OECD Economics Department Working Papers No. 1277

Household debt in OECD countries: Stylised facts and policy issues

Christophe André

https://dx.doi.org/10.1787/5jm3xgtkk1f2-en

OECD

Unclassified **ECO/WKP(2016)1**

Organisation de Coopération et de Développement Économiques
Organisation for Economic Co-operation and Development **01-Feb-2016**

English - Or. English

ECONOMICS DEPARTMENT

ECO/WKP(2016)1
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By Christophe André

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ABSTRACT/RÉSUMÉ

Household debt in OECD countries: stylised facts and policy issues

Household debt has risen markedly since the turn of the century and stands at a historically high level in most OECD countries. This paper offers an overview of developments in household debt over the past decades across a large sample of OECD countries, highlighting both common trends and country specificities. It examines the vulnerabilities associated with high household debt for households, the financial system and the wider economy. Finally, it describes the challenges faced by policymakers at the current juncture and outlines responses in terms of monetary, micro and macro-prudential, and housing policies.

JEL Classification: D14; E21; E52; G21; G28; R21; R31.

Keywords: Household debt, household balance sheets, mortgages, foreclosures, housing market, financial stability, monetary policy, micro-prudential policy, macro-prudential policy, housing policy.

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L'endettement des ménages dans les pays de l'OCDE : faits stylisés et questions de politique

L'endettement des ménages a nettement augmenté depuis le début du siècle et se situe à un niveau historiquement élevé dans la plupart des pays de l'OCDE. Ce document donne un aperçu de l'évolution de l'endettement des ménages au cours des dernières décennies à travers un large échantillon de pays de l'OCDE, soulignant à la fois les tendances communes et les spécificités nationales. Il examine les vulnérabilités associées à un endettement élevé des ménages pour ces derniers, le système financier et l'économie en général. Enfin, il décrit les défis rencontrés par les décideurs politiques dans la conjoncture actuelle et esquisse des réponses en termes de politiques monétaire, micro et macro-prudentielles, et du logement.

Classification JEL: D14; E21; E52; G21; G28; R21; R31.

Mots-clés: Dette des ménages, bilans des ménages, prêts hypothécaires, saisies immobilières, marché immobilier, stabilité financière, politique monétaire, politique micro-prudentielle, politique macro-prudentielle, politique du logement.

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HOUSEHOLD DEBT IN OECD COUNTRIES: STYLISED FACTS AND POLICY ISSUES

Christophe André[1]

Household debt has risen markedly in most OECD countries since the turn of the century, on the back of falling interest rates and innovation in mortgage markets. While the 2008 global financial (and economic) crisis (henceforth GFC) triggered deleveraging in some countries, household debt has stabilised at a high level or continued to rise in many others. High household debt may entail risks for households, the financial system and the wider economy. However, the level of aggregate household debt cannot stand alone as an indicator of risks. Rapid increases in debt, often associated with housing booms, are more suggestive of upcoming adverse economic and financial developments. These can take many forms. Financial distress can result from a deterioration of lending standards, as illustrated by the meltdown of the US subprime mortgage market, which was at the epicentre of the 2008 financial crisis. Another source of vulnerability is fragile mortgage financing structures, notably involving excessive reliance on short-term borrowing. The collapse of the UK mortgage lender Northern Rock in 2007 is a case in point. Finally, even in the absence of a direct impact of adverse shocks – such as falls in housing prices, drops in household income or increases in interest rates – on the financial system, high household debt may amplify the business cycle, as households adjust consumption to cope with their financial obligations. This is illustrated by the macroeconomic impact of recent falls in housing prices in Denmark and the Netherlands, the two countries with the highest household debt-to-income ratios in the OECD.

From a policy point of view, rising household debt creates a number of challenges. Assessing associated risks is difficult. Aggregate debt levels tell little about the ability of households to repay loans, which depends on the distribution of debt, income and wealth across households. Only in a few countries are comprehensive household-level data on all these dimensions available, even though national authorities, notably central banks, are increasingly working to fill the gaps. The resilience of mortgage financing structures to turmoil in financial markets is also difficult to evaluate, particularly when these structures are complex and opaque. Systemic risks are even more difficult to grasp, as shown by the US subprime crisis, which spread from a relatively small segment of the US mortgage market to global finance. Macroeconomic risks associated with high and rising household debt are also fairly difficult to assess. A related issue, as a large part of household debt in OECD countries consists of mortgages, is the difficulty of identifying housing bubbles in a timely manner. Uncertainties in diagnosis create difficulties in designing appropriate policy responses. Furthermore, they can generate political economy complications, as support for policies aimed at restraining growth in household debt may be weak, especially when these policies have undesirable short-term effects on the economy – e.g. lowering output growth and employment – or specific groups – e.g. first-time buyers, banks or homebuilders.

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[1] OECD Economics Department. Earlier versions of this paper were presented at the KDI International Conference "Household Debt from an International Perspective: Issues and Policy Directions" in Seoul on 10 July 2015 and at the National Bank of Poland Workshop "Recent trends in the real estate market and its analysis" in Zalesie Górne on 5-6 November 2015. The author would like to thank the organisers of these events, as well as participants who provided useful comments and suggestions and Jong Hoon Kim, who discussed the paper in Seoul. Thanks also to Vincent Koen, Jens Lunde, Gert Wehinger and other colleagues for useful comments and suggestions, to Thomas Chalaux and Clara García for excellent research assistance and to Sisse Nielsen, Mercedes Burgos and Heloise Wickramanayake for excellent editing support. OECD Working Papers should not be reported as representing the official views of the OECD or of its member countries. The opinions expressed and arguments employed are those of the author(s).

Assuming that action to curb growth in household debt is warranted, policymakers face another difficult choice regarding the most appropriate instruments to use. A wide range of instruments can affect household debt developments. Unfortunately, most of these instruments have side effects so their choice implies difficult trade-offs. Instruments can be broadly sorted into three categories: micro-prudential, macro-prudential and monetary policy. Sound micro-prudential regulation and supervision is essential to ensure effective risk management and consumer protection. Nevertheless, they may be insufficient to contain systemic and macroeconomic risks. Monetary policy is a crude tool to contain household debt, among other reasons because this objective may conflict with core objectives of stabilising consumer price and output levels. This is particularly the case in the current environment of near-zero policy interest rates in many countries. Macro-prudential policies are an appealing alternative, although they are largely untested in OECD countries.[2] Finally, in many countries high housing prices and household debt are associated with poorly functioning housing markets. Structural features of housing markets influence their resilience to shocks coming from the economy or the financial system. A holistic approach to housing issues is needed to achieve at the same time financial stability and decent, sustainable housing conditions for all.

This paper is organised as follows. The first section outlines developments in household debt in OECD countries over the past two decades. The second one analyses the drivers of debt increases. The third section explores the implications of high and rising household debt for financial stability and the macroeconomy. The fourth section sketches out policy responses, and the fifth one concludes.

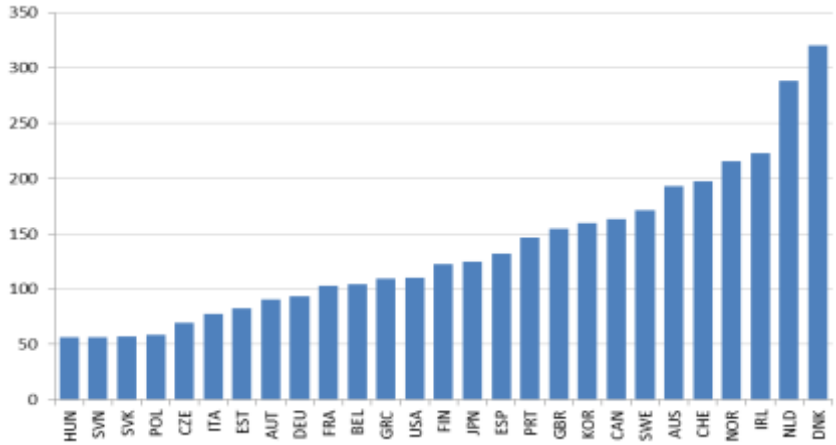
Household debt in OECD countries: stylised facts

Debt levels vary widely across OECD countries

The level of gross household debt ranges from less than 60% of net disposable income in some Central and Eastern European Countries (CEEC) to about 290% in the Netherlands and more than 320% in Denmark (Figure 1). Many factors influence the aggregate level of debt, including the depth of the financial system, the level of housing prices, demographics, the pension system, social safety nets and social attitudes relative to saving and borrowing. Denmark and the Netherlands have suffered sharp housing price adjustments recently, which affected macroeconomic performance, but had little direct impact on financial stability. The Irish banking system suffered massive losses on property development-related loans. Other countries with high household debt levels, including Australia, Canada, Korea, Norway, Sweden and Switzerland have sailed through the global downturn without major damage to household balance sheets and housing markets. Conversely, some of the countries where the housing bubble burst, such as Estonia, Greece, Spain and the United States, had relatively low aggregate household debt. As discussed below, while a high level of debt calls for vigilance, many other factors need to be taken into account to assess risks to households, financial institutions and the wider economy.

[2] Loan-to-value (LTV) caps have often been used as micro-prudential instruments, but more rarely for macro-prudential policy in OECD countries (see below).

Figure 1. Gross household debt in OECD countries
Per cent of net disposable income, 2013 or latest year available



Source: OECD National Accounts database.

Debt has risen rapidly since the turn of the century

Gross household debt rose markedly in most OECD countries between the mid-1990s and 2008. On average, it roughly doubled as a percentage of income. Figure 2 displays the evolution of the debt-to-income (DTI) ratio in four groups of countries, using different scales as debt levels vary widely across groups of countries. In the Anglo-Saxon group, debt ratios rose rapidly from 1995 to 2007. Trajectories diverged subsequently, with deleveraging in the United Kingdom and the United States, while debt accumulation continued, albeit at a slower pace, in Australia and Canada. The group of Northern countries includes the Nordics and the Netherlands, which share many common features. Although Korea is a very different country, it is included in this group, as household debt increases have been similar to those of Sweden. However, underlying causes differ, as the rise in debt was associated with rapid increases in housing prices in Sweden, but not in Korea. The debt ratio has increased steadily in the Northern group. Denmark and the Netherlands, which have the highest household debt levels in the OECD, are the only countries in this group where there has been deleveraging recently. The debt ratio increased rapidly from relatively low levels in the euro area periphery. The increase was associated with housing bubbles in Greece, Ireland and Spain, but not in Italy and Portugal. Although nominal debt is decreasing in all these countries, reductions in debt ratios have been limited by drops in income. In Central and Eastern Europe, debt ratios have risen from very low levels. In the context of a recently privatised housing stock and financial deepening, an increasing debt ratio was to be expected. The process was relatively smooth in most countries, but unsustainable indebtedness was followed by sharp adjustments in Estonia and Hungary. Structural features of housing and mortgage markets can partly explain divergent evolutions across countries (Box 1).

The DTI ratio shows strong asymmetry. While it increased briskly during the boom, it generally decreased little during the downturn (Bouis et al., 2013; MGI, 2015). This asymmetry largely reflects that deleveraging is mainly driven by shrinking inflows into debt, rather than increasing outflows, including through defaults (Bhutta, 2012).[3] The time needed to repair balance sheets is one of the reasons why recessions following housing market collapses tend to be protracted. High debt is widely seen as an obstacle to growth and financial stability (OECD, 2012; IMF, 2015a). Nevertheless, rapid deleveraging can

[3] In addition, there is evidence that reductions in household borrowing in the United States in the wake of the GFC were more driven by tighter lending standards than by a demand response to lower housing wealth (Gropp et al., 2014).

be harmful to growth, particularly if it happens mainly through credit contraction. Recent IMF estimates shed light on factors behind deleveraging in a sample of advanced economies between 2007 and 2014 (IMF, 2015a). In four countries, the gross household debt-to-GDP ratio fell by more than nine points, but the reduction was driven by very different factors. In the United Kingdom and the United States, nominal GDP growth made a sizeable contribution. Debt write-offs also helped, particularly in the United States, where non-recourse mortgages are prevalent. Asset revaluation further improved the net debt-to-GDP ratio, as property and stock market rebounded. In Latvia and Spain, deleveraging took a big toll on activity and employment, as it occurred mainly through a reduction in net debt issuance, although there were also significant debt write-offs. In Greece, gross household debt jumped up almost 18% of GDP, with lower output volume more than offsetting reduced debt issuance and no relief from write-offs. Net debt increased even more due to asset depreciation. This clearly illustrates the importance of the nature of the deleveraging process for growth and financial stability.

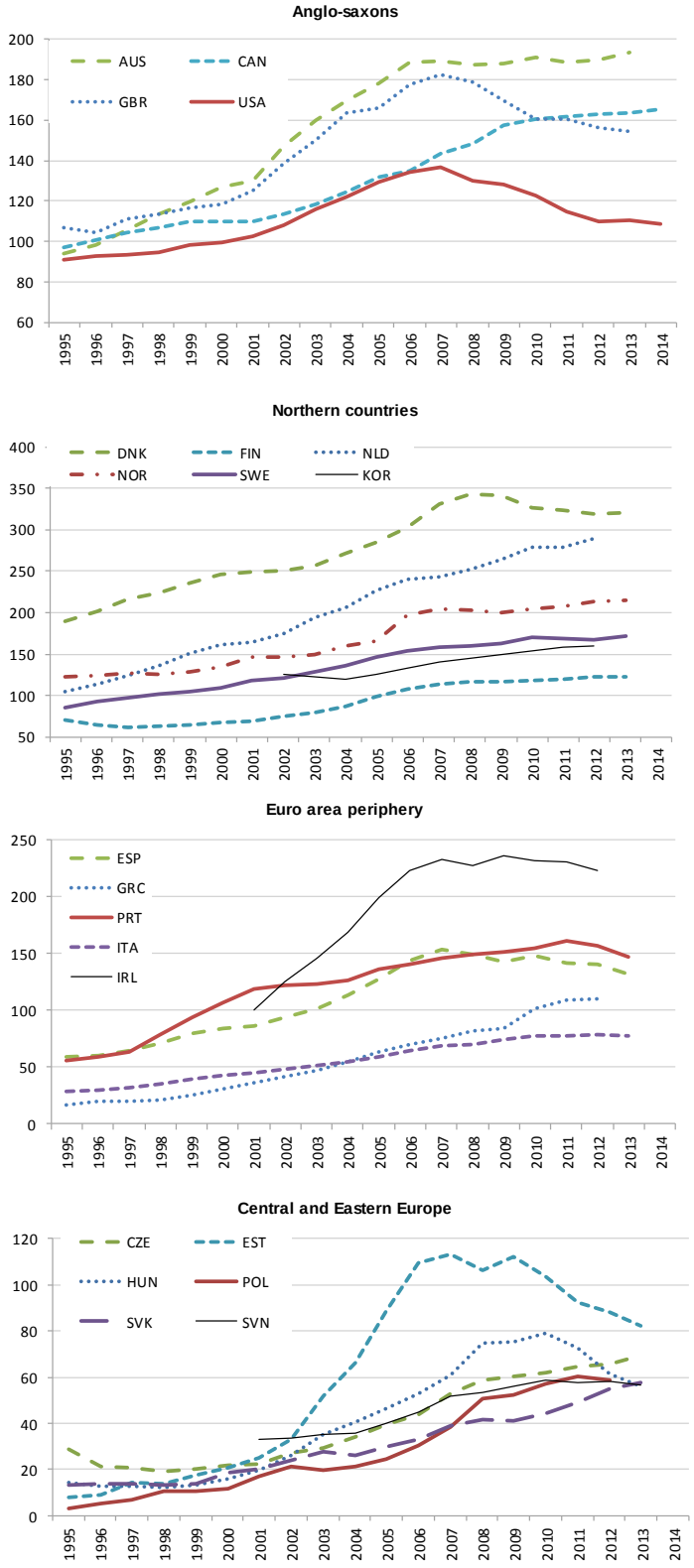
Box 1. Household debt in Hungary and other OECD Central and Eastern European Countries (CEEC)

After the fall of communism, mortgage lending expanded rapidly in Central and Eastern Europe (CEE). The rise of household debt resulted from the privatisation of the housing stock, low interest rates and increased availability of credit. Optimistic expectations about income growth supported the build-up of household debt before the crisis, as progressive catch-up with older EU members' income levels was anticipated (Chmelar, 2013). However, housing and mortgage markets evolved differently across countries. While in most countries the overwhelming majority of the population became homeowners, the Czech Republic moved towards a more balanced tenure structure, with a large rental market. The availability of rental housing provided an alternative to owner-occupied housing, especially in cities, alleviating pressure on housing demand. The type of mortgage products offered has also been very diverse. While the proportion of foreign-currency mortgages was negligible in the Czech and Slovak Republics, it was about 40% of outstanding loans in Poland, 70% in Hungary and 80% in Estonia in 2008. The very low share of foreign-currency loans in the Czech Republic results from low nominal mortgage rates in the national currency, associated with low inflation and high household saving ratios (Lux and Sunega, 2012).

The non-performing loan (NPL) ratios increased in all OECD CEEC during the crisis. The rise was relatively modest in the Czech and Slovak Republics and Poland. On the contrary, NPL ratios of loans to households rose spectacularly in Hungary, reaching about 15% in 2012. This can be partly attributed to the depth of the recession in Hungary. However, housing market and especially mortgage market structures also made Hungary less resilient to the economic crisis than its neighbours. Homeownership was "the only viable option for obtaining permanent housing" (Lux and Sunega, 2012). Strong policy support for homeownership contributed to increasing demand for owner-occupied housing. However, mortgage interest subsidies were cut in 2004, pushing up the cost of mortgages. This resulted in a widespread shift in demand towards mortgages in foreign currency, which carried lower interest rates. After 2004, the majority of new loans in Hungary were denominated in Swiss francs or in euros. This is an interesting – but not unusual – illustration of the perverse effect policy measures may have when behavioural responses are not anticipated or at least monitored closely enough. After 2008, the sharp depreciation of the forint increased the loan repayment burden 30% to 40% on average (Hegedus et al., 2011).

The Hungarian government launched a debt repayment programme in September 2011, which allowed debtors to repay their mortgages at an exchange rate about 25% below the market rate during a period of about five months. Further measures to lock in preferential exchange rates for five years and to convert non-performing foreign-currency mortgages into forints were introduced. However, the impact of these relief programmes on outstanding household debt has been modest. Relief schemes seem to have suffered from excessive complexity and poor targeting. In particular, only better-off households could afford to repay their loan in a single payment as proposed in the September 2011 programme. Another weakness of the rescue programmes was that two-thirds of the cost (of about 1½ per cent of GDP in total) was borne by the banks, which had limited capacity to absorb it. This may have worsened the credit crunch (IMF, 2012 and 2013). Ultimately, in November 2014, the central bank and the Banking Association agreed to rapidly convert foreign-currency mortgages into forint, at the market exchange rate of the date of the decision, to reduce the exposure of households to exchange-rate risk (IMF, 2015b).

Figure 2. Recent gross household debt developments in selected countries
Per cent of net disposable income (different scales)

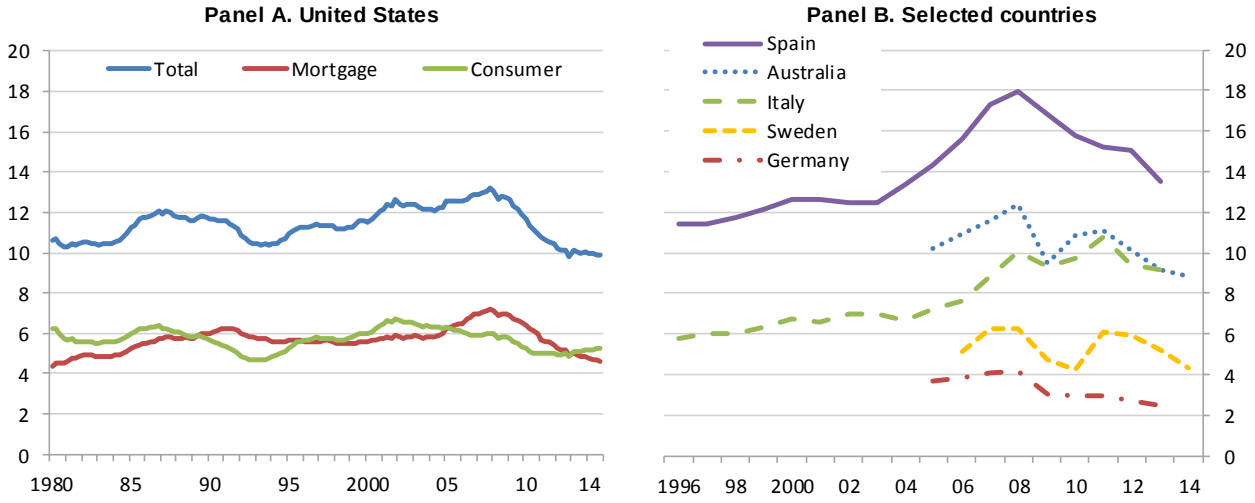


Source: OECD National Accounts database.

The debt service burden remains low

Although household debt stands at a historically high level in most OECD countries, household debt service generally remains moderate, as interest rates are also historically low. In the United States, the debt-service ratio has varied within a fairly narrow range over the past 35 years and is now close to its lower bound, after reaching a peak at the end of 2007 (Figure 3, Panel A). Debt service payments are also moderate in a sample of other OECD countries, among them some with high DTI ratios, like Australia and Sweden (Figure 3, Panel B). Debt service ratios have declined, as debt stabilised or receded, while interest rates fell steeply. Even if these numbers seem reassuring, a number of facts need to be kept in mind. First, the debt service ratio depends on mortgage repayment schedules. For example, the large share of non-amortising loans partly explains the low debt service burden in Sweden. Second, interest rates are close to historical lows and are likely to rise in the future. In a number of countries, variable mortgage rates are prevalent and higher interest rates would rapidly translate into higher debt service payments. The impact on the debt service ratio would be somewhat weaker if, as can be expected, interest rates increases coincide with rising disposable income. Third, aggregate numbers may mask high debt service burdens for some categories of households, which may be particularly vulnerable to interest rate increases or reductions in income.

Figure 3. Household debt service payments
Interest and principal, per cent of disposable income



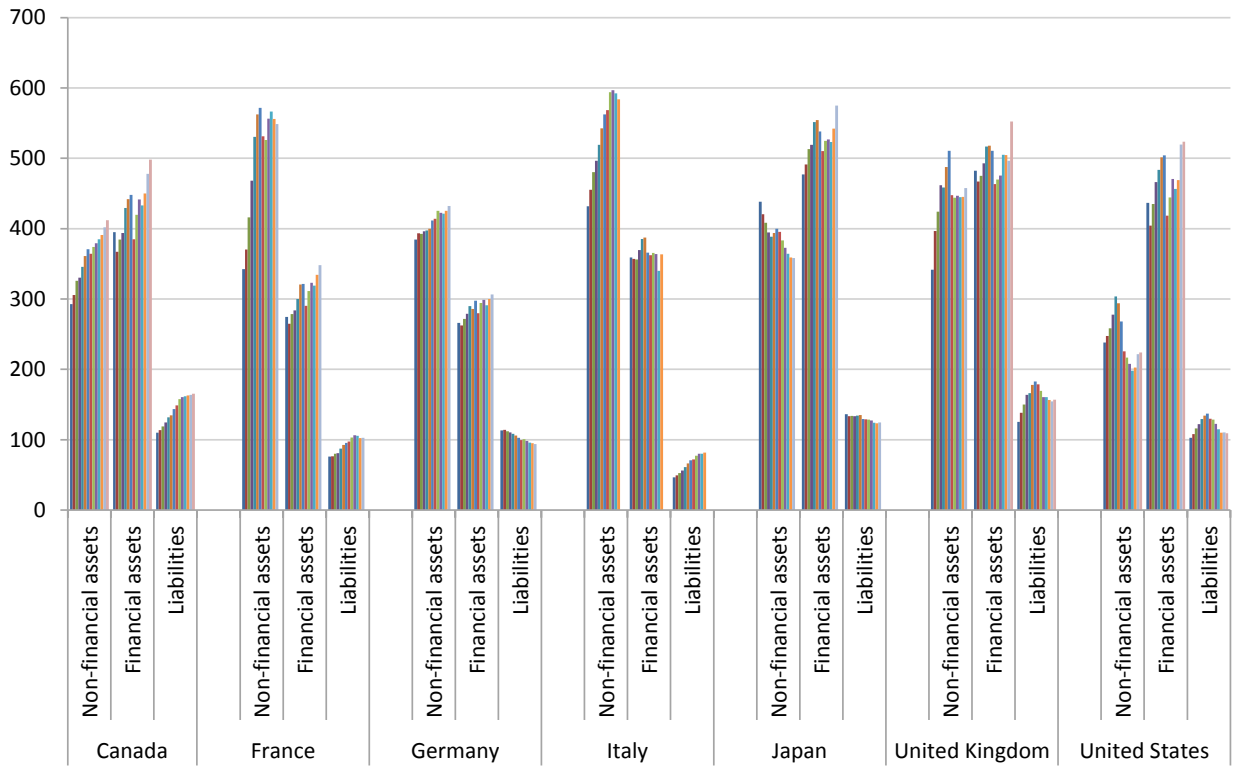
Source: OECD National Accounts database.

At the aggregate level debt is dwarfed by assets

Increases in gross household debt have generally been matched by increases in assets. In the major seven OECD countries, the sum of financial and non-financial assets is equivalent to a about seven to more than nine years of disposable income, while debt is equivalent to well below two years of income. Hence, on aggregate, the household sector has high net wealth. Although asset values have fluctuated significantly over the period 2001-14, wealth buffers always remained large (Figure 4). Assets also largely exceed liabilities in the countries with the highest household debt ratios, like Denmark and the Netherlands, where large amounts of wealth are accumulated in pension and life insurance funds. However, assets such as pension savings can generally not be mobilised to repay debt in case of financial difficulties. More importantly, aggregate positions mask the distribution of assets and debts. Typically, tenants and a part of the homeowners will have little or no debt, assets tend to be concentrated, and a fraction of borrowers are

vulnerable to adverse shocks, such as reductions in income or unemployment. Therefore, an assessment of risks associated with household debt requires data on the distribution of debt and assets across households.

Figure 4. Households assets and liabilities in the major seven OECD countries
Per cent of net disposable income, 2001-2014 (or latest)

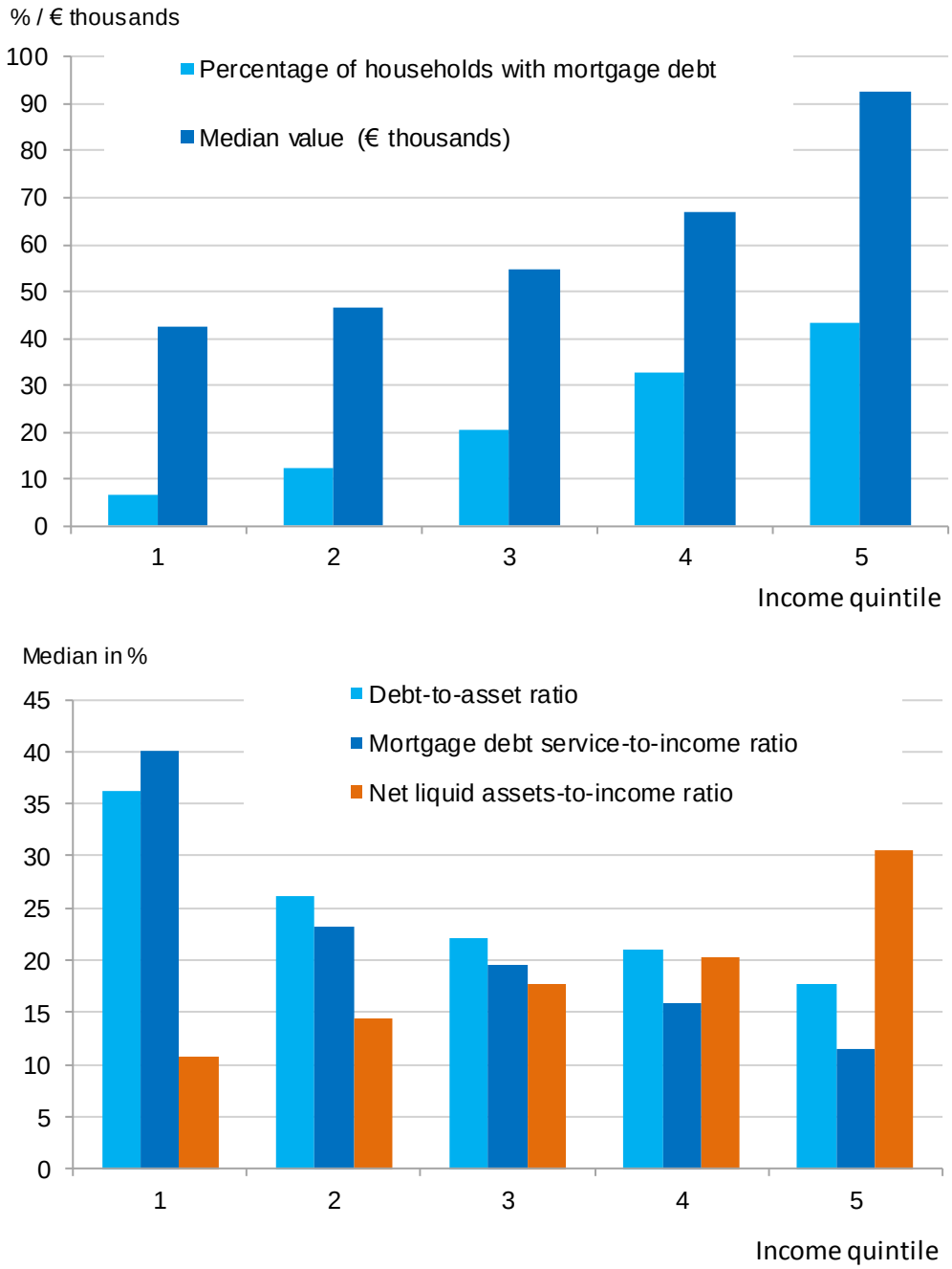


Source: OECD Economic Outlook database.

Debt is unevenly distributed across households

In general, highly indebted households tend to have relatively high incomes and wealth. As an illustration, in the euro area, both the percentage of households holding mortgage debt and the amount of debt they owe is positively correlated with income (Figure 5, first panel). Nevertheless, low-income indebted households tend to be more leveraged, to carry a higher debt burden relative to income and to have lower liquidity buffers than more affluent ones (Figure 5, second panel). In addition, these households tend to be more vulnerable to negative income shocks and unemployment. Hence, this segment of the market needs to be monitored carefully. Micro data can be used to perform stress tests to assess the vulnerability of households to different economic scenarios, notably interest rate increases and falls in income and housing prices. For example, Ampudia et al. (2014) carry out such an exercise for the euro area and find that overall euro area households are resilient, but that there is substantial heterogeneity across countries. In the early 2000s, economically vulnerable households in the United States, particularly the young, low- educated and African-Americans or Hispanics, accumulated large amounts of debt relative to income and their assets were largely concentrated in housing. Hence, the households most exposed to the consequences of the recession had the weakest and riskiest balance sheets (Boshara and Emmons, 2013). Following the recession, in some Southern European and CEE Countries the share of homeowners spending more than 40% of their income on housing costs, although generally lower than for renters, is substantial (Eurostat Housing Statistics; Rosenfeld, 2015).

Figure 5. Distribution of mortgage debt in the euro area
2010



Source: Eurosystem Household Finance and Consumption Survey (ECB, 2013).

Surveys of household finances are often compiled at relatively long intervals and become available with a fairly long lag. This is an important shortcoming for financial supervision and policy making. However, this problem can be at least partly overcome and more timely estimates provided, at the price of some reasonable approximations. For example, Krimmel et al. (2013) combine US Survey of Consumer

Finances data with quarterly macro-level financial accounts data to produce timely estimates of the state of household balance sheets.

Delinquencies and foreclosures reflect various factors

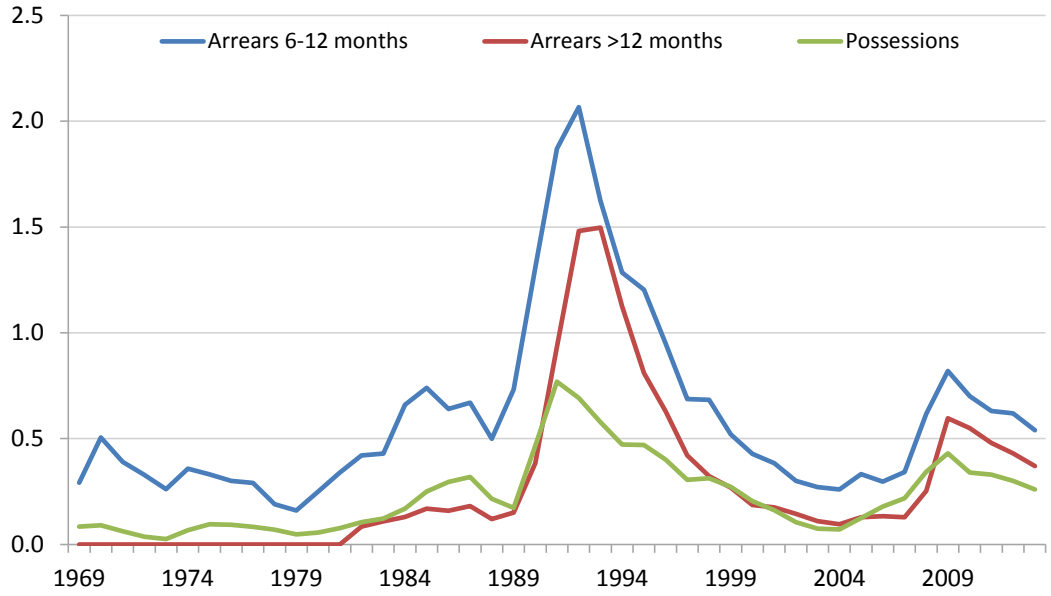
In the run-up to the GFC, mortgage lending soared in most OECD countries. In many cases, the expansion was supported by overly optimistic expectations about future economic and housing price developments. The crisis resulted in rising arrears, although with large differences across countries. Foreclosures rose sharply in the United States, but much less in other countries, partly as a result of institutional differences, state interventions and lender forbearance. In many countries, the share of non-performing mortgages rose only modestly, in particular because low interest rates alleviated the repayment burden. The transmission of lower policy rates to mortgages is especially strong in countries where variable rates are prevalent. The United Kingdom provides an illustration. During the downturn of the early 1990s, arrears and possessions increased markedly, as high interest rates pushed up the loan servicing burden. During the latest recession, low interest rates contained the increase in arrears, although a smaller increase in unemployment also contributed (Figure 6).

Among the countries with the steepest rises in mortgage delinquencies, it is useful to distinguish two categories. The first one includes the countries where defaults can be mostly attributed to excessive risk taking in mortgage lending, although deteriorating economic conditions also played a role. The US subprime crisis is the most obvious example. Countries where mortgages tied to foreign currencies or inflation (e.g. Hungary, Iceland) were prevalent also experienced high rates of delinquencies. In this category, defaults started early in the crisis. In the United States, where the ability of many subprime borrowers to repay their loan was contingent on rising housing prices, defaults and foreclosures skyrocketed soon after prices stopped rising in some states around mid-2006 (Figure 7). The countries in this category are relatively few. This is in line with historical experience, where residential mortgage lending has rarely been a source of major financial losses, contrary to loans to real estate developers and commercial property. From a policy point of view, failures in financial regulation and supervision can be seen as the main culprits for crises associated with lax underwriting practices. Sound micro-prudential standards should be able to avoid the repeat of similar episodes.

The second category creates more policy challenges. Even though some easing of credit standards contributed to a housing boom in some cases, defaults on residential mortgages in this category largely result from falling income and rising unemployment during the downturn. This is the case of several euro area countries, where most of the increase in delinquencies followed the deterioration in economic conditions. Countries which had gone through a construction and house price boom, like Ireland and Spain, have seen defaults increase sharply (Figure 8). Defaults also increased, albeit more modestly, in countries where housing markets had been relatively stable, like Italy and Portugal. As defaults are largely endogenous to the economic situation, they cannot be mainly blamed on poor underwriting, even though some financial institutions may have used overly optimistic assumptions in their stress tests during the boom. Hence, sound micro-prudential regulations need to be complemented with macro-prudential measures to take into account systemic risks and macroeconomic spillovers. It is worth noting, however, that Spain requires dynamic provisioning from banks since 2000 (Saurina, 2009). While this is likely to have mitigated credit losses during the downturn, it was not enough to prevent the preceding housing boom. Monetary policy can contribute to reining in lending to households in some circumstances, but sometimes this may conflict with its primary objective of stabilising inflation and output, as currently in Canada, Norway or Sweden. More generally, monetary policy is a crude tool to deal with asset price bubbles. Other policies, such as property taxation and land-use planning also have a role to play in reducing housing price and construction volatility.

Figure 6. Arrears and possessions in the United Kingdom

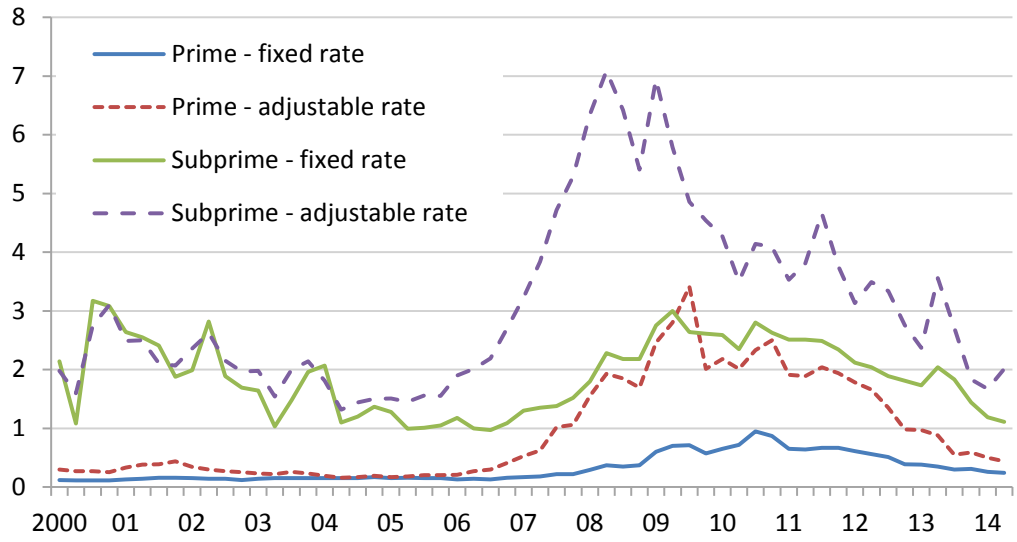
Per cent of outstanding mortgages



Source: Council of Mortgage Lenders.

Figure 7. Foreclosures in the US prime and subprime markets

Foreclosures started per quarter as a percentage of outstanding mortgages in each category

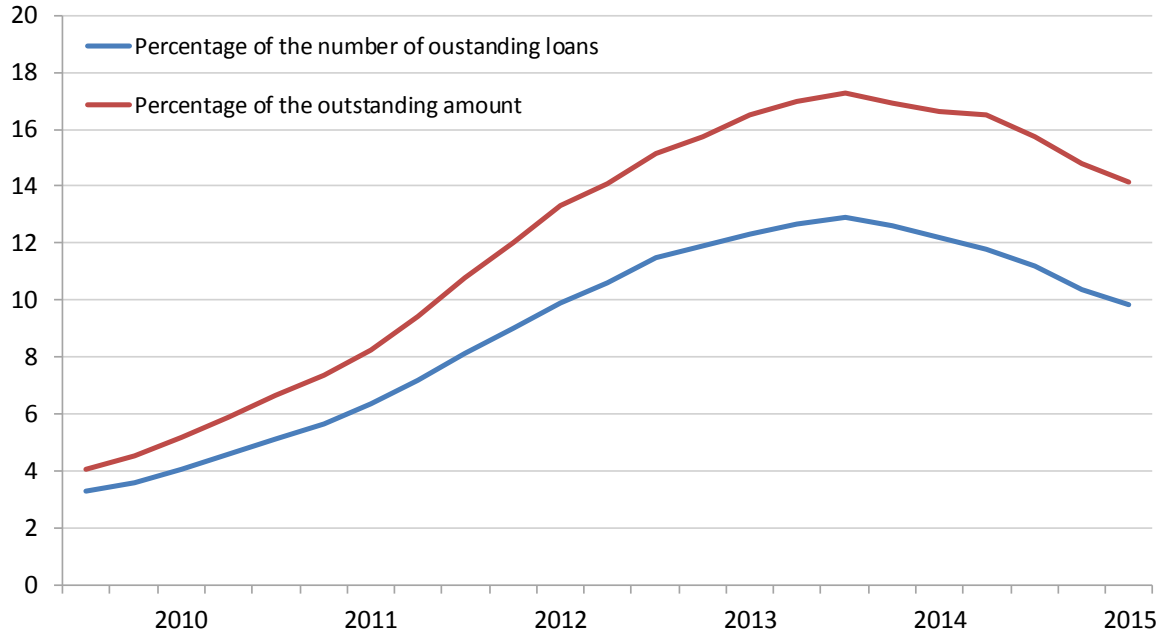


Source: Thomson Reuters Datastream.

Figure 8. Arrears in Ireland and Spain

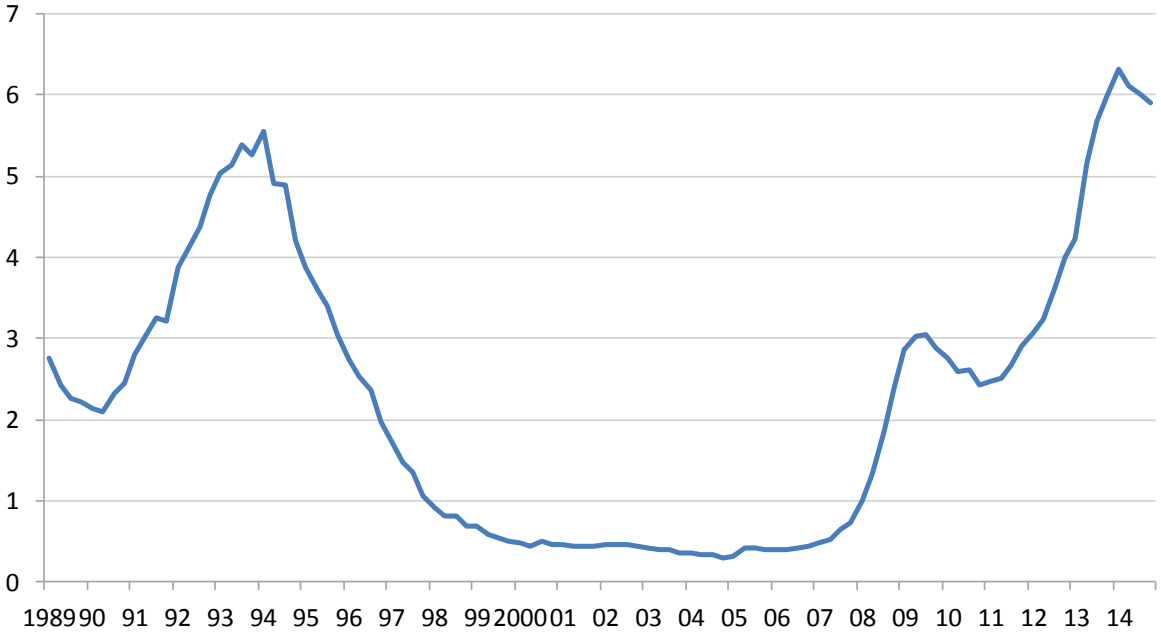
Ireland

Residential mortgages in arrears for more than 90 days



Spain

Percentage of non-performing loans for house purchase (>30 days in arrears)



Source: Central Bank of Ireland and Bank of Spain.

Another area which deserves close monitoring is lending to the construction industry and real estate developers. Historically, during most recessions associated with tumbling housing prices, financial institutions' losses related to commercial property mortgages and loans to developers have been much higher than those on residential mortgages. During the latest downturn, non-performing loans have weighed heavily on the Irish and Spanish banking sector and public finances, as governments stepped in to rescue distressed financial institutions. In Ireland, the government set up in late 2009 the National Asset Management Agency (NAMA), a state bank restructuring agency, which acquired 11 500 property development-related loans, with a nominal value of €72.3 billion (46% of GDP) at an average haircut of 58%. Subsequent capital injections added to the gross direct fiscal cost of the banking crisis. The net long-term fiscal cost of bank recapitalisation, although still very uncertain, is now estimated at about 22% of GDP (Honohan, 2015). Spain launched SAREB (Sociedad de Gestión de Activos procedentes de la Reestructuración Bancaria) in July 2012 to remove distressed real estate assets from the balance sheets of troubled financial institutions. SAREB, of which 55% are owned by the private sector and 45% by the government (through the FROB, Fondo de Reestructuratión Bancaria), received nearly 200 000 assets for an amount of €50.7 billion euros (about 5% of GDP), of which 80% are financial assets and 20% property.

Drivers of household debt

Debt and housing prices tend to move together

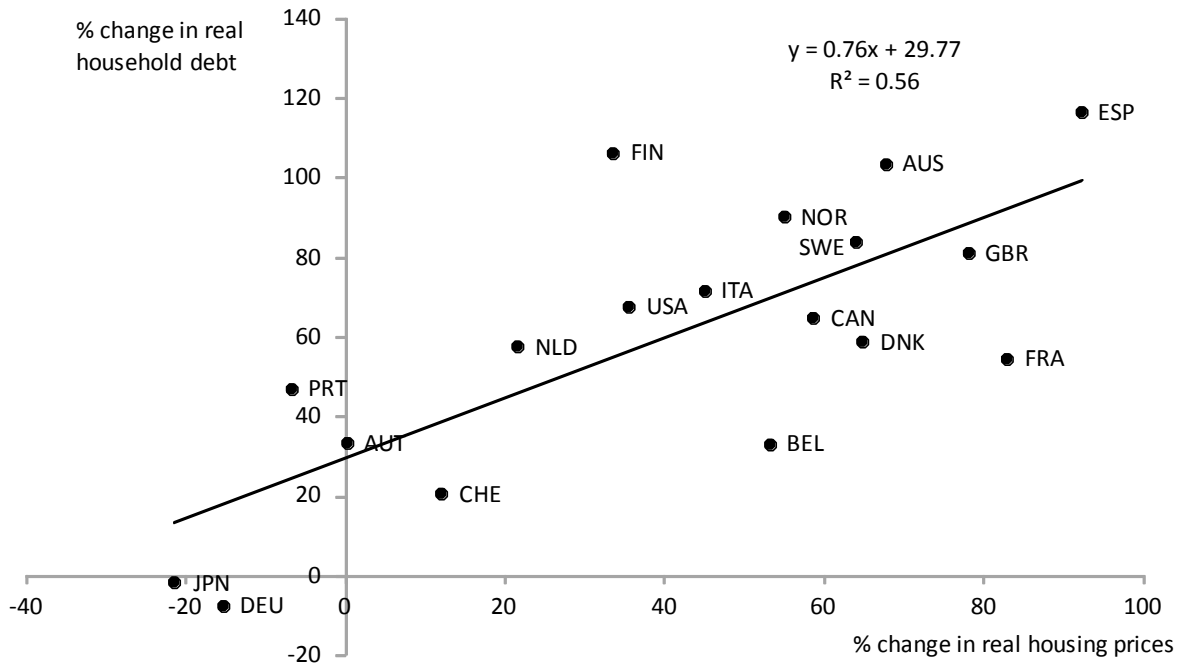
Mortgages account for the bulk of household borrowing in OECD countries. Therefore, the focus in this paper is on the link between household debt and developments in the housing market. This does not imply, however, that consumer credit cannot be the source of serious problems for financial institutions. While amounts are much lower than for mortgages, consumer loans tend to be unsecured and more prevalent in the lower income categories of households. Hence, default rates and credit losses can be high, as illustrated by the Korean credit card crisis in the early 1990s (Kang and Ma, 2009; Jones and Kim, 2014). All forms of credit raise social and consumer protection issues.[4] Nevertheless, from a macroeconomic perspective, mortgage debt is most important.[5]

There is a strong correlation between variations in housing prices and in household debt (Figure 9). This is not surprising, as buying dwellings is the main motive for household borrowing. The causality is likely to run in both directions. One the one hand, higher housing prices push households to take on bigger loans and increase the value of collateral which can be used to obtain credit. On the other hand, a loosening of borrowing constraints allows households to bid for more expensive homes. As supply is inelastic in many housing markets, at least in the short run, this pushes prices up. Recent literature provides evidence of these interactions. IMF (2011) documents the link between LTV ratios and house prices and credit growth for advanced economies. Duca et al. (2011) show that the easing of mortgage credit conditions in the early 2000s in the United States, reflected in higher cyclically-adjusted LTV ratios for first-time buyers, pushed up significantly housing price-to-rent ratios. Anundsen and Jansen (2013) estimate a structural vector error correction model (SVECM) for Norway over the period 1986Q2-2008Q4 and find a two way interaction between housing prices and household borrowing in the long run. Basten and Koch (2015) use exogenous shocks to immigration to identify the impact of housing prices on mortgage supply and demand in Switzerland, and find two-way causality between housing prices and mortgage debt. Fuster and Zafar (2014) provide survey evidence that willingness to pay for a home increases when required down-payments are lowered, especially among poorer and credit-constrained households.

[4] Such issues have been addressed by the OECD in its work on financial education and financial consumer protection, e.g. OECD (2009) and OECD (2011a); for more information see http://www.oecd.org/daf/fin/financial-education/.

[5] Mortgage debt amounts on average to about two-thirds of household liabilities in OECD countries. This number understates the importance of mortgages for ordinary households, as loans to individual enterprises (unincorporated enterprises owned by households) are included in household debt in the National Accounts.

Figure 9. Growth in household debt and housing prices
2000-2007



Source: OECD Economic Outlook database and national sources.

Housing prices are determined by a wide range of factors

The fundamental determinants of housing prices are well documented in the literature (e.g. Malpezzi, 1999; Meen, 2002; Girouard et al., 2006; Muellbauer and Murphy, 2008; Miles and Pillonca, 2008; André, 2010) and are only briefly recalled in this paper. The main fundamental drivers of demand are household income, interest rates, credit availability and demographics. Taxation, including property taxes and mortgage interest deductibility, also plays a role by affecting the user cost of housing (Poterba, 1984). The response of prices to changes in demand depends on the elasticity of supply, which in turn is affected by physical and regulatory constraints (Glaeser et al., 2005; Green et al., 2005; Caldera and Johansson, 2013). Models based on fundamentals tend to explain housing price developments fairly well in the long run. It is important to note, however, that having prices in line with fundamentals does not imply that large price variations should be ruled out. In fact, housing price determinants can be volatile and elasticities of housing prices to these determinants are often high. Hence, shocks to fundamentals can trigger large housing price reactions.

In the current low-interest rate environment, it is worth noting that the relation between interest rate and borrowing capacity is highly non-linear. Furthermore, the increase in borrowing capacity associated with a fall in the interest rate is larger the longer the duration of the mortgage. For the same reimbursement annuity, a 50-year mortgage at a rate of 4% allows borrowing almost three times the amount that could be borrowed at a rate of 12% over 20 years (André, 2015). However, a cap on LTV limits the expansion of borrowing capacity, as the increase in the required deposit is proportional to the increase in the loan amount. But during the boom which preceded the GFC, mortgage maturities were lengthened and LTV constraints eased in many countries. This illustrates how lower interest rates and financial innovation can interact to raise borrowing capacity considerably.

Although housing prices can be fairly well tracked by fundamentals over the long term, they tend to overshoot, in some case creating huge bubbles. There is strong evidence of extrapolative housing price expectations. Based on recent econometric estimates from several countries, Muellbauer (2012) argues that the rate of appreciation of housing prices over the past four years is a good proxy for the expected rate of housing price increase. Furthermore, momentum traders who believe it is a good time to buy a house because house prices will rise further, can have a sizeable effect on housing prices (Shiller, 2007; Piazzesi and Schneider, 2009). Real estate investors can amplify housing booms. For example, Haughwout et al. (2011) find that in the US states where housing bubbles developed in the 2000s, investors accounted for almost half of purchase mortgage originations at the peak of the cycle. Investors have also played an important role in housing market and household debt developments in Australia (Yates, 2011).

The prevalence of extrapolative price expectations has important implications for housing market dynamics. As supply is inelastic in the short term, given the time needed to build dwellings, an increase in demand pushes prices up. As prices rise, buyers with backward-looking price expectations tend to enter the market, pushing prices up further. A typical example is episodes of financial deregulation, which have often been followed by housing bubbles. A recent case is the introduction of interest-only loans in Denmark in 2003 (Lunde, 2007; Dam et al., 2011). The easing of borrowing constraints creates a housing demand burst. Competition for market share tends to induce lenders to take excessive risks. The supervision instruments suited to the new regime are not always in place. As a result credit grows briskly and housing prices increase sharply. The rise in the value of collateral allows more credits, a mechanism known as the financial accelerator (Kiyotaki and Moore, 1997; Bernanke et al., 1998; Aoki et al., 2002). Momentum traders and investors may inflate the bubble further. Such dynamic effects call for vigilance from policymakers when implementing measures which can be beneficial in the long term but entail significant transition risks.

The impact of an increase in demand for dwellings on the housing market and the economy varies with the elasticity of housing supply. In countries where supply is fairly inelastic (e.g. Australia or the United Kingdom), prices will stabilise rapidly at a higher level, assuming the shift in demand is permanent. In countries where supply is more responsive (e.g. Ireland, Spain or the United States), the combination of delays in supply responses – as building takes time, even in countries where supply is elastic – and backward-looking price expectations tends to generate a hog-type cycle. Housing prices and construction overshoot. Oversupply generates subsequent falls in housing prices and a collapse in construction (André, 2015). The cycle may be amplified by the behaviour of real estate developers taking advantage of local monopoly positions (Laszek and Olszewski, 2015).[6] As loans to the construction and real estate sectors tend to generate heavy losses following housing market busts, rapid increases in housing prices associated with a fast expansion of construction raises more concern among financial supervisors than those accompanied by limited increases in building activity. However, unless the increase in demand is purely temporary, low supply elasticity leads to a structural shortage of housing, which implies permanently higher housing prices. This leads to affordability problems, with associated social consequences. Furthermore, as higher housing prices tend to induce more borrowing, gross household debt will tend to increase, potentially creating risks for the stability of the financial system and the economy. Hence, an elastic housing supply is in general desirable. Nevertheless, policymakers should keep in mind the risk of overshooting in the case of a sudden demand spurt and be ready to take appropriate measures to dampen the construction cycle. Closely monitoring lending to building companies, real estate developers and investors is essential in that respect.

[6] Lux and Sunega (2010) also show, using the case of the metropolitan housing market in Prague, that market inefficiencies emerging from the nature of interrelations between developers, construction firms and the producers of building materials can prevent housing supply from reacting effectively to changes in demand.

Household debt and financial and macroeconomic stability

Debt can increase welfare by allowing households to become homeowners, to finance purchases of durable goods and to smooth consumption. However, high indebtedness increases the vulnerability of households to adverse events, such as unemployment, drops in income or falls in housing prices. Some of these vulnerabilities may be mitigated by country-specific institutional features. For example, a high income-replacement rate over a long period in unemployment insurance will limit the risk of default associated with a job loss. The consequences of defaulting also vary across countries. For example, non-recourse loans in many US states allowed households in negative equity to escape debt, which was much more difficult in most other OECD countries. Different types of mortgage contracts (e.g. fixed vs. variable rates, local vs. foreign currency, interest-only vs. amortising) also entail different kinds of risks for households. Financial institutions, in addition to credit risk, face funding risks, notably in the presence of maturity and/or currency mismatches. Countries whose financial institutions can raise stable and long-term funding face lower risks for a given level of debt than those where short-term funding, especially from abroad, is prevalent. These considerations make it difficult to determine an optimal level of lending, which will vary across countries and through time. Moreover, the worst housing crises were not associated with the highest levels of debt. Conversely, rapid growth in debt is associated with risks of severe recession.

Financial stability risks

Excessive household debt can entail risks for financial stability. A major difficulty in assessing these risks is that they are mostly indirect. In a number of cases, large losses for financial institutions resulted directly from excessively risky lending followed by high rates of defaults. This was the case in the United States and a number of countries where foreign currency denominated mortgages were common. To some extent foreign currency mortgages transform currency risk into credit risk, as household facing much higher repayments after large currency depreciations present a higher risk of default.[7] This is illustrated by the Icelandic crisis (Box 2). Nevertheless, direct credit risk is generally mild on residential mortgages, especially in countries with recourse loans. From a policy point of view, micro-prudential regulation and supervision should be able to limit such risks. Indirect risks play through different channels and are more difficult to control. The pro-cyclicality of the financial system combined with the housing market dynamics described above can generate housing bubbles. Financial institutions may accumulate assets with high risk correlations, thereby increasing their vulnerability to defaults or price falls. Commercial mortgages and loans to the construction and real estate sectors tend to be correlated and generate big risks, as illustrated recently by Ireland and Spain. As discussed below, housing market busts often generate outsized effects on the wider economy, which in turn cause defaults on both household and corporate loans, as well as losses on financial assets.

Risks are amplified by concentration. Banks in OECD economies are increasingly exposed to real estate. Jordá et al. (2014) show that, in a sample of 17 advanced economies, the share of mortgages in bank lending has roughly doubled over the past century to reach about 60%. Total bank lending has grown to 112% of GDP in 2007. Bank leverage hit a peak in 2007 and remains high by historical standards. High leverage partly reflects the perception that residential mortgages present low risks. There is, however, a paradox. On the one hand, banks perceive mortgage lending as safe because in most cases few households default, even when housing bubbles burst. On the other hand, mortgage lending can fuel housing bubbles, whose bursting may cause great damage to the economy and the financial system. This creates a major tension for policymakers, which is exacerbated in the current very low interest rate and abundant liquidity environment. As discussed below, macro-prudential tools can be used to address this challenge.

[7] Similarly variable rate mortgages carry the risk of partially transforming interest rate risk for households into credit risk for financial institutions.

In addition to credit risk, the funding structure of mortgage lenders tends to be vulnerable, as they typically engage in maturity transformation. Mortgage loans generally have a very long duration, but they are often funded through relatively short term and unstable sources. Traditionally, banks used to fund a large fraction of mortgages through deposits, even though Denmark and Germany have used covered bonds for more than two centuries and the United States has used mortgage-backed securities for decades. However, mortgages have been increasingly funded through wholesale funding, particularly during the boom which preceded the GFC. While wholesale funding is not a problem in itself, maturity mismatches and opacity have created vulnerabilities.[8]

Box 2. The Icelandic crisis

Between 2004 and 2008, Iceland experienced one of the most spectacular boom-bust cycles in history, which resulted in the collapse of its three largest banks within days in October 2008. The housing boom, while sharing characteristics with contemporaneous or past housing bubbles in other countries, originated in a financing model which combined an impressive number of weaknesses, ranging from a rapid loosening of lending standards and weak financial regulation and supervision to large maturity and currency mismatches between assets and liabilities of banks. Mortgages were only one of the areas of unsustainable banking expansion. While mortgage debt amounted to slightly over 100% of GDP at the peak of the housing boom, the assets of the three major banks reached about 10 times GDP in 2008 (Guðmundsson, 2012). The housing boom started when the mortgage market was deregulated in 2004, leading to the entry of the recently privatised banks. Loan-to-value and mortgage amount limits were progressively increased. With low interest rates, rapid economic growth and a generous mortgage interest tax credit, demand for housing soared, pushing real prices up by more than 50% between August 2004 and October 2007 in the Reykjavik region (Skulason, 2012). Mortgage rates were generally linked to the consumer price index (CPI). From 2006 onwards, rising interest rates on loans in Icelandic krona led banks to increasingly offer mortgages linked to foreign currencies, notably the Japanese yen and the Swiss franc. As a result of foreign currency or CPI-indexation, the debt burden of households soared in 2008 when the krona depreciated by more than 50% in effective terms, pushing the inflation rate to about 17%. Nearly a quarter of homeowners had debt service exceeding 40% of their disposable income at the end of 2008. As housing prices declined, the share of homeowners in negative equity rose to close to 40% in 2010 (IMF, 2012).

The collapse of the three main banks compelled the government to establish new banks. Contrary to bank rescue operations in many other countries, where governments supported a large share of the losses, the Icelandic bank resolution left the creditors of the three major banks with heavy losses, amounting to €45 billion. Measures also had to be taken to restructure household debt, which the devaluation of the krona, the associated inflation spike and the deterioration of the economic situation had made unsustainable. Social pressure on the government to provide relief to indebted households was strong. The first measures included a temporary moratorium on foreclosures and a temporary freeze of debt service pending rescheduling of payments on CPI and exchange rate-linked mortgages. Bankruptcy law was also amended to allow earlier exit, which increased the negotiating power of debtors against creditors. In June 2010, the Supreme Court ruled that linking loans denominated in krona to exchange rates was illegal and the principal of the loans was cut to the original principal plus accrued interests. The reduction on a loan amounted in some cases to as much as 50%. Meanwhile, many households with CPI-indexed mortgages were still struggling, and while freezing and rescheduling repayments provided short-term relief and some debt agreements were being restructured on a case-by-case basis, more systematic debt restructuring was needed for highly indebted households. In December 2010, the government and financial authorities announced a plan to allow writing off mortgage debt exceeding 110% of the property value under specific conditions. Overall, household debt written off amounted to more than 12% of GDP at end-2011 (Skulason, 2012). Such debt restructuring has undoubtedly helped the recovery of the Icelandic economy and the stabilisation of the housing market. While the Icelandic case illustrates the advantages of household debt restructuring, its relevance for other economies should not be overstated, as the costs were largely born by foreign lenders, which held a large share of bank debt.

The securitisation of subprime loans in the United States was accompanied by the creation of opaque financing chains involving structured financial products which became very difficult to value once it

[8] For a comprehensive analysis of the strengths and weaknesses of different types of mortgage systems, see Campbell (2012).

became obvious that defaults on subprime loans were set to increase dramatically. The underwriting and securitisation process was plagued by asymmetries of information, perverse incentives and conflicts of interest; lending standards were relaxed as risks could be transferred to investors; rating agencies receiving fees from the issuers of the securities they rated were inclined to underestimate risks; and compensation structures within financial institutions encouraged excessive risk taking and short-termism. Funding mechanisms encouraged unsustainable lending, which fuelled the housing bubble, and complicated the resolution of the crisis by increasing uncertainty about potential losses for financial institutions and investors, and by hampering debt restructuring. Furthermore, the opacity of financial structures contributed to the international spillover of the subprime crisis, even though the latter may only have been the spark that ignited the GFC, as it revealed widespread weaknesses in the global financial system (Kamin and DeMarco, 2010).

The case of the United Kingdom illustrates the vulnerability of mortgage lenders to maturity mismatches, even when mortgage arrears do not increase dramatically. UK mortgage lenders had become increasingly reliant on wholesale funding, in particular via the securitisation of mortgages. In 2001, lending by domestic UK banks to non-bank borrowers was comparable to domestic deposits. By 2008, the funding gap between retail deposits and lending had grown to £738 billion (about 50% of GDP), with almost half of it filled by interbank deposits from abroad. Wholesale funding allowed very rapid growth in mortgage lending. For example, the average annual growth rate of loans by Northern Rock between 2001 and 2006 was over 30% (Onado, 2009). When the US subprime market collapsed, liquidity evaporated and demand for mortgage-backed securities vanished, leaving banks unable to fund their portfolios and the government was forced to bail out several prominent mortgage lenders (André, 2011).

Mortgage securitisation has been hit severely by the US subprime crisis. However, it can make a valuable contribution to housing finance, provided it is done in a sensible way (Buiter, 2009). The experience of securitisation of prime mortgages in the United States has been fairly positive for decades. Albertazzi et al. (2011) find a low probability of default in a large sample of Italian securitised mortgages, as banks have applied stringent underwriting standards to build up a reputation among investors. Overall, securitisation can be an efficient tool for mortgage finance, provided underwriting is sound and products are transparent, allowing investors to assess risks reliably. A requirement for issuers of mortgage-backed securities to retain a significant part of the risk can mitigate risks related to asymmetries of information.

Covered bonds are more widely used than mortgage-backed securities in several European countries. They are generally considered particularly safe for investors as they offer dual recourse to both the mortgage pool and the issuer. But as a consequence, they generate “asset encumbrance”, i.e. assets are not available to other creditors in the event of the bank’s insolvency. They are often over-collateralised on an ongoing basis, providing an additional guarantee to investors. European covered bonds performed relatively well during the financial crisis compared to asset-backed securities and senior bank debt (ECB, 2008; Blommestein et al., 2011; Campbell, 2012). There is nevertheless a need for continued vigilance to ensure that covered bonds remain very safe investments. On the side of banks, financing through covered bonds may still entail refinancing risks if the maturity of the bonds is short compared to that of the mortgages.

Macroeconomic risks

Housing affects economic and financial developments via several channels. Housing has a large macroeconomic impact through residential investment, employment and consumption, which is abundantly documented in the literature. Leamer (2007) argues that housing plays a prominent role in the US business cycle. A number of studies using structural vector autoregressive (SVAR) models also show strong spillovers between housing and the wider economy (Goodhart and Hofmann, 2008; Jarocinski and Smets, 2008; Iacoviello and Neri, 2010; Musso et al., 2011; André et al., 2012; Gustafsson et al., 2015). A number

of studies analyse links between housing and credit and show that housing crises tend to be associated with financial crises and protracted recessions (Detken and Smets, 2004; ECB, 2005; Cecchetti, 2008; Claessens et al. 2008; Reinhart and Rogoff, 2009; IMF, 2011; Jordá et al., 2014). Sutherland and Hoeller (2012) explore the links between debt and macroeconomic stability and find that when private sector debt levels, particularly for households, rise above trend the likelihood of recession increases. Furthermore, when debt levels are high, recessions tend to be more severe.

Several studies have found an impact of housing wealth on private consumption, which tends to be larger in countries with the most sophisticated mortgage markets, in particular Anglo-Saxon countries and the Netherlands (Catte et al., 2004; Lettau and Ludvigson, 2004; Ludwig and Slok, 2004; Case et al., 2005; Muellbauer and Murphy, 2008). The correlation between estimated propensities to consume out of housing wealth and the completeness of mortgage markets and particularly the possibility of housing equity extraction, points to the role of collateral. The pure aggregate housing wealth effect should in theory be small. Increases in housing wealth are offset by the increase in the value of future rents and only distributional effects across households with different propensities to consume affect aggregate consumption in the absence of borrowing constraints. But the increase in collateral allows credit-constrained households to borrow against the value of their home and raise their level of consumption. When house prices fall, this effect is reversed and highly indebted households are forced to reduce consumption and to deleverage, as they are unable to raise new loans.

Recent studies using sub-national or micro data confirm the strong relation between household balance sheets and consumption. Most of them attribute a key role to credit constraints in this relation. Dynan (2012) shows that highly leveraged US households reduced consumption more than other households between 2007 and 2009, despite experiencing smaller changes in net worth. Mian et al. (2013) find that the marginal propensity to consume out of housing wealth is highest in areas of the United States with poorer and more leveraged households, which are facing the tightest credit constraints. Aladangady (2014) finds that US households with a high debt service ratio have a high marginal propensity to consume out of housing wealth, contrary to those with a low debt service ratio. This can be seen as evidence of the importance of the collateral effect, as opposed to the pure wealth effect, in the relation between housing wealth and consumption. Baker (2014) finds that high indebtedness increases the sensitivity of consumption to income shocks among US households and that this result is largely related to borrowing and liquidity constraints. Bunn (2014) finds that highly indebted households in the United Kingdom cut spending more than less leveraged ones after 2007, reversing stronger pre-crisis consumption growth. He presents survey evidence that lower spending was associated with a combination of tighter credit constraints and concerns about ability to make future debt repayments. Lau Andersen et al. (2014) find that highly leveraged Danish households also reduced consumption more than less leveraged ones after 2007, correcting unsustainable pre-crisis consumption levels. The relation between leverage and subsequent consumption growth is non-linear, with negative correlation found above a LTV ratio of 40%. Interestingly, the authors find little evidence that the correlation between leverage and consumption in Denmark is driven by credit constraints and rather emphasise the role of precautionary savings and revisions to income expectations when the crisis hit. Van Beers et al. (2015) find a negative relation between house price changes and savings in a large panel of Dutch households over the period 2006-11, with the strongest response for young households with negative equity, consistent with the presence of credit constraints.

Policy responses

Different classes of policy instruments can be used to prevent excessive increases in household debt. Sound micro-prudential regulations and supervision is essential. However, the pro-cyclicality of the financial system and risks related to correlated exposures across institutions and interconnections call for macro-prudential tools to complement micro-prudential measures. The border between micro- and macro-

prudential instruments is sometimes fuzzy. Many macro-prudential instruments have their origin in the micro-prudential toolkit, but may be used not only to ensure the safety of individual financial institutions, but also to influence aggregate debt development to prevent systemic and macroeconomic risks. Many reforms are currently being implemented to reinforce the stability and resilience of the financial system, including Basel III regulations and a wide range of country-specific measures. In this paper, the discussion is limited to the aspects of these reforms which are most directly related to the issue of household debt. Monetary policy is a blunt tool to control household debt developments, but may be used in cases where this does not conflict with inflation and output stabilisation. Structural features of housing markets may amplify or dampen the impact of financial shocks on household debt. A holistic approach to housing issues is needed to achieve at the same time financial stability and decent housing conditions for all.

Micro-prudential policy

The boom period preceding the GFC saw a relaxation of lending standards in many OECD countries. The US subprime market was an extreme case, where the ability of many borrowers to repay their loans depended on ever rising housing prices and the possibility to refinance mortgages at a lower interest rate. On a much smaller scale, "equity lending", which puts more weight on the value of collateral than on the repayment capacity of borrowers, also expanded in the United Kingdom, where it was driven by non-bank lenders, and resulted in high arrears (FSA, 2009). The "equity lending" model is clearly unsustainable and lenders should make sure borrowers have the financial capacity to repay their loans out of income or by selling assets under plausible conditions. During the boom, documentation of income and assets of borrowers was often neglected. Going forward, financial authorities need to make sure lending standards are sound, both in the bank and non-bank sectors. It is important that originators of loans do not face incentives encouraging excessive risk taking. Requiring more transparency and reinforcing consumer protection and financial education also encourages sound lending and borrowing practices. [9]

In a period of very low interest rates, variable mortgage rates may induce households to take excessively big mortgages if they fail to take into account that interest rates are likely to rise at some point during the life of the mortgage. It is often argued that fixed rate mortgages are preferable for this reason. However, fixed-rate mortgages have their own drawbacks. Cuts in policy rates provide relief to borrowers with variable-rate mortgages. As discussed earlier, this has played a role in limiting defaults in many countries. With fixed rates, the transmission mechanism is weaker. In some cases mortgages can be refinanced at lower rates, but there may be obstacles. In the United States, many mortgages fell into negative equity after 2007, preventing refinancing. In some countries, such as France, there are pre-payment penalties. If such penalties do not exist, financial institutions may be exposed to pre-payment risk.[10] On balance, it is not obvious that either type of mortgage should be preferred and measures distorting the choice of borrowers should probably be avoided, as the most suitable product depends in part on the profile of the borrower (Miles, 2004). One way to avoid that households take on excessive debt when interest rates are low in countries where variable rates are predominant is to make affordability calculations using as a benchmark a fully amortising loan of a reasonable duration at a representative long-term rate. This method has, for example, been recommended by the Finnish Financial Supervisory Authority and required for insured mortgages in Canada.

[9] A detailed analysis of housing finance systems is beyond the scope of this paper. Lunde and Whitehead (2015) provide a comprehensive review of housing finance in 21 countries, mostly European. Lea (2010) provides a comparison of mortgage product offerings in 12 major advanced countries.

[10] However, this is not always the case. In Denmark a fixed-rate loan can be prepaid at par. The fixed-rate loan contains a call option, which is paid for by the borrower through a higher interest rate. The loan can also be bought back at market value (Lunde, 2015).

Some features of mortgages tend to be associated with higher default risks, although the correlation is far from perfect, as individual characteristics of borrowers are critical. High loan-to-value (LTV) ratio loans increase the probability that households fall into negative equity. Regulatory caps on LTV are in place in a number of countries and in some others regulator or industry guidelines recommend a maximum LTV (see below for the macro-prudential use of LTVs). Limits are also imposed for mortgages included in covered bond pools. Low LTV ratios create a buffer for borrowers in case housing prices fall. However, they penalise first-time buyers. Caps on LTV can often be circumvented through the use of consumer credit or second lien mortgages to finance the requested deposit. For example, at the peak of the housing market in the United States, 45% of home purchases in coastal markets and bubble locations involved a second lien (Lee et al., 2012). A national credit register recording all loans may be necessary to avoid circumvention of lending limits (IMF, 2014). Caps on loan-to-income (LTI) or debt-to-income ratios (DTI) also exist in some countries. Analysis of the UK mortgage market suggests that from a micro-economic point of view caps on LTV, LTI and DTI are not a very efficient way to reduce mortgage risk and come at the cost of denying access to credit to some households who could afford it (FSA, 2009). A more flexible way to contain risks is to impose higher capital requirements or mortgage insurance for high LTV loans. Making insurance compulsory for some types of loans removes the risk of adverse selection. Insurance schemes still need to be designed to mitigate moral hazard. As discussed below, caps on LTV, LTI and DTI are sometimes used as macro-prudential instruments.

A number of mortgage product characteristics should be monitored carefully, especially when they are used to increase borrowing capacity. Some products designed for a niche market have tended to spread to a wide customer base during the latest boom, as they allowed increasing affordability, albeit at the cost of higher risks than traditional mortgages, both for borrowers and lenders. For example, loans with deferred repayment may be suited for young professionals with good prospects of rising income. However, they have sometimes been extended to borrowers with very uncertain ability to repay in the future. Low-documentation loans have traditionally been granted to self-employed who could not document a steady stream of income. But they were also extended to salaried workers, creating an incentive to overstate their income if not properly checked. Indeed, according to the UK Financial Services Authority, for 49% of all UK regulated mortgage sales in 2007, incomes were not verified (FSA, 2009). Foreign currency mortgages are suited for borrowers with revenue in foreign currency, but were increasingly extended to domestic currency income earners in order to take advantage of lower foreign currency interest rates, making these borrowers vulnerable to exchange rate risks.[11] In some Central and Eastern Europe countries they accounted for a large fraction of originations before the GFC. Interest-only mortgages tended to be used in combination with savings products, mainly for tax reduction. In countries where mortgage interest is tax deductible, there is an incentive to defer the repayment of the mortgage. In order to ensure that the borrower builds up capital to repay the loan at some point, savings can be accumulated in investment products (which sometimes also benefit from tax advantages). In 1995, 69% of new mortgages in the Netherlands were interest-only, of which only 14% were not associated with an investment product. The corresponding numbers for the United Kingdom were 62% and 10%. In 2006, interest-only mortgages accounted for nearly 88% of new loans in the Netherlands, of which 44% were not associated with an investment product. In the United Kingdom, as mortgage interest deductibility had been phased out, interest-only loans accounted for only 24% of new loans, but most of them (20%) were not coupled with an investment vehicle (Lunde et al., 2008). This suggests that during the boom many borrowers chose interest-only loans for affordability reasons and had unclear repayment strategies.

These examples show that risks relate more to mismatches between the products used by some households and their financial capabilities and ability to bear risks, than to the products themselves. Narrowing the range of products financial institutions may distribute entails welfare costs, as this will

[11] In some countries (e.g. Austria), borrowers in foreign currency were obliged to subscribe to a savings plan tied to the loan agreement in order to build up a buffer against exchange rate risks.

eliminate products which are likely to be suitable for some categories or borrowers. Furthermore, bans on products (be it mortgage-related or other products) may be easily circumvented through financial engineering or supplied by institutions outside the regulatory perimeter. Conversely, there is a risk of stifling the development of new products. While financial innovation can entail risks, some new products could meet borrowers' needs better than those currently available and bring more stability to housing finance (Miles and Pillonca, 2008; Shiller et al., 2011). More flexible measures, such as restrictions on use, underwriting guidelines and incentives may be more efficient. For example, bank regulators in Poland have requested tighter underwriting conditions for foreign-currency loans. Consumer protection regulation has also an important role in preventing unsustainable mortgage lending.[12] Policy makers should take into account that taking out a mortgage is one of the most important and financially significant decisions to be made by a consumer during their lifetime.[13]

In addition to monitoring lending standards, regulators need to make sure mortgage lenders and insurers have adequate capital and liquidity buffers. In particular, the resilience of funding models needs to be evaluated carefully in a world where capital flows are volatile. Large maturity and currency mismatches should raise concern. While some institutions may be vulnerable because of their own business model, weaknesses may also result from systemic risks. This justifies complementing micro-prudential regulations by macro-prudential policies.

Macro-prudential policy

Since the GFC, which has highlighted the role of systemic linkages in the build-up of financial imbalances and the propagation of shocks, there is a growing consensus in favour of macro-prudential policies among academics and policy makers (Hanson et al., 2011; Galati and Moessner, 2011). In addition, the current very low interest rates and abundant liquidity risk fuelling asset bubbles. Housing prices are rising fast in countries with fairly solid economies, like Australia, Canada, Norway and Sweden. As policy rates are being kept low to support the economy and in some cases fight deflation, other instruments are needed to rein in unsustainable increases in debt. Nevertheless, macro-prudential policies are largely untested in advanced countries and building an effective macro-prudential policy framework is a major challenge. Emerging economies have used macro-prudential tools more than OECD countries and some lessons may be drawn from their experience.[14]

[12] Even more than residential mortgages, commercial mortgages and loans to developers and construction companies require close scrutiny. As noted earlier, such loans have often generated high losses when a housing bubble burst. It is an area where the financial accelerator can be quite strong. As the value of property rises during a boom, real estate developers see the value of their collateral increase and can often secure additional loans. Such collateral concentrated in overvalued real estate provides little guarantee. But during booms with strong competition for market share among lenders, commercial considerations often tend to dominate risk management concerns. The recent Irish boom provides a concrete example of this mechanism at play (Carswell, 2011).

[13] In the United Kingdom, for example, it became clear that at the peak of the mortgage market in 2007, while the market had worked well for many consumers, it had also been a cause of hardship for others. The regulatory framework in place at the time had proved ineffective in constraining particularly high-risk lending and borrowing. In response the regulator, the UK's Financial Conduct Authority, introduced in 2014, under the Mortgage Market Review, a package of reforms aimed at ensuring continued access to mortgages for the majority of consumers who can afford them, while preventing a return to the poor industry practices of the past ensuring that, for example, that lenders are now responsible for assessing whether a consumer can afford the mortgage.

[14] Kuttner and Shim (2013) provide a systematic analysis of the effectiveness of non-interest rate policy tools in stabilising housing prices and credit, using a panel of 57 advanced and emerging economies. They find some evidence of an impact of changes in the maximum debt-service-to-income and LTV ratios, limits on exposure to the housing sector and housing-related taxes on housing credit growth. However, only housing-related taxes are found to significantly affect increases in housing prices.

Macro-prudential policy is meant to address systemic fragilities. More precisely, it aims at mitigating a fundamental market failure. Individual financial institutions generally fail to appreciate the impact of their actions on the financial system as a whole and the risks related to correlated exposures and interconnectedness. De Nicolò et al. (2012) identify three externalities, whose correction they see as intermediate targets to mitigate market failures which generate systemic risk. First, strategic complementarities – e.g. increased competition during booms, incentive structure of bank managers, prospect of a government bailout – induce financial institutions to take excessive or correlated risk during cyclical upswings, amplifying credit and liquidity cycles and asset price volatility. Second, externalities arise from fire sales during a contraction, which weaken balance sheets and may degenerate into a negative spiral between asset prices and balance sheet contraction. Third, interconnectedness propagates shocks through financial networks in which systemically important financial institutions (SIFIs) play a major role. These externalities can be reduced using a wide variety of instruments. Some are general, such as counter-cyclical capital buffers, limits on bank leverage or reserve requirements. Others are targeted at specific areas. This paper focuses on macro-prudential measures specifically targeting household debt. These are especially relevant, as mortgage lending is generally perceived as a low-risk activity by banks, but often accounts for a large share of banks' balance sheets and can fuel housing bubbles, whose bursting historically led to deep and protracted recessions.

The most widely used instrument targeting household debt directly is a cap on LTV ratios, which exists in about half of advanced economies and an even higher proportion of emerging countries (Mitra, 2015). In some instances, it is complemented by debt-to-income or debt service-to-income limits. However, in most cases it is not used as a macro-prudential tool, i.e. it is not adjusted in a dynamic way to take into account evolving risks. Nevertheless, a number of experiences suggest a LTV cap can be a useful macro-prudential tool:

- Hong Kong, China[15] has been, since the early 1990s, one of the most active users of LTV caps as a macro-prudential tool to prevent the build-up of systemic risk and dampen housing market fluctuations. Motivations for using macro-prudential tools include a currency peg with the US dollar, which constrains monetary policy, and volatile capital flows. The maximum LTV ratio is the main instrument. It varies with the value of the property and is complemented by other tools, such as a maximum debt servicing ratio. Macro-prudential policy has been successful in reducing household leverage and containing delinquencies following housing price falls. The impact on housing market fluctuations seem to have been more modest. Mortgage insurance programmes, which allow higher LTVs for insured mortgages, have mitigated the liquidity constraint on first-time buyers (Wong et al, 2011).

- Korea has actively used LTV limits since 2002 and DTI limits since 2005. These limits vary with the type of area (e.g. speculative, metropolitan), the value of the housing unit and some characteristics of the loan or the borrower. Over time the limits were extended from covering banks and insurance companies to all financial institutions to avoid circumvention. LTV and DTI caps appear to have dampened transaction and housing price increases. LTV tightening seems to have a greater effect on prices than DTI tightening. Interestingly, rising LTV caps seems to lower house price expectations and to affect investors more than first-time buyers (Igan and Kang, 2011). This finding is important given the role of expectations in the formation of housing bubbles and the usual concern that LTV caps may disproportionately harm first-time buyers. It is also important to note that Korea's housing policies, in particular measures to improve

[15] Hong Kong, China is included in this paper even though it is not an OECD member (it is, however, participating in the OECD Committee on Financial Markets), as its early use of macro-prudential tools provides useful insights into the impact of such instruments.

affordability by stimulating the supply of housing, have also contributed to stabilise housing prices and facilitated the task of macro-prudential policies.[16]

- New Zealand has introduced in 2013 a limit on the share of high-LTV new mortgages, in response to strong increases in housing prices. Banks are not allowed to issue more than 10% of new residential mortgages with a LTV over 80%. This "speed limit" approach provides flexibility for banks to extend high LTV loans to some customers with a suitable risk profile, while containing risks to financial stability (Spencer, 2013). Besides, minimum risk weights on high-LTV mortgages have been increased. Increases in housing prices have slowed significantly following the implementation of these measures.

- Canada requires mortgage insurance for residential mortgages with a LTV ratio above 80%. As housing prices continued rising rapidly, prudential regulations on government-backed mortgage insurance were tightened in several steps since 2008. In particular, the maximum LTV ratio was reduced from 100% to 95% (80% for investment and refinancing), the maximum amortisation period was reduced from 40 to 25 years, and the five-year fixed-rate mortgage was imposed as the benchmark for evaluating repayment capacity. These measures seem to have pushed banks to reduce their share of high-risk mortgages (Cheung, 2014). They also seem to have slowed overall mortgage credit growth and housing price appreciation (Krznar and Morsink, 2014). Nevertheless, housing prices have continued to increase and may have been overvalued by 10% to 30% in the third quarter of 2014 (Bank of Canada, 2014).

- Some Nordic countries have also moved towards lower LTV limits. Sweden has imposed an 85% cap in 2010. Mortgage debt growth has slowed after the introduction of the cap and stress tests suggest that the resilience of households to various shocks has increased (Braconier et al., 2014). The Financial Supervisory Authorities of Finland and Norway have also lowered their recommended maximum LTVs to respectively 90% and 85%. Denmark has had a maximum LTV of 80% for residential properties since the end of the 1980s and lower LTV limits for other type of properties (Lunde, 2015).

- Israel has limited the LTV ratio to 75% for first-time buyers and to 50% for investors since November 2012. These caps are complemented by limits on the variable rate component of loans, a 50% limit on the payment-to-income (PTI) ratio, a maximum loan term of 30 years, higher capital requirements for the riskiest loans and a supplementary reserve requirement for housing loans. These measures have led to a decline in the share of variable-rate mortgages and average LTV and PTI ratios and to higher mortgage rates. As of mid-2015, real housing prices had decelerated somewhat.

Beyond the LTV at the origination of the loan, an important consideration is the evolution of the LTV over the life of the loan. With amortising loans, the LTV ratio will tend to decrease steadily, barring sharp housing price falls. In other words, only recent mortgages will have a high LTV ratio. But in many countries, amortisation periods are very long. In some interest-only loans are prevalent. Then, the whole mortgage portfolio is large compared to the value of housing assets and households have narrow equity buffers. They risk falling into negative equity if prices decline. For example, in the Netherlands, where interest-only loans make up a large share of the mortgage stock, about 40% of households were in negative equity in 2013 (Kierzenkowski et al., 2014). In countries with recourse loans, negative equity may not trigger many defaults. Nevertheless, it lowers collateral and may also lock in some households in their

[16] Strong growth in household debt, partly fuelled by cuts in interest rates, prompted the Financial Service Commission to announce new measures in July 2015 to encourage the amortisation of mortgages and contain risky lending by non-bank financial institutions, which will become effective in early 2016.

dwellings. Another concern is that households may take out debt they will have difficulties to repay. As noted earlier, households may accumulate financial assets and thus reduce their net debt. But this is not necessarily the case. Hence, low amortisation entails risks for lenders. As discussed earlier, indebted households tend to reduce consumption more than others when facing an economic shock, which can amplify cyclical fluctuations. Hence, some countries are trying to encourage amortisation. The Netherlands has recently restricted mortgage interest tax deductibility to amortising loans. The Swedish Financial Stability Authority has encouraged amortisation and has proposed a formal requirement to amortise for mortgages with a LTV over 50%, although this has been blocked by a recent court ruling (Berg and Hansen, 2014).

Higher minimum risk weights on residential mortgages can also rein in mortgage lending by increasing capital requirements for banks, which are likely to push up mortgage rates somewhat. As default rates on mortgages are low in many countries, risk weights determined through internal bank models are also low. But systemic risk can justify higher risk weights. Therefore, some financial authorities have increased minimum risk weights on mortgages (or some categories) in recent years, notably in Belgium, Israel, New Zealand, Norway, Sweden, Switzerland and Hong Kong, China.

Dynamic provisioning has been used in Spain since 2000. It allows banks to build financial buffers during booms. It also provides investors with a more realistic view of banks' risk-adjusted returns, mitigating incentives for excessive risk taking. Another advantage of the system is that it can be rule-based, which avoids the difficult choice of the timing of activation. It is, however, difficult to calibrate as history can be a poor guide for future losses. In Spain, it has enhanced the resilience of banks during the downturn, even though it was not enough to cover all losses (Saurina, 2009). But it has been unable to prevent a huge housing boom.

As shown earlier, foreign-currency loans experienced high default rates in some Central and Eastern Europe countries following currency depreciations. While foreign-currency loans avoid a currency mismatch for banks financing themselves in foreign currency, the credit risk is increased by the vulnerability of the borrower to large currency depreciations. Moreover, a low interest rate in a foreign currency may bias perceptions of affordability. Hence, there is a strong case for applying tighter prudential standards for foreign-currency loans. Brzoza-Brzezina et al. (2014) show that, under plausible assumptions, regulations restricting foreign currency lending enhance welfare, even though they may have a short-term negative impact on economic activity.

Macro-prudential policy can also mitigate liquidity risk, by directly imposing liquidity requirements, or by using other instruments to restrain credit growth when liquidity risks appear to threaten financial stability. Housing booms have often been financed by inflows of foreign capital, which tend to be volatile. A strong correlation between increases in real housing prices and changes in the current account deficit was observed across a wide sample of advanced and emerging economies in the years preceding the GFC (Obstfeld and Rogoff, 2009). Vulnerabilities associated with capital inflows may also arise in the absence of current account imbalances, which only account for net flows while gross flows are also important in the build-up of financial imbalances (Borio and Disyatat, 2011; Ramskogler, 2015).

Implementing macro-prudential policies raises a number of additional challenges. Some instruments, like dynamic provisioning, once put in place act as automatic stabilisers. However, most instruments will require timely adjustments reflecting the evolution of risks. The complexity and innovation capacity of the financial system make the setting of rules for intervention particularly challenging. Hence, policymakers have to rely mostly on discretionary measures. This raises a number of questions. The first is about institutional settings. In many countries, the central bank has the primary responsibility for macro-prudential policy, but other countries have chosen other arrangements. For example, in Sweden the main responsibility lies with the Financial Supervisory Authority. The discussion of the merits of different

institutional settings, which are largely country specific, is beyond the scope of this paper. Nevertheless, it is important to stress that, as macro-prudential policy interacts with micro-prudential, monetary and macroeconomic policies, coordination between the institutions involved is essential.

A second issue is about the trigger for implementing macro-prudential measures. Financial imbalances are difficult to evaluate in real time. Looking specifically at housing booms, which are often associated with rapid increases in household debt, identifying unsustainable developments is not straightforward. Prior to the latest cycle, only about 60% of large real housing price upswings in a sample of 18 OECD countries since 1970 ended in a bust (Girouard et al., 2006). Recently, housing prices stabilised at a high level in many countries. Housing price-to-rent and price-to-income ratios are useful indicators of potential overvaluation, but even though they tend to revert to their long-term average over the long run, they are generally non-stationary, even when allowing for long memory processes (André et al., 2014). These ratios are affected by interest rates and structural features of housing markets, like urbanisation trends, supply responsiveness and taxation. Construction booms point to high risks, as very few are followed by a soft landing (Hoeller and Rae, 2007). Furthermore, as already mentioned, collapses in construction are often associated with high losses for banks. Thus, episodes where housing prices and construction both rise rapidly warrant particular vigilance. The literature also points to the association of high credit growth, abundant liquidity and fast increases in property prices as an early warning for financial crises (Alessi and Detken, 2009; Borio and Drehmann, 2009; ESRB, 2014; Dreger and Kholodilin, 2015). Beyond uncertainty, political economy considerations may hamper the implementation of macro-prudential policies, which have costs for the economy – e.g. lowering output growth and employment – or specific groups – e.g. first-time buyers, banks or homebuilders. Finally, macro-prudential policies should operate in a symmetric way, i.e. be loosened when risks are receding (ESRB, 2014).

A third issue is the risk of circumvention of macro-prudential measures. The risk of circumvention through cross-border banking and other forms of external financing is a particular concern in advanced and open economies (Cerutti et al., 2015). Targeted macro-prudential measures, such as LTV and DTI caps are more effective to rein in household debt than broader measures, such as capital requirements. However, they may be easier to circumvent. Developments in shadow banking and cross-border lending in response to tighter banking regulations should be monitored carefully (OECD, 2015).[17] The regulatory perimeter should encompass all institutions susceptible of generating systemic risk.

Monetary policy

Before the GFC, there was a broad consensus that monetary policy should focus exclusively on inflation at a horizon of around two years and possibly output or employment stabilisation depending on the specific mandate of the central banks (Galati and Moessner, 2011).[18] Views have evolved somewhat since the GFC (Yellen, 2009). Nevertheless, it remains that monetary policy is a blunt tool to deal with rapid rises in housing prices and household debt. There may be a case for tightening monetary policy – more than was done in recent years – when large increases in housing prices coincide with a solid economic expansion. Even then, monetary policy may not be the right tool to avoid housing bubbles. The interest rate hikes needed to stop a housing boom may be too big to be implemented without an excessively large impact on output, employment and inflation. In addition, housing bubbles often take place in a limited part of a country or monetary area. For example, before the GFC, such bubbles in the United States were located mainly in Arizona, California, Florida and Nevada. Similarly, developments varied across euro area countries, with housing bubbles in Ireland and Spain and flat or even declining housing prices in

[17] Monitoring of the shadow banking sector is being undertaken by the Financial Stability Board (e.g. FSB, 2015).

[18] This view was, however, challenged by some economists (Cecchetti et al., 2002; Roubini, 2006; White, 2006) and some central banks explicitly took into account housing price developments in their decisions at some point (e.g. the Reserve Bank of Australia and Sweden's Riksbank).

Germany. Using monetary policy to moderate housing price increases in this context is bound to be quite ineffective and to entail substantial costs in terms of economic activity.

At the current juncture, a number of countries are experiencing high and rising housing prices and household debt as well as sluggish output growth and deflation risks. In this situation, the use of monetary policy to rein in household debt would be in contradiction with its core objectives. It would weaken the economy and entail risks of de-anchoring inflation expectations. Hence, the monetary and financial authorities have to rely mostly on macro-prudential measures to keep household debt in check, although tax and housing market reforms could also help in some cases.

When economies move back towards a steady growth path, with inflation close to target, extraordinary monetary policy measures (e.g. quantitative easing) undertaken in response to the crisis will need to be pared back. Nevertheless, there will be a continued need to assess monetary policy measures within a policy mix to ensure household debt sustainability. For this, a number of factors have to be taken into account, including the level of systemic risk, the cost of crises associated with high leverage and the effectiveness of more targeted instruments, notably macro-prudential. Countries where housing price spillovers to the wider economy are strongest should consider resolute action, including macro-prudential, monetary, fiscal and structural measures, to avoid unsustainable construction and/or consumption expansions.

Housing policies

An extensive discussion of structural housing policies is beyond the scope of this paper.[19] However, it is essential to recognise that structural features of housing markets and policies may greatly complicate the task of monetary and financial authorities in stabilising the housing market and ensuring the sustainability of household debt. Hence, improved housing policies can yield a double dividend, as they increase well-being and economic efficiency, while contributing to financial stability. Over recent decades, policies have often pushed up demand, for example through favourable taxation of housing, housing allowances or encouraging the supply of mortgages, especially to low-income households who could not always afford them. At the same time, in many countries, urbanisation, tight land-use planning regulations and lack of investment in infrastructure have blunted the supply response. In addition, rental regulations have hampered the development of the private rental market in some countries (De Boer and Bitetti, 2014). The supply of affordable or social housing is in some places insufficient to ensure access to housing for the less affluent part of the population. The GFC has worsened supply-demand imbalances for affordable housing, as stagnation or falls in income and higher unemployment have increased demand for affordable and social housing, while public supply has been hurt by tighter budget constraints and private construction has suffered from uncertainty and tighter financing constraints (Rosenfeld, 2015; Salvi del Pero et al., 2016).

Conclusion

Household debt may entail risks for households, the financial system and the wider economy. Hence, it needs to be watched closely. However a high level of debt is not a sufficient indicator of risk. A more disaggregated examination of the distribution of liabilities and assets across households is needed to assess risks to financial stability and the macroeconomy. Financing structures for mortgages also need to be monitored carefully, as maturity and currency mismatches can entail big risks for financial institutions. In a number of countries, loose underwriting standards for mortgages were directly at the origin of financial distress, but in many others the sources of vulnerability were more systemic. This suggests that sound micro-prudential policies, although imperative from both a financial stability and consumer protection perspective, are not enough to contain financial risks. At the current juncture, accommodative monetary

[19] For a discussion of housing policies in OECD countries, see OECD (2011b).

policy is needed in most OECD countries to support the economy and bring inflation back to target. Exceptionally low interest rates may encourage the build-up of excessive household debt and create housing price bubbles. Macro-prudential policy should mitigate this risk, but this remains a challenge, as experience in implementing macro-prudential measures is limited and the development of the macro-prudential framework is still work in progress. Unsustainable developments in household debt are not only a potential threat to financial stability, they also have an impact on the macroeconomy, notably through private consumption and construction activity, which strengthens the case for preventive action. Finally, a number of OECD housing markets suffer from structural weaknesses, which makes stabilisation of household debt more complicated. While financial policy measures are the primary tools to control household debt in the short term, ensuring stability over the longer term, as well as meeting housing needs, requires a holistic approach to housing market issues.

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