

# Committee on the Global Financial System

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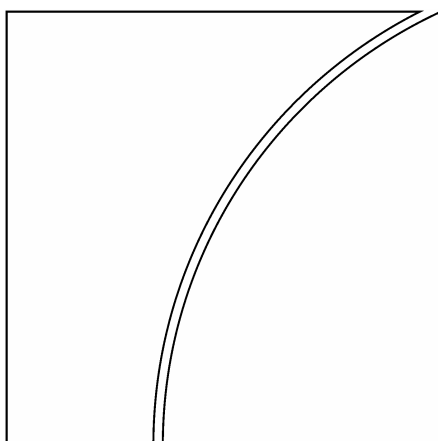
No 26

### Housing finance in the global financial market

CGFS working group report

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## **Executive summary**

At its meeting in November 2004, the Committee on the Global Financial System (CGFS) established a Working Group under the chairmanship of Mr Lars Nyberg of Sveriges Riksbank to study recent changes in housing finance systems as part of the Committee's ongoing work to guard against risks to financial stability. The recent developments in housing finance in the global financial market, ie increased household indebtedness and rising house prices, have been a focus of policy in a number of central banks and perhaps also a component in monetary policy decisions. This is, however, not the focus of this report. The main objectives of the Working Group were to analyse the significance of developments affecting the supply of, and demand for, housing finance. This report documents the Group's main findings. It highlights important similarities and differences that have helped shape the evolution of national housing finance systems.

### **What has happened?**

The Working Group noted a number of developments. On the supply side, where the lender structures of most markets remain largely national in nature, common developments include increased loan-to-value ratios, a reduction of credit restrictions, a wider array of loan contracts offered to borrowers, and a move towards greater reliance on capital market funding via securitisation of housing loans. Together, these developments have made borrowing cheaper and more readily available, which has allowed new categories of households to enter the housing market. In particular, sub-prime lending has increased significantly in countries where it is allowed. On the demand side, a number of countries have experienced a growing willingness on the part of households to assume risk, in particular interest rate risk arising from floating rate borrowing.

These developments have been associated with a rise in household indebtedness; house prices have increased in most industrialised and emerging economies, and in many countries housing debt per capita and house prices have reached new all-time highs. However, despite the observed large increases in housing debt, debt service costs have risen more modestly and have even fallen in some countries, compatible with the notion that lower interest rates have played an important role in leading households to assume more debt.

While a transformation of the housing financial sector is readily apparent in many economies, the Working Group notes that important differences between countries remain, in particular in terms of the speed at and extent to which these changes have evolved. Thus, some countries have experienced a rapid growth of household indebtedness, while others have seen more moderate developments.

### **Why has it happened?**

The Working Group identified four major common factors that have contributed to these changes.

First, macroeconomic developments - in particular, lower real and nominal interest rates related to the decrease in the level and volatility of inflation, higher and less volatile global output growth, and growing international cross-border investments - have led to an environment in which the demand for housing finance has grown steadily.

Second, advances in information technology and financial innovations have increased efficiency in housing finance systems, expanded economies of scale for the production of housing finance products and reduced costs for lenders and, in some countries, borrowers.

Third, financial liberalisation and deregulation have relaxed or removed credit restrictions. Regulatory frameworks have moved away from rigid controls towards enhancing efficiency through market discipline, supervision and risk-based capital guidelines. These changes and the resulting globalisation of capital markets have triggered strong growth in secondary mortgage markets.

Fourth, government policies, in particular housing policies, have generally been important factors in affecting both demand and supply in housing finance systems. In a number of countries, governments have been slowly reducing their role in housing markets. Nonetheless, government policies are at least partly responsible for many differences in household debt and house price growth between countries. For example, in several countries land use restrictions and planning policies might have contributed to higher house price rises for any given increase in demand. In addition, tax policy and

foreclosure laws strongly affect the demand and supply of mortgages and housing, and in turn house prices.

### **What are the possible implications for housing finance market participants?**

Several recent developments in global housing finance systems have contributed to an improved functioning of housing finance markets, and have enhanced financial and macroeconomic stability. Risk-priced lending and credit scoring have made credit more efficiently priced and allocated. Securitisation has allowed a higher degree of specialisation in financial markets and improved the allocation and pricing of risks in the global financial system. It has also allowed investors to diversify into other high-quality asset classes.

The significant growth of household borrowing and higher house prices in many economies in recent years have coincided with a period of low interest rates and improved access to credit. These developments have prompted central banks, rating agencies and others to assess whether new risks to the stability of the financial system have arisen. However, stress tests conducted by central banks and other authorities suggest that the level of indebtedness is broadly affordable and that the majority of borrowers are able to absorb both declines in house prices and higher interest rates. Furthermore, financial institutions, notably banks, appear sufficiently capitalised to withstand a substantial deterioration in household credit quality.

Nevertheless, it is also clear that new, more complex, types of mortgage contract have increased the choice of products available to households, potentially raising household welfare, but may also have allowed some households to overstretch themselves in the purchase of homes that otherwise would be unaffordable, perhaps adding to the risks in a housing market downturn. The strong growth in sub-prime lending might also be a potential source of risk if credit defaults turn out to be larger than expected.

For financial institutions, increased housing debt and new loan types raise the need for careful management of credit, operational and reputational risks. Furthermore, although increased reliance on capital market funding should on balance increase liquidity available to lenders, it also exposes them directly to financial market volatility.

For investors, lenders' increased reliance on capital market funding is likely to provide access to a potentially very large asset class in the form of mortgage-backed bonds. This should improve diversification opportunities and risk allocation - provided that the pricing of risks is sound. More broadly, the emergence of a new asset class linked to housing finance may create stronger links between global financial markets and domestic policies affecting housing markets. One possible implication is that this introduces a new source of market volatility.

### **What are the possible policy concerns and recommendations?**

The Working Group has identified several important possible policy concerns and recommendations for central banks:

- Households may not completely understand their mortgage contracts or how their payments could change in response to interest rate shocks or other developments. In particular, the introduction of negative amortisation loans and a number of other new loan contracts has led households to assume more, and increasingly complex, risk. This is part of a broad global trend in financial markets to shift risk towards households.
- The increased use of adjustable rate mortgage loans and other new mortgage instruments has increased households' sensitivity to changes in mortgage interest rates.
- Lenders, investors and regulators may find that older risk monitoring systems, which worked well when almost all borrowers were of high credit quality and used fixed rate loans, may not be adequate in an environment with significant numbers of sub-prime borrowers, and in which variable rate or other, more sophisticated, loan products have become increasingly common.
- Central banks and other policymakers need to ensure that they have access to a broad array of disaggregated data, particularly for more vulnerable subgroups of households. Furthermore, policymakers need to ensure that house price data are of high quality.

- Central banks could consider conducting their own stress tests as well as encouraging other authorities and market participants to engage in stress testing. The focus of these tests could be on household vulnerability, house prices and retail loan portfolios as well as liquidity risks from increased market funding.
- The trend towards increased globalisation, particularly in the investor base, will require more international information exchange. An important question for policymakers and market participants is how to discern who ultimately bears the housing finance risks and whether there are concentration risks.
- There are differences in the recent developments in household indebtedness and house prices, as well as in the institutional setups between countries. It is important to recognise that public policies are often one of the main factors explaining the contrasting recent developments. An important issue for policymakers is how changes in different regulations, taxes and subsidies might affect housing markets, and in turn the real economy through the housing finance system, with possible feedback effects from global financial markets.

## 1. Introduction

In November 2004, the Committee on the Global Financial System established a *Working Group on Housing Finance in the Global Financial Market* to explore the significance of developments affecting the supply of, and the demand for, housing finance. The objective of the Working Group was to consider whether new developments in housing finance, as well as increasing household debt combined with rising house prices, are likely to result in risks or vulnerabilities to the global financial system. House prices have risen rapidly at the same time as credit has expanded and as housing finance systems have, in several countries, improved. However, it is by no means clear what the causality is. Furthermore, even though there are a number of common factors behind the recent developments, there are also considerable differences between countries.

This report documents the Working Group's findings. It is based on existing research, the Group's discussions, written contributions by Group members on both individual markets and more technical topics, and presentations by and discussions with rating agency and housing finance industry specialists.<sup>1</sup> It is divided into four sections. Section 2 provides an overview of recent developments in the national housing finance markets of central banks participating in the Working Group. It highlights the main common developments across housing finance systems, acknowledging that significant diversity remains. Section 3 discusses what the Working Group sees as the main sources of the common developments, including macroeconomic developments, technological change and financial deregulation. Section 4 considers the possible benefits and risks associated with these housing finance market developments for households, financial institutions and financial markets. Finally, Section 5 suggests three main areas of focus for policymakers: (1) the need to encourage the provision of sufficient information to policymakers, lenders, investors and households to allow them to assess and manage mortgage risks; (2) the need for central banks to broaden their analysis of housing finance systems in order to improve the understanding of the links between housing finance developments, financial markets and broader real economic activity; and (3) the need for central banks and other policymakers to consider encouraging stress testing of housing finance systems by market participants that take into account feedback effects to and from housing prices and possibly other asset prices.

## 2. Developments in housing finance markets

This section presents the main developments and changes in housing finance markets, highlighting similarities as well as differences between economies. The main sources of these developments identified by the Working Group are considered in Section 3, and possible implications are discussed in Section 4.

This section first considers developments in housing debt relative to GDP and household debt service costs. The next subsection demonstrates that house prices have increased significantly in many of the countries covered by the report, while Section 2.3 turns to developments in the composition of lenders as well as the types of loan used in housing finance markets. Finally, Section 2.4 reviews some key developments in housing finance markets, pointing in particular to the increased use of loan securitisation.

### 2.1 Household debt

Mortgage debt among households in the countries covered by this report has grown significantly over the last two decades, as evidenced both by the ratio of mortgage debt relative to GDP and per capita, and by mortgage debt relative to household income (Graphs 2.1 and 2.2).

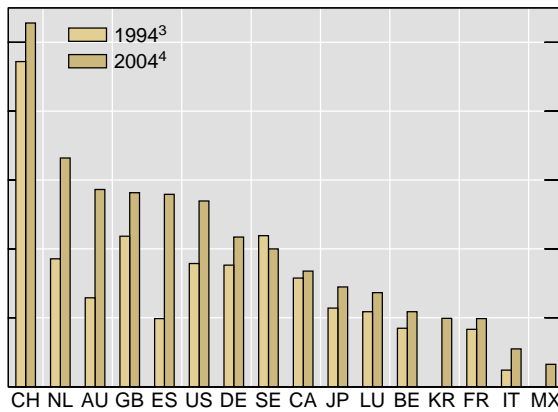
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<sup>1</sup> The Group was chaired by Lars Nyberg (Sveriges Riksbank) and involved members from 17 CGFS participant central banks. The Group's mandate is set out in Appendix 1 of this report. Part of the background material submitted by participating central banks will be made available at [www.bis.org](http://www.bis.org).

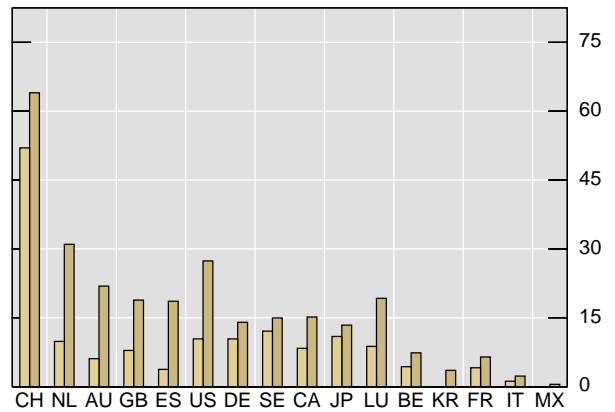


Graph 2.1  
Mortgage debt<sup>1</sup>

As a percentage of GDP



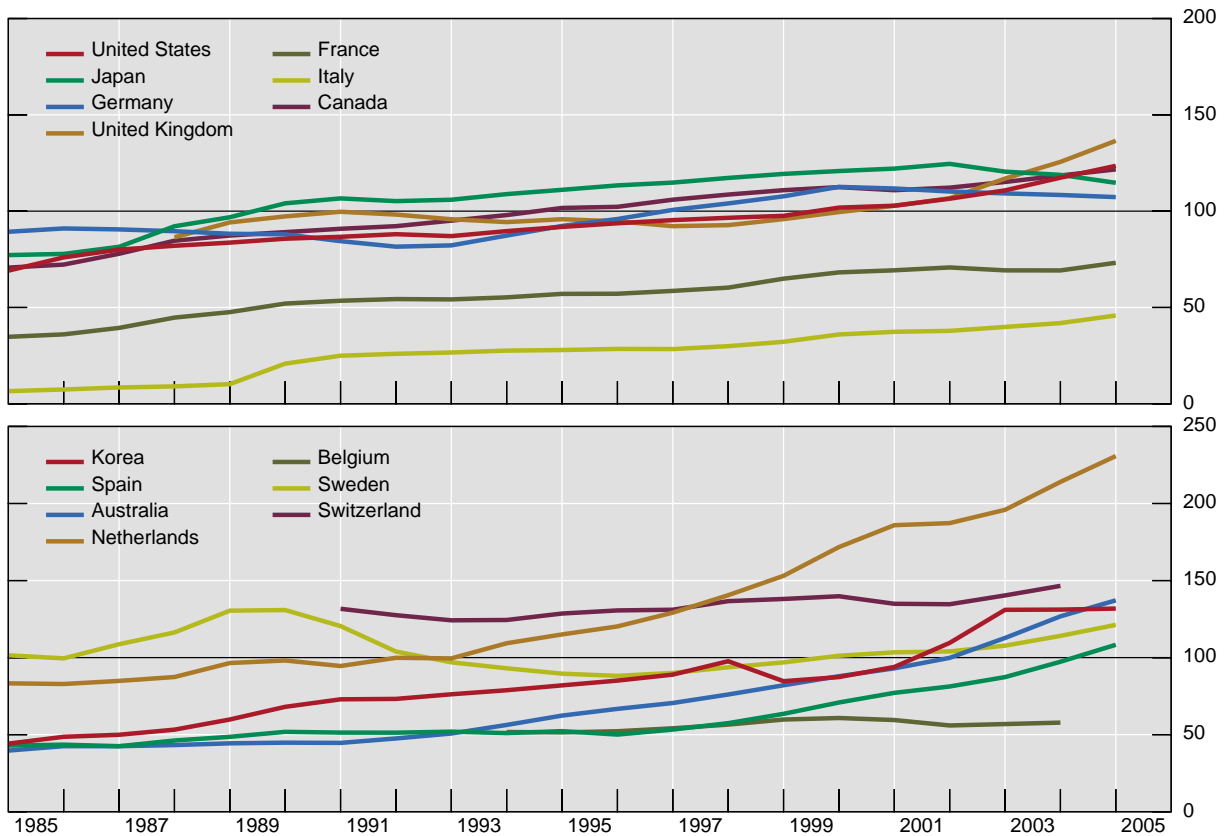
Per capita<sup>2</sup>



<sup>1</sup> Definitions may differ across countries. <sup>2</sup> In thousands of US dollars. <sup>3</sup> For Canada and the United States, 1990; for Japan, 1992; for Korea and Mexico, data not available. <sup>4</sup> For Belgium, France, Germany, Sweden and the United Kingdom, 2003.

Sources: European Mortgage Federation; OECD; national data; BIS estimates.

Graph 2.2  
Household debt/income ratios<sup>1</sup>



<sup>1</sup> Household debt as a percentage of household disposable income.

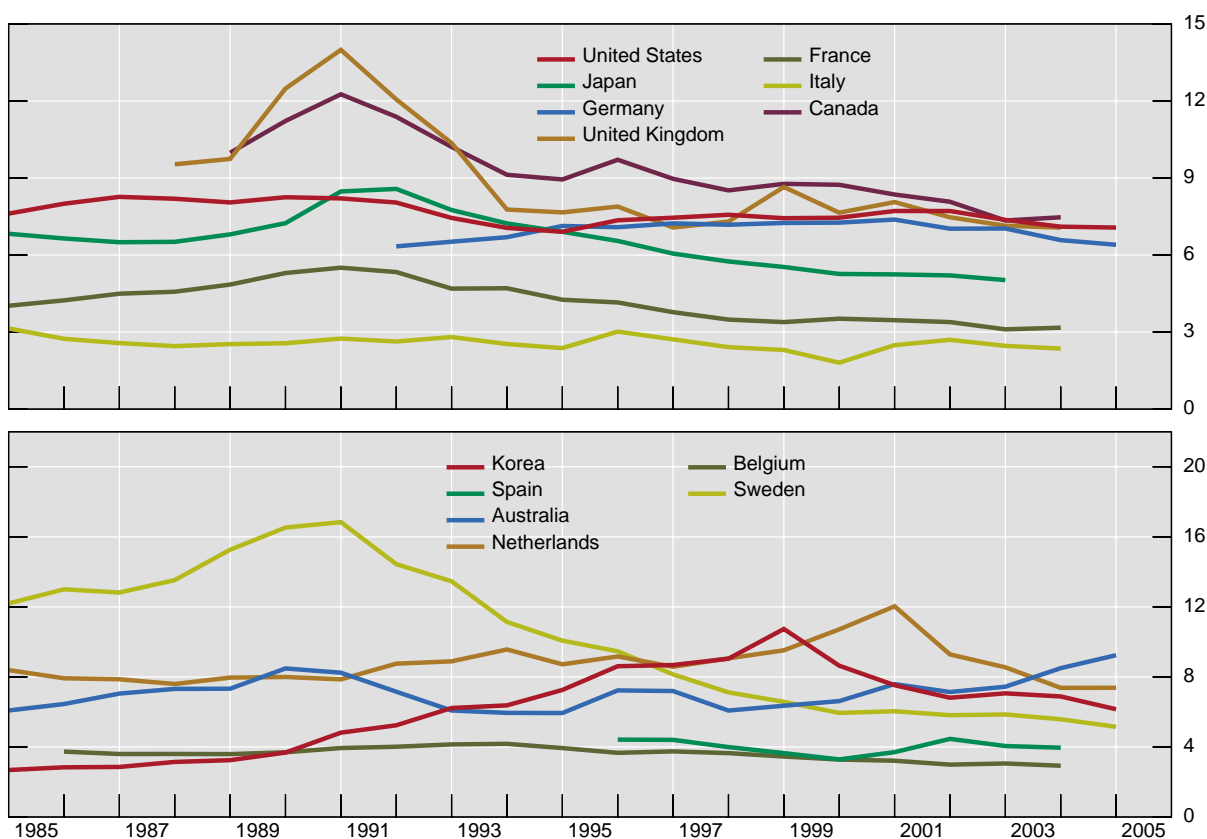
Source: National data.

In general, regardless of large differences between countries, the bulk of household debt is related to housing finance or mortgage borrowing, which in many cases has increased as a share of total debt. Thus, although other household debt has also grown, it is (still) generally a small part of total debt. However, due to the intrinsic characteristics of other debts, often unsecured, they may constitute higher risks to the financial system.

Despite the growth in mortgage debt, the size of housing finance markets differs between countries, with mortgage debt levels varying from around 125% of GDP in Switzerland to less than 10% of GDP in Mexico. The variations in debt levels across countries are probably due to differences in national housing and housing finance markets, which will be explored in Section 3 below. However, the large differences between countries cannot be explained by dissimilarities in owner-occupancy rates (Table A.1 in Appendix 2).

Even though mortgage debt has grown, interest rates have fallen over the same period, so that debt service costs have not risen as much as debt (Graph 2.3). In addition, household assets have increased together with debt. Thus, even in countries where the accumulation of household debt has been particularly strong, the debt/asset ratio has increased only slightly (Graph 2.4). In addition, in most countries average household net worth has been growing faster than disposable income in recent years. The increase in net worth reflects increases in households' financial holdings as well as rising house prices.<sup>2</sup>

Graph 2.3  
Household debt service/income ratios<sup>1</sup>

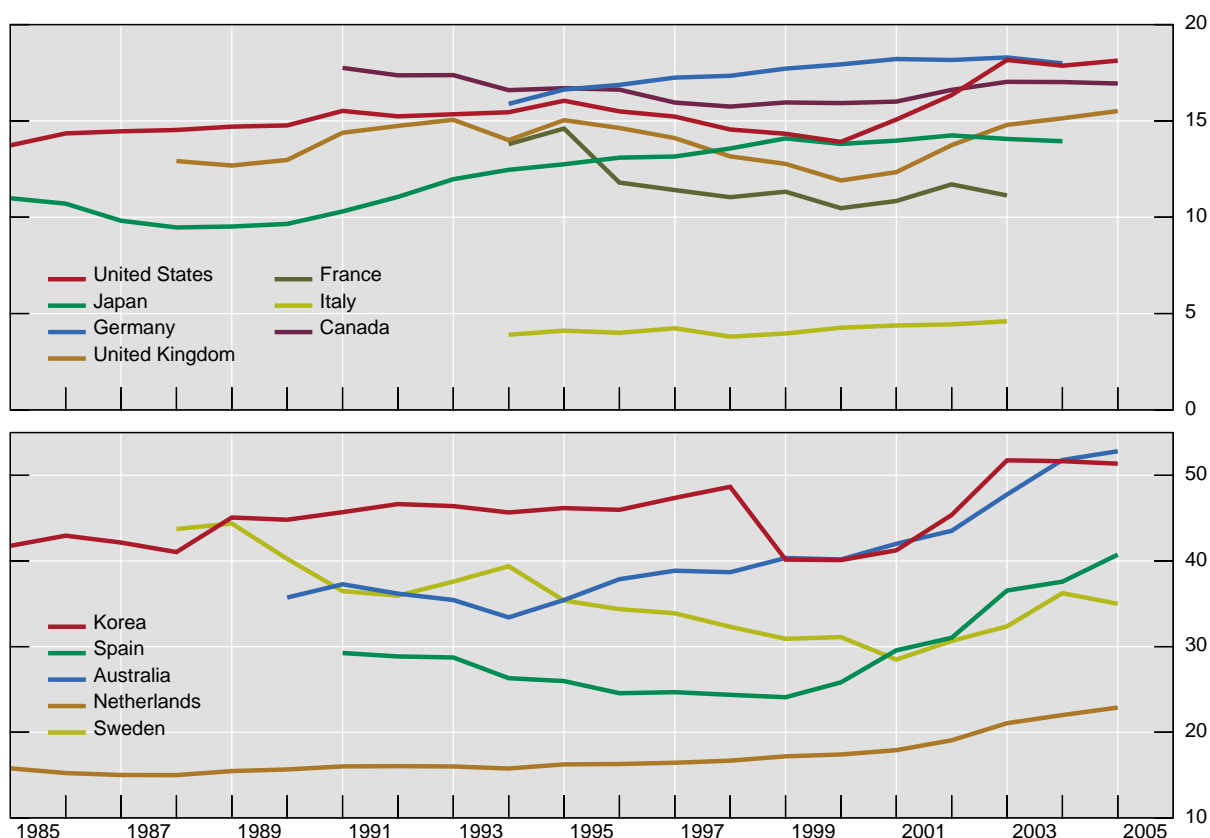


<sup>1</sup> Household debt interest payments as a percentage of household disposable income.

Sources: OECD; national data.

<sup>2</sup> For example, at end-2004 net worth exceeded 700% of disposable income in the Netherlands and was around 680% in the United Kingdom.

Graph 2.4  
Household debt/asset ratios<sup>1</sup>



<sup>1</sup> Household debt as a percentage of total assets (financial and non-financial) for the G7, the Netherlands and Sweden, and of financial assets for the others.

Sources: OECD; national data.

Overall, the financial wealth of households expanded rapidly during the 1990s and has recently recovered from the deep stock market downturn that took place in 2000. The ratio of household net wealth to income rose by more than 100 percentage points over the 1990s in the United States, the United Kingdom and Italy. The increase was somewhat less pronounced in Germany. The only - and important - exception is Japan, where household net worth has declined since 1990 as the value of non-financial assets has suffered from the fall in residential prices.

The composition of households' financial assets has also changed over the past two decades, with deposits and bonds having decreased in importance while equities, pension funds and insurance savings have increased in importance. Consequently, households' assets have become less liquid. A common feature of household financial holdings, except for Japan, over the past decades has been the reduced share of overall assets held in cash. Due to the greater share of illiquid assets in households' balance sheets, households may be more vulnerable to adverse shocks.

Debt and assets are unevenly distributed among households, with regard to both income and age clusters. Disaggregated data, where available, show a hump-shaped pattern of debt to age, consistent with the life cycle hypothesis (adjusted for liquidity constraints). Debt appears to be concentrated in households with high incomes, who also hold the bulk of assets. The macroeconomic implications of the increased leverage in the household sector will probably depend upon the composition and distribution of debt and assets in the household sector.

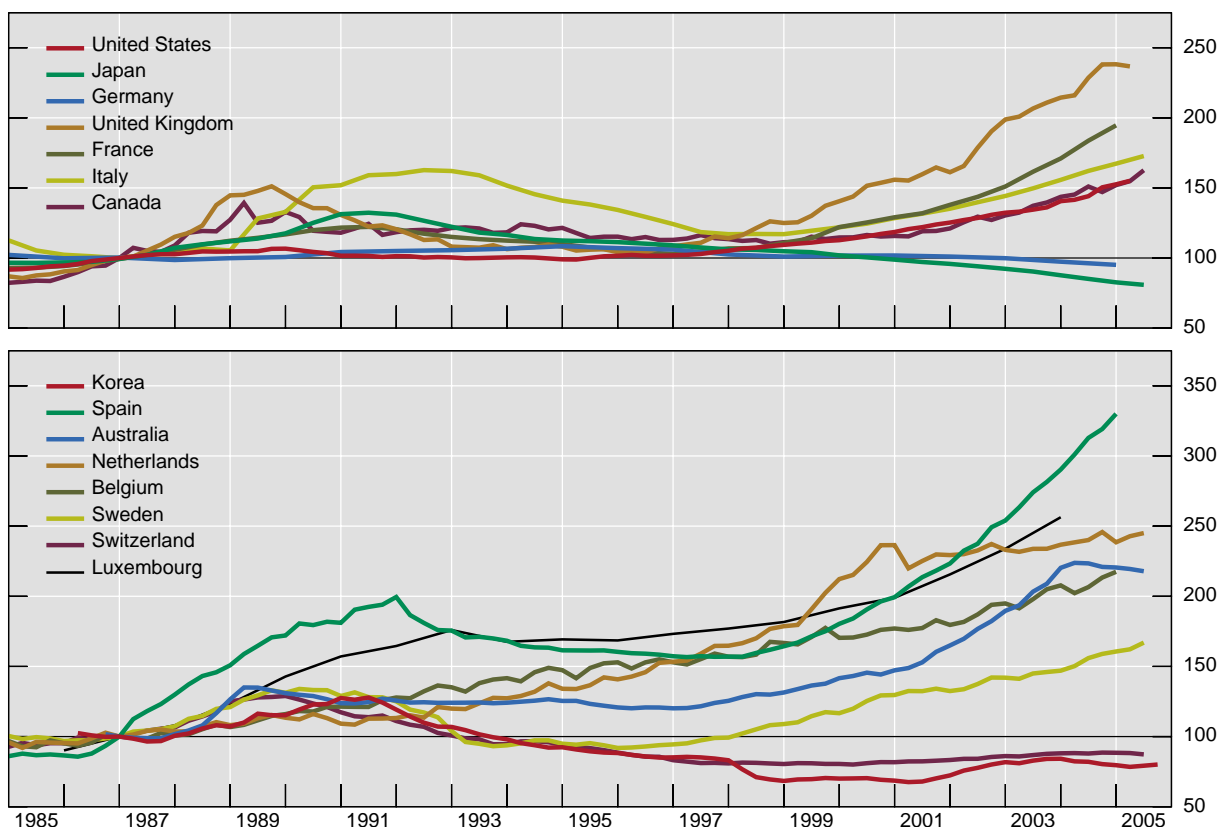
A noticeable trend over the past five years in the United States, the United Kingdom, Australia and Canada has been the rapid growth of borrowing by households with impaired or insufficient credit histories, typically referred to as sub-prime lending. This category, although somewhat vaguely defined, is usually taken to also include loans with features such as self-certified income or assets and low-documentation loans. In the US market, sub-prime lending grew at an average of roughly 25% a year from 1994 to 2003, and accounted for around 9% of total lending in 2004. Furthermore, sub-

prime lending has risen in the United Kingdom in recent years, though remains limited as a share of the total mortgage stock. In Canada, the sub-prime mortgage market has started growing rapidly in recent years, but represented only about 1.5% of total mortgage loans outstanding in 2005 Q1. Sub-prime lending is virtually non-existent in other markets. In some countries, this is due to consumer protection laws which limit the interest rates on mortgages at too low a level to compensate for the additional credit risk posed by sub-prime borrowers. In most markets, sub-prime lenders are specialised credit institutions that are either independent or a subsidiary of a larger commercial bank, finance company or investment bank.

## 2.2 House prices

Associated with the expansion of mortgage borrowing has been a broad-based increase in house prices in real terms over the past two decades (Graph 2.5).

Graph 2.5  
Real residential property prices<sup>1</sup>  
End-1986 = 100



<sup>1</sup> Nominal property (for Japan, land) prices less the personal consumption deflator (for Korea, consumer price inflation).

Source: National data and definitions.

Nevertheless, as with household indebtedness there are considerable differences between countries. House price increases have been particularly strong over the past decade in the United Kingdom, closely followed by Australia, Spain and Sweden. However, average prices have shown significantly lower growth rates in both the UK and Australian markets during the last 12-18 months and prices have fallen in some parts of both countries.<sup>3</sup> The Netherlands also belongs to this group, although it

<sup>3</sup> Examples are declining prices in Sydney and Melbourne in Australia, and in the "Outer South East" region in the United Kingdom.

has experienced more modest price rises since 2002. Price increases have also been significant in Belgium, France, Luxembourg and Italy in recent years.<sup>4</sup> In addition, house prices are at record levels in the United States, after a number of years of steady growth. In contrast, prices have remained stable in Germany, Switzerland and Korea. Japan experienced a real estate bubble in the latter half of the 1980s, and since the early 1990s has seen a long decline in real house prices.

## 2.3 Lenders and loan types

### *Lenders*

Over the last two decades, the lender structure of most housing finance markets has remained stable. Thus, despite the increasing global integration of financial markets and the financial industry, housing finance markets typically remain national in nature, with distinct legal and regulatory regimes. In most countries, a small number of national commercial banks or specialised lenders continue to dominate mortgage lending. Despite this, state, cooperative and regional banks are still active in some countries where they have traditionally played an important role (Germany, Spain and Switzerland). In Japan, both large and small private banks have become more active in origination as a consequence of the restructuring of public housing loan institutions. In the United States, mortgage markets are extremely competitive, with a wide variety of depository and non-depository institutions, including extensive networks of mortgage brokers, vying for customers. In Mexico, the dominant lender is still owned by the government via housing agencies, who originated more than 70% of loans in 2004, followed by commercial banks, who originated 17% (Box 1).<sup>5</sup> Thus, most markets continue to have only limited foreign presence on the origination side.

However, changes have taken place in some markets. For instance, new “pure” mortgage brokers in Australia and Canada have entered the sub-prime markets. Furthermore, large foreign financial firms have established a presence in Mexico and the United States.

There are a number of factors that may explain the relative stability of the loan origination structure of national housing finance markets. History matters because housing finance markets by nature have high entry barriers due to borrower customs and traditions.<sup>6</sup> Furthermore, national legal and regulatory frameworks, which are complex and have direct implications for mortgage contracts, differ markedly across countries. They encompass consumer protection laws, valuation and assessment standards, and bankruptcy, foreclosure and tenant eviction laws. These differences favour national lenders, by making expertise in local real estate practices costly to acquire.

### *Loan types and contract features*

Over the last two decades, most housing finance markets that have historically relied more on fixed rate products have experienced an increased demand for, and use of, adjustable rate mortgages as well as loan types combining features from both fixed and adjustable rate mortgages. These hybrid products have also been introduced in markets that historically have tended to rely more on adjustable rate loans.

Adjustable rate loans are defined as loans with adjustable interest rates for the entire life of the loan or fixed for the first one to five years and then adjustable. Fixed rate loans are defined as loans with interest rates fixed for more than five years.

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<sup>4</sup> Excluding Germany, average house prices in the European Union rose by 12.5% in 2004. For Luxembourg, see Central Bank of Luxembourg (2005).

<sup>5</sup> Before 1994, bank-originated loans grew rapidly following privatisation of the banks in 1991, with banks originating around 30% of all loans in 1992-93. Bank origination of housing loans virtually collapsed after the 1994 crisis, but has been increasing in recent years, with banks focusing mainly on upper-income borrowers.

<sup>6</sup> The report by the Forum Group on Mortgage Credit (2004) indicates that in the European Union different consumer protection standards may also be an obstacle. Anecdotal evidence from market participants suggests that competition in local markets is also restricted due to strong traditions.

Box 1

**The Mexican housing finance market**

The Mexican mortgage market was deeply affected by the financial crisis of 1994, at which time commercial banks accounted for 54% of mortgage loan origination. After the crisis, the vast majority of banks suffered massive credit defaults, to the extent that the government decided to rescue them by absorbing non-performing loans and becoming the largest shareholder in almost all banks. During this time, banks almost completely withdrew from the market. By 1996, they accounted for only 7%<sup>1</sup> of mortgage origination and the government became the largest mortgage provider.

A process of privatisation began after banks' balance sheets were strengthened. The new entrants to the banking industry were mainly foreign financial institutions, and today almost all banks are owned by international groups. When banks returned to the credit markets, they initially focused on consumption credit and decided only in 2003 to re-enter the mortgage market. To this end, some banks acquired non-depository institutions that specialised in mortgages.

Today, banks and non-depository institutions account for 17% of loan origination<sup>2</sup> and competition is generating lower mortgage rates and new products. Securitisation of mortgage pools started in 2003 but remains limited; outstanding mortgages account for USD 59 billion whereas outstanding MBSs amount to only USD 800 million. The unprecedented financial market stability, low interest rate environment and some legal reforms in recent years have played an important role in attracting both banks and debtors to mortgages. Mortgage rates have reached historical lows and the maturity extension of the government yield curve provides a more market-oriented reference for such loans.

Demographics play an important role in determining the demand for housing, and in turn the need to develop the mortgage market. In the most recent census (2000), an estimated 69% of the population (66 million people) was younger than 35. This translates into an annual household formation rate of 875,000 in 2004 and an estimate of 42.2 million households by 2020, almost double the 22.3 million recorded in 2000. For this reason, developing the housing finance market is a priority for the government. Action plans have included legal reforms targeted at reinforcing collateral rights and the creation of a public institution in charge of developing the mortgage market. However, a number of challenges remain, including additional reforms to the legal framework, raising the efficiency of loan origination, securitisation and servicing, and the development of mortgage insurance products.

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<sup>1</sup> Estadísticas de Vivienda 1993–2004, Dirección General de Política y Fomento a la Vivienda, Secretaría de Desarrollo Social. <sup>2</sup> Idem.

In addition, many markets have witnessed the introduction of interest-only loans and in some cases more sophisticated loan types with built-in options and clauses that trigger changes in the payment structure (Box 2). In most markets, the loan types introduced in recent years, such as interest-only loans and hybrid loans, share the feature that they postpone repayment of principal (Table 1).

Despite these common trends, significant differences remain across markets regarding the loan or contract types typically used. Indeed, some markets still rely almost exclusively on adjustable rate loans and others predominantly on fixed rate loans (Graph 2.6). Markets which rely primarily on fixed rate mortgage products include the United States, Canada, Germany, France, Belgium, Switzerland and the Netherlands.<sup>7</sup> Those that rely predominantly on adjustable rate loans include the United Kingdom, Spain, Sweden, Italy, Australia, Luxembourg and Korea.

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<sup>7</sup> These loans may be both with and without interest rate reset, and borrowers may have different prepayment conditions.

Box 2

**Innovative housing finance products**

The two standard mortgage types are *fixed rate mortgages (FRMs)*, for which total payments are fixed over the life of the loan, and *adjustable or variable rate mortgages (ARMs)*, for which payments fluctuate with interest rates. In the latter case, interest payments are often adjusted once or twice a year. In some cases (eg France), ARM contracts usually include a ceiling on the interest rate. For both loan types, the borrower typically repays the principal over the life of the loan. A *hybrid ARM* is a more sophisticated adjustable rate mortgage such as a loan initially with a fixed rate and subsequently with a variable rate, possibly with a shorter period for the initial fixed rate.

An *interest-only loan* is a mortgage for which initially the mortgage payment does not include any repayment of principal. At the end of the initial non-amortising period, the payment is raised to the fully amortising level. In this case, the new payment will be larger than it would have been if it had been fully amortising at the outset.

An *option adjustable rate mortgage (option ARM)*, *flexible ARM* or *negative amortisation adjustable rate mortgage (NegArm)* is a loan on which the interest rate adjusts monthly and the payment adjusts annually; the borrower is offered options on how large a payment to make. These typically include a minimum payment that may be less than the interest-only payment, which results in a growing loan balance, termed "negative amortisation". An attractive feature for the borrower is the low minimum payment in the first year, which may allow the borrower to buy a more costly house or use the monthly payment savings for other purposes. An option ARM will typically have a clause that ensures that, every five or 10 years, payments are "recast" to become fully amortising, which implies that payments will be raised to an amount that will pay off the loan within the remaining term at the current interest rate. The other typical clause is a limit on the loan-to-value ratio, which may range from 110 to 125% of the original loan balance. If the balance reaches the negative amortisation maximum, payments are immediately raised to the fully amortising level. Both these clauses may result in a significant increase in the payments required to service the loan.

An *accordion ARM* is an adjustable rate mortgage with fixed payments but uncertain maturity or term. The borrower knows that loan payments are the same through the life of the loan, but the life of the loan is not known. The degree of flexibility in an accordion loan depends on the term of the original loan and the practical limit on the term of the loan. There is typically a limit to the life of the loan, often 40 or 50 years, which restricts the flexibility for the borrower.

A *savings or equity mortgage* is a mortgage where part of the payment covers interest, and part goes into a fixed interest savings account or equity account. The use of this type of loan is often driven by tax advantages.

Table 1

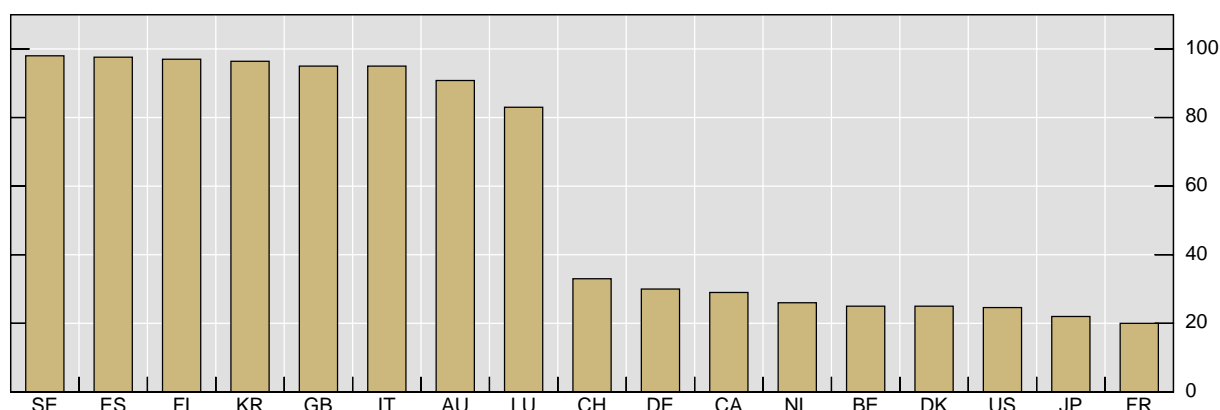
**Examples of housing finance products introduced in recent years**

Country	Product
Australia	Flexible mortgages with variable repayments; home equity loans, ie line of credit; split-purpose loans (splits loan into two sub-accounts, giving tax advantages); deposit bonds (insurance company guarantees payment of deposit at settlement); non-conforming loans; redraw facilities and offset accounts; new providers, including mortgage originators and brokers
Austria	Loans denominated in non-euro currencies, particularly Swiss franc and Japanese yen
Belgium	Loans available for up to 30 years; floating rate loans with the possibility of maturity extension if interest rates increase; mortgage loans with links to investment funds
France	Variable-payment mortgages
Japan	Home equity loans; reverse mortgages; fixed rate loans with the possibility of upward revision of the applied interest rate if the long-term interest rate hits the predetermined critical level
Netherlands	Savings or equity mortgages: part of payment covers interest, part goes into fixed interest savings account or equity account (confers tax advantages)
United Kingdom	Flexi-loans; offset mortgages (savings and mortgage held in same/linked accounts, with savings offset against mortgage balance); trackers, eg loans with interest rates that are automatically adjusted in line with movements in the yield on a prespecified market instrument
United States	Interest-only loans; option ARMs or negative amortisation loans; MTA or treasury rate trackers

Sources: European Mortgage Federation; national authorities.

Graph 2.6

**Mortgage products: percentage of adjustable rate loans<sup>1</sup>**



Note: Adjustable rate loans are defined as those where the interest rate is floating for life or fixed for the first one to five years and then floating or reset.

<sup>1</sup> Latest available data. For the United States, among first-lien mortgages only.

Sources: ECB; European Mortgage Federation; Eurostat; national data.

Prepayment conditions and rights (options) are another area where there are large differences across markets. For instance, in the United States standard fixed rate loans include an option to prepay without compensating the lender for capital or market value losses.<sup>8</sup> By contrast, in Germany the lender can ask for compensation for forgone earnings within the first 10 years of the contract.<sup>9</sup>

More broadly, in Europe it is standard to include some type of prepayment fee in the mortgage contract to reduce the borrower's incentive to prepay, although many European countries have legal limits on prepayment fees. In Belgium, for example, the maximum fee is three months' interest on the remaining amount. In Spain, the maximum fees are 1% and 2.5% for variable and fixed rate mortgage contracts, and in France the maximum fee is six months' interest at the average loan rate and 3% of the capital still to be repaid. In Italy, Luxembourg, Mexico, the Netherlands and Sweden, there are no legal restrictions on repayment fees.<sup>10</sup> Fixed rate loans in Australia tend to attract prepayment compensation to lenders, but their nature varies across lenders and product types, with fixed fees and compensation size often based on the spread between fixed and variable interest rates. The ability to make home equity withdrawals, ie homeowners' ability to borrow against accumulated home equity, is a second area where there are significant differences between markets. Home equity extraction is important in that it has served as a source of support for household expenditure in the United Kingdom and Australia during the recent global downturns.<sup>11</sup> (See also Box 8 below.)

<sup>8</sup> In the US market, prepayment penalties are almost exclusively used in the sub-prime market.

<sup>9</sup> Note, however, that in Germany the absence of tax deductibility for mortgage interest payments for owner-occupiers encourages repayment of mortgages, while the deductibility of mortgage interest payments in the United States by contrast discourages it.

<sup>10</sup> In Mexico, it is possible in principle, but high administrative costs make refinancing unattractive. It is estimated that interest rates need to decline by 600 basis points for refinancing to make sense.

<sup>11</sup> For discussions of this, see Davey (2001), Netherlands Bank (2003), Reserve Bank of Australia (2003a), Deep and Domanski (2002) and Debelle (2004a, b).



Table 2  
Selected contract features

Country	Home equity withdrawal	Valuation	Use of mortgage-backed securities
Australia	Yes	Market value	Extensive
Belgium	No	Market value	Limited
Canada	Yes	Market value	Extensive
France	No	Market value	Limited
Germany	Yes	Mortgage lending value	Yes
Italy	No	Market value	No
Japan	Limited	Mortgage lending value	Limited
Korea	Yes	Market value	Limited
Luxembourg	Not widely used	Market value	Limited
Mexico	Limited	Market value	Limited
Netherlands	Yes	Market value	Extensive
Spain	Not used	Mortgage lending value	Limited
Sweden	Yes	Market value	Limited
Switzerland	No	Mortgage lending value	Limited
United Kingdom	Yes	Market value	Yes
United States	Yes	Market value	Extensive

Sources: European Mortgage Federation; national authorities.

In the Netherlands, however, a reduction in mortgage equity withdrawal, compared to the high levels thereof at the end of the 1990s, is generally seen as one of the reasons for depressed consumer spending in 2001.

Most housing finance markets have contracts with a loan-to-value (LTV) ratio of 80-100%, although in some cases this may be restricted to 60% (Germany) while in others it can reach 125% (Netherlands); see Table 3.<sup>12</sup> Overall, depending on loan type and market, longer contracts are associated with higher LTV ratios.<sup>13</sup> Over the last two decades, there has been a trend towards higher LTV ratios in several countries, partly reflecting changing market practice and regulatory changes, which have resulted in lower down payments for housing loans.<sup>14</sup>

<sup>12</sup> It should be noted, however, that LTV ratios for Germany and Switzerland are not based on market values of houses but on the "mortgage value", which is typically between 10 and 25% below the current market value. The mortgage value is based on land value, sustainable rental streams, cost of construction and minimum maintenance costs. It does not include the value of the house or property in the case of a forced sale. See Batchvarov et al (2003) for a discussion.

<sup>13</sup> The indicated LTV ratios are those typically used in the market or the legally specified maximum, where one exists.

<sup>14</sup> See Jappelli and Pistaferri (2003).

Table 3

**Contract features in selected mortgage systems**

Country	Usual length of contract (years)	Estimated average LTV ratio (new loans)	% of owner-occupiers with mortgages
Australia	25	60-70%	45
Belgium	20	80-100%	56
Canada	25	75-95% <sup>1</sup>	54
France	15-20	78%	37.5
Germany	20-30	80-100%; 60% for Pfandbrief	na
Italy	5-20	80%	na
Korea	3-20	56.4%; max 70%	na
Japan	20-30	na <sup>2</sup>	na
Luxembourg	20-25	80%	na
Mexico	10-15	80-100%	na
Netherlands	30	87%; max 125%	85
Spain	15-20	70-80%	na
Sweden	30-45	80-95%	na
Switzerland	15-20	Max 80%; 65% for Pfandbrief issuance	na
United Kingdom	25	70%	60
United States	30	Typically about 85%	65.1 <sup>3</sup>

<sup>1</sup> 75% for conventional (non-insured) mortgage loans and 95% for insured mortgage loans. <sup>2</sup> The Government Housing Loan Corporation discloses the average LTV ratio for the underlying mortgages of its MBSs. The ratio has been around 70-80% from the first issue in March 2001 to date. <sup>3</sup> 2001 Survey of Consumer Finances, Board of Governors of the Federal Reserve System.

Sources: ECB (2003); national authorities.

## 2.4 Funding and financial markets

The growing issuance of mortgage-backed securities and covered bonds indicates that funding via financial markets of mortgage lending has become increasingly important in a number of countries. Unfortunately, data on capital funding are only available for some countries. However, despite these developments there are still significant differences across markets with respect to funding patterns. For instance, with 56% of mortgages being securitised, the US market is more reliant on securitisation than the European and other markets. For Europe, this is illustrated by the fact that the estimated outstanding amount of mortgage-backed covered bonds for the EU 15 area at end-2004 was around EUR 688 billion, implying that around 15% of all mortgages are being securitised. In many of the markets covered by this report, mortgage debt growth has coincided with the development of secondary markets for mortgage loans. However, the timing, legal framework and industrial organisation of secondary market development differ substantially across countries.

Mexico, Korea and Japan have all built a system with a dominant, standard-setting bond issuer. In Japan, the Government Housing Loan Corporation has up to now been one of the largest providers of

housing loans.<sup>15</sup> Mexico and Korea have in recent years put in place frameworks relying on government credit guarantees, with the aim of establishing a liquid secondary mortgage bond market.

In the United States, investment banks started marketing the first mortgage-backed securities in the mid-1970s. These first securities were based on pools of loans guaranteed by Ginnie Mae, a government organisation designed to encourage lending to lower-income borrowers and veterans, and thus carried no credit risk. However, because borrowers could prepay their loans at will, the securities carried substantial prepayment risk. It took several years of technical development, including the analysis of actual prepayment behaviour, before investors could price prepayment risk. Investors also used resecuritisation products, such as collateralised mortgage obligations, to divide prepayment risk into tranches. As the secondary mortgage market grew, regulators and policymakers adopted national standards and laws, leading to the development of a truly nationwide secondary market. By the early 1990s, a wide variety of mortgages were routinely securitised. Pools carrying credit guarantees from Fannie Mae or Freddie Mac are typically sold as pass-through securities, with the principal and interest payments going equally to all investors. Pools sold in the private label market are typically divided into tranches, allowing investors to take as much (or as little) credit or prepayment risk as desired. Although the private label market has traditionally been smaller than the market for MBSs guaranteed by Fannie Mae and Freddie Mac, since the beginning of 2004 the private label market has grown very rapidly while the volume of MBSs guaranteed by Fannie Mae or Freddie Mac has been about flat. As of mid-2005, USD 4.7 trillion of outstanding US residential mortgages were securitised (making the US market for bonds backed by housing finance loans close to seven times the size of the European market), of which 72% were guaranteed by Fannie Mae or Freddie Mac and the remainder in the private label market.<sup>16</sup>

In Europe, secondary mortgage markets rely on either RMBS structures or covered bonds (Box 3). Several European countries have implemented or are implementing laws regulating the issuance of covered bonds.<sup>17</sup> In the United Kingdom (where there is no covered bond law), a number of structured covered bonds have been issued. At present, the largest market for covered bonds, accounting for just over two thirds of the outstanding covered bonds in the European Union, is Germany, which has a long-standing tradition for issuing Pfandbriefe. The largest growth in the use of covered bonds in recent years has been in Spain (Box 4).

#### Box 3

##### **Securitisation of housing finance loans; some terminology**

A standard *mortgage-backed security (MBS)* or mortgage securitisation is a funding and risk transfer technique where the bank or finance company originator of mortgage loans sells and/or transfers these loans to an independent special purpose company or vehicle (SPC) in return for a cash payment. A *residential mortgage-backed security (RMBS)* is based on residential mortgages, while a *commercial mortgage-backed security (CMBS)* is based on commercial mortgages. This company then issues (sells) bonds or notes to investors and uses the proceeds from the sale to purchase the mortgage loans from the originator. The ongoing cash flow from the mortgage loans (interest and principal payments, prepayment penalties, late charges, etc) is used to redeem the bonds/notes. An *MBS master trust structure* is a securitisation where the SPC issues multiple bond series. The benefit of this structure is that it avoids the cost of creating separate SPCs for each bond. This type of structure is predominantly used in the UK market.

A *covered mortgage bond* is typically a mortgage securitisation where the bank keeps the loans on its balance sheet, and the legal rights as well as the underlying loans satisfy conditions set out in a law regulating the issuance of covered bonds. A *structured covered bond* is a mortgage securitisation which is not issued under a covered bond law, but where similar rights and risk protections are put in place via the use of derivatives contracts.

<sup>15</sup> It is to be restructured by the end of March 2007, and will have a function similar to the US government-supported entities, Fannie Mae and Freddie Mac, in terms of developing Japan's RMBS market.

<sup>16</sup> See Lewis (1989) for more detail on the development of the US secondary mortgage market.

<sup>17</sup> Belgium is in the process of implementing a covered bond law. In France, the Caisse de Refinancement de l'Habitat (CRH) was established in 1985 by the main mortgage-originating banks to support the issuance of covered mortgage bonds. From 1985 to 1988, it benefited from a government guarantee on the issued bonds. This guarantee was lifted in 1988, with no noticeable impact on the CRH's funding costs or access to the market. Sweden has recently implemented a covered bond law. Luxembourg enacted legislation for "banques d'émission de lettres de gage" in 1997.

#### Box 4

##### **Mortgage credit financing and covered bond developments in Spain**

In Spain, securitisation of banking assets became increasingly important in the 1990s, due to high growth in mortgage credit volumes and increased competition between financial institutions, combined with regulatory changes facilitating the use of covered bonds.

The first steps towards creating a legal framework enabling asset securitisation by financial institutions were taken in 1981, when a new Law of the Mortgage Market made it possible for lenders to finance mortgage credit through the issuance of different types of covered bonds (cédulas, bonos and participaciones hipotecarias). In the 1990s, two important additional steps in the development of the Spanish legal framework governing securitisation were made: (a) the creation in 1992 of the first type of special purpose vehicle which made off-balance sheet securitisation of participaciones possible, and (b) the introduction in 1998 of a more flexible type of special purpose vehicle which can issue bonds against any financing instrument, not only mortgage loans. The latter in particular aided securitisation by enabling smaller savings banks to jointly securitise pools of cédulas. The three main types of covered bonds have different structures. Cédulas are backed by the whole mortgage portfolio of a credit institution (complying with certain conditions) while bonos and participaciones are covered by a specific pool of mortgages.

The collateral used for covered bonds must comply with the following conditions: (a) the mortgage borrower should own the collateral fully and the mortgage must be the most senior debt claim; (b) LTV ratios for mortgage loans for house purchase and for commercial property cannot exceed 80% and 70% respectively; (c) mortgage collateral must be valued by special valuation firms under the supervision of the Bank of Spain; and (d) total issuance cannot exceed 90% of the outstanding mortgage loans of a credit institution (in the case of cédulas excluding loans backing other types of covered bonds). Holders of both cédulas and bonos have a claim on the originator of covered bonds, and in the event of liquidation a senior claim on the mortgage credit portfolio used as collateral.

Cédulas are viewed as an attractive funding method for originators for several reasons: (a) the issuer can choose the maturities of the bonds, which do not have to match the maturities of underlying loans; (b) given the high quality standard, they are a relatively cheap way to raise funds in comparison with other products; and (c) they can be used as Tier 1 collateral in monetary operations in the euro area. For bonos, the bond maturity cannot exceed that of the underlying loans, which may explain why mainly cédulas have been used for covered bond issues. Participaciones have been used mainly for off-balance sheet securitisations via special purpose vehicles.

The market for cédulas is one of the fastest-growing covered bond segments in Europe. At the end of 2004, the volume of new issues of cédulas by Spanish non-bank monetary and financial institutions stood at EUR 19.2 billion and the outstanding amount issued by Spanish commercial and savings banks (no foreign banks have issued cédulas) was EUR 58.6 billion, 19% and 7% of total mortgage credit originated by the two types of institutions, respectively. The majority of securitised bonds (83% of total issues) are directly backed by mortgage loans (47%) or through cédulas (36%). The typical securitisation of cédulas is a single series AAA-rated fixed coupon bond, with a benchmark maturity of 10 years, although bonds are issued with maturities ranging from three to 20 years. The main investors in Spanish covered and asset-backed bonds are foreign investors (62% in 2004), followed by financial institutions (34%) and households and non-financial corporations (4% - but with an increasing trend). In July 2005, the MTS group, the market leader for fixed income assets in Europe, opened a cédula segment for bond series larger than EUR 1.5 billion, which should increase market liquidity.

MBSs and RMBSs, which in Europe are used primarily in the United Kingdom, are also used in Japan, Korea and Mexico.<sup>18</sup> In Japan, RMBSs constitute roughly half of the issuance volume of securitised products, which amounts to JPY 5-6 trillion annually, almost the same as the issuance volume for publicly issued corporate bonds. Moreover, in Japan many MBSs are issued by the private banks on their own initiative.

In Mexico, issuance of mortgage bonds was initiated in 2003 with the first MBS of USD 31 million. In 2004, issuance increased to USD 417 million. To date in 2005, issuance has only reached USD 249 million. Based on international statistics and the size of the Mexican mortgage market, it is estimated that outstanding MBSs have the capacity to reach a total of USD 31 billion. MBS transactions so far in Mexico have been based on securitised pools of mortgages primarily from low-income borrowers, although some pools have also included lower middle-income borrowers.

<sup>18</sup> Comprehensive data are not available, but the cumulated issuance of RMBSs in Europe is approximately EUR 400 billion.

### ***Funding patterns and sub-prime lending***

Despite the differences observed with respect to funding patterns, a common feature of markets that have sub-prime lending is that lenders in this segment often rely on securitisation as their primary source of funding, even in countries where capital market funding is not common.<sup>19</sup> This extensive use may stem from the fact that it is the most competitive type of funding. However, it may also be because sub-prime lending is dominated by new loan originators, who are not deposit-takers. In addition, prime lenders that are also active in the sub-prime market segment make extensive use of securitisation.

In the United States, about 55% of sub-prime loans are securitised. In Australia, nearly 100% of sub-prime lending is funded via the capital market while major banks and regional banks securitise only 7% and 25% of their mortgage lending, respectively. In the United Kingdom, the majority of non-conforming loans are securitised through RMBS, compared to an estimated 10-15% of prime loans.<sup>20</sup> Most UK sub-prime lenders do not take deposits and depend on capital markets for their funding. Canadian sub-prime lenders also securitise their mortgages more frequently than traditional lenders. However, to date all Canadian RMBSs based on sub-prime loans have been based on "near prime" borrowers - part of which can be insured by the federal government through its housing agency (CMHC). This implies that many of the sub-prime lenders' mortgage loans are much less risky than those in Australia, the United Kingdom and the United States.<sup>21</sup>

The US sub-prime market grew rapidly in the 1990s, largely without the participation of Fannie Mae and Freddie Mac. However, since 2001 Fannie Mae and Freddie Mac have substantially increased their participation in this market, mainly by buying the senior tranches of private label RMBSs backed by sub-prime loans. In 2004, they purchased 44% (versus 11% in 2001) of all sub-prime mortgages, while the remaining 56% were securitised through the private label market. The UK non-conforming market has also grown rapidly in recent years.<sup>22</sup> Here lenders include publicly listed companies (eg Kensington, Paragon), subsidiaries of banks/building societies/finance companies (eg GMAC RFC, Platform, igroup) and companies owned by investment banks (eg Southern Pacific, Preferred Mortgages). Interestingly, some UK banks active in this market use a separately branded subsidiary (eg Halifax's Birmingham Midshires).

## **3. Sources of developments in housing finance markets**

This section analyses the sources of the developments discussed above. It also stresses some country-specific factors affecting the background and the likely future evolution of housing finance markets.

The section is structured as follows. Section 3.1 reviews the macroeconomic developments while Section 3.2 considers financial innovations and technological changes, such as hardware and software improvements, that have influenced the housing finance sector. Section 3.3 discusses financial liberalisation and regulation.

### **3.1 Macroeconomic developments**

Three macroeconomic trends have played an important role for developments in the housing finance market in industrialised countries and emerging market economies alike. First, the level and volatility of inflation, and therefore of interest rates, have declined. Second, output growth has become more

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<sup>19</sup> Sub-prime lenders in most markets rely extensively on credit scoring and typically outsource the servicing of loans.

<sup>20</sup> The definition of "non-conforming" loans includes "buy-to-let" mortgages as well as "sub-prime" mortgages (see page 7).

<sup>21</sup> This may explain why delinquency rates for Canadian "sub-prime" lenders are low relative to those seen in the US market.

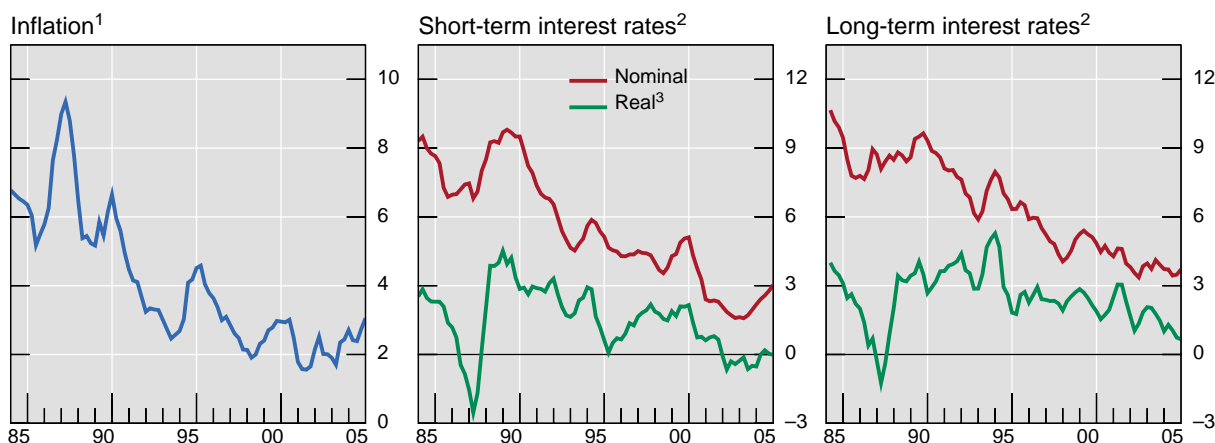
<sup>22</sup> UK non-conforming RMBS issuance volumes grew 92% between 2003 and 2004, against only 26% for prime RMBSs. UK non-conforming RMBSs accounted for 32% of the country's total RMBS issuance in 2004. See Moody's (2005).

stable. A third development which is likely to have been facilitated by these macroeconomic trends is the significant increase in cross-border financial sector investment.

**Lower and less volatile inflation contributing to lower nominal interest rates**

Inflation has fallen sharply across the globe since the 1970s (Graph 3.1). This trend can be explained by various factors, such as a stronger commitment from monetary authorities towards price stability, the adoption of more prudent fiscal policies and the ongoing global liberalisation of markets for goods, services and labour.

Graph 3.1  
**Inflation and short- and long-term interest rates in the OECD area**  
 In per cent and percentage points

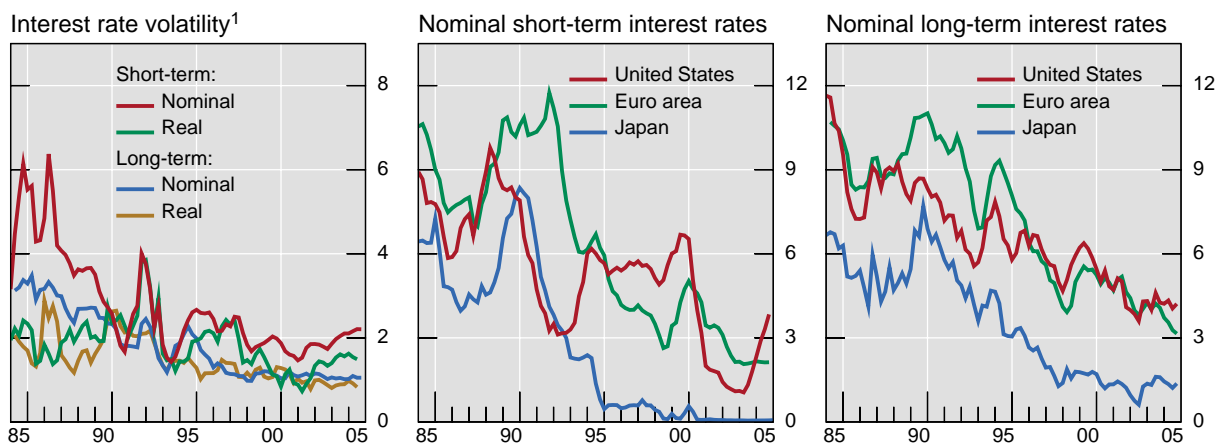


<sup>1</sup> Annual changes in consumer prices; OECD area excluding high-inflation countries. <sup>2</sup> Weighted average of major OECD economies based on 2000 GDP and PPP exchange rates. <sup>3</sup> Nominal rates less annual inflation.

Sources: OECD; Bloomberg; national data; BIS calculations.

This general reduction of inflation levels, as well as a decrease in inflation volatility (Graph 3.2), is one of the important structural factors driving the observed reduction in risk-free, longer-term nominal interest rates and, more recently, in real interest rates (Graph 3.3).

Graph 3.2  
**Short- and long-term interest rates and volatility in the OECD area**  
 In per cent and percentage points



<sup>1</sup> In the OECD area; see Graph 3.3 for a further explanation.

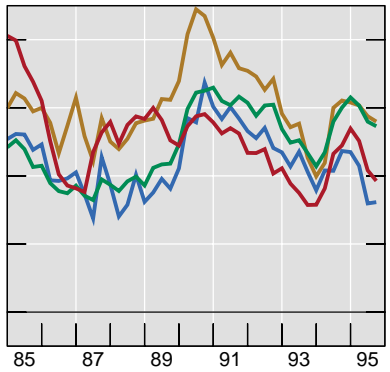
Sources: OECD; Bloomberg; national data; BIS calculations.

Graph 3.3

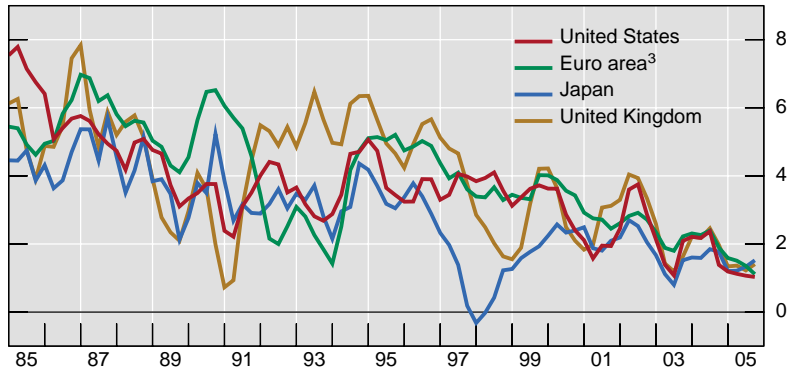
**Long-term real interest rates**

Quarterly averages, in per cent

Ex post, based on realised inflation<sup>1</sup>



Deflated with average current and past three-month inflation rates<sup>2</sup>



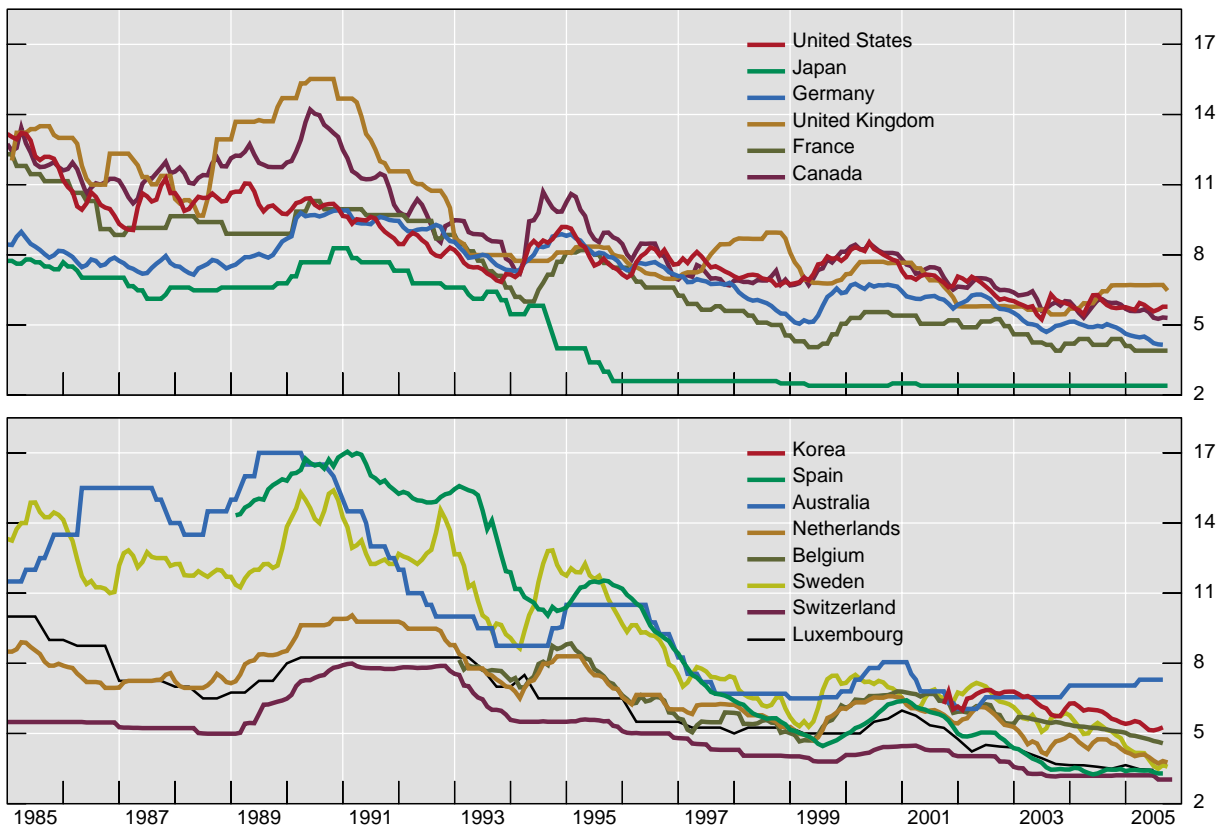
<sup>1</sup> Nominal yields on 10-year government bonds minus the realised consumer price inflation (annualised) over the corresponding 10-year horizon. <sup>2</sup> Nominal yields on 10-year government bonds minus average consumer price inflation of the current and past three months. <sup>3</sup> Prior to 1999, Germany.

Sources: National data; BIS calculations.

Graph 3.4

**Mortgage rates**

In per cent



Source: National data and definitions.

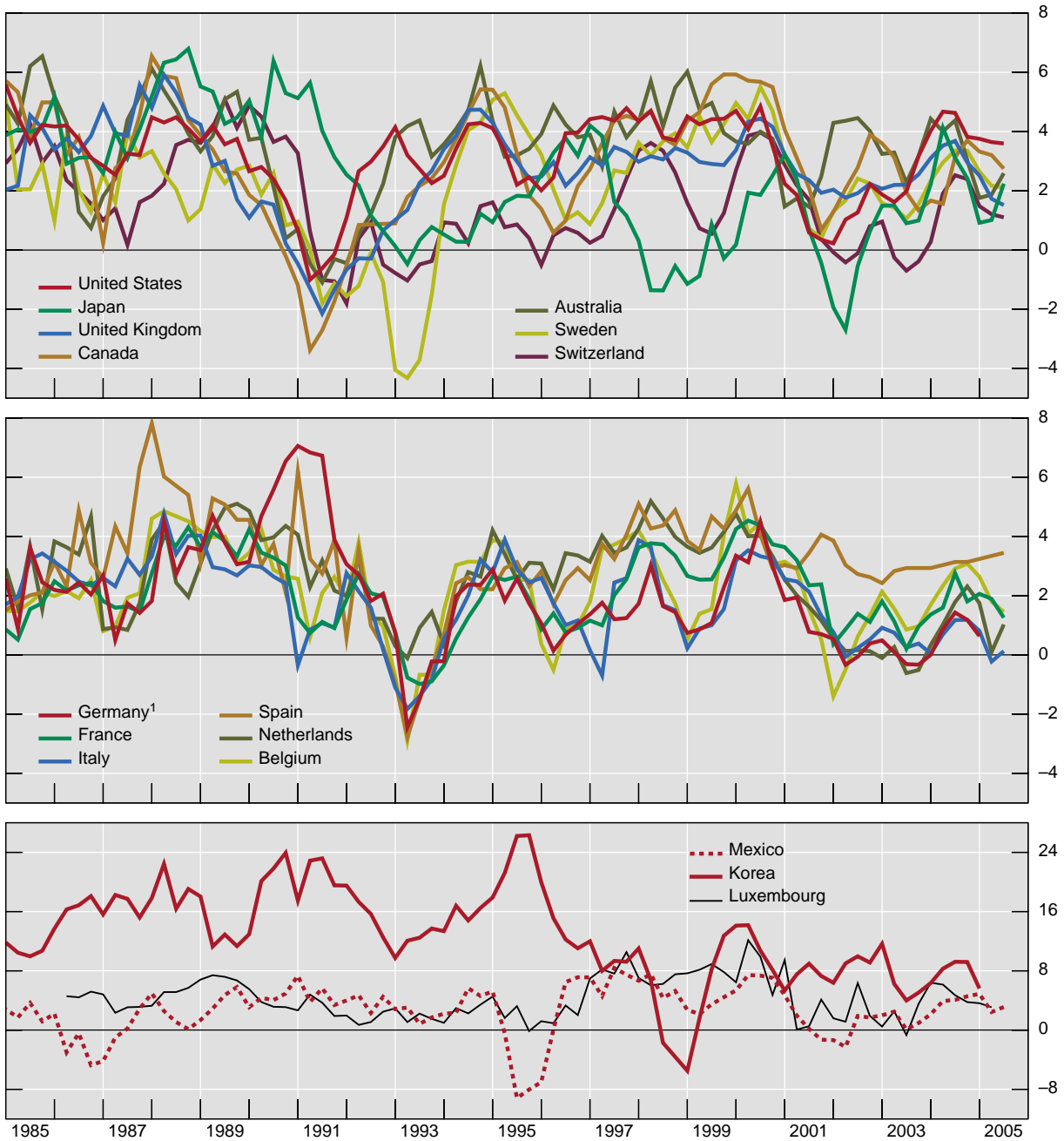
The available evidence suggests that this decline in nominal interest rates has stimulated both the demand for and supply of mortgage loans. First, the demand for mortgage debt is influenced to a large extent by the size of the nominal debt service costs in the first few years of a loan (affordability). Lower interest rates have thus enabled households to increase their leverage.

Second, lenders tend to focus on borrowers' nominal debt service costs (principal and interest payments) to income in assessing loan applications. A decline in interest rates therefore results in more households getting access to credit. Furthermore, the low level of risk-free long-term interest rates may have induced financial intermediaries to increase mortgage lending, as an element of the global search for yield.

Graph 3.5

**Real GDP**

Annual changes, in per cent



<sup>1</sup> Prior to 1992, western Germany.

Source: National data.

The reduced volatility of inflation may also have contributed to observed changes in mortgage product choice. Less volatile shorter-term nominal interest rates have made adjustable rate loans more



attractive for borrowers, thereby boosting demand for them, as evidenced by the increased demand for adjustable rate loans in markets previously dominated by fixed rate loans.

### ***Lower output volatility***

A second trend has been towards faster economic growth at the global level, often accompanied by lower short-term output volatility. Phases of expansion in industrial countries seem to have lengthened, while the rate of expansion in many emerging market economies has risen sharply. There are indications that, recently, economic downturns have generally become less common and less severe (Graph 3.5). This has contributed to the rising demand for housing in most countries, with Germany, Japan and Switzerland being notable exceptions.<sup>23</sup> Moreover, the lower frequency and severity of economic downturns has reduced the volatility of household income and may have contributed to an increased attractiveness of flexible rate mortgages and a willingness to assume higher debt burdens.

But the linkages between macroeconomic growth and the housing market do not seem to be one-sided, as housing market developments have affected the macroeconomy as well. The house price rises witnessed in many countries have raised household wealth. In combination with increased financing possibilities, this has stimulated the practice of mortgage equity withdrawal, thereby supporting households' consumption and macroeconomic growth (Box 8).

### ***Globalisation of investments via global financial markets***

Global cross-border financial activity has been increasing over the past 15 years, although the shift has been more extensive for sovereign debt markets than for housing-related securities. One reason for this increased activity has been the widening US external deficit, which has been associated with increased foreign purchases of US securities, including of US dollar-denominated agency securities and MBSs. At present, around 65% of the outstanding stock of US Treasuries and roughly 20% of the outstanding stock of US residential mortgage-related securities are owned by non-US entities.<sup>24</sup> The growing presence of international investors is also apparent in, for example, Germany and Spain. One fifth of German Pfandbriefe are held by foreign investors.<sup>25</sup> Foreign players also play a central role in the Spanish covered bond and MBS markets (see Box 4 above). However, seen from a broad EU perspective, non-EU investor participation remains subdued in Europe and, hence, the potential benefits of a cross-country diversification of the pool of mortgage loans backing covered bonds or RMBSs have yet to be realised.

## **3.2 Technology and financial innovations**

Like many others, the housing finance industry has been influenced by information technology and financial innovations. The new technologies have allowed more accurate risk estimates, which in turn have paved the way for financial innovations. First, hardware improvements have led to dramatic gains in the speed and quality of telecommunications as well as information technology. Second, software innovations have improved database management and security. Third, advances in econometric modelling in the financial industry have increased the ability to assess market developments, borrower credit risk and borrower prepayment risk. Examples of this type of innovation include quantitative pricing tools, credit scoring, accounting and risk management systems.

All aspects of the intermediation process have been affected; origination and distribution, contract design, servicing, collateral management and funding. The impact is perhaps most clearly visible in the success enjoyed by global banks in consumer finance markets in Mexico and Korea. These global

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<sup>23</sup> Differences in aggregate income growth and housing demand have partly been driven by differences in population growth.

<sup>24</sup> US mortgage-related securities are defined here as MBSs or corporate debt issued by Fannie Mae or Freddie Mac (because these companies use corporate bonds to purchase large portfolios of their own MBSs), as well as residential MBSs issued in the private label market.

<sup>25</sup> Grittini et al (2005).

banks have successfully transplanted techniques developed in more sophisticated markets, including proprietary credit scoring models, business processes and other software. These firms often acquire existing distribution networks. The result so far has been a visible increase in the profitability of the acquired banks due to a greater variety of products being offered, including mortgages, as well as improved pricing and credit and interest risk management.<sup>26</sup>

Another indication of the impact of financial innovation is that banks are increasingly involved in providing non-banking products related to housing finance. These products include income protection insurance (particularly popular in the Netherlands and Sweden), which pays debt service costs following income loss, and property and life insurance. These services are typically provided to attract borrowers, and are underwritten either by related entities or third parties. Hence, mortgage lenders not only compete via pricing and special loan features, but also by offering complementary services, often using mortgages as a means for customer acquisition beyond the disintermediation stage.

Technological developments have also affected housing finance systems:

- *Concentration and outsourcing of servicing.* As a result of lower computing and telecommunications costs, the back office activities of mortgage servicers have become cheaper. These activities include tracking incoming payments, contacting customers and computing expected payments for adjustable rate, interest-only or option ARM mortgages. Moreover, physical distance is now much less of a barrier than before, lowering costs further for servicers with customers in geographically diverse areas.<sup>27</sup>
- *Creation of new and more sophisticated services and products.* Technological advances combined with innovations in financial engineering techniques have enabled service providers to unbundle and repackage the risks embedded in existing financial products, allowing them to tailor new products to meet the demands of specific borrowers and investors. In particular, financial innovation via the use of derivatives contracts, including credit default swaps, has allowed lenders to create new products and to better manage the risks arising from existing loan products.<sup>28</sup> Moreover, technology and deregulation have allowed financial institutions to offer products and services in combination with mortgage loans, such as insurance and home equity-secured credit lines or credit cards.
- *Credit scoring and automated underwriting.* Technological advances have also enabled financial service providers to harness information more productively. One aspect of this is the increased ability to design pools to meet specific risk profile requirements using, for example, credit scoring. In housing finance markets, particularly in the United States, there has been an increased use of credit scoring models in combination with automated underwriting. A second example is the use of direct mail campaigns targeting customers with certain types of loans, amounts of home equity or credit scores.<sup>29</sup> A third example is that servicers in the US market have begun to adapt their own behaviour according to the type of borrower. For example, sub-prime servicers typically phone borrowers even before the first payment is due, as they have found that this lowers the probability of non-payment. A fourth example is that credit bureaus have both more timely and more comprehensive information on borrowers than before, quickly alerting lenders to delinquencies. Credit reporting bureaus also allow lenders to track borrower debt to income or “back end” ratios, ie the ratio of all debt payments (mortgage, credit cards, auto loans, student loans, etc) to income. Finally, having more effective and objective gathering and processing of a borrower’s credit history also permits a more precise measurement of credit risk, enabling creditors and investors to consider the performance of large groups of loans to enhance statistical models of default and prepayment probabilities, thus improving both pricing accuracy and risk management.

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<sup>26</sup> See Posner (2004) and CGFS (2004).

<sup>27</sup> Kretschmar and Damaske (2003) provide a discussion of developments in Germany. See also Rajan (2005).

<sup>28</sup> A notable example of this may be the use of long-term fixed rate callable mortgage loans in combination with interest rate swaptions by Fannie Mae and Freddie Mac, which has allowed them to issue significant amounts of fixed rate bullet bonds.

<sup>29</sup> See Straka (2000), Gates et al (2002) and Center on Japanese Economy & Business (2000).

- *Standardisation of documentation and legal structures.* To facilitate the automation of credit evaluations and bring down servicing costs, mortgage servicers have focused on standardising both the design and the legal structures of underlying loans. This process, encouraged by rating agencies, has also made secondary markets more transparent. Finally, technological progress has reduced the cost of approving loans under a standardised set of lending guidelines.

### 3.3 Financial liberalisation and regulation

The regulation and supervision of housing finance markets have changed considerably over the past two decades: many official barriers and credit restrictions have been relaxed or removed as governments have reconsidered the legal and regulatory framework in which financial institutions operate.<sup>30</sup> In the past, regulations in the financial services industry, especially as applied to banking organisations, tended in many countries to focus almost entirely on safety (eg consumer protection and prevention of failures). However, over time, the focus of regulatory frameworks has shifted from regulatory control towards enhancing efficiency through market discipline, supervision and risk-based capital guidelines.

Housing finance products directed towards households are still to a large extent provided at a regional or local level. However, financial liberalisation has unleashed competitive pressures from global providers, which have forced national and regional players to respond by altering their product offerings, providing better pricing (which requires increased efficiency) and extending the range of services through customisation.

At the same time, the liberalisation and resulting globalisation have made capital markets more liquid and efficient, which may have contributed to a shift from a bank-centred system towards a more market-based one. This process is likely to be strengthened further by the implementation of Basel II, which provides a more transparent and market-oriented regulatory framework. At the same time, the implementation of Basel II is expected to lead to a stronger role for rating agencies, in the national as well as the international market for mortgage credit.<sup>31</sup> This trend is likely to be reinforced by the continued growth of secondary mortgage markets, as rating agencies are likely to focus on assessing the credit status of MBSs in order to increase their appeal to international investors. Globalisation of funding may also have been encouraged by the strength of banks' mortgage lending relative to deposits, forcing intermediaries to fund their business via capital markets.

#### ***Other incentives provided by public authorities***

The role of public authorities in housing finance systems has changed in a number of countries, as governments have slowly retreated from housing markets. Nevertheless, most countries have a long history of close public sector involvement, with a variety of policies targeted at housing. These policies can be divided into four groups: tax policies, price and rent regulations, land use and construction restrictions, and financing. Typical examples included the creation of mortgage bond markets, investment stimulus, social housing, housing and urban regeneration, and the encouragement of saving or consumption. Thus, there is still considerable government involvement in housing finance systems in all countries and borrowers' choices remain heavily influenced by government policies.<sup>32</sup>

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<sup>30</sup> It is often difficult to disentangle the effects of regulatory reform in financial services from the effects of advances in technology and innovations in financial engineering that work in the same direction and may precede regulatory changes. This is particularly true in situations where deregulation in the financial services industry is a response by policymakers to technological advances and where regulatory changes have simply reflected changes previously implemented by market participants.

<sup>31</sup> This is particularly true for medium-sized and small banks that may not, for resource reasons, use internal rating systems.

<sup>32</sup> Ball (2005) provides an overview for European markets. See also Batchvarov et al (2003).

Box 5

**Residential mortgage insurance in Canada**

By federal law, Canadian financial institutions are allowed to extend conventional residential mortgages up to 75% of the value of a residential property. For high-ratio mortgages, ie mortgages with a loan-to-value ratio higher than 75% (and up to 95%), mortgage insurance is required to protect lenders against borrower default.<sup>1, 2</sup> Mortgage insurance can be provided by either a government agency or a private insurer approved by the Superintendent of Financial Institutions. The Canadian mortgage insurance market is at present shared between CMHC - a Crown Corporation wholly owned by the Government of Canada - and one private sector firm, Genworth Financial Canada. Both CMHC's and Genworth Financial's obligations carry an explicit government guarantee.

The accessibility to insured mortgage loans is restricted by: (a) the use of the property (principal residence of the borrower only); (b) the location of the property (Canada); and (c) the creditworthiness of the borrower (the service ratio on mortgage debt and on total debt must not exceed given percentages of the household income). The cost of mortgage insurance - paid by the borrower - includes a fixed application fee and a mortgage insurance premium - calculated as a percentage of the loan - which varies with the loan-to-value ratio and with the mortgage type (fixed or floating rate).

Residential mortgages insured by CMHC can then be pooled into mortgage-backed securities (NHA-MBS).<sup>3</sup> The NHA-MBS programme was introduced in 1987 by the federal government, with the objective to improve the supply of low-cost mortgage funds in Canada. A key feature of NHA-MBS that makes them attractive to investors is the CMHC guarantee - on behalf of the government - of the full timely payment of principal and interest, regardless of the amount, in the case of mortgagors' default and/or NHA-MBS issuers' default.

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<sup>1</sup> As stated in the legislation, the insurance should cover the amount of the loan that exceeds 75% of the value of the property. In practice, however, mortgage insurers insure the total amount of the loan. <sup>2</sup> Currently, insured mortgages represent about 45% of total residential mortgage outstanding balances from chartered banks, compared to less than 30% in the mid-1990s, but down from a peak at 57% in 2000. <sup>3</sup> In 2004, NHA-MBS represented 12% of total residential mortgage outstanding balances, compared to less than 2% in 1990. At the same time, securitization of conventional residential mortgages expanded at a more moderate pace and represented only 2% of total residential mortgage outstanding balances in 2004.

Despite a decline in recent years, most countries still provide significant tax subsidies on mortgages as part of a broader government policy to support or improve the quality of housing and home ownership rates.<sup>33</sup> This is typically done by offering some form of deductibility of interest payments. Many countries provide full or partial deduction of mortgage interest payments, while interest payments on consumer credit may not be tax-deductible. France, Germany, Japan and Luxembourg have various forms of subsidies, while Canada has a minor tax relief measure. Furthermore, Australia, Italy, Japan and Spain give first-time home buyers special treatment. For instance, Italy allows mortgage interest deductions for first-time home owners only, while Japan has a time-limited special tax credit for first-time home buyers.<sup>34</sup> In other markets, including Australia, France and the United Kingdom, there is no mortgage interest tax relief on main residences, although in Australia there is a cash grant for first-time home buyers. In some countries, deductibility is partly offset by property taxes (eg the United States) or various forms of imputed rental income tax based on (assessed) property values (eg Switzerland). Another taxation of residential property is stamp duties or registration taxes, which vary from 1-4% (France, Sweden, the United Kingdom, Germany) to 10-12% (Belgium).<sup>35</sup> This adds to the aggregated transaction costs. In addition, taxes on capital gains on housing assets are widely used but differences within the systems may influence house prices. For instance, in Germany landlords are not taxed on capital gains as long as the property has been owned for more than 10 years. The corresponding threshold in Belgium is five years. In a related vein, tenant-friendly letting and renting laws in combination with a strong housing market may encourage a buy-to-let (empty dwelling) market. For example, the right of possession for a tenant is rather strong in Spain and has, together with its strong housing market, encouraged the growth of a buy-to-let market.

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<sup>33</sup> An exception might be in Belgium, where tax subsidies for mortgage loans related to owner-occupied houses increased in 2005.

<sup>34</sup> See also Box 6 on the buy-to-let market.

<sup>35</sup> Catte et al (2004) and country notes.

Second, most countries have established a variety of housing subsidy schemes, including social housing subsidies, special family allowances and various schemes that benefit first-time home buyers.

Third, all countries regulate closely the use of land and building activities - directly via zoning or planning laws, and indirectly via environmental laws and regulations. There are indications that in some cases planning policies may have constrained housing supply, thereby encouraging house price increases. For example, the Netherlands changed planning policies in the mid-1990s. This constrained land supply in suburban areas in a period of growing housing demand and may have caused house prices to rise. For Spain, it has been argued that policy-induced land supply restrictions have interacted with expectations of stronger house price increases. And in the United Kingdom, the planning system has been cited as one of a number of constraints on the supply of land for house building.<sup>36</sup>

Table 4  
**Efficiency of mortgage enforcement procedures**

Country	Months usually required for payment to creditors <sup>1</sup>	Administrative costs, as a percentage of loan <sup>2</sup>	Grace period before default is declared
Australia	na	na	na
Belgium	18	18.7	na
Canada	na	na	na
France	15-25	7	na
Germany	12-24	4.2	na
Italy	60-84	14-18	1-2 years
Japan	na	na	na
Korea	na	na	na
Luxembourg	5	15 <sup>3</sup>	na
Mexico	na	na	na
Netherlands	6	3	na
Spain	7-9	5-15	na
Sweden	4-6	5	na
Switzerland	na	na	na
United Kingdom	na	na	na
United States	8.4	11.5	Typically 90 days

<sup>1</sup> Total time from the writ of execution (in the countries where the lender must be given the right by a court to distribute the proceeds to creditors). <sup>2</sup> Costs usually incurred, including both fixed and variable components. They do not include lost interest during foreclosure. <sup>3</sup> Notary costs recoverable from borrower.

Sources: European mortgage federation; national authorities.

Fourth, personal bankruptcy and foreclosure regimes differ significantly in terms of the rights given to creditors and borrowers (Table 4). It is well documented that weaker credit protection, including in particular foreclosure rights, has negative implications not only for access to housing loans but for households' access to credit more broadly.<sup>37</sup> Finally, all countries have consumer protection laws

<sup>36</sup> Barker (2004).

<sup>37</sup> Chiuri and Jappelli (2003) provide international evidence that credit market imperfections, including in particular judicial efficiency, regulation and informational asymmetries, are important for the size of mortgage markets. Jappelli et al (2005) document the role of judicial efficiency for credit markets in Italy.

which also affect the functioning of both housing and the housing finance market, although there are significant differences in the nature and strength of consumer protection rights across jurisdictions.<sup>38</sup>

## 4. Implications of recent housing finance market developments

This section identifies the consequences, positive and negative, of the developments presented in the previous two sections. Section 4.1 summarises the generally beneficial effects of improvements in the housing finance market. Section 4.2 discusses the recent build-up of household debt and household financial vulnerability. Section 4.3 looks at potential risk implications for individual banks and institutions, and Section 4.4 weighs up the overall implications for financial markets and macroeconomic stability.<sup>39</sup>

### 4.1 Positive implications of recent housing finance market developments

Several recent developments have contributed to the better functioning and efficiency in housing finance markets, including secondary markets for housing loans. This has been beneficial to the financial system at large and may have added to economic growth. In particular:

- Risk-priced borrowing and credit scoring mean that credit has become more efficiently priced and more efficiently allocated.
- The enlarged menu of housing finance products has increased borrower choice. The lowering of mortgage costs reflects in part the impact of efficiency gains due to better management of regulatory capital and increased competitive pressure.<sup>40</sup>

Increased reliance on capital markets for funding housing finance is likely to result in previously illiquid credit exposures becoming significantly more liquid and accessible to investors. Thus, as bond-based housing finance loans become an increasingly important asset class in the global financial system, this should ultimately result in better diversification opportunities for investors. This represents a move towards more complete financial markets, which should lead to improved pricing and a better distribution of risks, thus increasing economy-wide risk-bearing capacity.

### 4.2 Implications and risks of increased household debt

The significant growth in household debt levels since the late 1980s has coincided with a decrease in the cost of mortgage credit and improved access to credit for a broad group of households. Indeed, it cannot be ruled out that debt/income ratios will continue to rise, although perhaps at a slower pace than has been seen recently. As average incomes rise and financial sophistication increases, *both* sides of the household balance sheet can be expected to expand relative to income. Nonetheless, although debt levels have risen, the financial vulnerability of households is generally considered to be low. This assessment is supported by several factors:

- Since real and nominal interest rates have declined, the growth of household indebtedness has in many cases not been associated with an increase in debt service ratios.
- In most countries, the overall interest sensitivity of mortgage payments is still relatively low despite the increasing popularity of variable rate mortgages.

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<sup>38</sup> In most countries, consumer protection laws affect housing finance contract pricing and thus the ability of lenders to price-differentiate. They also affect contracts to protect borrowers, for instance by mandating certain steps in the process when buying or selling a house.

<sup>39</sup> These three sections are based in part on, respectively, Ellis and Lehnert (2005), Van Dijkhuizen and Gobbi (2005) and Grittini et al (2005).

<sup>40</sup> The assessment that competitive pressures have increased is based on indicators such as market concentration, dispersion, convergence of lending margins and level of interest rate pass-through.

- Financial market development has enlarged the menu of housing finance options and improved households' access to credit. Both factors should imply that households have become less financially vulnerable.

Furthermore, stress tests indicate that first-round effects of plausible shocks to the household sector have very little impact from a financial stability viewpoint. However, most stress tests are partial and focus only on a few risk factors, such as higher interest rates or income losses (Box 6). Second-round effects, which depend on macroeconomic responses and changes in expectations and which are more difficult to assess, are typically disregarded.

One risk associated with underwriting standards that allow higher LTV ratios and new mortgage products is that households may borrow too much because they cannot assess their long-run debt servicing capacity.<sup>41</sup> For example, households may fail to recognise the volatility of interest payments on adjustable rate mortgages, the importance of features such as prepayment penalties in fixed rate mortgages, or jumps in payments in negative amortisation variable rate mortgages. One aspect of this is that lenders may not provide adequate guidance to households, particularly less experienced borrowers.

In most countries, households are the primary owners of the housing stock, either as their own homes or as private rental properties. Hence, an upswing in property prices or housing wealth expands the value of their assets relative to their liabilities, which allows further borrowing. There is substantial empirical evidence that housing wealth effects may have influenced economic developments in a number of countries (Box 8). Nevertheless, it is uncertain to what extent increases in house prices have been "self-propelling" or have been determined by other factors.<sup>42</sup>

A sudden decline in house prices or housing wealth may have a range of consequences.<sup>43</sup> If a decline is temporary and the household is not simultaneously experiencing payment difficulties, it might not perceive any negative effects. This is unless housing is used as a short-term investment opportunity in the current low interest rate environment, through the buy-to-let market (Box 6). In this case, falling house prices could more directly impair the household's financial situation.

However, if home equity becomes negative, ie if the market price falls below the value of the loans, households' ability to move may be restricted, which may in turn reduce their ability to respond to local labour market shocks, which would further increase vulnerability to income shocks. Moreover, if house price declines coincide with a decline in bond markets, households may face two negative wealth shocks, which suggests a more significant impact on consumption in this situation. The obvious example of this is where housing finance-related risks have ultimately been transferred back to households, for instance via pension fund investments in mortgage bonds.

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<sup>41</sup> This is an issue for sub-prime borrowers who may be unable to obtain finance from more conventional sources. Stephens (2004) shows that households are able to predict job losses, but are systematically optimistic. He also shows that even if a household accurately predicts the probability of job loss, it does not reduce consumption ahead of the job loss.

<sup>42</sup> The causality between mortgage borrowing and house prices probably goes in both directions; see ECB (2003) and Tsatsaronis and Zhu (2004). The literature on the determinants of real house prices points to several other factors that influence house prices, including (expected) household income, nominal interest rates, inflation, rate of house price increases, taxes, demographics and public policies towards housing. See Nickel (2004) for an interesting discussion for the United Kingdom.

<sup>43</sup> Catte et al (2004) provide evidence that deeper, more developed housing and mortgage markets play an important role for consumer behaviour and the overall efficiency of the economy. See Ortalo-Magné and Rady (2005) for a discussion of the transmission of economic downturns via the housing market.

## Box 6

### The role of the buy-to-let market

The Australian buy-to-let market illustrates the importance of taxation, design of regulations affecting landlord-tenant relations and the role of social rental housing. Australia is the only country represented on the Working Group in which the buy-to-let market segment - ie households buying residential property to rent to other households - helped drive the upswing in house prices and debt to a significant extent (see below). Despite an owner-occupancy rate of around 70%, borrowing to purchase rental housing accounted for around 45% of new housing finance over 2002 and 2003. Demand by prospective landlords was particularly evident in inner-city apartment markets, which saw strong price rises despite a substantial expansion in supply. Australian households have a greater propensity to own rental property than households in other countries,<sup>1</sup> and tax data show a trend increase in the proportion of Australian taxpayers engaged in leveraged property investment over this period.<sup>2</sup>

In contrast, most other countries where data are available did not see a demand response out of proportion to the buy-to-let segment's share of the total housing stock. For example, lending for buy-to-let in the United Kingdom has expanded considerably in recent years, with the entry of specialist lenders and products aimed at this market, but tailored buy-to-let lending represents less than 10% of new lending or loans outstanding.<sup>3</sup> Non-owner-occupied lending (including for second homes) has also risen in the United States, but its share of total lending, around 15% in 2004, is less than half its share of the dwelling stock. The stock of Toronto condominiums being rented out seems to have declined over the past decade, despite anecdotal evidence of increased investor interest in rental property in Canada.<sup>4</sup> After German reunification in 1990, buy-to-let lending was boosted temporarily by generous depreciation rates in addition to tax-deductible mortgage interest rates for residential real estate investors. In France, the Robien law, which allowed buy-to-let investors to benefit from partial tax exemption on their rental income, has been an important driver of loan growth, and accounted for 17% of new lending in 2004, up from 12% in 2000. These differences in outcomes probably reflect one or more of the following three factors. First, the tax systems in other countries generally provide less incentive to invest in geared residential rental property than is the case in Australia. Second, rent controls and other regulations affecting landlord-tenant relations in some other countries tend to make rental properties less attractive relative to other asset classes. Finally, in many countries social rental housing accounts for a larger share of the dwelling stock than in Australia, thereby limiting tenants' demand for private rental housing.

The Australian tax system allows landlords to deduct both cash expenses such as mortgage interest and non-cash expenses such as depreciation against income at full marginal rates, including against labour income not associated with the management of the property. Capital gains on income-producing assets held for more than a year are taxed concessionally at half the taxpayer's normal marginal rate. This provides an incentive for investors to prefer asset classes that earn both income streams and capital gains over fixed interest assets. In contrast, non-interest rental expenses cannot be deducted against unrelated labour income in the United States or the United Kingdom, while the Canadian system only allows cash expenses to be deducted against non-property income, not depreciation expenses. Deduction of expenses in excess of rental income against other taxable income is likewise not possible in countries that tax net wealth rather than property income flows, such as the Netherlands. Some cantons in Switzerland impose higher tax rates on capital gains if the asset was held for less than two years.

In a number of Canadian provinces, most continental European countries and some jurisdictions in the United States, controls on rent increases and restrictions on grounds for eviction impose a risk that rental returns will be less than expected, which reduces the attractiveness of this asset class in these countries. For example, rent increases in Belgium and Switzerland must be justified by cost or CPI increases. In many countries, it is also difficult to time the realisation of capital gains, because of the lengthy notice periods that must be given before tenants must vacate. The United Kingdom has had similar regulation of landlord-tenant relations to that in Australia, since the introduction of Assured Shorthold tenancy in the late 1980s, but this generally does not apply to the larger social rental sector, into which some tenants may substitute. Social rental also represents a large fraction of the rental stock in continental European countries such as Sweden and the Netherlands.

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<sup>1</sup> Reserve Bank of Australia (2003b). <sup>2</sup> Reserve Bank of Australia (2004). <sup>3</sup> Bank of England (2004). <sup>4</sup> Canadian Mortgage and Housing Corporation (2004).



## Box 7

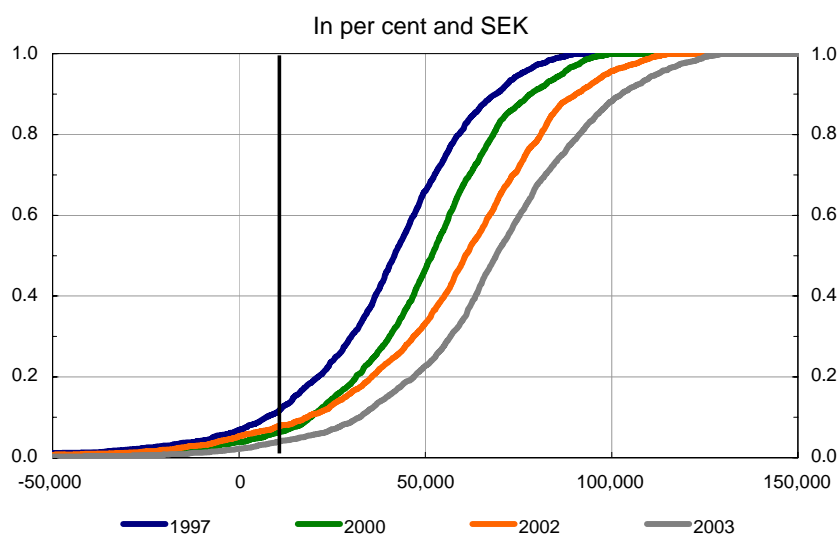
### Stress tests on Swedish household micro data

Since 2004, the Riksbank has augmented the analysis of the total household sector, presenting data on debt and wealth for households in different income categories by dividing households into five income categories according to their disposable income. This information is used to identify the groups of households that are most financially vulnerable, ie those with a small or negative "financial margin", defined as disposable income minus cost of living and interest payments. The analysis has been performed on the basis of wealth and income data from Statistics Sweden for Swedish households for the years 1997 and 2003.

The curves in Graph 6.1 indicate how the proportion of households in category 3 with no financial margin grows as the household budget shrinks. Zero on the horizontal scale represents the point where the incomes and expenditures of the indebted households in the category balance exactly, given the conditions for that year. From 2002 to 2003, the proportion of households with no financial margin decreased from over 2.6% to about 2.2%.

Graph 6.1

### Tolerance of rising expenditure or loss of income in income category 3



Note: The curves, which represent the distribution of financial margins in four selected years, show the proportion of indebted households in relation to the size of the financial margin (horizontal axis). A parallel shift to the right accordingly indicates an improvement in the financial strength of the income category.

Source: Sveriges Riksbank.

The databank also permits stress tests on categories of households. The proportion of households that would have lacked a financial margin if monthly costs had risen by SEK 1,000 is represented by the intersection of the thick vertical line and the respective curve. Partial or more complex scenarios can be constructed to study the ability to service debt in different scenarios, such as increases in interest rates or unemployment.

Households with variable rate loans are affected immediately by a change in interest rates, while for fixed rate loans the impact is only felt when the loans are renegotiated. The short-term effects are studied first, ie taking as given the fixed rate loans. Then follows an analysis of the long-term effects that arise if the change in the interest rate affects the entire stock of debt. All the loans are assumed at that stage to have been renegotiated at the new higher rate.

The Riksbank's analysis shows that interest rate increases have only negligible effects on households' financial margins, even accounting for long-term effects. If the general level of interest rates rose by 4 percentage points, the average interest ratio would increase by almost 2 percentage points, to just below 7% in the short run. But this sharp rise in interest costs does not affect the proportion of households below the margin to any great extent (from 9.7% to 10.1% in the short run and to 10.4% in the long run). The main explanation for this is that the households with the tightest margins also have the smallest loans.

Box 7 (cont)

**Stress tests on Swedish household micro data**

In the event of unemployment, a household suffers a loss of income equivalent to the difference between its previous salary and its unemployment benefit. In these scenarios, all gainfully employed persons have been assigned an equally large probability of becoming unemployed, which is likely to mean that the effect is overestimated. The analysis shows that even unemployment increases of as much as 3 percentage points have only minor effects on financial margins. This result also holds when unemployment and household expenditures are stressed simultaneously.

One explanation for this apparent resilience of households is the composition of their debt and income. The households that have small or no financial margins generally belong to the lowest income categories, and these households lose a smaller share of their income if they become unemployed. In particular, in the low-income category, only 3% of households have two persons with employment income today (as compared to 90% in the high-income category). The level of indebtedness is also very limited in these income categories.

In general, the majority of the loans are attributable to the highest income categories of those households that also own the real and financial assets. These households have margins left once interest expenses and regular living costs have been paid. The risk that cost increases in the form of higher interest rates would lead to difficulties is therefore small. On the other hand, a loss of income following unemployment would greatly reduce the household's income in this group, but in general not enough to cause payment difficulties.<sup>1</sup>

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<sup>1</sup> See Sveriges Riksbank (2004, 2005).

It is also clear that recessions can be exacerbated through a downturn of the housing market. For example, the recent housing price boom in the Netherlands clearly illustrates that the effects of shocks are stronger when the household sector is stretched and vulnerable. Other examples of housing downturns exacerbating broader economic downturns include the United Kingdom in the early 1990s. The result was a significant incidence of negative equity and a sizeable upswing in home foreclosures and repossessions.<sup>44</sup> This contrasts with the experience so far from the most recent cycles in Australia and the United Kingdom, where house prices have stabilised at high levels, rather than fallen significantly, after an earlier period of rapid house price inflation.

### **4.3 Implications and risks for financial institutions**

Mortgage lending is generally a low-risk business as lending is based on the value of the underlying collateral. This is also the case for countries where household debt levels have risen to historical highs. National assessments suggest that only severe shocks in interest rates, incomes and house prices significantly affect households' ability to service their mortgages. Moreover, financial institutions, in particular banks, appear sufficiently capitalised to withstand a substantial deterioration in retail credit in severe stress scenarios, even if the recent loosening of credit standards in a number of countries<sup>45</sup> is interpreted as a sign of increased future vulnerability. However, a few caveats to this general assessment are warranted.

First, in many countries the share of housing-related loans in banks' portfolios is very large, in some cases as much as 50%. Since primary mortgage markets are typically domestic, this may lead to concentrations of lending which could leave banks, for instance specialised mortgage banks, vulnerable to idiosyncratic shocks. This risk concentration may not be adequately captured by stress tests, which are typically conducted for the aggregate banking sector or insurance sector.

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<sup>44</sup> In the US market, local recessions in Texas and New England in the 1980s and early 1990s, respectively, also resulted in housing and economic downturns reinforcing each other. Finally, the Japanese experience after the bursting of the bubble in the late 1980s, with the combination of a drop in land prices and continuation of payments on mortgages, also had a clear negative impact on household spending. According to Bank of Japan (1998), 61% of households that were concerned about their balance sheet had reduced spending, while of the households without such concerns only around 38% had cut back on expenditure.

<sup>45</sup> See the Board of Governors of the Federal Reserve System's US Senior Loan Officer Survey and the ECB's Euro Area Bank Lending Survey.

Box 8

**Mortgage equity withdrawal and consumption**

Mortgage equity withdrawal (MEW) is the generic term for transactions in which homeowners liquidate home equity, either with the acquisition of new debt or as part of a housing transaction. Depending on the prevailing laws and financial instruments available to them, homeowners can acquire additional debt collateralised by their home as part of either refinancing or remortgaging, by drawing on an existing line of credit, or by taking on a second mortgage (also known as a “junior lien”).

When moving to a new house, the seller has the opportunity to extract or liquidate equity by making a smaller down payment on the new house than the accumulated equity in the current house. In addition, sellers may purchase cheaper homes (or move into rental quarters), in which case the liquidated home equity is not offset by increased debt.

Aggregate national MEW can be constructed using data on total residential mortgage debt and housing investment. In principle, aggregate MEW is the net increase in residential mortgage debt not offset by housing investment or construction. The Bank of England computes official estimates of MEW in the United Kingdom. A methodology for computing MEW and several of its components for the United States is discussed in Greenspan and Kennedy (2005). Surveys of individual homeowners can provide extra detail, especially on the uses of funds raised by MEW; examples from the Netherlands are discussed in BIS 2005 (pp 21-39), from the United States in Canner et al (2002), and from the United Kingdom in Benito and Power (2005).

Evidence from Australia, Sweden, the United Kingdom and the United States indicate that housing transactions are the dominant channel for MEW. The total volume of MEW rises and falls with turnover in the housing market and, in some cases, with the volume of refinancing. Surveys of the uses of funds raised via MEW show a similar pattern across countries: homeowners list home improvement and repayment of other (non-mortgage) debt as the most common uses, with spending next, and then other uses, including investments and gifts to family members.

Simply because aggregate MEW is rising, however, does not necessarily mean that total consumption will also rise. Forward-looking homeowners could be using MEW as the cheapest way of financing their chosen path for consumption. In this view, MEW reacts endogenously to consumption, rather than acting as an exogenous force driving up consumption. For example, a shock to wealth may lead to increased consumption: rather than selling assets to realise the wealth gains, consumers may finance the consumption with increased borrowing against housing. Such forces lead to a correlation between MEW and consumption without a causal link from MEW to consumption. In fact, in Sweden, Australia and other countries, the link between MEW and consumption is weak. However, MEW is seen as a key reason for increased consumer spending in the Netherlands in 1999 and 2000 and depressed spending in 2001.<sup>1</sup>

In the United States, consumption growth over the past decade has been boosted in part by a decline in the saving rate. The volume of MEW over this period roughly matches the extra consumption, suggesting that MEW can explain much of the drop in the saving rate. However, econometric models of consumption based on income, interest rates and wealth that exclude MEW also predict a drop in the saving rate over the same period.<sup>2</sup>

Looking across countries, as retail financial developments make MEW easier, especially without requiring a housing transaction, homeowners may view their home equity as more liquid and thus more accessible at short notice, reducing their precautionary motive for saving. The result would be a long-lived, but ultimately transitory, consumption boom. The period of increased consumption could last several years as households adjust their saving and consumption plans to new financial products and because financial developments themselves take several years.

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<sup>1</sup> BIS (2005). <sup>2</sup> Greenspan (2005).

Second, the ultimate loss-given-default for the lender depends on the value of the collateral at the time of resale. Thus, higher current market values need not imply that loss-given-default is lower, if there is a risk of house prices declining in the future. Furthermore, in times of rapid growth in housing prices, valuers (or assessors) in some cases may face greater pressure to provide non-objective valuations (or assessments) to justify lending decisions. This is reinforced by the fact that, in aggregate, there

may be a positive feedback between credit growth and house prices because of the intimate link between mortgage lending and collateral values.<sup>46</sup>

Third, the rapid growth of sub-prime markets in some countries raises the issue of the extent to which a highly competitive housing finance environment has led to increased risk-taking. A related question is whether giving new borrowers access to housing credit has given additional short-term support to house prices, thereby leading to a cycle in which more lending leads to higher property prices, which leads to lower delinquencies and thus even more lending. Sub-prime lending, particularly in the United States, has grown rapidly in a period in which an increasing number of borrowers have taken out interest-only or variable rate loans (including some with negative amortisation options) and in which house prices have risen. It is worth noting that risk models of financial institutions have in many countries not been tested in a downturn scenario featuring a rapid increase in interest rates and a strong decline in house prices.<sup>47</sup> Thus, there may be a risk that lenders are underestimating households' probability and severity of default.<sup>48</sup> It is also questionable whether current risk models properly address the wealth and consumer confidence effects of house price declines. This underscores the importance of collecting housing data that enable financial institutions to manage credit risks in a sound way.<sup>49</sup> Another aspect is that not all countries have conducted household surveys to collect distributional data on households.

Fourth, lenders increasingly rely on capital market funding, which may be due to a combination of rapid growth in housing finance combined with a reduction in the volume of deposits, which compels lenders to seek alternative means of funding. It may also reflect the fact that capital market access has lowered the funding costs for housing loan providers, thereby increasing the incentive to securitise mortgage loans. Greater reliance on securitisation means that the risks relevant to financial institutions are changing. Lenders can dispose of interest rate and credit risk, and concentrate instead on income from mortgage servicing rights (so-called "packaging fees"). Hence, in principle, institutions that package and sell loans do not need to manage credit and interest rate risks, but are instead exposed to liquidity, operational and reputational risks. Growing dependence on financial markets has also increased the exposure to market turbulence. One aspect of this is that, in periods of severe market unrest or uncertainty, a whole group of housing finance lenders may suddenly find it difficult to obtain funding. Thus, although internationally active financial institutions build up exposures to non-domestic mortgages to diversify risks, spillover effects from foreign housing markets could become a source of concern. Housing finance-related risks may thus ultimately be transferred back to households, for instance via pension funds.

Fifth, for lenders a particular interest risk arises from the possibility that fixed rate borrowers may repay the mortgage loan ahead of schedule. In contrast to adjustable rate borrowers, fixed rate borrowers typically prepay when there is a decline in interest rates (unless deterred by prepayment penalties). Such prepayments can also be triggered by borrowers' need to sell because of a job change, a rise in property prices, or an increase in the borrower's wealth.<sup>50</sup> Lenders manage prepayment risk in several ways. As discussed above, one approach, which is used in a number of European markets, is to demand compensation for capital losses resulting from prepayment. Another approach, which is used in the US market, is to ensure funding that matches perfectly the loans given, also in terms of the prepayment risk. The result is so-called callable bonds, which expire as borrowers prepay. A third

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<sup>46</sup> Kiyotaki and Moore (1997) provide a theoretic analysis of this. Tsatsaronis and Zhu (2004) argue that house price developments are dependent on inflation, the yield curve and bank credit, but that national differences in the mortgage markets also matter. House prices are found to be more sensitive to short-term rates where floating rate mortgages are more widely used and more aggressive lending practices are associated with stronger feedback from prices to bank credit. Hofmann (2003) and Gerlach and Peng (2005) argue that causality is from house prices to lending, not the other way around.

<sup>47</sup> See UBS (2005a,b,c) for discussions of credit risk considerations for more sophisticated loan products.

<sup>48</sup> In this context, it is important to distinguish between owner-occupier loans and loans to non-owner-occupiers such as housing companies, which may prove much more vulnerable in a downturn due to their higher leverage.

<sup>49</sup> One difficulty is that residential property is (1) a very heterogeneous product and (2) has a relatively low turnover rate, which makes prices and price changes hard to measure. Countries have chosen different solutions (repeated sales, hedonic) to overcome this methodological problem, thereby making international comparisons of housing markets difficult.

<sup>50</sup> This is often referred to as "non-financial" prepayment.

approach is to use derivatives such as swaptions, interest rate caps and other types of derivatives to manage prepayment risk.

#### **4.4 Implications and risks for financial markets**

The rapid growth of sub-prime lending in new markets, combined with the introduction of new and complex loan types, could raise some issues for financial markets. One question is whether lenders and investors are able to assess accurately the risks of this lending, given a lack of previous experience. Another question is whether the risk of contagion from larger domestic housing finance markets via bond markets has increased. This aspect has until recently mainly been an issue for the US market, but could become a broader concern as this form of lending grows in other markets.

As investors create diversified global housing finance-based portfolios, it is likely to become less clear who ultimately bears which risks and whether new risk concentrations are emerging. For central banks, regulators and policymakers more broadly, assessing linkages as well as potential build-ups of risk will become more challenging. It is possible, though unlikely, that these risks, if not checked by prudent oversight, could offset the diversification benefits from having access to a broader set of mortgage bond markets.<sup>51</sup>

Another question is how the growth in mortgage bond markets may impact on other markets. In particular, will this result in more interest derivatives such as swaptions and similar products becoming available? Is there a risk that larger mortgage bond markets will raise interest rate volatility and cause financial market turbulence due to a US-style prepayment “wave” as in mid-2003? In this context, an ancillary question is whether the implementation of International Financial Reporting Standards will lead financial institutions to increase their hedging activities, which could further increase the risk of spillover effects to global financial markets.

A final set of issues concerns the potential impact of Basel II, which will make capital requirements for banks more sensitive to the risk profile of the underlying assets in order to bring regulatory capital requirements closer to economic capital requirements. In the case of mortgages, this typically means a lowering of capital requirements, which reduces the incentive to securitise mortgages as it is more attractive for banks to keep them on the balance sheet.<sup>52</sup>

Another aspect is that capital requirements for covered bonds will be tied to the issuer rating, as opposed to current practice, where in many cases regulatory requirements do not discriminate among issuers. This is likely to introduce price differentiation for covered bonds, reflecting issuer rating differences. This could potentially make covered bonds a more attractive source of funding for highly rated lenders, and MBS issuance more attractive for lower-rated issuers.

Finally, Basel II is likely to make the use of ratings in market-based housing finance more pronounced, which may be a positive development as this may have a disciplining effect on credit risk assessments and via the increased transparency and comparability across housing finance systems in the longer run. A possible negative consequence of this could be that markets will be more volatile during periods of perceived rating adjustments.<sup>53</sup>

## **5. Policy issues**

In many markets, household borrowing and property values have been bolstered in recent years by lower interest rates and improved access to credit. These developments have prompted central banks, rating agencies and others to assess the stability of the financial system. The results from extreme yet historically realistic stress scenarios have been reassuring on the whole: for all markets for which

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<sup>51</sup> See IMF (2005).

<sup>52</sup> Hancock et al (2005) provide a discussion for the United States, where regulatory capital arbitrage has been a primary motive for securitisation.

<sup>53</sup> See CGFS (2005).

these tests were performed, the analyses indicate that the indebtedness is broadly affordable and that in some countries the majority of borrowers have the capacity to absorb both declines in house prices and higher interest rates. Furthermore, financial institutions, notably banks, are sufficiently capitalised to withstand a substantial deterioration in household credit quality. Finally, the dispersed nature of home mortgage borrowers implies that concentration risks are less severe for these borrowers than for entities with commercial property-related debt, and thus that large-scale losses from mortgage borrowers' defaults are less likely.

However, recent developments in global housing finance markets still raise a number of policy issues for central banks. The trend towards an increased demand for adjustable rate mortgage loans and interest-only loans, as well as the introduction of other, more exotic, mortgages warrants close monitoring. While a wider choice of mortgages may have enhanced households' welfare by matching their preferences better, there is a concern that more exotic financial products may add to the risks that some households overstretch themselves and purchase homes that otherwise would be unaffordable.

Furthermore, the growth of sub-prime borrowing has allowed previously underserved groups of borrowers to enter the housing market. These borrowers may be, on the whole, less financially robust than average. Thus, even though the general level of household vulnerability is low, credit risk in sub-prime markets may turn out to be larger than expected.

There have been a number of episodes in which a recession has been exacerbated by adverse developments in housing markets. It is therefore natural to ask whether recent increases in household borrowing and house prices could unwind in ways that severely affect overall economic activity. The risk of such a development might be higher today than just a few years ago, for instance because sub-prime borrowers and households that have used new exotic mortgage contracts to finance their houses have become particularly vulnerable. On the other hand, so far the recent experiences in the United Kingdom, Australia and elsewhere suggest that changes in macroeconomic conditions, including in the stance of monetary policy, need not trigger sharp reactions in housing markets.

### **Ensuring access to sufficient information**

Given the higher level of household leverage, as well as the complexity of the risks involved in mortgage loans (particularly for the latest generation of innovative housing finance products), it is important to ensure that lenders provide sufficient guidance about risks to borrowers. This is particularly relevant in markets with a high fraction of less experienced borrowers and with new types of loans. Furthermore, it is important to enhance market transparency regarding pricing and contractual terms to help borrowers obtain loans that best fit their needs. Indeed, financial education for all households, at all stages of the life cycle, ought to be encouraged.

It is also desirable to encourage the ultimate holders of housing finance-related risks to develop adequate risk management tools, in particular since most credit risk models may not have been tested in a downturn. Increased use of stress tests is a supplementary tool, possibly conducted in a coordinated fashion by financial institutions, as these are both lenders and investors. This might usefully include consideration of the effects of rising cross-border exposures, which may add to risks of cross-border contagion as well as offering the potential for better risk diversification.

The growing importance of housing finance also points to new data requirements in order to make reliable financial stability assessments. One particularly important aspect of this is that robust financial vulnerability assessments of retail markets require distributional data that permit a focus on the most exposed households. Thus, central banks and other policymakers need to ensure that they have access to a broad array of disaggregated data. Of course, data should ideally be available at the household level to enable a precise analysis of the size of the most vulnerable subgroup of the population, and the extent of the risks they face.<sup>54</sup> An important policy implication is the need to

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<sup>54</sup> For example, the national average LTV ratio, obtained by dividing total debt by some measure of assets that are security for the debt, could be high, but it could be that the high LTV ratios are all concentrated in high-income or high-wealth households, who have plenty of scope to respond to shocks and low probabilities of receiving a negative income shock. Household vulnerability is lower in this situation than if the high LTV ratios are concentrated on higher credit risk borrowers, who are likely to have low or variable incomes.

assess the effect of the increased interest rate sensitivity in the household sector due to the greater use of adjustable mortgage loans and more sophisticated loan contracts.

One particular tool that could be developed further in central banks and other authorities is stress tests. In principle, these allow analyses of the effect of increased household debt levels and reliance on capital market funding in various scenarios, eg interest rate, house price and broader macroeconomic shocks. For policymakers to have confidence in the results of stress tests, however, the models must use data on the behaviour of borrowers and lenders in historical stress situations.

### **Monitoring of housing finance systems**

The growth in the size of the housing finance market implies that an important policy aspect is how changes in different regulations, taxes and subsidies might affect housing markets and the real economy through the housing finance system.

In addition, the growing sophistication of housing finance markets has led to a gradual increase in the importance of specialised non-bank institutions along the whole housing finance “value chain”. While it seems unlikely that specialised housing finance service providers such as loan servicing companies and mortgage insurers will in general be the single point of failure in the system, it is clear that operational failures or defaults of these companies may be a cause of disruption. This implies that, going forward, sound risk assessments need to look beyond traditional mortgage lenders.

Another aspect is that it becomes more difficult for policymakers and market participants to know who is ultimately holding market and credit risks, as these are increasingly transferred via financial markets. More rigorous assessments may also improve the understanding of whether and to what extent new contract types have contributed to the rise in house prices, and more broadly improve our ability to disentangle the role of various factors on the demand side as well as the supply side of housing markets.

### **Financial market concerns**

On the whole, the increasing importance of financial markets for housing finance should reduce funding and liquidity risks for lenders. These developments also allow investors to diversify into another high-quality asset class. Nevertheless, the prospect of having a larger fraction of global financial markets linked to housing finance raises a number of issues. Non-US entities hold a significant fraction of securitised US mortgages. The growing presence of international investors is also apparent in, for example, Germany and Spain.<sup>55</sup> This raises the issue of whether the degree of international coordination and information exchange among central banks, supervisors and other authorities is appropriate. It is at present not known what the allocation of housing finance-related risks is, or whether there are concentrations of these risks.

The increased reliance on market funding in mortgage markets may imply stronger financial market responses to changes in domestic policies in the future. Regulation of land and housing supply, tax laws, government subsidy schemes, public saving and investment incentive schemes, and bankruptcy rules could feed back through global financial markets.

Another consequence is that housing finance may have become more sensitive to financial market conditions. For example, changes in funding conditions for lenders may feed through more directly to borrowers and, hence, also affect the real economy. Thus, even though credit risk held by mortgage lenders may well be unlikely to generate systemic difficulties, as this would probably require both a deterioration in collateral and a failure of households’ ability to repay debt, lenders are becoming increasingly reliant on markets for funding. This raises the risk that weakness in these financial markets could generate wider disruption across the financial system. Finally, should refinancing or prepayment of housing finance loans become more widely available, the risk of more volatile bond and derivatives markets in periods with prepayments becomes a broader issue.

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<sup>55</sup> Although the overall level of foreign activity in the German housing finance market is still limited.

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## **Appendix 1: Working Group mandate**

The Working Group on Housing Finance in the Global Financial Market is to explore the significance of developments affecting the supply of, and the demand for, housing finance. The Working Group should, in particular, describe and analyse the forces driving these developments.

Changes on the *supply side* of housing finance are closely related to developments in capital markets, in particular the introduction of new technologies, ie contracts and instruments, and increased cross-border activities that may affect the funding behaviour of financial institutions. In turn, this may introduce new risks and increase the sensitivity of housing finance markets to capital market developments. The change in the funding of mortgage loans may also have an impact on property prices and, hence, introduce new risks in global property markets.

Developments on the *demand side* include households' growing preference for a more complete menu of housing finance choices, which will affect their risk exposures and their ability to manage risks arising from the housing finance market. This is part of a broader trend involving households assuming greater responsibility for the management of financial risk, a development that may introduce new risks and risk characteristics to households.

The Committee expects that an important part of the Working Group's efforts will entail providing an overview of the microstructures of different national housing finance systems, since awareness of national characteristics will promote an understanding of common themes and idiosyncratic issues in housing finance markets.

The Working Group would aim to report back to the CGFS at its meeting in November 2005.

## Appendix 2: Tables

Table A.1  
Owner-occupancy rates

Country	1980	1990	2002-04
Australia	71	72	72 <sup>5</sup>
Belgium	59	67	71
Canada	62	63	66
France	47	54	55
Germany	41	39	42
Italy	59	68	80
Japan	60	61	60
Korea	na	53 <sup>2</sup>	54 <sup>3</sup>
Luxembourg	60	64	70
Mexico	66 <sup>1</sup>	78	78
Netherlands	42	45	54 <sup>4</sup>
Spain	73	78	82 <sup>5</sup>
Sweden	58	56	61
Switzerland	33	31	35
United Kingdom	58	65	69
United States	65	64	68

<sup>1</sup> 1970. <sup>2</sup> 1995. <sup>3</sup> 2000. <sup>4</sup> 2004. <sup>5</sup> 2001.

Sources: European Mortgage Federation; national authorities.

### Appendix 3: Members of the Working Group

#### Chair

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Reserve Bank of Australia	Luci Ellis
National Bank of Belgium	Grégory Nguyen
Bank of Canada	Virginie Traclet
Bank of France	Gilles Moëc Imène Rahmouni
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Bank of Italy	Giorgio Gobbi
Bank of Japan	Mahito Uchida
Bank of Korea	Tae Soo Kang Byeong-Ha Yoo
Central Bank of Luxembourg	Jean Marie Thoss
Bank of Mexico	Alfredo Sordo
Netherlands Bank	Arjen van Dijkhuizen
Bank of Spain	Maria-Cruz Manzano
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Swiss National Bank	Martin Brown
Bank of England	David England
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