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Part 2

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The small picture on the front cover shows the "Banker's" clock, which was designed by Arne Jacobsen for the Danmarks Nationalbank building.

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Contents

Danish Families' Financial Robustness, Variable Rates and Deferred Amortisation 1

Asger Lau Andersen and Anders Møller Christensen, Economics, Charlotte Duus and Ri Kaarup, Financial Markets

The large gross debt of Danish households has attracted considerable negative attention internationally. The analysis of debt and debt structure at family level in this article shows that the threat to financial stability from this is limited. Most families have robust finances that are resilient to a strong increase in interest rates or a protracted period of unemployment, although this may, in many cases, entail considerable lifestyle changes. Deferred-amortisation loans give rise to special problems. It is not common to use deferred amortisation to otherwise increase savings.

Corporate Saving and Investment 53

Kirstine Eibye Brandt, Jacob Isaksen and Søren Vester Sørensen, Economics, and Jens Uhrskov Hjarsbech, Statistics

The net lending of Danish firms is currently very high. The reversal in corporate net lending during the economic slowdown was more pronounced than normally warranted by the business cycle. But this cannot be attributed to a larger need for debt reduction than in other countries. Corporate gross savings have risen during the crisis, particularly due to falling interest expenses and dividend payments. Over a number of years, the level of corporate gross savings has been high in Denmark relative to several other OECD countries, particularly as a result of higher property income and lower dividend payments. Another factor explaining the increase in corporate net lending is a stronger decline in investment spending. An econometric analysis shows that the current investment ratio in Denmark is somewhat below its long-term level, while this is not the case for the other countries overall. An analysis of accounting data at firm level shows that medium-sized firms, in particular, have reduced their investment spending, and that this applies especially to real-estate firms and trading and transport firms.

Danish Families' Financial Robustness, Variable Rates and Deferred Amortisation

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Charlotte Duus and Ri Kaarup, Financial Markets*

INTRODUCTION AND SUMMARY

The far higher gross debt-to-income ratio of Danish families compared with families in other countries has attracted considerable attention among international organisations, credit rating agencies and a number of observers. In a report from November 2012, the European Commission (2012) describes the level of family indebtedness as unsustainable, and in the press release from Fitch credit rating agency, in which it affirms Denmark at AAA – Fitch (2012) – the level of family indebtedness is referred to as exceptional. As a counterpart of the substantial debt, Danish families also hold considerable assets, not least in the form of individualised pension wealth. Concerns have been expressed about families' ability to service their debt in the event of rising interest rates or higher unemployment, the considerations being that the families with large debt are not necessarily the ones that hold substantial assets.

In continuation of a previous article on the wealth and debt of Danish families, cf. Andersen et al. (2012), the possible threat to financial stability in Denmark from the income and debt of Danish families is examined at family level. The families' overall balance sheet is good and has contributed to Denmark's current-account surpluses for many years.

The main conclusion is that the threat to financial stability from Danish families' debt and debt structure is limited. The assessment is based on the share of the debt held by families with particularly tight personal finances, among other factors. Indeed, the credit institutions have suffered only moderate losses on private customers in recent years.

Most families have robust finances and, if they reduce consumption or savings, are resilient to negative events such as a strong increase in interest rates or a protracted period of unemployment, although this may entail considerable lifestyle changes. This assessment does not take into positive account that a rise in interest rates is very likely to go hand in hand with an economic recovery and hence better opportunities for families to increase their income by seeking further employment. Moreover, most families by

far have a buffer of liquid assets, which can, in most cases, cover the additional costs of interest-rate increases for more than one year.

This article contains a detailed analysis of the number of families that will encounter financial problems in the event of interest-rate increases, unemployment or expiry of the deferred-amortisation period, and whether this will entail losses on lending by credit institutions. The basis of the sensitivity analysis is how the individual family's income after tax, interest and redemptions and fixed expenditure, i.e. the disposable amount, changes if interest rates increase by 5 percentage points, or in the event of higher debt redemptions or a temporary loss of income due to a period of three or six months' unemployment for the family's principal earner. It is calculated whether the disposable amount is large enough to sustain an average budget or a tight budget, respectively, and the changes in the disposable amount are broken down. Disregarding the calculations of the consequences of a temporary loss of income, the family's income is regarded as fixed in the analysis.

The families whose disposable amounts become insufficient represent a risk of default for the credit institutions. Whether the end result is default and possibly enforced sale, depends on the family's scope for e.g. cutting down their consumption further or divesting assets. In the event of enforced sale, the credit institutions' losses depend on the sales price of the assets that may have been pledged as collateral for the loans, cf. the analysis in Danmarks Nationalbank (2012).

In the analysis, special focus is on the loan types raised by Danish families from the mortgage banks. No such previous analysis exists at detailed level. Families who have raised mortgage loans with deferred amortisation tend to have had higher debt than other families before raising the mortgage loan. Moreover, they tend to raise larger loans and generally, they do not compensate for this by otherwise saving up.

Specifically, the degree to which families with deferred amortisation use it to reduce other, and often more expensive, debt is examined. This happens, but is not common. Families with deferred amortisation clearly tend to have lower savings than families with amortisation.

As a result of the combination of falling house prices and the fact that mortgage banks have often granted loans with deferred amortisation up to the limit of 80 per cent of the market value of a home, a large share of these loans now exceed 80 per cent of the market value. This applies to around half of the loans with deferred amortisation.

Loans with deferred amortisation pose a serious problem in that they are efficient only in periods of rising house prices. This is probably reflected in some mortgage banks bringing an end to granting loans with deferred amortisation at up to 80 per cent of the value of the home.

THE DATA APPLIED

This article applies new, detailed data. The mortgage banks have made data on all lending to private individuals available to Danmarks Nationalbank and the Ministry of Business and Growth, among others. In anonymised form, this information has been pooled with income, tax and wealth data from Statistics Denmark's income and population data registers at individual level and then aggregated, using the family as the economic unit. Box 1 contains a statistical definition of a family.

For each mortgage loan, the data provided by the mortgage banks shows the original principal, disbursement date, maturity, number of due dates per year, any interest-rate adjustment period and proportion of the loan subject to interest-rate adjustment and interest cap, if any. Moreover, the mortgage banks have provided information on remaining maturity, remaining debt, current interest rates, the latest administration margin, any arrears on the loan, any start and end dates for the most recent period of deferred amortisation and any access to deferred amortisation in the future. On the basis of this information, the individual mortgage loans can be classified as fixed-rate or variable-rate loans and loans with or without deferred amortisation. It is possible to calculate redemptions and interest payments.

The data also includes the mortgage banks' valuation of the loan-to-value, LTV, ratios for the properties pledged as collateral for the respective loans. The mortgage banks use different property valuation

DEFINITION OF A FAMILY

Box 1

The analyses in this article are based on Statistics Denmark's definition of "E-families". According to this definition, a family consists of one or two adults and any children living at home. Two adults are regarded as members of the same family if they live together and meet at least one of the criteria below:

- They are spouses or registered partners
- They have at least one joint child registered in the Civil Register (CPR)
- They are of opposite sex with an age difference of less than 15 years, are not close relatives and live in a household with no other adults.

Adults living at the same address who do not meet at least one of the above criteria are regarded as members of different families.

Children living at home are regarded as members of their parents' family if they are under the age of 25, live at the same address as at least one of their parents, have never been married or in registered partnership and have no children registered in CPR.

Given these criteria, a family may consist of two generations only. If there are more than two generations living at the same address, the family consists of the two youngest generations together.

DANISH FAMILIES' ASSETS AND LIABILITIES

Box 2

Family gross debt consists of all debt items appearing in Statistics Denmark's personal income register. It includes debt to banks and mortgage banks, the Mortgage Bank of the Kingdom of Denmark, financing companies and municipalities as well as debt related to credit cards and mortgage deeds. Gross debt does not include private debt. The gross debt ratio is given as gross debt divided by income after tax.

Family assets consist of bank deposits, the market value of stocks and bonds as well as mortgage deeds in custody accounts. Moreover, the value of real property is included in some analyses while excluded in others. Whether it is included is specified in the text and in the notes for the individual Charts. The value of real property has been calculated at an approximated market price, as described in Andersen et al. (2012). Pension wealth is not included in family assets.

A family's net wealth is the difference between the value of its total assets (with or without real property) and its gross debt. The family's net wealth ratio is net wealth divided by income after tax.

For a number of assets information is not available. Cash holdings, the value of the family's durable consumer goods, including cars, boats, household effects and art, and the value of private cooperative housing are not included, whereas any debt accumulated for acquisition of these goods is included. This reflects that most income and wealth data stems from the individual family members' notices of assessment, which do not include these items.

methods. The methods are approved by the Danish Financial Supervisory Authority. All variables have been calculated at year-end for the years 2009, 2010 and 2011.

Data from Statistics Denmark is derived from the personal income and population registers. The personal income register is mainly based on data from the Danish tax authority, SKAT, on private individuals' income, tax, wealth and debt. The population register makes it possible to link this information to a number of socioeconomic variables. This data covers the period from 2002 to 2010.

For some families, the registered income after tax is zero or negative. Since income is a key variable in the analyses below, only families with an annual income after tax of at least kr. 25,000 are included. The families thus excluded are dominated by the very young. Moreover, families where the main source of income of at least one member is self-employment or employment as an assisting spouse are excluded.¹ All adults in the family must be fully liable to income tax in Denmark in order for the family to be included in the analysis.

In addition, the analysis of families with mortgage debt is limited to families whose mortgage loans are based on owner-occupied homes or

¹ A self-employed person is the sole proprietor of a firm, the profit of which is higher than the sum of that person's wages, old-age pension or early retirement pension.

**AGGREGATED DATA FOR ALL FAMILIES AND FAMILIES WITH MORTGAGE
LOANS, 2010**

Table 1

	All families			Families with mortgage loans		
	Number of families	Share of liabilities, per cent	Share of assets, per cent	Number of families	Share of liabilities, per cent	Share of assets, per cent
All families	2,837,195	100.0	100.0	1,076,142	100.0	100.0
Families with self-employed	166,713	24.6	22.2	95,570	18.5	17.9
Families without full tax liability	54,724	0.4	0.4	3,856	0.4	0.4
Families with income after tax of less than kr. 25,000	74,661	2.4	1.7	5,667	1.5	1.2
Families without self-employed, with full tax liability and income after tax of at least kr. 25,000	2,570,518	74.3	76.8	973,459	80.5	81.3

Note: Families with self-employed members are defined as families in which at least one of the adult members can be classified as self-employed or assisting spouse. Families without full tax liability are defined as families in which at least one of the adult members has less than full tax liability in Denmark. Pension wealth is not included in the assets, but housing wealth is included.

Source: Mortgage banks, Statistics Denmark and own calculations.

summer cottages as collateral. Where several private individuals are liable for the same mortgage loan, equal liability is assumed. The analyses also assume joint and several liability among family members.

In order to obtain a comprehensive overview of Danish families' assets and liabilities, the families' gross debt, total assets, net wealth and net wealth ratios are examined. They are described in Box 2.

The analysis for 2010 relates to just over 90 per cent of both the whole population and the share of families with mortgage debt, cf. Table 1. In terms of income, these families cover just under 90 per cent of all families' total incomes as well as total incomes of families with mortgage debt.

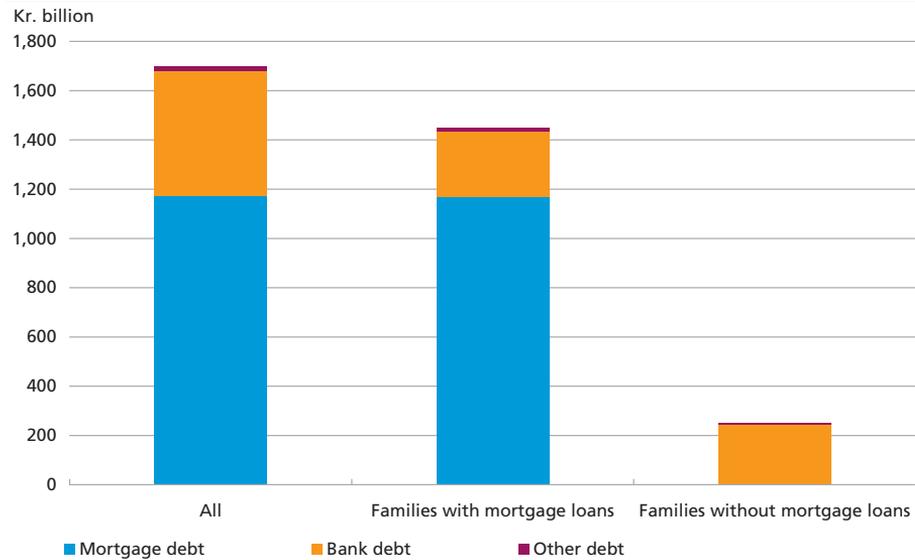
DEBT STRUCTURE

Just over two thirds of the families' total debt is mortgage debt, just under one third is bank debt, while debt to other creditors represents only just over 1 per cent. Out of the 2.6 million families included in the study, around 38 per cent had mortgage debt in 2010. These families account for 85 per cent of the families' total debt, cf. Chart 1.

By tradition, mortgage loans in Denmark have been fixed-rate loans with amortisation, most often annuity loans. But product development and liberalisation over the last 10-15 years have enabled borrowers to raise variable-rate loans and loans with deferred amortisation. Since these loan types provide more flexibility, they can improve the family's

TOTAL FAMILY DEBT, 2010

Chart 1



Note: Other debt includes all calculated debt other than debt to mortgage banks and banks.

Source: Mortgage banks, Statistics Denmark and own calculations.

welfare. Deferred-amortisation loans can thus make it easier to obtain higher consumption than would otherwise have been the case when younger, and spend the savings later in life. At the same time, the new loan types expose the families to other risks than previously.

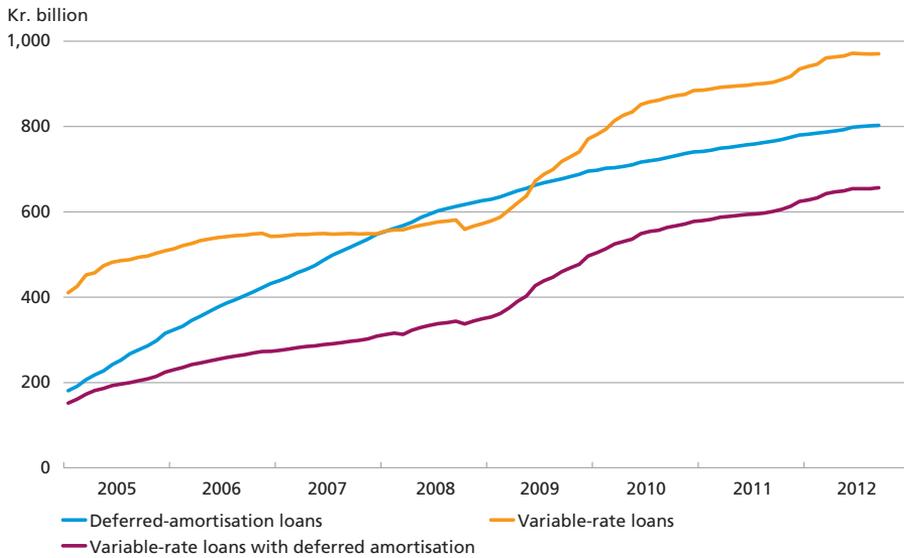
A key factor for a loan to work as intended is that the borrower actually understands and has insight into the consequences and risks associated with the individual loan types. This applies especially to the risks associated with future income and interest-rate and property-price developments. Borrowers who have raised mortgage loans on the basis of excessively optimistic expectations could make themselves vulnerable in the event of loss of income, rising interest rates or expiry of the deferred amortisation period.

The new mortgage loan types have gained considerable ground in recent years, cf. Chart 2. From the 1st quarter of 2005 to the 3rd quarter of 2012, the share of variable-rate loans out of total lending by mortgage banks thus rose from 46 per cent to 68 per cent. During the same period, deferred-amortisation loans rose from 20 per cent to 56 per cent of total mortgage lending.

Previous analyses indicate that some families have used the lower repayments of deferred-amortisation loans and variable-rate loans to raise larger loans than they would otherwise have done, cf. Danmarks Nationalbank (2011). Other analyses indicate that a considerable part of the increase in property prices until 2008 was driven by the introduction

MORTGAGE LOANS FOR OWNER-OCCUPIED HOMES AND SUMMER COTTAGES

Chart 2



Note: "Deferred-amortisation loans" cover both fixed-rate and variable-rate loans with deferred amortisation. "Variable-rate loans" cover variable-rate loans with and without deferred amortisation.
 Source: Danmarks Nationalbank.

of deferred-amortisation loans, among other factors, cf. Dam et al. (2011).

At end-2010, most families had only one type of mortgage loan, cf. Table 2. Fixed-rate loans with amortisation and variable-rate loans with deferred amortisation – i.e. the safest and most risky types – are the most popular types of mortgage loans. The number of families whose entire mortgage debt consists of traditional fixed-rate debt with amortisation is slightly higher than the number of families whose entire mort-

NUMBER OF FAMILIES WITH MORTGAGE DEBT BROKEN DOWN BY LOAN TYPE, 2010

Table 2

Number of families	All mortgage debt is this loan type	Part of the mortgage debt is this loan type	No mortgage debt of this loan type
Variable-rate loans with amortisation	173,744	82,705	717,010
Variable-rate loans with deferred amortisation	269,242	78,519	625,698
Fixed-rate loans with amortisation	301,990	82,799	588,670
Fixed-rate loans with deferred amortisation	93,493	36,067	843,899

Source: Mortgage banks, Statistics Denmark and own calculations.

TOTAL FAMILY DEBT BROKEN DOWN BY LOAN TYPE, 2010

Chart 3

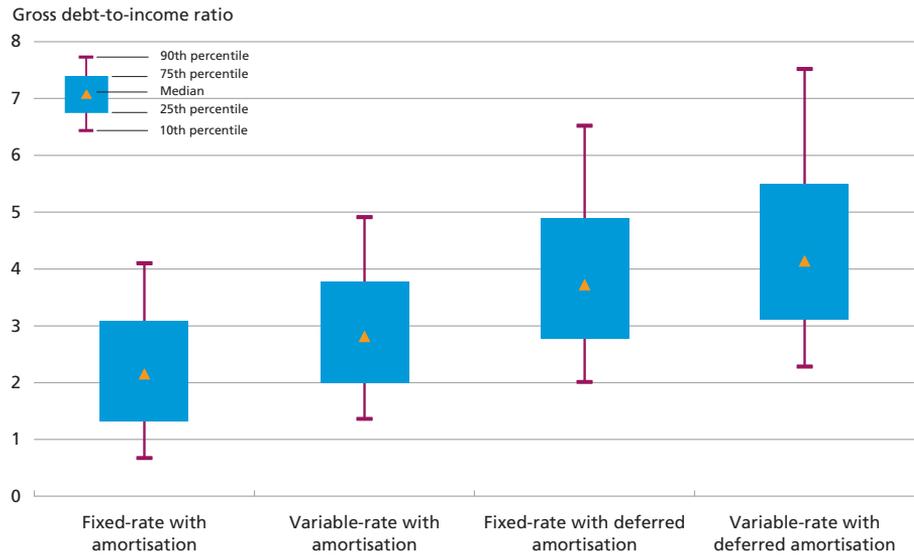


Note: The "variable-rate" and "deferred amortisation" bars, respectively, include all families with at least one variable-rate mortgage loan and at least one deferred-amortisation mortgage loan, respectively. The "only fixed-rate with amortisation" bar solely includes families whose *entire* mortgage debt is fixed-rate loans with amortisation. Other debt includes all other debt than mortgage bank and bank debt.

Source: Mortgage banks, Statistics Denmark and own calculations.

GROSS DEBT-TO-INCOME RATIO BROKEN DOWN BY LOAN TYPE, 2010

Chart 4

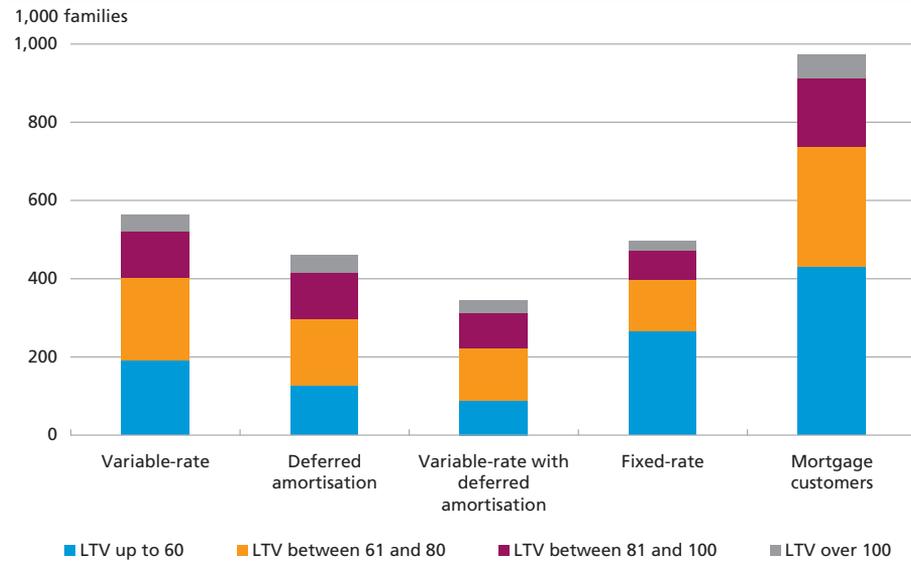


Note: The Chart includes only families whose *entire* mortgage debt consists of one loan type.

Source: Mortgage banks, Statistics Denmark and own calculations.

REMAINING DEBT RELATIVE TO PROPERTY VALUE BROKEN DOWN BY LOAN TYPE, 2010

Chart 5



Note: The LTV ratios state the remaining debt as a ratio of the value of the property pledged as collateral for the loan measures in per cent. Property valuations are the mortgage banks' valuations as at end-2010. If a family has loans in several properties, *only* the loans in the property with the highest LTV ratio are included in the Chart. The loan type categories include all families with at least one loan of the type in question. The same family may therefore appear in several of the above categories if it has several loans in the same property. The category "mortgage customers" thus does not equal the sum of the other categories.

Source: Mortgage banks, Statistics Denmark and own calculations.

gage debt is variable-rate debt with deferred amortisation, but the latter group has higher total debt. Slightly less than half of all families with mortgage debt have variable-rate mortgage debt only, while 41 per cent has fixed-rate debt only. 37 per cent of all families have opted for deferred amortisation on their entire debt, and 28 per cent have chosen variable rates with deferred amortisation for their entire debt. The families with variable-rate loans and/or deferred amortisation account for more than half of mortgage borrowers.

On average, families with variable-rate loans and/or deferred amortisation are liable for a larger share of the total debt compared with families who choose only fixed-rate mortgage loans with amortisation, cf. Chart 3. This relationship between loan types and the amount of debt raised is also reflected in debt as a ratio of disposable income, cf. Chart 4.

Variable-rate mortgage loans and/or loans with deferred amortisation are especially popular among families with large loans relative to the property value, cf. Chart 5.

The mortgage banks are more exposed to families with variable-rate loans and deferred-amortisation loans than to families with fixed-rate

loans with amortisation. Given the higher LTV ratios, this will, all else equal, increase the probability of losses for the mortgage banks if the families' ability to pay deteriorates. Since variable-rate mortgage loans entail an interest-rate risk and borrowers with deferred amortisation do not reduce their debt on an ongoing basis, the new loan types are taken to be more risky than the traditional ones.

FAMILIES WITH MORTGAGE LOANS WITH DEFERRED AMORTISATION

The age structure among families with deferred-amortisation mortgage loans differs from that of other families with mortgage debt, cf. Table 3. For families whose oldest member is less than 40 years old and families with members over 65 years, deferred amortisation loans account for a larger share of total debt than for other families. These differences are not surprising. Families in the 40-59 age group often have high incomes and typically repay previously raised debt and really accumulate pension savings at that stage of life.

The share of old-age pensioners and early retirement benefit recipients is higher among families with deferred-amortisation mortgage debt, cf. Table 4. Moreover, families with deferred-amortisation loans are overrepresented in the Greater Copenhagen area. As regards other characteristics, there is little difference between families with and without deferred amortisation.

The income distribution among families with deferred-amortisation loans is characterised by greater dispersion than the income distribution

NUMBER OF FAMILIES WITH MORTGAGE LOANS BROKEN DOWN BY AGE GROUP, 2010

Table 3

Oldest family member	Families with deferred-amortisation loans	Families with loans with amortisation only	Total
15-24 years	4,634	3,178	7,812
25-29 years	20,537	15,279	35,816
30-34 years	41,346	32,986	74,332
35-39 years	55,208	54,045	109,253
40-44 years	55,263	65,027	120,290
45-49 years	53,086	72,955	126,041
50-54 years	43,719	69,196	112,915
55-59 years	39,636	65,180	104,816
60-64 years	44,847	56,058	100,905
65-69 years	44,142	36,279	80,421
70-74 years	28,292	18,892	47,184
75-79 years	16,516	11,545	28,061
80+ years	13,128	12,485	25,613
Total	460,354	513,105	973,459

Source: Mortgage banks, Statistics Denmark and own calculations.

CHARACTERISTICS OF FAMILIES WITH AND WITHOUT DEFERRED-AMORTISATION MORTGAGE LOANS, 2010

Table 4

Percentage of families	Families with deferred-amortisation loans	Families with loans with amortisation only
With two adult members	70.9	74.5
With children	43.5	44.0
With children aged 10 or below	27.4	24.2
At least one member in education programme	1.0	0.6
At least one member in old-age retirement or early retirement	23.6	17.2
At least one member is a recipient of social benefits or social pension benefits	5.9	6.8
At least one member has tertiary education	13.9	12.7
All adult members are unskilled	11.9	12.5
Resident in the Capital Region of Denmark	28.8	22.9
Resident in the Central Denmark Region	22.5	23.7
Resident in the North Denmark Region	10.2	12.3
Resident in Region Zealand	18.2	16.6
Resident in the Region of Southern Denmark	20.3	24.5

Source: Mortgage banks, Statistics Denmark and own calculations.

among other families. In 2010, there was a considerably larger share of families with family income after tax of less than kr. 300,000 among the families with deferred-amortisation loans. On the other hand, this group also included a slightly higher share of families with family income after tax of more than kr. 800,000. Naturally, the differences in income distribution should be viewed in light of the different age structures of the two groups of families. Accounting for the different age structures, the two groups' average family incomes after tax do not differ substantially.

Gross debt among families with deferred-amortisation loans

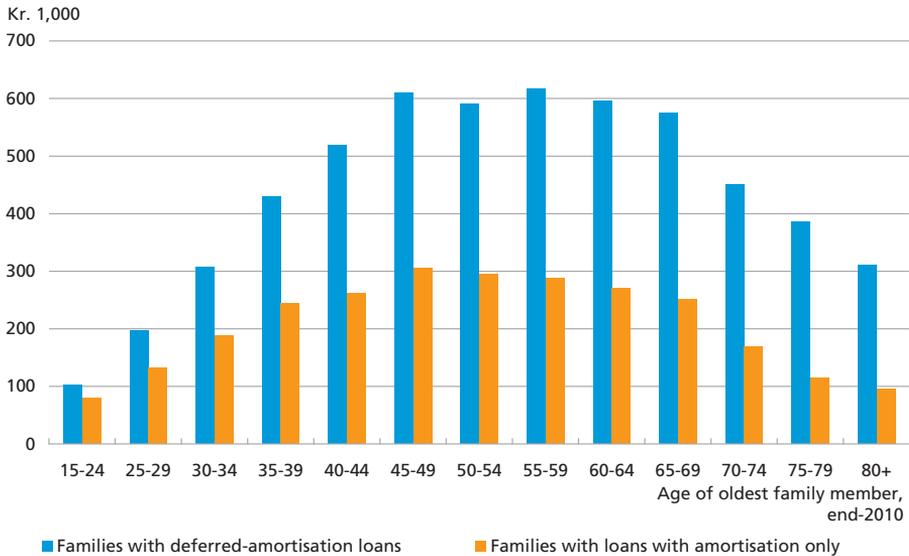
Mortgage loans with deferred amortisation were introduced in 2003. The following sections compare the behaviour regarding indebtedness and savings for the group of families with deferred-amortisation loans and the group of families paying redemptions on all of their mortgage loans. In order to obtain an accurate picture, the focus is solely on families who raised at least one mortgage loan in the period 2003-10.

On average, the gross debt is higher for families with deferred-amortisation loans than for other families. The share of families with a gross debt ratio of more than 500 per cent is thus markedly larger for families with deferred-amortisation loans than for other families irrespective of age.

The higher gross debt among families with deferred-amortisation mortgage loans is driven by at least one of the following three factors: Families with deferred-amortisation loans may have repaid a smaller

AVERAGE GROSS DEBT BEFORE RAISING THE FIRST MORTGAGE LOAN

Chart 6



Note: The Chart shows the average gross debt at the beginning of the year in which the family raised its most recent mortgage loan. The Chart includes only families without mortgage debt at the beginning of that year. Only families who raised mortgage loans in the period 2003-10 are included.

Source: Mortgage banks, Statistics Denmark and own calculations.

share of their debt in the period between the year of raising the debt and 2010; families with deferred-amortisation loans may have raised larger mortgage loans; or families with deferred-amortisation loans may have had larger debt before raising the mortgage loans.

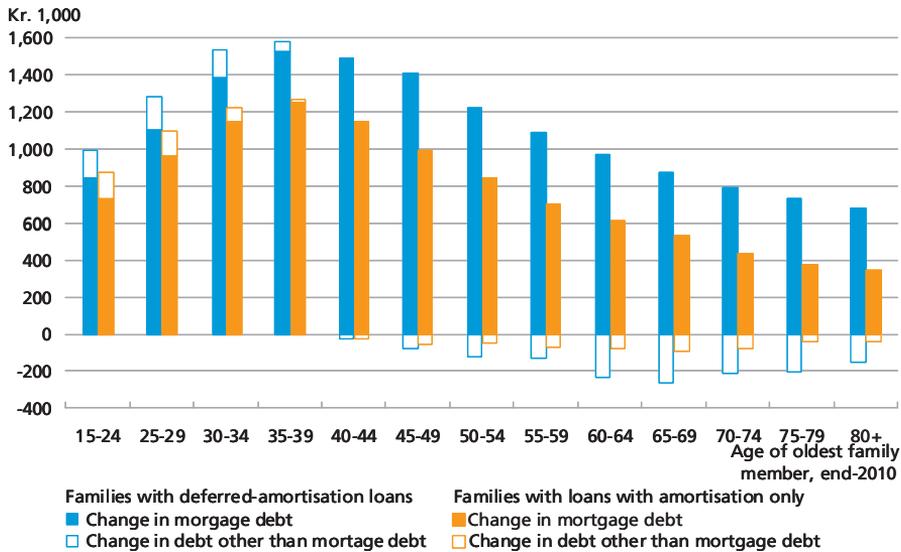
Families who opted for deferred amortisation on their mortgage loans in 2010 on average had larger debt than other families with mortgage debt already before they raised their first mortgage loan, cf. Chart 6.¹ This difference is seen in all age groups, and in most cases it is around kr. 200,000-300,000.

On average, families with deferred-amortisation loans also experienced stronger increases in debt than other families during the year of raising their first mortgage loan, cf. Chart 7. This difference is seen in all age groups, peaking for the 45-49 age group at approximately kr. 400,000. This is a clear indication that families with deferred-amortisation loans have raised larger mortgage loans than other families with mortgage debt.

¹ The focus here is solely on families with no mortgage debt at the beginning of the year of raising their most recent mortgage loan. For these families, the year of raising their most recent mortgage loan is taken to be the year of raising their first mortgage loan. Only families who have raised mortgage loans in the period 2003-10 are included. The calculations are thus based on around 111,000 families, of whom just over half opted for deferred amortisation in 2010. Naturally, this group may include a few families with previous mortgage loans that have been repaid in full. This number is very low, however, probably among older families, so it has no impact on the overall picture.

AVERAGE CHANGE IN GROSS DEBT DURING THE YEAR OF RAISING THE FIRST MORTGAGE LOAN

Chart 7



Note: The Chart shows the average change in gross debt from the beginning of the year in which the family raised its most recent mortgage loan until the end of that year. The Chart includes only families without mortgage debt at the beginning of that year. Only families who raised mortgage loans in the period 2003-10 are included. Changes in debt other than mortgage debt cover both bank debt and debt to creditors other than banks and mortgage banks.

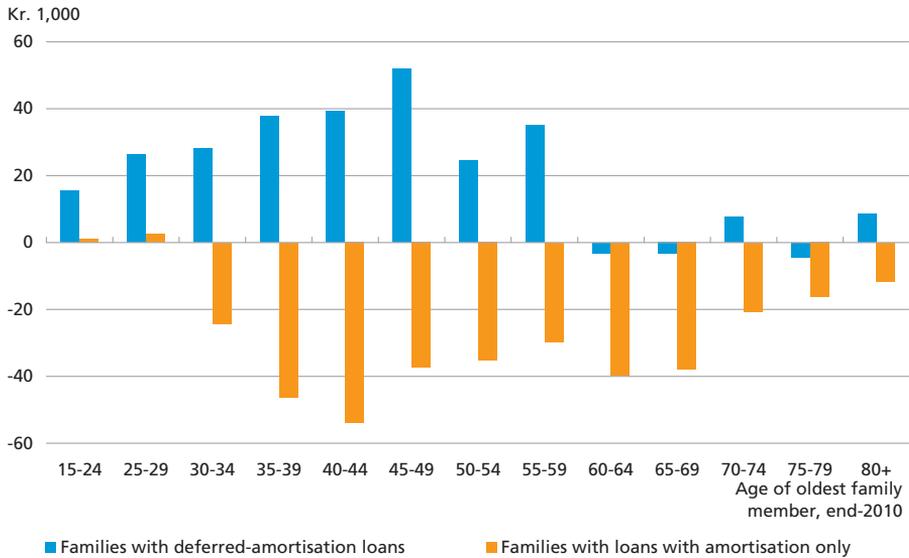
Source: Mortgage banks, Statistics Denmark and own calculations.

Finally, the development in average gross debt from the year of raising the debt to 2010 differs considerably for the group of families with deferred-amortisation loans relative to other families with mortgage debt, cf. Chart 8. This difference is most pronounced for the age groups up to 59 years: While the average family in the group of families without deferred-amortisation loans reduced their debt during these years, the average gross debt was increased in families with deferred-amortisation loans. In the older age groups, the average gross debt in families with deferred-amortisation loans was relatively unchanged.

Therefore, the gross debt was markedly higher, on average, for families with deferred-amortisation loans than for families without deferred-amortisation loans. This difference is most pronounced in the 45-49 age group, where it amounts to around kr. 780,000. Of this amount, up to kr. 390,000 is attributable to the size of the first mortgage loan, while approximately kr. 300,000 can be attributed to families with deferred-amortisation loans having larger debt than other families before raising their first mortgage loan. The remaining kr. 90,000 can be explained by further indebtedness on the part of families with deferred-amortisation loans since raising the first loan, while other families have reduced their debt.

AVERAGE CHANGE IN GROSS DEBT FROM YEAR OF RAISING THE FIRST MORTGAGE LOAN UNTIL 2010

Chart 8



Note: The Chart shows the average change in gross debt from the year in which the family raised its most recent mortgage loan until 2010. The Chart includes only families without mortgage debt at the beginning of the year of raising the debt. Only families who raised mortgage loans in the period 2003-10 are included.

Source: Mortgage banks, Statistics Denmark and own calculations.

Net debt among families with deferred-amortisation loans

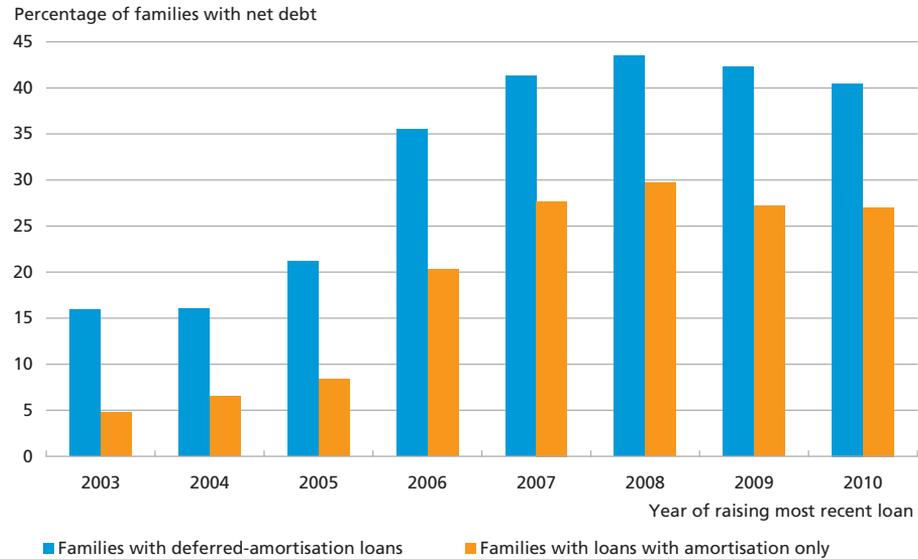
In order to obtain a more accurate picture of Danish families' finances, it is also important to look at the families' assets and the difference between assets and debt, i.e. net wealth. At the end of 2010, 37 per cent of the families with deferred-amortisation loans had net debt, while debt exceeded assets (including housing wealth) for only 19 per cent of the families who pay redemptions on their mortgage debt.

As a result of property price hikes until 2007 and subsequent declines, the size of the net debt is connected to when the family bought its first home. Families who raised mortgage loans for house purchase while property prices were peaking, will generally have seen a decrease in the value of their homes, while the market value of their debt has remained unchanged. Consequently, many of these families have net debt. Since deferred-amortisation loans have gradually increased in popularity, these loans have generally been raised later than other loans. This might distort the comparison of net debt between families with and without deferred amortisation.

Consequently, the frequency of net debt in families with deferred amortisation is compared with the frequency of net debt in other families with amortisation who have raised their most recent mortgage loan in the same year, cf. Chart 9. In general, the frequency of net debt is

NET DEBT IN 2010 BROKEN DOWN BY YEAR OF MOST RECENT RAISING OF LOAN

Chart 9



Note: Only families who raised mortgage loans in the period 2003-10 are included. Assets are calculated including housing wealth, but excluding pensions.

Source: Mortgage banks, Statistics Denmark and own calculations.

CORRELATION BETWEEN DEFERRED AMORTISATION AND NET DEBT IN 2010
– TO BE CONTINUED

Box 3

On average, the net debt is higher or the net wealth smaller for families with deferred amortisation than for other families with mortgage debt.¹ As mentioned previously, the group of families with deferred amortisation includes a higher number of younger families, whose income level tends to be slightly higher than that of families of the same age with other mortgage debt. Since the size of the net debt varies systematically with both age and income, it is relevant to allow for these differences between the two groups. For this purpose, the following linear regression model is estimated:

$$Net\ debt_i = \beta_0 + \beta_1 \cdot deferred\ amortisation_i + x_i \delta + \varepsilon_i$$

where *Net debt_i* is the net debt in kroner for family *i* at the end of 2010, *deferred amortisation_i* is a dummy variable indicating whether family *i* opted for deferred amortisation in 2010, and *x_i* is a vector of control variables for age, income and year of raising the most recent mortgage loan. Dummy variables are included for each age group in order to take the non-linear relationship between age and net debt into account. In the same way, income is adjusted by including dummy variables for seven different intervals for family income after tax. Finally, dummy variables for the years 2003-10 are included, where the value of each variable is 1, if the family's most recent mortgage loan was raised in the year in question.²

**CORRELATION BETWEEN DEFERRED AMORTISATION AND NET DEBT IN 2010
 – CONTINUED**

Box 3

Estimation of the model results in a positive coefficient for the dummy variable for deferred amortisation, cf. the Table below. This means that families with deferred amortisation in 2010 tend to have higher net debt than other homeowner families in the same age and income groups who raised their most recent mortgage loans in the same year. The average difference across all age and income groups and years of raising the loan is around kr. 300,000. The difference is highly statistically significant.

LINEAR REGRESSION MODEL FOR FAMILY NET DEBT IN 2010

Variable	Coefficient estimate	Standard error
Deferred amortisation in 2010	298,367	3,754
Age of oldest family member		
15-24 years	-121,266	19,952
25-29 years	110,836	10,363
30-34 years	178,668	7,985
35-39 years	103,362	7,123
45-49 years	-121,389	6,919
50-54 years	-305,159	7,148
55-59 years	-549,043	7,339
60-64 years	-879,761	7,529
65-69 years	-1,214,449	8,290
70-74 years	-1,372,753	10,137
75-79 years	-1,426,823	12,697
80+ years	-1,595,240	14,213
Family income after tax		
Under kr. 200,000	376,289	7,231
Kr. 200,000-300,000	162,000	5,911
Kr. 300,000-400,000	43,880	5,890
Kr. 500,000-600,000	-131,332	5,765
Kr. 600,000-700,000	-346,205	7,096
Kr. 700,000-800,000	-597,235	9,709
Over kr. 800,000	-1,435,489	9,318
Year of raising most recent mortgage loan		
2003	-520,589	9,544
2004	-457,322	9,029
2005	-394,202	7,221
2006	-103,619	7,618
2008	7,105	*8,363
2009	-64,722	6,860
Constant	-241,091	8,195

Note: The dependent variable is the family's net debt in kroner at end-2010. The variable "Deferred amortisation in 2010" indicates whether the family, at end-2010, had at least one mortgage loan for which it had, during the year, exercised the deferred amortisation option. The calculations include only families who raised mortgage loans in the period 2003-10. * Insignificant.

Source: Mortgage banks, Statistics Denmark and own calculations.

¹ The calculation of assets includes housing wealth, but not pensions.

² The reference category for the age of the oldest family member is 40-44 years. The reference category for family income after tax is kr. 400,000-500,000, while the reference category for the year of raising the most recent loan is 2007.

considerably higher in families who raised their most recent mortgage loan after 2005 than in families who raised their most recent mortgage loans in the period up to and including that year.

Notwithstanding the time of raising the most recent loan, it is remarkable that the frequency of net debt is substantially higher in families with deferred-amortisation loans than in families with amortisation.

Even considering differences in age, income and year of raising the loan, the conclusion is that net debt is higher for families with deferred amortisation than for families without it, cf. Box 3. The average difference across all age and income groups and year of raising the loan is around kr. 300,000.

It should be emphasised that the analysis does not show a direct causal link between opting for deferred amortisation and higher net debt. The results merely show that the difference in average net debt between the two groups in 2010 cannot be explained by variations in age or income structure or year of raising the loan. But it is a distinct possibility that the group of families with deferred-amortisation loans differs from the group of families without such loans in other ways and that one or more of these differences induce them to raise deferred-amortisation loans and increase their debt. Therefore, it cannot be ruled out that families with deferred amortisation would have raised more debt via other channels than families who pay redemptions on their entire mortgage debt, if the option of deferred amortisation had not existed.

Overall, the conclusion is that, on average, families with deferred amortisation mortgage loans have more debt than families with amortisation. These results also apply if adjusted for an overweight of families whose oldest member is under 40 years or over 65 years, respectively, among families with deferred-amortisation loans. The higher average debt levels can be attributed to higher gross debt before raising mortgage loans, larger mortgage loans raised and lower current savings.

SAVINGS AND REDEMPTIONS IN FAMILIES WITH DEFERRED-AMORTISATION LOANS

All else equal, redemptions on mortgage debt lead to higher home equity, meaning that families who pay redemptions on their mortgage loans save up in their homes. But redemptions on mortgage loans are only one of several types of savings, and families with deferred-amortisation loans can compensate for the lack of redemptions in other ways. For example, deferred amortisation on mortgage loans can be utilised for redemptions on other debt, savings in financial assets or pension savings.

The Association of Danish Mortgage Banks (2011) has conducted a survey of borrowers' utilisation of deferred amortisation on the basis of interviews with 860 homeowners with deferred amortisation. The interviewees were asked about their main motives for choosing deferred amortisation, among other questions. 57 per cent of the respondents stated that they opted for deferred amortisation in order to reduce debt, save up or invest. 88 per cent stated that they used the saved repayments as intended.

In order to achieve an accurate picture of the relationship between the choice of deferred amortisation and savings behaviour, an analysis is performed of the size of both redemptions on mortgage debt and other types of savings for families with and without deferred amortisation, respectively. A comparison is therefore given of redemptions on mortgage debt, redemptions on other debt, pension contributions, savings in free funds and total net savings in 2010 for each of the two groups.¹ Since the focus here is on those who are active in the labour market, families with members over 59 years are excluded. Since income plays a large role in the individual family's scope for saving up, all savings components are expressed in per cent of income after tax. The calculation of the individual savings components is described in Box 4.

A typical family with deferred-amortisation loans tends to have slightly lower savings in free funds than a typical family with amortisation, cf. Chart 10. For both categories, however, the largest contribution to savings by far comes from pension savings. Again, the typical family with deferred-amortisation loans tends to have slightly lower savings of this type. But the most pronounced difference between the two categories is related to redemptions on mortgage debt. The typical family with deferred amortisation pays no redemptions at all, while the typical family in the group of other families spends around 6 per cent of their income after tax on redemptions on mortgage debt. However, the typical family with deferred-amortisation loans pays some redemptions on other debt, although this is not sufficient to compensate for the lack of redemptions on the mortgage debt. As a result, the saving ratio is considerably lower for the typical family with deferred amortisation than for the typical family without it.

Table 5 shows the median values by age group.² It is worth noting that the median value for redemptions on other debt is somewhat higher among families with deferred-amortisation loans in the younger age groups. Consequently, a typical young family with deferred amortisation

¹ The focus is still only on families who raised mortgage loans in the period 2003-10.

² A breakdown by income groups shows a similar picture.

CALCULATION OF SAVINGS IN 2010

Box 4

With a view to assessment of Danish families' total net savings, four different savings components are calculated for each family. Redemptions on mortgage debt, redemptions on other debt, savings in free funds and pension contributions.

Redemptions on mortgage debt are calculated on the basis of information on all mortgage loans of the family. For each loan, the redemptions in 2010 are calculated as the decrease in the remaining debt (stated at par value) from end-2009 to end-2010. If this is not possible, due to lack of data, the size of the redemptions is calculated assuming that the loan is an annuity loan. It is then possible to calculate the redemptions on the basis of information on principal, remaining debt, loan type, maturity, number of due dates per year and nominal interest rate. The family's total redemptions on mortgage debt are calculated as the sum of redemptions on the individual loans.

Other debt consists of bank debt, debt related to mortgage deeds and debt to banks and mortgage banks abroad. These debt items are sourced from Statistics Denmark's personal income register, which is mainly based on information from SKAT. Redemptions on other debt are calculated as the reduction in debt from end-2009 to end-2010. If the family, during 2010, raised new debt exceeding the redemptions on the old debt, the redemptions on other debt will be negative.

Pension savings are calculated as the sum of all contributions to labour-market pensions and private pension schemes. Again, this information is sourced from Statistics Denmark's personal income register.

Free funds cover bank deposits, the market value of stocks and bonds, mortgage deeds in custody accounts and foreign assets, all sourced from Statistics Denmark's personal income register. Savings are calculated as the change from end-2009 to end-2010. If the family, during 2010, reduced the value of these assets, savings will be negative. This type of savings is influenced by changes in stock and bond prices, but for most families, the impact is modest.

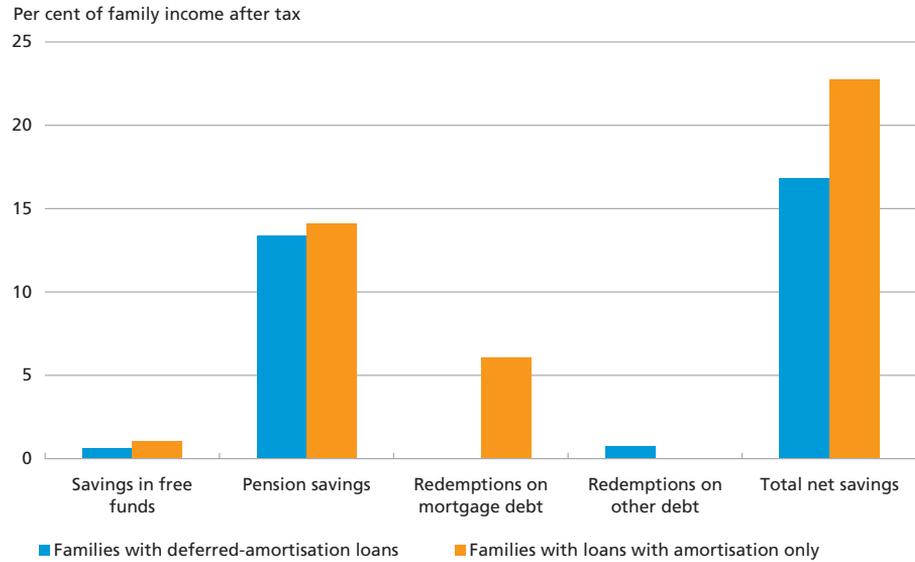
Family net savings are calculated as the sum of the four savings components mentioned above. However, the calculation excludes a number of asset items. This applies first and foremost to the value of real property, which constitutes the largest asset by far for most families. Real property is excluded from the calculation, because for most families by far changes in the value of real property are solely attributable to property prices and not to changes in the family's holdings. Consequently, changes in housing wealth are not necessarily indications of real savings behaviour. But the exclusion of real property may also have unfortunate consequences: For a family selling a house and e.g. depositing the proceeds from the sale at the bank, savings in free funds will be registered at a high value, while there will be no record of the sale of the asset. A similar problem applies to other assets, e.g. cars. In order to mitigate this problem, all families who were involved in property transactions in 2010 are excluded. However, it is not possible to similarly exclude families who have been involved e.g. in car transactions.

The calculation also excludes families who raised mortgage loans in 2010, because raising a new mortgage loan will be registered as a large negative redemption on mortgage debt, while the value of the acquired property will not be registered.

Subject to these reservations, the above calculation methods will provide an accurate picture of families' real savings in 2010 in most cases by far, although the calculation may be influenced by noise in some cases.

MEDIAN VALUES FOR SAVINGS AND REDEMPTION RATIOS, 2010

Chart 10



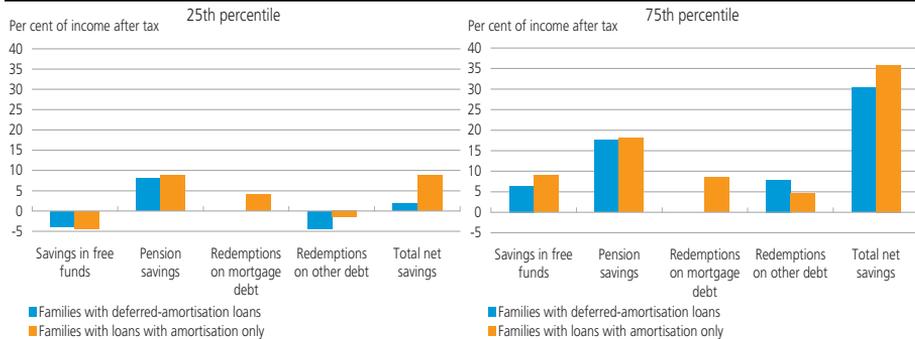
Note: The Chart shows the median value in 2010 for each stated savings and redemption ratio among homeowner families who raised mortgage debt in the period 2003-09, whose oldest family member was under 60 years old in 2010, and who were not involved in real property transactions or raised mortgage loans during 2010.
 Source: Mortgage banks, Statistics Denmark and own calculations.

tends to pay slightly more redemptions on other debt compared with a typical young family with amortisation. This difference is also seen among families in the highest income groups. In none of these groups, the difference is large enough to compensate for the lack of redemptions on mortgage debt.

Chart 11 focuses on the tails in the breakdowns of savings and redemption ratios. The picture is generally the same as that for median values.

25TH AND 75TH PERCENTILES FOR SAVINGS AND REDEMPTION RATIOS, 2010

Chart 11



Note: The Charts show the 25th and 75th percentiles, respectively, in the distributions for each of the savings components shown among homeowner families who raised mortgage loans in the period 2003-09, whose oldest member was under 60 years in 2010, and who were not involved in real property transactions or raised mortgage loans during 2010.

Source: Mortgage banks, Statistics Denmark and own calculations.

**MEDIAN VALUES FOR SAVINGS AND REDEMPTION VARIABLES BROKEN
DOWN BY AGE OF OLDEST FAMILY MEMBER**

Table 5

Per cent of family income after tax	Families with deferred-amortisation loans	Families with loans with amortisation only
Savings in free funds		
25-29 years	-0.2	0.0
30-34 years	0.5	0.5
35-39 years	0.4	0.5
40-44 years	0.4	0.7
45-49 years	0.5	0.9
50-54 years	0.8	1.3
55-59 years	0.8	1.3
Pension savings		
25-29 years	6.5	8.6
30-34 years	11.2	11.8
35-39 years	13.3	13.8
40-44 years	14.0	14.8
45-49 years	13.9	14.8
50-54 years	13.5	14.3
55-59 years	13.5	13.9
Redemptions on mortgage debt		
25-29 years	0.0	5.0
30-34 years	0.0	5.3
35-39 years	0.0	5.9
40-44 years	0.0	6.3
45-49 years	0.0	6.3
50-54 years	0.0	6.1
55-59 years	0.0	6.1
Redemptions on other debt		
25-29 years	0.1	0.0
30-34 years	2.2	0.4
35-39 years	3.0	0.4
40-44 years	1.7	0.1
45-49 years	0.6	0.0
50-54 years	0.2	0.0
55-59 years	0.2	0.0
Total net savings		
25-29 years	8.1	13.2
30-34 years	14.6	19.2
35-39 years	17.6	21.9
40-44 years	17.3	23.2
45-49 years	16.8	23.0
50-54 years	16.3	22.8
55-59 years	17.0	22.8

Note: The Table includes only families who raised mortgage loans in the period 2003-10.

Source: Mortgage banks, Statistics Denmark and own calculations.

The main impression is that the typical family with deferred-amortisation mortgage loans may pay slightly more redemptions on other debt compared with other families, but the extra redemptions are not sufficient to compensate for the lack of redemptions on the mortgage debt. Therefore, the typical family with deferred amortisation tends to

have lower total savings than the typical family in the same age and income group with amortisation.

It is important to keep in mind that a causal link may not necessarily exist from the option of raising deferred-amortisation loans to the savings ratio. The difference in savings ratio may be attributable to unobservable systematic variations between families opting for deferred amortisation and families who do not. If the option of deferred-amortisation mortgage loans did not exist, it can thus not be ruled out that families with deferred amortisation today would have found other ways of reducing their total savings. But deferred-amortisation mortgage loans have no doubt facilitated reduction of savings.

FAMILIES WITH VARIABLE-RATE MORTGAGE LOANS

At any given time, the interest rate on variable-rate mortgage loans is normally lower than the interest rate on fixed-rate loans with the same maturity. However, the drawback of the lower interest rate is the risk of interest-rate increases, which is avoided for families with fixed-rate mortgage loans only. Consequently, families with variable-rate mortgage debt need a financial buffer in the form of budgetary scope to absorb any future interest-rate rises. Periods of temporary interest-rate hikes may also be weathered by selling assets. It is therefore necessary to take liquid assets¹ into account in an assessment of a family's financial robustness.

Families with variable-rate mortgage loans do not differ significantly from families with fixed-rate loans as regards region of residence and the probability of a family member receiving public benefits, cf. Table 6. Families with variable-rate loans include a higher share of families whose oldest member is under 50 years, cf. Chart 12, and also a higher share of families with children.

Income and assets among families with variable-rate loans

Gross debt is higher for families with variable-rate mortgage debt than for families with fixed-rate mortgage debt only. At the same time, the disposable income is higher, on average, for families who opt for variable-rate loans than for families with fixed-rate mortgage loans only, cf. Chart 13. Thus, the annual income is, on average, just over kr. 54,000 lower for families with fixed-rate loans only than for families with variable-rate loans. This relationship also applies after adjustment for age structure.

¹ In the following, a family's liquid assets are assumed to be the sum of bank deposits, the market value of stocks and bonds and mortgage deeds in custody accounts.

CHARACTERISTICS OF FAMILIES WITH VARIABLE-RATE MORTGAGE LOANS, 2010

Table 6

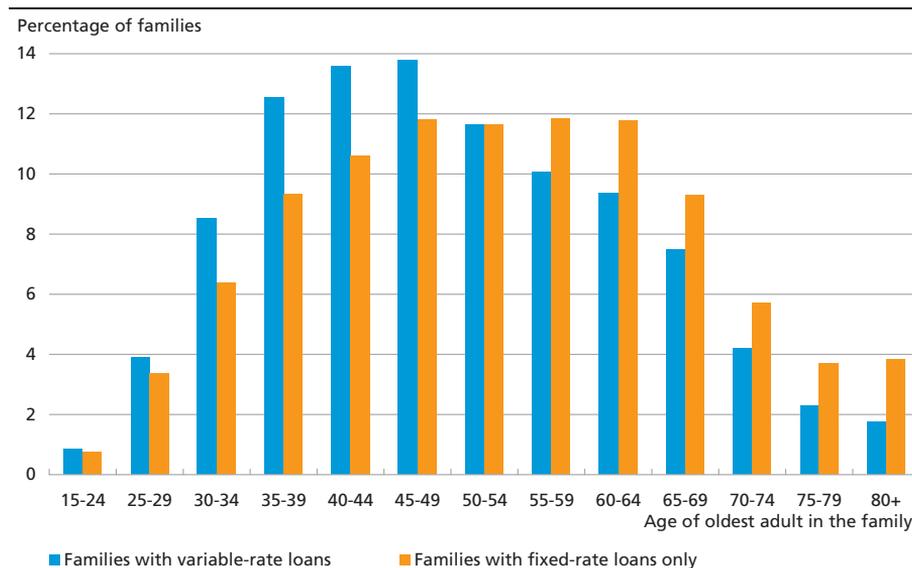
Percentage of families	Families with variable-rate loans	Families with fixed-rate loans only
With two adult members	74.6	70.3
With children	48.5	37.3
With children aged 10 or below	29.2	20.9
At least one member in education programme	0.9	0.6
At least one member in old-age retirement or early retirement	17.0	24.6
At least one member is a recipient of social benefits or social pension benefits	5.6	7.5
At least one member has tertiary education	13.5	12.0
All adult members are unskilled	9.9	15.4
Resident in the Capital Region of Denmark	26.4	24.8
Resident in the Central Denmark Region	23.4	22.8
Resident in the North Denmark Region	11.0	11.7
Resident in Region Zealand	16.5	18.6
Resident in the Region of Southern Denmark	22.8	22.2

Source: Mortgage banks, Statistics Denmark and own calculations.

On the other hand, families with variable-rate mortgage debt, on average, have approximately kr. 10,000 less of assets, excluding housing wealth and pension, compared with families with fixed-rate mortgage debt only.

AGE OF OLDEST ADULT IN THE FAMILY AND LOAN TYPE, 2010

Chart 12

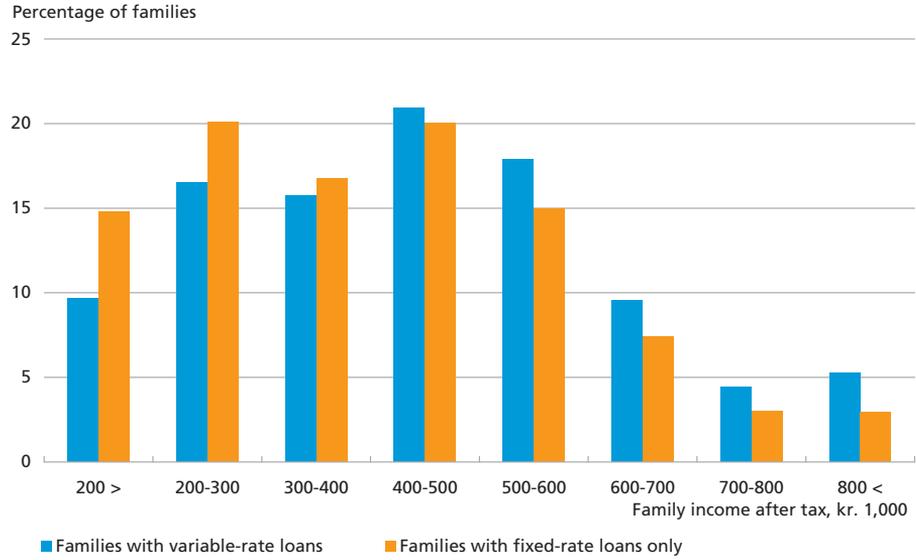


Note: Families with variable-rate loans cover all families with at least one variable-rate mortgage loan.

Source: Mortgage banks, Statistics Denmark and own calculations.

DISPOSABLE INCOME AND LOAN TYPE, 2010

Chart 13



Note: Families with variable-rate loans cover all families with at least one variable-rate mortgage loan.

Source: Mortgage banks, Statistics Denmark and own calculations.

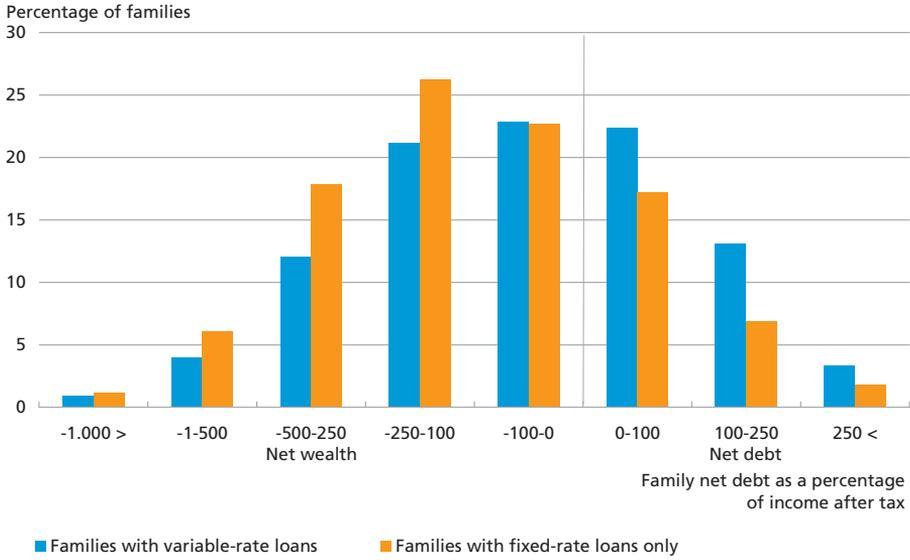
As a result of higher gross debt and fewer assets, the net debt ratio is higher for families with variable-rate mortgage loans than for families with fixed-rate loans only.¹ Average net wealth for families with fixed-rate mortgage loans only is almost 300 per cent of income after tax, while it is around 180 per cent of income after tax for families with variable-rate loans. This trend is particularly pronounced for families whose oldest member is under 60 years old, cf. Chart 14.

As already mentioned, variable-rate loans are also more widespread among families with mortgages in properties with high LTV ratios. The reason may be that variable-rate loans were not reintroduced until 1996. Thus, some families with only fixed-rate loans raised their mortgage debt before the reintroduction of variable-rate debt. This is taken into account by comparing the changes in total indebtedness for new mortgage borrowers in the year of raising their first mortgage loan². The comparison is limited to the years 2002-10, covering a period when variable-rate loans were available. Irrespective of age group, new borrowers who opted for variable-rate loans, raised more debt than new mortgage borrowers who chose fixed-rate loans, cf. Chart 15.

¹ This result applies whether or not housing wealth is included.

² The focus here is solely on families without mortgage debt at the beginning of the year of raising their most recent mortgage loan. For these families, their most recently raised mortgage loan is also assumed to be their first mortgage loan.

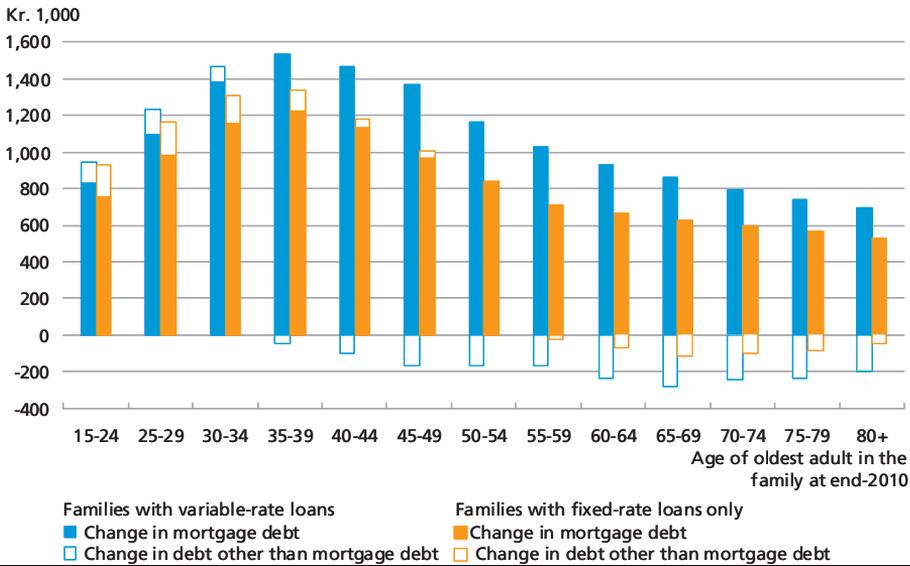
NET DEBT RATIO OF FAMILIES WHOSE OLDEST MEMBER IS UNDER 60 YEARS, 2010 Chart 14



Note: Assets are calculated including housing wealth, but excluding pensions. Families with variable-rate loans cover all families with at least one variable-rate mortgage loan.

Source: Mortgage banks, Statistics Denmark and own calculations.

AVERAGE CHANGE IN GROSS DEBT DURING THE YEAR OF RAISING THE FIRST MORTGAGE LOAN Chart 15

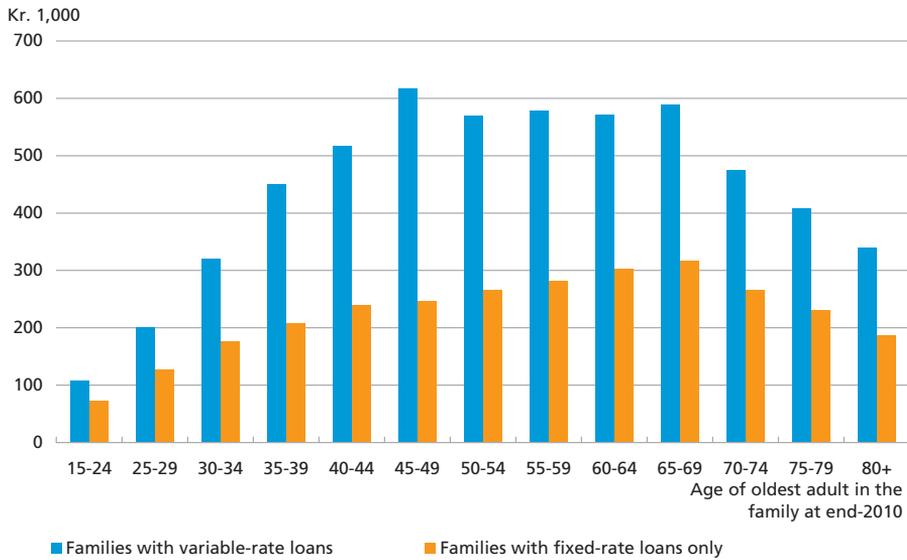


Note: The Chart shows the average change in gross debt from the beginning of the year when the family raised its first mortgage loan until the end of that year. Only families without mortgage debt at the beginning of that year are included. Only families who raised mortgage loans in the period 2002-10 are included. Changes in debt other than mortgage debt cover both bank debt and debt to creditors other than banks and mortgage banks. Families with variable-rate loans cover all families with at least one variable-rate mortgage loan.

Source: Mortgage banks, Statistics Denmark and own calculations.

AVERAGE GROSS DEBT BEFORE RAISING THE FIRST MORTGAGE LOAN

Chart 16



Note: The Chart shows the average gross debt at the beginning of the year in which the family raised its first mortgage loan. Only families without mortgage debt at the beginning of that year are included. Only families who raised mortgage loans in the period 2002-10 are included. Families with variable-rate loans cover all families with at least one variable-rate mortgage loan.

Source: Mortgage banks, Statistics Denmark and own calculations.

In terms of new mortgage borrowers' debt before raising their first mortgage loan, it is also seen that new borrowers who raised variable-rate debt had higher debt before raising their first mortgage loan, compared with new borrowers raising fixed-rate loans, cf. Chart 16.

Overall, it can be concluded that families with variable-rate loans tend to have higher current income than other families, but fewer assets. Together with higher gross debt, this entails higher net debt as well. This also applies to the debt-to-income ratio. Families with high debt before they raise their first mortgage loans and families who raise higher-than-average loans tend to opt for variable-rate debt more frequently than other families.

FINANCIAL MARGIN

Whether a family encounters financial distress depends on its ability to adjust its consumption to its current income, and on whether the family holds liquid assets as a buffer if its current income becomes insufficient to meet its current consumption. A family should be regarded as financially vulnerable if its current income is insufficient and there are not enough liquid funds to cover the difference between expenses and consumption for a relevant period.

With a view to assessment of a family's financial robustness, a standardised budget method is applied below – the financial margin – to measure whether the current income is sufficient to meet current consumption. The financial margin is defined as the amount at the family's disposal after paying housing occupancy expenses, other fixed expenses and general costs of living in line with standard budgets for different family types. If the disposable income does not exceed the sum of these expense items, the financial margin is negative, and the family's current income should be regarded as insufficient.

A similar method has been used in Sweden, Norway and Finland (see e.g. Mäki-Franti (2011), Jönsson et al. (2011), Persson (2009), Johansson and Persson (2006), and Vatne (2006)), and Danmarks Nationalbank previously applied a similar approach in the *Financial stability* publications (see e.g. Danmarks Nationalbank (2007) and (2010)).

The applied data contains detailed information on each family's income, holdings of liquid assets and expenses for interest and redemptions on debt. However, there is no information on the individual family's consumption. That is why standardised budgets are used as measures of the families' consumption, taking into account owner occupancy or not, as well as the number of adults and children in the family.

Two budgets are applied: an average budget reflecting the consumption pattern of an average family and a tight budget reflecting the consumption of families in the lowest income group. It should be noted that the tight budget cannot be regarded as a poverty limit, but that it reflects the actual consumption of a segment of the population.

It is also important to point out that even families with very positive financial margins may mismanage their finances to such a degree that they default on their debt. Out of the 5,800 families in arrears on their mortgage loans at end-2010, only 3,000 had negative margins irrespective of the budget applied.

Bearing this in mind, the breakdowns of the financial margin and underlying budgets are regarded as fair indications of the families' financial situation. The budgets applied and the financial margin are described in more detail in Box 5.

The families' financial situation

Chart 17 shows the breakdown of the financial margin by all families and families with mortgage debt for both budgets. The Chart shows the share of families with a financial margin of zero or less – i.e. the share of families with insufficient current income to cover an average budget and tight budget, respectively. It is clear that the share with insufficient

CALCULATION OF FINANCIAL MARGIN – TO BE CONTINUED

Box 5

The financial margin can be used as an expression of families' financial scope. It can also be used to examine how exposed families are at the outset and how vulnerable they are to changes in their financial situation. The financial margin is defined by:

- Disposable income
- redemptions on mortgage loans
- housing occupancy expenses
- other fixed expenses
- a sufficient disposable amount
- = *financial margin*

The disposable income is sourced from Statistics Denmark, and it excludes interest expenses and tax payments, including any property taxes. Redemptions on mortgage debt are sourced from the mortgage banks' reporting, and they are deducted from disposable income. Redemptions on other debt are not included.

Housing occupancy expenses and other fixed expenses are found via the Consumer Survey of Statistics Denmark. For tenants, housing occupancy expenses cover rent, electricity, heating, gas, etc. and for owners also electricity, gas, heating, but also maintenance of the home, renovations, etc. Repayments on debt, including mortgage debt, are not included in order to avoid duplication. Other fixed expenses cover insurance, transport, TV licence, telecom subscriptions, and for families with children expenses for daycare institutions. Most expenses for housing occupancy and other fixed expenses will be difficult to reduce in the short term for the individual family.

As regards the average budget, the figures from the Consumer Survey for the average family are used, while the tight budget is based on the average consumption of households with annual gross income of less than kr. 150,000. For each family, the expense budget set out takes into account only whether they own their home and neither the size of the home in question, nor total family income.

The sufficient disposable amount is determined using the Danish Financial Supervisory Authority's classification of bank customers, cf. Danish Financial Supervisory Authority (2012).

Under the average budget, the sufficient disposable amount is used to achieve the grade 2a. This grade is given to private customers with good credit quality. Under the tight budget, the sufficient disposable amount is used to achieve the grade 2c, which is given to customers with strong indications of weakness, but without objective evidence of impairment.

current income is considerably smaller for families with mortgage debt than for all families overall.

Applying the average budget, the financial margin is negative for almost 35 per cent of all families. This figure is 16 per cent for families with mortgage debt. Looking at the families' ability to pay their fixed expenses, including interest and redemptions on debt, and to maintain reduced consumption with their current income provides a substantially

CALCULATION OF FINANCIAL MARGIN – CONTINUED

Box 5

ANNUAL EXPENSES, 2010

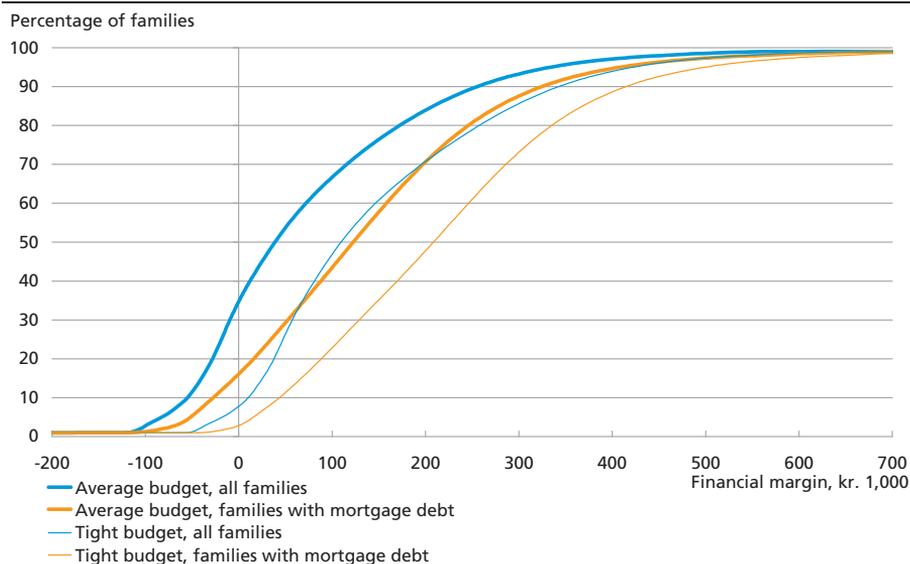
Kr.	Average budget		Tight budget	
	Homeowners	Tenants	Homeowners	Tenants
Expenses:				
Housing occupancy expenses	58,068	23,344	35,386	17,666
Rent	-	45,854	-	30,328
Other fixed expenses	31,294	31,294	14,918	14,918
Total expenses	89,362	100,492	50,304	62,912
Extra if minimum one child	3,499	3,499	1,032	1,032
Sufficient disposable amount:				
One adult	60,000	60,000	36,000	36,000
A couple	102,000	102,000	66,000	66,000
Extra per child	30,000	30,000	18,000	18,000

Note: Housing occupancy expenses have been adjusted for the family living in an owner-occupied home or a rented home. The average budget refers to average expenses for all families, while the tight budget is based on the level of expenses for families with a total gross income of up to kr. 150,000.

Source: Statistics Denmark's Consumer Survey, the Danish Financial Supervisory Authority and own calculations.

BREAKDOWN OF FINANCIAL MARGIN, 2010

Chart 17



Note: "All families" cover families both with and without mortgage debt.

Source: Mortgage banks, Statistics Denmark and own calculations.

DEBT BROKEN DOWN BY FINANCIAL MARGIN, ALL FAMILIES, TIGHT BUDGET, 2010

Table 7

Financial margin, kr. 1,000	Mortgage debt, kr. billion	Mortgage debt, per cent	Bank debt, kr. billion	Bank debt, per cent	Other debt, kr. billion	Other debt, per cent
Below 0	34.8	3.0	29.0	5.7	31.3	5.9
0-75	101.7	8.7	75.2	14.8	77.5	14.7
75-150	164.8	14.1	93.3	18.3	96.2	18.2
150-250	296.3	25.3	117.5	23.1	121.5	23.0
Over 250	573.3	49.0	194.6	38.2	202.2	38.2
Total	1,170.9	100.00	509.6	100.00	528.7	100.00

Note: All families cover families both with and without mortgage debt.

Source: Mortgage banks, Statistics Denmark and own calculations.

different picture. The share of all families with a negative financial margin thus drops to 8 per cent. This percentage holds far less than 8 per cent of the debt, be it mortgage debt, bank debt or other debt, cf. Table 7. As regards families with mortgage debt, the share with a negative financial margin falls to 3 per cent if the tight budget is applied in the calculations.¹

Among those with a negative financial margin, under the average but not the tight budget, old-age pensioners and recipients of early retirement benefits are clearly overrepresented, cf. Table 8. However, most of the families whose principal earner is in the oldest age groups have a substantial amount of assets. Irrespective of the size of the financial margin, the 10th percentile of families whose oldest member is at least 60 years has more assets than liabilities, cf. Chart 18. Moreover, it appears that the ratio of assets to liabilities is highest in the lowest margin intervals.

The clear overrepresentation of old-age pensioners and recipients of early retirement benefits is in accordance with the overall income pattern for families with a negative financial margin under the average budget, cf. Chart 19. Since low-income families typically have a tight budget, the average budget distorts the picture of the families' ability to service their debt.

Moreover, the size of the individual families' mortgage debt tends to rise with income. The higher the income, the higher the price of the properties for which the family can raise debt. Out of all families, 38 per cent had mortgage debt at end-2010, and they accounted for 55 per cent of total income after tax.

¹ A corresponding analysis on Finnish data finds that the financial margin is negative for slightly over 30 per cent of homeowners and around 40 per cent of tenants, applying an average budget. Under a minimum budget, the figures are 1 per cent for homeowners and 3.5 per cent for tenants, cf. Mäki-Fränti (2011). A Swedish analysis shows that the financial margin is negative for 7.35 per cent of the households, cf. Persson (2009).

CHARACTERISTICS OF FAMILIES WITH A NEGATIVE AND POSITIVE FINANCIAL MARGIN, RESPECTIVELY, UNDER THE TWO BUDGETS, 2010

Table 8

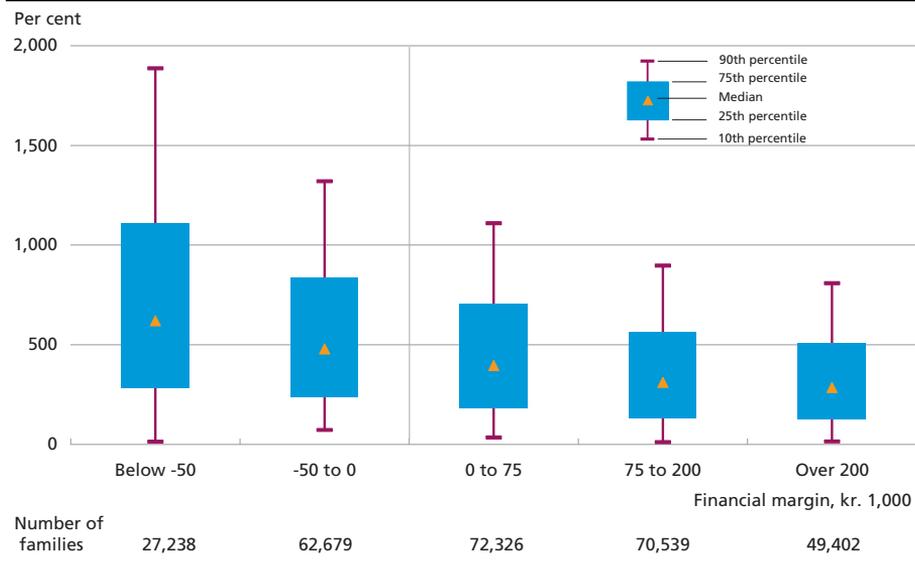
Percentage of families	Average budget		Tight budget	
	Negative financial margin	Positive financial margin	Negative financial margin	Positive financial margin
With two adult members	16.0	62.6	8.7	49.6
With children	11.0	35.1	6.5	28.4
With children aged 10 or below	8.0	19.9	4.7	16.7
At least one member in education programme	9.8	1.0	34.8	1.4
At least one member in old-age retirement or early retirement	41.7	21.0	11.1	29.6
At least one member is a recipient of social benefits or social pension benefits	16.9	9.9	16.1	12.0
At least one member has tertiary education	1.6	11.6	1.8	8.7
All adult members are unskilled	51.3	17.1	48.2	27.3
Resident in the Capital Region of Denmark	31.5	32.2	39.1	31.4
Resident in the Central Denmark Region	22.2	22.0	22.8	22.0
Resident in the North Denmark Region	10.9	10.0	9.3	10.4
Resident in Region Zealand	13.9	14.8	11.1	14.8
Resident in the Region of Southern Denmark	21.5	21.0	17.7	21.5

Source: Mortgage banks, Statistics Denmark and own calculations

Under the tight budget, around three quarters of the families have a financial margin of more than kr. 50,000. For some families, however, the fixed expenses will be set too low under the tight budget, so they

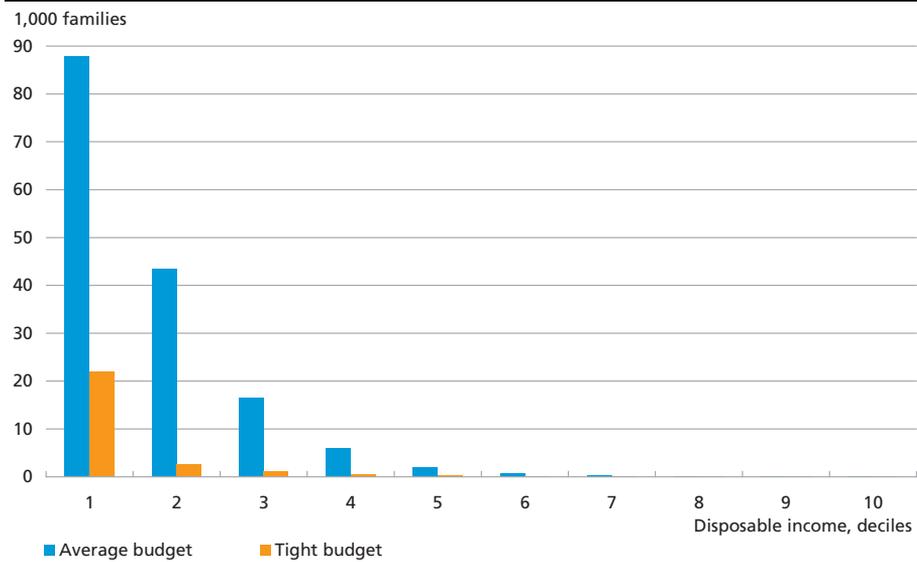
NET WEALTH RATIO VS. FINANCIAL MARGIN FOR FAMILIES WHOSE OLDEST MEMBER IS AT LEAST 60 YEARS – AVERAGE BUDGET, 2010

Chart 18



Note: The family's net wealth as a percentage of income after tax. The Chart covers only families with mortgage loans.
 Source: Mortgage banks, Statistics Denmark and own calculations.

FAMILIES WITH A NEGATIVE FINANCIAL MARGIN AND MORTGAGE DEBT, 2010 Chart 19



Note: The calculation of income deciles includes only incomes for families with mortgage debt.
 Source: Mortgage banks, Statistics Denmark and own calculations.

will actually have less money to spend. In some cases, families with a negative financial margin will have a buffer of assets, particularly in the oldest age groups, while in other cases, especially in the youngest age groups, they will have the opportunity to raise debt or perhaps receive support from broader family relations.

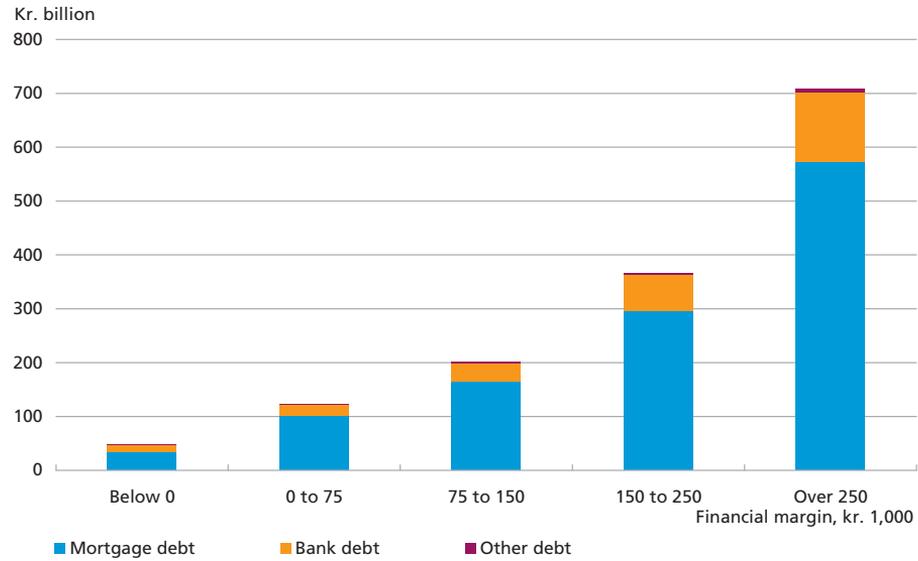
Table 8 also shows that the number of families with at least one member in an education programme is relatively higher among the families with *only* a negative financial margin under the average budget, just as the number of singles is higher. This group also has overrepresentation of families resident in the Greater Copenhagen area.

Families with a negative or slightly positive financial margin under the tight budget hold only a small share of the families' total gross debt, cf. Chart 20. Among families with a negative financial margin, only 2,229 families have loans in properties with an LTV ratio exceeding 100, cf. Chart 21. These families hold total debt of approximately kr. 7 billion, of which kr. 5 billion constitutes mortgage debt.

As mentioned previously, a family may choose to sell assets if its current income is insufficient to meet current expenses. Of course, this option exists only if the family has liquid assets and only until they run out. Given a time horizon of one year, some families with mortgage debt are able to bridge the gap between income and expenses by selling assets in the form of bank deposits, stocks, bonds and mortgage deeds in custody accounts. Among families with mortgage debt, the number

BREAKDOWN OF DEBT VS. FINANCIAL MARGIN, FAMILIES WITH MORTGAGE DEBT, TIGHT BUDGET, 2010

Chart 20

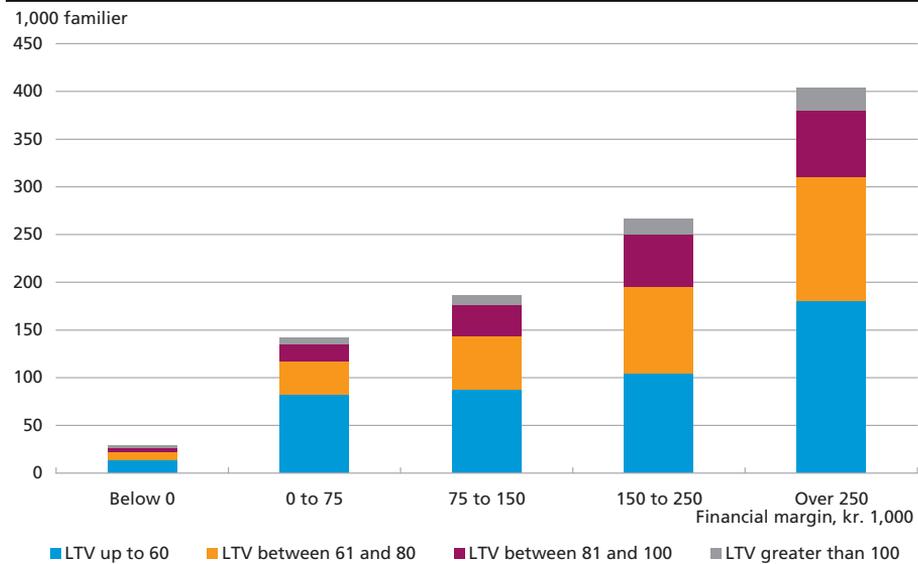


Note: Other debt includes all debt other than debt to mortgage banks and banks.

Source: Mortgage banks, Statistics Denmark and own calculations.

FAMILIES' REMAINING DEBT RELATIVE TO PROPERTY VALUATION, TIGHT BUDGET, 2010

Chart 21

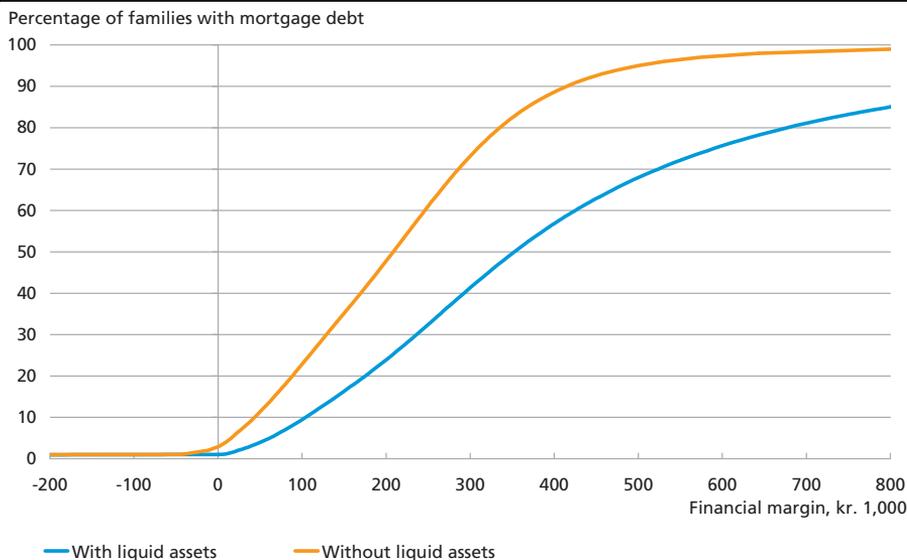


Note: LTV ratios indicate the remaining debt as a percentage of the property value of the property serving as collateral for the loan. Property valuations are the mortgage banks' valuations at end-2010. Families with loans in several properties are included once per property, whereby a family may be included more than once in the same bar. Only families with mortgage debt are included in the Chart.

Source: Mortgage banks, Statistics Denmark and own calculations.

BREAKDOWN OF FINANCIAL MARGIN ADJUSTED FOR LIQUID ASSETS,
FAMILIES WITH MORTGAGE DEBT, TIGHT BUDGET, 2010

Chart 22



Note: Liquid assets include bank deposits, market value of stocks and bonds and mortgage deeds in custody accounts.
Source: Mortgage banks, Statistics Denmark and own calculations.

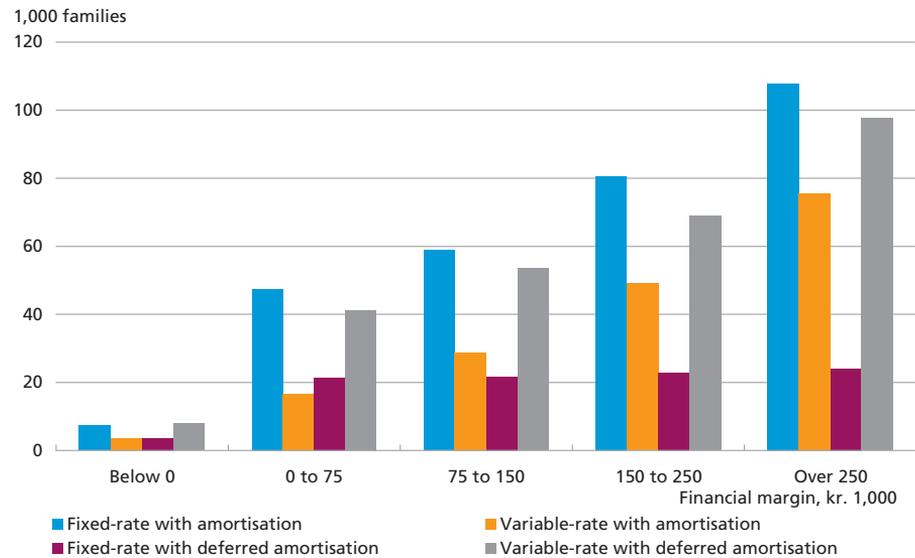
with a negative financial margin is thus brought down to 1 per cent when the tight budget is applied to the calculations, cf. Chart 22.

The share of families with variable-rate loans among families with mortgage loans and tight finances is almost the same as the share of families with variable-rate loans among mortgage borrowers in total, cf. Chart 23. This applies despite these families' higher income, on average, the current low level of interest rates and the resulting lower repayments on variable-rate loans. Moreover, a share of the variable-rate debt was raised when short-term interest rates were higher, meaning that when raising the loan these families were able to manage a higher level of interest rates than the current level. Even at the current low level of interest rates, there are still almost 16,000 families with a negative financial margin under the tight budget and with at least one variable-rate loan. These families' total mortgage debt amounts to kr. 27 billion, while other debt totals kr. 11 billion.

All in all, the conclusion is that a large majority of families with debt are able to pay their bills. Moreover, families with financial difficulties only account for a modest share of the total debt. In addition, the LTV ratios for the properties pledged as collateral for this limited part of the debt are low. The risk to financial stability from families with a negative or slightly positive financial margin under the tight budget is assessed to be limited. The credit institutions suffered only marginal losses on pri-

FAMILIES WITH ONE TYPE OF MORTGAGE DEBT ONLY VS. FINANCIAL MARGIN – TIGHT BUDGET, 2010

Chart 23



Note: The Chart covers only families whose entire mortgage debt consists of one loan type.

Source: Mortgage banks, Statistics Denmark and own calculations.

vate customers even during the financial crisis. Thus, loan impairment charges and arrears have been modest. The arrears ratio for mortgage loans for owner-occupied homes was thus only 0.32 per cent at end-June 2012.¹ Naturally, this is also a consequence of the low interest burden due to the drop in interest rates in the wake of the financial crisis, and of the relatively moderate increase in unemployment.

FAMILIES' INTEREST-RATE SENSITIVITY

A sensitivity analysis of the consequences to family finances of an interest-rate increase is performed in order to assess the families' financial robustness.

If the business cycle in Denmark mirrors that of the euro area, and Danish interest rates shadow euro area rates, interest rates will rise in periods of positive economic development and favourable employment trends. This strengthens the income basis of some families, at the same time as repayments on variable-rate mortgage debt increase. Other families will find it easier to work more. There will also be a positive impact on house prices, unless the interest-rate increase is very high and sudden. However, such an interest-rate hike should be expected to be temporary.

¹ The arrears ratio is calculated quarterly by the Danish Mortgage Banks' Federation and the Association of Danish Mortgage Banks and published on the websites of the two institutions. It shows the share of total repayments in arrears 3½ months after the due date.

ANALYSIS OF INTEREST-RATE SHOCK

Box 6

In the analysis of families' interest-rate sensitivity, interest rates are assumed to rise both on debt other than mortgage debt (other debt) and on variable-rate mortgage debt.

Variable-rate mortgage loans are granted with many different fixed-rate periods. Interest rates are assumed to rise for all loans with a fixed-rate period of up to one year. For loans with longer fixed-rate periods (e.g. F5 loans), it is assumed that the interest rate is first adjusted at the end of the year equal to the year of raising the loan plus the fixed-rate period. The analysis takes into account that many variable-rate loans are capped. For variable-rate mortgage debt, both interest payments and redemptions are recalculated.

The analysis has two parts. The first – primary – part assumes a time horizon of one year. Here, interest rates are assumed to increase only on loans subject to adjustment in 2010 i.e. around 79 per cent of all variable-rate loans. The second part is a simplified analysis of the consequences of a permanent interest-rate increase in the medium term, and this increase is assumed to be phased in for all variable-rate loans. Just over 14 per cent of variable-rate loans are subject to adjustment in either 2011 or 2012, while approximately 6 per cent are subject to adjustment in 2013 or 2014. Thus, only 1 per cent of variable-rate loans have not been subject to adjustment after four years. The reason is that the fixed-rate period is 5 years or less for most variable-rate loans by far.

The shocks are increases of 5 and 9 percentage points, respectively. An interest-rate increase of 9 percentage points should be assumed to be a short-lived shock.

Interest rates on other debt can be calculated by means of the register data set from Statistics Denmark. The interest rate is assumed to rise by the same number of percentage points as the interest rate on variable-rate mortgage debt, and interest payments are recalculated. However, redemptions, if applicable, are not known, so they cannot be recalculated.

When interest payments go up, tax payments change, since the interest deductibility changes. Tax is therefore recalculated for all individuals, and disposable incomes are adjusted. The tax calculations are made on the basis of tax legislation as at end-2010. Finally, families' new financial margins are calculated.

AVERAGE INTEREST-RATE LEVELS FOR MORTGAGE DEBT BEFORE AND AFTER INTEREST-RATE SHOCK, 2010

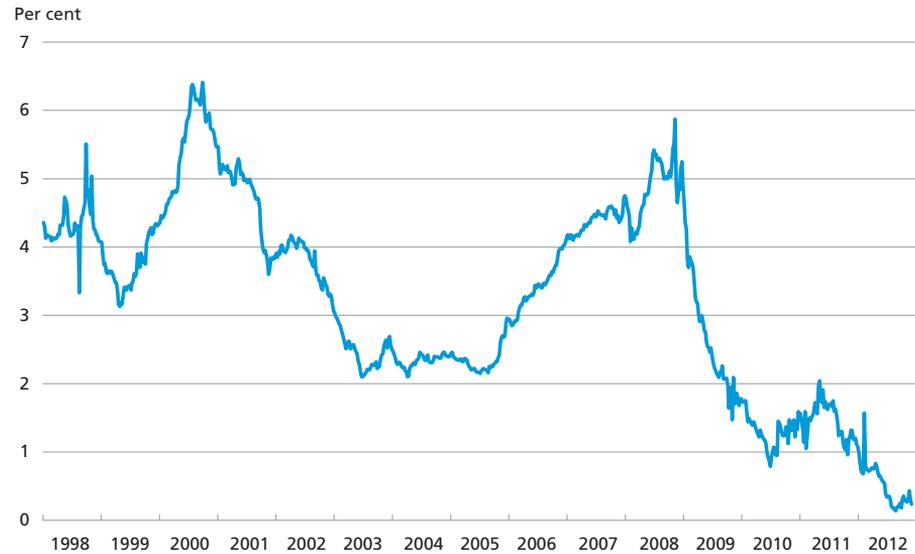
Table 9

Interest-rate level for mortgage debt, per cent	Before interest-rate shock	After shock of 5 percentage points	After shock of 9 percentage points
Fixed-rate loans	4.75	4.75	4.75
With adjustment in 2010	1.98	6.34	8.96
- Uncapped	1.96	6.96	10.96
- Capped	2.01	5.18	5.18
Fully phased-in interest-rate shock	2.29	6.79	9.69
- Uncapped	2.39	7.39	11.39
- Capped	2.01	5.18	5.18

Note: The yield to maturity stated by the mortgage banks at end-2010 is used as the basis for the calculations.
Source: Mortgage banks and own calculations.

DEVELOPMENTS IN AVERAGE SHORT-TERM BOND YIELD

Chart 24



Note: The Chart shows the development in the average short-term bond yield in Danish kroner. The data applied relates to 1- and 2-year uncallable bullet bonds underlying repayments on adjustable-rate loans. The average yield is calculated on a weekly basis, indicating the average yield to maturity for the week in question.

Source: Danish Association of Mortgage Banks.

The consequences to family finances of interest-rate increases of 5 and 9 percentage points, respectively, are calculated below. The interest-rate shocks are described in Box 6. Table 9 shows the resulting average interest-rate levels. It is taken into account that just under one third of the families with variable-rate loans have capped loans. The caps are in the interval of 3.45-6 per cent.

As regards variable-rate loans with adjustment in 2010, the level of interest rates after an increase of 5 percentage points roughly corresponds to the highest weekly level of the short-term bond yield after 1998, cf. Chart 24.¹ For uncapped loans and loans with adjustment after 2010, the average interest-rate levels are slightly higher after an increase of 5 percentage points. Since the level of interest rates is lower today than at the end of 2010, interest rates would have to rise by more than 5 per cent to reach the levels analysed.

A sudden hike in short-term interest rates of 9 percentage points is an extremely hard stress scenario, which is not very likely as long as the Danish economy is in order. This scenario has been chosen in order to throw light on families' ability to weather temporary strong interest-rate hikes, e.g. in connection with a currency crisis. Since the costs of a

¹ The highest weekly level (in the period from January 1998 to November 2012) of the average short-term bond yield was observed in calendar week 38 in 2000, at 6.41 per cent.

temporary hike may be covered by selling assets, it is particularly relevant to consider the families' asset holdings in this scenario.

EFFECT OF AN INTEREST-RATE SHOCK

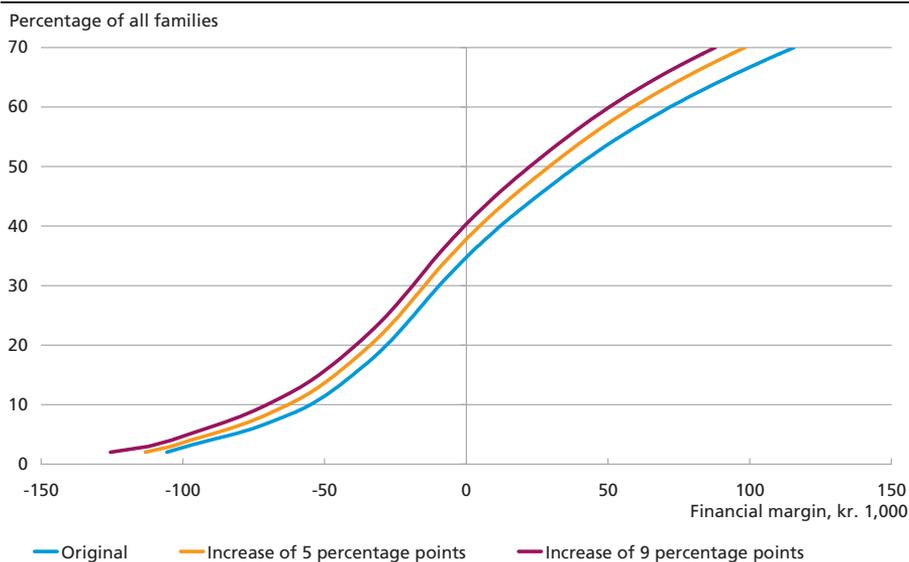
Only a small share of all families move from a positive to a negative financial margin after an interest-rate shock lasting one year, cf. Charts 25 and 26. Under the average budget, the financial margin becomes negative for 3 per cent more families if interest rates rise by 5 percentage points. The figure is 2 per cent under the tight budget. One reason is that one fourth of all families have no debt. In addition, many families have no mortgage debt, and their gross debt ratio is, on average, much lower than the ratio for families with mortgage debt. Moreover, 42 per cent of the families with mortgage debt have only fixed-rate debt, so for them interest-rate changes affect only other debt, if any.

Mainly families without mortgage debt and families with variable-rate mortgage debt move from the positive to the negative interval, cf. Chart 27. However, the number of families with variable-rate mortgage debt is still relatively low compared with the number of families without mortgage debt.

In April 2012, the Association of Danish Mortgage Banks interviewed a sample of homeowners with F1 loans, cf. Association of Danish Mortgage

BREAKDOWN OF FINANCIAL MARGIN UNDER THE AVERAGE BUDGET,
INTEREST-RATE SHOCK LASTING ONE YEAR, ALL FAMILIES, 2010

Chart 25

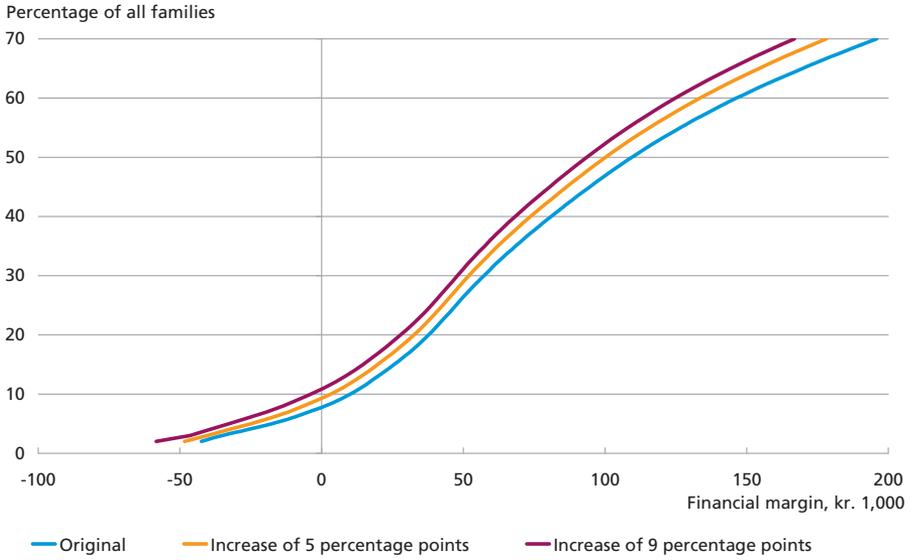


Note: All families cover families both with and without mortgage loans.

Source: Mortgage banks, Statistics Denmark and own calculations.

BREAKDOWN OF FINANCIAL MARGIN UNDER THE TIGHT BUDGET, INTEREST-RATE SHOCK LASTING ONE YEAR, ALL FAMILIES, 2010

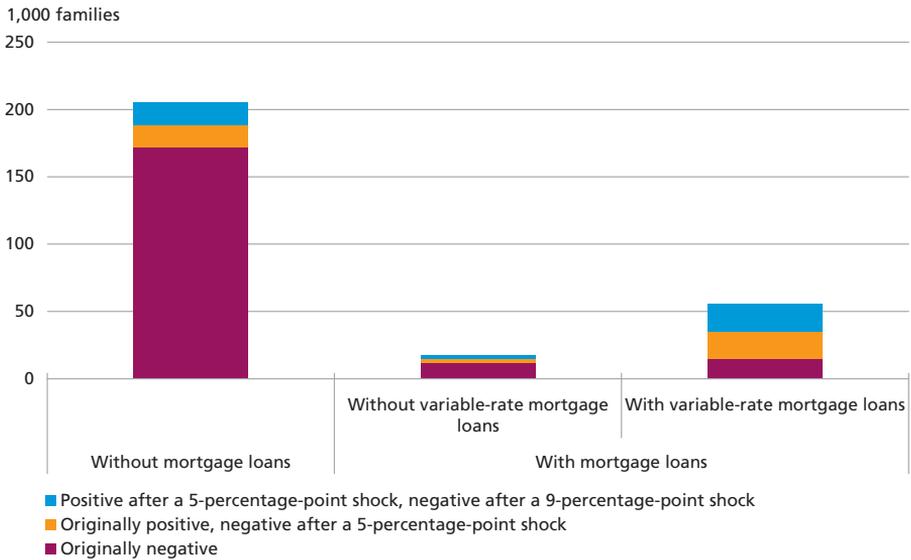
Chart 26



Note: All families cover families both with and without mortgage loans.
 Source: Mortgage banks, Statistics Denmark and own calculations.

FAMILIES WITH A NEGATIVE FINANCIAL MARGIN – TIGHT BUDGET, 2010

Chart 27



Note: Families with variable-rate loans cover families with at least one variable-rate mortgage loan.
 Source: Mortgage banks, Statistics Denmark and own calculations.

DECREASE IN FINANCIAL MARGIN PER MONTH ON AN INTEREST-RATE
INCREASE OF 5 PERCENTAGE POINTS, 2010

Table 10

Number of families	Families <i>with</i> mortgage debt	Families <i>without</i> mortgage debt
No change	141,154	535,193
Kr. 1-500	156,668	704,925
Kr. 501-1,000	131,208	155,221
Kr. 1,001-2,000	190,290	121,673
Kr. 2,001-3,000	116,733	43,867
Kr. 3,001-5,000	127,213	24,164
Over kr. 5,000	110,193	12,016

Source: Mortgage banks, Statistics Denmark and own calculations.

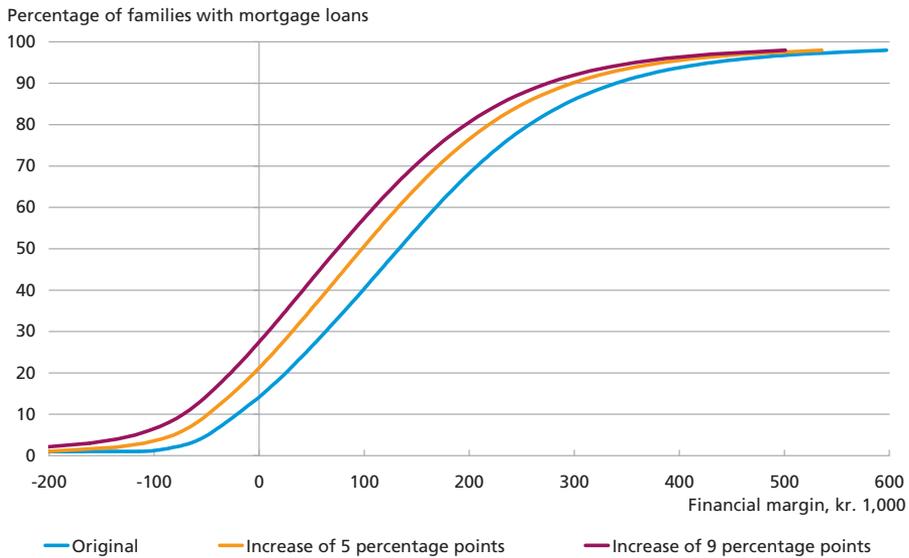
Banks (2012). When asked whether they were prepared for a possible increase in the repayments on their adjustable-rate loans at the next adjustment, 85 per cent of the respondents said that they were prepared to a high or some degree. 11 per cent said that they were prepared to a lower degree, and 2 per cent replied that they were not prepared at all.¹ In the same survey, the Association of Danish Mortgage Banks asked the respondents to assess "how much extra they would be able to pay on their loans each month (before tax) before they would encounter notable constraints on their current consumption/savings" (Association of Danish Mortgage Banks (2012) p. 2). On average, the respondents assessed that they could manage an increase in repayments of kr. 3,100 per month before a notable decline in their standard of living would set in. In addition, the respondents assessed that the pain threshold was an increase in repayments of kr. 4,200 per month. For increases beyond this threshold, they found that they would no longer be able to service their mortgage loans.

Table 10 shows the decline in the families' financial margin after an interest-rate shock of 5 percentage points. Almost 240,000 families will have over kr. 3,000 less at their disposal per month, taking into account that higher interest expenses imply lower tax. For 110,000 families, the monthly disposable amount will shrink by over kr. 5,000. The results in the Table are not directly comparable with the survey conducted by the Association of Danish Mortgage Banks. Firstly, the calculation is made on an after-tax basis, secondly interest expenses on other debt are also assumed to rise, and thirdly all families are considered. Last, but not least, the analysis is based on interest rates in 2010, while the survey was conducted in April 2012. With these reservations in mind, quite a few stated, asked directly, that they would experience increases in repayments of a size they would find difficult to manage.

¹ The remainder replied "don't know".

BREAKDOWN OF FINANCIAL MARGIN UNDER THE AVERAGE BUDGET,
INTEREST-RATE SHOCK LASTING ONE YEAR, FAMILIES WITH VARIABLE-RATE
MORTGAGE LOANS, 2010

Chart 28



Note: Only families with at least one variable-rate mortgage loan are included.

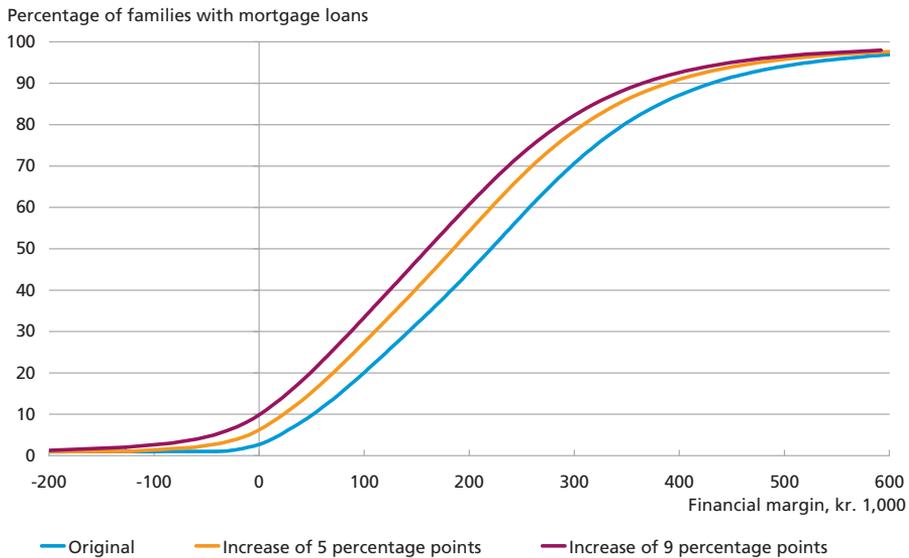
Source: Mortgage banks, Statistics Denmark and own calculations.

If only families with variable-rate mortgage debt are considered, the effect of an interest-rate shock is relatively pronounced, cf. Charts 28 and 29. Among these families, the number whose financial margin becomes negative under the tight budget grows from around 15,000 to close to 35,000 on an interest-rate increase of 5 percentage points. This corresponds to 6 per cent of the families with variable-rate loans becoming unable to meet current expenses from current income. An interest-rate increase of 9 percentage points would move another 20,000 or so from the positive to the negative interval.

After an interest-rate shock, families with tight finances account for a larger share of the debt burden than previously, cf. Table 11. The share of total mortgage debt held by families with negative financial margins thus grows from 3.0 to 6.4 per cent when the tight budget is applied to the calculations. The share of bank debt among families with a negative financial margin rises from 5.7 to 12.4 per cent. But not many of these families have high LTV ratios. The number of families with a negative financial margin and a home with an LTV ratio of more than 100 per cent rises from around 2,250 initially to approximately 4,750 after an interest-rate increase of 5 percentage points. Among the remaining 51,000 or so families with a negative financial margin, just over 10,000

BREAKDOWN OF FINANCIAL MARGIN UNDER THE TIGHT BUDGET, INTEREST-RATE SHOCK LASTING ONE YEAR, FAMILIES WITH VARIABLE-RATE MORTGAGE LOANS, 2010

Chart 29



Note: Only families with at least one variable-rate mortgage loan are included.

Source: Mortgage banks, Statistics Denmark and own calculations

have homes with LTV ratios of 80-100, while around 41,000 have only homes with an LTV ratio of less than 80, cf. Chart 30.

The 4,750 families with loans in properties with an LTV ratio of over 100 per cent as well as a negative financial margin under the tight budget only hold 1 per cent of total mortgage debt and just over 1 per cent of families' total bank debt, cf. Table 12. Whether this debt leads to losses for credit institutions initially depends on families' ability to e.g. cut consumption further, sell assets or increase their income, and then on how much the loans exceed the sales price of the asset pledged as

BREAKDOWN OF DEBT BY FINANCIAL MARGIN AFTER INTEREST-RATE SHOCK OF 5 PERCENTAGE POINTS, ALL FAMILIES, TIGHT BUDGET, 2010

Table 11

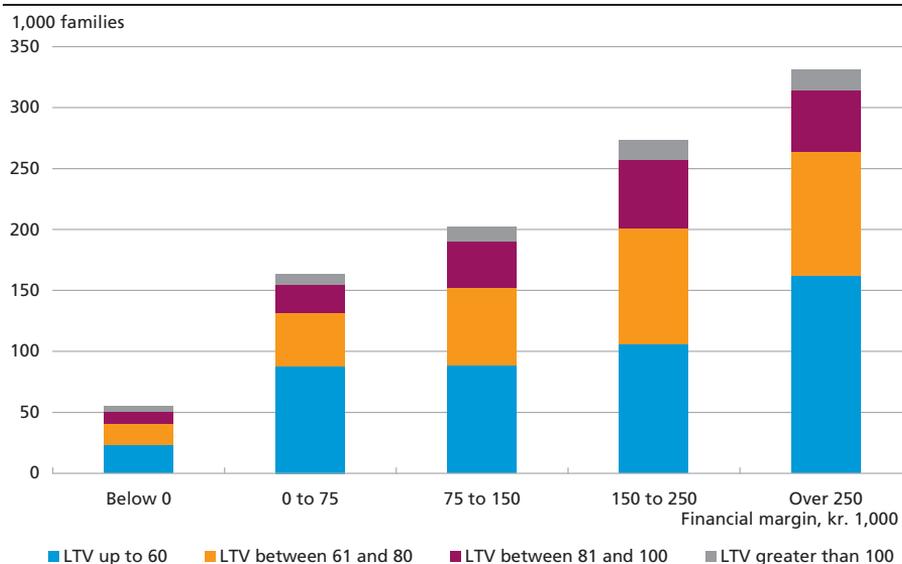
Financial margin, kr. 1,000	Mortgage debt, kr. billion	Mortgage debt, per cent	Bank debt, kr. billion	Bank debt, per cent	Other debt, kr. billion	Other debt, per cent
Below 0	75.3	6.4	63.3	12.4	68.6	13.0
0-75	129.9	11.1	86.6	17.0	89.4	16.9
75-150	194.9	16.6	98.5	19.3	101.8	19.3
150-250	317.9	27.2	117.2	23.0	120.8	22.8
Over 250	452.9	38.7	144.0	28.3	148.2	28.0
Total	1,170.9	100.00	509.6	100.00	528.7	100.00

Note: All families cover families both with and without mortgage debt.

Source: Mortgage banks, Statistics Denmark and own calculations.

REMAINING DEBT RELATIVE TO PROPERTY VALUE AFTER AN INTEREST-RATE INCREASE OF 5 PERCENTAGE POINTS, 2010, TIGHT BUDGET

Chart 30



Note: LTV ratios indicate the remaining debt as a percentage of the property value of the property serving as collateral for the loan. Property valuations are the mortgage banks' valuations at end-2010. Families with loans in several properties are included once per property, whereby a family may be included more than once in the same bar. Only families with mortgage debt are included in the Chart.

Source: Mortgage banks, Statistics Denmark and own calculations.

collateral with the credit institutions. Mortgage loans will always be based on real property as collateral.

If a family encounters financial problems of such a magnitude that their property ends up in an enforced sale, the sales price will often be lower than the price that could be obtained in the free market, cf.

BREAKDOWN OF DEBT BY FINANCIAL MARGIN AFTER INTEREST-RATE SHOCK OF 5 PERCENTAGE POINTS, FAMILIES WITH LTV RATIOS OVER 100, TIGHT BUDGET, 2010

Table 12

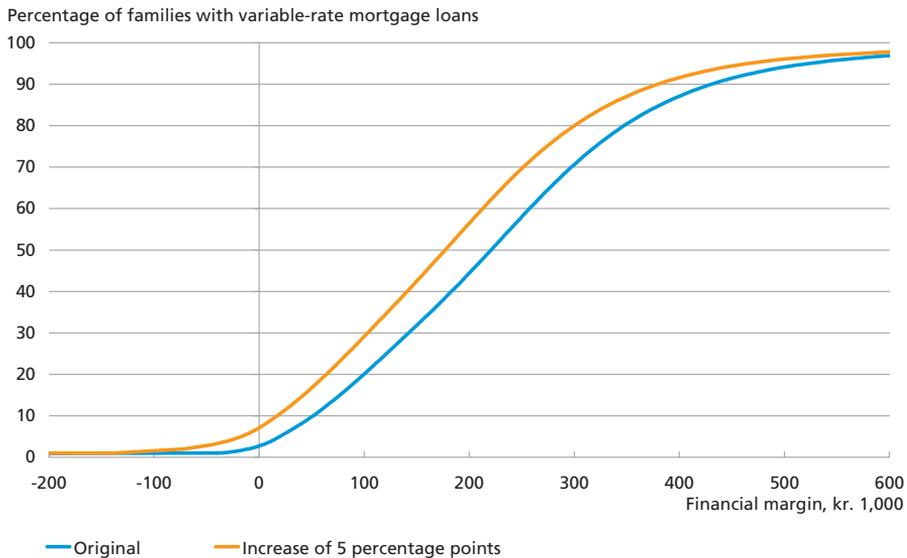
Financial margin, kr. 1,000	Mortgage debt, kr. billion	Share of total mortgage debt, per cent	Bank debt, kr. billion	Share of total bank debt, per cent	Other debt, kr. billion	Share of total other debt, per cent
Below 0	12.6	1.1	3.8	1.4	0.6	4.1
0-75	12.4	1.1	2.5	0.9	0.2	1.7
75-150	19.6	1.7	3.9	1.5	0.3	2.4
150-250	29.8	2.5	5.9	2.3	0.4	3.1
Over 250	42.5	3.6	8.0	3.1	0.5	3.3
Total	116.9	10.0	24.1	9.2	2.1	14.7

Note: All families cover families both with and without mortgage debt.

Source: Mortgage banks, Statistics Denmark and own calculations.

BREAKDOWN OF FINANCIAL MARGIN UNDER THE TIGHT BUDGET, FULLY IMPLEMENTED INTEREST-RATE SHOCK, FAMILIES WITH VARIABLE-RATE MORTGAGE LOANS, 2010

Chart 31



Note: Only families with at least one variable-rate mortgage loan are included.

Source: Mortgage banks, Statistics Denmark and own calculations.

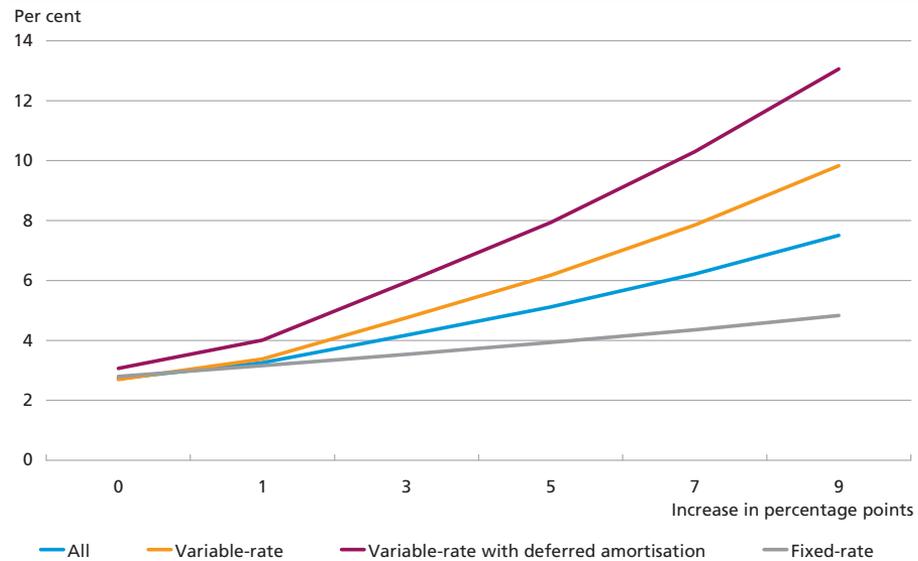
Danmarks Nationalbank (2012). This means that banks and mortgage banks may lose money on enforced sales of properties for which the total loans are assessed to constitute less than 100 per cent of the market price. But their losses will often be smaller than the loss on the property, since the borrower is personally liable, meaning that banks and mortgage banks have other ways of enforcing their claims.

The duration of the shock also influences families with variable-rate mortgage loans, since only part of the variable-rate mortgage debt is subject to adjustment in the first year. Once the interest-rate shock is fully implemented, the financial margin becomes negative for another 5,000 or so families with variable-rate loans, cf. Chart 31. Families with variable-rate loans with adjustment one or more years ahead will, however, have more time to adjust their budgets.

Among families with variable-rate mortgage loans there is substantial variation in the effect of an interest-rate shock for families with and without deferred amortisation, respectively, cf. Chart 32. A total of 63 per cent of the families with variable-rate loans have opted for deferred amortisation, and these families hold around 70 per cent of the mortgage debt among families with variable-rate mortgage loans. The combination of deferred amortisation and variable-rate loans means that an interest-rate increase will be fully passed through to repayments on the

SHARE WITH NEGATIVE FINANCIAL MARGIN, FAMILIES WITH MORTGAGE DEBT, TIGHT BUDGET, 2010

Chart 32



Note: Only families with at least one mortgage loan are included.

Source: Mortgage banks, Statistics Denmark and own calculations.

loan. If redemptions are paid on a variable-rate annuity loan, the redemptions will fall if interest rates rise.

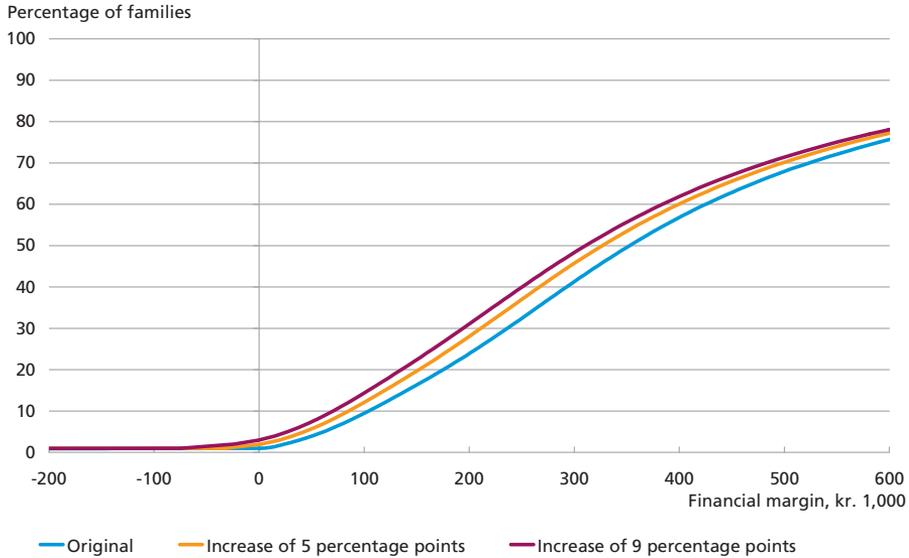
It is relevant to take family assets into account especially in connection with temporary interest-rate increases. Most families have enough liquid assets to meet the extra expenses resulting from the interest-rate increases for a period of more than one year, cf. Chart 33.

All in all, most Danish families have robust finances and are able to weather rather large interest-rate increases, although this will often result in lifestyle changes in the form of lower consumption. The group of families who encounter financial problems as a result of an interest-rate increase mainly consists of families without mortgage debt and families with variable-rate mortgage debt. Among families with variable-rate mortgage debt, those who have opted for deferred amortisation are particularly exposed.

LTV ratios are low among the families whose financial margin becomes negative. Less than 5,000 of the families who encounter financial problems thus have loans in properties with an LTV ratio exceeding 100 per cent, and these families hold only around 1 per cent of families' total debt to banks and mortgage banks. Moreover, most families by far have a buffer of liquid assets, which can cover the additional costs of interest-rate increases for more than one year.

BREAKDOWN OF FINANCIAL MARGIN ADJUSTED FOR LIQUID ASSETS,
FAMILIES WITH MORTGAGE DEBT, TIGHT BUDGET, 2010

Chart 33



Note: Liquid assets include bank deposits, market value of stocks and bonds and mortgage deeds in custody accounts.

Source: Mortgage banks, Statistics Denmark and own calculations.

INCOME SHOCKS

As described above, families' exposure depends e.g. on their ability to service their debt commitments from their current disposable income. The stress scenarios for interest rates imply shocks to current debt repayments. However, it is just as relevant to apply stress scenarios to the other side of the equation, i.e. disposable income, by looking at the individual families' robustness to unemployment.

For approximately every second person who became unemployed in 2010, the period of unemployment lasted less than 3 months. For more than 1 in 4 persons who became unemployed, the period of unemployment lasted 3-6 months. It is therefore relevant to examine the families' ability to withstand a decrease in income as a result of a period of unemployment of 3 or 6 months, respectively, taking the rules on unemployment benefits and tax into account.

In order to analyse the individual family's robustness to temporary unemployment, two stress scenarios are constructed in which the family's principal earner loses his or her earned income for 3 and 6 months, respectively.

Families' financial margins under the two stress scenarios are examined below. The calculations take into account whether or not the indi-

ANALYSIS OF TEMPORARY LOSS OF INCOME

Box 7

The purpose of this analysis is to examine the individual family's robustness to a temporary loss of income. This means that the analysis is performed at micro level and cannot be aggregated to the economy overall. Whether the individual families can cope with a temporary loss of the principal earner's income is analysed by assuming that the earned income of the principal earner lapses and is replaced by unemployment or social benefits, depending on the person's entitlement. The analysis includes all families, also persons with a very low probability of becoming unemployed, including those in high income groups.

It is only possible to become unemployed if the person had a job to start with. Therefore, the analysis is limited to families whose principal earner was employed throughout 2010. The definition is that the principal earner has not been affected by unemployment, not received pension, early retirement benefits, social pension benefits, sickness or maternity/paternity leave benefits, social benefits, unemployment benefits or student grants and has a positive earned income. Moreover, the analysis is limited to families whose principal earner is in the 18-64 age group. According to this delineation, 1.8 million persons were employed throughout 2010, corresponding to 69 per cent of the total workforce in the 18-64 age group.

The loss of earned income for the family's principal earner is expected to last for 3 or 6 months. Statistics Denmark's registers contain information on whether a person has unemployment insurance. In addition, the rules on social benefits are used for calculation of whether a person is entitled to such benefits in the event of unemployment. The disposable income is recalculated, and tax is also adjusted to match the change in income. All calculations of tax, unemployment benefits and social benefits are based on the rules for 2010, as that is the most recent year for which employment data is available. The change in the family's financial margin given the change in disposable income is then examined. The analysis is performed only with a time horizon of one year. Thus, the assumption is that income is the only factor that changes.

vidual principal earner is entitled to unemployment benefits or social benefits. The calculations are described in more detail in Box 7.

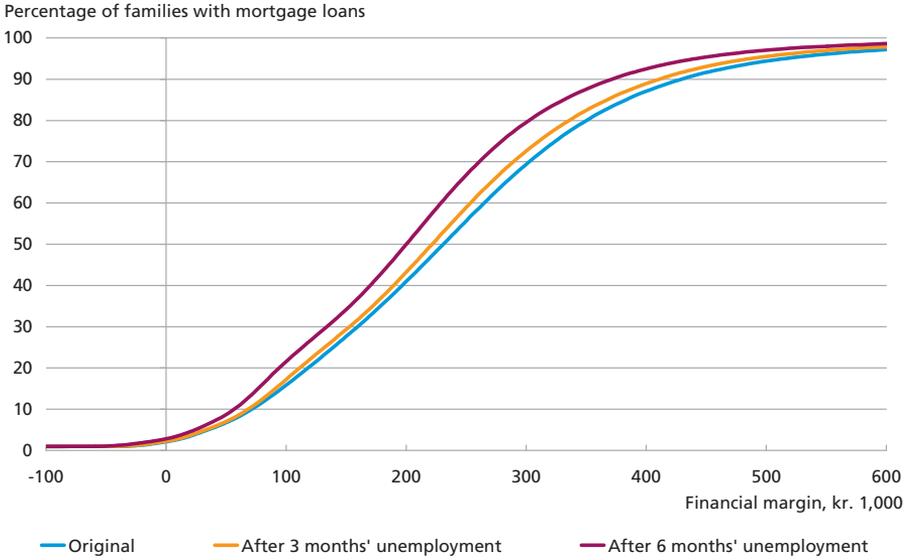
Chart 34 shows the changes in the cumulative distribution of financial margins in the two stress scenarios one year ahead. It appears that very few families move from the positive to the negative interval for financial margins when the principal earner becomes unemployed. A large majority of the families with mortgage loans thus have enough financial scope to sustain lapse of one income for six months on a tight budget.

Since the lapse of income is assumed to be temporary, families' liquid assets should be taken into account when examining the effects of the unemployment shocks. A large majority of families with mortgage debt have enough liquid assets to cover a 6-month decline in the principal earner's income, cf. Chart 35.

Virtually all of the families with mortgage debt who have a positive financial margin in the baseline scenario have enough budgetary scope to

BREAKDOWN OF FINANCIAL MARGIN IF THE PRINCIPAL EARNER BECOMES UNEMPLOYED, FAMILIES WITH MORTGAGE DEBT, TIGHT BUDGET, 2010

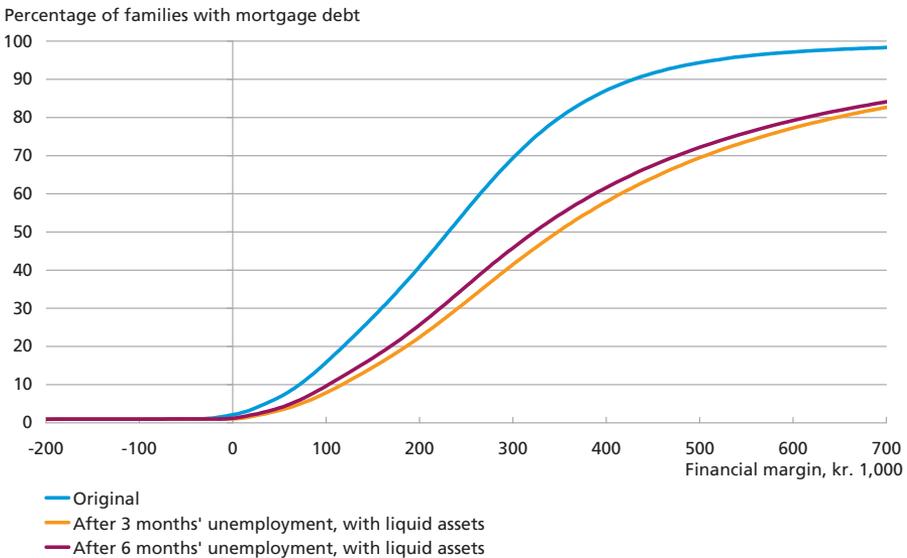
Chart 34



Note: It is assumed that the loss of earned income for the principal earner lasts for 3 or 6 months, respectively, and that the lost income is replaced by unemployment or social benefits, depending on the principal earner's entitlement.
 Source: Mortgage banks, Statistics Denmark and own calculations.

BREAKDOWN OF FINANCIAL MARGIN, ADJUSTED FOR LIQUID ASSETS, IF THE PRINCIPAL EARNER BECOMES UNEMPLOYED, FAMILIES WITH MORTGAGE DEBT, TIGHT BUDGET, 2010

Chart 35



Note: It is assumed that the loss of earned income for the principal earner lasts for 3 or 6 months, respectively, and that the lost income is replaced by unemployment or social benefits, depending on the principal earner's entitlement. Liquid assets include bank deposits, the market value of stocks and bonds and mortgage deeds in custody accounts.
 Source: Mortgage banks, Statistics Denmark and own calculations.

withstand a decline in the principal earner's income for up to 6 months. Moreover, many families have enough liquid assets to cushion the shock. Families with mortgage loans are thus well positioned to weather temporary periods of unemployment, applying a partial perspective, i.e. the individual family is affected by unemployment without an increase in total unemployment in the economy.

EXPIRY OF DEFERRED AMORTISATION

For the largest share by far of deferred-amortisation loans, the duration of the deferred-amortisation period is 10 years.¹ Since the first deferred-amortisation loans were issued in 2003, deferred-amortisation periods will begin to expire as from 2013. Based on data on the families' mortgage loans at end-2011, the number of families exposed to expiry of deferred amortisation is less than 5,000 in 2013, cf. Chart 36, rising to approximately 27,000 in 2014 and almost 70,000 in 2015. For more than 110,000 families, the period of deferred amortisation will expire in 2019.

When the deferred-amortisation period expires the principal must be repaid over the remaining maturity, unless the loan is refinanced. For 30-year loans with deferred amortisation for the first 10 years, the principal must thus be repaid over 20 years. Most families with deferred-amortisation loans have enough budgetary scope to begin to pay redemptions on their mortgage debt already now, cf. Box 8.

At this stage, 10 per cent of the families will be unable to repay the mortgage debt over 20 years if the tight budget is applied to the calculations. This does not necessarily mean that they will be unable to do so when their deferred-amortisation period actually expires. Before that time, some of these families may have repaid other debt, obtained a higher income or have assets to sell.

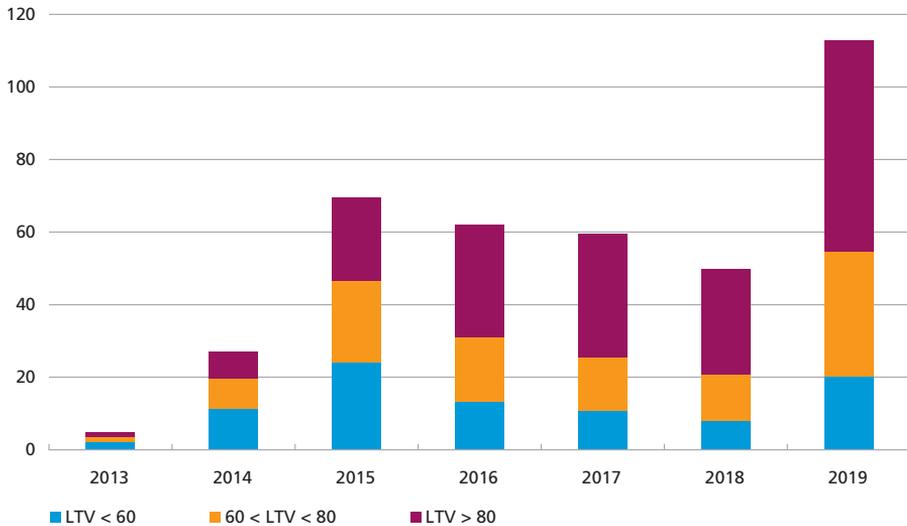
However, many families must be expected to wish to prolong the deferred-amortisation period by raising a new deferred-amortisation loan at up to the limit of 80 per cent of the current property valuation, redeeming the existing loan. Due to the combination of non-repayment of the debt, which is often raised at up to 80 per cent of the property valuation, and falling house prices, the remaining debt of many of the deferred-amortisation loans now exceeds 80 per cent of the market value, cf. Chart 36. Unless house prices rise before the expiry of the deferred-amortisation period, quite a few families will have to find alternative funding of the share of the loan exceeding the 80-per-cent limit. For the

¹ In 2007 it became possible to grant loans with longer deferred-amortisation periods, provided that the LTV ratio is lower than 75.

EXPIRY OF DEFERRED AMORTISATION AND LTV RATIO

Chart 36

Number of families with deferred amortisation expiring during the relevant year, 1,000



Note: The Chart shows the number of families with at least one deferred-amortisation loan where the deferred-amortisation period expires at the latest during the year stated. The year of expiry is calculated on the basis of the starting date of the most recent deferred-amortisation period, assuming that the total deferred-amortisation period is 10 years. A family may be included in several different years if it has more than one deferred-amortisation loan. The LTV ratio is the remaining debt as a ratio of the property value of the property serving as collateral for the loan. The property value is the mortgage bank's valuation at end-2011. If a family has more deferred-amortisation loans expiring in the same year, but which are based on different properties as collateral, the loan with the highest LTV ratio is shown in the Chart.

Source: Mortgage banks, Statistics Denmark and own calculations.

median family with deferred-amortisation loans and an LTV ratio of more than 80 per cent, this funding requirement is around kr. 144,000.

If a family has sufficient liquid funds, they may be used for redemption of the existing loan, thereby reducing the borrowing requirement when raising a new deferred-amortisation loan. If this is taken into account, more than 100,000 families with LTV ratios over 80 per cent are facing expiry of the deferred-amortisation period in the coming years.

CALCULATION OF HYPOTHETICAL REDEMPTIONS

Box 8

Hypothetical redemptions are calculated for all deferred-amortisation loans in order to examine whether families with deferred amortisation have enough financial scope for paying redemptions on their mortgage loans. The hypothetical redemptions if the loan was to be repaid as from the following year are calculated. Thus, the redemptions are calculated on the basis of the remaining debt and interest rates in 2010, and the loan is to be repaid over the next 20 years. If the remaining maturity is less than 20 years, this is used instead. This increases total redemptions for families with one or more deferred-amortisation loans.

The analysis shows that for around 10 per cent of the families with deferred-amortisation loans, the financial margin will be negative under the tight budget after the calculations of hypothetical redemptions.

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Corporate Saving and Investment

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1. INTRODUCTION AND SUMMARY

During the recent global economic and financial crisis, Danish non-financial corporations (firms) have significantly increased their savings surplus, known as net lending. Net lending is what remains of corporate gross savings after investment (subsequently we use the term corporate to refer to non-financial corporations). Firms have achieved this rise e.g. by sharply reducing investment spending, on the one hand, and by increasing gross savings *inter alia* through lower dividend payments. Thus the firms' restraint during the crisis has been a key contributing factor to the economic downturn and subsequent weak recovery. We will take a closer look at the drivers of the trend in net lending, and compare it with developments in other countries. To that end, we analyse the level of investment. Furthermore, we examine a data set with firm-level accounting data for Denmark.

Net lending is currently higher than at any time during the period for which we have statistics, i.e. the last 30 years. The reversal in net lending from the end of the boom until now has been very sharp and is almost equivalent to the reversal from the late 1980s to the early 1990s. Similar developments have taken place in other countries, but few countries have higher corporate net lending than Denmark. Net lending usually varies with the business cycle, but by looking at data for a number of countries, we find indications that the change in Danish corporate net lending in the wake of the economic crisis has been more substantial than would normally be warranted by the business cycle. But given that neither the debt level nor the increase during the preceding boom was exceptionally high, Danish firms' wish to improve their net lending position does not seem to be motivated by a greater need to reduce debt than in other countries. However, other factors that are difficult to quantify may have an impact. For instance, the Danish financial sector has been hit hard during the crisis. Consequently, Danish firms have had the incentive to become more independent of bank funding in future by consolidating.

The analysis of data at firm level shows that corporate gross accumulation of gross debt has declined after the end of the boom. Despite

continued balance-sheet expansion, corporate leverage has decreased for medium-sized firms and especially for large firms due to a rising ratio of equity to total liabilities.

The increase in gross savings since 2007 is attributable to falling interest expenses, tax and dividend payments. Over a number of years, the level of corporate gross savings has been high in Denmark relative to several other OECD countries. The high level of gross savings is attributable especially to higher property income and fewer dividend payments in Denmark than in other countries. But since many factors are at play, including tax issues and corporate structures, the low dividend level is difficult to explain empirically based on a few economic factors. Our firm-specific data demonstrates that large firms are among the lowest dividend payers as a percentage of profits, while a breakdown of the data by industry shows that the real estate, financing and insurance industries, in particular, have low dividend payout ratios.

As mentioned earlier, the reversal of corporate net lending is attributable also to a large drop in investment spending. Based on a cross-country econometric analysis, we find that the current investment ratio is largely in line with the long-term level for the average of the countries, while the Danish level is somewhat below the long-term level. Presumably this means that investment will pick up over the longer term and thus contribute to growth. A calculation of net investment, i.e. gross investment less depreciation, at firm level shows that medium-sized firms, in particular, have reduced their net investment, while an industry breakdown indicates that primarily real-estate firms and trading and transport firms have reduced their net investment.

Like in other Northern European countries, in particular, Danish foreign direct investment, FDI, has increased over time, which should be seen in light of the fact that cross-border investment has become easier and that firms have generally become more international. In an international perspective, Danish FDI holdings are relatively high. This could help to explain Danish firms' relatively high property income from FDI. A frequent point of discussion in the economic debate has been that FDI reduces domestic investment spending, but neither the economic literature nor recent developments provide a clear answer to the effect of outward FDI on domestic investment. Nor is there any relationship between domestic investment and FDI in the accounting data applied for Danish firms.

2. CORPORATE NET LENDING

In recent years, Danish non-financial corporations (subsequently also referred to as firms) have significantly improved their savings balance,

i.e. net lending. We analyse patterns in corporate net lending – seen over a longer horizon and relative to other countries – with a view to assessing whether or not recent developments are unusual.

The current account and sectoral savings balances

Net lending is what remains of corporate gross savings (profits after tax less dividend payments) after investment (capital expenditure). In other words, net lending is a savings balance where a savings surplus entails that, on a net basis, financial assets are acquired and, conversely, a deficit entails that net financial liabilities are generated. For a more detailed review of net lending, see Box 1.

Developments in the net lending of individual sectors are linked to the savings balances of other sectors, since a savings deficit e.g. in the public sector tends to be offset by increased household savings in an attempt to counteract future tax increases or cost cutting. Business cycle developments affect the sectoral savings balances in different ways. During an economic upswing, the propensity of firms and consumers to invest and consume rises, causing their savings balances to decline. Conversely, public finances typically improve during an upswing and deteriorate during a downturn, driven by automatic stabilisers (income taxes, unemployment benefits, etc.). Savings balances are thus impacted by corporate and household behaviour, as well as economic policy and are key drivers of cyclical fluctuations. Developments in the savings balances of individual sectors should also be seen in the context of the economy as a whole and be assessed over an extended period of time.

During the recent economic downturn, the private sector has significantly strengthened net lending, cf. Chart 1. In 2011, corporate net lending was positive at 5 per cent of the gross domestic product, GDP, equivalent to an increase of almost 7 per cent of GDP relative to the trough in 2007. Households, on the other hand, still had a small savings deficit in 2011, but have reduced it by more than 4 per cent of GDP since 2007. The reversal in household savings balances is reflected in a very large current account surplus of 6 per cent of GDP in 2011, although the public sector moved from a large budget surplus to a deficit during the period 2007-11. This increase in household savings has been a key factor in recent slow economic growth.

On previous occasions, significant reversals have also been seen in the savings balances of individual sectors. In the mid-1980s, firms and households had accumulated substantial savings deficits, generating large current account deficits during that period. A significant reversal was seen in corporate and household net lending in step with the downturn in the late 1980s, while the public sector once again accumulated signifi-

CALCULATION OF CORPORATE NET LENDING

Box 1

Corporate net lending is recognised in the national accounts, both in the non-financial and financial accounts. As far as Denmark is concerned, they are reconciled, while this is not the case for some other countries. Another cross-country difference is in the delineation of households and firms, which may vary internationally in statistics. In the EU, sole proprietorships, mainly farms, are part of the household sector, while in the USA they are included in the corporate sector. These differences could affect comparability. Our analyses are based on figures from the OECD, which have to a large extent been adjusted for these differences, resulting, however, in significant reduction of the length of time series, especially for the USA.

The comparability of corporate savings could be impacted by factors, the significance of which may vary across countries and over time. For instance, the national accounts do not adjust corporate income for inflation effects on corporate debt and capital gains. In a situation of high inflation, corporate savings will thus be underestimated. Adjusted for this, the international trend towards increased corporate gross savings is eliminated in the G7 countries, cf. IMF (2006). Another element that could influence the calculation of corporate savings is how firms choose to distribute income to their shareholders. If firms buy back shares, this does not affect corporate savings in the national accounts, while distribution of dividends reduces savings. The significance of share buybacks has increased over time, cf. the IMF (2006), which could also impact comparability of the development in corporate net lending data over time and across countries.

Table 1 shows the calculation of corporate net lending from output from non-financial transactions in the national accounts as a percentage of GDP. Some items are also recorded in kr. billion.

FROM GROSS VALUE ADDED TO NET LENDING – NON-FINANCIAL CORPORATIONS

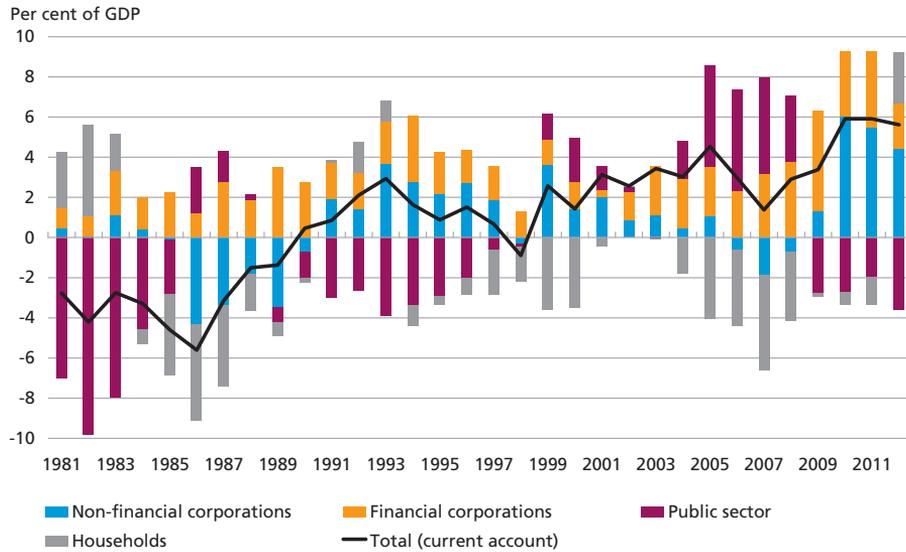
Table 1

	1995	2000	2005	2007	2011
	Kr. billion				
Gross value added	477.8	644.8	760.4	854.7	880.4
Net lending	21.9	18.2	17.0	-31.3	98.3
	Per cent of GDP				
Gross value added	46.9	49.8	49.2	50.4	49.1
- Compensation of employees	28.6	29.6	30.3	32.1	30.1
- Taxes less subsidies on production	-0.4	-0.1	-0.1	0.0	-0.1
= Gross operating surplus	18.7	20.3	18.9	18.3	18.3
+ Property income (incl. transfers)	1.4	1.9	5.8	6.4	5.6
- Net interest paid	0.6	0.9	1.1	2.2	0.8
- Income and property taxes	1.9	2.5	3.0	3.0	2.4
= Net operating surplus after tax	17.5	18.9	20.6	19.5	20.7
- Dividends paid	2.8	4.0	6.7	7.0	5.5
= Gross savings	14.7	14.9	14.0	12.5	15.2
- Capital expenditure (incl. capital transfers)	12.6	13.5	12.9	14.3	9.7
Of which fixed gross investment	12.2	12.7	11.8	13.0	9.7
Net lending	2.1	1.4	1.1	-1.8	5.5

Source: Statistics Denmark.

CURRENT ACCOUNT AND SECTORAL NET LENDING 1981-2012

Chart 1



Note: Total net lending is not necessarily fully consistent with the current account, e.g. due to unilateral capital transfers. Figures for 2012 are based on the quarterly national accounts for the first two quarters.

Source: Statistics Denmark.

cant deficits that were only unwound during the 1990s. For many years, financial corporations have recorded positive net lending, at around 2 per cent of GDP, but after the financial crisis in 2008, the savings surplus has increased to more than 4 per cent of GDP. Households, on the other hand, have been recording negative net lending more or less continuously since the mid-1980s¹. During some periods, the cyclical link between changes in savings balances is reinforced by the effect on cyclical developments of economic-policy measures targeted at impacting the savings balance of households, in particular, *inter alia* by reducing the tax value of interest deduction.

Corporate net lending

During the period 1981-2011, corporate net lending varied considerably, from a trough with a deficit of more than 4 per cent of GDP in 1986 to a savings surplus of 6 per cent of GDP in 2010. Thus the surplus seen during recent years is the highest observed surplus for the last 30 years.

In the 1990s, firms posted significant surpluses of 2-4 per cent of GDP, and during the period 1991-2005, the average annual savings surplus in the sector was just under 2 per cent of GDP. The latest reversal in net lending has been sharp – similar in strength to that of the reversal dur-

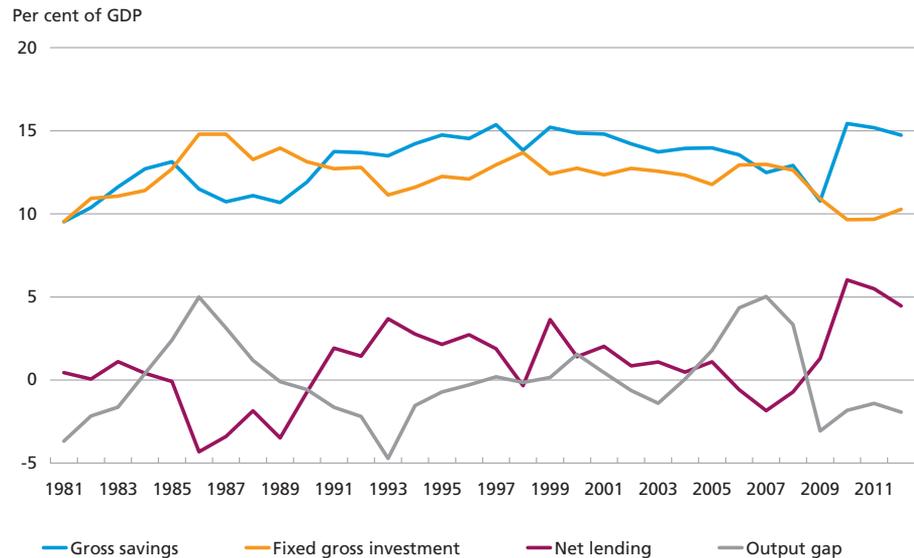
¹ For an analysis of household savings, see Isaksen et al. "Household Balance Sheets and Debt", *Monetary Review*, 4th Quarter 2011, Part 2, Danmarks Nationalbank.

ing the period of slow growth in the late 1980s and early 1990s. But the point of departure for the change in net lending has been different, and net lending is currently at a higher level than back then, while the real interest rate was higher then than the current rate.

Compared with the current cyclical downturn, the fall in investment was slightly larger during the period from 1987 to 1991, while the decline in inventory investment has been greater during the current downturn. The change in gross savings was of the same magnitude as during the current cyclical downturn. Over time, fluctuations in corporate net lending have moved with the business cycle, illustrated in Chart 2 by the output gap. The reason is that corporate savings behaviour is also impacted by cyclical factors and affects cyclical developments. In cyclical downturns, firms have generally tended to accumulate savings surpluses. This may reflect a need for consolidation and debt reduction, e.g. as a result of a weaker economic outlook, increased uncertainty and more limited access to funding. In response, firms tend to reduce investment expenses, lower inventories and cut staff expenses. Economic upturns, on the other hand, will see increasing investment and inventory rebuilding. Corporate savings behaviour thus helps to impact cyclical developments and corporate restraint is a key contributing factor to the weak economic activity in recent years. During the period since the early 1980s, firms have generally recorded savings surpluses, i.e. positive net

DEVELOPMENT IN CORPORATE NET LENDING, GROSS SAVINGS AND INVESTMENT, 1981-2012

Chart 2

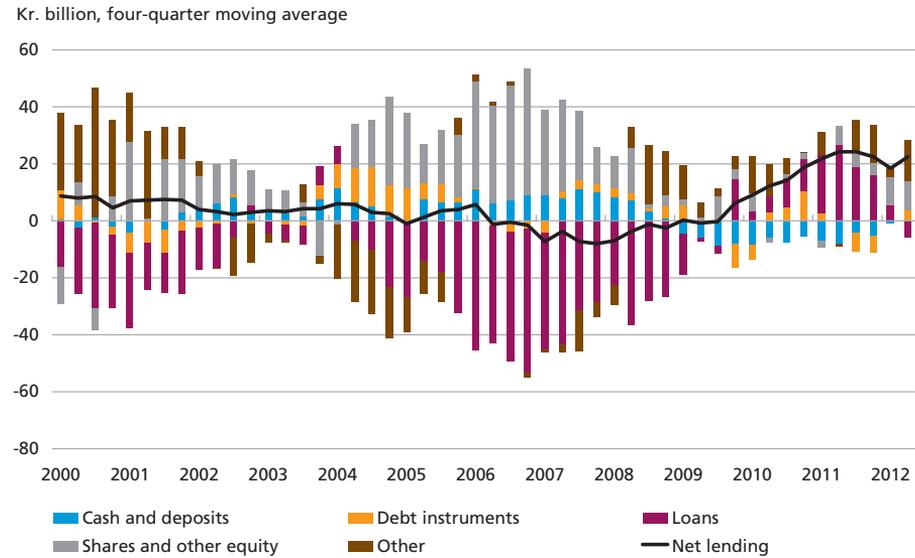


Note: Output gap data for the period 1981-84 stems from the OECD Economic Outlook, while data for the period 1985-2012 is from Danmarks Nationalbank.

Source: Statistics Denmark, Danmarks Nationalbank and OECD.

CORPORATE FINANCIAL TRANSACTIONS, BROKEN DOWN BY INSTRUMENTS 2000-12

Chart 3



Note: The Chart shows net assets, i.e. financial transactions in assets less financial transactions in liabilities.
Source: Danmarks Nationalbank.

lending. During the period from 1990 to 2005, corporate net lending was negative for only one year.

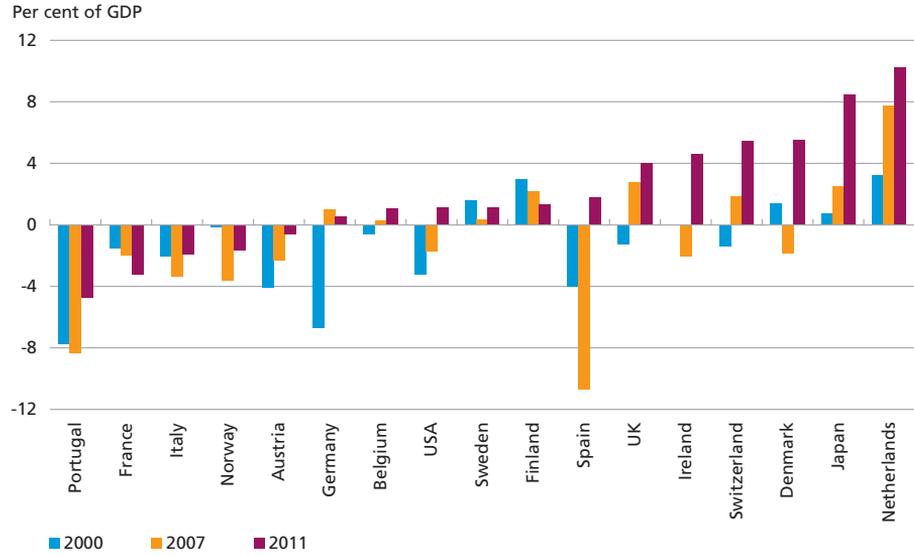
The financial accounts of the national accounts illustrate the financial movements that are overall equivalent to corporate net lending. They show that in the run-up to the financial crisis, firms built up their financial balance sheets by raising loans and investing the funds in shares and other equity and by increasing cash holdings, cf. Chart 3.

This trend towards balance-sheet expansion stopped as the economic downturn took hold. After the financial crisis, firms have reduced their loans, illustrated in the Chart as a positive change in the item "loans". This development reflects that firms have reduced liabilities in the form of loans and accumulated assets in the form of lending to others. Firms have also reduced their cash holdings and, again in 2011, made significant investment in shares and other equity.

The increase in corporate net lending in recent years has also been seen in other countries, cf. Chart 4. But compared with other countries, Danish firms have seen relatively large adjustment in net lending during the current downturn, attributable e.g. to a greater fall in investment, cf. Chart 5. Thus net lending is higher only in Japan and the Netherlands. Spain has had the most significant adjustment, with Spanish firms turning a large savings deficit of more than 10 per cent of GDP in 2007 into a small surplus of just under 2 per cent of GDP in 2011.

DEVELOPMENT IN CORPORATE NET LENDING FOR SELECTED COUNTRIES

Chart 4

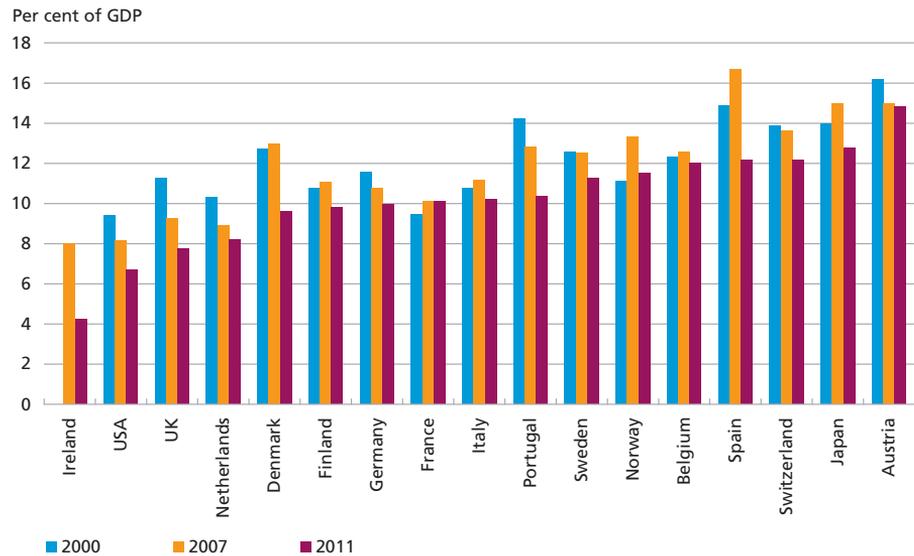


Note: For Japan, Switzerland and the USA, the most recent figures are from 2010.
Source: OECD.

In many countries, investment is lower and net lending higher than in 2000, but in Denmark investment has fallen more than in most other countries.

DEVELOPMENT IN CORPORATE GROSS INVESTMENT AS A PERCENTAGE OF GDP

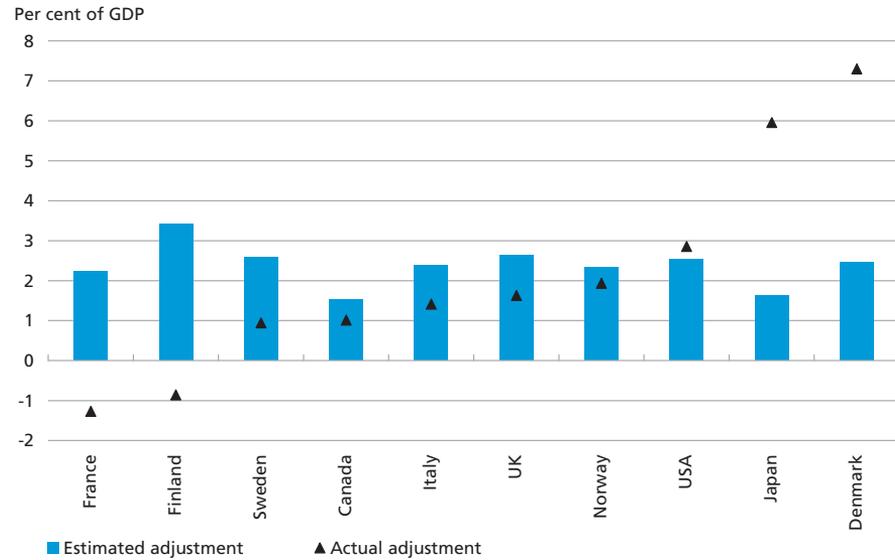
Chart 5



Note: For Japan, Switzerland and the USA, the most recent figures are from 2010.
Source: OECD.

CHANGE IN CORPORATE NET LENDING IN SELECTED COUNTRIES, ACTUAL AND ESTIMATED, 2007-11

Chart 6



Note: For Japan and the USA, the actual adjustment is relative to 2010.

Source: OECD, IMF and own calculations.

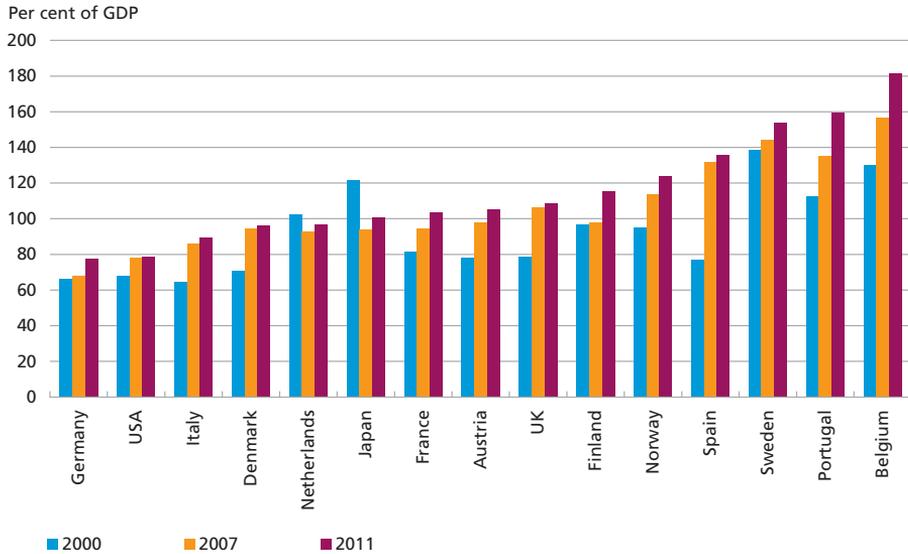
To facilitate assessment of the extent to which the trend in Danish corporate net lending reflects cyclical developments during the crisis, we have examined data from a number of countries using regression analysis¹. Based on the estimated model, a change in the output gap of 1 percentage point will lead to an increase in net lending of 0.4 per cent of GDP for the selected cross-section of countries. Based on developments in the output gap and average elasticity, this entails that corporate net lending should have risen by 2.5 per cent of GDP from 2007 to 2011. The actual increase of 7.3 per cent of GDP indicates an adjustment in Danish corporate net lending above the average relationship, cf. Chart 6.

Net lending in Finland, Sweden and France has risen less than would be indicated by the estimated relationship. For the USA, the UK, Canada and Norway, the adjustment is closer to that warranted by the model. Such average considerations are subject to very considerable uncertainty and should be interpreted with caution. Moreover, the regression analysis does not allow for other factors that may impact corporate net lending.

¹ Cyclical effects on net lending are analysed by estimates from panel regressions for the G7 countries (excl. Germany) and Denmark, Sweden, Norway and Finland for the period 1981-2011. The regression seeks to explain corporate net lending as a percentage of GDP, using the output gap as a measure of cyclical impacts. We find a significantly negative relationship between the output gap and net lending. This relationship is robust to including a lagged endogenous variable and a linear trend. Based on the estimated relationship, a fall in the output gap of 1 percentage point, e.g. as a result of recession, over a four-year term will lead to an increase in non-financial corporations' net lending of about 0.4 percentage points on average. The OECD (2007) finds a coefficient of 0.3 in a model for the whole of the corporate sector, i.e. including financial corporations.

DEVELOPMENT IN CORPORATE GROSS DEBT FOR SELECTED COUNTRIES

Chart 7



Note: Gross debt has been calculated as corporate liabilities in securities with the exception of shares, loans and insurance technical reserves. Differences in the calculation of the non-financial corporations sector's gross debt hamper international comparisons. In Denmark, borrowing has been consolidated for the sector, omitting loans between non-financial corporations. In a number of other countries, loans between non-financial corporations are estimated and included in different ways in the sector's gross debt. However, this does not change the overall conclusion.

Source: OECD.

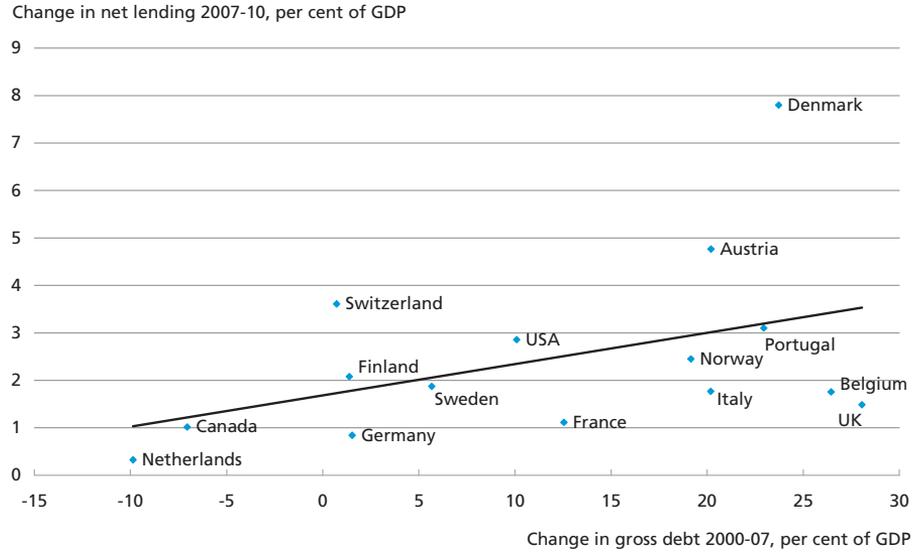
For instance, financial aspects may have played a role. One such aspect is a corporate need for debt reduction. Higher accumulation of debt may increase vulnerabilities, especially to lower turnover as a result of the economic situation and to potential tightening of credit terms. Consequently, higher accumulation of debt during good times may result in a need for subsequent consolidation in the form of some years with positive net lending. Corporate debt accumulation in Denmark was slightly stronger than in a number of other countries in the period 2000-07, cf. Chart 7. Danish corporate gross debt increased from just over 70 per cent of GDP to just under 95 per cent of GDP in 2007.

Across countries, there was a positive relationship between the accumulation of debt from 2000-07 and the change in net lending from 2007-10, cf. Chart 8, albeit with significant differences across countries with otherwise similar debt developments. Thus the increase in Danish corporate gross debt is in line with that of a number of other countries in which corporate net lending has not risen as strongly as in Denmark.

Another measure of the corporate debt burden is the ratio of corporate debt to income (gross operating surplus property income less interest payments and land rental). Higher debt does not necessarily entail higher risk, as long as earnings rise correspondingly. Based on this

CORPORATE ACCUMULATION OF DEBT 2000-07 AND CHANGE IN NET LENDING 2007-10

Chart 8

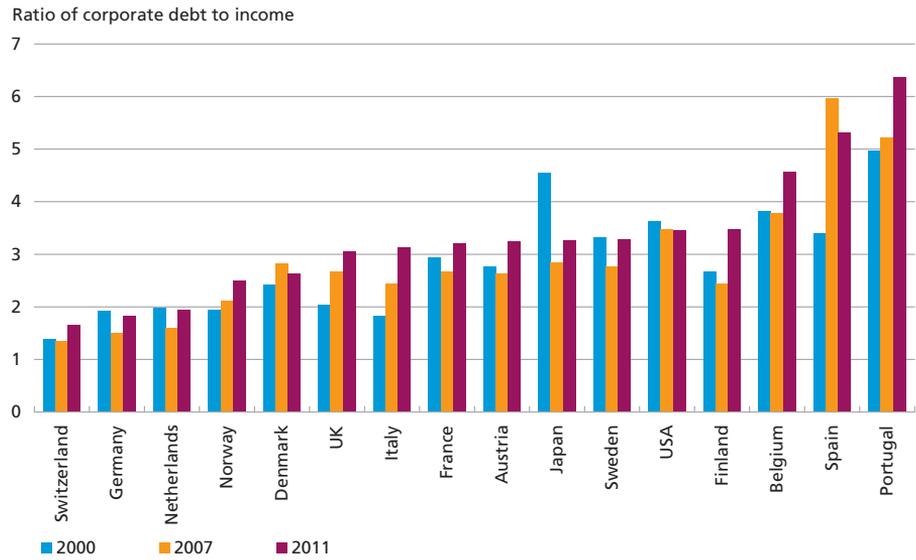


Note: Countries such as Spain and Ireland experienced a significantly higher increase in debt before the crisis and adjustment in net lending during the crisis than the countries shown, but have been excluded for the sake of clarity.
Source: OECD.

measure, there are no indications that corporate leverage has increased disproportionately in Denmark, cf. Chart 9. Thus the rise in the corporate debt-to-income ratio is moderate and the debt-to-income ratio is

CORPORATE GROSS DEBT-TO-INCOME RATIO

Chart 9



Note: See note for Chart 6 above.
Source: OECD.

average compared with other countries. This indicates that Danish firms have increased earnings in step with borrowing, e.g. by purchasing return-generating financial assets, cf. below. Thus the corporate debt level in Denmark does not seem to provide an aggregate explanation of the greater adjustment to net lending in recent years relative to other countries. At firm level, however, there could be a link between accumulation of debt and net lending, which we will investigate further in Section 5. Other factors that are difficult to quantify could play a role. The Danish financial sector has been hit relatively hard by the crisis, increasing the incentive of firms to become more independent of bank funding in future. Add to this that uncertainty as to future prospects remains very high, e.g. due to the sovereign debt crisis in some southern euro area member states, which has also encouraged firms to consolidate. Therefore, low interest rates, reflecting this uncertainty, have led to increased savings.

3. CORPORATE GROSS SAVINGS

As described above, high gross savings have contributed to Danish firms' positive net lending, on average. In this section, we will look at elements in corporate transactions that help to explain this.

After the economic downturn, firms have increased gross savings by 2.7 per cent of GDP. The rise in gross savings was of similar magnitude during the downturn in the late 1980s and early 1990s. The difference between then and now is that the increase in gross savings in the current downturn is not driven by a rise in corporate gross profits, but rather by a fall in interest expenses, taxes and dividends. In an international context, corporate gross savings in Denmark have grown strongly after the crisis, cf. Chart 10 (left).

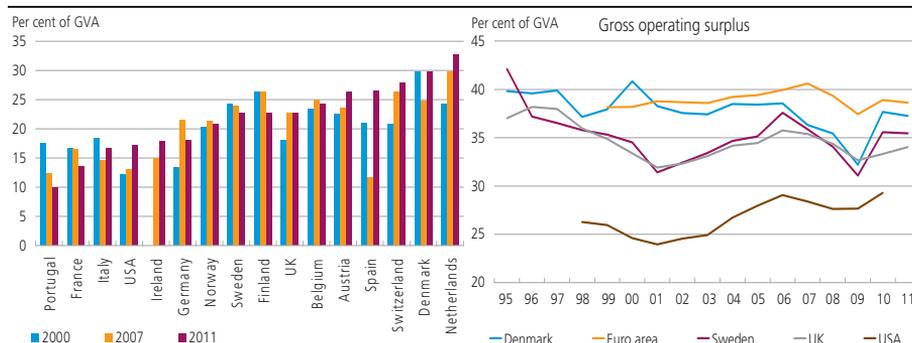
High Danish gross savings in an international context help to explain why Danish firms have generally had positive net lending. However, gross operating surplus (value added less labour costs) is at an average level internationally, cf. Chart 10 (right) and Table 2¹. This indicates that high corporate gross savings in Denmark are not attributable to a higher profit share of domestic output.

Over time, gross operating surplus has been fairly constant in Denmark and a number of other countries. In a few countries, especially Germany and Belgium, gross operating surplus has been increasing.

¹ To increase cross-country comparability, we show corporate transactions as a percentage of gross value added (GVA) rather than GDP, thereby allowing for the fact that non-financial corporations' share of the overall economy varies from one country to the next.

DEVELOPMENT IN CORPORATE GROSS SAVINGS (LEFT) AND GROSS OPERATING SURPLUS (RIGHT) FOR SELECTED ECONOMIES

Chart 10



Source: OECD.

Conversely, profit including property income and interest payments (corporate income) has generally tended to increase, cf. Chart 11 (left).

Corporate property income in Denmark has been rising sharply since the late 1990s, driven by increasing holdings of financial assets and higher dividend payments. To that end, it should be noted, however, that property income as defined in the national accounts has not been

NON-FINANCIAL CORPORATIONS' NET LENDING – COMPARISON OF AVERAGES FOR THE PERIOD 1995-2010 FOR SELECTED COUNTRIES

Table 2

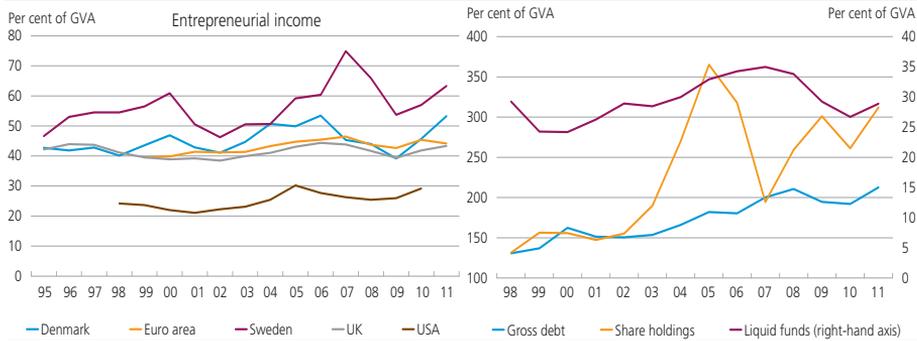
Per cent of GVA	Gross operating surplus	Property income (excl. Interest rates)	Net interest expenses	Tax	Profit after tax	Dividends paid	Gross savings	Gross investment	Net lending
Average 1995-2010									
Denmark	37.8	9.1	2.3	4.9	39.5	10.9	28.6	25.3	2.6
Finland	43.4	6.4	3.6	6.2	40.1	13.4	26.8	18.8	7.5
Norway	52.4	5.4	3.5	13.4	40.0	18.2	21.8	20.6	-1.7
Sweden	35.2	23.1	3.7	4.1	49.3	24.2	24.8	20.4	4.0
Netherlands	39.3	2.8	2.9	4.7	34.2	9.9	25.8	16.9	9.5
Germany	39.6	3.7	2.2	3.4	38.3	20.7	17.6	19.0	-0.3
Belgium	36.1	7.7	0.0	4.5	39.4	17.4	22.0	21.6	0.2
Austria	40.4	4.5	3.1	3.6	38.1	14.8	23.3	29.4	-4.2
France	30.6	11.4	2.7	3.6	33.4	17.8	15.6	18.1	-1.9
Italy	45.7	3.0	3.1	4.6	40.7	23.6	16.5	22.0	-3.4
Spain	36.1	4.2	5.7	5.7	27.1	8.6	18.6	30.6	-10.5
Portugal	37.8	3.1	4.6	6.0	28.8	11.9	16.9	26.2	-11.2
Switzerland	32.9	11.2	2.2	3.9	38.2	16.2	23.2	22.4	2.2
UK	34.7	8.8	2.8	4.7	35.8	15.5	20.3	17.7	2.8
USA	26.7	1.3	2.9	3.2	20.9	6.8	14.0	15.4	-1.5
Average	37.9	7.0	3.0	5.1	36.3	15.3	21.1	21.6	-0.4

Note: For the USA, data is for the period 1998 to 2010, and for Spain for the period 2000-10.

Source: OECD.

ENTREPRENEURIAL INCOME FOR DENMARK AND SELECTED ECONOMIES (LEFT) AND DANISH FIRMS' GROSS DEBT, SHARE HOLDINGS AND LIQUID FUNDS (RIGHT)

Chart 11



Note: Entrepreneurial income is gross operating surplus plus property income less interest expenses. Corporate gross debt, share holdings and liquid funds have not been consolidated for intra-sector claims.

Source: Statistics Denmark and OECD.

consolidated for inter-corporate dividend distribution¹. Interest payments were also increasing in the pre-crisis years, driven by higher gross debt, but have fallen since 2008 in response to low interest rates. Developments in property income reflect *inter alia* that firms have increased their financial balance sheets. Danish firms have built up holdings of shares and other equity, e.g. foreign firms, cf. below, and have increased borrowing. Thus their gross debt and share holdings grew from approximately 130 per cent of gross value added, GVA, in late 1998 to about 200 per cent of GVA and 310 per cent of GVA, respectively, at end-2011, cf. Chart 11 (right). However, as opposed to firms in a number of other countries, especially the UK and the Netherlands, Danish firms have not accumulated significant liquid reserves.

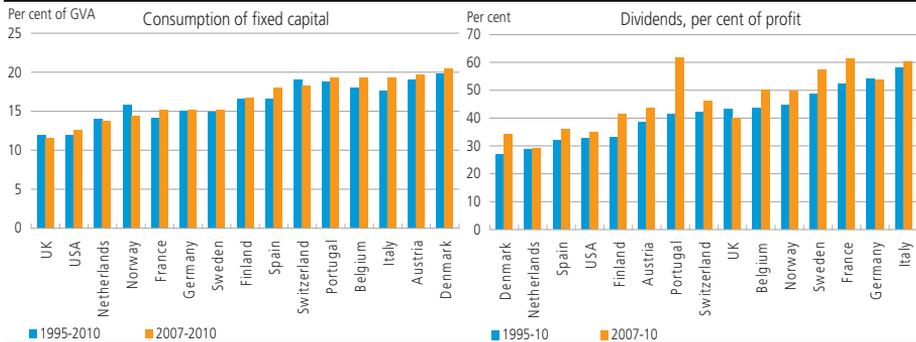
Comparisons of savings levels should also take into consideration that Danish firms have a higher consumption of fixed real capital (depreciation) than their counterparts in other countries, measured as a percentage of GVA, cf. Chart 12 (left)². Adjusted for this – by looking at net savings (gross savings less consumption of real capital) – the savings level of Danish firms, measured as a percentage of GVA, is still about 3 per cent higher than the average of the other countries.

In addition to high property income and increasing depreciation, a key driver of the relatively high savings ratio is lower dividend payments in Denmark than in other countries, both in terms of GVA and profits, cf.

¹ There is a high degree of co-variation between property income received and dividends paid, and therefore property income received should not be construed as an expression of corporate net property income.

² The size of the capital stock and estimates of depreciation thereof are subject to considerable uncertainty and should be interpreted with caution.

CORPORATE CONSUMPTION OF FIXED REAL CAPITAL (LEFT) AND CORPORATE DIVIDEND PAYMENTS AS A PERCENTAGE OF PROFIT (RIGHT) Chart 12



Note: Corporate dividends are payments for dividends distributed in the national accounts as a percentage of corporate income after tax and transfers. The Charts show average values for the periods.
Source: OECD.

Chart 12 (right). In general, corporate dividend payouts increased across countries during the period 1995 to 2010 – also in Denmark.

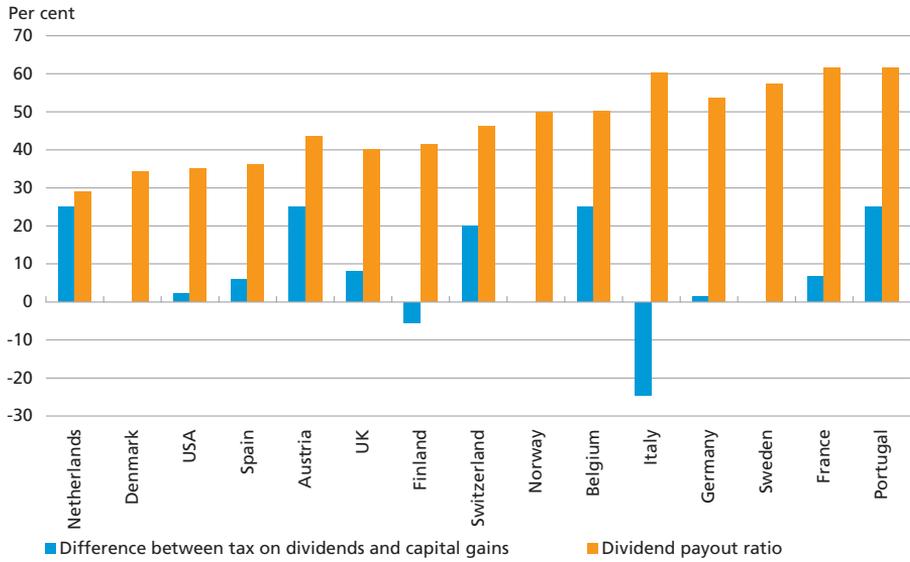
The economic literature cites many drivers of corporate decisions on the payment of dividends, cf. *inter alia* Allen and Michaely (2002). For instance, fiscal and institutional structures may play a major role and cultural differences may exist. Therefore, it may be difficult to explain cross-country differences based on a few factors.

In Denmark, corporate dividends are taxed relatively heavily compared with other countries. In many countries, it is basically more attractive for shareholders to receive gains in the form of share buybacks than by distribution of dividends. Jacob and Jacob (2010) also find a positive relationship for differences in the taxation of dividends and capital gains. But since the taxation of equity income in Denmark is uniform – whether achieved from dividends or capital gains on share holdings – it is unclear whether this relationship may explain the relatively low dividend payouts in Denmark. If these differences are observed across countries and compared with the average dividend payout ratio, there is no clear cross-country relationship, cf. Chart 13¹. But there are a number of aspects to consider in the assessment of the relationship between tax structures and firms' propensity to pay dividends. In principle, high dividend tax will make it more attractive to retain earnings in the firm rather than having to raise external share capital, cf. Becker et al. (2012).

¹ Similarly, there is no strong cross-country relationship between the average dividend payout ratio and the difference between the corporate tax rate and the interest income tax rate. This difference may be seen as the difference in the taxation of a business owner who – instead of receiving dividends and saving them up in the form of interest-bearing assets – chooses to have the firm make the same investment, entailing that the interest income is taxed at the corporate tax rate rather than the higher personal income tax rate on capital gains.

RELATIONSHIP BETWEEN DIVIDEND PAYOUT RATIOS AND DIFFERENCES BETWEEN TAXATION OF DIVIDENDS AND TAXATION OF CAPITAL GAINS

Chart 13



Source: OECD, Ernst & Young (2012) and IBFD (2011).

This could increase the incentive for firms to retain earnings to finance investment or act as a buffer for unforeseen shocks to earnings.

As mentioned earlier, the economic literature cites a number of factors other than tax issues that may impact corporate decisions on the payment of dividends, for instance business and ownership structures across countries. According to Allen and Michaely (2002), the distribution of ownership could affect corporate dividend decisions. A potential mechanism is that the firm pays dividends to prevent loss of confidence in the management's or a controlling owner's ability to manage the company correctly. The ownership structure of the Danish corporate sector is slightly different in that e.g. foundation ownership is highly significant in Denmark and more popular than in other countries. However, within the scope of this analysis it is not possible to assess the significance of foundation ownership on corporate dividend decisions, since based on our data at firm level (described in section 5), we cannot examine ownership structures and thereby look at the significance of foundation ownership over other types of ownership.

4. WHAT ARE THE DETERMINANTS OF CORPORATE INVESTMENT?

The decline in corporate investment in recent years to the lowest percentage of GDP for 30 years has triggered expectations of growth potential for investment in the coming years. However, Denmark was not

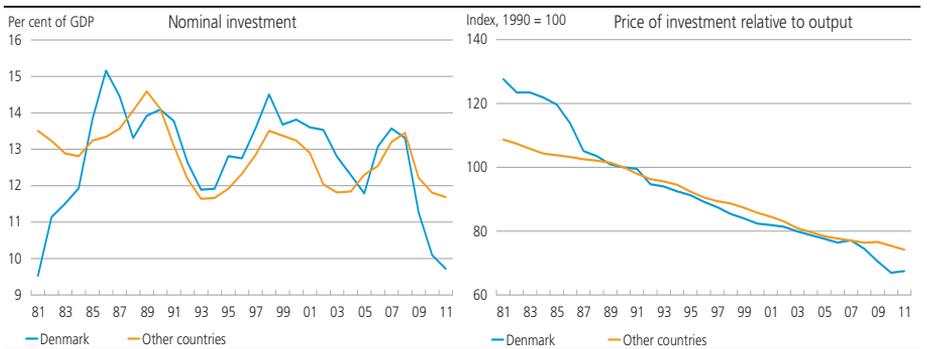
the only country to experience a contraction in investment during the period 2007-11. Investment also dropped sharply in most other OECD countries, thus contributing to the reversal in net lending.

The relationship between net lending and investment was also apparent in the run-up to the crisis when investment rose as a percentage of GDP. Over a longer horizon, nominal investment as a percentage of GDP has shown a declining trend for the OECD countries overall, cf. Chart 14 (left). In Denmark, the trend in investment as a percentage of GDP has largely tracked that of the other countries, although somewhat more volatile. The fluctuations are clear in the early 1980s and for the current substantial decline.

Developments reflect that over the last 30 years, the ratio of the price of capital (the investment deflator) to the GDP deflator has gradually fallen in the OECD countries, cf. Chart 14 (right). Again, Denmark has closely mirrored the other OECD countries for large parts of the period since the early 1980s. When the relative price of investment goods declines, it becomes cheaper for firms to maintain a fixed capital stock. Mechanically, this entails that if firms wish to keep investment's share of GDP in real values constant, the share of investment of GDP in nominal terms will fall. Both the OECD (2007) and the IMF (2006) cite that the decline in the nominal investment ratio may be due to developments in the relative price ratio.

Other things being equal, another factor to impact the investment level is the depreciation rate. Among Danish and foreign firms, the gap between capital consumption and investment in new capital has narrowed since the early 1980s, cf. Chart 15. In general, capital consumption has been higher in Denmark than in the other countries. The sharp rise

INVESTMENT (LEFT) AND RELATIVE PRICES (RIGHT) Chart 14

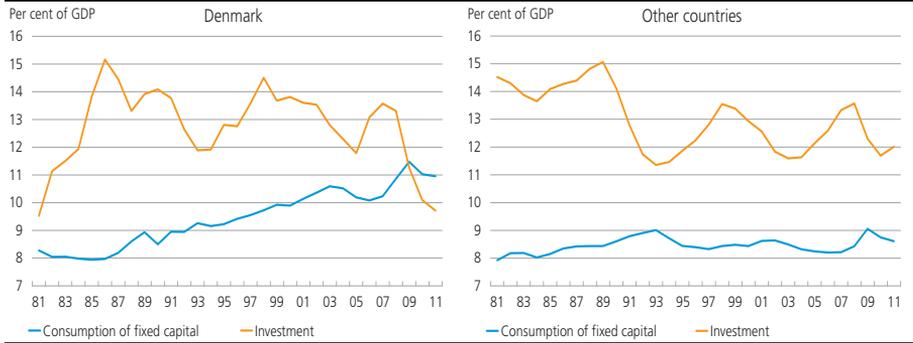


Note: Investment is nominal investment excl. residential investment of the private sector. GDP is for the entire economy. Other countries is a simple average of Australia, Belgium, Canada, Finland, France, Netherlands, Norway, UK, Sweden, Germany, USA and Austria. Investment for Austria extends only to 2010.

Source: OECD, *Economic Outlook*, no. 90, 91.

INVESTMENT AND CONSUMPTION OF CAPITAL

Chart 15



Note: Other countries comprise Canada, Finland, France, Netherlands, Sweden and USA. Investment comprises investment excl. residential investment of the private sector. Consumption of capital is corporate consumption. The Charts show nominal values.

Source: Statistics Denmark, OECD, Eurostat, Reuters Ecowin, Statistics Sweden.

in Denmark since the mid-1980s helps to explain why capital consumption has exceeded investment in the last few years.

As it turns out, a rather clear negative relationship exists between the relative price and the depreciation rate. Thus the relative price fall of investment goods has helped to increase the replacement of capital, causing depreciation to rise. This applies especially to IT equipment whose use in production has grown over time. The limited life of IT equipment has also contributed to a further increase in total depreciation.

So far, this article has dealt with the nominal level of investment. In the next section, we will focus on the real level, since this unit affects real GDP growth. Therefore, in order to examine whether future growth potential exists for investment, it is necessary to perform the analysis based on real quantities.

Econometric analysis of real corporate investment

This section analyses cross-country corporate investment, using panel analysis. In order to facilitate comparability across countries, we look at investment relative to capital stock, referred to as the investment ratio. The point of departure of our econometric analysis is the calculation of investment in the national accounts, comprising investment *inter alia* in buildings, equipment and machinery in the firm's home country. Inventory investment and foreign direct investment (FDI) are not included. We examine FDI separately below.

Several factors may affect corporate investment. The econometric model applied in our analysis (see Box 2) is based on the neoclassical theory of investment, cf. e.g. Jorgenson (1971). Under this theory, the investment ratio is determined by the depreciation rate (capital consumption-to-capital stock ratio), relative prices and output.

MODEL DERIVATION AND DATA

Box 2

In the analysis of the investment ratio, i_t , we use the following econometric relation

$$i_t = \alpha_i + \sum_{j=1}^3 \beta_j \Delta y_{t-j} + \beta_4 \log(ko)_{t-1} + \varepsilon_t, \tag{1}$$

where α_i is a country-specific constant, y_t is output, ε_t are residuals. ko_t is corporate capital costs, comprising the cost of using and owning capital (user cost), UC_t , and the relative price ratio, rp_t , of capital and output

$$ko_t = UC_t \cdot rp_t = (r_t - \pi_t^e + \delta + \sigma - \pi_t^{rp}) \frac{p_{K,t}}{p_{Y,t}}. \tag{2}$$

In (2), r_t is the yield on a 10-year government bond, π_t^e is the inflation expectation in terms of the average of the last five years' development in the output deflator, $p_{Y,t}$. δ is the depreciation rate, which is assumed to be constant, σ is a constant risk premium, and π_t^{rp} is the inflation rate in relative prices between the investment deflator, $p_{K,t}$, and the output deflator. Since the availability of cross-country data is limited, we have excluded tax considerations in the expression.

(1) has been inferred from a model of a representative firm's profit maximisation problem:

$$\Pi_t = P_{Y,t} Y_t - UC \cdot P_{K,t} K_t - P_{L,t} L_t, \tag{3}$$

resulting in the firm's desired amount of capital, K_t^* , in period t

$$K_t^* = \frac{P_{Y,t}}{UC \cdot P_{K,t}} \frac{\partial Y_t}{\partial K_t}. \tag{4}$$

Due to capital adjustment friction, it is not possible for the firm to continuously achieve the desired capital stock. Instead, it is assumed that the firm applies the following rule

$$\frac{K_t}{K_t^*} = \left(\frac{K_{t-1}}{K_t^*} \right)^\lambda, \tag{5}$$

where λ determines capital stickiness. The closer λ is to 0, the closer the firm's capital stock will be to the desired level in period t . By log-linearising, taking the difference and assuming that the production function will take a Cobb-Douglas form, the following expression is obtained for net investment in period t , when (2) is inserted in (3)

$$\Delta k_t = \sum_{j=0}^{\infty} (1-\lambda) \lambda^j \Delta y_{t-j} - \sum_{j=0}^{\infty} (1-\lambda) \lambda^j \Delta (UC_t \cdot rp_{t-j}), \tag{6}$$

where lower cap letters denote that the variable is log-linearised and $rp = p_Y / p_K$.

The following approximation is used to go from net investment to gross investment

$$\Delta k_t \approx \frac{K_t - K_{t-1}}{K_{t-1}} = \frac{I_t}{K_{t-1}} - \frac{C_t}{K_{t-1}} \equiv i_t - \delta_t, \tag{7}$$

where C_t is consumption of capital. (7) is inserted in (4) to obtain a relation for gross investment

CONTINUED

Box 2

$$i_t = \delta_t + \sum_{j=0}^{\infty} (1-\lambda)\lambda^j \Delta y_{t-j} - \sum_{j=0}^{\infty} (1-\lambda)\lambda^j \Delta (UC_t \cdot rp_{t-j}). \quad (8)$$

It appears from (6) that the investment ratio depends on the depreciation rate, growth in relative prices and output growth. Note that if firms choose to cost minimise rather than profit maximise, the expression of relative price includes the wage deflator instead of the GDP deflator. The lagged values are due to the firm's formation of future expectations, since information on period t is not available when the firm is to decide on its investment level in the period. The econometric relation is based on (6), where the depreciation rate is assumed to be constant. Inspired by MONA, we also include user cost in level, not in changes.

To calculate the investment ratio, i_t , we have calculated capital stock in period t using the capital accumulation equation

$$K_t = K_{t-1} + I_{t-1} - C_{t-1}, \quad (9)$$

where I_{t-1} is investment in fixed capital in the previous period, and C_{t-1} is consumption of fixed capital in the previous period. The initial size of the capital stock is based on estimates for 1960 made by the Kiel Institute, projected using (9).

The analysis uses annual data for 12 OECD countries: Belgium, Canada, Denmark, Finland, France, Netherlands, Norway, UK, Sweden, Germany, USA, Austria. For Germany, figures for western Germany are used until 1991. Due to lack of availability of data, we use all firms and thus include financial corporations in the analysis. However, their capital and investment represent such a limited share of the total volume that we can reasonably say that results are driven mainly by non-financial corporations. For most countries, the sample runs from the mid-1960s until today, resulting in an unbalanced panel. We have used the following data sources: the Kiel Institute, the OECD, *Economic Outlook*, nos. 90 and 91, Eurostat, Ameco, Statistics Denmark, Reuters EcoWin.

¹ The derivation follows Tevlin and Whelan (2003).

Growth in output has a positive impact on the investment ratio, since for a given output, an optimum volume of capital stock exists which firms wish to attain based on demand expectations. Using output growth as an explanatory variable could present an endogeneity problem, since capital is part of output and investment makes a direct contribution to GDP. This problem is addressed by modelling corporate expectations of demand on lagged values of GDP.

A decline in the relative price ratio makes it more attractive for firms to substitute labour for real capital. In our model, the cost of owning and using capital stock, user cost, cf. Jorgenson (1967), depends on the real interest rate, the depreciation rate, a risk premium and inflation in the relative cost of capital relative to output.

The depreciation rate is positively related to the investment ratio, since higher capital consumption needs to be offset by increased investment to maintain the level of the capital stock in the long term. The depreciation rate primarily depends on the rate at which the capital stock is run down, but price and technological advances also affect the depreciation rate. During the last few decades in which the ratio of IT capital stock to total capital stock has grown, the depreciation rate has increased. The reason is the short economic life of IT capital stock, which prices decline relatively faster than those of traditional capital stock, underpinned by rapid technological advances.

In most investment analyses, the depreciation rate is assumed to be constant and is included in the user cost-of-capital expression, cf. Schaller (2006). However, Tevlin and Whelan (2003) find proof that the depreciation rate of US firms was not constant during the IT revolution of the 1990s. They also point out that since IT investment is more cost-sensitive than investment in non-IT capital stock, the transition to increased use of IT has caused corporate investment decisions to become more price-sensitive. We follow the norms of the economic literature and assume that the depreciation rate is constant and include it in the user cost term. As already described, a negative relationship exists between relative prices and the depreciation rate, and we find strong empirical evidence in support of/for this claim. This entails that we can expect greater elasticity to the relative price ratio than in a perfectly specified model.

In addition to these factors, a number of other aspects may impact the investment level. For instance, as shown in the previous section, the business cycle, uncertainty in this respect, firms' access to credit and their debt levels may affect investment. By including GDP growth with a three-year lag, we capture part of the cyclical fluctuations.

Estimation results indicate that the investment ratio depends positively on output growth and negatively on the cost of capital, cf. Table 3. Thus the signs are as expected. The long-term coefficient on output growth can be approximated by adding up the coefficients on the lagged growth rates for output. This yields a long-term coefficient of 0.35. Thus a permanent increase in potential GDP growth of 1 percentage point leads to a rise of 0.35 percentage points in the investment ratios of the OECD countries.

How the investment ratio and investment relation are specified varies in the economic literature. Several analyses examine the ratio of investment to GDP or GVA. According to OECD (2007), a decline in the relative price has contributed to the fall in the investment-to-GDP ratio in nominal terms. In addition to the relative price, they specify that a drop in

ESTIMATION OF MODEL WITH INVESTMENT RELATIVE TO CAPITAL STOCK Table 3

	Model
Constant	15.50**
Output growth (-1)	0.18**
Output growth (-2)	0.07**
Output growth (-3)	0.10**
Capital costs (-1)	-2.23**
Number of observations	531
R ²	0.77

Note: ** (*) indicates that the estimate is significant for a 1 (5) per cent significance level. The P value has been calculated based on robust standard errors. The estimation method is a panel estimation with country-specific constants.

Source: AMECO, OECD, Bloomberg and own calculations.

potential output has had a negative impact on developments. IMF (2006) also points to the relative capital cost development as an explanation of the fall in investment as a percentage of GDP in nominal terms, but also demonstrates that the increase in the real level may to some extent be explained by relative price developments.

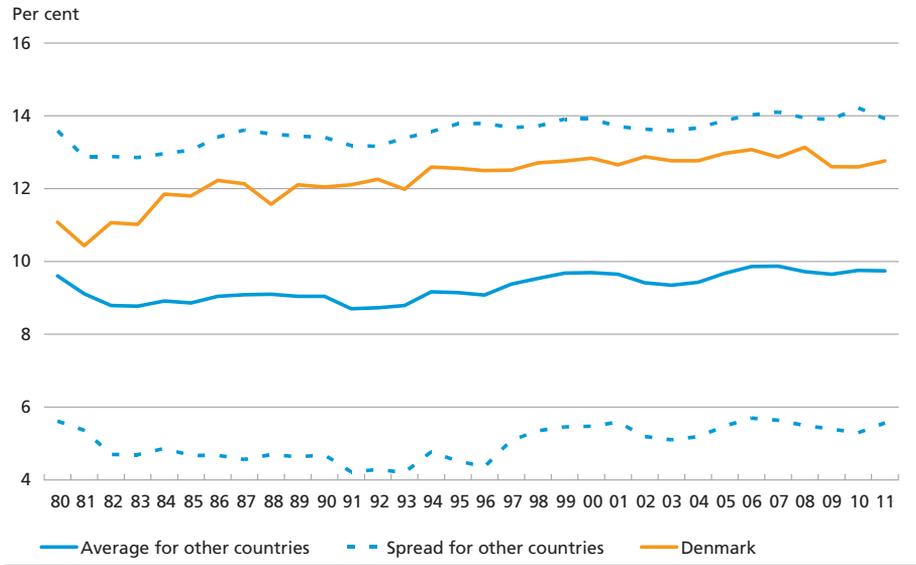
The basic model (see equation 6 in Box 2) has been widely criticised, e.g. by Chirinko (1993). The criticism is that the model has no explicit dynamics. Instead, mechanical dynamics have been included in the model by assuming that firms form expectations about the future based on historical trends. Instead of these implied dynamics, use of models such as the Tobin's q model is recommended. That model explicitly relates the dynamics between the variables, since they are included in the model with different time lags. But Oliner et al. (1995) demonstrate that models with explicit dynamic assumptions do not provide better projections than models with implied dynamics. They actually show that the opposite is true and that traditional models perform better.

Given that we are interested in examining whether there is growth potential for investment, we need to look at the structural level of the investment ratio. Based on the estimation, we calculate the structural level of the investment ratio by using the approximate coefficient on the long-term relation between the investment ratio and output growth together with the other model estimates. However, we use potential growth in the calculation instead of actual growth, on which the model is estimated. This calculation shows that the Danish structural investment ratio has been somewhat higher than the average investment ratio of the other countries every year since 1980, cf. Chart 16. The calculation also shows that the gap used to be smaller but widened during the 1980s.

Based on the model, it is possible to decompose the development of the estimated structural investment ratio. Since 1980, the structural invest-

STRUCTURAL INVESTMENT RATIO

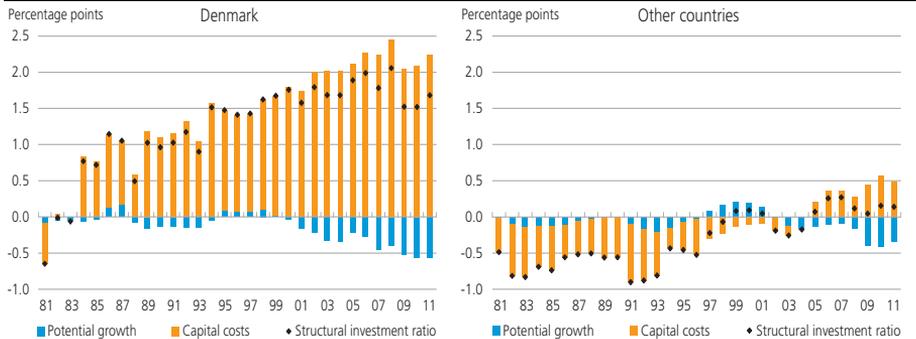
Chart 16



ment ratio has increased in Denmark, while the level in the other countries is largely unchanged, cf. Chart 17. Declining capital costs have been the main drivers of this development in Denmark. However, over the last decade lower potential growth has detracted from the investment ratio, especially in Denmark, cf. Chart 17 (left). The large positive contribution from relative prices should be seen against the backdrop that the depreciation rate is assumed to be constant and any variation is to some extent captured by the coefficient on the relative price ratio. Consequently, the isolated effect of the relative price ratio on the structural investment ratio could be overestimated.

DEVELOPMENT IN STRUCTURAL INVESTMENT RATIO SINCE 1980

Chart 17



Source: Own calculations.

DEVELOPMENT IN STRUCTURAL FACTORS			Table 4	
Change relative to 1980-89	Potential growth (percentage points)		Capital costs	
	1990-99	2000-09	1990-99	2000-09
Denmark	0.0	-0.8	-0.4	-0.7
Other countries	0.1	-0.0	-0.1	-0.3
Belgium	0.2	-0.1	-0.2	-0.3
Canada	-0.1	-0.1	-0.2	-0.5
Finland	-0.7	0.1	0.1	-0.2
France	-0.4	-0.5	0.0	-0.2
Netherlands	1.0	-0.1	0.1	-0.3
Norway	0.6	1.0	0.0	-0.3
Germany	-0.1	-0.9	-0.3	-0.5
UK	0.4	0.1	-0.0	-0.3
Sweden	0.2	0.8	-0.1	-0.3
USA	0.0	-0.8	-0.2	-0.6
Austria	0.3	0.1	-0.1	-0.2

Note: The Table shows changes in the average for the decade relative to the average for the 1980s.

Source: OECD, *Economic Outlook*, No. 90, own calculations.

Across countries, a relatively large difference exists in the pattern of structural factors, explaining the development in the structural investment ratio, cf. Table 4.

The development in potential growth entails that the investment ratios across countries do not follow the same trend. Thus potential growth in Denmark was at the same level throughout the 1980s and 1990s, subsequently declining by almost 0.8 percentage points in response to weaker growth in total factor productivity, cf. Andersen and Rasmussen (2011). The opposite has been true of Sweden and Norway where progress in potential growth has helped to boost the investment ratio. Large economies such as the USA and Germany have also seen a reduction in their growth potential and looking forward demographics are expected to contribute further to slower growth in most countries, cf. Nuño et al. (2012). Capital cost developments provide a clear indication of how declining capital costs have contributed to an increase in the investment ratio in virtually all countries.

Based on the econometric analysis, the difference between the actual and structural levels of investment can be calculated. The calculation shows that actual investment, and thus the difference, mirrors the business cycle and that, in the run-up to the crisis, all countries strongly accumulated capital, since firms were expecting continued growth in demand, cf. Chart 18. But when the crisis struck, corporate investment appetite weakened. The actual investment ratio in Denmark is currently significantly lower than the structural ratio, while this is not the case for

DIFFERENCE BETWEEN ACTUAL AND STRUCTURAL INVESTMENT RATIOS

Chart 18



Source: Own calculations.

the other countries overall. Thus, our results indicate that there is growth potential for investment in Denmark in future.

Foreign direct investment

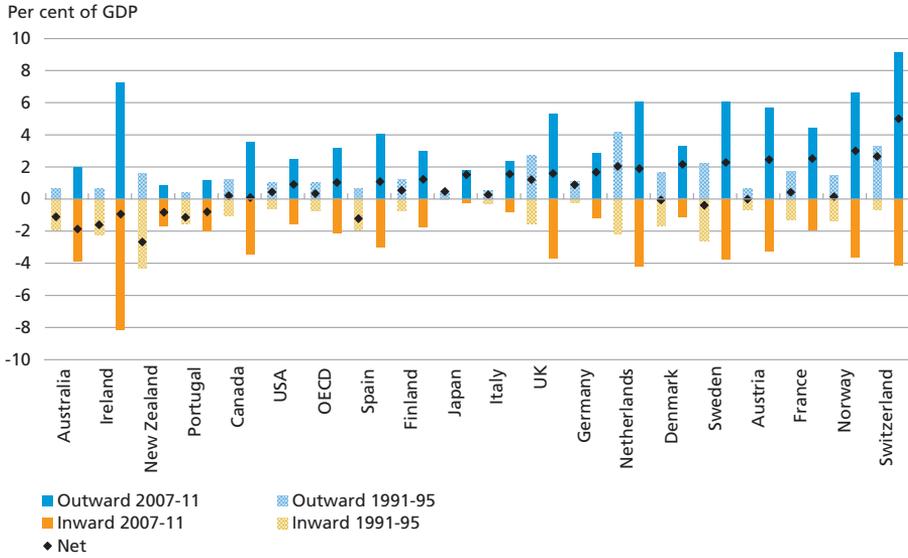
The possibility of making foreign direct investment, FDI, may affect domestic investment. A broad segment of countries saw a rise in outward and inward FDI from the early 1990s until the late 2000s, cf. Chart 19. This should be viewed in the context of a general globalisation trend, facilitating investment across national borders and prompting firms to become more international. Many OECD countries have experienced a net outflow of FDI. In northern European countries, including Denmark, the net outflow of FDI totalled about 2 per cent of GDP in 2007-11.

Although Denmark has a relatively high net position, the spread between inward and outward FDI is relatively small relative to other countries with a high net position. One reason is that Denmark invests less abroad; another is that foreign countries invest less in Denmark than in other countries.

The growing volume of outward FDI has led to significant FDI holdings in northern European countries, in particular, cf. Chart 20. Danish holdings are generally high, although not exceptionally high compared with those of other northern European countries such as Sweden and the Netherlands, whose holdings are higher than Denmark's. The explanation could be that Dutch and Swedish firms have been focusing on FDI

INWARD AND OUTWARD FDI

Chart 19



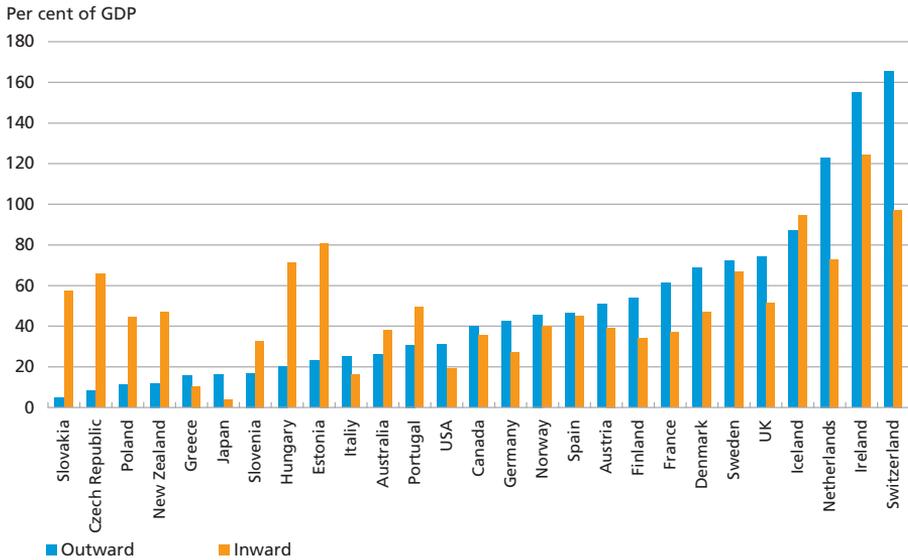
Note: Figures refer to the entire economy and are averages for the periods 1991-95 and 2007-11. Inward FDI is shown with a negative sign to illustrate it below the x-axis.

Source: OECD.

for slightly longer than Danish firms. The general trend is for western European countries to have larger holdings of outward than inward FDI. One reason could be relatively low labour costs e.g. in eastern European countries, which have large inward FDI holdings.

FDI HOLDINGS, 2011

Chart 20

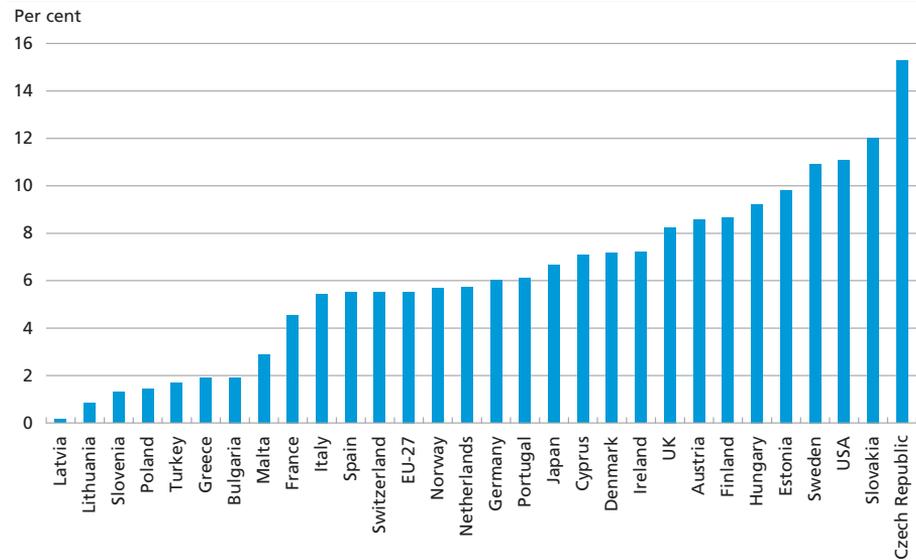


Note: Figures refer to the entire economy.

Source: OECD.

RETURN ON FDI, 2007-10

Chart 21



Note: The return has been calculated as foreign income relative to outward FDI holdings. Figures are averages for the period 2007-10.

Source: Eurostat.

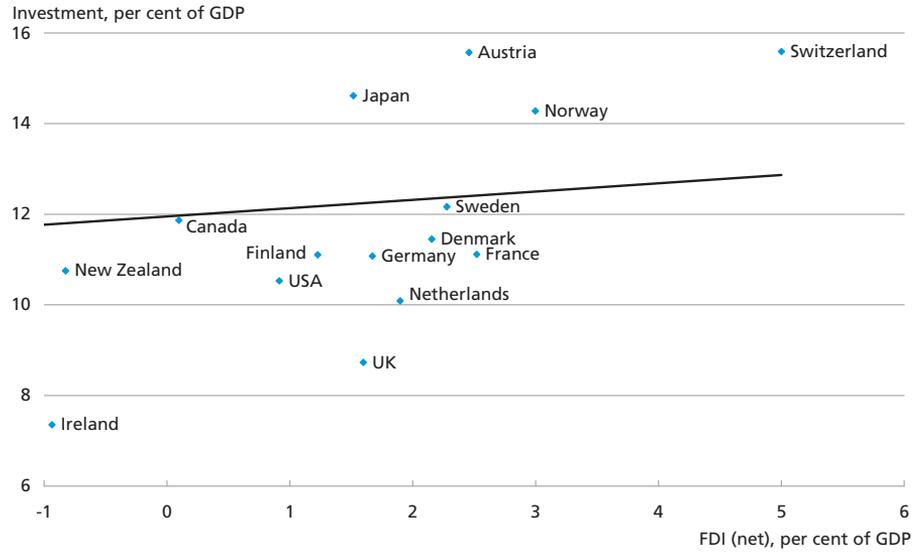
FDI holdings abroad generate a return for firms in the home country. This return is part of the firms' property income. Denmark is in the top half for these returns, although we are lagging behind countries such as Finland and Sweden, cf. Chart 21. Slovakia and the Czech Republic (and to a less extent Estonia and Hungary) record relatively high returns. But this should be seen in the context that their outward FDI holdings are at a relatively low level. Switzerland, on the other hand, has a high level of outward FDI, while their return is relatively moderate.

As regards the relationship between domestic investment and net FDI flows, there does not seem to be any clear relationship, cf. Chart 22. If anything, data suggests a weak positive relationship. Findings from previous studies do not show any clear relationship between domestic investment and FDI either. Desai et al. (2005) find indications that outward FDI is a complement to domestic investment for multinational corporations, while Feldstein (1994) has found that it is rather a substitute.

Drawing a direct parallel between domestic investment and FDI involves certain problems, since the statistical calculation of the two differs. In the domestic investment item in the national accounts, investment in buildings and machinery is included, while the calculation of FDI is broader. The concept of FDI also includes investment in shares and other equity (portfolio investment) when accounting for more than 10 per cent of the equity of the foreign firm. A similar domestic investment

DOMESTIC INVESTMENT (EXCL. RESIDENTIAL INVESTMENT) AND FDI (NET)

Chart 22



Note: Figures are averages for the period 2007-11. If Switzerland is excluded, the positive trend is less pronounced.
Source: OECD.

would fall within the category of investment in shares rather than in fixed capital and would thus be included in the financial accounts of the national accounts. When the possibility of making FDI is included in the analysis, a difference in placement of net lending may therefore be more prominent rather than substitution of domestic capital stock for foreign capital stock.

In the statistics, foreign reinvestment of profits from investment abroad will be recorded as outward FDI. In other words, countries with a high return on their FDI holdings abroad automatically have a relatively high outward FDI if the profits stay abroad. Due to data limitations, we have not been able to take this into account in the analysis.

5. ANALYSIS BASED ON ACCOUNTING DATA FOR DANISH FIRMS

The first part of the article has shown that Danish firms have significantly increased net lending in recent years. This section seeks to improve the understanding of the causes of this development, since the increase may reflect widely different trends across firms, e.g. as a result of differences in size or industry. Furthermore, corporate form and FDI may have played a role. Therefore, we analyse developments in accounting data at firm level (subsequently referred to as micro data) for a large segment of Danish firms.

Below, we initially describe the micro data set and how, based on this, we are able to calculate an approximate measure of net lending that is compatible with the national accounts. We proceed to examine in detail various findings from the first part of the article, including dividend payments by Danish firms, their FDI and increasing gross debt until the end of the boom, followed by deleveraging.

Calculation of an approximate measure of net lending in micro data

The analysis is based on an Experian micro data set, comprising accounting data for Danish firms, submitted to the Danish Business Authority. From the data set, we select firms classified as non-financial corporations, but leave out branches of foreign subsidiaries and special purpose entities. Furthermore, a few adjustments are made. We have a total of 1,057,521 observations over 9 years from 2002-10 of 202,823 firms.

As already described, net lending may generally be calculated as the difference between gross savings and gross investment. However, gross savings cannot be deduced or approximated from accounting data. But it is possible to approximate a measure of net operating surplus from which we can calculate net savings, in the national accounts given by gross savings less consumption of fixed real capital, equivalent to depreciation of non-financial fixed assets. Below, this methodology is described in brief, see Chart 23 for a presentation of the method.

In micro data, operating profits may be used as an approximation of the net operating surplus in the national accounts. However, the total operating profits of the firms in our data set rose faster than the net operating surplus in the mid-2000s and subsequently remained at a higher level until 2008. The steep increase may be due to the fact that, at the beginning of the period for which we have data, more firms are included in the micro data set. Moreover, definition differences exist between the national accounts and corporate accounts, entailing that a precise comparison of the concepts is not possible.

A calculation e.g. of property income and other current transfers that are not included in micro data is required to go from operating profits to net operating surplus. In order to approximate net savings, we therefore distribute these items as well as interest received and interest paid from the national accounts to the micro data set, based on the financial assets and liabilities of the individual firm. Dividends paid by firms exist in micro data and comply with the national accounts item. In micro data, current taxes on income and wealth are calculated as the corporate tax on operating profits. This results in tax payments that largely match the national accounts. The net operating surplus less these items yields net savings.

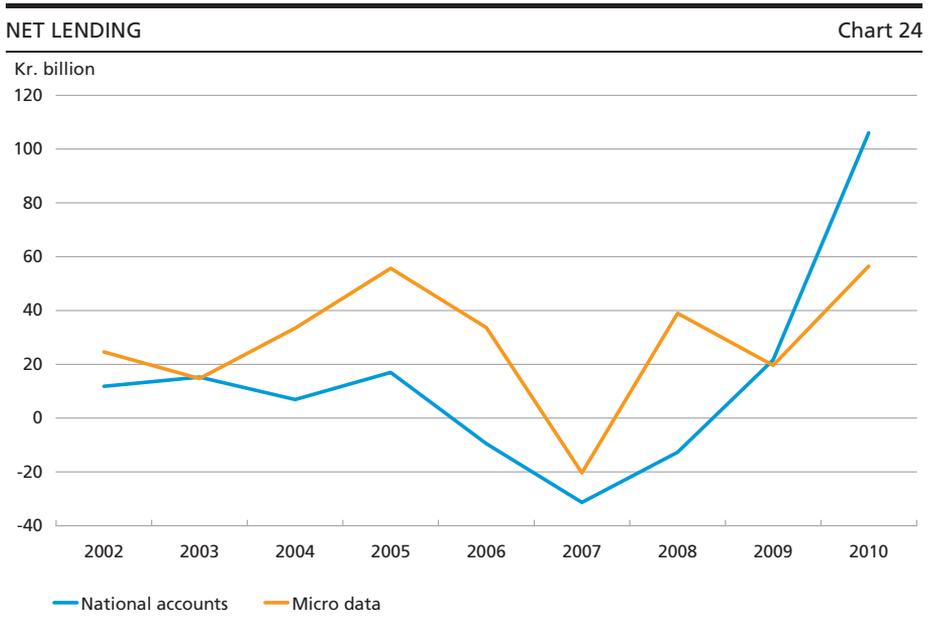
NATIONAL ACCOUNTS AND COMPANY ACCOUNTS		Chart 23
National accounts		Company accounts
Gross value added		
- Compensation of employees		
- Taxes less subsidies		
Gross operating surplus		
- Consumption of real fixed capital		
Net operation surplus	=	Operating profits
- Interest paid	= -	Interest expenses (calculated)
+ Property income (incl. various transfers) and interest received	= +	Property income (incl. various transfers) and interest income
- Current taxes on income and wealth	= -	Current taxes on income and wealth (calculated)
Net operating surplus after tax	=	Net profits after tax
- Dividends paid	= -	Dividends paid
Net savings	=	Net savings
- Gross fixed capital formation	= -	Change in fixed assets
+ Consumption of fixed real capital	= -	
- Changes in inventories	= -	Change in inventories
Net lending	=	Net lending

Micro data has no measure of fixed gross capital formation. But micro data has a statement of non-financial fixed assets, broken down by tangible and intangible fixed assets. Therefore, we use the annual change in non-financial fixed assets, recognised less depreciation, as a measure of net fixed capital formation in the national accounts. The national accounts show an increase in net investment during the years 2006-07, followed by a steep drop triggered by the economic downturn. Micro data may to some extent replicate developments, albeit at a higher level. This could be due to revaluation of the capital stock which will be included as a change in non-financial fixed assets, but will not appear as an investment in the national accounts. In addition to gross fixed capital formation, changes in inventories are also deducted from gross savings to arrive at net lending in the national accounts. Changes in inventories are approximated from inventory changes and is in line with the national accounts.

Net lending may thus be approximated from the measure of net savings less the change in non-financial fixed assets (net investment) and changes in inventories, cf. Chart 23.

Net lending calculated based on micro data

Net lending has increased in recent years from a trough in 2006-07. The fall towards the trough was attributable to firms investing more than



Source: Statistics Denmark, Experian and own calculations.

they saved during the boom. In 2009, firms reduced both savings and investment, while in 2010 they increased savings but investment did not follow suit. Approximated net lending based on micro data does not yield the same trend and level as the national accounts, cf. Chart 24. However, the 2007 trough is shown in micro data, as is the subsequent increase in net lending, although it is not as strong as in the national accounts. The difference between aggregate accounting figures and the national accounts should be seen in the context of the differences in concepts described above.

However, micro data may still help us to see cyclical developments from a different perspective than the aggregate level, and examining the differences between firms may add more nuances to the analyses. In the following sections, we will take a closer look at what micro data may tell us about the cyclical developments of the period.

The business cycle and firm-specific characteristics

The pattern in recent years of growth in investment until 2008, replaced by a decline, is reflected also in firms' debt levels. In the run-up to the financial crisis, firms built up their financial balance sheets e.g. by raising loans to finance higher investment. As the downturn took hold, the trend towards accumulation of debt subsided, and in the wake of the crisis firms began deleveraging.

The business cycle also affected inventory levels held by firms. Until 2008, firms built their inventories and for the next two years they sharply reduced their inventories. This is a natural consequence of the lag in corporate adjustment of output to demand.

Dividend payments have mirrored the business cycle and corporate profits. Dividend payments increased until 2006, followed by a decline, and since then they have been showing a slightly decreasing trend.

The micro data set facilitates an examination of the types of firms that have driven the change in the variables specified above. In the subsequent sections, we will look at debt development, then investment and inventories and finally dividend payments.

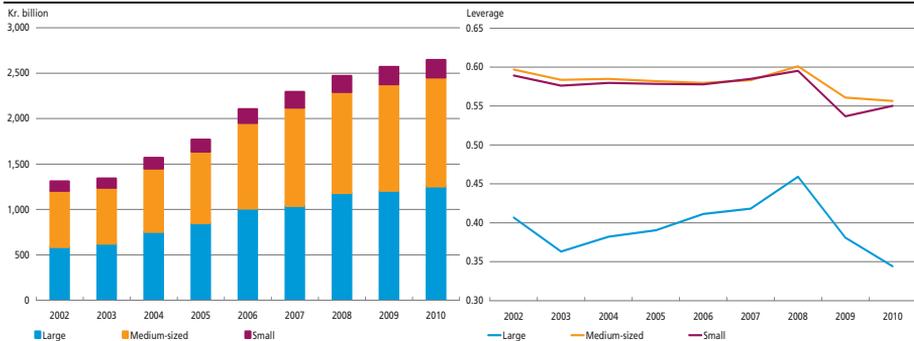
Accumulation of debt and consolidation

Micro data shows that corporate debt was rising sharply from 2002 until 2008, after which the growth in debt has slowed, cf. Chart 25 (left). As expected, both the level and development in corporate debt are driven by large and medium-sized firms. The slowdown in debt accumulation in 2009 and 2010 was widely distributed across firm sizes. The debt slowdown also materialised in most industries with the exception of the financing industry (in this analysis represented by non-financial holding companies) and the trading and transport industries, which saw a sharp rise in debt levels in 2010. Furthermore, growth in debt accumulation slowed for most corporate types, including public and private limited liability companies which have raised more than 90 per cent of the total debt.

The slowdown in debt accumulation is reflected in a decline in corporate leverage, defined as the debt-to-total assets ratio, cf. the

TOTAL DEBT (LEFT) AND MEDIAN OF LEVERAGE (RIGHT), BROKEN DOWN BY FIRM SIZE

Chart 25

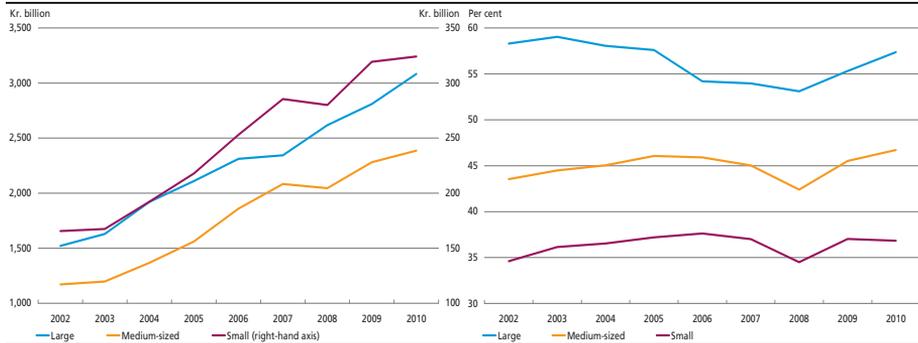


Note: Small firms are defined as firms with total assets under kr. 10 million, medium-sized firms as firms with total assets between kr. 10 million and kr. 1 billion and large firms as firms with total assets over kr. 1 billion. Firms are categorised based on their average total assets for the years in which they are included in the data set. Leverage is given by debt relative to total assets.

Source: Experian.

TOTAL ASSETS (LEFT) AND EQUITY-TO-TOTAL ASSETS RATIO (RIGHT),
BROKEN DOWN BY FIRM SIZE

Chart 26



Note: See Chart 25 for a definition of small, medium-sized and large firms.
Source: Experian.

right-hand panel of Chart 25. Large firms, in particular, have deleveraged, while the leverage of small firms picked up slightly again in 2010. The Chart also shows that the median leverage ratio of large firms is 10-20 percentage points lower than the median of small and medium-sized firms. This would indicate that large firms have better access to funding sources other than debt, e.g. share issues¹.

Small firms are more dependent on short-term borrowing than medium-sized and large firms that are presumably in a stronger bargaining position and have better possibilities e.g. of issuing long-term bonds rather instead of raising short-term debt.

In spite of the slowdown in debt accumulation, large firms, in particular (especially non-financial holding companies and industrial firms) have increased their total assets, cf. Chart 26 (left). Furthermore, a rise in the equity-to-total assets ratio has been observed for large and medium-sized firms since the trough in 2008, cf. Chart 26 (right), reflected in a decline in leverage as shown above. The opposite trend is observable for small firms. Thus, our micro data shows that medium-sized and large firms, in particular, have been able to consolidate after the end of the boom without having to reduce their aggregate total assets.

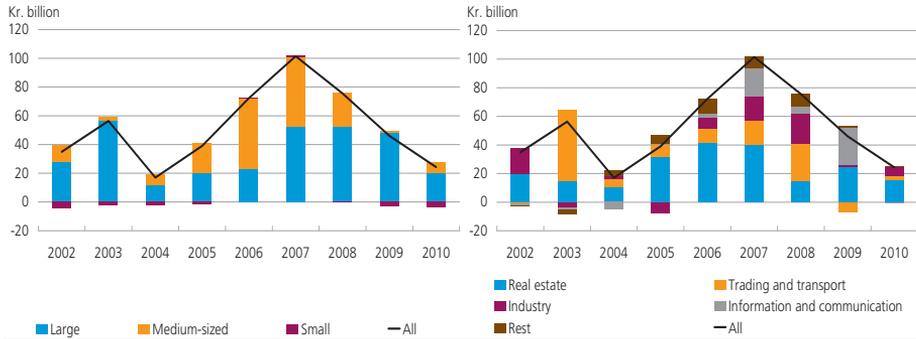
Corporate investment

Firms have also reduced investment in response to the severe economic downturn. Both micro data and the national accounts show that firms increased investment during the boom, but since 2007 they have sharply reduced investment.

¹ Petersen and Risbjerg (2009) also find that small and medium-sized firms have a higher debt-to-total assets ratio.

NET FIXED CAPITAL FORMATION, BROKEN DOWN BY FIRM SIZE (LEFT) AND INDUSTRY (RIGHT)

Chart 27



Note: See Chart 25 for a definition of small, medium-sized and large firms.

Source: Experian.

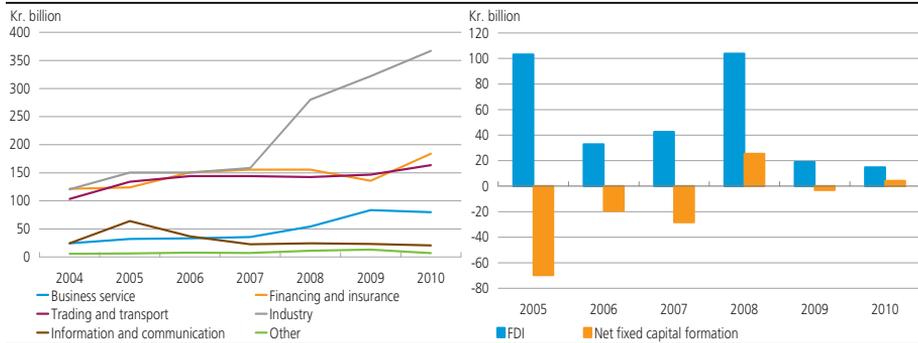
Investment was driven primarily by large and medium-sized firms, cf. Chart 27 (left). In the run-up to the financial crisis, medium-sized firms invested heavily, which was not the case during the last few years of the period. Large firms also cut back on investment, primarily in 2010. Small firms had negative investment (decline in fixed assets, *inter alia* as a result of depreciation or disposal of fixed assets exceeding new investment) almost throughout the period with the exception of 2006 and 2007. There are, however, differences within the group. Just under one third of the firms had positive investment at least once during the period. This segment of firms had positive investment for all years during the period, and from 2004-08 they sharply increased investment. However, they reduced investment in 2009 and 2010.

The real estate sector is the driver of the strong increase in investment until 2007, cf. Chart 27 (right). Trading and transport firms and the industrial sector invested heavily both in 2007 and 2008 and thus reduced their investment later than the real estate sector. The reason could be that the downturn hit the real estate sector first and then spread to the rest of the economy.

As described in section 4, it is not given that FDI acts as a substitute for real investment in Denmark. By linking the micro data set to FDI information at firm level, we can examine which firms invest abroad¹.

FDI holdings have increased by just under kr. 300 billion since 2007 – as a result both of new investment and revaluation of existing holdings. The notable increase in 2008 was attributable mainly to new investment, while the rise in 2009 and especially in 2010 was driven by an increase in

¹ Data is only available from 2004 onwards for approximately 600 firms per year. This sample covers about 85-90 per cent of total FDI holdings. These firms have been selected as reporters to Danmarks Nationalbank's balance-of-payments statistics based on size, entailing that the firms are larger than the average firm size.

FDI HOLDINGS, BROKEN DOWN BY INDUSTRY (LEFT) AND NEW FDI AS WELL AS NET FIXED CAPITAL FORMATION (RIGHT)
Chart 28


Note: The Charts show only data for firms that have provided information on FDI. The left-hand Chart shows holdings, while the right-hand Chart shows new investment. In addition to new investment, revaluation of existing investment contributes to changing holdings from one year to the next; consequently, there is no one-on-one relationship between changes in holdings and new investment.

Source: Experian and Danmarks Nationalbank.

the investment value. Despite an economic downturn that has affected most of the world, the average firm has thus managed to make a profit from FDI. Chart 28 (left) shows that developments in FDI holdings are driven mainly by industrial firms.

The right-hand panel of Chart 28 shows investment broken down by (real) net investment and new FDI for firms that have provided information on FDI. Based on this information, it is difficult to assess whether FDI acts as a substitute or complement to net investment. The same applies if net investment is compared with total financial fixed assets, including FDI. Thus a simple correlation analysis at firm level (not illustrated) shows no indications that FDI acts either as a substitute or complement to real domestic investment.

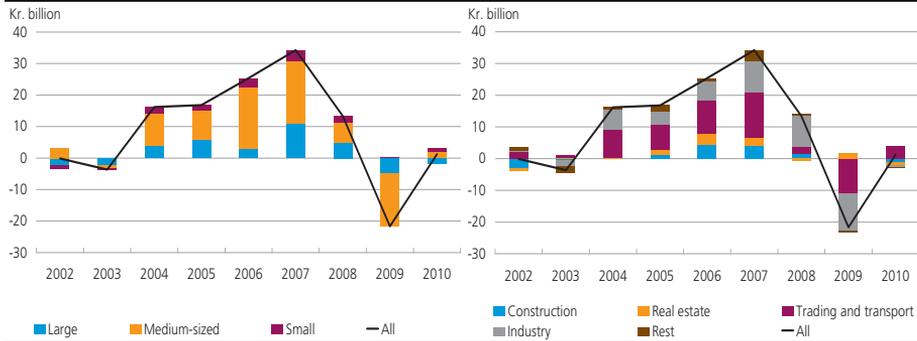
The export shares of firms that have provided information on FDI are significantly higher the average of the population as a whole, and most of the firms by far are public limited liability companies. For firms with FDI, financial fixed assets, comprising e.g. direct investment, account on average for just over 70 per cent of total fixed assets. This share is somewhat higher than for the entire population, whose share is between 55 and 60 per cent. But the distribution is more readily comparable to the group of large firms, whose share of financial fixed assets is about 70 per cent for all years in the period. Thus it seems that large firms tend to have a higher share of financial fixed assets than small and medium-sized firms.

Inventory development

Inventory investment makes up only a small fraction of GDP, but is characterised by wide fluctuations, especially in terms of its percentage

CHANGES IN INVENTORIES, BROKEN DOWN BY FIRM SIZE (LEFT) AND INDUSTRY (RIGHT)

Chart 29



Note: See Chart 25 for a definition of small, medium-sized and large firms.

Source: Experian.

of GDP. Therefore, inventory investment has a major impact on the economy in the short term, but only a small effect on long-term growth.

A decline in demand with little prospect of early improvement will cause firms to reduce output. However, there tends to be some degree of sluggishness in the adjustment of output to new demand levels, resulting in increased inventory production. Subsequently, firms will seek to reduce inventories e.g. to cut costs. This inventory effect is reflected both in the national accounts and in micro data.

Medium-sized firms have accounted for most of this development, cf. Chart 29. Large and small firms have followed the same trend, but with smaller fluctuations. The larger fluctuations for medium-sized firms could indicate a higher degree of cyclicity. Public limited liability companies were the drivers of inventory growth both in the pre-crisis and crisis years. Private limited liability companies also stockpiled inventories until the start of the economic downturn, but have not reduced inventories after the inception of the crisis. Trading and transport as well as industrial firms have been the main drivers of developments. Construction firms also increased inventories until 2008, but have not reduced them to the same extent.

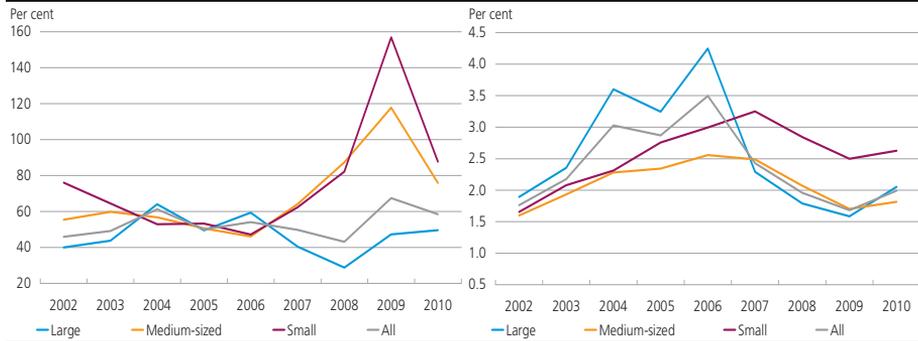
Dividend payments

During the boom, corporate dividend payments rose only to fall when the financial crisis struck. This trend, which may be attributed mainly to the dividend payments of large firms, is similar in the national accounts and in micro data.

The dividend payout ratio, i.e. the ratio of dividends paid to net profits after tax, was largely in line for all sizes of firms during the boom, cf. Chart 30 (left). In 2008 and 2009, medium-sized and small

DIVIDENDS RELATIVE TO NET PROFITS AFTER TAX (LEFT) AND TOTAL ASSETS (RIGHT), BROKEN DOWN BY SIZE OF TOTAL ASSETS

Chart 30



Note: See Chart 25 for a definition of small, medium-sized and large firms.
Source: Experian.

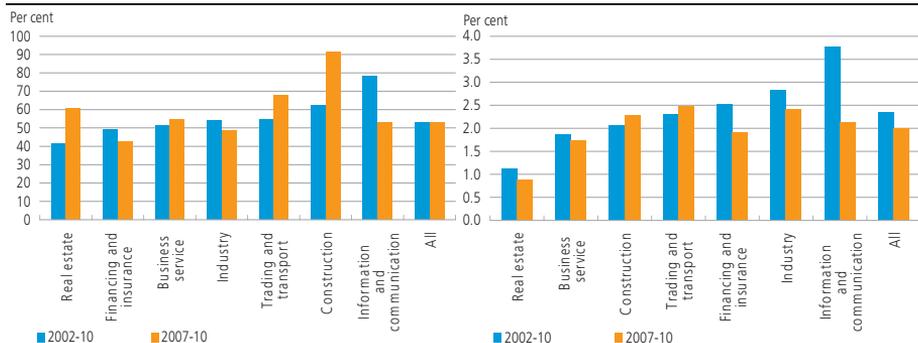
firms significantly increased their dividend payout ratios, while large firms maintained their levels. The sharp rise in the dividend payout ratios of medium-sized and small firms reflects a greater fall in net profits after tax than in dividend payments.

Relative to their total assets, large firms paid a greater share than small and medium-sized firms in the run-up to the financial crisis. But this trend was reversed in 2007 after which large firms reduced their ratios of dividends to total assets to a greater extent than small firms, cf. Chart 30 (right).

Overall, the dividend payout ratio has not changed significantly in recent years relative to the pre-crisis years. But there are wide variations within individual industries. Construction, trading, transport and real estate firms sharply increased their dividend payout ratios in 2007-10, cf. Chart 31 (left). Firms in the information and communication industry, on

DIVIDENDS RELATIVE TO NET PROFITS AFTER TAX (LEFT) AND TOTAL ASSETS (RIGHT), BROKEN DOWN BY INDUSTRY

Chart 31



Source: Experian.

the other hand, reduced their dividend payout ratio, while the remaining industries kept their dividend payout ratios largely constant.

Information and communication firms and, to a lesser extent the financing and insurance industry, stand out with a sharp reduction in their ratios of dividends to total assets, cf. Chart 31 (right). The remaining industries have not seen major changes in the ratios of dividends paid relative to total assets.

The vast majority of firms paid no dividend at all from 2002-10. About 28 per cent of firms on average paid less than one fifth of their net profits after tax in dividends. The total dividend payments of these firms account for 90 per cent of overall dividend payments. This group of firms, representing 70 per cent of total assets, operates in the trading and transport, real estate, business service, financing and insurance and industrial industries. Less than 1 per cent of firms paid more than 20 per cent of their net profits after tax in dividends. Furthermore, a group of firms paid dividends although their net profits after tax were negative. These firms had negative net savings and paid dividends on their equity.

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