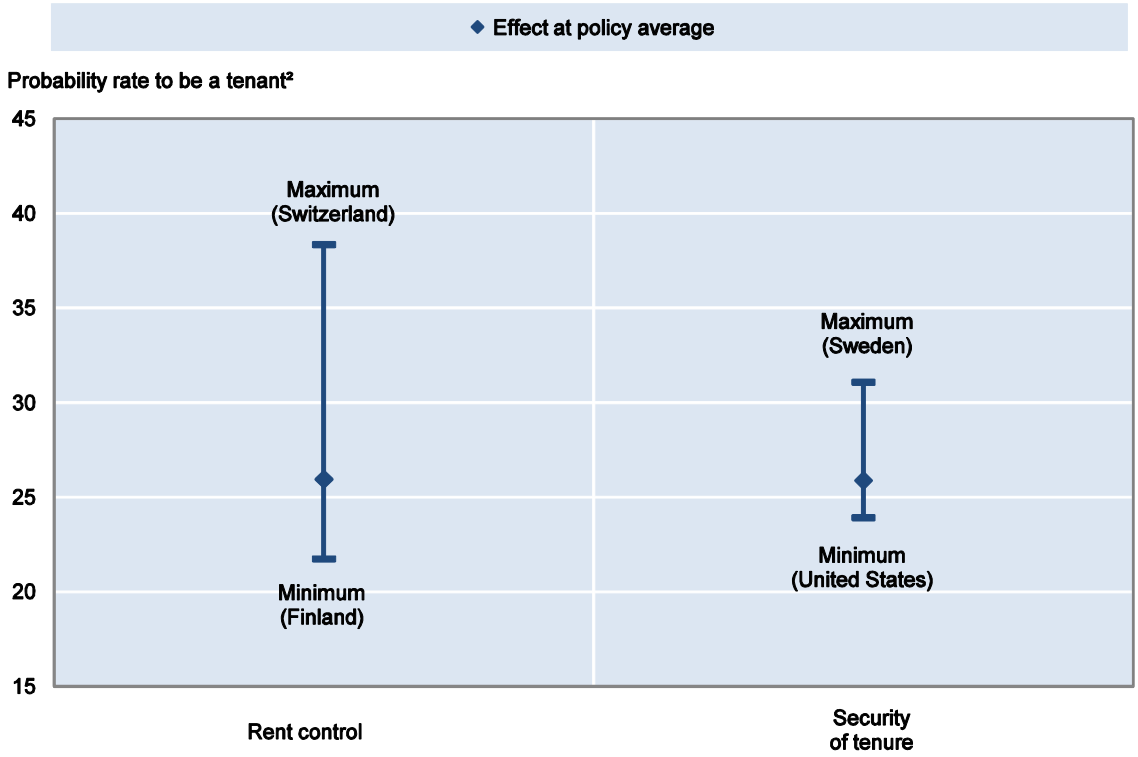
67. Households' perception and preferences for risk are also important drivers of tenure choice. Several studies have identified the desire for security of tenure as one key driver of homeownership (*e.g.* Bourassa, 1995; Burgess and Skeltys, 1992). Given the importance households attach to security, rental

36 For instance, in Spain a public institution (Sociedad Pública de Alquiler) has been created to provide guaranteed rental schemes for tenants and landlords in order to encourage the development of the rental sector. It manages the letting procedure, guarantees the contract arrangements, manages the necessary legal actions if the contract is breached, and provides full management services, including the search for a new dwelling should the tenant move for employment-related reasons.

37 These results are based on estimating a tenure choice model where the dependent variable is a binary variable taking on 1 if the household is a renter in the private or social sector, and 0 if a homeowner. The control variables include age, household's disposable income, household size, education, marital, and employment status as well as country controls, such as the degree of urbanisation and total national income. The estimates are based on 2007 data from the EU-SILC database for European countries, HILDA for Australia, AHS for the United States and SHP for Switzerland.

regulations that enhance tenure security may increase *ceteris paribus* the attractiveness of rental housing relative to homeownership, although overly strict tenure protection may end up distorting tenure choice. Indeed, OECD cross-country evidence shows that stricter rent regulation and tenant protection are associated with greater probability to be a renter. For example, increasing tenure protection from the lowest level observed among the countries in the sample (the United States) to the average level (equivalent to an increase of 2 standard deviations) would raise the probability to be a tenant by 5 percentage points (Figure 23).[38] In a similar way, stricter rent controls make renting a more attractive tenure choice, possibly reflecting that such controls reduce uncertainty about future housing costs by limiting rent increases (Figure 23).

Figure 23. Economic significance of the effect of policies on tenure choice[1]



1. Based on estimates from the following probit regression of the probability to be a tenant (in the private or social sector) relative to being a homeowner:
$$\Pr_{hi}(rent = 1) = \Phi(\alpha + \beta P_i + H_{hi}\phi + C_i\Gamma + e)$$
where ϕ denotes the normal distribution, h denotes household and i denotes country. Pr is the probability that a household will choose to be a renter (in the private or public sector), controlling for household characteristics (H), such as income, education, employment status, and policies (P) (rent control and security of tenure). The vector C controls for other country-specific factors including national household income and the degree of urbanisation, while the error term e captures shocks and unobservable factors affecting the households tenure choice.

2. The dot is the average probability to be a tenant (in the private or social sector) evaluated at average policy and household characteristics. The distance between the Min/Max and the average is the change in probability associated with a policy change.

Source: OECD calculations based on 2007 EU-SILC Database, on HILDA for Australia, SHP for Switzerland and AHS for the United States.

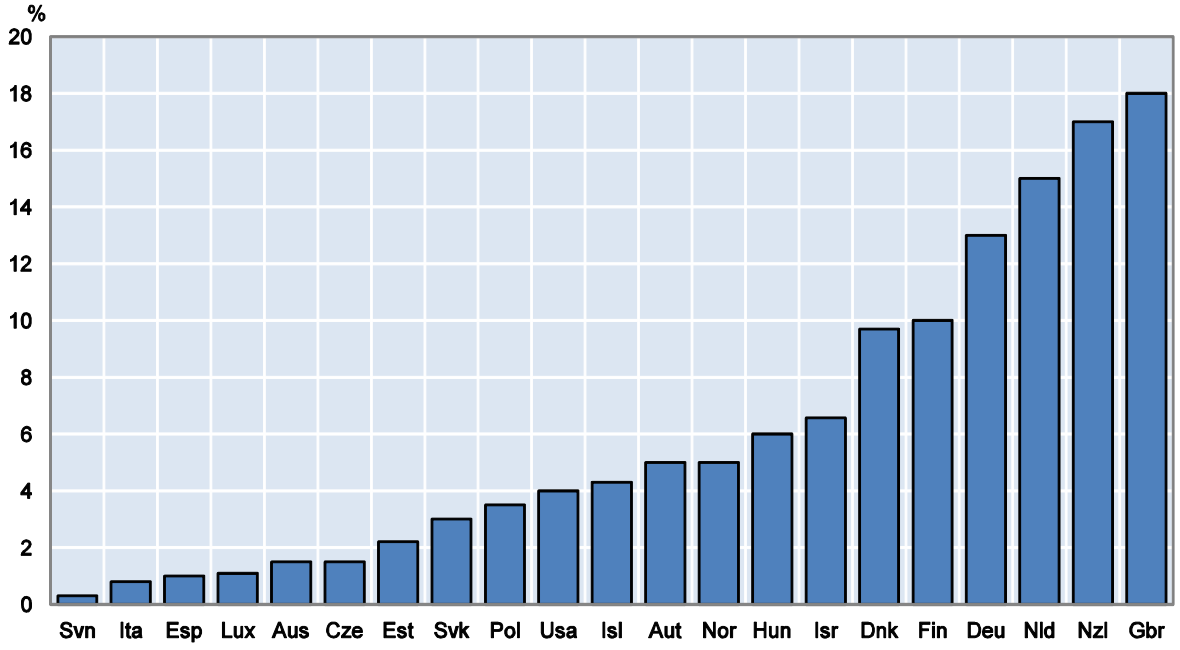
38 Andrews and Caldera Sánchez (2011) shows the estimation result of the effect of rent regulations and tenure protection on the probability of being a homeowner, which is the mirror image of the probability of being a tenant.

Rent allowances affect demand for rental housing and households' housing opportunities…

68. Direct provision of social housing is only one way in which governments can help low-income households. Many countries also have some form of allowances for private rental accommodation, either in the form of a general allowance granted to any low-income household regardless of employment status, or as part of social assistance schemes, in which case it is exclusively paid to social assistance claimants (see OECD, 2007 for an overview). In Austria, Denmark, Finland, Germany, Norway and Sweden the two housing allowances coexist. By contrast in the United Kingdom housing benefits are provided to low-income households and similarly in Belgium, Canada, Japan, Korea, Luxembourg, the Slovak Republic and Switzerland housing is supported through their social assistance programme.

69. The coverage of rental allowances (measured as the share of population receiving allowances) ranges from around 18% of the population in the United Kingdom to less than 1% in Spain, Italy and Slovenia (Figure 24). The low take-up of such allowances in the latter countries most likely reflects that in these countries a vast majority of households are homeowners. The extent of these allowances varies with the type of household and income. For instance, for an unemployed couple with two children, the maximum rent allowance varies from 2% of the average wage in Germany to 20% in Ireland (Figure 25). Taking into account both the value and the coverage of subsidies they appear to be most significant in the United Kingdom and some Nordic countries.

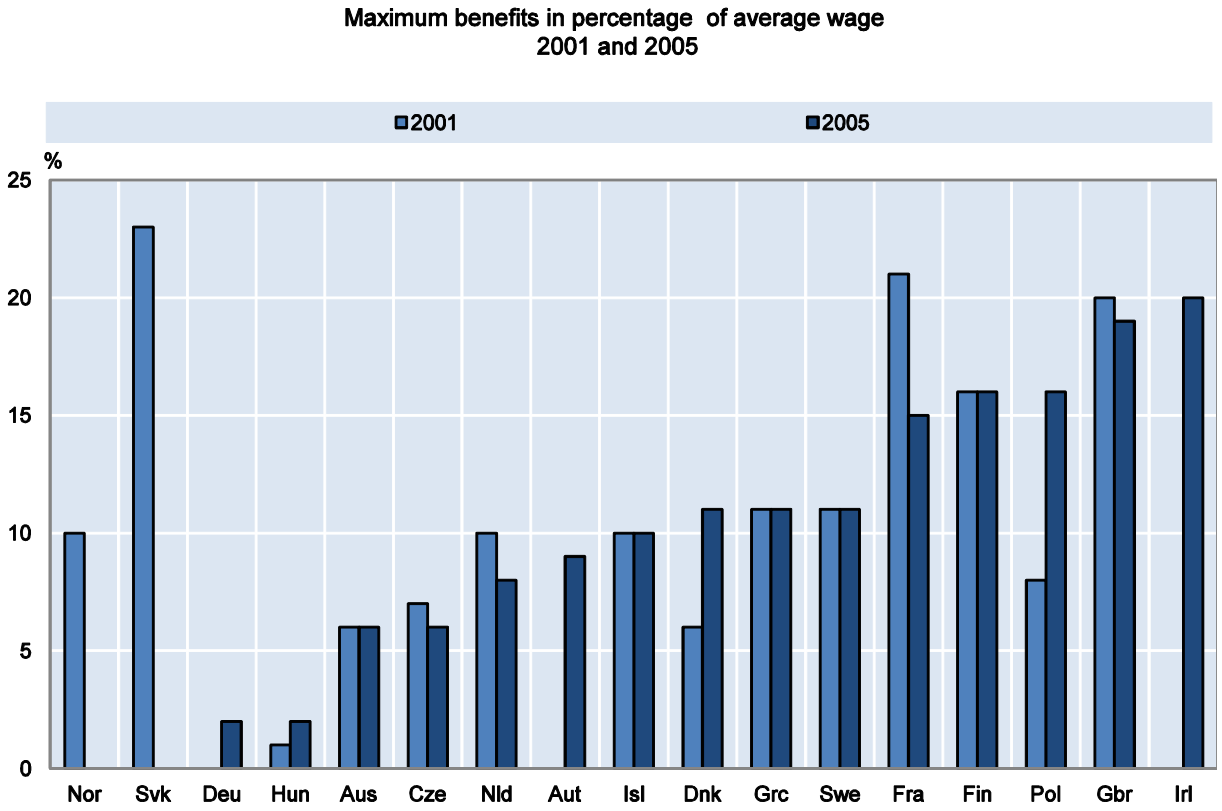
Figure 24. Percent of population receiving cash allowances for rental costs,[1] 2009



1. Australia, Austria, Netherlands and New Zealand refer to households.

Source: OECD Housing Market questionnaire.

Figure 25. Generosity of housing subsidy: cash housing allowances for rented accommodation



Source: OECD Benefits and Wages Database.

…but they may end up being capitalised into rents and undermine work incentives…

70. Part of the benefit of government income transfers may shift from renters to landlords without necessarily enhancing housing consumption of households. Since supply is constrained in the short run, it is possible that landlords capture part of the subsidy through rent increases, partly offsetting the targeted increase in housing consumption (Laferrére and Le Blanc, 2004). The existing empirical evidence confirms that rent allowances are passed onto higher rents, although to a varying degree across countries (*e.g.* Gibbons and Manning 2006; Kangasharju, 2003; Susin, 2002). Thus, such allowances may entail fiscal cost without necessarily large improvements in housing opportunities for low-income households. Moreover, benefits such as housing allowances have the potential to undermine work incentives, particularly for second-earners, if benefits are phased out as earned income increases. In these cases, an increase in gross earnings fails to translate into a sufficient net income increase to justify starting work due to higher taxation and benefit withdrawals (*e.g.* Immervoll *et al.* 2008).

…and could also lead to over-consumption of housing

71. Ill-designed housing allowances can also distort housing consumption choices. For instance, when allowances are based on a percentage of the actual rent, tenants may overspend on housing leading to efficiency losses (Haffner and Boelhouwer, 2006). Over-consumption of rental housing is best prevented when the income transfer is independent of a certain dwelling and its actual rent level (Barr, 1998; Haffner and Boelhouwer, 2006), *i.e.* the allowance is portable. In such a situation the recipient can choose freely

between dwellings and search for housing that best meets her needs. However, most countries calculate rent allowances on the actual rent level (OECD, 2007). To limit over-consumption a solution is to set ceilings on the allowance through the use of a norm rent, which could include provisions for regional variation in rental costs, for calculating the actual allowance.

6. Spillovers from housing to the wider economy

6.1 Housing wealth influences household consumption and savings

72. Until very recently, increases in house prices have substantially raised household wealth, although the implications for aggregate consumption (and saving) are not straightforward. Increases in house prices redistribute wealth between different types of households and the overall effect on consumption depends on the different households' marginal propensities to spend out of a wealth increase and the composition of households in the economy (*e.g.* Bajari *et al.* 2005; Sinai and Souleles, 2005). Aside from these direct wealth effects, there is also an indirect effect of house prices through the influence on consumers' access to credit. Insofar as houses serve as better collateral than other assets it is possible that credit-constrained households face better lending terms as the value of their homes increases. Deregulation of financial markets and the changing nature of mortgage markets may have increased the scope of collateral effects and enhanced the possibility to withdraw equity, allowing households to better smooth temporary downturns in income (Dynan *et al.* 2006). The empirical literature often finds positive long-run effects on overall consumption, which are found to be greater for housing than for financial assets (*e.g.* Girouard *et al.* 2006), potentially reflecting that housing is an asset held by a larger share of the population. Additionally, recent evidence suggests that increases in house prices may have played an increasingly important role in reducing saving (since rising asset values works as a substitute for active saving) in the most recent years in some countries (Hüfner and Koske, 2010).

6.2 The role and determinants of house price volatility

73. House price volatility can affect other parts of the economy through a number of channels. From the household's perspective, volatility in house prices increases uncertainty and may reduce welfare, given that a large share of households' wealth is often held in housing. In turn, changes in housing wealth can affect households' saving decisions and consumption. The banking and mortgage sectors may be of systemic importance and are vulnerable to fluctuations in house prices due to their exposure to the housing market. Volatility in housing markets can be transmitted into macroeconomic instability with consequences for the overall economy.[39] In turn, until very recently house price variability is likely to have been affected by the general trend decline in macroeconomic volatility (*e.g.* Sutherland *et al.* 2010). Cross-country empirical estimates show that lower variability in inflation, interest rates and real incomes is associated with lower house price variability across countries (Box 6 and Andrews 2010). Volatility in residential investment is another source of macro volatility. For instance, in countries with relatively responsive housing supply, it is possible that dwelling investment adjusts rapidly to demand shocks, contributing to cyclical swings in economic growth. Thus, there may be a trade-off between price and investment volatility.

High leverage raises house price volatility…

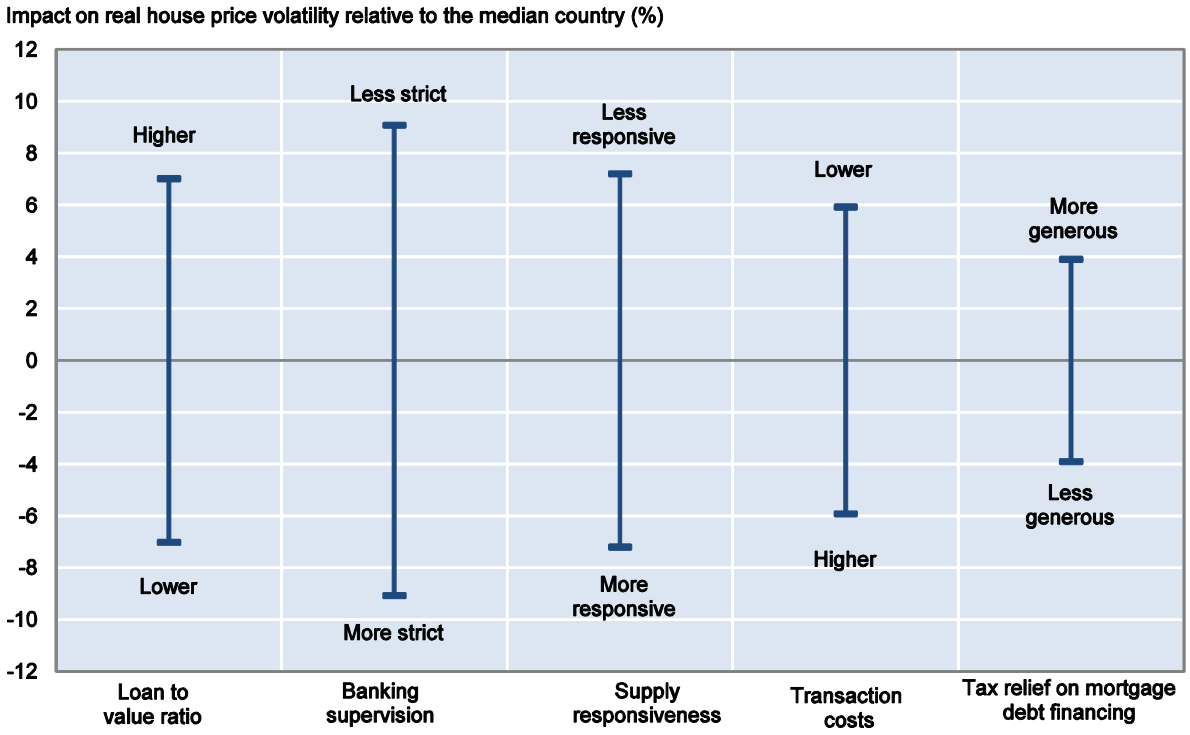
74. While mortgage markets characterised by high maximum LTVs may promote economic resilience by helping to facilitate housing equity withdrawal, they also make it easier for investors to take

[39] As discussed above, while excessive house price volatility may amplify macroeconomic volatility through wealth effects, to the extent that lower volatility in house prices is achieved at the cost of greater volatility in residential construction, the implications for macroeconomic stability are less clear.

leveraged positions in housing, which may amplify house price variability (Catte *et al.* 2004). Indeed, evidence suggests that an increase in the LTV ratio has been associated with higher real house price volatility (Box 6 and Figure 26).

Figure 26. Real house price volatility: the role of structural and policy factors[1]

Per cent deviation from the median



1. The upper/lower bounds show the percentage deviation from the sample median house price volatility (which is set equal to zero) arising from a 0.5 standard deviation change in each housing market feature from the median. All other variables are unchanged. Estimates are based on random effects panel regressions for between 16 and 20 OECD countries, over the period circa 1980-2005. The dependent variable is the standard deviation in annual real house price growth and the model also controls for macroeconomic volatility and time fixed effects (see Andrews 2010 for details).

Source: OECD calculations based on the econometric estimates in Table 6.1 in Box 6 (see Andrews 2010).

Box 6. A Model of real house price volatility

The following cross-country panel model was estimated to test the influence of macroeconomic factors and policy and structural housing market features on real house price volatility, with *i* indexing countries and *t* five-year intervals:

$$\sigma_{i,t}^{HP} = \alpha + \sum_{K} \beta_1^{\ K} Z^{K}{}_{i,t} + \beta_2 BankSup_{i,t} + \beta_3 SupplyE_i + \beta_4 Taxrelief_i + \beta_5 Transcosts_i + \beta_6 Den_i + \eta_t$$

Where the dependent variable real house price volatility, $\sigma^{HP}_{i,t}$, is constructed by estimating the standard deviation of annual real house price growth over each five-year block (in log terms); the vector $Z^{K}{}_{i,t}$ contains a number of macroeconomic factors, including the level of the unemployment rate and the volatility of: real household income growth, real construction costs, inflation, real interest rates and dwelling investment growth;[1] BankSup is an index increasing in the degree of banking supervision, which takes a number of factors into account including the reach of the banking supervision agency and the implementation of capital adequacy ratios based on the Basel standard;[2] time invariant structural housing market features are: the estimated responsiveness of new housing supply (SupplyE), the tax relief on debt financing cost (Taxrelief) and the indicator of average transaction costs involved in buying a dwelling (Transcosts). The model also controls for population density (Den) as this is likely to influence responsiveness of new supply, but the results are robust to not including this variable. Time-fixed effects (η_t) are included to control for common global shocks and standard errors are clustered at the country level. The sample consists of around 20 OECD countries, over *circa* 1980-2005, implying up to five observations per country.

The above model is estimated using a random effects approach, where $\upsilon_{i,t} = a_i + \pi_{i,t}$, which assumes that the country-fixed effects a_i are uncorrelated with the independent variables. While this is a strong assumption, the Hausman test validates the choice of the random effect model over a fixed effect model. An additional advantage of the random effect model is that it uses the cross-country variation in the data allowing the effect of time invariant variables to be directly estimated from the model.

For a smaller set of countries for which data on LTVs are available ($LTV_{i,t}$) the effect of leverage on real house price volatility is also assessed. In addition to the direct effect of leverage, the effect of LTVs on real house price volatility is allowed to vary with the cross-sectional variation in transaction costs and the responsiveness of new supply. Accordingly the following specification is estimated:

$$\sigma_{i,t}^{HP} = \alpha + \sum_{K} \beta_1^{\ K} Z^{K}{}_{i,t} + \beta_2 BankSup_{i,t} + \beta_3 SupplyE_i + \beta_4 Taxrelief_i + \beta_5 Transcosts_i + \beta_6 Den_i$$
$$+ \beta_7 LTV_{i,t} + \beta_8 LTV_{i,t} * Transcost_i + \beta_9 LTV_{i,t} * SupplyE_i + \eta_t + \upsilon_{i,t}$$

Table 6.1 presents the main empirical results that are discussed and illustrated in the main text. Full details on data and estimations are contained in Andrews 2010. Columns 1-4 present the results for the complete sample of countries, while column 5 presents the results concerning the effect of leverage on house price volatility. To aid the interpretation of the total impact of LTV, responsiveness of new supply and transaction costs on house price volatility in column 5, the bottom of Table 6.1 contains an estimate of this effect. The total effect of LTV is: ($\beta_7+\beta_8$*$Transcost_{i,median}+\beta_9$*$SupplyE_{i,median}$); the total effect of responsiveness of new supply is: ($\beta_3+\beta_9$*$LTV_{i,\ median}$) and; the total effect of transaction cost is: ($\beta_5+\beta_8$*$LTV_{i,\ median}$). These effects are evaluated at the median value of the other variable(s) included in the interaction term.

Table 6.1 Panel models of real house price volatility

	(1)	(2)	(3)	(4)	(5)
Macroeconomic volatility terms					
Log of the volatility of real household income growth	0.234*	0.234**	0.239**	0.193	0.011
	[0.122]	[0.116]	[0.120]	[0.125]	[0.158]
Log of the volatility of CPI inflation	0.349***	0.243**	0.235*	0.258**	0.253
	[0.111]	[0.120]	[0.131]	[0.125]	[0.174]
Log of the volatility of short term real interest rates	0.400***	0.386***	0.421***	0.475***	0.468***
	[0.140]	[0.128]	[0.122]	[0.127]	[0.139]
Structural housing market terms					
Banking supervision index			-0.208**	-0.220***	-0.258***
			[0.085]	[0.075]	[0.048]
Supply responsiveness				-0.388***	2.075**
				[0.123]	[0.973]
Tax relief on housing				0.035	0.217**
				[0.116]	[0.092]
Transaction costs				-0.040*	0.306**
				[0.021]	[0.131]
Loan to value (LTV) ratio					0.055***
					[0.014]
LTV ratio x Transaction costs					-0.005***
					[0.002]
LTV ratio x Supply responsiveness					-0.030***
					[0.011]
Control variables					
Log of the volatility of dwelling investment growth	0.053	0.042	0.063	0.081	0.16
	[0.092]	[0.110]	[0.104]	[0.117]	[0.119]
Unemployment rate	-0.007	0.005	0.011	0.021	0.031*
	[0.014]	[0.017]	[0.016]	[0.014]	[0.018]
Population density				-0.001	0.000
				[0.000]	[0.000]
Constant	2.204***	1.765***	2.203***	2.781***	-1.782
	[0.460]	[0.546]	[0.524]	[0.625]	[1.631]
Hausman Test					
H0: Difference in coefficients not systematic	5.1				
P>Chi2	0.9545				
Chi-2 tests (p-values)					
H0: Macroeconomic coefficients (jointly) = 0	0.000***	0.000***	0.000***	0.000***	0.000***
Overall impact of interacted variables on real house price volatility evaluated at the median (p-values in brackets)					
Total effect of:					
LTV ratio					0.020***
					[0.001]
Supply responsiveness					-0.338***
					[0.000]
Transaction costs					-0.055***
					[0.000]
Time fixed effects?	No	Yes	Yes	Yes	Yes
Number of observations	112	112	112	107	75
Number of countries	22	22	22	20	16
R-squared	0.32	0.37	0.42	0.49	0.60

Standard errors in brackets. * significant at 10%; ** significant at 5%; *** significant at 1%. Time-fixed effects not shown.

Source: OECD calculations.

1. The level of the unemployment rate is included to proxy for the level of economic confidence as well as the propensity for marginal buyers to be drawn into the market. The results are robust to using either short- or long-term interest rates.
2. The index of banking supervision takes into account the following factors: *i)* whether a country adopted a capital adequacy ratio based on the Basel standard; *ii)* the extent to which banking supervision agencies are independent of executives' influence; *iii)* if banking supervisory agency conduct effective supervisions through on-site and off-site examinations; and *iv)* if the banking supervisory agency covers all financial institutions without exception (See Abiad *et al.* (2008) for more details).

…but volatility can be reduced by banking supervision

75. Problems arising from inadequate banking supervision and, in turn, poorly underwritten residential mortgages contributed significantly to the recent financial crisis, which was characterised by a noticeable increase in house price variability. Consistent with this, empirical evidence suggests that more rigorous banking supervision has been associated with lower real house price volatility in OECD countries, after controlling for macroeconomic and other structural determinants of house price variability (Box 6). Indeed, the impact of banking supervision appears reasonably large, with a half standard deviation tightening in the supervision indicator associated with a 9% reduction in real house price volatility (Figure 26).

… as well as by more responsive housing supply

76. House prices tend to rise faster in environments with lower responsiveness of new housing supply, and the variability of house prices is also likely to be higher if the supply of new housing is less responsive and if the demand for housing is subject to large shocks. Cross-country estimates confirm a negative association between housing supply responsiveness and real house price variability (Box 6 and Figure 26).

Transaction costs vary across countries and may influence house price volatility

77. Replies to the OECD Housing Questionnaire show that housing transaction costs differ considerably across countries. These costs include a number of different types of costs and fees, such as transfer taxes (*e.g.* stamp duties, acquisition taxes etc.), registration fees incurred when registering the property in the land registry, partly aiming at raising revenues and redistributing income, as well as notarial or other legal fees and real estate agency fees (see Box 7 for details).[40] In some cases, the fees to be paid to intermediaries can be set directly by government regulations (or by government-backed self regulation by the profession) or be influenced by legal barriers to entry into some markets (*e.g.* notarial real estate services). On average, among the countries surveyed these costs are comparatively high in Belgium, France and Greece and significantly lower in some Nordics and the United Kingdom (Figure 27).[41]

78. As already mentioned, transaction costs discourage housing transactions and could curb the liquidity of housing markets, leading to an inefficient allocation of housing, with potential negative repercussions for residential and, thereby, labour mobility (see below). However, earlier studies have suggested that such costs can also reduce volatility by curbing speculative transactions since they lower the expected net return on these trades (Catte *et al*. 2004). There is some evidence for this effect: house price volatility tends to be negatively associated with transaction costs, but this effect is relatively small when compared to the impact of more prudent banking supervision (Box 6 and Figure 26).

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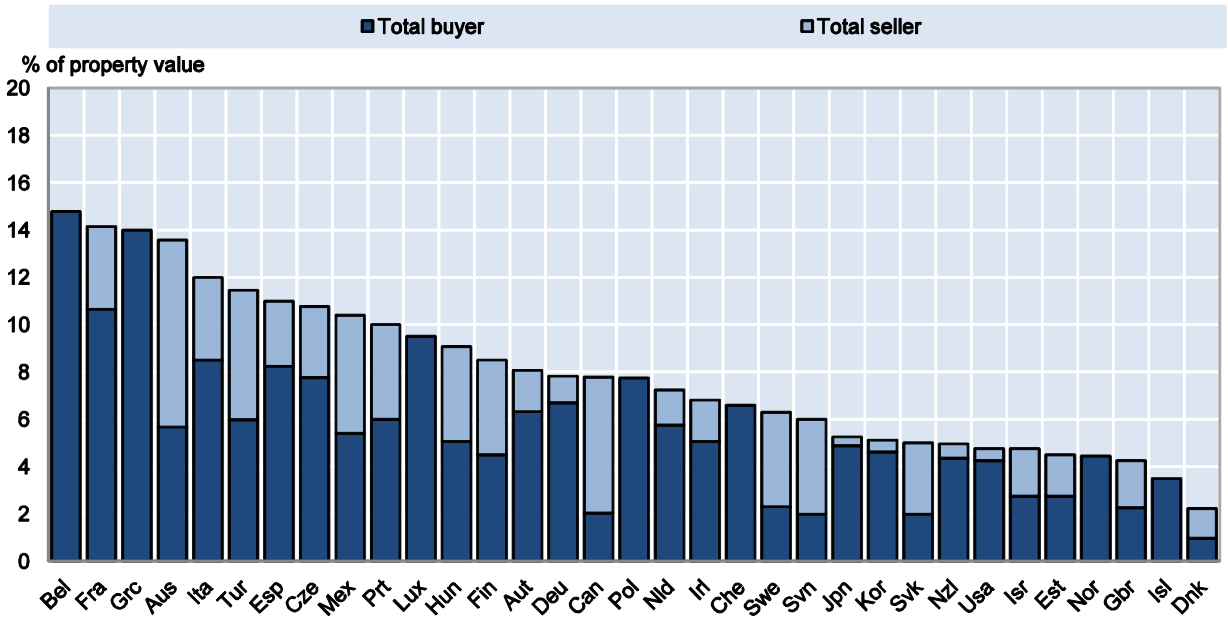
40 In some cases it was not possible to report the break-down of the overall cost into its various types as this information was not available (*e.g.* Greece) and in a few cases the cost estimate does not cover all cost (*e.g.* real estate fees) due to lack of information.

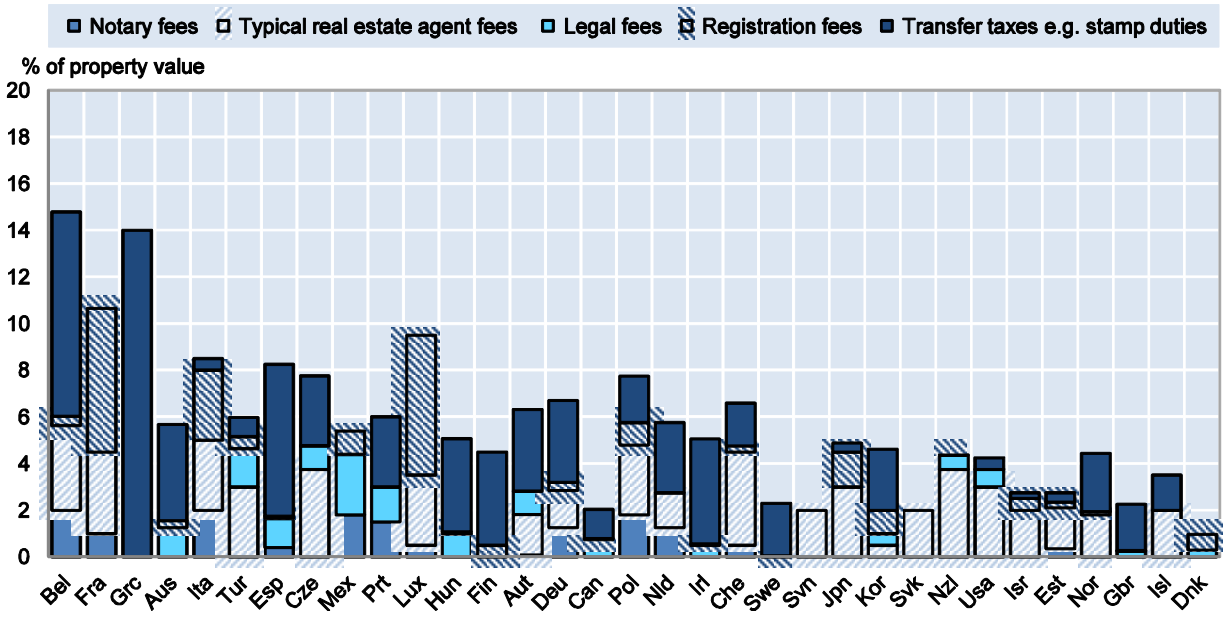
41 In general the bulk of the cost falls, on the buyer, although in some countries the seller also pays a substantial part. In practice, the incidence of these costs is also likely to fall on buyers, particularly in areas with high housing demand. Transfer taxes and registration fees account for, on average, around 50% of overall costs. Typical real estate agency fees also account for a large part of overall costs in many countries while in some countries notarial and legal fees explain an important part.

Figure 27. Transaction costs,[1] 2009

A. Transaction costs on buyer and seller



B. Transaction costs on buyer by type



1. Transaction costs refer to average costs. See Johansson (2011) for details. The estimates do not take into account the various tax breaks that exist in countries for certain dwellings implying that the estimated cost may overestimate the actual cost in some countries, in particular in Italy, where such tax breaks are frequent.

Source: Calculations based on OECD Housing Market questionnaire.

Box 7. Measuring transaction costs

An indicator of the extent of transaction costs in buying and selling a dwelling has been constructed based on information gathered through the OECD Housing Market Questionnaire. The indicator includes the following components (Johansson 2011 provides details on the construction of the indicator):[1]

- Transfer taxes: are taxes imposed on the sale and purchase of real estate? These include, for instance, stamp duties (*i.e.* primarily a tax on documents).
- Registration fees: are fees and taxes incurred in registering the property with the competent land cadastre or registry to create a record of the exact details of the property that has a registered title and the exact details of the owner of the property?
- Notarial and other legal fees: are fees linked to the property transaction? In some countries the use of notaries is mandatory in real estate transactions. Notaries act as witness to the signature of the sale and purchase contract and verify the identity of the signatories and that there are no liens on the property (*e.g.* the owner shares ownership with others, owes costs of repair to the property or outstanding tax payments).
- Typical real estate agency fees: are fees linked to real estate agents who act as intermediaries in property purchases and typically assist buyers during the registration process? In some countries such fees are influenced by regulations on these types of services such as minimum tariffs and/or entry restrictions.

1. The indicator reports average transaction costs as a percent of property value. In the case when the cost is a flat fee, this fee has been transformed into a percent of property value by making an assumption on the average house price (see Johansson 2011 for details).

Tax relief on debt financing of housing may also increase volatility in house prices.

79. Tax-favouring of homeownership is one, among several, structural factors that have been identified as a potential source of house price variability (Catte *et al.* 2004). One hypothesis put forward is that mortgage tax relief encourages speculative behaviour by lowering the cost of leveraging the financing of housing investment. In turn, this raises house price variability. Indeed, there is some evidence to support this hypothesis: more generous tax relief on debt financing cost appears to amplify house price volatility (Box 6).

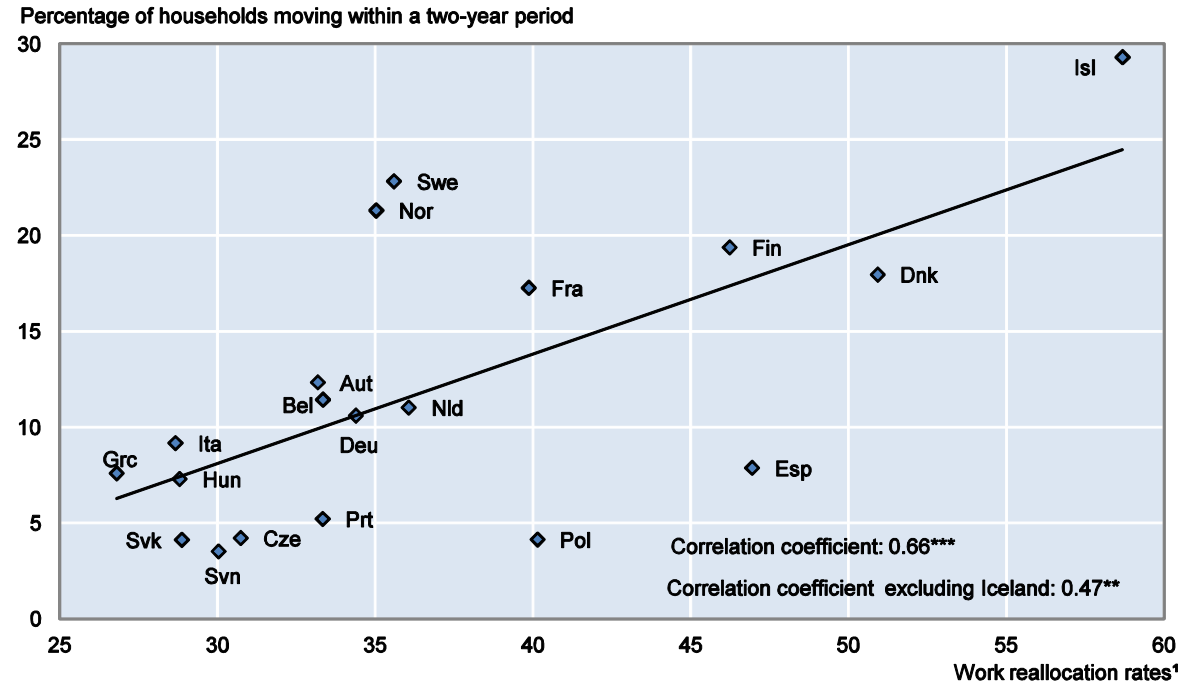
6.3 The importance of residential mobility for the labour market

80. Residential and geographical mobility contribute to the efficient matching of jobs and the allocation of human resources within the labour market (Henley *et al.*1994), especially in the event of permanent shocks requiring a reallocation of production factors - such as sector and structural changes related to globalisation or technological progress (Janiak and Wasmer, 2008).[42] For instance, studies have shown that in the United States adjustment to shocks largely occurs through migration between regions (*e.g.* Decressin and Fatas, 1995; Blanchard and Katz, 1992). Indeed, there is a positive correlation across countries between residential mobility and reallocation of workers (Figure 28).[43] Policy interventions in housing markets may affect geographical and, in turn, labour mobility and could give rise to mismatches and other inefficiencies in these markets (*e.g.* van der Vilst *et al*. 2003).

42 However, excessively high turnover in the housing market may cause social capital losses, particularly for less-educated individuals (David *et al*. 2010; Janiak and Wasmer, 2008). Recent evidence also suggests that residential reallocation can impair educational outcomes for children who need to adjust to a new living area and integrate into a new neighbourhood (Ersing *et al.* 2009).

43 As mentioned above, the data used in this study is imperfect because it cannot distinguish between residential turnover within a region and residential mobility across regions.

Figure 28. Residential mobility and work reallocation



*** denotes statistical significant at 1% level; ** denotes statistical significant at 5% level.

1. Work reallocation rates are country averages of reallocation rates (hiring and firing rates) expressed in percentage of total dependent employment. See OECD Employment Outlook (2010a).

Source: OECD calculations based on 2007 EU-SILC Database and OECD Employment Outlook (2010a).

High transaction costs in moving lower residential mobility…

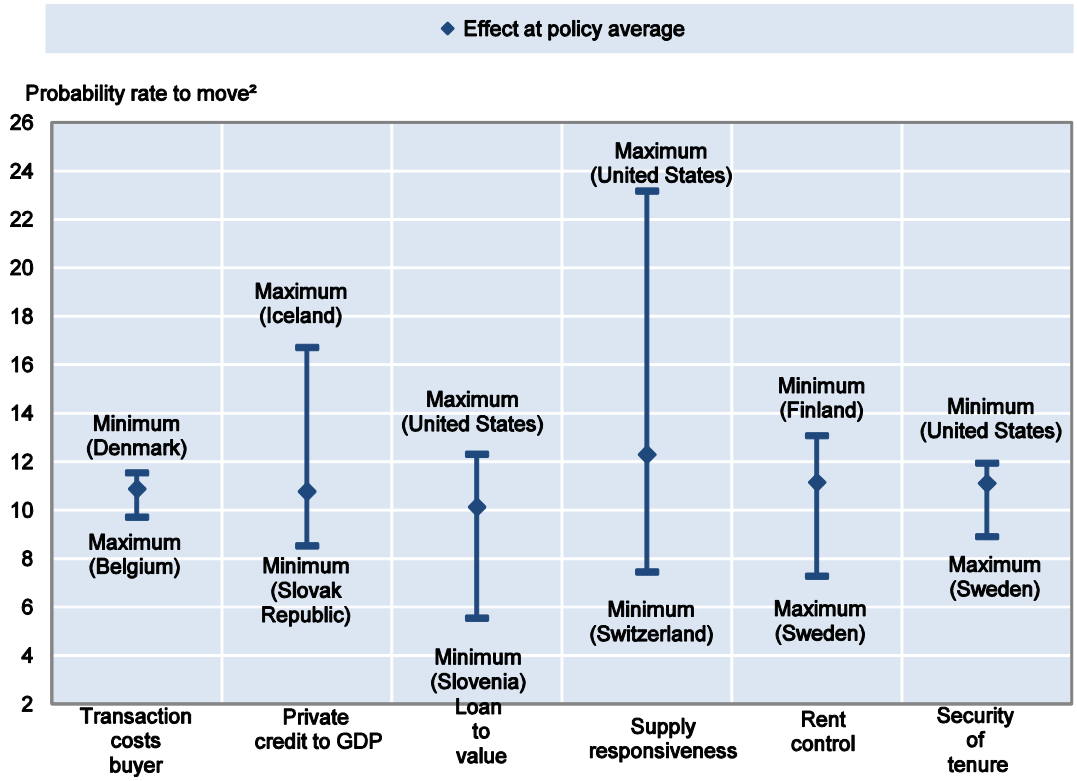
81. Existing studies have shown that search and transaction costs in the housing market create lock-in effects and reduce residential and labour mobility (Oswald, 1996, 1999; Haurin and Gill, 2002; van Ommeren and Leuvensteijn, 2005). Indeed, OECD cross-country evidence shows that higher transaction costs in property purchase are associated with lower residential mobility after controlling for a number of household and country characteristics (Box 8 and Caldera Sánchez and Andrews 2011). For example, reducing transaction costs from the highest to the average level (equivalent to a change of 2 standard deviations or 10 percentage points) among the countries included in the study would increase the average household's probability of moving (which is 12% over a two-year period in the countries covered) by around 1.5 percentage points (Figure 29). The effect of transaction costs on mobility is likely to be small compared to the mobility reducing effect caused by growing house price differentials between depressed and fast-growing areas caused by region-specific shocks (as proxied by the responsiveness of supply, see below).

...while greater access to credit facilitates residential mobility

82. To the extent that changing residence is financially costly, it is likely that easier access to credit and a lower cost of finance can aid mobility. In fact, OECD evidence suggests that greater access to credit (proxied by the share of private credit in GDP) and lower down-payment requirements (proxied by higher LTV ratios) are associated with higher residential mobility (Figure 29 and Box 8). This effect is particularly pronounced for younger households, possibly reflecting the fact that they have had less time to accumulate the wealth (savings) needed to overcome mobility costs (see Caldera Sánchez and Andrews

2011). Similarly, analysis based on data for the United States indicates that residential mobility tends to be higher in states with less regulated banking sectors (see Caldera Sánchez and Andrews 2011).

Figure 29. Residential mobility and policies[1]



1. Based on estimates described in Box 8. See Caldera Sánchez and Andrews (2011) for details.

2. The dot is the average probability to move evaluated at average policy and household characteristics. The distance between the Min/Max and the average is the change in probability associated with a policy change. The reported probabilities for the supply responsiveness and loan to value have a different mean than the other specifications because they are estimated on a reduced sample of countries due to data constraints.

Source: OECD calculations based on 2007 EU-SILC Database, on HILDA for Australia, SHP for Switzerland and AHS for the United States.

…but very high leverage poses risk to mobility

83. However, high leverage ratios can potentially undermine mobility rates (Ferreira *et al.* 2008). If house prices decline significantly, households in negative equity may be unable to refinance their mortgage in order to facilitate a move to a region less affected by the economic shock, while many other homeowners may be unwilling to sell their home and crystallise a loss. Indeed, consistent with the sharp rise in the number of households with negative equity, mobility in the United States between 2005 and 2009 declined by approximately 15%, concentrated amongst homeowners with mortgages and particularly the most leveraged of this group (Figure 30, upper panel). Moreover, residential mobility appears to have fallen more in US states that experienced a larger rise in the share of households in negative equity, and this relationship is robust after controlling for changes in state-level economic performance and demographic factors (Figure 30, bottom panel).

Responsive housing supply enhances mobility...

84. An unresponsive supply of housing affects the average availability of housing and regional housing market imbalances, which can reduce residential mobility. There is evidence that large price differentials between areas, for instance caused by region-specific shocks in combination with rigid supply, can lead to lower geographical mobility since households in lower-priced areas have a larger credit hurdle to clear if they wish to move to the higher priced region (Saks, 2008; Barker, 2004; Cameron and Muellbauer, 1998). OECD empirical findings show that in countries with a more responsive supply of new housing, residential mobility tends to be much higher (Box 8). For example, increasing the responsiveness of supply from the lowest level among the countries included to the average level (equivalent to a change of 1 standard deviation) would raise the average household's mobility rate by around 5 percentage points (Figure 29). OECD empirical estimates also show that mobility is lower in US cities with more stringent land-use regulations, which are usually associated with an unresponsive housing supply. It is possible that the interaction between low supply responsiveness and labour market policies also matter for mobility. For example, wage co-ordination can make moving to fast-growing supply-constrained areas even less desirable as the incentives to move are reduced if no wage gains can be expected due to a relatively flat distribution of wages.

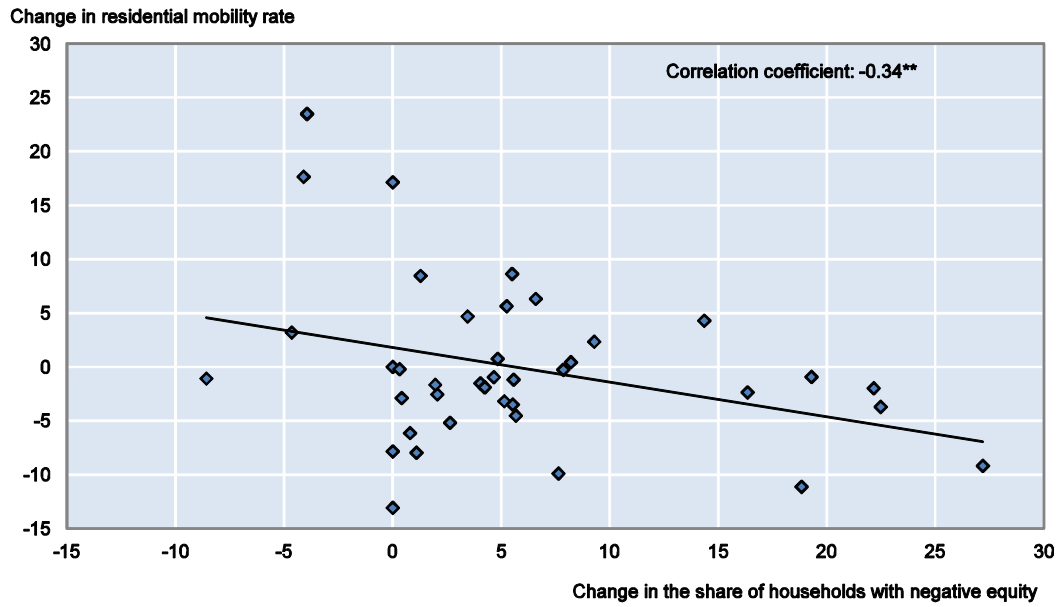
..by contrast strict rent regulation hinders mobility

85. Strict regulations in rental markets can reduce residential mobility by discouraging the supply of rental housing and decreasing tenants' incentives to move. Indeed, if rents in rent-regulated dwellings are set, or vary, differently from those in non-regulated dwellings, rent regulation may limit residential mobility as sitting tenants in rent-controlled dwellings will be reluctant to move and give up their below-market rents (*e.g.* Lind, 2001; Nagy, 1997; European Housing Review, 2009). Strict tenant-landlord regulation, resulting in high tenure security, can have adverse mobility outcomes as it lowers the expected returns from residential rental supply, potentially reducing investment and/or encouraging hoarding or alternative uses of the existing stock by households. Difference in tenant security across regulated and unregulated segments of the market can also reduce mobility by curbing residential turnover as tenants may have to give up secure tenancies for less secure ones. Combined, the negative effects of rental regulation on supply and tenants incentives may lead to lower turnover in the rental sector and, thus, lower residential mobility.

Figure 30. United States: mobility and negative equity

A. **United States: Recent trends in residential mobility by tenure**
Proportion of households that moved in the previous two years

B. **Residential mobility rate[1] and share of households in negative equity**
Percentage point change 2007-2009, United States state-level data



** denotes statistical significant at 5% level.

1. Residential mobility rate is measured as the change in the two-year mobility rate between 2007 and 2009.

Source: OECD calculations based on American Housing Survey (AHS).

86. The estimates in Box 8 show that residential mobility tends to be lower in countries with stricter rent regulation (measured both in terms of rent control and tenure security) than elsewhere. The magnitude of this effect seems to be fairly large. For example, reducing rent control from the strictest to the average level (equivalent to a change of 2 standard deviations) among the countries included in the study would increase an average household's mobility by around 4 percentage points (Figure 29). Again, this cross-country finding is corroborated by evidence based on US city-level data showing that mobility is lower in cities having rent controls than in cities without rent controls.

Rent allowances are likely to be less harmful for mobility than direct provision of social housing

87. One advantage of portable housing allowances over direct provision of social housing is that they do not seem to hinder residential and labour mobility (ECB, 2003). Earlier studies found that housing subsidies "locked-in" tenants in the case that these subsidies are not portable (*e.g.* Hughes and McCormick, 1981; 1985). An additional advantage is that in a majority of countries households can receive rent subsidies for any rental dwelling, *i.e.* both social and private rental, and this can facilitate residential mobility. At the same time, ill-designed phasing out schemes of means-tested housing benefits can reduce job-seeking incentives for the unemployed or reduce incentives for job progression of employed tenants, as benefit withdrawal increases the effective marginal income tax rate (Immervoll *et al.* 2008).

Box 8. Policy determinants of residential mobility: cross-country and US city-level analysis

Cross-country and cross-city variation in policies and institutions has been exploited to assess the role of policy settings in explaining residential mobility. Based on OECD indicators of key housing policies, the analysis considers the influence of transaction costs in moving and regulations in the rental market (see Boxes 5 and 7). The effect of broader policies that influence housing affordability like the availability of credit and income support policies are also considered. In addition, the analysis also accounts for the effect of the responsiveness of housing supply with respect to changes in housing prices

The following cross-country probit specification was estimated:

$$\mathrm{Pr}_{ic} = \Phi(\alpha + \beta P_c + H_{ic}\phi + C_c\Gamma + e_{ic}) \qquad (8.1)$$

where ϕ is the normal distribution, Pr_{ic} is the probability to change residence for household head i in country c in the year 2007; P_c denotes housing policies or other policies that may influence the decision to move, H_{it} denotes household characteristics (tenure type, education, age, income etc). Policies are introduced in the regression analysis one at a time to avoid multicollinearity problems.[1] The analysis also controls for country-specific factors C_c including the degree of urbanisation and total household income. e_{ic} is an error term capturing shocks affecting the household decision to move.

The table below reports the evidence discussed in the text. Additional evidence is provided for the United States obtained through the estimation of Equation (8.1) using household data and policies measured and the state or city level. These findings strengthen the implications from the cross-country analysis to the extent that they control for omitted institutional differences by looking at developments within a single country. Full details about data and estimations are provided in Caldera Sánchez and Andrews (2011).

Box 8. Policy determinants of residential mobility: cross-country and US city-level analysis cont'd

Table 8.1: The effect of policies on residential mobility: cross-country analysis

	(1)	(2)	(3)	(4)	(5)	(6)
Policies/supply responsivness	Transaction costs buyer	Private credit to GDP (2006)	Loan to value	Supply responsiveness[2]	Rent control	Security of tenure
Dependent variable: 1 if head of household changed residence within the past two years, 0 otherwise						
Policy/supply responsiveness	-0.002***	0.031***	0.002***	0.087***	-0.020***	-0.016***
	(0.000)	(0.000)	(0.000)	(0.004)	(0.002)	(0.003)
Old age (44+)	-0.120***	-0.119***	-0.118***	-0.124***	-0.119***	-0.120***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Home owner	-0.194***	-0.197***	-0.198***	-0.198***	-0.203***	-0.195***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Social/subsidised tenant	-0.061***	-0.061***	-0.066***	-0.062***	-0.066***	-0.061***
	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)
Low education attaintment	-0.036***	-0.039***	-0.037***	-0.036***	-0.042***	-0.037***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Middle education attaintment	-0.012***	-0.011***	-0.011***	-0.008**	-0.012***	-0.013***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Unemployed	-0.001	-0.001	-0.001	-0.001	0.000	-0.001
	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)	(0.004)
Disposable income	0.028**	0.028**	0.025**	0.015	0.027**	0.030**
	(0.012)	(0.012)	(0.011)	(0.012)	(0.012)	(0.012)
Squared disposable income	-0.001**	-0.001**	-0.001**	-0.001	-0.001**	-0.001**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Household living in cohabitation	-0.037***	-0.035***	-0.036***	-0.038***	-0.036***	-0.037***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Total national income	0.020***	0.011***	0.015***	-0.032***	0.011***	0.014***
	(0.001)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)
Urbanisation rate	-0.027***	-0.028***	-0.024***	..	-0.023***	-0.028***
	(0.001)	(0.001)	(0.001)	..	(0.001)	(0.001)
Number of observations	142162	138063	139961	108394	133153	138803

1. Estimates from probit regression. Values are marginal effects. The coefficients correspond to the impact of a change in the explanatory variable on the probability to move estimated at the mean of the independent variables. The sample is restricted to individuals who are the head of the household to avoid the results being influenced by atypical tenure status. The estimates are weighted by the individual sampling probability. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

2. Urbanisation rate excluded from (4) because highly correlated with supply responsiveness.

Source: OECD calculations. See Caldera Sánchez and Andrews (2011) for details.

7. Policy implications

7.1 Policy objectives and housing outcomes

88. Most housing market policies are aimed at addressing efficiency and equity objectives.[44] In addition, a number of other non-housing policies also have repercussions for housing markets. In order to evaluate the effectiveness of policies affecting housing markets and identify possible areas for reform, it is useful to classify the main objectives of the policies described in previous sections in the following broad categories:

- A first objective is to **repair market failures and account for externalities**, which may give rise to inefficiencies in housing markets. To address such imperfections governments have a number of policy tools. Well-designed rental regulations can be used to deal with asymmetric information between landlords and tenants. They may also address market power of landlords and the possibility that they exploit this power by unexpectedly raising rents, since high, fixed costs of moving may expose tenants to the risk of hold-up. Building codes and land-use regulations are put in place to protect public health and safety, reduce congestion costs and address environmental and other neighbourhood externalities associated with new developments.

- An additional objective of housing policies is to **promote broader economic efficiency**. For instance, land use regulations that encourage the supply of under-used land for residential construction or policies that lower the cost of moving facilitates residential and, thereby, labour mobility and the efficient allocation of human capital.

- **Redistributive and social concerns** also motivate interventions in housing markets. The link between housing and broader social outcomes (*e.g.* housing conditions may influence individuals' health status) leads to paternalistic views as to what constitutes minimum, socially acceptable standards of housing. Social housing is one way for governments to provide housing that meets such standards to certain categories of households and to redistribute income, insofar as it provides housing at a lower cost than would be the case on a pure market basis. Another tool to redistribute income is the provision of housing allowances supporting rental and other housing costs for low-income households. In addition, the perception that homeownership generates positive neighbourhood externalities and raises social capital has been put forward as one justification behind policies aimed at encouraging homeownership.

- Housing markets are also influenced by policy interventions motivated by **non-housing objectives**, for example the need of raising revenues - which in some cases result in levying of recurrent property, transaction and capital gains taxes. Likewise, efficiency considerations in financial markets have led to deregulation and removal of market imperfections, which have lowered the cost of mortgage financing and eased access to credit for housing purchases.[45]

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44 As in other areas of public policy, housing market policies also suffer from some path dependence to the extent that some of them (*e.g.* certain types of social housing policies or rental regulations) survived developments in related markets (*e.g.* financial or labour markets) that undermined the original motivations for such policies (*e.g.* post-War housing shortages, poorly-developed financial intermediation and durable job stability).

45 More recently, however, excessive risk-taking by creditors and poor regulatory supervision have led to the financial crisis which has impaired lending markets, potentially constraining the supply of credit to households going forward.

89. Previous sections analysed the individual effect of these housing and non-housing policies on the supply of, and demand for housing, as well as the potential side-effects of policies on the wider economy. Table 6 summarises such individual effects but it is important to keep in mind that, due to complementarities among policies, housing outcomes and their spillovers are dependent on how housing systems operate as a whole, as well as how they interact with non-housing policies. For example, the house price capitalisation effect of housing demand shocks tends to be stronger in countries with less flexible supply and/or greater tax relief on debt financing cost. Similarly, the combination of rigid housing supply and strict rent controls and tenant-landlord regulations significantly reduces residential mobility. Against this background, the next section provides some conclusions concerning efficient housing policies, as well as a check-list of issues useful for assessing the appropriateness of country-specific housing market settings (Box 9).

Table 6. Sum-up of the effects of policies on housing outcomes

Policies and their main objectives	Primary effects on housing markets	Side-effects on housing markets	Side-effects on other markets
Housing objectives			
-Market failures and externalities			
Rental regulations	Address market imperfections such as unequal bargaining power between landlords and tenants or risk of hold up. Rent control appears to have no clear effect on capping average rents. Tenure protection discourages the supply of new rentals and encourages rental demand potentially distorting tenure choice.	Restrict the quantity of housing supplied. reduce investment in dwelling maintenance leading to quality deterioration. Redistributive effects between different types of tenants.	Reduce residential and labour mobility.
Land-use and building regulations	Reduce environmental externalities and protect public health but restrict housing supply (both rental and owner-occupied) if poorly designed/enforced.	Raise house prices and the cost of housing.	Increase house price volatility. Hinder residential mobility and thereby effective allocation of resources.
-Redistributive and social concerns			
Provision of social housing	Add to low-cost housing supply.	Crowding out of private investment. Residential segregation if poorly designed/enforced.	Reduce mobility by locking-in tenants in so far rental regulations are stricter than for private rentals.
Housing allowances	Support housing costs for low-income households.	Over consumption of housing: Capitalised into rents.	Portable subsidies may enhance residential and labour mobility, but in combination with taxes rent allowances may affect work incentives.
Non-housing objectives			
Housing related taxation	Raise revenues. Encourage homeownership of certain household groups but no apparent evidence that interest deductibility raises overall homeownership.	Inefficient allocation of housing. Interest deductibility raises house prices particularly if supply is inelastic. Encourage speculative behaviour.	Distorts allocation of durable consumption and investment towards housing away from other types of durable goods and investments.
Transaction taxes	Inefficient way of raising revenues. Distort housing transactions.	May tilt the consumption of housing from owner-occupancy towards renting.	Reduce house price volatility. Reduce residential and labour mobility.
Financial and mortgage market regulation, banking regulation	Increased access to credit and homeownership of credit constrained households.	Raise house prices if supply is inelastic. Encourage speculative behaviour and raise house price volatility although prudential regulation can help.	Facilitate consumption smoothing. Facilitate residential and labour mobility.

7.2 Implications for efficient policy design

Policies aimed at addressing market imperfections

- Excessively strict rental regulations distort the supply of housing and hinder residential mobility. Such regulations appear to have relatively small benefits in terms of lower, average rent levels and/or greater supply of affordable quality housing. Moreover, especially if they are poorly targeted, rental market regulations may have undesirable redistributive effects among different categories of tenants. Therefore, regulations that go beyond correcting market failures and bring rents far out of line with market rents and/or tilt the balance of tenant-landlord relations disproportionally in favour of either party should be re-designed. A reasonable compromise could be a system in which rents are free to vary for new contracts and for contract renewals, while rent increases are regulated within the duration of the contract coupled with an adequate security of tenure.

- Land-use policies and regulations and policies towards the construction sector should ensure a more efficient use of land, as well as speeding up cumbersome licensing processes so as to facilitate a flexible adjustment of housing supply. In areas with a shortage of rental housing, reducing restrictions on the construction of multi-family dwellings consistent with urban planning rules may raise rental supply. Well-designed taxes on under-used/vacant land could be imposed on landowners to encourage residential development in countries with a shortage of land for residential construction. For example, linking the assessment of property value-for-tax purposes to the market value may increase incentives for developing vacant land. In countries where the construction industry is characterised by a few large constructors, competition policy hindering collusive behaviour in the construction sector is also important for a flexible supply. A more responsive supply would help to avoid excessive increases and volatility in house prices and low residential mobility. The design of such policies should, however, balance the benefit of additional supply against the potential cost of new developments in terms of congestion and environmental amenity losses.

Policies aiming at addressing redistributive or social concerns

- Two social housing models emerge: one broad-based, where social housing is widely accessible and the other more targeted and means-tested. One potential advantage of a targeted system is that it can in principle focus on households in greatest need of housing and therefore achieve its goals at a lower cost than less targeted social housing systems. However, it is likely that more targeted social housing systems are associated with greater spatial segregation with potential adverse social and economic outcomes for tenants, such as lower educational attainment of children. Thus, it is important to design such programmes so to avoid spatial concentration by ensuring that location of social housing is well integrated in the urban structure and have appropriate access to transport networks and public services. Frequent reassessment of eligibility of incumbent tenants with appropriate action if eligibility has changed is important as it frees up social housing for needier households. Such reassessments should be designed to avoid possible disincentives to labour market participation amongst incumbent tenants.

- Well-designed portable housing allowances may be preferable to the direct provision of social housing, as they do not seem to directly hinder residential mobility. To avoid over-consumption of housing and efficiency losses, the subsidy design should include housing expenditure ceilings or be based on a norm rather than actual rent coupled with minimum requirements on housing

standards. Moreover, allowance withdrawal schemes should take into account implications for labour market participation of benefit recipients.

Policies with mainly non-housing objectives

- Most countries do not tax imputed rental income, while those that do substantially under-estimate the rental value, reflecting that this tax is particularly unpopular in most countries. This distortion in the tax treatment of housing relative to other investments within income taxation should be removed by taxing housing and alternative investments in the same way, which would ideally be done by taxing the imputed rents and allowing interest deductibility. In circumstances when this is not feasible, a "second best" approach is the removal of mortgage interest relief or the use of property taxes levied on appropriately assessed cadastral values.

- In practice, implementing a co-ordinated increase in property tax may be difficult as local governments often control property taxation. While removing mortgage interest deductibility is considered to be politically unpopular, highlighting the regressive nature of such policies could help to facilitate reform. Such reforms may be easier in times of rising house prices as fewer households are likely to suffer a capital loss in the event of selling their home. To limit any adverse house price effects, mortgage interest deductibility arrangements could be phased-out gradually, possibly by capping the deductions in nominal terms.

- More generally, taxation of households' investment and savings in housing should be treated in the same way as other instruments (*e.g*. pension savings, purchase of shares or investment in a small business) by ensuring that the wedge between pre- and post-tax returns is the same as for alternative investments.

- Transaction costs, including transaction taxes, have adverse effects in terms of hindering residential and thereby labour mobility, which are likely to outweigh the benefits in terms of reducing excessive volatility in house prices. Moreover, as a revenue-raising tool, transaction taxes are inefficient as the same tax revenue can be obtained at a lower distortionary cost by taxing income or consumption. Therefore, such one-off cost should be reduced, particularly in cases when they are excessively high and are likely to significantly reduce residential mobility. To the extent that such costs are also driven by regulations limiting competition among intermediaries involved in housing transactions (*e.g.* notaries, real estate agencies), these regulations should be reviewed.

- Deregulation in mortgage markets has increased access to credit and lowered the cost of housing finance with positive implications for homeownership of previously credit-constrained households. However, the recent financial crisis demonstrates the potentially destabilising effects of excessive leverage and risk-taking on the broader economy. More specifically, the recent volatility in housing markets in some OECD countries can be connected to a significant relaxation of lending standards, which triggered an expansion in credit that was generally incompatible with the prudential assessment of risk. In addition, high leverage ratios pose a risk for residential mobility, as households in negative equity may not be able to re-finance their loan and get locked-in. Therefore, mortgage market innovations should be coupled with appropriate regulatory oversight and prudential banking regulation.

Box 9. Checklist for country reviews

Drawing on the above analysis, this box suggests a list of issues that can help in assessing housing market settings in member countries and provide guidance on how to identify the most appropriate policy instruments in order to enhance the functioning of these markets and minimize the undesired side effects of policies.

Descriptive features that are relevant for the functioning of the housing market and its side effects on the economy.

- Responsiveness of housing supply to prices is key for smooth housing market adjustment, low housing price volatility and residential mobility. Are there estimates of housing supply elasticity? Are there estimates at the sub-national level, possibly corresponding to regional housing markets?

- Shortage of residential land can curb housing supply responsiveness to demand shocks. How important is under-supply of land for development of residential housing? Are there bottlenecks in housing markets locally and/or nation-wide? Are there large price or price inflation differentials between regions?

- Structural weaknesses in construction markets can also curb housing supply. How competitive is the construction industry? What is the degree of openness to foreign firms or investments? Are there skill shortages?

- Housing demand shocks can originate from demographic and financial market developments. Is household structure changing over time? How has net immigration flows evolved? To what extent has financial deregulation led to easier mortgage credit? Have mortgage credit conditions changed after the recent financial crisis?

- Geographical residential mobility is closely related to labour mobility and is affected by housing tenure structure. What is the extent of residential mobility in the housing market? Can data distinguish between residential turnover and geographical mobility proper? What is the structure of tenures (owner-occupied/rental, social/private housing segments)?

Policies aimed at addressing housing market imperfections

- Land-use and planning regulations aimed at addressing housing market externalities should encourage an efficient use of land and a speedy adjustment of housing supply.

  - Are congestion and environmental externalities taken into account in land-use and planning decisions?

  - Do land-use and planning regulations unnecessarily restrict new developments? How burdensome is the administrative and licensing process? How long does it take to obtain approval for a building permit? Are there incentives for landowners and developers to release under-used land for residential development? Are there unnecessary obstacles to the construction of multifamily dwellings?

  - Does a lack of complementary public services, such as infrastructure, hinder new supply of housing in certain areas? For instance, is there vacant land that could be used for residential developing but lacks infrastructure?

- Regulations in rental markets should not distort housing supply, inhibit residential mobility and unintentionally redistribute income (or generate rents).

  - Is the rental sector heavily regulated in terms of rents or rent increases? For instance, are there large differences in rents between the regulated and unregulated segments of the rental market? What is the evidence on the redistributive effects of rent controls?

- Are tenant-landlord regulations disproportionally favouring tenants or landlords? Are there large differences in tenant tenure protection between the regulated and non-regulated rental sectors? Are rental contracts typically of longer duration in the regulated market?
- To what extent do rental market regulations differ across the private and social housing segments of the market?
- Is there any evidence of rental housing shortages (either hoarding of existing housing or insufficient new construction) or housing quality deterioration as a result of rental market regulations?
- Is there any evidence of low residential mobility linked to rental market regulations?

Policies aimed at addressing social and/or redistributive concerns

- Social housing should target households in need and avoid socio-economic segregation.
  - How is social housing provided? Is the governance system efficient? Is there any evidence of failure, such as poor maintenance or degradation?
  - Is there a shortage of low-cost housing? For example, is there a long queue for social housing?
  - Is social housing means-tested or open to all? If it is means-tested, is there any evidence of social segregation that can be directly linked to the provision rules? If it is open to all, is there any evidence of exclusion of relevant categories of households?
  - Is there an efficient and transparent allocation system? Can landlords deny households access to social housing and, if so, on what basis? Does reassessment of eligibility take place? How does such reassessment avoid disincentives to labour market participation?
  - Is there a large difference in rents between private and social rentals? Is there any evidence of lower residential mobility for social housing tenants?
- Public support to housing should avoid deadweight losses, over-consumption and disincentives to work.
  - To what extent can households receive cash allowances to cover rent and other housing costs?
  - Are such allowances means-tested? Are they portable? Are they based on a share of actual or some norm rent?
  - Can households receive allowances for both social and private rentals?
  - To what extent withdrawal or phasing-out schemes account for repercussions on job-seeking incentives?

Other policies that impinge on housing markets

- Housing should be taxed in the same way as other investment and durable consumption goods. Generous tax relief for housing has the potential to be capitalised into house prices, carrying unfavourable consequences for efficiency and equity.
  - Are imputed rents taxed? If so, is the rental value underlying the tax calculation in line with market value of the property?
  - Are interest rates on loans for principal residences deductible from income? If so, are there any limits on the deductibility in terms of time or amount? Are interest rates for secondary homes deductible? Is there any evidence on the extent to which mortgage interest deductibility is regressive?
  - Are recurrent taxes on immovable property used? How frequent is the updating of the cadastral/administrative value for tax purposes?
  - If imputed rents are exempt from tax and mortgage interests are deductible, are there any plans to phase out mortgage interest deductibility or tax imputed rents? To what extent recurrent taxes on property can be considered as a substitute for taxation of imputed rents?

- How are capital gains from the sale of principal residences taxed? Are gains exempt if held for a certain period? Exempt if re-invested? Are capital gains from secondary residences exempt?

- Housing transaction costs should not distort housing market transactions and hinder residential mobility.

  - What are the costs involved in buying and selling a property? What is the incidence of these costs?
  - Are there regulations (or government-backed self regulation of professions) hindering competition in the provision of legal and other services for house purchases (*e.g.* notaries, real estate agencies) that could inflate transaction costs?

- Financial deregulation widens the access to housing for low-income households and facilitates residential mobility, but also has the potential to be destabilising without adequate prudential regulation.

  - Is there a wide variety of mortgage loans in terms of flexible *versus* fixed rates, contract duration, etc.? Is reverse mortgage (whereby housing wealth can be made liquid) allowed?
  - Is there regulation in the mortgage finance market that restricts credit and makes housing finance costly for some households? Is it costly to refinance mortgage loans?
  - Is there any prudential regulation concerning home loans? For instance, how much documentation is required to obtain a mortgage? Are LTV ratios regulated? Is there any evidence of excessive leverage by low-income households?
  - Is there any evidence of low residential mobility among high-leveraged households?

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