Household Balance Sheets and Debt – an International Country Study

Jacob Isaksen, Paul Lassenius Kramp, Louise Funch Sørensen and Søren Vester Sørensen, Economics

1. INTRODUCTION AND SUMMARY

As in most advanced economies, the net wealth of Danish households has grown considerably over the last 15 years. In an international perspective, household net wealth is at an average level. However, the development in net wealth masks a steep increase in both gross wealth and gross debt – known as balance-sheet build-up – which is somewhat higher than in other advanced economies. This article analyses the extent to which household balance-sheet build-up can be explained by underlying structural factors, including the institutional and economic-policy framework. Furthermore, it analyses whether such balance-sheet expansion in the household sector has any particular consequences.

The access to raise debt – the basic element of financial development – is a positive factor. It channels funds from those who desire to save, e.g. for consumption after retirement, to those who wish to invest or consume now. It thus facilitates productive investment and consumption smoothing at varying incomes. Similarly, it may be expedient for individual households to borrow and invest at the same time. In a Danish context, typical households save for pensions while having housing debt. Higher growth and welfare will therefore be associated with a certain level of gross debt.

Higher gross debt also entails a certain risk – especially if credit management is inadequate. Despite having net wealth as a result of housing and pension wealth, households may find it difficult to service their debt in a recession or in the event of large interest-rate increases, because such wealth is relatively illiquid and sensitive to value adjustments. Consequently, high gross debt may, in some cases, pose a risk to financial stability and lead to higher volatility in private consumption.

It is therefore important to assess the possible consequences of financial balance-sheet build-up by households. At the same time, it is relevant to examine the extent to which household savings, financial bal-

ance sheets and gross debt can be explained by underlying structural factors, including the institutional and economic-policy framework.

Section 2 reviews household net wealth and financial balance sheets across a number of OECD countries and describes the above development. In terms of the net wealth structure, it is worth noting that while Danish households, as well as Dutch and UK households in particular, have high pension wealth, their other net financial wealth is lower.

As regards balance-sheet build-up, Danish households' balance sheets are distinguished by large assets and liabilities. The highly developed Danish mortgage-credit and pension systems have facilitated a higher level of gross debt. In an international perspective, the Danish institutional framework with its well-developed financial system, notably the mortgage-credit and pension systems, enables households to make relatively sophisticated decisions regarding the accumulation and composition of their assets and liabilities.

The household sector should not be viewed in isolation from the rest of the economy due to the cross-sector interaction between savings, wealth and gross debt. If the public sector accumulates debt, households will, to a certain extent, see this as a sign of higher future taxes (or lower public benefits) and raise their net wealth accordingly by increasing their savings.

In order to assess the sustainability of household financial balance sheets across countries, it is necessary to apply a wider perspective and include the other sectors of the economy and the economy as a whole. Hence, section 2 also discusses the financial balance sheets of the other sectors and Denmark's overall external debt. In Denmark, the public sector has positive net wealth, unlike many other countries which have net debt. Moreover, the Danish economy overall has net external assets. This means that, in an international perspective, Denmark has a favourable financial balance-sheet position, particularly as a result of efforts in recent decades to improve its government finances and turn the sustained current-account deficits into surpluses.

Household net wealth, i.e. the difference between household assets and liabilities, is a result of accumulated savings and value adjustments. Section 3 analyses household savings. In an international context, the Danish household savings level is low. The same applies to the other Nordic countries, although to a lesser extent. Based on an econometric analysis, we find that the low savings level in Denmark and the other Nordic countries should be viewed against the backdrop of the high level of corporate savings and can be explained by larger public sectors, better government budget balances and higher levels of tax deduct-

ibility of interest expenses (the latter seemed to play a more important role in the 1980s than in the subsequent decades).

Developments in household gross debt are analysed in section 4 based on an econometric analysis. It demonstrates that the strong increase in the gross debt of Danish households is, to a large extent, offset by substantial growth in their pension wealth. Since the prevalence of labour-market pensions is a significant contributing factor behind the rise in pension wealth, this indicates that Danish households have not been as interested in increasing total savings as envisaged by the labour-market pension schemes. One reason is that more people want to have gross debt for a longer period, and that they save up for their retirement rather than bringing down their debt. This has resulted in balance-sheet build-up with higher assets and liabilities. Lower real interest rates and structural unemployment have also contributed to expanding household gross debt as a result of better opportunities to service and obtain higher debt.

The consequences of high gross debt are analysed in section 5. On the face of it, high gross debt entails more pronounced household sensitivity to interest-rate changes and shocks to the economy. Our results indicate greater fluctuations in private consumption in countries with a high level of household gross debt. Greater fluctuations in private consumption amplify cyclical fluctuations.

Based on an econometric analysis covering a number of EU member states, we find that there is no statistical link across countries between the level of gross debt and household arrears. Danish household arrears are very low. But the low level of household arrears indicates that household debt is offset by assets to such an extent that it has not led to major financial-sector losses on direct lending to the households. The low level of losses on lending to the households should be seen in the light of the current low level of interest rates. The high interest-rate sensitivity means that households will be more vulnerable to interest-rate increases, especially if such increases occur at a time of high un-employment and weak growth. Consequently, due to the substantial expansion of household balance sheets, it is essential for the robustness of the economy to ensure appropriate framework conditions for low interest rates, particularly robust government finances and current-account surpluses.

A comprehensive analysis of vulnerabilities with a view to assessing financial stability would require detailed data on the distribution of wealth and gross debt across individuals and the exposure of individual financial institutions. Hence, the vulnerability depends on the extent to which gross debt is distributed on those households that have assets. A

data set sufficient to compare housing wealth, financial assets and debt as well as pension wealth across individuals has not yet been developed. This is a task for future analyses.

Labour-market pensions will be further extended for the next many years, which, viewed in isolation, will contribute to sustained growth in the household gross debt ratio. Such balance-sheet build-up will increase household sensitivity to interest-rate changes and cyclical fluctuations, thereby in itself amplifying such fluctuations. Conversely, the reduction of the marginal value of interest deductibility in the event of high interest expenses to 25 per cent in the period up to 2019 will increase the costs of having debt for some households, thereby reducing the tendency for sustained balance-sheet expansion. It may also contribute to a higher household savings ratio.

2. HOUSEHOLD WEALTH AND DEBT

In most OECD countries, households have expanded both their balance sheets (wealth/assets and debt/liabilities) and net wealth (wealth less debt) over the last 15 years, cf. Chart 2.1. The net wealth of Danish households rose by approximately 250 percentage points of disposable income from 1995 to 2010, while in Sweden, France and Spain it increased even more. In a few countries, including the USA, Japan, Portugal and Ireland, the net wealth remained almost unchanged, however.

The development in gross wealth, gross debt and net wealth cannot be viewed in isolation. Household wealth consists mainly of housing

HOUSEHOLD NET WEALTH (LEFT-HAND SIDE), GROSS DEBT AND PENSION
WEALTH (RIGHT-HAND SIDE)   Chart 2.1
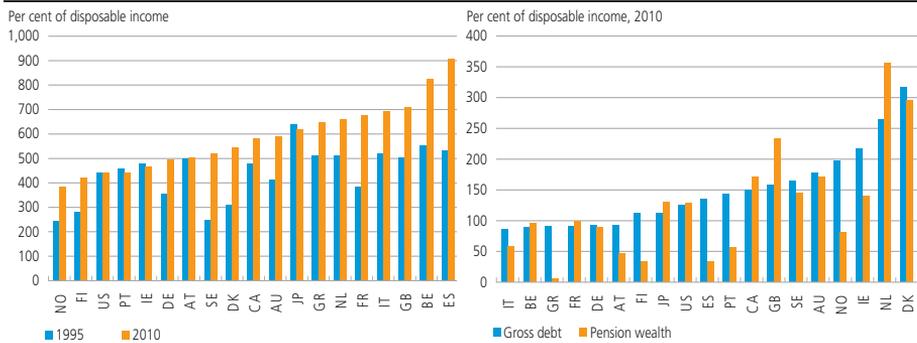

Note: Data for 2010 are partially estimated. In some countries, tax payments on pension savings pay-out reduce pension wealth after tax. The above data are shown before tax, as the current tax rate will not necessarily apply at the time of pay-out. Moreover, household wealth cannot be isolated from the rest of the economy, including government net wealth. Calculating net wealth after tax reduces the Danish households' net wealth by around 100 per cent of disposable income, resulting in a level that only just exceeds the level in Portugal. Conversely, the public sector's net wealth increases accordingly.
Source: OECD, national central banks and own calculations.

HOUSEHOLD WEALTH AND GROSS DEBT   Chart 2.2

Per cent of disposable income, 2010
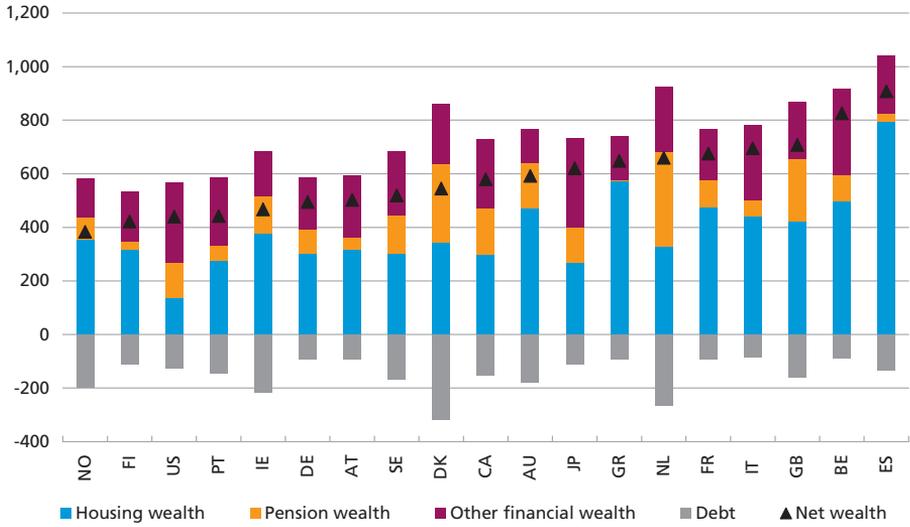
Note: See the note to Chart 2.1.
Source: OECD, national central banks and own calculations.

wealth, pension wealth and other financial wealth, cf. Chart 2.2. Gross debt can be broken down into short-term and long-term debt, with long-term loans against the home as collateral making up the majority of total gross debt. A comparison of household debt across countries shows a clear correlation in that countries with large gross debt typically also have large assets in the form of pension savings, cf. Chart 2.1 (right-hand side).

The growth in housing wealth has been a key factor contributing to the development in net wealth since 1995, cf. Chart 2.3.[1] Comparisons of housing wealth across countries are subject to some uncertainty, however. The housing wealth data structure is described in Box 2.1.

Concurrently with the growth in housing wealth, household gross debt has also risen due to reduced costs of having debt and expanded credit facilities. This is partly attributable to falling interest rates and structural unemployment as well as considerable financial development and liberalisation in many countries. Housing wealth and gross debt have thus increased at the same time, thereby contributing to balance-sheet expansion (an increase in both assets and liabilities) in the household sector.

---

[1] In Spain, housing wealth doubled from approximately 400 per cent of disposable income in 1995 to around 800 per cent in 2010. We have been unable to break down the housing wealth into resident and non-resident households. Part of the immense housing wealth in Spain is owned by non-resident households.

HOUSING AND PENSION WEALTH   Chart 2.3
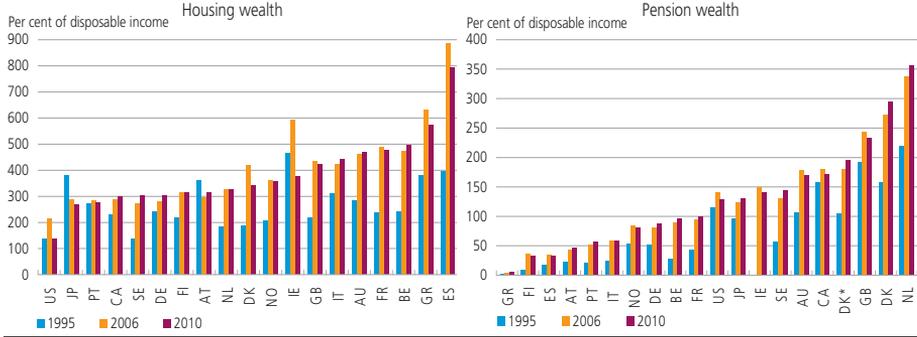
Note: Left-hand chart: See Box 2.1. Right-hand chart: DK* is pension wealth after tax.
Source: OECD, national central banks and own calculations.

Denmark differs from most other OECD countries by having a highly flexible, well-developed and robust home loan market. For example, it is easy to borrow against home equity in Denmark. Hence, a well-functioning home-financing market provides easy access to mortgage financing, which has contributed to balance-sheet build-up in the household sector. There is a clear correlation between the degree of financial development and the gross debt ratio, cf. Chart 2.4 (left-hand side).

In some countries, including Denmark and the Netherlands, pension savings account for a large part of the wealth. In Denmark, this can be attributed to the widespread use of labour-market pensions, among other factors, cf. Box 2.2. Having substantial pension savings reduces the need to be free from debt before retirement. To the extent that households sustain a high level of gross debt for a prolonged period of life, e.g. in order to save for their retirement rather than reducing their

| CALCULATING HOUSING WEALTH | Box 2.1 |

There are considerable differences in the amount of housing wealth across countries, cf. Chart 2.2. Housing wealth is calculated exclusive of empty building sites and agricultural land. Commercial properties owned by households are included. Homes owned by non-resident households are recognised in the country in which the home is located. Consequently, housing wealth in Spain is overestimated (many non-residents, including Danes, own homes in Spain), while housing wealth in Denmark is underestimated, as it is difficult for non-residents to purchase homes in Denmark.

The data are based on information from national central banks and in some cases have been adjusted to facilitate, wherever possible, comparison of housing wealth across countries[1]. In case of gaps in the data set, we have constructed data by forward and/or backward projection by means of an index based on accumulated real gross investment less 2.5 per cent annual depreciation multiplied by a house price index.

[1] Housing wealth in Norway is subject to additional uncertainty, since data are only available for a single year, i.e. 2008. Data for Ireland in 1995 are 2002 figures.

FINANCIAL DEVELOPMENT, PENSION WEALTH AND GROSS DEBT | Chart 2.4
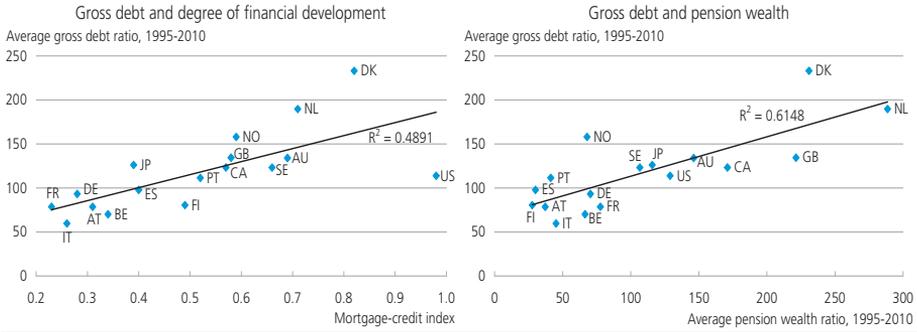
Note: Data for 2010 are partially estimated. Left-hand chart: For a more detailed description of the mortgage-credit index, see Box 4.1 below. Right-hand chart: Pension wealth is calculated before tax. See the note to Chart 2.2.
Source: OECD, national central banks, IMF (2008) and own calculations.

housing debt, the debt ratio will increase for the household sector as a whole. For individual households, however, the peak level of debt over their lifetimes will not necessarily rise. Finally, pension savings are typically tax-advantaged, while interest expenses are tax deductible (in Denmark, the tax value of interest deductibility is 33 per cent, while pension yields are taxed at 15 per cent). This may provide incentives for some households to borrow to finance their pension savings. The accumulation of substantial pension wealth has thus contributed to balance-sheet build-up in the household sector, cf. Chart 2.4 (right-hand side).

PENSION SAVINGS IN DENMARK | Box 2.2

The use of savings-based pension schemes organised by employers (labour-market pensions) in Denmark has increased considerably over the last 20 years. In 2005, just over three fourths of the population between the ages of 35 and 55 contributed to a pension scheme. At the same time, labour-market pension contribution rates have gone up. According to an estimate by the Danish Economic Councils, pension wealth measured as a percentage of the gross domestic product, GDP, will have doubled by around 2045 compared with the 2005 level. Moreover, the Danish Economic Councils' analyses show that the coverage of many employees will actually exceed 100 per cent if other wealth such as housing wealth is included.[1]

Compulsory pension savings schemes are tax-advantaged, which has contributed to their growing popularity. The tax benefits mainly consist in capital yields being taxed at only 15 per cent, while the value of interest deductibility is 33 per cent (in most other countries, yields on pension savings are not taxable). This should also be seen in relation to the fact that other positive capital income is taxed at either 37 or 48 per cent. Moreover, contributions are deductible to the extent that income tax is not payable until pay-out. Further tax benefits are achieved if the income tax rate is lower at the time of pay-out than at the time of contribution (e.g. for those who do not pay top-rate tax after retirement).

CONTINUED	Box 2.2

The degree to which it is possible to speculate in tax asymmetries between contribution and pay-out is uncertain, however, because the effective rate of marginal tax at the time of pay-out is often quite high due to the set-off of pensioner credit, among other factors. Besides, the tax benefits for younger employees are distributed over a large number of years. The difference between the highest and lowest marginal tax rates is currently around 15 per cent. Spread over e.g. 15 years, the tax savings correspond to an excess return of around 1 per cent per year in simplified terms. Allowing for the fact that the return is reduced by the administration costs to the pension company, while the borrowing costs are increased by contribution rates to the mortgage bank, it will not be particularly advantageous for many households today to borrow to finance pension savings, e.g. by choosing deferred-amortisation loans and placing the extra liquidity in a pension savings scheme. There used to be more incentive to borrow to finance contributions to pension schemes when the tax value of interest deductibility was higher, and the difference between the highest and the lowest marginal tax rate was bigger, which may have contributed to the expansion of Danish household balance sheets.

But the pension systems and their reforms may affect the total household savings level. In the estimate of the Danish Economic Councils, the crowding-out effect of labour-market pensions in Denmark is only around 15-30 per cent. This means that additional savings of kr. 1 in a labour-market pension increases the net wealth by kr. 0.75-0.80. However, according to the Danish Economic Councils, the estimates are subject to considerable uncertainty, and the future crowding-out effect may increase as a result of greater wealth.

Given that the Danish household savings ratio has not increased in the last 20 years, the Danish Economic Councils' estimate of the crowding-out effect is very low. Instead, the combination of a substantial expansion of labour-market pensions and a relatively constant savings ratio indicates that households have increased their balance sheets, which is confirmed by the corresponding development in gross wealth and gross debt.

[1] The coverage indicates the income in the first year after retirement relative to the income in the last year before retirement, adjusted for pension contributions.

As a consequence, growing housing and pension wealth and financial development have contributed to the expansion of household balance sheets.

Gross debt has risen considerably over the last 15 years, reflected in doubling of the gross debt ratios in many countries, although to a lesser extent than wealth. The gross debt ratio is particularly high in Denmark, the Netherlands and Norway, while Italy, France and Germany are in the low range, cf. Chart 2.5. Japan and Germany are the only countries in which the households have not increased their gross debt ratio over the last 15 years.

Household net wealth and the rest of the economy
Household net wealth cannot be viewed in isolation from the rest of the economy. If the public sector has substantial net debt, households must

HOUSEHOLD GROSS DEBT   Chart 2.5

Per cent of disposable income
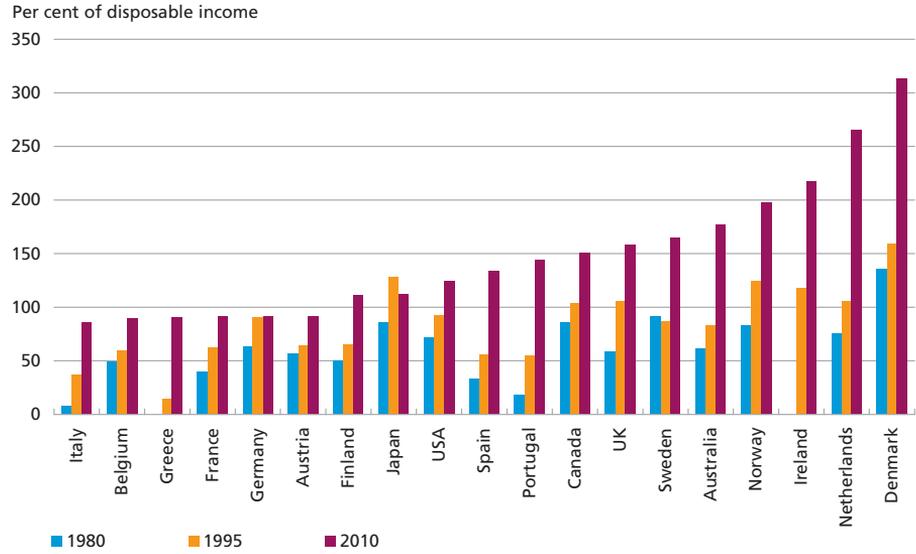
Note: For Germany 2010: The data refer to 2009. For Norway 1980: The data refer to 1987.
Source: OECD, Cecchetti et al. (2011) and national central banks.

expect higher taxes and/or poorer public service in the future, while large corporate debt means that households must expect lower future dividend payments. Both of these factors point to households building up greater net wealth through savings.

Net wealth for all sectors taken as one equals a country's net external assets, also called external debt.[1] A country will accumulate external debt if it has sustained current-account deficits as a result of a savings deficit in the economy overall (investments exceed national savings).[2]

Among the OECD countries, Norway, Belgium, Japan and Germany, among others, have substantial net external wealth, while Portugal, Ireland, Greece and Spain, among others, have considerable external debt. Denmark has gone from having considerable external debt in the 1980s to having net external wealth of around 10 per cent of GDP in 2010, cf. Chart 2.6 and Table 2.1. This reflects a long period of sustained current-account surpluses.

In most countries, the public sector has net debt, while the private sector has net wealth. The Nordic countries are unique in that their public sectors have net financial wealth. In Denmark, the public sector has

---

[1]   It should be noted that external debt is a net figure. On the other hand, household debt usually refers to gross debt.
[2]   A high level of external debt may entail a risk that non-resident lenders suddenly lose confidence. Substantial external debt is especially problematic if it consists mainly of loans. If external debt consists primarily of inward foreign direct investment, the vulnerability is normally deemed to be far less pronounced.

EXTERNAL DEBT AND NET FINANCIAL ASSETS AT SECTOR LEVEL (2010)   Chart 2.6

Per cent of GDP
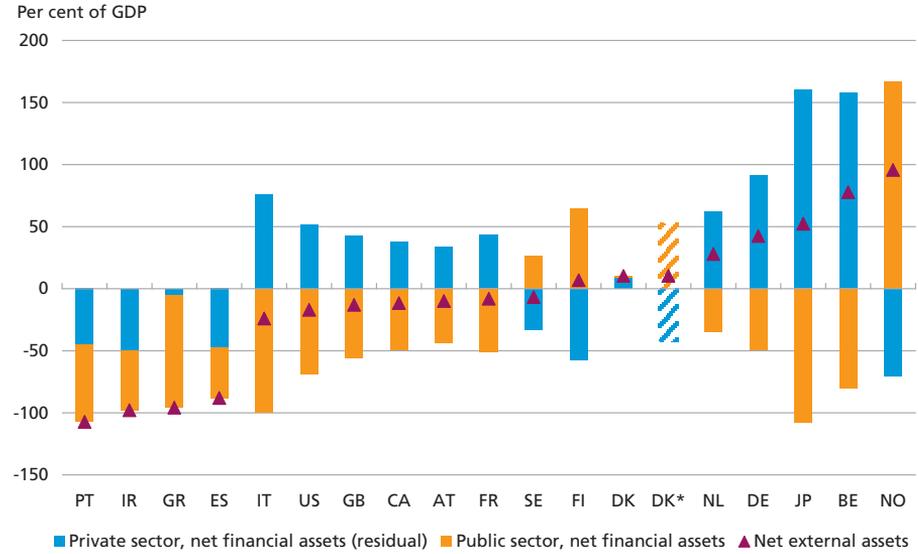
Note: Due to lack of data, statistics for Italy, France, Germany, Japan and Ireland are from 2009. DK* indicates sector
         balance sheets for Denmark, adjusted for deferred tax on household pensions.
Source: IMF, Eurostat, OECD.

moderate positive net financial wealth when including holdings in various funds. Allowing for the fact that part of household pension savings are deferred tax accruing to the public sector on pension pay-out, however, the public sector's net wealth is considerably higher, cf. Table 2.1.[1]

Non-financial corporations in all countries have negative net financial assets. This is natural, since they invest in real assets, buildings, machinery, etc. But it is difficult to interpret the development in net financial wealth for the firms, and to compare the levels across countries. If, for example, a firm has a large surplus that is not distributed, its net financial wealth will not increase. The reason is that while the firm's financial assets will increase if the surplus is deposited in a bank account, its equity capital and thus its liabilities will also increase. This means that the net financial wealth remains unchanged.[2] Moreover, non-financial corporations will normally not have large portfolios of shares, so stock price fluctuations will only have a minor impact on the asset side. The liabilities side, on the other hand, includes a large portfolio of stocks (stock issued by the non-financial corporation), resulting in much

---

[1] In the Netherlands, the public sector also has net wealth when allowing for deferred taxation of
     household pension wealth.
[2] If, instead, a surplus is used to finance a new machine, the net financial assets will actually fall, since
     the financial assets remain unchanged, while the financial liabilities increase as a result of retained
     surplus.

FINANCIAL ASSETS AND LIABILITIES AT SECTOR LEVEL AND NET EXTERNAL
ASSETS IN 2010   Table 2.1

Per cent of GDP	Denmark	Sweden	Nether-lands	Germany	UK	Spain
Households						
Financial assets	250.5	202.9	298.4	187.3	298.3	169.2
Deferred tax on pension (liability)[1]	52.4	22.8	53.6	20.4	25.6	4.1
Liabilities	153.2	87.1	132.7	62.1	106.2	91.7
Net financial assets	97.3	115.8	165.7	125.2	192.1	77.5
Net assets excl. deferred tax[1]	44.9	93.0	112.2	104.8	166.5	73.5
Financial corporations						
Net financial assets[2]	1.5	13.6	0.8	10.5	-25.5	13.4
Non-financial corporations						
Financial assets	190.6	286.4	201.7	129.5	153.5	206.4
Liabilities	281.1	455.3	257.5	189.5	277.1	342.6
Net financial assets	-90.5	-169.0	-55.9	-60.0	-123.6	-136.2
Public sector						
Financial assets	66.0	78.7	43.7	37.6	33.3	36.4
Liabilities	64.7	52.6	78.1	88.2	89.3	76.6
Net financial assets	1.3	26.1	-34.4	-50.6	-56.1	-40.3
Net assets incl. deferred tax	53.7	48.9	19.2	-30.2	-30.5	-36.2
Total economy						
Net financial assets	9.6	-13.5	76.3	25.1	-13.0	-85.6
Net external assets[3]	10.4	-6.7	28.0	42.5	-13.0	-88.0

Source: OECD, Eurostat.
[1] Adjustment is made for deferred tax on pension contributions using average pension tax rates from OECD (2011).
[2] Only net financial assets for the financial sector are shown, since the financial assets and liabilities in this sector are very high, constituting to a high degree outstanding accounts within the sector.
[3] The net financial assets for the total economy and the net external assets may differ. The net financial assets are calculated on the basis of the financial accounts, while the net external assets are calculated in the balance-of-payments statistics. As those statistics are not always reconciled, there may be major differences.

stronger fluctuations. A strong decrease in corporate net assets may thus
be attributable to a large increase in the prices of domestic shares.

In most countries, the financial sectors have moderate, but positive net
financial assets.[1]

Further analyses

As mentioned earlier, households have increased their net wealth and
balance sheets considerably over the last 15 years. Chart 2.7 shows a
stylised relation between the households' net wealth, balance sheets,
savings and price fluctuations. The development in net wealth is deter-
mined by price fluctuations and household savings. Net wealth is merely
an expression of the difference between the value of household assets
(including homes) and liabilities. The assets and liabilities are larger than

---

[1] The central bank is included as part of the financial sector shown in Table 2.1.

NET WEALTH, BALANCE-SHEET EXPANSION AND SAVINGS Chart 2.7
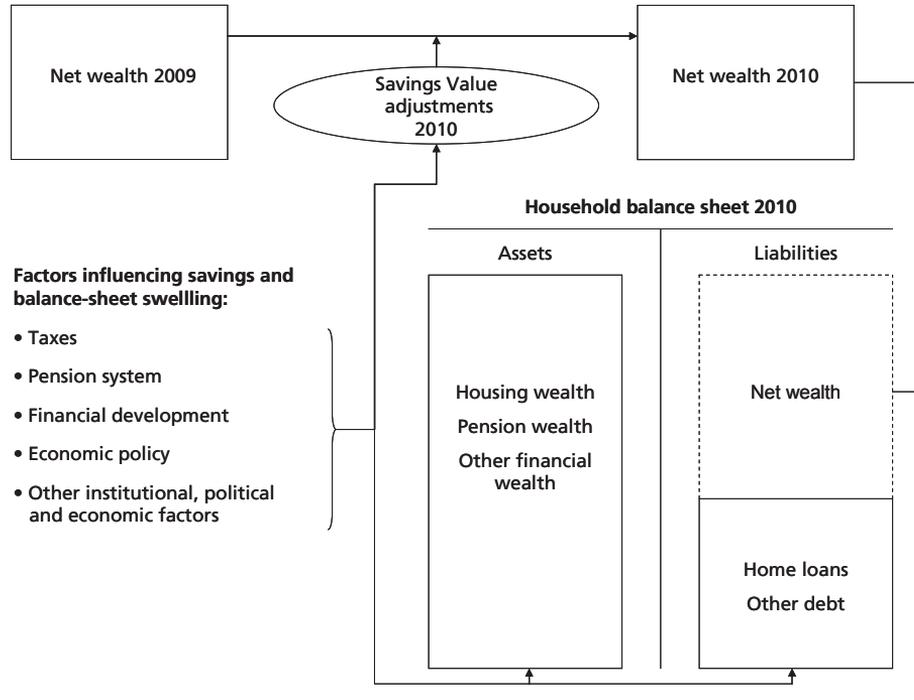
the net wealth, as households have raised loans that are placed in various assets. This balance-sheet expansion reflects factors such as taxes, financial development, economic policy, etc.

The amount of household savings also depends on several factors, including wealth, business cycles, the tax system and other economic-policy and institutional factors. If households obtain large capital gains, it will reduce their savings needs. Similarly, higher corporate savings will implicitly lead to higher household savings, as private firms are ultimately owned by the households, thereby reducing the households' savings needs. Conversely, large government deficits may imply higher future taxes and thus a need to save. In addition, a large variety of other factors may affect household savings. Section 3 analyses household savings in more detail, based on an econometric analysis of the net savings ratio, among other factors.

Viewed in isolation, net wealth is not affected by balance-sheet build-up due to e.g. borrowing to finance investments in home purchases or in financial assets such as private pension schemes. Large asset/liability balance sheets potentially imply more significant value adjustments, e.g. as a result of interest-rate changes. The incentives for borrowing and balance-sheet expansion are also affected by the tax system, the pension

system and the financial system. All other things being equal, interest deductibility combined with tax-advantaged savings in owner-occupied homes or pensions provides an incentive to raise debt with a view to purchasing a home or boosting pension contributions. Similarly, a more well-developed financial system enables a more sophisticated balance-sheet composition with better wealth distribution on several assets, rather than savings in a single asset, e.g. a home. Besides, there will be an impact from other economic factors, e.g. interest rate and inflation levels, which will, all other things being equal, also affect the households' ability to raise debt. Household gross debt and balance-sheet build-up will be analysed further in section 4, based on the above factors.

3. ANALYSIS OF HOUSEHOLD SAVINGS

As described in the previous section, household savings are among the factors that impact household balance sheets.

We look into the household savings ratio, i.e. household savings relative to household disposable income. Household gross savings are compiled in the national accounts (ESA 95) as income (including pension contributions) after tax, less private consumption.[1] Hence, the gross savings ratio is gross savings relative to income (including pension contributions) after tax. Savings can also be compiled as net savings, i.e. gross savings less depreciation (impairment due to wear and tear) of the capital stock (mainly the housing stock). In the econometric analysis later in this section, we use the net savings ratio for data availability reasons, since the gross savings ratio is not available for all countries. The gross savings ratio is more closely related to the households' liquidity position, however, as depreciation affects asset values rather than liquidity. The development in gross and net savings is more or less identical over time, cf. Chart 3.1, since the size of the capital stock and thus depreciation change slowly over time.

In the vast majority of countries, the gross savings ratio has either declined or remained unchanged since 1980, cf. Table 3.1. In Denmark, the gross savings ratio has generally been very low compared with the other OECD countries. The other Nordic countries and the Anglo-Saxon countries are also in the low range as regards household gross savings ratios.

---

[1] In the national accounts (ESA 95), household disposable income is defined as income, excluding pension contributions, after tax. Accordingly, disposable income less private consumption is not equal to savings.

DANISH HOUSEHOLDS' NET AND GROSS SAVINGS RATIOS	Chart 3.1

Per cent of disposable income
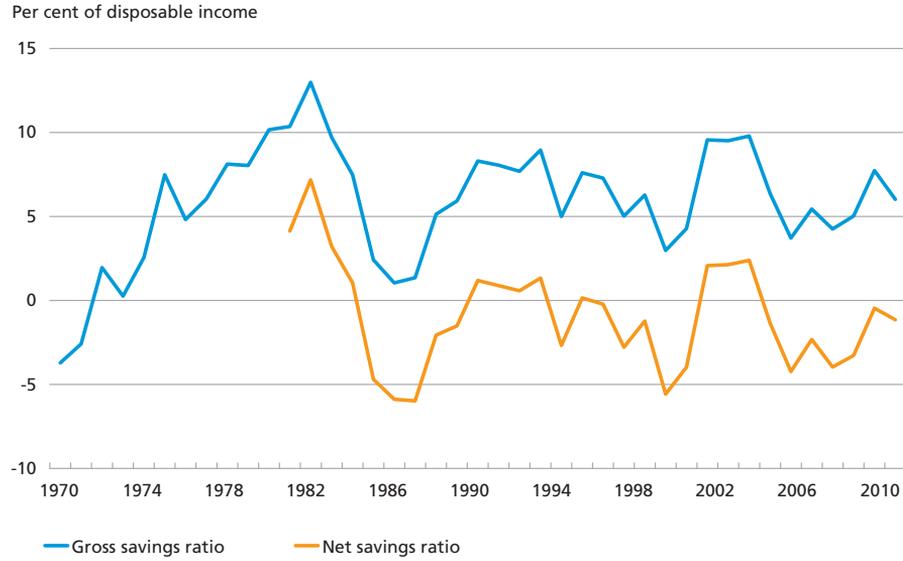
Source: Statistics Denmark.

Can the household-related differences be explained?: An econometric analysis

OECD (2004) points to a number of statistical factors which may impede the comparison of savings ratios across countries. Firstly, the size of the public sector affects the savings ratio measured. In some countries, the

AVERAGE SAVINGS RATIO						Table 3.1
Per cent	1980-85	1985-90	1990-95	1995-2000	2000-05	2005-10
Australia	20.6	17.3	14.0	12.2	9.1	13.2
Austria	15.0	17.1	17.1	14.1	13.7	15.6
Belgium	16.7	17.0	19.8	17.9	16.5	16.6
Canada[1]	17.1	13.2	11.6	5.8	3.5	3.6
Denmark	8.9	4.0	7.6	5.6	7.2	5.4
Finland	9.7	8.4	12.4	9.0	8.5	8.9
France	16.0	12.2	14.4	15.3	15.5	15.3
Germany	16.8	17.2	17.5	15.9	15.7	16.9
Italy	30.5	28.3	24.2	18.6	15.8	14.9
Japan	22.6	20.2	20.1	17.1	11.9	10.4
Netherlands	17.9	19.5	19.7	16.2	13.2	12.5
Norway	10.2	5.9	10.1	9.2	11.6	10.1
Portugal	24.4	21.5	14.9	10.7	10.4	8.8
Spain	12.7	12.6	13.4	12.7	11.4	12.9
Sweden	11.5	6.1	9.9	7.1	9.3	12.0
UK	10.7	6.8	10.1	7.8	4.7	3.9
USA	14.4	11.4	10.4	8.5	7.2	8.2

Note: Gross household savings ratio.
Source: OECD, national central banks and statistical agencies.
[1]   For Canada, the net savings ratio is shown due to lack of data.

households bear the costs of health and education, while in other countries those services are offered by the public sector and financed through household income taxes. Assuming identical household savings in monetary terms, the savings ratio will, all other things being equal, be higher in countries that finance such costs through taxes, as the heavier tax burden reduces disposable income (the numerator in the savings ratio).[1]

Savings ratio fluctuations can also be difficult to compare across countries. For example, disposable income in the national accounts does not include capital gains. This affects e.g. the savings ratio in Denmark, since the compilation of household disposable income in the national accounts does not include capital gains on pension wealth, while pension-yield tax is registered as a household expense.

In addition to such compilation-related factors, there will also be a number of impacts from fundamental behavioural, institutional and economic-policy aspects which may cause cross-country differences in the household savings ratios. In order to assess the importance of these aspects, we will use an econometric analysis to explain the development in household savings ratios.

The theoretical approach to describing household savings and debt is the *Life Cycle Hypothesis Model*, which was originally designed by Modigliani and Brumberg. The basic idea is that throughout their lives, people will seek to obtain a steady development in consumption. Rather than being constant over time, their income will normally follow a life cycle. Young people's income will be low due to their need for education. As they get established on the labour market, their income will rise. When they get older, their income will decline again, e.g. due to retirement.

The desired consumption does not necessarily fit this income pattern. Consequently, a typical pattern is that households initially raise debt, e.g. for purchases of consumer durables, then they save up, e.g. through a labour-market pension scheme and/or by repaying a home loan, and finally they draw on their wealth, e.g. by having their pension savings paid out.

According to this basic idea – that households want to even out consumption over time – several factors influence household savings and indebtedness, cf. Hüfner and Koske (2010), among others. In addition to the variables included in the life cycle model, a number of variables for

---

[1] Similarly, if a country's public sector is financed through indirect taxes (e.g. VAT and excise duties) to a higher degree than through income taxes, the savings ratio of that country will, all other things being equal, be lower, since the disposable income is higher due to lower income taxes.

HOUSEHOLDS' AND NON-FINANCIAL CORPORATIONS' GROSS SAVINGS   Chart 3.2

Per cent of household disposable income
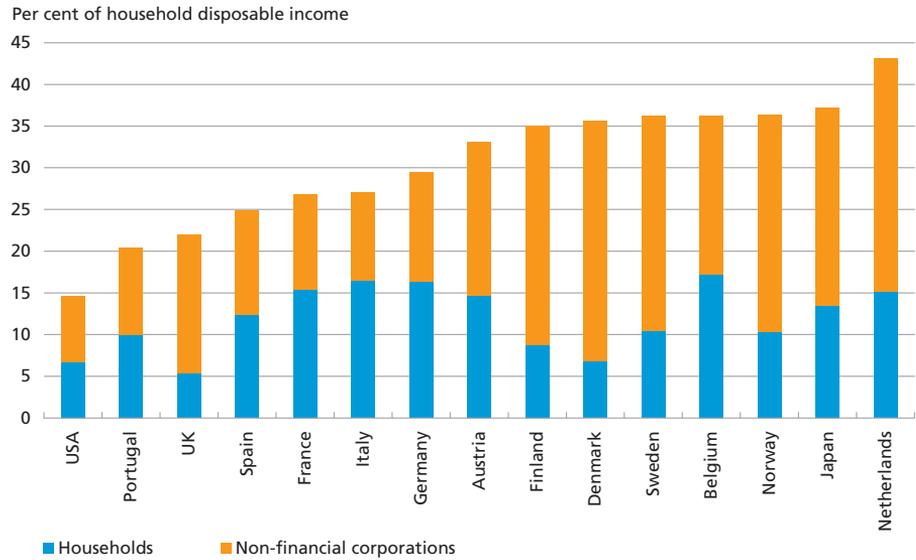
Note: Average for 1995-2009. For Spain: average for 2000-09, and for Japan: 1995-2008.
Source: OECD.

the size of the public sector are used, as inspired by Koskela and Virén (1994) as well as Tanzi and Zee (1998), among others.

In addition, we include corporate savings as an explanatory variable. Firms are ultimately owned by households (apart from foreign-owned firms) and, in principle, the corporate sector might also be recognised in the household balance sheet. Therefore, it makes sense to include corporate savings as an explanatory variable, since corporate savings can be seen as a substitute for household savings.[1] It is remarkable that the savings level of non-financial corporations in Denmark – and to a slightly lesser extent the other Nordic countries – is quite high compared with other countries, cf. Chart 3.2.

This difference may reflect taxation differences. Depending on the tax system, it may be an advantage for households owning firms to leave the surplus in the firm and be taxed according to the corporation tax rate, which is lower than the capital gains tax rates. But the high level of corporate savings may also be attributable to other factors. For example, the corporate or ownership structure may be of importance, as it may provide different incentives for ordinary private investors and funds that are subject to special mandates and regulations.

[1]   Alternatively, total private-sector savings should be examined.

A selection of the variables that may affect household savings ratios are presented in Box 3.1. A detailed bibliography of different studies of household savings ratios is found in Hüfner and Koske (2010).

VARIABLES WHICH MAY AFFECT HOUSEHOLD SAVINGS RATIOS	Box 3.1

Real interest rates, taxation of capital income, and interest deductibility
The relation between real interest rates and savings is not clear. Real interest rates constitute the relative price of consumption today rather than in the future. High real interest rates imply a high price of consumption today relative to future consumption, which encourages savings. This is called the *substitution effect*.

There is also an *income effect*, which may potentially point in the opposite direction. All other things being equal, higher interest rates imply higher yields on savings. This will increase the future consumption opportunities for persons with positive wealth, thereby reducing the savings motive.

Taxation of capital income, which reduces effective interest rates on savings, will reduce the savings incentive based on the same reasoning as for real interest rates. Similarly, interest deductibility encourages borrowing (and spending of savings) by reducing effective costs.

Corporate savings
A considerable number of firms are owned by the households. If firms retain their surpluses rather than disbursing them as dividend, households will obtain a capital gain instead, which, according to the national accounts, is not included in their income or savings. If households prefer to let the corporate surpluses remain in the firms, e.g. for tax reasons, this will cause their real savings to be underestimated.

Wealth
According to the life cycle model, household wealth will have a negative impact on savings. Increased wealth implies more resources available for consumption (including future consumption), thereby reducing the incentive to save. The impact on savings will depend on whether they are regarded as temporary or permanent. While temporary (uncertain) wealth gains as a result of e.g. fluctuations in stock prices, will not lead to any major changes, permanent (certain) wealth gains will lead to changes in consumption and thus in savings. Several studies find that housing wealth is considered to be more certain and thus has a greater impact on household consumption and savings.

Uncertainty and the size of the public sector
Households have a precautionary savings motive, as the savings can be used as a buffer against unexpected losses of income or to cover unforeseen expenditure. Hence, growing uncertainty will lead to increased savings. A stable macroeconomic situation will reduce the precautionary savings motive. Besides, a more extensive social safety net will reduce the need for savings to cover unforeseen losses of income. Countries with a large public sector typically have a more developed safety net, which reduces the uncertainty of the individual households and thus their savings. Likewise, in countries with a large public sector, income inequalities will, to a higher degree, be

CONTINUED	Box 3.1

evened out through taxes, and since the savings ratio increases with the level of income, such redistribution may contribute to reducing savings. Conversely, a higher tax level will entail lower disposable income, which would, in monetary terms, lead to a higher savings ratio at the same level of savings.

Demographics

The savings ratios of young people and the elderly will typically be lower compared with those of the middle-aged, since young people typically raise debt, the elderly spend their savings, and the middle-aged, who have the highest income, save up for their retirement. Consequently, a larger share of the population outside the labour force means a lower savings ratio.

Government deficit and debt

There will typically be a negative relation between the net borrowing/net lending of the public and private sectors. One reason is that a forward-looking household will, to a certain extent, see a government deficit as an expression of higher taxes and/or lower public consumption in future. Growing government deficits thus encourage increased private savings. Such a response is called Ricardian equivalence.[1] Full Ricardian equivalence rests on a number of strong assumptions which will not be met in practice. For example, credit restrictions will lead to a number of households not responding as assumed. Household savings are therefore likely not to be fully adjusted to larger government deficits.[2]

Financial development and credit restrictions

In practice, it is not possible for all households to borrow as much as they want. The extent of such credit restrictions is determined especially by developments in the country's financial markets. A more developed financial sector will provide more savings opportunities that are better suited to individual needs, and lead to increased competition. In theory, this will also result in better resource allocation and thus potentially higher returns. On the other hand, a more developed financial sector often leads to fewer credit restrictions and thus a reduced precautionary savings motive, since it makes it possible to raise debt to cover unforeseen expenditure and loss of income.

[1] The term originates from Barro (1974). This topic is still being discussed, as it is of particular relevance when assessing the efficiency of fiscal-policy stimulus.
[2] Nickel and Vansteenkiste (2008) find indications that the degree of Ricardian equivalence may be dependent on the level of government debt. While they find a positive relation between government deficits and current-account deficits at low levels of debt, a similar relation is not found at high levels of debt. This indicates that at high levels of government debt, there is a higher degree of household awareness of the potential consequences of government finances.

The analysis estimation method is elaborated on in Box 3.2. For data availability reasons, we use household net savings relative to household disposable income as an expression of the household savings ratio. Our data set is constructed on the basis of data from the OECD, Eurostat and the World Bank and contains annual data for 17 OECD countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy,

PANEL ESTIMATION WITH COUNTRY-SPECIFIC CONSTANTS	Box 3.2

The econometric models used to describe household savings and debt are based on panel estimation with country-specific constants. Panel estimation makes it possible to use the information in the development over time across several countries at once, thereby obtaining more accurate estimates of the explanatory variables than if using the development over time in a single country. To allow for inexplicable permanent differences in the level of savings and debt across countries, we include country-specific constants, also called *fixed effects*. Because of the use of country-specific constants, major permanent differences in the levels of savings and debt across countries are not necessarily explained by the explanatory variables.

The basic specification is expressed as follows:

$$Y_{it} = \alpha_0 + \theta_i + \sum_{k=1}^{K} \beta_k X_{kit} + \varepsilon_{it}$$

where Y_{it} is the endogenous variable for country i at time t, calculated in years. α_0 is a common constant, and θ_i is a vector with country-specific constants. β_k is a vector of k estimated coefficients, X_{kit} is a vector of k explanatory variables, and ε_{it} is an error term. Y_{it} and X_{it} are specified in more detail in individual analyses.

The estimations of the level of debt include lagged values of the explanatory variable (i.e. the debt ratio) in order to avoid autocorrelation, which means that we set up a dynamic panel estimation. To check its robustness to endogeneity problems, we have used a 1-step Generalised Method of Moments, GMM, cf. Arellano and Bond (1991).

Japan, the Netherlands, Norway, Portugal, Spain, Sweden, the UK and the USA. The period analysed is 1980-2008 for the majority of the countries, including Denmark.

Table 3.2 presents the results of the estimated relation between the household net savings ratio and the potential explanatory variables. In addition to the explanatory variables in Table 3.2, we have made a number of estimations using other explanatory variables. For example, we have attempted to include variables for household wealth (housing wealth and stock prices) and a financial development index (Abiad et al. (2008)). Our estimation showed no significant impact from those variables, however. One reason may be that the variables used did not adequately reflect the underlying conditions we wanted to describe in the model. Another reason may be that the effects of the variables are not captured by the model due to cross-country variations.[1]

By and large, the results of the econometric analysis of the preferred model provide the expected signs. The demographic variable, i.e. the

---

[1] In a Danish context, the difference between estimated and actual net savings ratios may indicate that the development in household savings is affected by the development in property prices and the price of other assets, cf. Chart 3.3. This is also consistent with the fact that the variation in private consumption increases with higher gross debt, cf. Section 5.

ESTIMATED MODEL OF HOUSEHOLD SAVINGS RATIOS	Table 3.2
	Estimated coefficient
Constant	0.283***
Elderly people aged 64+ as a share of the population aged 15-64	-0.678***
Cyclically adjusted government budget balance (ratio of GDP)	-0.593***
Cyclically adjusted government current disbursement (ratio of GDP)	-0.133***
Corporate savings (ratio of GDP)	-0.452***
Real interest rate after tax	0.234***
R^2	0.83
Durbin Watson statistic	0.35

Note: The real interest rate after tax is based on a marginal income tax rate, a 10-year government bond yield and a smoothed inflation series as a proxy for inflation expectations. In addition to the variables in Table 3.1, the model includes a dummy for Germany in 1995, a trend for Germany in the period 2004-08, and a trend for Sweden in 2007-08 to ensure normally distributed error terms. The results are robust when allowing for heteroskedasticity. *** (**) (*) indicate that the estimate is significant at a 1, (5), (10) per cent level of significance.
Source: Own calculations.

share of elderly people in the population, has the expected negative sign. According to the life cycle model, the savings ratio will decline when a person retires, which is consistent with similar analyses, cf. Hüfner and Koske (2010).

According to the estimated model, a better government budget balance is linked to lower household savings. Conversely, a deterioration will lead to higher savings. This indicates partial[1] Ricardian equivalence, i.e. households to some extent factoring in future changes in taxes and expenditure. The coefficient of the cyclically adjusted government budget balance is 0.59, so a government deficit increase of 1 pct of GDP will cause the household savings ratio to rise by 0.59 percentage points.[2]

Cyclically adjusted government expenditure also has the expected negative sign. According to Koskela and Virén (1994), income taxes contribute to explaining the lower level of household savings in the Nordic countries relative to other OECD countries in the period 1970-91. Haque et al. (1998) also conclude that public expenditure as a ratio of GDP and the government deficit are the most important factors explaining savings ratio differences across OECD countries. Tanzi and Zee (1998) find that the tax burden is a key factor explaining the savings level across OECD countries in the period 1970-94, and a heavy tax burden entails lower savings.

---

[1] The economic literature refers to various factors, including credit restrictions and limited rationality, which would make full Ricardian equivalence unrealistic. Another factor might be that under well-planned countercyclical fiscal policy, a deterioration of the cyclically adjusted government budget balance would not be seen as an expression of higher future taxes.
[2] As household disposable income constitutes only a percentage of GDP, this means that the impact of household savings on national savings is less than indicated by the coefficient. In Denmark, household disposable income constitutes around 50 per cent of GDP, so higher household savings as a result of an increase in the government deficit of 1 per cent of GDP would amount to around 0.3 per cent of GDP.

The effect from the real interest rate after tax is positive, so a higher real interest rate after tax leads to higher savings. In general, according to the literature, there is also a positive relationship between real interest rates and the savings level, see e.g. Hüfner and Koske (2010), and at micro level, cf. Attanasio and Weber (2010), among others. Unlike the literature, our analysis seeks to allow for the effect of interest deductibility against income tax by calculating the real interest rate after tax based on the tax value of interest deductibility when financing home purchases.[1] A positive interest deductibility value reduces effective after-tax real interest rates and thus savings, which is in accordance with the theoretical relation described in Box 3.1.

We also find a strong significant negative relation between corporate savings as a ratio of GDP and the household savings ratio. Our model differs from most similar studies (see e.g. the bibliography in Hüfner and Koske (2010)) by including corporate savings as an explanatory variable. One exception is Callen and Thimann (1997), who also find a negative relation. Based on the estimated coefficients, the actual values of the explanatory variables and country-specific constants, the result is the model-calculated (estimated) savings ratio, cf. Chart 3.3. To a reasonable extent, the model captures the development in the household savings ratio over time, but it shows less fluctuation than the actual level, which also changes due to cyclical fluctuations and other temporary factors.

The estimated savings ratio in Denmark is substantially lower than the average estimated savings ratios in the other countries. Throughout the period, the estimated savings ratio is outside the scope of two standard deviations relative to the average for the non-Nordic countries, although the difference is slightly reduced over the period. If we look at the average for all the Nordic countries, the savings level is also lower, but the deviation is less pronounced, and an approximation is seen over the period, cf. Chart 3.4.

We can determine the factors which, according to our model, cause the difference in savings ratios by decomposing the differences in estimated savings ratios into contributions from individual variables included in the model, cf. Chart 3.5. As mentioned, we have allowed country-specific constants in the estimated model. For Denmark, this unexplained effect contributes negatively to the savings level relative to the non-Nordic countries, while the contribution for the Nordic countries as a whole constitutes a smaller, negative ratio of the total difference.

---

[1] For countries where interest is not deductible, the tax value is zero. For countries where interest is fully deductible, the tax value equals the marginal tax rate for an average employee, except in the Nordic countries where limitations in the interest deductibility value as a result of tax reforms are taken into account. An estimate based on data from Hilbers et al. (2008) and IBFD (various volumes) is used for countries with partial interest deductibility.

ESTIMATED AND ACTUAL NET SAVINGS RATIOS FOR DANISH HOUSEHOLDS

Chart 3.3

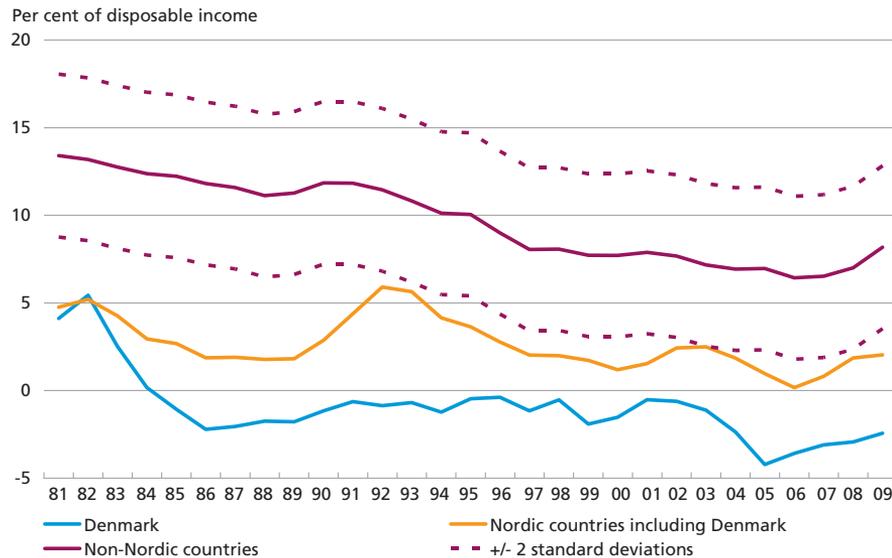Per cent of disposable income

— Actual   — Estimated
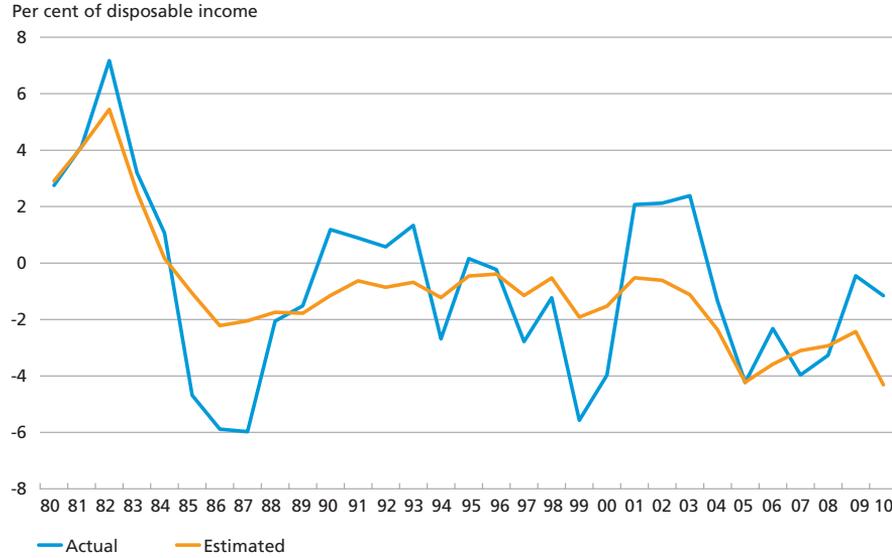
Note: The estimated savings ratios for 2009 and 2010 are based on an out-of-sample forecast.
Source: Own calculations.

Similarly, the demographic differences also contribute only to explaining a smaller part of the differences in the estimated savings ratio. This factor had the strongest impact in the 1980s when the large shares of

ESTIMATED NET SAVINGS RATIOS FOR THE HOUSEHOLD SECTOR   Chart 3.4

Per cent of disposable income

— Denmark   — Nordic countries including Denmark
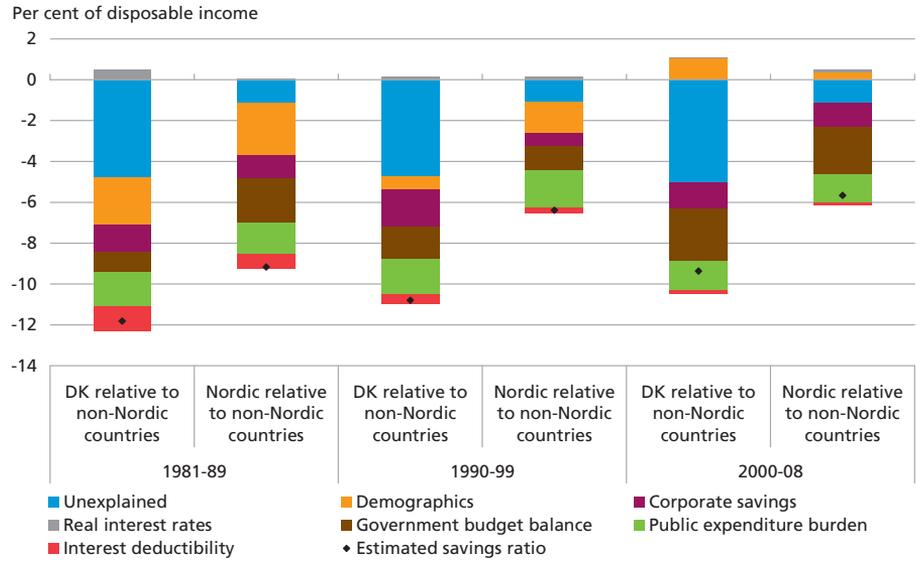— Non-Nordic countries   ---- +/- 2 standard deviations

Note: Australia is not included in the estimate for the savings ratios of non-Nordic countries, since government
         expenditure data is only available from 1989. Statistics for 2009 are based on an out-of-sample forecast.
Source: OECD, Eurostat, IMF, and own calculations.

DECOMPOSITION OF THE DIFFERENCE IN HOUSEHOLD SAVINGS RATIOS
FOR DENMARK AND THE NORDIC COUNTRIES   Chart 3.5

Per cent of disposable income

DK relative to non-Nordic countries	Nordic relative to non-Nordic countries	DK relative to non-Nordic countries	Nordic relative to non-Nordic countries	DK relative to non-Nordic countries	Nordic relative to non-Nordic countries
1981-89		1990-99		2000-08	

■ Unexplained   ■ Demographics   ■ Corporate savings
■ Real interest rates   ■ Government budget balance ■ Public expenditure burden
■ Interest deductibility ◆ Estimated savings ratio

Note: The decomposition of the difference between the estimated savings ratios in the two (groups of) countries is
         estimated as the difference between the contributions of the individual variables in the two (groups of)
         countries. The contribution from the individual variable is estimated by multiplying the variable's average value
         for the different periods by the estimate in Table 3.1. The unexplained part consists of the country-specific
         constants as well as a dummy for Germany in 1995, a trend for Germany in the period 2004-08, and a trend for
         Sweden 2007-08.
Source: Own calculations.

elderly people in the Nordic countries contributed to explaining a
savings ratio difference of just over 2 percentage points. The effect sub-
sequently reversed, but it is now much less influential as an explanatory
factor.

One of the most important sources in the model to explain the lower
savings ratios in Denmark and the Nordic countries compared with the
other OECD countries is the higher corporate savings as a ratio of GDP.
According to the model, the household savings ratio is reduced by 1.5-2
percentage points as a result of the relatively higher level of corporate
savings.

Another very important factor is the size of the public sector measured
by its expenditure as a ratio of GDP. According to the model, it con-
tributes to reducing the savings ratio of the Nordic countries by an aver-
age 2 percentage points relative to the other countries. As described in
Box 3.1, there may be several reasons for this relationship. A more ex-
tensive public safety net reduces the need to save up for precautionary
reasons. Besides, the high level of expenditure is financed by high in-
come taxes and a more progressive tax system. In relative terms, this
reduces the income of people with high incomes more, thereby reducing

the average savings ratio, since people with high incomes typically have a higher propensity to save.

Differences in the strength of public finances are also important. Denmark and the Nordic countries have generally had better public finances than the non-Nordic countries. Even if the model shows only partial Ricardian equivalence, this difference has a major impact on the estimated difference in savings ratios. For Denmark, this factor contributed to reducing the estimated savings ratio by just over 1 percentage point in the 1980s compared with the non-Nordic countries, but the relative improvement in public finances subsequently contributed to explaining a difference in savings ratios of just over 2 percentage points in the period 2000-08. The impact is the same for the Nordic countries taken as one, even though the change compared with the 1980s is greater for Denmark.

A third economic-policy factor of major importance is the value of interest deductibility. In the calculation of this effect, we have used the coefficient on the real interest rate after tax and examined the interest deductibility value measured as the interest rate multiplied by the tax value of the interest deductibility. It appears that interest deductibility played an important role in the 1980s when interest rates were high and the tax value of interest deductibility particularly so, especially in Denmark, where the average tax value of interest deductibility exceeded 60 per cent in the mid-1980s (peaking at just over 73 per cent in 1984-86). In the 1990s and the 2000s, interest deductibility contributed somewhat less to explaining the difference, partly because of the decrease in the level of interest rates, partly because the tax value of interest deductibility was reduced by tax reforms in the Nordic countries (in Denmark as a result of the tax reforms in the 1980s and the "Whitsun Package"). Denmark is still in the upper range, since interest is not tax deductible in a number of countries (cf. Table 4.3).

The above discussion shows a number of possible reasons why the household savings ratio in Denmark and the Nordic countries in general is lower than in the rest of the OECD countries in our survey. It should be noted, however, that our model has difficulty explaining the difference between Denmark and the other Nordic countries where the differences in the estimated savings ratio are attributable mainly to unexplained country-specific constants, cf. Chart 3.6. Accordingly, the Danish savings ratio is lower than warranted by the structural factors of the model.

The results should be interpreted with some caution, however. In addition to statistical uncertainty, there is a risk that other important factors are not included in the model. It is worth noting that our model does not include household wealth. We have attempted to use indicators of the households' housing wealth and financial wealth, but they

DECOMPOSITION OF THE DIFFERENCE IN HOUSEHOLD SAVINGS RATIOS
BETWEEN DENMARK AND THE OTHER NORDIC COUNTRIES   Chart 3.6
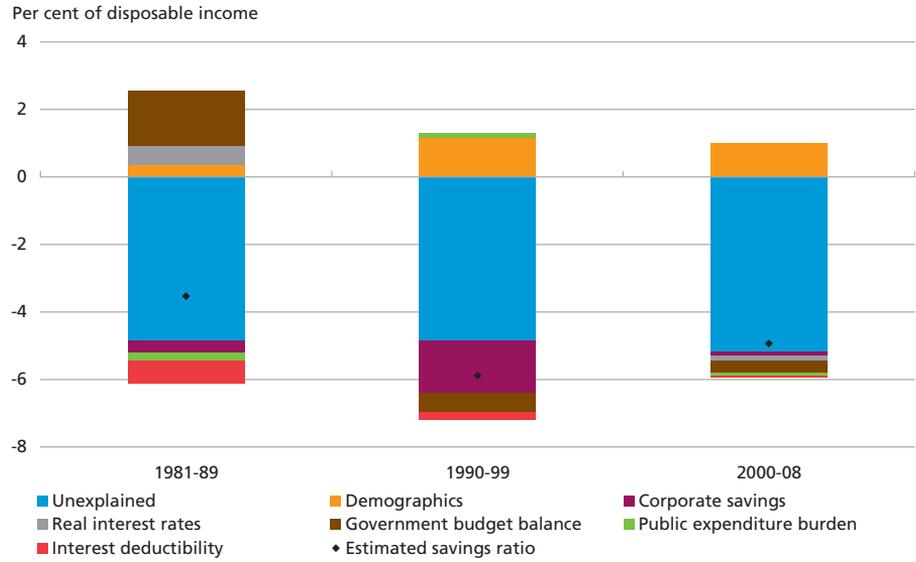
Per cent of disposable income

Note: The decomposition of the difference between the estimated savings ratios in the two (groups of) countries is
        estimated as the difference between the contributions of the individual variables in the two (groups of)
        countries. The contribution from the individual variable is estimated by multiplying the variable's average value
        for the different periods by the estimate in Table 3.1. The unexplained part consists of the country-specific
        constants as well as a trend for Sweden in 2007-08.
Source: Own calculations.

are not significant in the estimations. There is a strong theoretical as-
sumption that household wealth affects household savings, cf. the initial
discussion in this section. Besides, we know from other contexts, e.g.
consumption relations in macroeconometric models[1], that the house-
holds' propensity to consume is positively dependent on their wealth.
Only a limited number of panel data studies are available which analyse
household wealth in terms of its impact on savings across countries, but
according to Hüfner and Koske (2010), the literature does not provide
any unambiguous results. It is evident, however, that household wealth
will explain the low level of savings, since the review in section 2 showed
that the net wealth of Danish households is at an average level com-
pared with the other countries in our data set.

    Furthermore, the effect of the tax system on household savings is only
partially taken into account by our analysis. In this context, it is not
possible to take into account all channels through which the tax system
affects the household savings ratio. For one thing, the tax systems vary
quite considerably across countries, e.g. in terms of whether capital in-
come is taxed as personal income or as other income. For another, there
are typically many different tax rates and limits which change over time.

[1]   Including Danmarks Nationalbank's MONA model.

This is why there are no available data to analyse the importance of different forms of capital income taxation.

Conclusion

Our results indicate that structural factors account for a considerable share of the difference in savings levels in Denmark and the other Nordic countries compared with the other advanced economies. Notably, they indicate that a larger public sector and a better structural government budget balance contribute to explaining the lower savings ratio in Denmark. This is consistent with previous studies, including Koskela and Virén (1994), Callen and Thimann (1997), and Haque et al. (1999). Moreover, the results indicate that interest deductibility may previously have played a role, especially for Denmark in the 1980s, but that it is not likely to be of key importance in relation to the current difference.

4. ECONOMETRIC ANALYSIS OF HOUSEHOLD GROSS DEBT

In the previous section, we analysed household savings which affect household net wealth. In this section, we take a closer look at the factors that drive household gross debt, which, together with net wealth, make up the total balance sheet.

As already described, there has been strong growth in household gross debt relative to disposable income, i.e. the gross debt ratio, in most OECD countries over the last 15 years. The gross debt ratio has increased particularly strongly in Denmark and the Netherlands, and both countries' gross debt ratios are now substantially higher than those of other OECD countries. As described in section 2, the gross debt developments and the cross-country differences are primarily attributable to the expansion of household assets and liabilities; a balance-sheet expansion that does not necessarily affect the amount of net wealth. Concurrently with the growth in gross debt in most countries since 1995, net wealth has generally increased over the same period.

The first section describes a number of theoretical relations that may contribute to explaining the development. We subsequently estimate a panel model in order to be able to assess the importance of individual factors.

Possible explanations of rising debt

Based on the life cycle model, the literature points to various factors possibly contributing to explaining the development in the gross debt ratio. To a large extent, these factors are identical to those influencing the savings ratios, but the transmission mechanisms differ, cf. Box 4.1.

POTENTIAL IMPACT OF VARIABLES ON HOUSEHOLD DEBT RATIOS	Box 4.1

Real interest rates

Lower real interest rates make it possible to service larger debt, as they reduce the costs of having debt. Presumably, the main channel for this contribution is balance-sheet expansion.

Inflation

Declining inflation and thus declining nominal interest rates may reduce credit restrictions. The reason is that in the first years, payments on e.g. a 30-year mortgage loan are very much affected by the level of interest rates. Higher inflation and thus interest rates mean that the first-year payments will constitute a larger share of disposable income than is the case when inflation is low. Since it is a requirement by many banks that first-year payments are limited to a certain percentage of household disposable income, lower nominal interest rates will expand credit facilities. Another factor with a similar effect is that a lower level of inflation is typically associated with higher macroeconomic stability, thereby facilitating a higher level of gross debt, all other things being equal.

Structural unemployment and uncertainty

Lower structural unemployment (Nairu) means that the risk of becoming unemployed is reduced. Consequently, fewer households will be subject to credit restrictions. Moreover, the uncertainty is reduced. Less uncertainty will reduce risk premiums and the volume of asymmetrical information. Reduced uncertainty is due to, inter alia, lower structural unemployment and lower inflation. Presumably, this contributes through both balance-sheet expansion and a desire to reduce net wealth (less need for a large financial buffer).

Private pension savings

As described in section 2, the accumulation of large pension wealth may contribute to increasing gross debt. This contributes mainly through balance-sheet expansion.

Government debt

As described in section 2, high government debt may lead to a desire to increase net wealth, thereby reducing gross debt.

Financial development

The degree of financial development and financial innovation may affect the level of debt in several ways. Firstly, new financial products may reduce the debt-related costs. For example, deferred-amortisation loans reduce first-year payments. Secondly, financial development will reduce the extent of credit restrictions. Under the Danish mortgage-credit system, almost all households have access to cheap home loans. Reduced credit restrictions will increase debt, because more households will be able to raise loans (balance-sheet expansion), and because the need to have a large financial buffer for precautionary reasons to cover unforeseen expenditure and loss of income is reduced (desire to reduce net wealth).

The index for the degree of financial development used in the analysis below is the *Financial Reform Index* constructed by Abiad et al. (2008). The index is based on a weighting of seven parameters: credit regulation, interest-rate regulation, competition

CONTINUED	Box 4.1

barriers, financial supervision, privatisation, international capital flows and securities markets. The index is normalised to lie between 0 and 1 and is available for the period 1973-2005. In 2005, nine of the 17 countries included in the estimation have an index of 1, and the lowest score is 0.81 (Finland). As seen, there are only limited cross-section differences in the last years. Since the impact of financial liberalisation on debt is likely to be subject to a certain lag, the index is lagged by five years, thereby maximising the correlation coefficient between the debt ratio and the financial index.

Other indices have been constructed for the degree of financial development, e.g. the IMF's Mortgage Market Index from 2008, which is, unfortunately, only available for one year. This index is estimated on the basis of six variables: mortgage-equity withdrawal, possibility of debt conversion, loan-to-value ratio, typical term, covered bond issues as a ratio of home loans outstanding, and mortgage-backed security issues as a ratio of home loans outstanding. It shows that there continue to be considerable differences across countries. The index is strongly correlated with the debt ratio, cf. Chart 2.4 (left-hand side).

In addition to the factors in Box 4.1, the development in house prices is often mentioned as a significant factor behind the development in gross debt, since rising house prices make it necessary and/or possible to raise more debt, thereby contributing to balance-sheet expansion. It is not clear, however, whether the debt increases due to house prices alone, or whether gross debt and house prices are driven by the same underlying factors. For example, falling interest rates and financial innovation have reduced user cost and first-year payments on homes, see Dam et al. (2010), thereby contributing to both rising house prices and increased gross debt. To the extent that house prices were, during the estimated period, driven mainly by the factors described in Box 4.1, inclusion of house prices may cause the estimated importance of the other factors to be underestimated. Viewed in isolation, this speaks in favour of not including house prices in the model to be estimated.

House prices are also affected by other variables, e.g. household expectations of future developments in house prices and taxation of real property. Besides, it is notoriously difficult to estimate accurately differences in the degree of financial development across countries and financial innovation. To the extent that house prices, and thus housing wealth, primarily measure financial innovation, house prices can be interpreted as an indicator of such innovation. Furthermore, a number of countries have experienced a housing bubble, which is not captured by the underlying factors, but may affect the development in debt levels. Viewed in isolation, this speaks in favour of including house prices in the model to be estimated. Accordingly, we estimate the model both with and without housing wealth as an explanatory variable.

Econometric analysis

We estimate a panel data model to get a better understanding of the extent to which various factors have contributed to driving the development in the household gross debt ratio. Our data set consists of annual data for 17 OECD countries for the period 1995-2010.[1]

Since the gross debt ratio is a stock measure, its development is sluggish. For this reason, the lagged value of the gross debt ratio is also included as an explanatory variable (for the periods *t-1* and *t-2*). Gross debt is defined as a percentage of disposable income, cf. Table 4.1.

We have made two estimations, including and excluding housing wealth, respectively. All variables have the expected sign and are significant, cf. Table 4.2.

The model's explanatory power is not substantially improved by including housing wealth, although it is significant. As expected, the importance of the other explanatory variables decreases when housing wealth is included. This is consistent with the fact that housing wealth is, to a large extent, determined by some of the variables that determine the level of gross debt. Presumably, rising house prices have also contributed independently to increasing gross debt ratios, e.g. where parts of a housing bubble have been mortgaged.

When decomposing the gross debt ratio change from 1995 to 2010 based on the estimated long-term relation described in model 1, it can be seen that the rise in cross-country gross debt ratios reflects several different factors, cf. Chart 4.1.

According to the estimated model, financial developments have only had a relatively moderate effect on the increase in the gross debt ratio. The estimated model applies the Financial Reform Index, cf. Box 4.1. According to that index, the degree of financial development varies only relatively moderately across countries. In reality, the cross-country differences are probably much bigger, cf. Chart 2.4 (left-hand side). For example, the Danish mortgage-credit system is one of the most developed, robust and flexible lending markets in the world. The mortgage-credit system has been highlighted as a home-financing system that has performed relatively well during the financial crisis, cf. e.g. Shin (2010). The US system, like the Danish one, is highly flexible, but the crisis has demonstrated that it is far less robust.

The large increase in the gross debt ratios in Denmark and the Netherlands mainly seem to be the result of higher pension wealth. The estima-

---

[1] The 17 countries are: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Italy, Japan, the Netherlands, Norway, Portugal, Spain, Sweden, the UK and the USA. The time period is limited, because, for a number of countries, data on household financial assets are only available from 1995.

VARIABLES USED IN THE DEBT RATIO ESTIMATION	Table 4.1
Variable	Definition
Gross debt ratio	Gross debt, per cent of disposable income
Short-term real interest rate	Short-term nominal interest rate less inflation, per cent
Inflation	Annual growth in consumer price index, per cent
Nairu	Structural unemployment, per cent of labour force
Public sector's net assets	Government net assets, per cent of disposable income
Pension wealth	Pension wealth before tax, per cent of disposable income
Housing wealth	Housing wealth, per cent of disposable income
Financial development	Index between 0 and 1

Note: The public sector's net assets are measured as a percentage of household disposable income, thus making it
easier to compare the parameter estimates.
Source: OECD, national central banks and statistical agencies. Data for 2010 for pension wealth and the public sector's
net assets are partially estimated. Financial development based on Abiad et al. (2008).

tion shows that when the pension wealth rises by 1 per cent of dispos-
able income, the debt will grow by approximately 0.4 per cent of dispos-
able income. Viewed in isolation, this results in a crowding-out effect of
40 per cent. It is possible, however, that in addition to increasing their
gross debt, households will also reduce other savings, thereby amp-
lifying the total crowding-out effect. This rules out direct comparison
with the crowding-out effect of 15-30 per cent estimated by the Danish
Economic Councils, cf. Box 2.2.

REGRESSION ESTIMATES FOR THE DEBT RATIO				Table 4.2
Explanatory variables	Model 1	Long-term	Model 2	Long-term
Gross debt ratio (t-1)	1.19***	---	1.17***	---
Gross debt ratio (t-2)	-0.30***	---	-0.28***	---
Short-term real interest rate	-0.35*	-3.30	-0.29	-2.49
Inflation	-1.15***	-10.83	-1.12***	-9.58
Nairu	-1.49***	-13.96	-0.95**	-8.12
Financial development (t-5)	19.43*	201.30	22.49*	192.56
Pension wealth	0.04**	0.39	0.04**	0.31
Public sector's net assets	0.03***	0.27	0.03***	0.25
Housing wealth	---	---	0.01**	0.10
R^2	1.00	---	1.00	---
Durbin-Watson statistic	1.96	---	1.93	---

Note: * 10 per cent significance level, ** 5 per cent significance level, and *** 1 per cent significance level, based on
"Panel Corrected Standard Errors", which are robust to variance differences across countries. The estimates
include fixed effects and a dummy for Norway 2006. The latter does not affect the estimation results, but
provides normally distributed error terms, cf. specification tests. We used a GMM estimation as a robustness
check, cf. Arellano and Bond (1991). The models are quite robust to the choice of instruments, and, based on the
GMM estimations, the bias in the OLS estimation of the basic model is deemed to be modest. We also estimated
the model including period-specific effects to capture any timing trends in the variables. The results vary only
slightly. The effect of inflation and, particularly, real interest rates (will not be significant) decreases, while the
effect of pension wealth and, particularly, government net assets increases.
Source: Own calculations. Data sources: See above.

CHANGE IN HOUSEHOLD GROSS DEBT RATIO FROM 1995 TO 2010,
MODEL 1   Chart 4.1

Change in gross debt ratio, 1995-2010
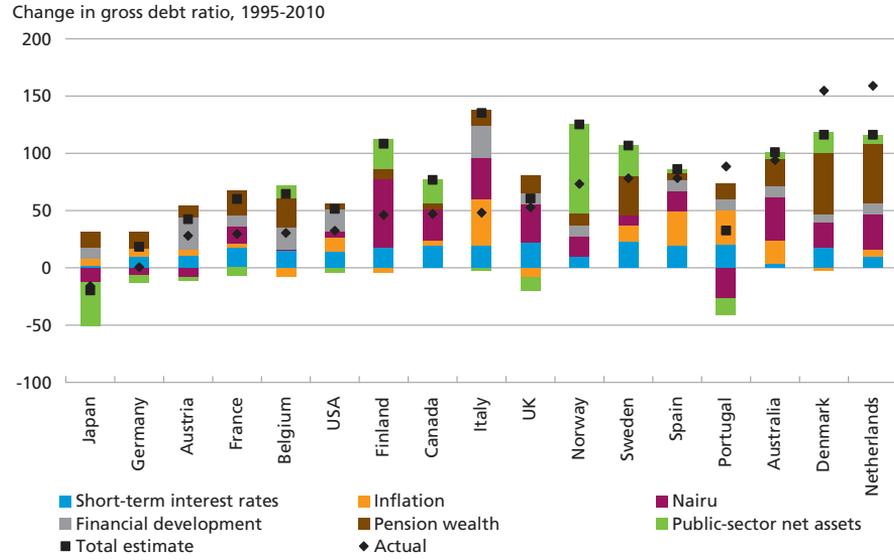
Note: Calculations based on model 1 above. The chart is based on the long-term relation. The explanatory power of the
        long-term relation is lower than for the estimated short-term model. The estimated and actual changes differ
        accordingly.
Source: Own calculations.

Assuming a doubling of the Danes' pension wealth ratio by 2045 compared with the 2005 level, as estimated by the Danish Economic Councils, this will, according to the estimated relation and all other things being equal, lead to an increase in the gross debt ratio of around 100 percentage points relative to the 2010 level, i.e. a debt level of around 400 per cent of disposable income.

The surge in government debt in the wake of the financial crisis implies a reduction of the households' gross debt ratio. In a number of countries, the government net financial debt has increased by more than 30 per cent of household disposable income since 2007. According to the estimated relation, this will result in a reduction of household gross debt by around 8 per cent of disposable income. In Denmark, the government net financial wealth has decreased by around 10 per cent of household disposable income since the end of 2008, and according to the estimated model, this results in a reduction of household gross debt of around 3 per cent of disposable income.

We have included various tax rates in the model estimations during the process, but they have not been significant. However, there is no doubt that Denmark, like most other OECD countries, has strong tax incentives to save through pension schemes rather than free financial wealth, cf. Table 4.3. Moreover, the level of interest deductibility con-

COMPARISON OF THE TAX VALUE OF INTEREST DEDUCTIBILITY AND
CERTAIN TAX CONDITIONS FOR SELECTED COUNTRIES   Table 4.3

Unit	Interest deductibility[1]		Housing tax[2]	Tax on current pension yields[3]	Effective tax over time[4]		
	Home loan	Other			Pension savings	Other savings	Difference
Denmark	33.7	33.7	1.05	15	23.4	44.1	20.7
Sweden	30.0	30.0	1.4	15	17.5	28.8	11.3
Norway	28.0	28.0	0.5	0	10.1	29.2	19.1
Finland	30.0	28.0	0.2	0	15.2	33.0	17.8
Netherlands	33-52	0.0	0.5	0	15.4	27.2	11.8
France	20.0	0.0	0.7	0	1.3	15.8	14.5
Germany	0.0	0.0	1.5	0	11.5	28.7	17.2
UK	0.0	0.0	1.0	0	6.2	22.3	16.1
USA	29.4	0.0	1.7	0	7.5	22.4	14.9
Japan	0.0	0.0	1.7	0	1.4	11.9	10.5

Source: Danmarks Nationalbank, OECD, IBFD (European Tax Handbook 2011), Hilbers et al. (2008), and Yoo and de Serres (2005).

[1] For the Nordic countries, the tax value of interest deductibility is set at a maximum limit. For other countries, interest is typically deductible at the marginal tax rate. A range is used for the Netherlands, while an average marginal tax rate is used for the USA. For France, interest on home loans is subject to a 20 per cent tax relief or a maximum amount of 3,750 euro (this limit is raised by 500 euro per dependant).

[2] In Denmark, housing tax is a weighting of property tax and property value tax. For other countries, it is typically a local tax. Data are not available for the Netherlands, France, the UK and the USA.

[3] Yoo and de Serres (2005). Few countries tax pension savings on an ongoing basis. In addition to those mentioned, they include Australia (7.1 per cent), New Zealand (33 per cent) and Italy (12.5 per cent). Belgium taxes the balance (0.17 per cent).

[4] The effective savings tax rates are estimated in Yoo and de Serres (2005). A comparison is made with the average effective tax rate for a one-off investment in either pension savings or other savings over the period from the investment is made until the age of 65 when the savings are disbursed (average for nine age groups). For pension savings, deductibility of pension contributions and taxation of pension yields (PAL taxation) are taken into account. For the benchmark portfolio, the average marginal tax is used as a proxy for capital yields tax.

tinues to be high in Denmark. Presumably, the combination of interest deductibility, which continues to be in the upper range in an international context, and which used to be even higher, and the strong tax incentives to save through pension schemes has contributed to the substantial balance-sheet expansion seen in Denmark over the last 15 years.

5. CONSEQUENCES OF HIGH GROSS DEBT

In Denmark, household gross debt is high compared with other countries. The reasons for the high debt were analysed in the previous section. This section examines the macroeconomic consequences of high debt.

The focus is on the more pronounced vulnerability associated with high gross debt, e.g. to interest-rate changes and unemployment. More pronounced vulnerability may lead to increased household arrears and ultimately to losses for banks and mortgage banks, and it may amplify fluctuations in private consumption and cyclical fluctuations in general. A proper assessment of the impact on financial stability requires detailed

information on the distribution of debt on borrowers and lenders, which is outside the scope of this study.

The relationship between gross debt and economic growth is discussed at the end of this section.

Debt and losses in the financial sector

One concern as regards the high level of gross debt in Denmark is that it may lead to the financial sector suffering increased losses on lending to households during an economic slowdown or in the event of rising interest rates. Among other things, higher gross debt means that the Danish household sector will be more sensitive to interest-rate changes, especially if interest rates rise at a time of high unemployment and weak growth. But over the last 15 years, during which period the gross debt ratio has doubled, the financial sector in Denmark has only suffered moderate losses on lending to the household sector compared with the situation during the crisis in the early 1990s.

Even after the financial crisis, the losses of banks and mortgage banks on lending to the household sector have been relatively small, reflecting, among other factors, relatively low unemployment, very low interest rates and great household wealth. Viewed in isolation, low loss rates cannot be taken to indicate that the level of gross debt does not affect the loss rates. A comprehensive analysis of the impact on financial stability of a large household debt ratio requires detailed data on the distribution of debt and wealth on individual households and on the exposure of individual financial institutions.

Households with high gross debt will typically have high gross wealth (both housing and pension wealth), since their homes are collateral for a large part of the gross debt. Besides, part of the increase in the gross debt ratio in Denmark may be attributable to the fact that households have debt for a longer period of time, e.g. because they save through pension schemes rather than reducing their housing debt, and because a larger number of households have debt as a result of an easing of credit restrictions, cf. section 4 above. This indicates that the peak of the individual household's gross debt ratio over its life cycle did not rise as much as the gross debt ratio for the household sector as a whole. For this reason, the households' vulnerability probably did not increase to the degree warranted by the household sector's gross debt ratio alone.

In the following, we analyse whether a high gross debt ratio increases the number of households in arrears on their home loans or rent. This analysis may give an indication of the extent to which high gross debt in the household sector affects financial stability when viewed in isolation.

DATA FOR HOUSEHOLDS IN ARREARS	Box 5.1

Data for the share of households stating that they have been in arrears with either their home loans or their rent over the previous 12 months are based on two questionnaire surveys, European Community Household Panel, ECHP, covering the period 1994-2001, and European Union Statistics on Income and Living, EU-SILC, covering the period 2004-10.

   The levels of the two questionnaire surveys do not seem to be directly comparable, since all countries experience a considerable increase in the number of households in arrears from 2001 to 2004. This is inconsistent with e.g. the trend in the banks' losses during the same period. Accordingly, we have chosen to link the two questionnaire surveys by maintaining the 2004 level in the period 2001-03, after which the trend is determined in arrears using ECHP.

   We have thus constructed a data set for nine countries (Austria, Belgium, Denmark, France, Italy, the Netherlands, Portugal, Spain, and the UK) for the period 1995-2009. Given the uncertainty associated with data and a number of data breaks, the results should be interpreted with caution. For Denmark, the constructed series for the share of households in arrears is fairly consistent with the trend in the loss ratios of the Danish banks, cf. Chart 5.1, although there is a certain amount of deviation in the period 1997-2000.

| THE LOSS RATIOS OF DANISH BANKS AND THE SHARE OF HOUSEHOLDS IN ARREARS WITH HOME LOANS OR RENT	Chart 5.1

Source: Danmarks Nationalbank, Eurostat and own calculations, cf. the above description of the data construction.

We have chosen to base our analysis on data on the percentage of households in arrears. They are comparable across countries.[1] Specific-

---

[1] Alternatively, we might analyse the banks' losses on lending to the household sector, but such data are publicly available for very few countries. Data on bad loans are available, but they are not comparable across countries for two reasons. Firstly, calculation methods vary across countries. Secondly, due to legislation differences, the period during which a loan is registered as bad, varies across countries. In countries where a loan is registered as bad for a long period of time, the holdings of bad loans will be larger without this reflecting larger losses.

ARREARS WITH HOME LOANS OR RENT, 2009   Chart 5.2

Per cent of all households
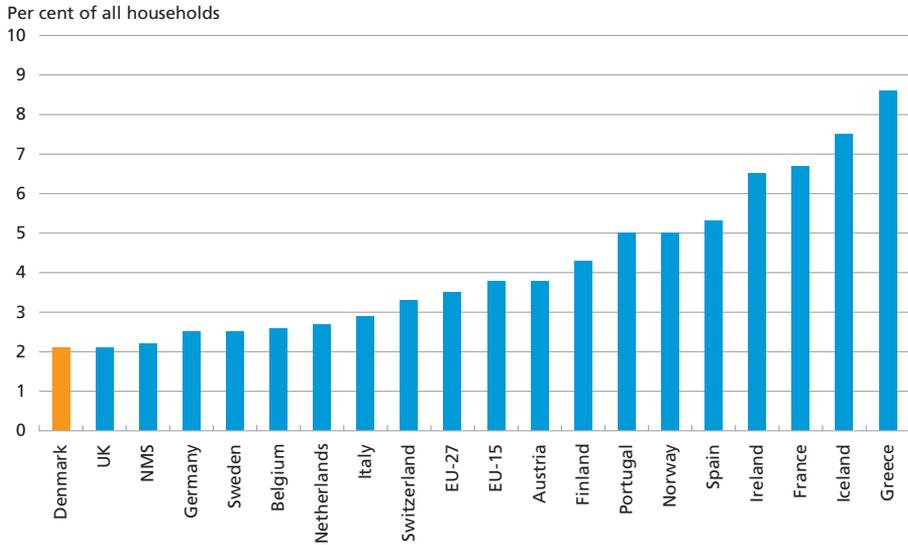
Note: NMS: New member states.
Source: European Union Statistics on Income and Living Conditions.

ally, comparable data across countries are available for the percentage of households stating that they have been in arrears with either their home loans or their rent over the previous 12 months. The data set is constructed on the basis of two European questionnaire surveys, cf. Box 5.1.

The percentage of households in arrears with home loans or rent in 2009 is very low in Denmark compared with other European countries, cf. Chart 5.2. This indicates that the high Danish level of gross debt does not contribute significantly to the size of the losses on lending to the households. As a consequence of Danish mortgage credit and insolvency legislation, Danish households will probably go to great lengths to avoid payment problems in relation to their home loans. The Danish mortgage credit system and its performance during the crisis are described in more detail in the article entitled "Danish Mortgage Credit" in Part 1 of this Monetary Review.[1]

In the estimation below, we examine whether the gross debt ratio may contribute to explaining the development in the percentage of households in arrears with home loans or rent across countries. Changes in unemployment and in the short-term interest rate are included as control variables. In addition, we include country-specific effects to capture structural differences across countries and period-specific effects

---

[1]   Gundersen et al. (2011).

REGRESSION ESTIMATES FOR THE SHARE OF HOUSEHOLDS IN ARREARS
WITH HOME LOANS OR RENT   Table 5.1

Explanatory variables	Short-term
Arrears (*t-1*)	0.616[***]
Δ Unemployment	0.284[***]
Δ Short-term nominal interest rate	0.143
Level of gross debt	-0.006
R^2	0.825
Durbin-Watson statistic	1.898

Note: Estimates based on a panel estimation including both country-specific and period-specific effects. * 10 per cent
        significance level, ** 5 per cent significance level, and *** 1 per cent significance level, based on "Panel
        Corrected Standard Errors", which are robust to variance differences across countries, among other factors. We
        also estimated an alternative model, multiplying the gross debt ratio by the changes in unemployment and
        interest rates. This did not alter the conclusions, but had lower explanatory power.
Source: Estimates based on data from the OECD and national central banks.

to capture the general cyclical position in the euro area. Finally, the
lagged value of arrears is included to avoid autocorrelation. The only
significant explanatory variable is the change in unemployment where
rising unemployment increases the percentage of households in arrears,
cf. Table 5.1.

Despite the fact that household balance sheets, by their nature, seem
to prevent the high gross debt ratio from directly affecting the losses of
the financial sector, there may be indirect effects. The reason is that
high gross debt amplifies fluctuations in private consumption, cf. the
analysis below. This may result in increased losses on lending to firms
whose output is aimed at domestic private consumption. It is also pos-
sible that the high gross debt ratio has amplified the fall in house prices,
thereby increasing the losses on lending to the construction sector.

Cyclical fluctuations and debt

Households influence the business cycle through private consumption,
which accounts for the largest share of domestic demand in nearly all
countries. Viewed over the last 30 years, private consumption fluctu-
ations have declined while gross debt has increased, cf. Chart 5.3.

The generally more stable growth in the last decades before the crisis
– called "The Great Moderation"[1] – is typically explained by improved
economic policies, both monetary and fiscal policies, and/or a decline in
the variability of the shocks to the economy. Despite the increasingly
stable development in general, private consumption growth varies
across countries. The variations are most pronounced in countries with
high household gross debt, cf. Chart 5.4.

---

[1]   Bernanke (2004).

STANDARD DEVIATION OF ANNUAL REAL GROWTH IN PRIVATE
CONSUMPTION AND THE DEVELOPMENT IN GROSS DEBT   Chart 5.3
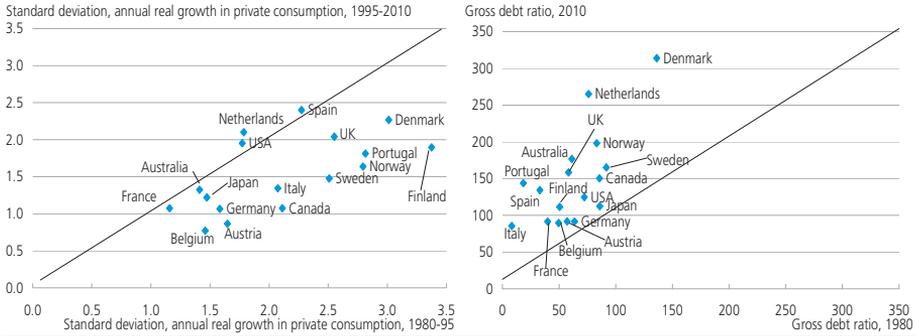

Note: An alternative might be to plot the so-called z-scores where the standard deviation is divided by the mean value.
        This takes into account that the standard deviation may decline as a result of lower structural growth. However,
        z-scores indicate the same result, i.e. a more stable level of consumption growth.
Source: OECD, national central banks and own calculations.

Comparison of fluctuations in private consumption across countries is
impeded by cross-country variations in the composition of household
consumption. In countries with a large public sector, household con-
sumption will, in effect, to a large extent be paid by the government.
Typically, this includes healthcare services, childcare, care for the elderly,
and education. These consumption components – particularly healthcare
services – are less volatile than other consumption components. Moreover,
the households' need to have large holdings of liquid assets is reduced.

HOUSEHOLD GROSS DEBT AND CONSUMPTION VOLATILITY   Chart 5.4
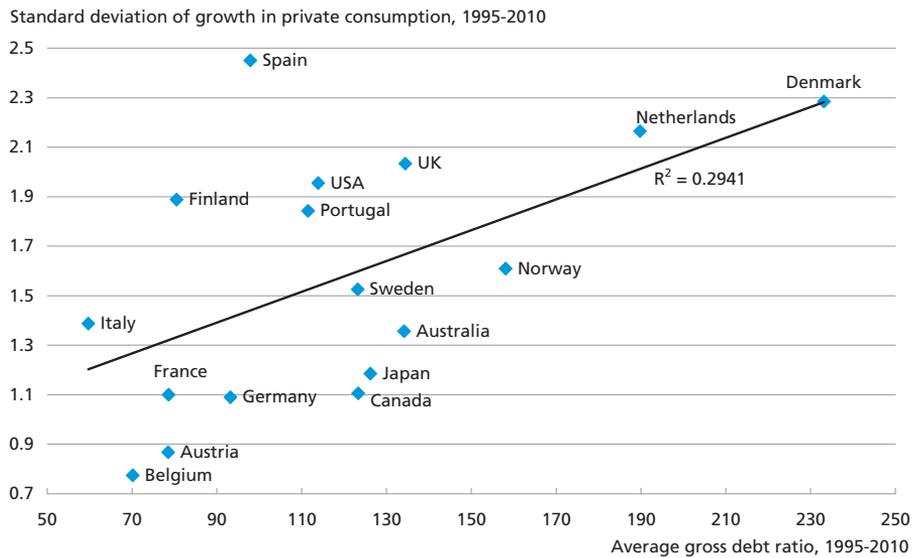
Note: Data for 2010 are partially estimated. If Spain is excluded, R^2 will increase to 0.45.
Source: OECD, national central banks and own calculations.

Consequently, countries with a large public sector will experience higher variability in that part of consumption which is paid by the households themselves. Inclusion of individual public consumption reduces fluctuations in consumption across countries, but the countries with the highest level of gross debt still experience the largest fluctuations.

The relation between the level of gross debt and the fluctuations in private consumption may be attributable to the fact that a high level of debt amplifies the effect of shocks to the economy, because households with a high level of gross debt change their consumption patterns more than households with a lower level of gross debt, or they sell some of their assets, e.g. their homes. A number of transmission channels through which the level of gross debt affects cyclical fluctuations can be pointed out.

Interest-rate increases reduce the disposable income of households with debt, especially those with a high level of short-term debt, thereby reducing consumption. For households with net assets, interest-rate increases will reduce the market value of bonds and the value of homes. The net effect of interest-rate increases must be expected to be lower disposable income (and in the short term reduced wealth) and thus lower consumption, and the effect is reinforced the larger the individual household gross debt and the larger the number of households with gross debt.

For households with high gross debt that are temporarily hit by unemployment, consumption smoothing through increased borrowing will not be possible to the same degree as for households with low gross debt. Alternatively, the households may try to sell their assets, e.g. their homes, in order to reduce their gross debt. This may lead to falling house prices, thereby reducing private consumption.

In order to better assess the impact of a high gross debt ratio in the household sector, we examine the fluctuations in private consumption using a panel data model. The model takes into account exogenous shocks, structural differences across countries and general cyclical fluctuations.

Panel estimation

Private consumption is often described as a function of household disposable income and net wealth. Accordingly, fluctuations in private consumption can often be attributed to fluctuations in income and wealth in particular. The development in private consumption will also affect income, however.[1] Consequently, fluctuations in private consumption

---

[1] Wealth may also be affected by the development in private consumption, but the relation is much weaker. Here, we choose to assume that wealth is exogenous and therefore not affected by the development in private consumption.

cannot be estimated directly as a function of income fluctuations, as this is not an exogenous variable (which results in non-consistent coefficient estimates).

Instead, we include country and period-specific effects adjusting for structural differences across countries and global cyclical fluctuations. In addition, the standard deviation of growth in net assets is included.

The standard deviation of consumption is calculated for five 3-year periods over the period 1995-2009 for the same 17 countries as in the above estimation of the debt level. By defining each time unit as a 3-year period, we seek to avoid that we, by construction, create problems with autocorrelation between observations.

All variables have the expected sign, and the gross debt ratio is strongly significant, cf. Table 5.2.

The estimation indicates that higher gross debt leads to greater fluctuations in the economy, even when taking into account structural differences, general cyclical fluctuations and fluctuations in net asset growth. This indicates that the high level of household gross debt has contributed to a larger decline in private consumption during the financial crisis in Denmark than in other countries.

Other consequences of gross debt

In addition to the high level of gross debt affecting macroeconomic and financial stability, a higher level of gross debt will, all other things being equal, lead to interest-rate changes having a stronger impact. Hence, there are many indications that the interest-rate pass-through has increased over time. For Denmark, this can also be attributed to changes in the home-financing structure, cf. Drejer et al. (2011). High gross debt may also reduce the pass-through of fiscal policy stimulus in a slump, since households increasingly need to reduce their gross debt, resulting in a higher savings ratio.

REGRESSION ESTIMATES FOR FLUCTUATIONS IN PRIVATE CONSUMPTION	Table 5.2
Explanatory variables	Estimated coefficient
Standard deviation in net asset growth	0.027[***]
Gross debt ratio	0.009[***]
Constant	-0.372
R^2	0.820
Durbin-Watson statistic	1.896

Note: Estimates based on a panel estimation including both country-specific and period-specific effects and a dummy for Spain. * 10 per cent significance level, ** 5 per cent significance level, and *** 1 per cent significance level, based on "Panel Corrected Standard Errors", which are robust to variance differences across countries.
Source: Own calculations.

In the current situation, households in several advanced economies have tried to consolidate their financial balance sheets and reduce their debt. This has led to low growth in private consumption. The question is whether it is possible to find a threshold level determining when the gross debt is too high, thereby having a negative impact on growth as a result of increased instability.[1]

Presumably, it is difficult to determine such a threshold level, especially because there are considerable institutional differences across countries, including in pension systems and the degree of financial development[2]. Furthermore, in order to assess the private sector's gross debt, it is necessary to view the gross debt in relation to the assets (for the households e.g. pension wealth and housing wealth). So, as described earlier, the high household gross debt ratio in Denmark is accompanied by substantial pension and housing wealth.

It should be noted that growth is not the only relevant potential negative effect of high gross debt. For example, a high level of household gross debt is associated with greater fluctuations in private consumption, as described previously. A higher variability of private consumption may result in lower household benefits if a more stable development in private consumption is preferred, which economic theory often assumes to be the case.

---

[1] In principle, the relationship between debt and growth is positive, since debt enables productive investment. In general, the economic literature also finds a positive relation between financial development (and thus debt) and growth.

[2] The literature has found it difficult to define when the level of private-sector gross debt is too high across countries. In a study of OECD countries, Cecchetti et al. (2011) find that high government gross debt (more than 85 per cent of GDP) is associated with lower growth. On the other hand, they find no statistical evidence of a corresponding threshold value for private-sector gross debt.

LITERATURE

Abiad, Abdul, Enrica Detragiache and Thierry Tressel (2008), A new database of financial reforms, *IMF Working Papers*, No. 266.

Arellano, Manuel and Stephen R. Bond (1991), Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations, *Review of Economic Studies*, Vol. 58, No. 2.

Attanasio, Orazio P. and Matthew Wakefield (2010), The effects on consumption and saving of taxing asset returns, *Dimensions of Tax Design: the Mirrlees Review*, Oxford University Press, Chapter 7.

Attanasio, Orazio P. and Guglielmo Weber (2010), Consumption and saving: models of intertemporal allocation and their implications for public policy, *Journal of Economic Literature*, Vol. 48, No. 3.

Barro, Robert J. (1974), Are government bonds net wealth?, *Journal of Political Economy*, Vol. 82, No. 6.

Blomquist, Niels and Susanne H. Thamsborg (2010), Global imbalances – a threat to the upswing?, Danmarks Nationalbank, *Monetary Review*, 3rd Quarter.

Boadway, Robin and David Wildasin (1995), Taxation and savings: A survey, *Fiscal Studies*, Vol. 15.

Bernheim, B. Douglas (2002), Taxation and saving, in A. J. Auerbach and M. Feldstein (ed.), *Handbook of Public Economics*, Vol. 3.

Catte, Pietro, Nathalie Girouard, Robert Price and Christophe André (2004), Housing markets, wealth and the business cycle, *OECD Economics Department Working Papers*, No. 17.

Cecchetti, Stephen G., M. S. Mohanty and Fabrizio Zampolli (2011), The real effects of debt, *BIS Working Paper*, No. 352.

Damgaard, Jannick (2007), From debtor to creditor country – an analysis of investment income, Danmarks Nationalbank, *Monetary Review*, 1st Quarter.

The Danish Economic Councils (2008), Opsparing (Savings – in Danish only), *Dansk økonomi,* Spring, Chapter 2.

Dynan, Karen E. and Donald L. Kohn (2007), The rise in U. S. household indebtedness: Causes and consequences, Federal Reserve Board, *Finance and Economics Discussion Series*, No. 37.

Glick, Reuven and Kevin J. Lansing (2011), Consumers and the economy, Part I: Household credit and personal saving, Federal Reserve Bank of San Francisco, *Economic Letter*, January.

Gundersen, Poul, Stig Hesselberg and Sean Hove (2011), Danish mortgage credit, Danmarks Nationalbank, *Monetary Review*, 4th Quarter.

Haque, Nadeem Ul, M. Hashem Pesaran and Sunil Sharma (1999), Neglected heterogeneity and dynamics in cross-country savings regressions, *IMF Working Papers,* No. 128.

Hüfner, Felix and Isabell Koske (2010), Explaining household saving rates in G7 countries: implications for Germany, *OECD Economics Department Working Papers*, No. 75.

Kerdrain, Clovis, Isabell Koske and Isabelle Wanner (2010), The impact of structural policies on saving, investment and current accounts, *OECD Economics Department Working Papers*, No. 815.

Harvey, Ross (2004), Comparison of household saving ratios: Euro area/United States/Japan, OECD, *Statistics Brief*, No. 8.

IBFD, International Bureau of Fiscal Documentation (various volumes), *European Tax Handbook*.

IMF (2008), The housing sector and the business cycle, *World Economic Outlook*, April, Chapter 3.

Koskela, Erkki and Matti Virén (1994), Taxation and household saving in open economies: Evidence from the Nordic countries, *The Scandinavian Journal of Economics*, Vol. 96, No. 3, Tax Policy in Small Open Economies.

Ludwig, Alexander and Torsten Sløk (2002), The impact of changes in stock prices and house prices on consumption in OECD countries, *IMF Working Papers,* No. 1.

Nickel, Christiane and Isabel Vansteenkiste (2008), Fiscal policies, the current account and Ricardian equivalence, *ECB Working Paper Series*, No. 935.

OECD (1994), *Taxation and household saving*.

OECD (2011), *Pensions at a glance*.

Salotti, Simone (2010), Global imbalances and household savings: the role of wealth. *The Social Science Journal*, Vol. 47, No. 1.

Saez, Emmanuel (2009), Details matter: The impact of presentation and information on the take-up of financial incentives for retirement saving, *American Economic Journal: Economic Policy*, Vol. 1.

Shin, Hyun Sung (2010), Financial intermediation and the post-crisis financial system, *BIS Working Papers,* No. 304.

Sousa, Ricardo M. (2009), Wealth effects on consumption – evidence from the euro area, *ECB Working Paper Series*, No. 1050, May.

Tanzi, Vito and Howell H. Zee (1998), Taxation and the household saving rate: evidence for OECD countries, *IMF Working Papers*, No. 36.

Yoo, Kwang-Yeol and Alain de Serres (2005), Tax treatment of private pension savings in OECD countries, *OECD Economic Studies*, No. 39, 2004/2.