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HAS THE RISE IN DEBT MADE HOUSEHOLDS MORE VULNERABLE?

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ABSTRACT/RÉSUMÉ

Has the rise in debt made households more vulnerable?

This paper reviews, for a number of OECD economies, macroeconomic developments in household balance sheets over the past two decades. The main findings show that the rise in household debt to historical levels has been driven by a combination of favourable financial conditions and buoyant housing markets. There have also been a number of supply-side innovations in credit markets that have eased the access to credit for lower-income borrowers and reduced financial constraints for first-time homebuyers. Total household net wealth has risen and provided households with a financial cushion against a negative shock. That said, households in a number of countries have leveraged balance sheets and the sensitivity to house price and interest rate developments has likely increased. The paper then examines micro-level information which suggests that most of the debt is held by households better able to manage it. In particular, the major part of debt is held by higher-income households, who also spend a smaller proportion of their disposable income servicing debts. Lower-income households, with less ability to service debt, do not hold that much and, as such, the spill-over effects from this group to the rest of the economy are perhaps not large. Whether the situation remains benign or not is discussed in the final section of the paper. Estimates presented point to significant effects of changes in net wealth on household saving rates in a large number of the countries studied.

This working paper is a comprehensive version of OECD Economic Outlook No. 80, Chapter III.

JEL codes: D1, E21
Keywords: household debt, household assets, housing market

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Les ménages sont-ils plus vulnérables du fait de leur endettement croissant ?

Cette étude examine pour un certain nombre de pays de l'OCDE, l'évolution macroéconomique des bilans des ménages depuis deux décennies. Le fait que l'endettement des ménages, en particulier sous la forme d'emprunts hypothécaires atteigne des niveaux records dans plusieurs pays tient à des conditions financières favorables et au dynamisme du marché du logement. En outre, un certain nombre d'innovations sont apparues du côté de l'offre sur le marché du crédit et ont facilité l'emprunt pour les titulaires de bas revenus tout en allégeant les contraintes financières pour les primo-acquéreurs. De plus, le patrimoine net des ménages a aussi cru et permet de protéger financièrement les ménages en cas de choc négatif. Cela étant, l'effet de levier des ménages semblent important dans plusieurs pays et la sensibilité à l'évolution des prix des logements et des taux d'intérêt s'est probablement accentuée. L'étude analyse ensuite des informations microéconomiques et montrent que la majeure partie de l'endettement est le fait des ménages les mieux à même de le gérer. En particulier, la dette a été surtout contractée par les ménages à revenu élevé, qui affectent une plus faible proportion de leur revenu disponible au service de leur dette. Les ménages à bas revenu, dont la capacité de service de la dette est moindre, ne représentent pas une aussi forte proportion de l'endettement, de sorte que l'impact de la situation de cette catégorie sur le reste de l'économie n'est sans doute pas très marqué. Les conséquences de ce phénomène sont discutées dans la dernière partie de cette étude. Les estimations suggèrent des effets de richesse important sur le taux d'épargne des ménages dans plusieurs pays.

Ce document de travail est une version détaillée du chapitre III des Perspectives économiques de l'OCDE no 80.

Classification JEL: D1, E21
Mots clés : endettement des ménages. actifs des ménages, marchés des logements

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HAS THE RISE IN DEBT MADE HOUSEHOLDS MORE VULNERABLE?[1]

Introduction and summary

1. Over the past decade, household debt has risen to record levels in a number of OECD countries. The large size of these debt run-ups, coupled with, in several instances, changes in the characteristics of some of the relevant instruments, are estimated to have raised the sensitivity of the household sector to changes in interest rates, asset prices and incomes (Debelle, 2004). In this sense, the household sector may have become more vulnerable to adverse shifts in these variables.

2. This paper begins by reviewing, for a number of OECD economies, macroeconomic developments in household balance sheets and incomes over the past two decades. It then examines micro-level information to provide a more recent cross-sectional snapshot of the household sector. The purpose to this paper is to assess household financial vulnerability. Following the plan of the paper, the main findings are:

- The rise in household debt, in particular mortgages, to historical levels in a number of countries has been driven by a combination of favourable financial conditions and buoyant housing markets. There have been, as well, a number of supply-side innovations in credit markets that have eased the access to credit for lower-income borrowers and reduced financial constraints for first-time homebuyers.

- While debt, particularly mortgages, has risen sharply, so has total household net wealth, reflecting mostly the sharp appreciation of property values and an increase in homeownership rates as well as, after 2001 the recovery in equity markets. This large stock of assets provides households with a financial cushion against a negative shock. That said, households in a number of countries have leveraged balance sheets and the sensitivity to house-price and interest rate developments has likely increased.

- The fraction of disposable income devoted to servicing debt (interest and principal payments) has also been moving up. Part of this rise, however, is compositional, reflecting increasing homeownership rates, driven by improved access to credit markets for first-time purchasers who

1. The authors thank Sebastian Barnes, Jorgen Elmeskov, Michael Feiner, Felix Huefner, Vincent Koen, Paul van den Noord, Laura Vartia and Tadashi Yokoyama for helpful comments. They also thank individual country experts Juan Ayuso, Phill Briggs, Matthew Corder, Umar Faruqui, Risto Herrala, Gerbert Hebbink, Johannes Hoffman, Martin W. Johansson, Jonathan Kearns, John Kelly, Trinh Lee, Kevin B. Moore, Kenneth Juhl Pedersen, Mathias Persson, Grant Scobie, Elmar Stöss, Paolo Finaldo Russo, Kari Takala and the European Central Bank for providing micro data statistics and useful discussions, Anne Eggimann and Sarah Kennedy for excellent technical assistance.

tend to have higher debt and lower income levels. Despite these developments, however, mortgage-delinquency rates have been trending down over the past decade.

- Household surveys in various countries that identify debt holdings by age and income group provide a complementary perspective on the issue of vulnerability. Studies using such micro data suggest that most of the debt is held by households better able to manage it. In particular, the major part of debt is held by higher-income households, who also spend a smaller proportion of their disposable income servicing debts. Lower-income households, with less ability to service debt, do not hold that much and, as such, the spill-over effects from this group to the rest of the economy are perhaps not large.

3. Whether the situation remains benign or not depends on what happens to interest rates, asset values (particularly house prices) and incomes. In the event of adverse developments in these variables consumption and the wider economy would be affected. Looking, for instance, at the implications of a sharp and unanticipated rise in interest rates, higher debt levels would imply that a larger proportion of income would be devoted to debt servicing, the size of which would depend importantly on the maturity structure and characteristics of the debt. The resulting reduced capacity to service debt could also adversely affect households' access to credit and accordingly their ability to smooth consumption. Balance sheets would tend to deteriorate and households would be expected to increase saving.[2] Estimates presented in the final section of this paper point to significant effects of changes in net wealth on household saving rates in a large number of the countries studied. As well, the deterioration in balance sheets could further affect access to credit. There could also be negative feedback effects through worsening income.

The debt run-ups: broad trends and some underlying causes

4. Looking at a group of 15 OECD countries for which data are available, total household borrowing, as a proportion of GDP, has increased considerably over the past two decades (Figure 1, upper panel).[3] However, the process has not been uniform across countries and, in 2005, debt levels ranged from below 40% of GDP in Italy to above 100% in the United Kingdom, the Netherlands and Denmark.

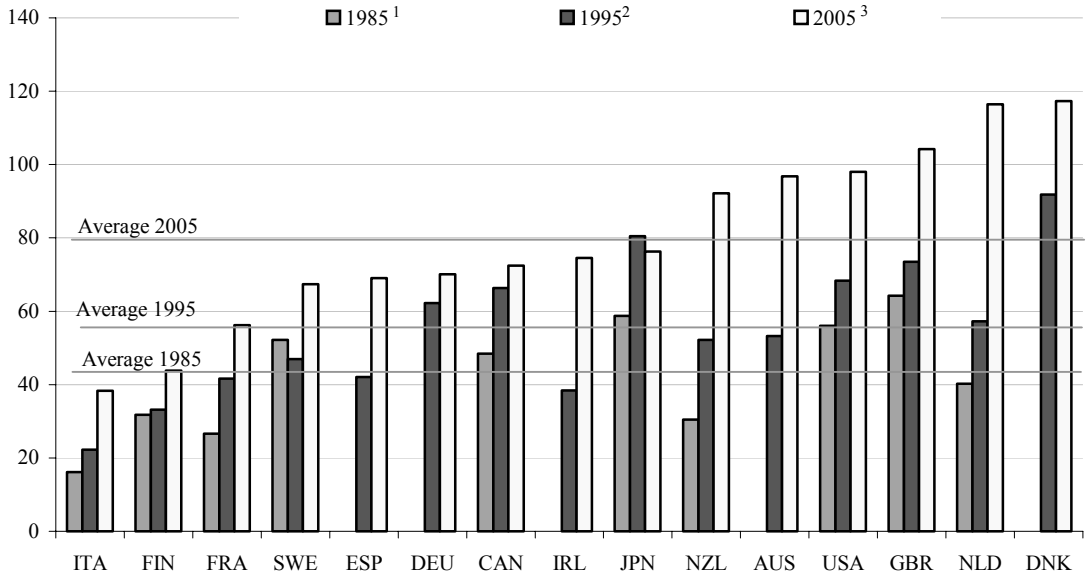
5. The share of mortgage debt has been rising over time, accounting for approximately two thirds of total household debt in most countries by 2005 (Figure 1, lower panel). Similarly, credit card debt, which is a substantially smaller portion of household liabilities, has risen rapidly and spread to a wider range of social groups (for instance, in the United States, the United Kingdom and Australia) but accounted only for less than 5% of total household debt (Reserve Bank of Australia, 2006, Bucks *et al.*, 2006, and Del-Rio and Young, 2005). In Korea, in contrast, the share of credit card debt has been declining from the high levels reached at the peak of the boom-and-bust credit card cycle in 2002 (OECD, 2005).

2. The effects on spending from changes in housing wealth have been estimated to be larger in English-speaking countries than in some Continental European countries, see Catte *et al.* (2004).

3. The data are not strictly comparable across countries due to different statistical definitions of the household sector. For example, in some countries, unincorporated businesses and non-profit institutions serving households are included in the household sector data, whereas in others they are not. See the Statistical Annex for further details.

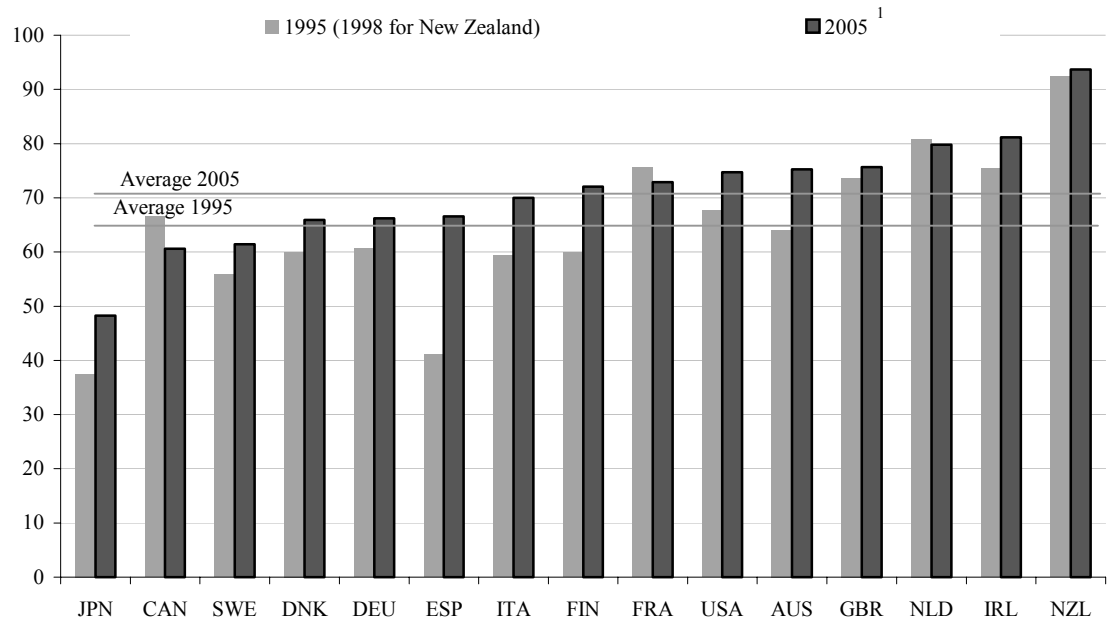
Figure 1. Trends in household debt

Household debt as a percentage of GDP



1. 1987 for the United Kingdom.
2. 1999 for Ireland.
3. 2004 for Japan, Denmark and Spain.

Mortgage debt as a percentage of households debt



1. 2004 for Japan, Denmark and Spain.

Source: See statistical annex.

6. Underlying these debt trends have been buoyant housing markets and favourable financing conditions. These developments have been reinforced in several countries by financial liberalisation and innovation,[4] which have facilitated the access to credit of borrowers who were previously denied it and relaxed financing constraints on first-time homebuyers. One result is that homeownership rates have increased. Transactions and search costs have also been lowered and borrowing against existing collateral (mortgage equity withdrawal) has become cheaper and more readily available (Klyuev and Mills, 2006; Reserve Bank of Australia, 2006; and Danmarks Nationalbank, 2006). These, as well as, other reforms have allowed existing borrowers to expand their balance sheets, in the process, raising their net worth. In the wake of these changes, several countries with initially lower debt ratios have seen stronger debt growth compared with those with initially higher debt ratios. This has been particularly noticeable in Australia, the Netherlands, New Zealand and Spain. For a number of new European Union Member countries, one study suggests that the convergence in living standards towards that of the European Union average has also contributed to this rapid credit expansion (Coricelli *et al.*, 2006). Another important factor was the convergence of interest rates towards the comparatively low German levels with the creation of the single currency.

Macroeconomic measures of vulnerability

Assessing the health of household balance sheets

7. Household debt, expressed as a ratio of disposable income, has increased rapidly in most of the countries under study (Japan and Germany excepted). At the same time, there have also been important developments on the asset side of household balance sheets, and net wealth (total wealth less liabilities) has risen significantly (Table 1). By 2005, net wealth had grown to a level of about seven times disposable income in several countries. The recovery in equity prices since the bursting of the dotcom bubble in 2000-01 provided a boost to household wealth, but the gains for the most part have been due to a rise in the non-financial wealth component (Figure 2, upper panel), fuelled by large house-price increases. Such rises have been particularly pronounced in New Zealand and Spain. By contrast, in Germany and Japan, where declines in house prices have occurred, a notable increase in the share of housing assets in household portfolios was not recorded. In these economies, household gross wealth peaked earlier in the 1990s and has since stabilised.

8. The lower panel of Figure 2 shows that the increase in mortgage debt has, for the most part, been accompanied by gains in net non-financial wealth. The collateral position of households has accordingly improved in the majority of countries since the early 1990s, with Japan and Germany being exceptions. While part of the rise in assets may be illiquid, their large size provides households with a cushion that can be used to fund consumption or service debt, should they be hit by an adverse shock. Empirical evidence for several countries including the United States, the United Kingdom, Canada, Australia and New Zealand, all of which have fairly flexible mortgage markets, has shown that households with high housing wealth are better able to smooth consumption in the face of shocks (see for instance Beaumont, 2005; Lustig and Van Nieuwerburgh, 2004; and Hiebert, 2006).

4 . See Girouard *et al.* (2005) for a cross-country overview of financial innovations in mortgage markets.

Table 1. **Household debt and net wealth**

Per cent of annual disposable income

	Debt				Net wealth			
	1995	**2000**	**2005**		**1995**	**2000**	**2005**	
United States	93	107	135		510	575	573	
Japan	130	136	132	*	736	750	725	*
Germany	97	111	107		541	575	578	*
France	66	78	89		461	547	752	
Italy	32	46	59		702	820	936	*
United Kingdom	106	118	159		569	750	790	
Canada	103	114	126		370	527	640	
Australia	83	120	173		514	567	734	
Denmark	188	236	260	*	357	524	562	*
Finland	64	66	89		202	302	319	
Ireland		81	141			618	775	
Netherlands	113	175	246		369	528	515	
New Zealand	96	125	181		472	445	670	
Spain	59	83	107	*	540	646	935	*
Sweden	90	107	134		262	387	436	

Note: * for year 2004 instead of 2005. Debt refers to total liabilities outstanding at the end of the period. Net wealth is defined as non-financial and financial assets minus liabilities.

Source: See statistical annex.

9. The balance sheet positions of households are not, however, without risks. While in most countries, household net wealth positions look healthy, in several, leverage, defined as the ratio of debt-to-net assets, has been trending upward, raising vulnerability to asset-price declines (Figure 3).[5] There are a number of motivating factors behind these developments. For example, households have borrowed (either directly or through mortgage equity withdrawals) to finance pension and other asset acquisitions, some of which receive favourable tax treatment.[6] However, leverage has also been driven by buoyant housing markets, which has encouraged buyers to take out large mortgages on expectations of capital gains. For a number of countries, these price gains have been realised, and leveraged positions have increased only moderately. Nonetheless, even for these economies, given high levels of mortgage debt, leverage positions remain sensitive to changes in interest rates and asset prices (particularly house prices).

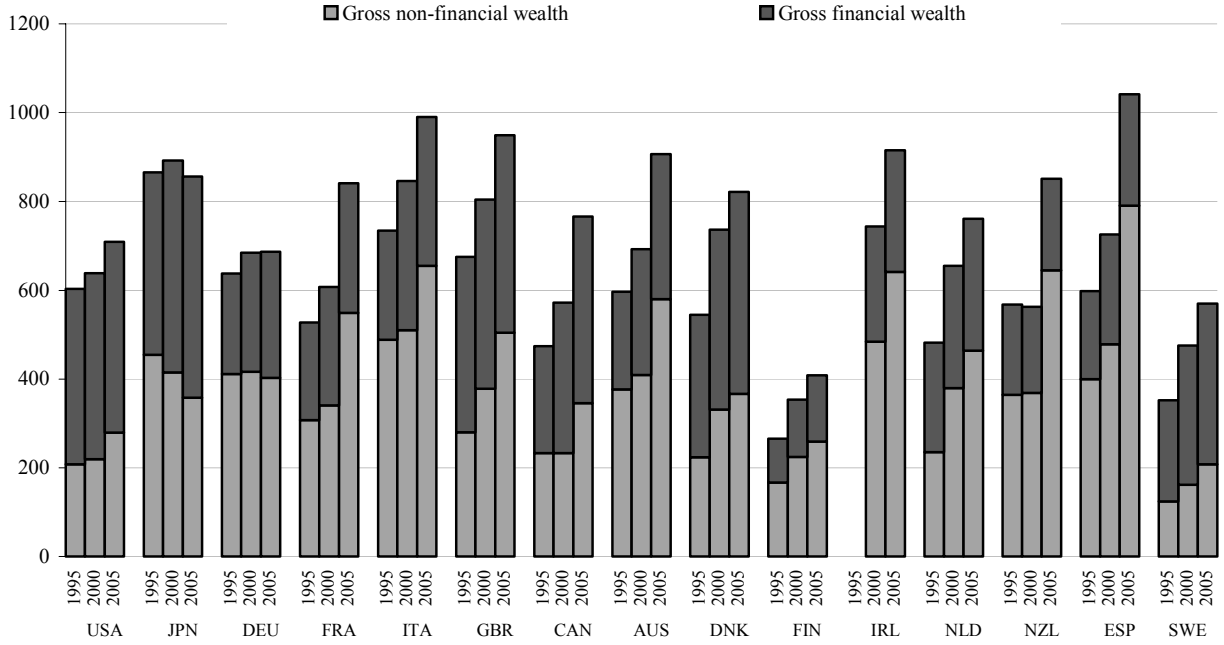
5 . Cross-country comparisons of household wealth are difficult to make because of institutional differences, *inter alia*, the sizeable amount of wealth held in the form of pension assets and family trusts outside household balance sheets. See Briggs (2006) for example in the case of New Zealand.

6 . See Catte *et al.* (2004), which summarises the different tax regimes affecting residential property prices.

Figure 2. Household wealth

Gross wealth and its components

Per cent of disposable income



Note: The latest data for Japan, Germany, Italy, Denmark and Spain are for 2004.

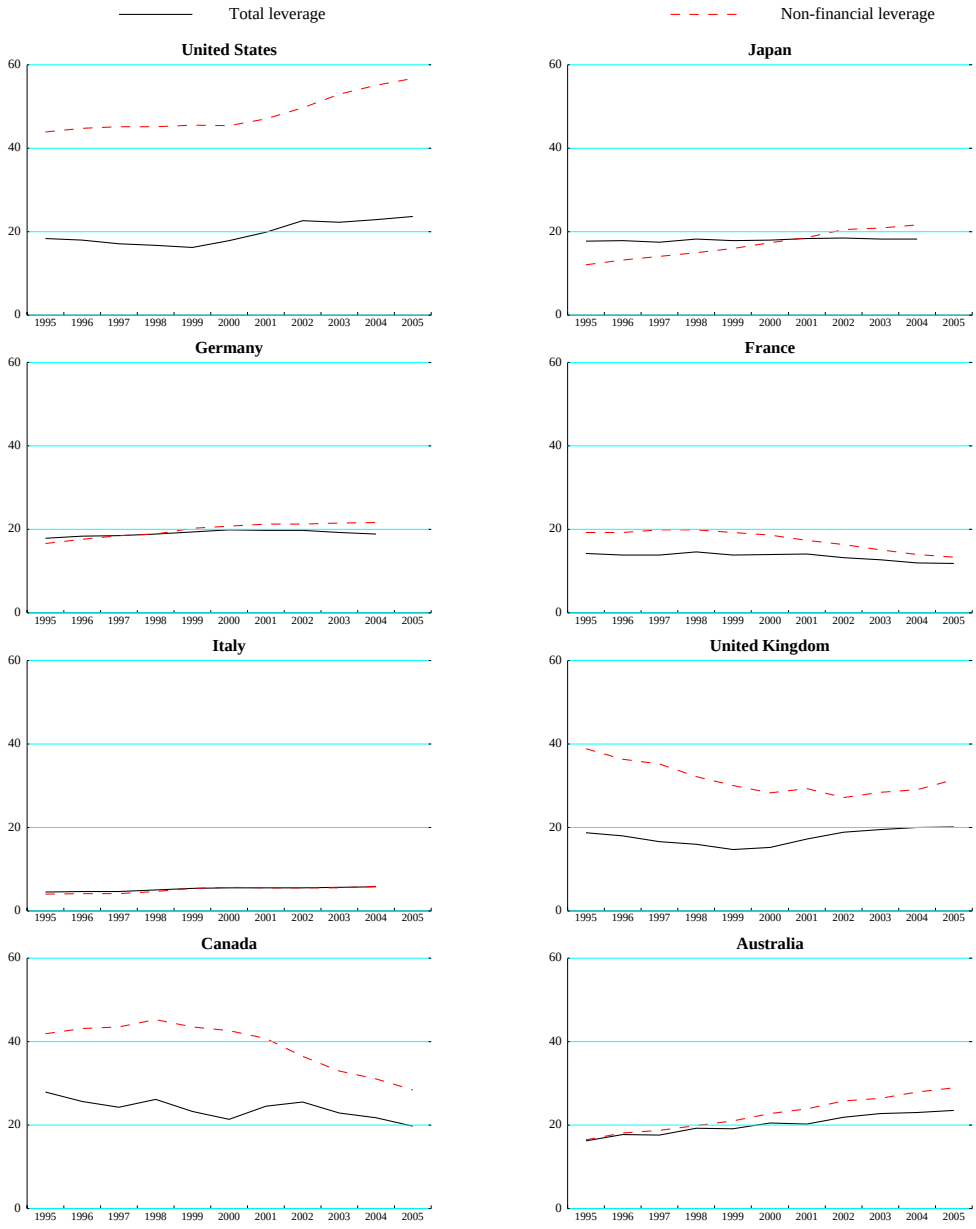
Net non-financial wealth and mortgage debt

Per cent of disposable income

Note: The latest data for Japan, Germany, Italy and Spain are for 2004. Net non-financial wealth is defined as non-financial wealth minus mortgage debt.

Source: See statistical annex.

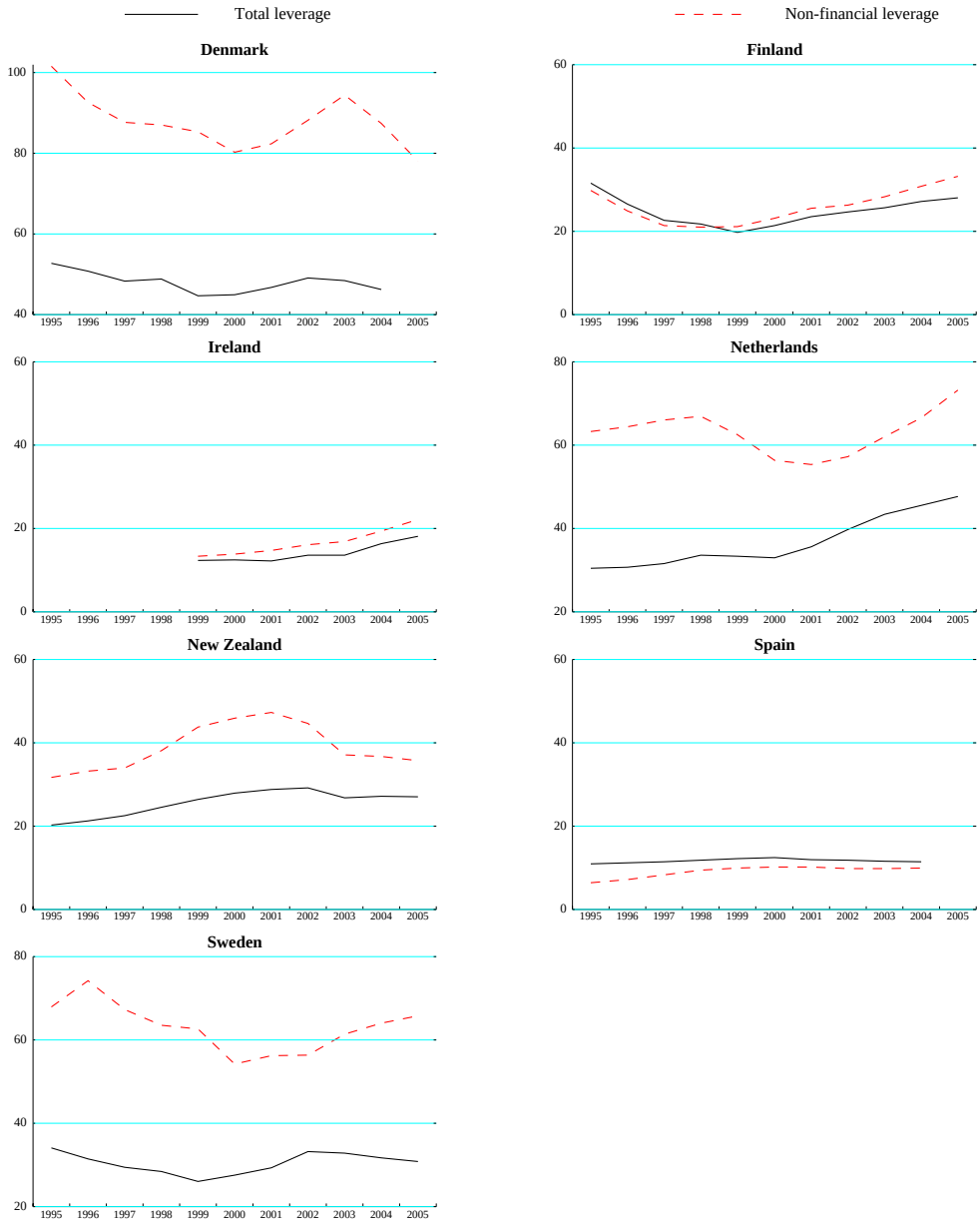
Figure 3. Households leverage ratios
Liabilities as a percentage of net wealth



Note: Total leverage is defined as total liabilities divided by net wealth and non-financial leverage as mortgage debt divided by net non-financial wealth.

Source: See statistical annex.

Figure 3. Households leverage ratios (cont.)
Liabilities as a percentage of net wealth



Note: Total leverage is defined as total liabilities divided by net wealth and non-financial leverage as mortgage debt divided by net non-financial wealth.

Source: See statistical annex.

Evaluating households' debt-servicing capacity

10. A sharp rise in interest rates or a negative hit to incomes, in addition to any effect it would have on net wealth positions, would push up debt-service ratios -- the fraction of disposable income devoted to debt repayment. The speed and extent of any rise in repayments would be related to the characteristics of the debt (most importantly, its maturity and composition between fixed and variable rate instruments). A rise in debt-service burdens could constrain households' access to credit, affecting their ability to smooth consumption in response to shocks. Two measures of debt-servicing capacity are examined here: one based on interest payments only and another that takes account of interest payments and principal repayments (Figure 4).[7, 8] The interest-and-principal measure is more comprehensive and more likely to provide a better picture of how households are faring but it is available for only a limited number of countries. Households facing debt service burden of over one third of their income and total debt-service costs (including student loans, autos loans and credit card payments) in excess of 40% of their income can be categorised as risky borrowers (see for instance Alexander, 2006 and ECB, 2005).

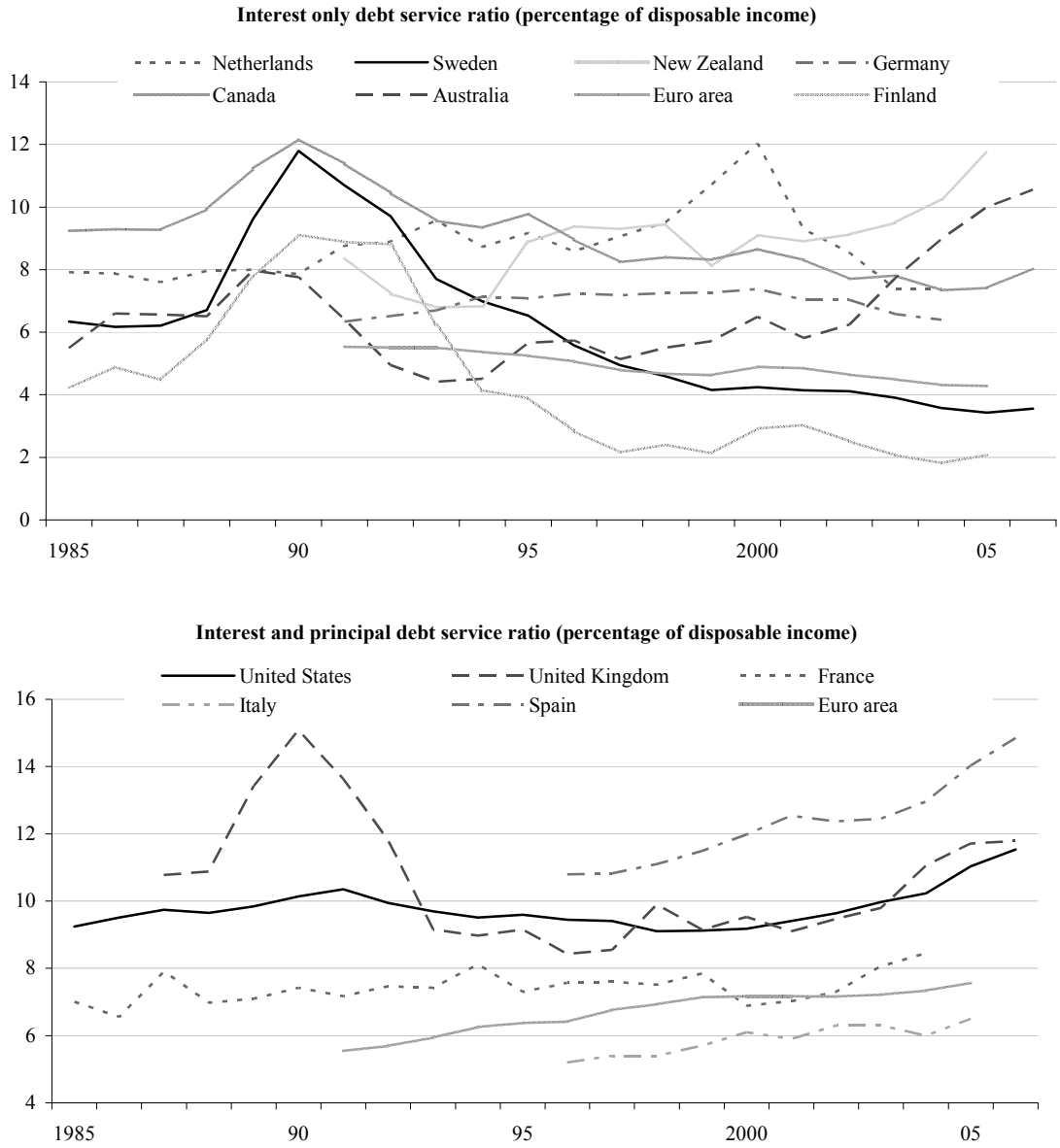
11. The interest-service burdens have been relatively stable since peaking in the late 1980s and early 1990s (the exception is the Netherlands), with the general increase in indebtedness having been mostly offset by declines in borrowing costs (Figure 4, upper panel). However, more recently, in Australia and New Zealand, the interest-burden ratio has risen rapidly, reaching respectively 8½ and 12% of disposable income in 2005. The more comprehensive measure of the debt-service burden has increased for all of the countries for which data are available (Figure 4, lower panel). In the United States, the United Kingdom, France and Italy, the debt-service ratio has recently started to rise slightly while in Spain, this ratio has been increasing continuously over the past decade. A broader measure, produced by the US Federal Reserve Board, takes account of additional obligations like automobile lease payments, housing rents, insurance and property taxes to calculate a financial obligations ratio. This measure has been rising steadily over the past two decades and now stands just over 19% of disposable income, compared with just over 11% for mortgages.

12. Several factors are affecting trends in the aggregate debt-service ratio. First, the composition of the pool of homeowners has been changing. Over the 1990s, homeownership has risen, in part because of new mortgage products facilitating housing acquisition by borrowers with limited funds for a down payment. These new homeowners, who would have previously been renters, have entered the homeowner market with high debt levels relative to their income and this has been a contributing factor to the rise in the aggregate debt-service measure. In the United States, the increase in homeownership during the 1990s was concentrated among households with limited funds for a down payment (see Dynan *et al.*, 2003 and Bucks *et al.*, 2006). Second, loan maturities have increased in a number of countries and this has brought down annual amortisation.

7. Data on debt-servicing burdens are not strictly comparable across countries. Variations in estimates are based on different assumptions relating to the average maturity of households' loans, the structure of debt in terms of mortgage loans and other loans and the interest paid on different kinds of household loans.

8. Debt-service ratios for homeowners and renters are distributed differently across loan types. Mortgages are the dominant component of homeowners' debt, whereas credit cards, auto and student loans are the major components of renters' debt. As a result, changes in mortgage interest rates will affect the debt-service ratio only of homeowners, whereas changes in consumer loan interest rates will disproportionately affect the debt-service ratio of renters. In the United States, the debt-service ratio for renters is substantially higher than that for homeowners because of the greater share of income devoted to rent and consumer debt payments, see Bucks *et al.* (2006).

Figure 4. Household debt service burdens



Note: Data for the United States and France refer to mortgage debt and for other countries to total household debt.

Source: National central banks and European Central Bank.

13. The third factor affecting households debt service burden is housing equity withdrawal and re-financing. These vehicles have allowed homeowners to take advantage of lower interest rates to reduce their monthly payments and, in several countries, to extract some of the built-up equity in their homes.[9] Mortgage refinancing at lower rates clearly reduces debt service burdens, even if most of the proceeds are spent. On the other hand, the housing equity withdrawal effect is ambiguous. It increases household debt service burden, even if most of the proceeds are reinvested. But if the proceeds are used to payoff debt with higher interest rates, the debt service burden will decrease. In the United States and the United Kingdom, these two effects seem to have been partly offsetting. Some of the equity extracted has been used to pay down more expensive consumer debt or to make purchases that would otherwise have been financed by more expensive and less tax-favoured credit. At the same time, a number of homeowners have also taken advantage of house price inflation to increase their borrowing by re-mortgaging.

14. Another development that has implications for vulnerability is the changing composition of debt away from fixed rate and towards more flexible instruments. These newer types of loans come in several forms, including instruments with rates that move with market interest rates, products that allow borrowers to pay only interest instead of the conventional interest-plus-principal or to pay less interest than is accrued (negative amortisation loans that lead to rising loan principal balances), as well as loans with various combinations of initially reduced rates and rapid reset conditions. These instruments have the effect of lowering initial monthly payments but at the expense of incurring the risk of larger payments later should mortgage rates be readjusted upward. However, the flexibility of mortgage markets in several countries has allowed households to switch to fixed-rate instruments very rapidly and with little cost. For example, the United Kingdom, which has traditionally been regarded as a variable rate country, is reporting a higher proportion of initial fixed rate mortgage loans than variable rate loans since mid-2005.[10] The contracting of mortgage loans with adjustable rates has been generally more prevalent in the United Kingdom, Italy, Australia, Finland, Ireland and Spain than in the other countries (Figure 5, upper panel).

15. To date, there have been few signs at the aggregate level that households are having trouble meeting payment obligations. A commonly used indicator of debt-repayment ability, the delinquency rate,[11] shows that arrears on housing loans held by banks have been trending down, or have remained quite low relative to the average of the past decade (Figure 5, lower panel). Indeed, the downward trend in delinquencies has reflected growing credit availability, falling interest rates and longer maturities. However, lags in the response of arrears to increasing debt ratios may be significant.[12]

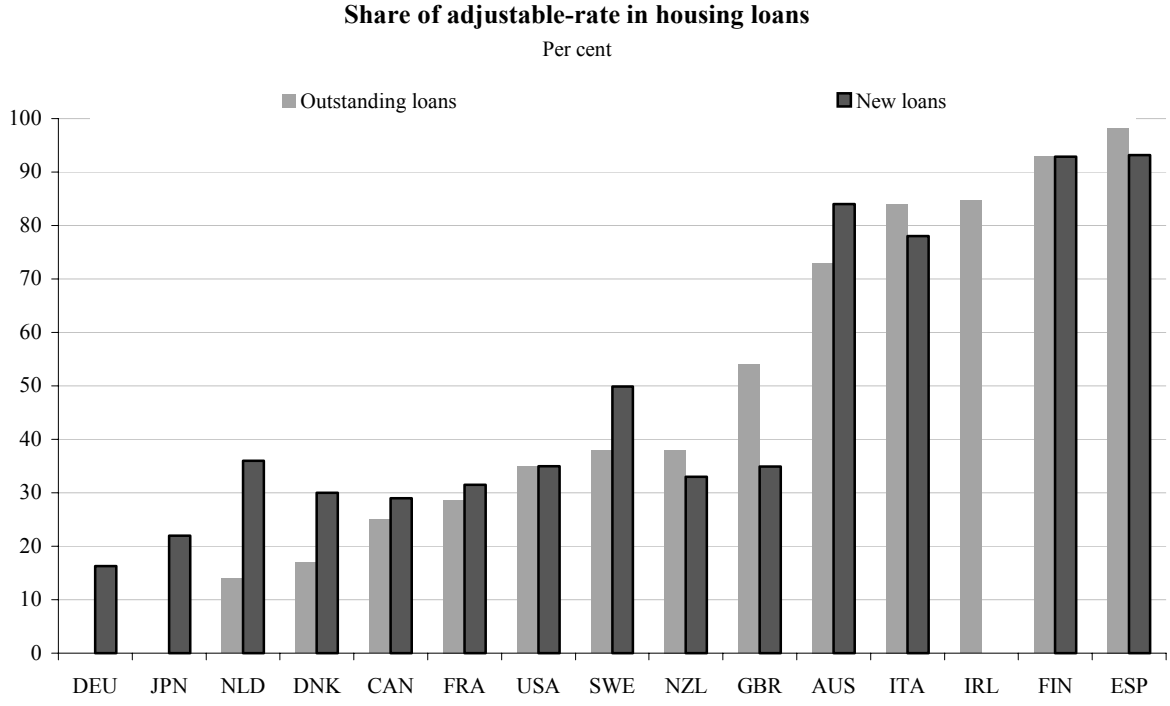
9 . See for instance Greenspan and Kennedy (2005), Klyuev and Mills (2006), Schwartz *et al.* (2006) and Riksbank (2005b) for a discussion of the effects of mortgage-equity withdrawal on consumption.

10 . For a comprehensive review of the different types of mortgage interest rates in Europe, see European Mortgage Federation (2006).

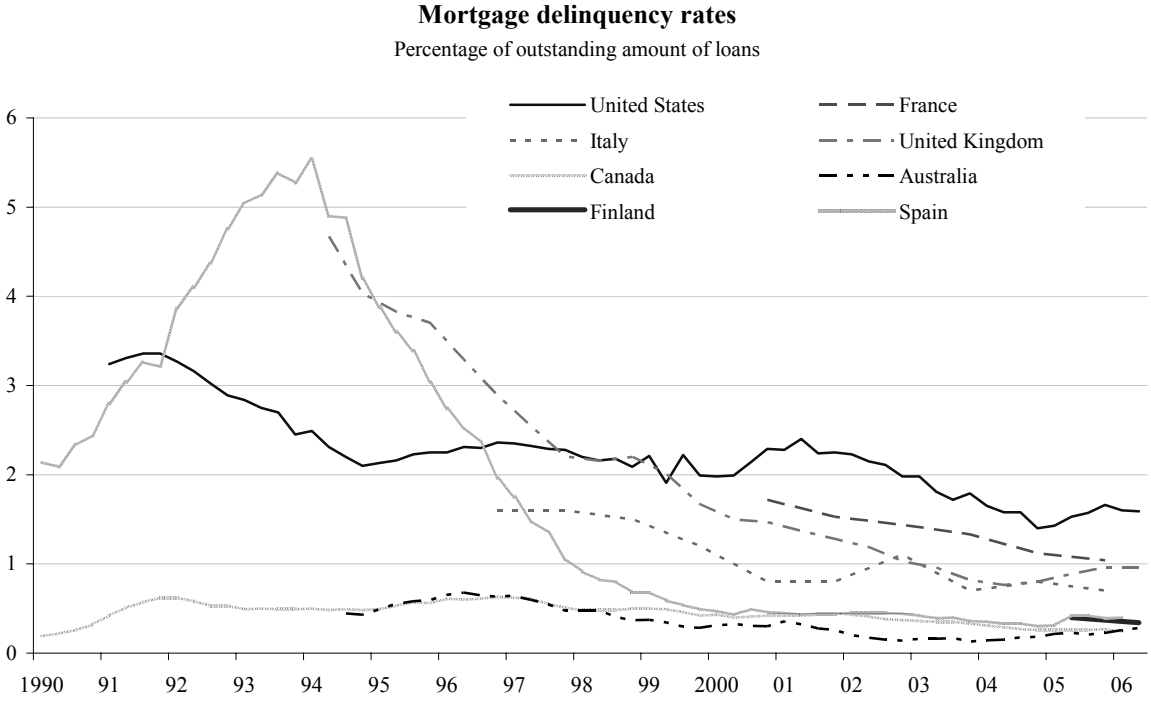
11 . The standard definition of credit delinquency is loans that are in repayment default for at least three months. The main difference across countries is how these loans are defined, *i.e.* how long it takes before the loan can be judged as non-recoverable and hence can be written off as a loss for the credit institution. The timing of this process depends on national regulation. In France and Italy, the time before a loan can be written off is particularly long, thus the same loan can be counted as non-performing for several years while in other countries it will be considered as non-performing for no more than six months. This partly accounts for the fact that in France and Italy the stock of delinquency loans as a proportion of the total loans' stock is larger (see Moody's, 2003).

12 . In the literature, there is no agreement about which financial indicator is the most important predictor of households' delinquency, see, for example, Rinaldi and Sanchis-Arellano (2006); Duygan and Grant (2006); Diaz-Serrano (2004); and May and Tedula (2005).

Figure 5. Adjustable rate loans and vulnerability



Note: Latest year for which data are available. For further detail, see statistical annex.



Note: Loans refer to mortgages for all countries except Finland and Italy where they include all loans to the households sector. For Italy, they refer to new bad debts during the year as a percentage of outstanding loans.

Source: See statistical annex.

The level of risks borne by credit institutions appears to have increased

16. The relaxation of credit standards and the growing use of payments reduction features in mortgages have, however, increased credit risk in mortgage markets (Frankel, 2006). Several banks and other private financial institutions have recently specialised in offering "affordable" loan products. These non-conventional housing loans with weaker standards are likely to appeal more to consumers with low credit ratings who may find it difficult to obtain finance from traditional sources. These mortgages are often used to consolidate existing (secured and unsecured) debts. In Australia and in the United States, for instance, a much higher proportion of non-conventional borrowers (compared with those who use more conventional instruments) are behind schedule on their loan repayments. According to the Reserve Bank of Australia (2005), nearly 4% of the value of securitised non-conventional loans was in arrears, compared to only 0.2% of both other securitised and bank's housing loans. In the United States, the delinquency rate for sub-prime mortgages is estimated to be around seven times that of prime mortgages. Moreover, in the United States, such loans accounted for less than 50% of government sponsored enterprises and pools issuance in 2001, but for more than three quarters in 2005.

17. At the same time, in several countries, banks and other private financial institutions have increased the proportion of mortgage loans in their overall lending to the households sector. In the United States for instance, the fraction of outstanding residential mortgage debt held by banks and other private institutions has risen by more than 10 percentage points although the share of government sponsored enterprises and pools dropped by 10 percentage points. While in these traditional financial institutions[13] a uniform interest rate for almost all (prime or near prime) loans continues to apply, a pattern which is sustainable in part because the credit quality of the underlying household panel is good and rather homogeneous, in other institutions, mortgage rates tend to vary in line with the default probabilities suggested by the standard distributions of households' credit scores. On the other hand, increased securitisation of mortgage loans has allowed banks to improve their risk management.

Evidence from micro data

18. Aggregate measures of household debt only provide information about the position of the household sector as a whole or some notional average household. As such, these indicators mask important disparities in financial conditions across different segments of the population due to the substantial heterogeneity among households. In this respect, analysis using micro data indicators can potentially help identify pockets of fragility within the sector. This section summarises the results of various studies that have used household-level surveys for particular countries to analyse the financial position of the sector. While the methodologies may differ, the results of these studies may provide complementary information on vulnerability to that obtained from macro measures.[14]

13 . Traditional agency mortgage pools include securities by GNMA, FNMA, FHLMC, FAMC and the Farmers Home Administration.

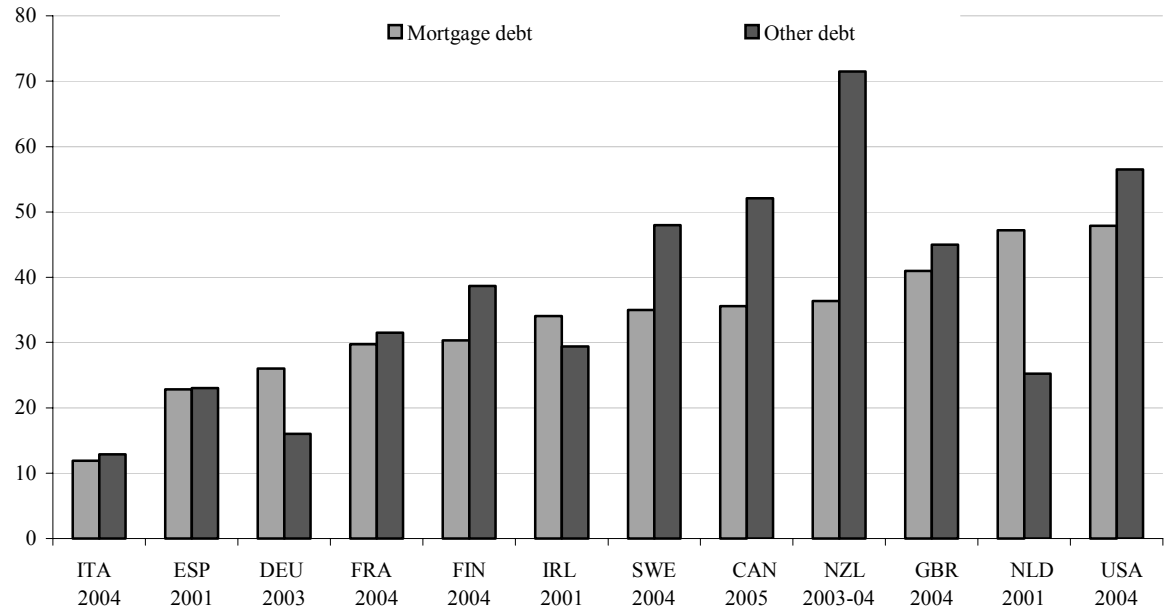
14 . The Statistical Annex reports the sources of the different household surveys.

Household indebtedness by age and income group[15]

19. The share of households with mortgage and non-housing debt varies greatly across countries (Figure 6), with Italy and Germany at one extreme and the Netherlands and the United States at the other. Repeated cross-sectional analyses report that, since the late 1990s, the fraction of household with debt has increased slightly in the United States and in the Nordic countries, while it has remained roughly unchanged in Canada and the United Kingdom. Such analysis is not available for the other countries studied here.

Figure 6. Proportion of households holding debt

Per cent



Note: Some households may be holding both categories of debt.

Source: See statistical annex.

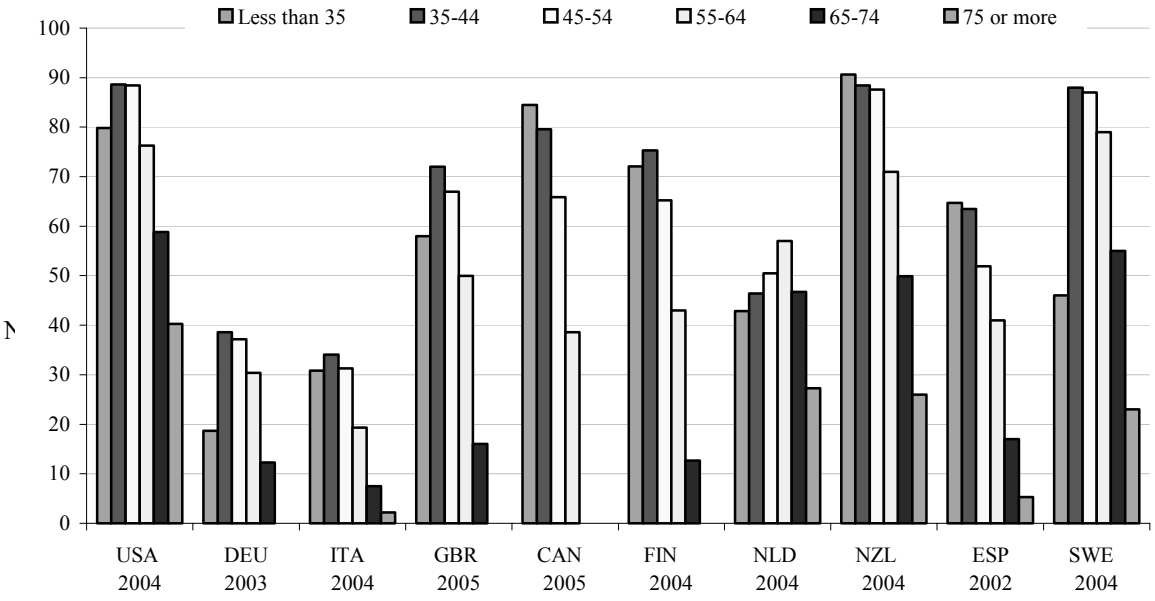
20. Debt-holding patterns are generally consistent with predictions from the life-cycle theory of consumer behaviour. The percentage of indebted households peaks among young households (less than 35 years of age) or households in the middle-age groups (Figure 7, upper panel). Within these age groups, the percentage of indebted households often exceeds 70%. Debt holding declines sharply for those aged over 65, especially in the United Kingdom, Germany, Italy, Finland and Spain.

15 . Empirical analysis of the determinants of household debt using aggregate and cross section data include Magri (2002) for Italy; Barnes and Young (2003) for the United States; Tudela and Young (2005) for the United Kingdom; Central Bank and Financial Services Authority of Ireland (2005); Herrala (2006) for Finland; Zochowski and Zajaczkowski (2006) for Poland and Crook and Hochguertel (2006) for several OECD countries.

Figure 7. Debt holding patterns

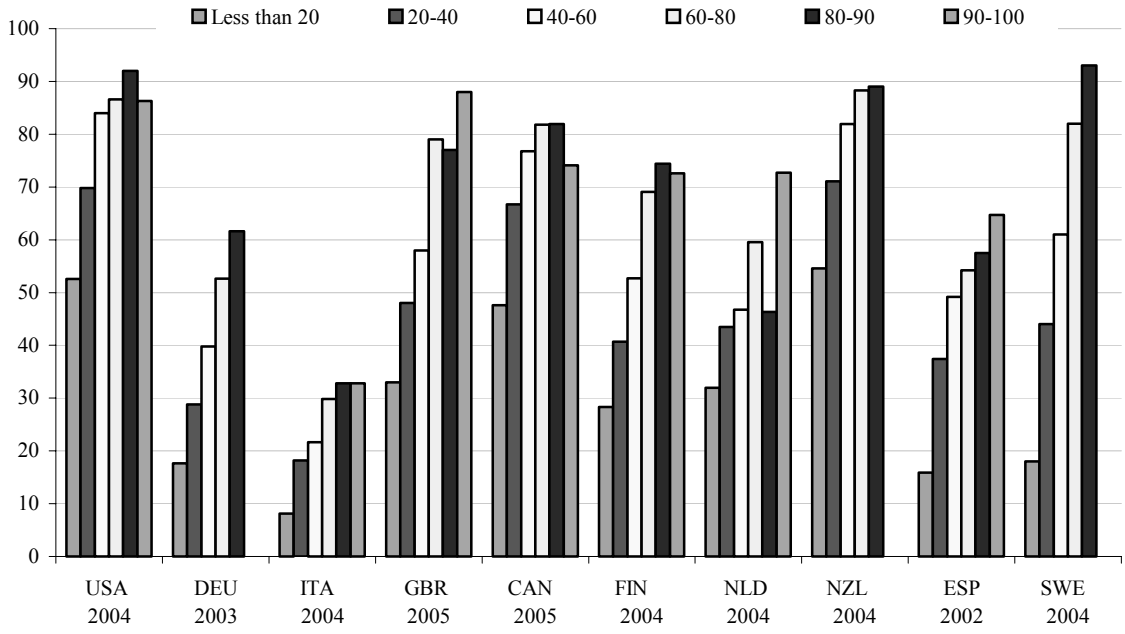
Percentage of indebted households

By age



Note: For Germany, the United Kingdom and Finland, the last age group is 65 or more. For Canada, the groups are less than 35, 35-49, 50-64 and 65 or more.

By percentile of income



Note: For Germany, New Zealand and Sweden, the last group is 80-100.

Source: See statistical annex.

21. The lower panel of Figure 7 shows that borrowing has been mostly undertaken by households with the highest incomes. In the United States, the United Kingdom, Canada, Finland, New Zealand and Sweden, the proportion of indebted households in the upper income group exceeds 80%. The share of indebted households in the lower income group is nonetheless high in the United States, Canada and New Zealand, relative to other countries. For the countries for which a time perspective is available, the share of indebted households in the lowest income groups has increased the most since the end of the 1980s, reflecting the effect of the liberalisation of credit markets on the group of households which previously were most subject to credit rationing.

22. Table 2 shows the median value of debt holdings for those individuals with debt according to their age (as a percentage of *per capita* income). The median value of the debt is equal to the value that comes mid-way in the debt distribution. This measure is less sensitive to the extremes of the distribution

Table 2. Distribution of household median debt

Percent of overall per capita income

Median debt by age

	Less than 35	35-44	45-54	55-64	65-74	75 or more
United States (2004)	114	295	281	162	85	52
Italy (2004)	95	95	76	51	32	46
Netherlands (2004)	720	741	538	453	360	405
New Zealand (2004)	126	342	281	68	7	3
Spain (2002)	300	219	137	105	57	92
Sweden (2004)	269	417	374	361	211	124

	Less than 35	35-44	45-54	55-64	65 or more
Germany (2003)	610	626	612	518	337
United Kingdom (2005)	81	375	226	103	34
Finland (2004)	100	316	182	88	55

	Less than 35	35-49	50-64	65 or more
Canada (2005)	257	277	119	36

Median debt by income

	Less than 20	20-40	40-60	60-80	80-90	90-100
United States (2004)	24	54	151	316	460	707
Italy (2004)	44	57	51	76	101	171
United Kingdom (2005)	38	30	113	264	263	780
Canada (2005)	26	92	256	348	416	537
Finland (2004)	34	96	210	312	292	350
Netherlands (2004)	208	542	528	640	686	686
Spain (2002)	93	107	166	207	213	384

	Less than 20	20-40	40-60	60-80	80-100
Germany (2003)	430	430	496	613	1017
New Zealand (2004)	27	39	153	284	549
Sweden (2004)	99	107	176	311	622

Source: See statistical annex.

and therefore provides a better picture of the typical household's debt than the average debt.[16] The median value of debt peaks for households in the 35 to 44 age category for almost all of the countries under review, reflecting the larger number of first-time homebuyers in this group. Indeed, the share of the population at household formation age (24 to 44 year old) has increased rapidly since the mid-1990s in the United States, the United Kingdom, Australia, Ireland, Netherlands and Spain. Median debt in the middle age group (aged 45 to 54) has also been relatively high, and the fact that the number of households in this group has recently risen may help to explain the aggregate increase in debt. The median debt falls steadily through middle age before dropping off more sharply for those aged over 65; the fall in median debt for this category is essentially related to paying down mortgages.

23. The median value of debt holdings rises across income groups, reflecting considerable borrowing to fund assets by high-income earners. Households in the top income percentiles account for the largest part of the aggregate debt. In contrast, households in the bottom one make up a very small share of aggregate debt.

Debt-servicing burdens by age and income group

24. In order to further assess the macroeconomic risks implied by the debt-servicing burden, it is instructive to consider different income and age categories. For example, for lower-income households, income and interest rate shocks may imply greater financial duress as they tend to have lower saving ratios and will probably also have less collateral or financial reserves. Their share in the total distribution could matter for macroeconomic outcomes.[17]

25. Figure 8, upper panel shows that the median debt-service ratio has been highest in the younger age groups (less than 35 and 35 to 44), likely reflecting that these households are first-time homebuyers. However, middle-age households (45 to 54), who also hold a large share of debt (Table 2), have a lower debt-service burden. Overall, for all the countries under review, households have recently devoted less than a quarter of their income to debt servicing. For the United States, for which there is information, the debt-service ratio distribution seems to have drifted up slightly for most age groups over the past decade, consistent with the trend in the aggregate data (Doms and Motika, 2006). While recent micro data for France are not available, the 2000 debt service ratio per income deciles indicated a burden roughly similar to the US profile (Bourdin, 2006).

26. The median debt-service burden indicator suggests that indebted households in the highest income groups are better able to service their debt (Figure 8, lower panel). They have median interest-to-income ratios close to 15% for most of the countries under review. The main exception is Finland, where the highest income households have much higher debt service burden than the lowest, but they still enjoy an interest to income ratio of less than 10%, *i.e*. much lower than in any other country. In Italy and New Zealand, the debt servicing ability at the bottom income groups is extremely weak; however, these households have not taken on much debt.

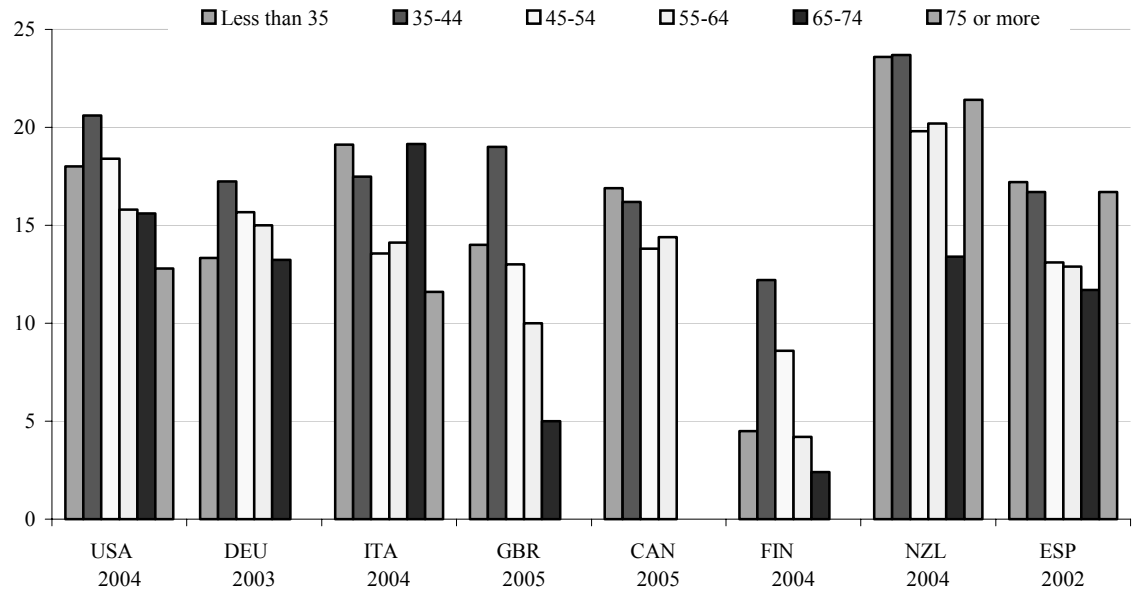
16 . Due to the lack of availability of data on income distribution, the median debt has been normalised by household disposable income at national level divided by population.

17. See for example, Herrala and Kauko (2006) who used Finnish household micro data to estimate the effect of interest rate changes (and other shocks) on household distress and bank loan losses.

Figure 8. Distribution of debt service burden of indebted households

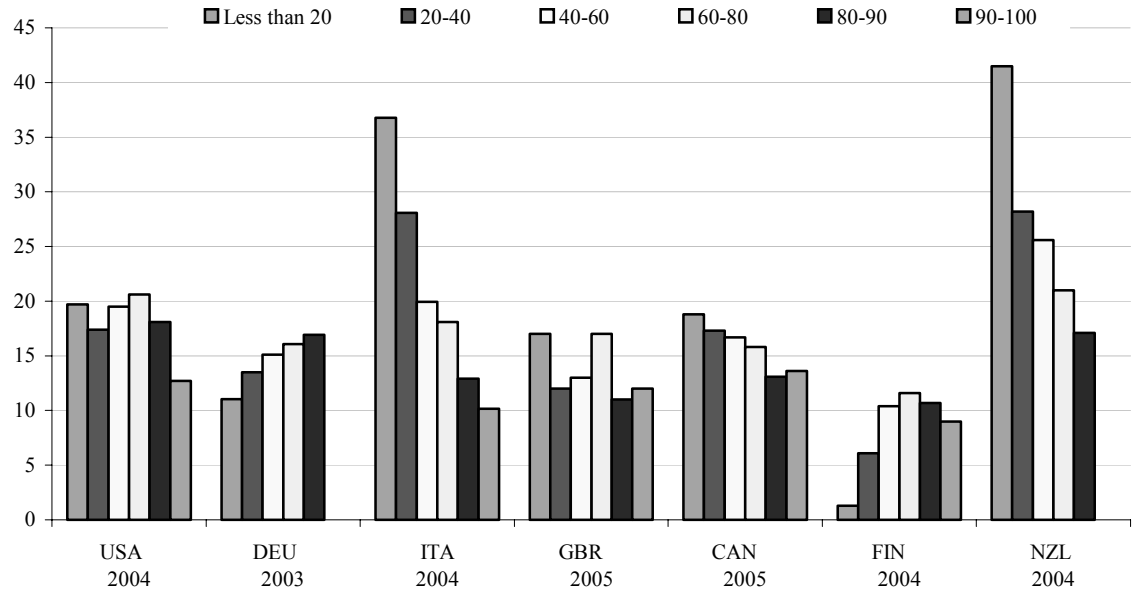
Per cent of disposable income

By age



Note: For Germany, the United Kingdom and Finland, the last age group is 65 or more. For Canada, the groups are less than 35, 35-49, 50-64 and 65 or more.

By percentile of income



Note: For Germany and New Zealand the last group is 80-100.

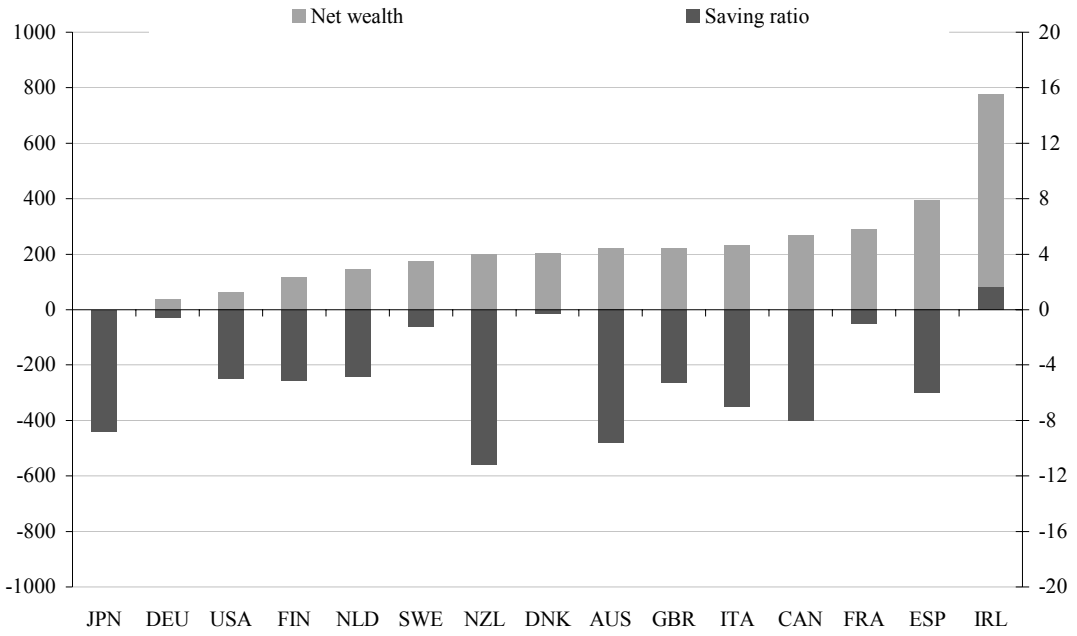
Source: See statistical annex.

Households borrowing and saving: Risks to the wider economy

27. Large rises in asset prices and the fall in inflation have allowed households to achieve a given level of wealth with less saving. Rising asset valuations, which households seems to view as a substitute for active savings in lifetime wealth building, have certainly contributed to the drop in the saving ratio during the 1990s. In addition, the flexibility and liquidity of mortgage markets in several countries, has helped households to rely on housing as a source of saving or investment. Figure 9 shows such a negative relationship between the changes in the saving ratio and the change in net wealth over the past decade for most countries. The main exceptions are Japan where the collapse of asset prices has kept the stock of wealth flat in relation to income and Ireland, where the strong economic performance has raised household's income and encouraged an increase in the level of savings.

Figure 9. Changes in saving ratios and wealth (1995-2005)

Percentage points of disposable income



Note: Change over 1995-2004 for Japan, Germany, Italy, Denmark and Spain.

Source: See statistical annex.

28. The extent to which the declining trend in saving ratios can be explained by net wealth developments can be assessed using a simple econometric relationship. An equation for household saving behaviour focussing on a reduced set of explanatory variables including the net wealth-to-disposable income ratio, inflation, real interest rates and unemployment rates has been constructed. As discussed above, the wealth variable is meant to capture the extent to which households perceive asset appreciation to be a substitute for saving out of income. The effect of an increase in the real interest rate on saving is ambiguous in theory. The higher reward from saving may be offset by an income effect if net financial assets are positive. Empirical studies have tended to find mixed results (de Serres and Pelgrin, 2002)

although the substitution effect seems to dominate. The inflation variable captures the precautionary saving motive in the face of higher uncertainty. Finally, a time trend has been used in some equations to capture the effects of financial deregulation and innovations which have expanded household access to borrowed money and reduced the need for precautionary saving. Annual data were used, with the estimation period ranging from 1980 to 2005, according to data availability.

29. A great part of the variance of the saving ratio can be explained by the wealth-to-income ratio alone or by this ratio and a limited number of additional variables. For 12 countries out of the 15 included in the sample, a negative and significant relationship between the saving rate and household net wealth is estimated, with coefficients ranging between -0.01 and -0.06 (Table 3). Thus, an increase in the wealth to income ratio of 100 percentage points decreases the saving ratio by 1 to 6 percentage points. These coefficients are of similar magnitude as those reported in other studies (Catte *et al.*, 2004; Hiebert, 2006; Klyuev and Mills, 2006; and Lansing, 2005). For Japan, Ireland, Denmark and New Zealand, it was not possible to find a long run relationship due to the lack of sufficiently long time series. The above results suggest that the long decline in saving ratio in several countries seems to be a behavioural response to the long expansions in stock and housing markets together with falling interest rates over the same period (Figure 10).

30. In those countries where wealth valuation effects have increasingly been used as a substitute for personal saving, a marked fall in asset values has the potential to trigger a compensatory increase in the saving ratio, implying a slowdown in household consumption. This could have significant effects on the overall economy, given the importance of private consumption in national income, thereby also possibly adding to any stain on financial sector balance sheets. In the United States, however, the possibility of cooling asset markets and raising borrowing costs may move the saving ratio to a level which is more in line with historical averages. While such a development would act as a short-term drag on household spending and GDP growth, an increase in domestic saving would probably help correct the large imbalance that exists in the US current account.

Table 3. Regression results for household saving

	Australia	Canada	Finland	France	Germany	Italy	Netherlands	Spain	Sweden	United Kingdom	United States
Net wealth (% of disposable income)	-0.05***	-0.02**	-0.05***	-0.02***	-0.05***	-0.01***	-0.04***	-0.01***	-0.06***	-0.03***	-0.04***
Real short-term interest rate		0.62***	0.51***	-0.96***							0.55***
Real long-term interest rate						1.13***			-0.79***	-0.57*	
Inflation		0.93***				0.77***					0.29**
Unemployment rate		1.02***							0.80**		
Sample	1992-2005	1980-2005	1980-2005	1980-2005	1991-2004	1980-2004	1980-2005	1990-2004	1980-2005	1987-2005	1980-2005
R^2	0.87	0.97	0.66	0.75	0.84	0.95	0.74	0.47	0.64	0.85	0.89
SE of regression	1.45	0.96	2.00	0.97	0.49	1.67	1.07	1.55	2.41	1.02	1.13

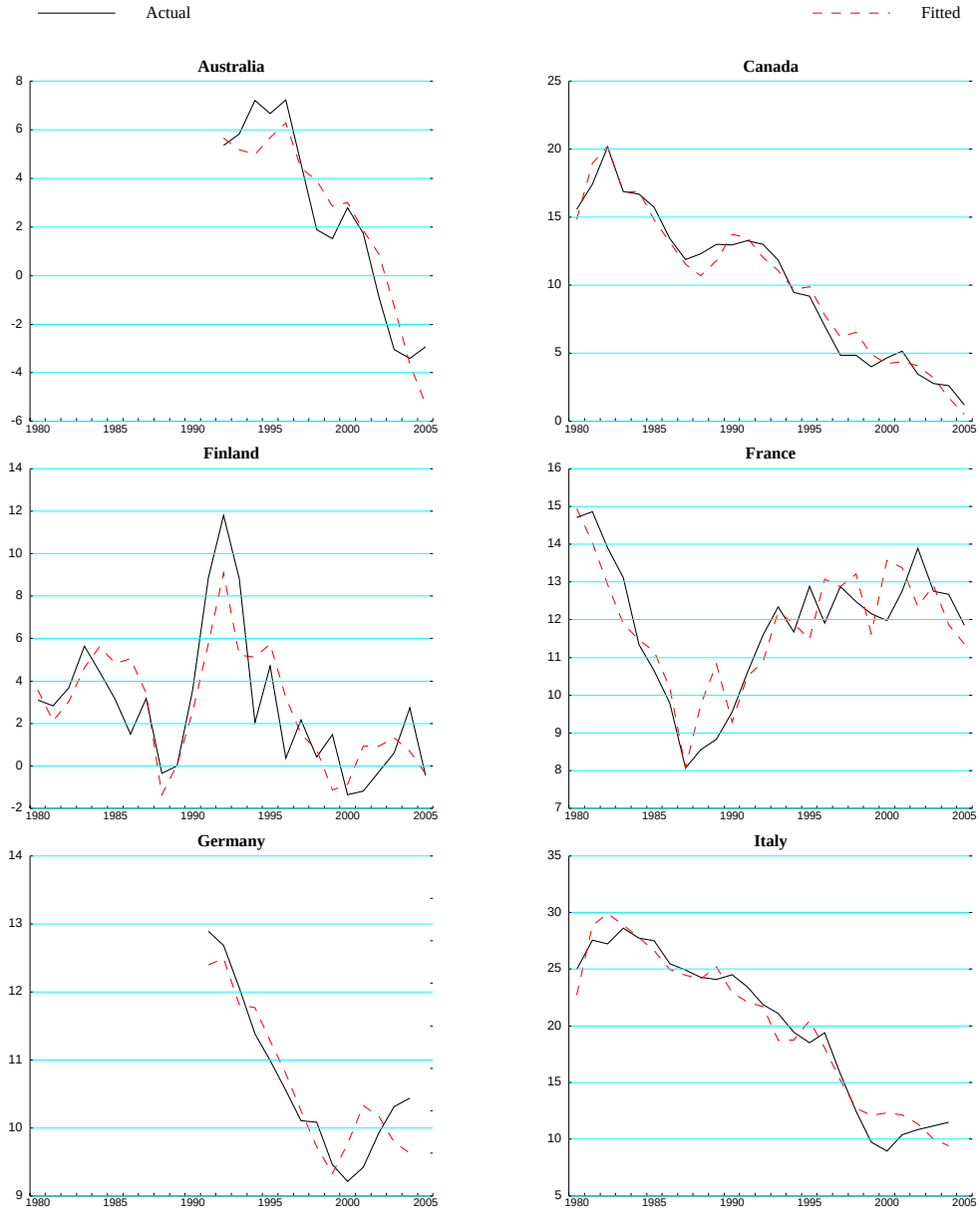
Endogenous variable: Gross saving ratio for Spain and the United Kingdom, net saving ratio for other countries.

Note: *, **, *** indicate statistical significance of coefficients at the 10%, 5% and 1% level respectively. For Finland, France, the Netherlands and Sweden, the regression includes a time trend. Net wealth is defined as total assets minus total liabilities, inflation is measured by the change in the consumer price index, real short-term and long-term interest rates are respectively the 3-month money market rate and the 10-year government bond yield, minus the inflation rate.

Source: OECD calculations. Data sources: See statistical annex, and OECD Economic Outlook 80 database.

Figure 10. Households saving ratio
Per cent of disposable income

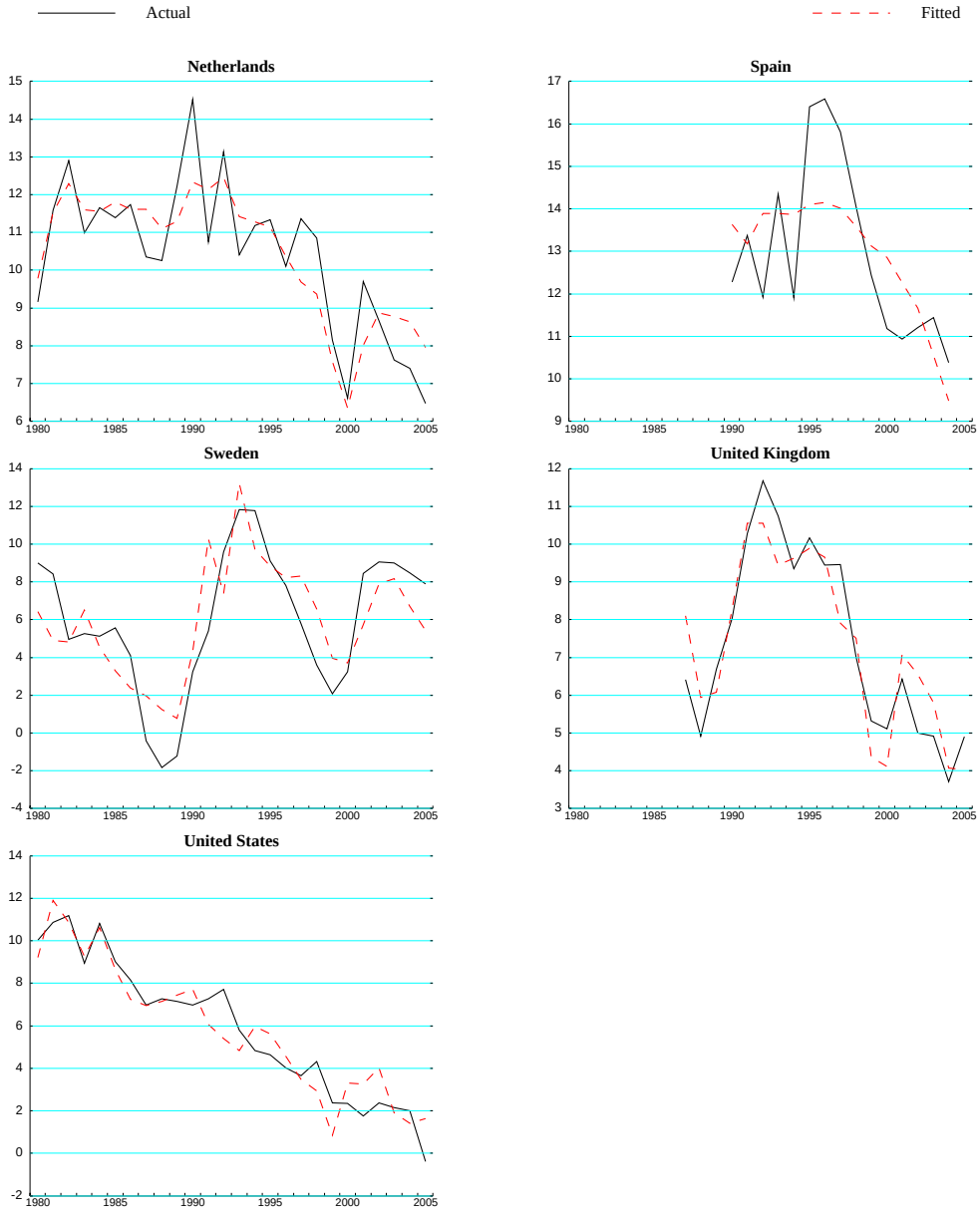
Actual and fitted values (different scales)



Note: The saving ratio is gross for Spain and the United Kingdom and net for other countries.
Source: OECD calculations.

Figure 10. Households saving ratio (cont.)
Per cent of disposable income

Actual and fitted values (different scales)



Note: The saving ratio is gross for Spain and the United Kingdom and net for other countries.
Source: OECD Calculations.

STATISTICAL ANNEX

31. This statistical annex details the macro and micro data sources used for this study. There are three main differences between macro and micro data on the household sector's assets and liabilities:

- First, unincorporated businesses and non-profit institutions are included only in the macro data.
- Second, the level of detail between the two sources differs (for example, as concerns the treatment of managed accounts such as trusts and estate investment funds).
- Finally, the valuation methods for various assets and liabilities differ.

Sources for the macroeconomic data

Household assets and liabilities

32. Data for household assets and total liabilities (amounts outstanding at the end of the period) are based on the UN System of National Accounts 1993 (SNA 93) and, more specifically, for European Union countries, on the corresponding European System of Accounts 1995 (ESA 95). Households include non-profit institutions serving households. Households also include self-employed persons and sole proprietors, except in the United States. Net wealth is defined as non-financial and financial assets minus liabilities.

33. Non-financial assets consist mainly of dwellings and land. For Germany, Italy and the United States, data also include durable goods. For Canada, France, Japan, the United Kingdom and the United States, data also include non-residential buildings and fixed assets of unincorporated enterprises and of non-profit institutions serving households, although coverage and valuation methods may differ. For Denmark, housing wealth has been estimated using the stock of dwellings at constant prices and house price data from Statistics Denmark. For Sweden, housing wealth data are from the Bank of Sweden. Net non-financial wealth is defined as financial assets minus mortgages.

34. Financial assets comprise currency and deposits; securities other than shares, loans, shares and other equity; insurance technical reserves; and other accounts receivable/payable. Not included are assets with regard to social security pension insurance schemes. Equities comprise shares and other equity, including quoted, unquoted and mutual fund shares. Net financial wealth is defined as financial assets minus financial liabilities excluding mortgages.

The sources for these data are:

Australia: Australian National Accounts, Financial Accounts.

Canada: Statistics Canada, Bank of Canada.

Denmark: Statistics Denmark.

Finland: Bank of Finland.

France: INSEE, *Rapport sur les comptes de la nation*; Banque de France.

Germany: Deutsche Bundesbank, *Monthly Report* and *Financial accounts for Germany 1991 to 2005*, Special Statistical Publication, 2006.

Ireland: Central Bank and Financial Services Authority of Ireland, *Quarterly Bulletin*, No. 3, 2006.

Italy: Banca d'Italia, Supplements to the Statistical Bulletin; Ando, A., L. Guiso and Financial Accounts of OECD countries.

Japan: Cabinet Office, Government of Japan, Annual Report on National Accounts.

New Zealand: Reserve Bank of New Zealand.

United Kingdom: Office for National Statistics, United Kingdom, National Accounts and Financial Statistics.

United States: Federal Reserve Statistics Release, Flow of Funds Accounts of the United States.

Spain: Bank of Spain.

Sweden: Bank of Sweden and Statistics Sweden.

35. Mortgage debt data for non G-7 countries have been estimated using various national sources and are not necessarily fully consistent with SNA 93 and ESA 95. For Australia, mortgages refer to outstanding loans to households for housing by type of lending institution in the Financial Accounts of the Australian National Accounts. For Denmark, mortgages are from Statistics Denmark and refer to lending of mortgage banks by sector. For Finland, mortgage data are from the Bank of Finland. For Ireland, data are from the Central Bank and Financial Services Authority of Ireland 2006 *Quarterly Bulletin* No. 3, (see Kelly, 2006). For New Zealand, data are from the Reserve Bank of New Zealand. For Spain, data are from the Bank of Spain and for Sweden, from Statistics Sweden.

GDP and disposable income

36. GDP and household disposable income are taken from the OECD Economic Outlook 80 database.

Share of adjustable rate loans in housing loans

37. The 2005 data for the *share of new loans* in housing loans are defined as loans with a duration of one year or less. For most European countries, the data are from European Mortgage Federation (2006). For France, the data are from Gouteroux (2006). For Italy, data are from the Bank of Italy. For Finland, they are from the Bank of Finland. For Japan and Canada, they refer to the Bank of International Settlements (BIS) (2006) and correspond to adjustable rate loans with a duration up to five years. For New Zealand, data are from the Reserve Bank of New Zealand. For Australia, the data come from the Reserve Bank of Australia. For Ireland, data are from Central Bank and Financial Services Authority of Ireland (2006).

38. The data for the *share of outstanding loans* are defined as loans with a duration of one year or less. They are taken from Girouard *et al.* (2005) for Australia, Canada and France. For most European countries, the data are from European Mortgage Federation (2006). For Japan, data are from the BIS (2006). Other, country-specific sources are: Bank of Italy (2006), Bank of Finland and the Reserve Bank of New Zealand.

Sources for mortgage delinquency rates

Australia: Bank on-balance sheet housing loan arrears 90+ days, Reserve Bank of Australia.

Canada: Residential mortgage loans in arrears three months or more, Canadian Bankers' Association and Statistics Canada.

France: "Part des encours douteux, Enquête auprès des principaux établissements distributeurs de prêts à l'habitat", Banque de France.

Finland: Non-performing assets of households, Bank of Finland.

Italy: New bad debts during the year as a percentage of outstanding loans, Bank of Italy.

Spain: Household non-performing loans (for house purchase), Bank of Spain.

United Kingdom: Mortgage arrears for more than three months, Council of Mortgage Lenders.

United States: Delinquency rate on single-family residential mortgages, booked in domestic offices; all commercial banks (seasonally adjusted), Federal Reserve Board.

Sources for the proportion of households holding debt

39. The "other debt" category is generally defined as unsecured debt in the form of personal loan, overdraft, credit card, store card, student loan, social fund loan and other loan.

Spain and Ireland: ECB (2005).

Canada: The data, provided by the Bank of Canada, are based on the *Canadian Financial Monitor* (CFM), a survey conducted by Ipsos Reid Canada. Data are for 2005. For more detail, see Faruqui (2006).

France: Banque de France (2005).

Finland: Bank of Finland (2006).

Germany: Federal Statistical Office

Italy: Banca d'Italia (2006b).

United States: Bucks *et al.* (2006).

United Kingdom: May *et al*. (2004).

Sweden: Bank of Sweden

New Zealand: Treasury of New Zealand. For information, the proportion of households holding "other debt" excluding student loans is 69.4% and the proportion of households holding "other debt" excluding credit cards is 48.3%.

Sources for the micro data

Australia: No micro data were provided for the study. There are, however, two household micro surveys which are of interest, the Household Expenditure Survey (HES) conducted by the Australian Bureau of Statistics and the Survey of Household and Income and Labour Dynamics (HILDA), which is administered by the Melbourne Institute. The aggregate results from the HES are available at:
http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/6530.0Main+Features12003-04%20(Reissue)?OpenDocument.
The information on HILDA is available at http://melbourneinstitute.com/hilda/.
For more detail, see Kohler *et al.* (2004).

Canada: The data, provided by the Bank of Canada, are based on the *Canadian Financial Monitor* (CFM), a survey conducted by Ipsos Reid Canada. Data are for 2005. For more detail, see Faruqui (2006).

Denmark: No micro data were provided for the study. However, households' indebtedness is discussed in Danmarks Nationalbank (2006).

European Union countries: The European Central Bank (ECB) provided some data from the 2001 European Community Household Panel database. They are reported in part in ECB (2005).

Finland: Data for 2004 are from the Bank of Finland (2006).

France: No micro data were available for the study. However, the Banque de France has produced several studies on household indebtedness, see for instance Banque de France (2005) and Boutillier *et al.* (2005). See also the work from the Commissions du surendettement at:
http://www.banque-france.fr/fr/instit/services/page3a.htm.
Selected micro data are reported for 2005 in Mouillart (2006).

Germany: The data, provided by the Federal Statistical Office, are based on the Income and Expenditure Survey 2003. For more details, see Bartzsch and Stöss (2006).

Italy: The data, provided by the Bank of Italy, are based on the 2004 Survey of Household Income and Wealth (SHIW), Banca d'Italia (2006a and b). For details on the previous surveys, see http://www.bancaditalia.it/statistiche.

Netherlands: The data, provided by the Nederlandsche Bank, are based on preliminary results of the 2004 regular Dutch DNB Household Survey (DHS). For details see Van Els *et al.* (2003) and De Nederlandsche Bank (2005).

New Zealand: The data, provided by the Treasury of New Zealand, are based on the survey SoFIE for 2004, see http://www.stats.govt.nz/additional-information/survey-of-family-income-employment/default.htm.

Spain: The data, provided by the Bank of Spain, are based on the 2002 Survey of Household Finances (EFF). For more detail see Barcelo (2006), Banco de Espana (2005), Bower *et al*. (2005) and Bover (2004).

Sweden: The data were provided by the Bank of Sweden and Statistics Sweden. An analytical exposé of the Bank of Sweden uses of micro data can be found in Johansson and Persson (2006).

United Kingdom: The data were provided by the Bank of England and are based on 2005 NMG Research survey and on the Bank's calculations. For more information, see Barwell *et al.* (2006). For details on the 2004 survey, see May *et al.* (2004).

United States: The data are from the Federal Reserve Bank and are based on the 2004 Survey of Consumer Finances. They are reported in Bucks *et al.* (2006). For references to earlier surveys, see Aizcorbe *et al.* (2003).

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