The Wealth and Debt of Danish Families

By Asger Lau Andersen, Anders Møller Christensen and Nick Fabrin Nielsen, Economics, Sigrid Alexandra Koob and Martin Oksbjerg, Statistics, and Ri Kaarup, Financial Markets

1. INTRODUCTION AND SUMMARY

Compared with other countries, Danish households have a very high debt-to-income ratio. This has attracted considerable attention from the International Monetary Fund, IMF, and the credit rating agencies, among others. The European Commission (2012) recently pointed out the households' high gross debt as a danger signal, while also aknowledging that it partly reflects very substantial pension savings and an extensive social safety net.

At the aggregate level, these issues have recently been discussed in the Monetary Review by Isaksen et al. (2011) and Kramp et al. (2012). Overall, the high gross debt is offset by large assets, e.g. via the widespread use of labour-market pensions, but whether this also holds true at the level of the individual family cannot be determined using aggregate data for the whole economy. If this is the case, the development is less of a concern than if debt and assets are held by different persons.

In this article, we look into – at family level – the composition of gross debt for families in different income and age groups and the degree to which the debt is offset by various types of assets. Relative to other studies, e.g. Danish Economic Councils (2008) and the Ministry of Economic and Business Affairs (2010), we focus more on the distribution of the debt.

The high gross debt of Danish families, viewed in an international perspective, is concentrated in the families with the highest incomes. In 2010, the 20 per cent of the families with the highest incomes after tax thus accounted for 53 per cent of total family gross debt. The half with the lowest incomes accounted for 14 per cent in total of the gross debt.

Among the families with the highest incomes, the ratio of gross debt to income after tax, i.e. the gross debt ratio, is highest for families whose oldest member is in his or her thirties, and the gross debt ratio generally decreases as the age increases.

Within the various age groups, the gross debt ratio is generally higher for high-income families than for families with lower incomes. This indi-

cates that the debt is often raised in order to finance purchases of luxury goods, including a larger home.

The overall impression is that families with debt also have the income required to service the debt.

The percentage change in gross debt from 2002 to 2010 is most pronounced for the oldest age groups in the study. The families in the lowest income groups have also shown relatively high percentage increases. Measured in kroner, however, high-income families and families in the middle of the age distribution interval have clearly accounted for the strongest growth.

At end-2010, the assets of the families in this analysis totalled almost kr. 3,400 billion, excluding pension wealth. This value is around twice the value of the gross debt, and real property in Denmark worth around kr. 2,600 billion is the dominant asset type. Besides pension wealth, this analysis also excludes a number of other assets due to insufficient data. Such assets are, *inter alia*, cash holdings and the value of the family's durable consumer goods, e.g. cars, boats, household effects, etc. The value of private cooperative housing is also excluded.

Like the distribution of gross debt, the distribution of assets is very uneven. Large assets are predominantly held by families with substantial gross debt. However, the group of families with no gross debt at all also includes a number of families with considerable assets.

Although the value of the assets is almost twice as high as the gross debt, more than one out of three families still had net debt in 2010.

Net debt is not prevalent in the oldest age groups. But more than half of the families in the 25-34 age group have net debt, irrespective of the size of their income, which should be attributed to education-related debt, among other factors.

Most families with current or previous affiliation with the labour market will have assets in the form of pension savings. The savings-based pension system is still under expansion, entailing considerably stronger growth in pension wealth than in incomes over the last decades.

A family's pension wealth is generally less liquid than its other assets, but knowledge of active pension saving should be expected to be incorporated in the family's other decisions. Families of retirement age will thus increasingly be able to service their debt without compromising on lifestyle. Consequently, for persons reaching retirement age gross debt of a certain size will be less of a problem than previously.

As opposed to most other assets, pension wealth is taxed when released. After estimated taxation, families' pension wealth, excluding the value of public service pensions, amounted to approximately kr. 1,500

billion at end-2010. For one third of the families, pension wealth after tax exceeded kr. 1 million.

Taking pension wealth into account, less than one out of four families has net debt. Net wealth increases strongly with age. Half of the families in the 60-64 age group have net wealth of more than five times their annual income after tax, and for one out of four of the families in this age group net wealth is more than eight times the family's annual income.

The large gross debt of Danish families indicates that they are frequent users of the financial system, for many reasons, since gross debt is generally offset by even more substantial assets. The balance between gross debt and assets can be explained especially in terms of family income, age, house prices and the structure of the pension system.

The families predominantly use the financial system, they do not abuse it. However, some families are so heavily indebted that they are assessed to find it difficult to manage their debt using their own income. The debt problems of families with net debt have grown in the period under review, but the drop in the general level of interest rates and the increased use of adjustable-rate loans have reduced the interest burden. Given the current economic outlook, the extent of the indebted families cannot, however, be assumed to pose a threat to the household sector or the financial sector.

As regards the soundness of the financial sector, the results support the conclusion that the most pronounced threats to financial stability do not come from families' debt-to-income ratios. So far, the financial sector's losses on household exposures have been modest despite rising gross debt and a number of years of rising unemployment. But, as expected, it is also clear that families who experience prolonged periods of unemployment are more vulnerable than other families. Should unemployment become more widespread than the current level, losses on private customers should therefore be expected to increase.

Finally, it should be pointed out that we are far from having performed all possible analyses of these register data. Thus, we have not performed econometric analyses following the individual families over time. Further analyses will no doubt provide new knowledge, including modification of some conclusions and strengthening of others.

2. DATA

The analyses are primarily based on anonymised register data from Statistics Denmark for the years 2002-10, although not all registers are updated to end-2010. The information on families' pension wealth is

DEFINITION OF A FAMILY Box 1

The analysis unit used in this article is the *family*. The decomposition of the population into families is made on the basis of 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 counted 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 counted as members of different families.

Children living at home are counted as members of their parents' family if they are under the age of 25, live at the same address as at least one of the 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 more than two generations are living at the same address, the family consists of the two youngest generations together.

based on results from work performed for the Welfare Commission relating to 2003. The data is formed with the family as the economic unit. Box 1 contains a statistical definition of a family.

A review of the data revealed that quite a few families had zero or negative income after tax. Since the ratio of debt to income after tax is used in several of the analyses below, only families whose annual income after tax exceeds kr. 25,000 are included. The families thus excluded are dominated by the very young. Families with self-employed persons are also excluded, and 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. The significance of these exclusions appears from Table 1.

The analysis for 2010 thus concerns 91 per cent of the families accounting for 89 per cent of total income after tax, 74 per cent of gross debt and 77 per cent of registered assets.

All income data and most wealth data are based on the annual tax reports for the individual family members. This excludes unregistered incomes, private debts, cash holdings, the value of the family's durable consumer goods (such as cars, boats, household effects and art) and the value of private cooperative housing, whereas any debt raised in order to acquire these assets is included.

Real property in Denmark (excluding cooperative housing) is included in wealth at approximated market prices. For each county/region, the relationship between cash sales prices for properties sold in the market

AGGREGATED DATA FOR SELECTED GROUPS OF FAMILIES, 2010 Table 1

	Number of families	Income after tax, kr. billion	Liabilities, kr. billion	Share of liabilities for all families, per cent	Assets, kr. billion	Share of assets for all families, per cent
All families	2,836,759	882.4	2,371.2	100.0	4,387.9	100.0
Families with self-employed	166,713	88.0	582.1	24.6	974.2	22.2
Families without full tax liability	54,288	6.3	10.5	0.4	16.5	0.4
Families with income after tax of less than kr. 25,000	74,225	-2.9	56.5	2.4	74.6	1.7
Families with income after tax of exactly zero	36,152	0.0	1.3	0.1	0.4	0.0
Families with negative income after tax	8,900	-3.2	49.3	2.1	65.4	1.5
Families without self-employed, with full tax liability and income after tax of at least kr. 25,000	2,570,518	789.2	1,762.5	74.3	3,371.6	76.8

Note: Families with self-employed are defined as families in which at least one of the adult members can be classified as self-employed or assisting spouse. The classification is based on information on the person's most important source of income. 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.
Source: Own calculations on the basis of register data from Statistics Denmark.

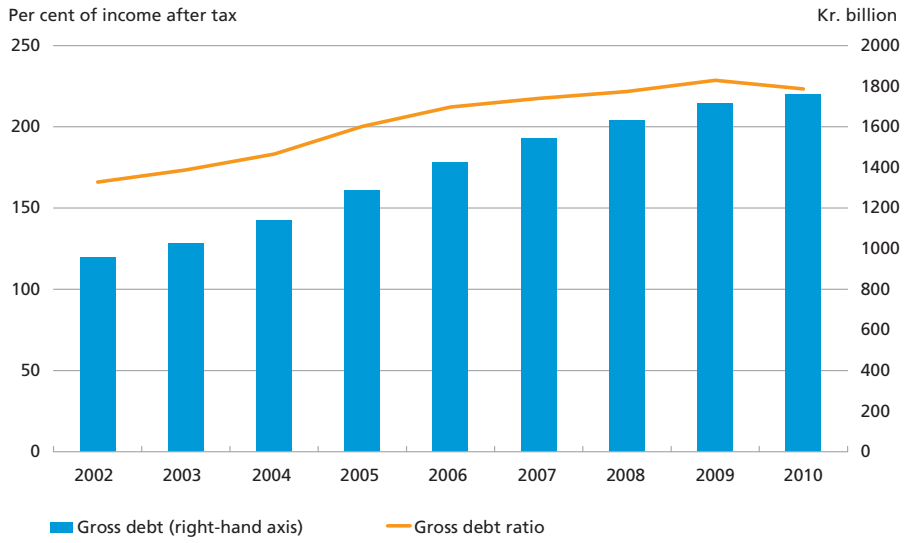
and the property valuation is used for adjustment of the property valuation from the annual tax report.

Compared with the Danish data for household income and debt analysed in Isaksen et al. in the Monetary Review, 4th Quarter 2011, there are some differences, particularly reflecting different data sources. Isaksen et al. use national accounts data including income, assets and debt for non-profit organisations serving households. Naturally, these organisations are not considered in this study, which is structured around the family. Another important difference is that debt in the form of arrears to the public sector is included in the financial accounts of the national accounts, but not in the family data set. Moreover, the income concepts applied differ slightly. In this analysis, family income after tax has been calculated excluding rental value and contributions to pension schemes administered by employers. Interest expenditure is not deducted from family income.

3. FAMILY GROSS DEBT

Aggregating the gross debts of the more than 2.5 million families included in the analysis shows the well-known picture of strongly rising gross debt in the years 2002-10, cf. Chart 1. Furthermore, since gross debt has shown much stronger growth than annual income after tax, the relationship between the two, i.e. the gross debt ratio, has increased from 1.7 to 2.2. In 2010, however, the rate of growth in income after tax

AGGREGATE GROSS DEBT AND AGGREGATE GROSS DEBT RATIO Chart 1



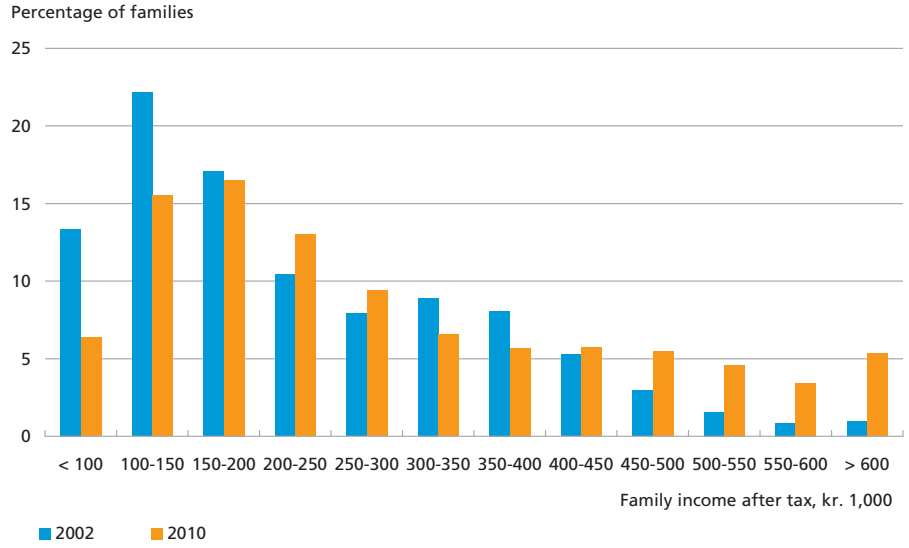
Note: The aggregate gross debt ratio is calculated as aggregate gross debt divided by aggregate income after tax for all families in the population.

Source: Own calculations on the basis of register data from Statistics Denmark.

was slightly higher than that of gross debt, resulting in a slight decrease in the aggregate gross debt ratio relative to 2009.

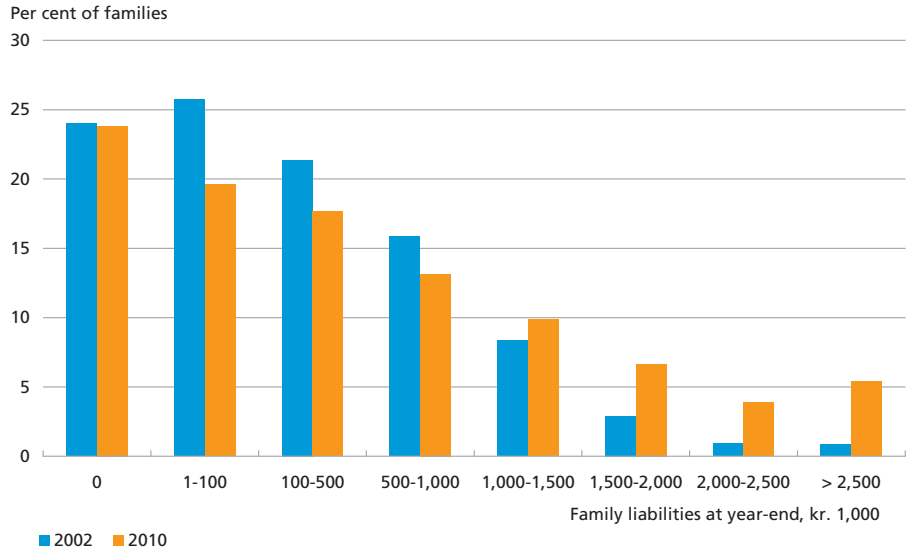
Chart 2 shows the distribution of family income after tax in 2010. The well-known phenomenon that the income distribution is skewed to the

DISTRIBUTION OF FAMILY INCOME AFTER TAX Chart 2



Source: Own calculations on the basis of register data from Statistics Denmark.

DISTRIBUTION OF FAMILY LIABILITIES Chart 3



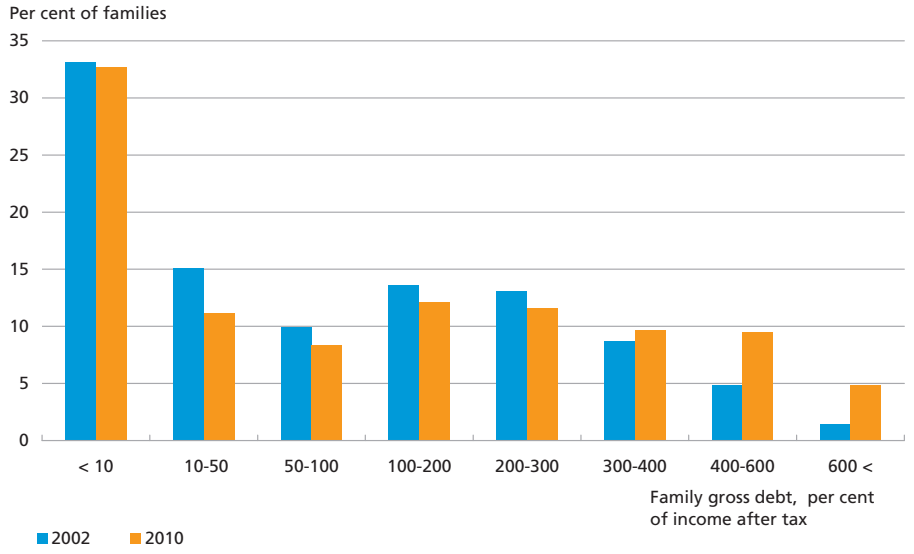
Source: Own calculations on the basis of register data from Statistics Denmark.

right clearly appears from the Chart. This reflects partly income differences at individual level, partly variations in family size. Moreover, the Chart also reflects the generally higher nominal incomes in 2010 compared with 2002.

Chart 3 shows the distribution of family gross debt. Almost one fourth of all the families did not have any debt at all in 2010, half of the families had debt of less than kr. 1 million, while the last fourth had gross debt exceeding kr. 1 million. Slightly more than 5 per cent of the families had gross debt exceeding kr. 2.5 million. The share of families with high debt has risen strongly relative to 2002.

Chart 4 shows the ratio of gross debt to income after tax, i.e. the gross debt ratio. As a result, data for 2002 and 2010 become immediately comparable in view of the automatic adjustment for general income growth in the period. For half of the families, their gross debt in 2010 was smaller than their income after tax. At the opposite end of the scale, nearly 15 per cent of the families had gross debt of at least four times their income after tax. The debt-to-income ratio gives an indication of the debt burden on the individual family. However, it is not possible to state exact thresholds for when debt should be considered to be problematically large. This would depend on the income and income prospects. It would also depend on the capacity of the family's finances to sustain a general increase in interest rates in the future, on the family's lifestyle, the extent of its marketable assets and its possibilities of re-

DISTRIBUTION OF FAMILY GROSS DEBT RATIO Chart 4



Note: The gross debt ratio is calculated as the gross debt at year-end as a percentage of total family income after tax.
Source: Own calculations on the basis of register data from Statistics Denmark.

ceiving financial support from e.g. a broader group of relatives. It has not been possible to break down the gross debt at family level by loan type and interest-rate exposure, but such a breakdown is envisaged in a future analysis.

From 2002 to 2010 the share of families with gross debt of more than four times the size of their income after tax doubled, while the share with gross debt below the annual income fell considerably.

Gross debt ratio, income and age

A high gross debt ratio will reflect either a high gross debt in absolute terms or modest income, or possibly both. Theoretically, there is good reason to expect a positive link between income and gross debt. Families who have experienced income growth and expect income growth in the future will be inclined to raise debt in order to acquire a good home, a good means of transport and otherwise support private consumption in line with the new, expected higher income. Financial institutions also have an interest in extending such loans, in so far as they can obtain a sufficient degree of certainty that the loan will be repaid, often via the borrower's pledging of real property or durable consumer goods as collateral. In this situation, the resultant gross debt will contribute to increasing the welfare of the families involved. Naturally, the flip side of the coin is that if the future income expectations are not fulfilled, the

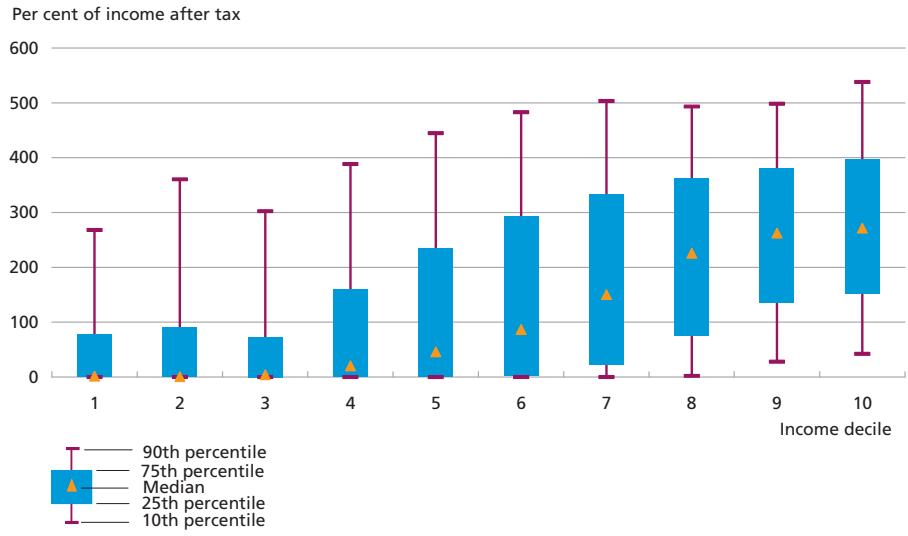
family will find it difficult to service the loan as agreed, and it will experience reduced welfare as a result of large and unmanageable debt. At the same time, the lender runs a risk of loss.

It is hardly possible to calculate theoretically well-founded values of the optimum ratio of gross debt to current income. For young families with expected permanent income growth of a certain size, raising considerable debt would be a rational thing to do if they can manage the risks associated with unfulfilled expectations – including the consequences of social events such as unemployment and divorce – and the possible dependence on future developments in interest rates unless they opt for a fixed-interest loan. For families closer to retirement age, income growth will often be of a more temporary nature, entailing less capacity to sustain indebtedness. The age of the family should therefore be expected to have considerable influence on the size of the gross debt.

Chart 5 shows the distribution of family gross debt ratios in various income groups in 2010. Families are divided into 10 groups, or deciles, according to income after tax. For each of the 10 groups of equal size the Chart shows the distribution of the gross debt ratio. The median shows the gross debt ratio for the middle family in each income decile after ranking the families according to gross debt ratio. Similarly, the

DISTRIBUTION OF FAMILY GROSS DEBT RATIO ACROSS INCOME DECILES, 2010

Chart 5



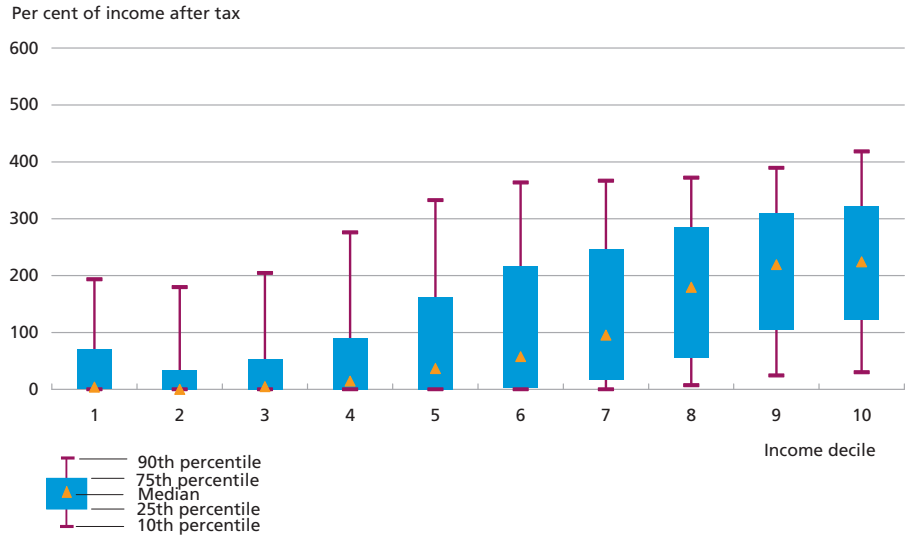
Note: The grouping of families into income deciles is based on income after tax.
Source: Own calculations on the basis of register data from Statistics Denmark.

10th percentile indicates that 10 per cent of the families have a gross debt ratio below the marking. The 90th percentile indicates that 10 per cent of the families have a gross debt ratio exceeding the marking.

The pattern is very clear: the ratio of gross debt to income after tax increases strongly with income size. In each of the three lowest income deciles, the median family has no gross debt at all. In this decile, the family income after tax is up to kr. 173,000. In the next income deciles, the median for the gross debt-to-income ratio rises from decile to decile, whereby the median family in the top income decile has gross debt of just over 2½ times their annual income after tax. In 2010, the top income decile comprised families with income after tax exceeding kr. 565,000. The pattern of the median is generally reflected in the other percentiles. As from the fourth income decile, the 75th percentile rises as income increases. Thus, 25 per cent of the families in the highest income group have gross debt of more than four times the size of their annual income after tax. Among the families in the lowest income decile, the 10 per cent with the highest debt had gross debt of at least 2.8 times the size of their income after tax in 2010. The corresponding figure in the five highest income deciles was around five.

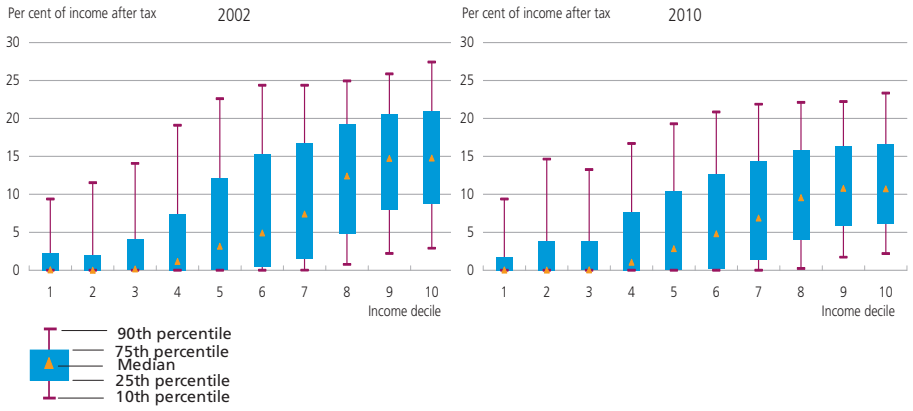
The same pattern is reflected in 2002, but with lower gross debt ratios, cf. Chart 6. This applies across the distribution.

DISTRIBUTION OF FAMILY GROSS DEBT RATIO ACROSS INCOME DECILES, 2002 — Chart 6



Note: The grouping of families into income deciles is based on income after tax.
Source: Own calculations on the basis of register data from Statistics Denmark.

DISTRIBUTION OF FAMILY INTEREST BURDEN ACROSS INCOME DECILES Chart 7



Note: The interest burden is calculated as the family's interest expenses as a percentage of income after tax.
Source: Own calculations on the basis of register data from Statistics Denmark.

Despite the increase in gross debt ratios in practically all income deciles from 2002 to 2010, most families have seen a diminishing interest burden, defined as the family's interest expenses relative to income after tax, cf. Chart 7. In the highest income decile, the interest expenses for the median family in 2010 accounted for approximately 10 per cent of income after tax, against approximately 15 per cent in 2002.

This can be attributed to the generally falling interest rates and the increasing popularity of adjustable-rate loans during the period.

The overall picture from Charts 5 and 6 is that the gross debt ratio is high primarily for high-income families. However, the link between income and gross debt ratio is complicated by both quantities being systematically related to the ages of the family members. As mentioned previously, younger families tend to have a higher gross debt ratio than older families, while income is expected to rise with age up to a certain point, after which it declines. In order to obtain a clearer picture of the link between gross debt ratio and income, we have therefore examined their covariation within given age groups. The positive link between gross debt ratio and income after tax is observed within all age groups, cf. Table 2.

In consumption theory, goods for which consumption rises more than proportionally as income increases are called luxury goods. The behaviour of gross debt is similar, which is a sign that debt is often incurred in order to finance purchases of luxury goods or for investment purposes, including buying a home.

Above we examined the covariation between gross debt ratio and income after tax, given the age of the oldest family member. Similarly, we

MEDIAN GROSS DEBT RATIOS BY AGE AND INCOME, 2010 Table 2

Gross debt ratio, median, per cent	Income decile									
	1	2	3	4	5	6	7	8	9	10
Oldest family member										
15-24 years	0.0	3.8	9.8	16.8	22.2	28.4	44.9	146.0	187.2	61.5
25-29 years	45.8	33.1	31.9	39.6	53.2	67.1	101.2	262.6	315.7	274.7
30-34 years	65.6	46.1	40.0	46.8	65.7	97.2	157.2	293.2	340.4	355.5
35-39 years	59.5	43.2	32.8	41.5	60.4	89.7	171.2	286.4	324.0	344.8
40-44 years	50.1	39.3	29.3	35.0	56.7	80.1	150.2	256.1	287.3	305.0
45-49 years	50.5	39.3	27.4	34.9	56.8	79.6	142.7	227.8	253.1	265.0
50-54 years	41.8	36.1	25.0	33.3	59.1	96.7	164.9	209.2	229.3	242.8
55-59 years	26.3	31.8	19.4	28.6	58.4	105.3	168.8	189.2	206.7	230.3
60-64 years	17.8	16.1	12.1	19.2	51.4	126.7	165.1	178.8	190.1	214.0
65-69 years	0.5	5.9	3.4	20.5	99.8	154.4	174.6	183.6	189.3	187.5
70+ years	0.0	0.0	0.0	0.0	0.8	33.9	100.8	104.3	98.1	74.6

Note: The Table shows the median of the gross debt ratio for the group of families in the relevant cell. The families have been grouped into income deciles before the grouping into age groups. This means that the figures are comparable both horizontally and vertically, but the figures in certain cells are based on a limited number of families. For example, in 2010 the top income decile included only 61 families whose oldest member was 15-24 years old.

Source: Own calculations on the basis of register data from Statistics Denmark.

can examine the link between gross debt ratio and age, given the family's income level. Below we will thus examine the covariation of the relationship between gross debt and income in 2010 and the age of the oldest family member for various income groups. It should be noted that the number of families varies in the different age groups in these income quartiles, as Table 3 clearly shows.

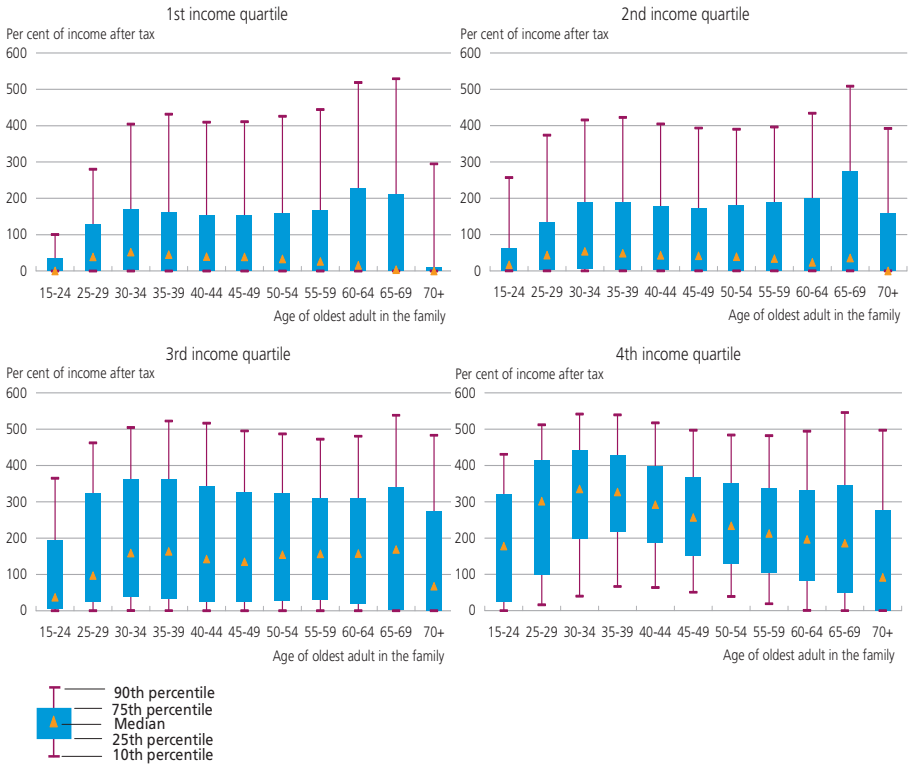
The lowest income quartile has a relatively high number of families from the youngest and oldest age groups. In contrast, the top income quartile is dominated by families whose oldest member is 35-54 years old.

NUMBER OF FAMILIES BY AGE AND INCOME QUARTILE Table 3

Number of families	Income quartile			
	1	2	3	4
Oldest family member 15-24 years	150,475	33,537	14,609	812
25-29 years	65,846	57,879	48,343	14,698
30-34 years	26,973	46,562	59,070	54,690
35-39 years	20,380	43,905	61,152	89,424
40-44 years	19,590	42,387	63,818	100,581
45-49 years	20,947	44,426	63,676	107,791
50-54 years	20,635	42,484	55,691	93,167
55-59 years	20,412	43,673	57,078	80,491
60-64 years	32,397	44,640	75,209	60,357
65-69 years	50,068	61,096	68,781	25,271
70+ years	214,911	182,036	75,203	15,347
Total	642,634	642,625	642,630	642,629

Source: Own calculations on the basis of register data from Statistics Denmark.

GROSS DEBT RATIO BY AGE AND INCOME QUARTILE, 2010 Chart 8

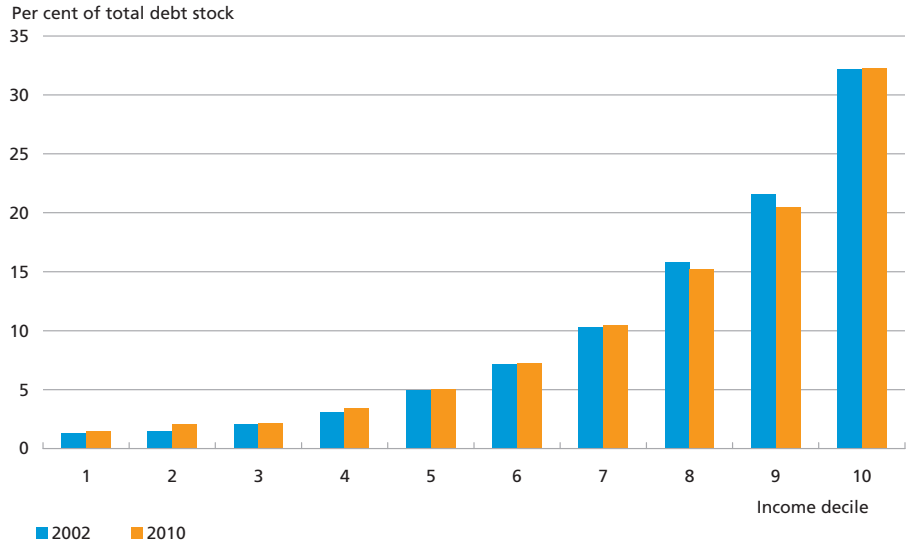


Source: Own calculations on the basis of register data from Statistics Denmark.

In the lowest income intervals, i.e. the 1st and 2nd income quartiles, there is no clear link between gross debt ratio and age, which is hardly surprising given the very low level of debt for the median families. Measured by the median, families in the age groups between 25 and 44 years have slightly higher debt than the very young and the older families. The relationship outlined above clearly appears in the highest income quartile, i.e. with family income after tax exceeding kr. 417,000 in 2010. In this group gross debt is high particularly for families whose oldest member is 30-39 years, after which gross debt gradually declines with age. However, in almost all income and age groups, around 10 per cent of the families, i.e. the 90th percentile, have gross debt of at least 4-5 times the size of income after tax. The gross debt ratios are particularly high for the 10 per cent of the families with the highest debt in the 65-69 age group. Presumably, this reflects lower income in connection with retirement.

A consequence of the gross debt-to-income ratio rising with income is that the highest income groups account for the largest share of the

GROSS DEBT STOCK BY INCOME DECILE Chart 9



Source: Own calculations on the basis of register data from Statistics Denmark.

families' total gross debt, cf. Chart 9. Thus, the 30 per cent of the families with the highest incomes accounted for almost 70 per cent of total gross debt in 2010. Among these families, relatively few are immediately facing retirement and consequently a decrease in income in the near future. The half of the families with the lowest incomes together accounted for 14 per cent of total gross debt.

Development in gross debt since 2002

Table 4 throws light on the development in average gross debt since 2002 for various subgroups of the population. It appears that gross debt has increased for all income groups, all age groups, and for homeowners as well as tenants. The percentage increase since 2002 has been most pronounced for low-income families and especially for older families. Measured in kroner, high-income families and families in the middle of the age distribution interval have clearly accounted for the strongest increases.

The considerable increases in family gross debt have resulted in markedly stronger growth in aggregate gross debt relative to total family income after tax. Thus, the aggregate gross debt ratio rose from 166 per cent of income after tax in 2002 to 223 per cent in 2010, cf. also Chart 1, corresponding to an increase by 57 percentage points over the entire period.

The detailed data behind this article can be used to analyse how the development in the ratio of gross debt to income after tax in different

AVERAGE GROSS DEBT FOR VARIOUS POPULATION GROUPS Table 4

Kr. 1,000	2002	2010	Change 2002-10	Relative change, per cent
Income deciles				
1st income decile	51.1	100.9	49.8	97.5
2nd income decile	56.4	142.0	85.6	151.7
3rd income decile	78.5	150.1	71.5	91.1
4th income decile	120.7	237.1	116.5	96.5
5th income decile	190.8	346.3	155.5	81.5
6th income decile	277.9	497.5	219.6	79.0
7th income decile	400.1	717.1	317.0	79.2
8th income decile	613.8	1042.6	428.8	69.9
9th income decile	836.8	1406.8	570.0	68.1
10th income decile	1251.0	2216.3	965.3	77.2
Age groups				
15-24 years	79.7	82.3	2.7	3.4
25-29 years	279.7	379.9	100.3	35.9
30-34 years	510.5	831.0	320.5	62.8
35-39 years	621.3	1079.1	457.8	73.7
40-44 years	638.6	1098.9	460.3	72.1
45-49 years	609.5	1058.2	448.7	73.6
50-54 years	573.7	988.9	415.2	72.4
55-59 years	498.2	879.1	380.9	76.5
60-64 years	360.5	746.8	386.3	107.2
65-69 years	226.6	589.1	362.5	160.0
70+ years	86.0	249.6	163.7	190.4
Type of housing				
Families in owner-occupied housing	717.0	1268.3	551.3	76.9
Families in rental housing	120.4	187.2	66.8	55.5

Note: All averages are calculated for families belonging to the relevant population group in the year in question. For example, the average gross debt in 2002 for families in the 30-34 age group has been calculated for families whose oldest member was 30-34 years old in 2002. The corresponding figure for 2010 has been calculated for families whose oldest member was 30-34 years in 2010. The grouping into income deciles is based on family income after tax.

Source: Own calculations on the basis of register data from Statistics Denmark.

population subgroups has contributed to the overall pattern. This can be done specifically by decomposing the change in the aggregate gross debt ratio into contributions from changes in the corresponding ratios for each subgroup, cf. Box 2.

A breakdown of families by income after tax shows that the families at the high end of the income scale have contributed most to the rise in the aggregate gross debt ratio, cf. Chart 10. Out of the total increase of 57 percentage points, just over 30 percentage points can thus be attributed to the higher gross debt ratio for the group of families in the three top income deciles in 2010 compared with 2002. As mentioned, the families in the lowest income deciles have seen the strongest relative increases in gross debt. Nevertheless, the rise in these families' gross debt ratio had only a modest effect on the aggregate gross debt ratio.

DECOMPOSITION OF CHANGE IN THE AGGREGATE GROSS DEBT RATIO Box 2

The aggregate gross debt ratio is defined as the sum of family gross debt divided by the sum of family income after tax. The change in the aggregate ratio can be decomposed into contributions from changes in the corresponding gross debt ratios for various subgroups of families and contributions from changes in the income distribution between these subgroups.

The relationship between the aggregate gross debt ratios in year *t*, BGK_t, and the gross debt ratios in each subgroup of families can be expressed as follows:

$$BGK_t = \frac{BG_t}{DI_t} = \frac{\sum_j BG_t^j}{\sum_j DI_t^j} = \sum_j s_t^j BGK_t^j \ ,$$

where BG_t^j and DI_t^j are total gross debt and total income after tax, respectively, for the families in subgroup *j* in year *t*, while BG_t and DI_t are the corresponding aggregates. $s_t^j \equiv DI_t^j / DI_t$ denotes subgroup *j*'s share of aggregate income after tax in year *t*, while $BGK_t^j \equiv BG_t^j / DI_t^j$ is the total gross debt ratio for subgroup *j* in year *t*. The aggregate gross debt ratio can then be written as the weighted sum of gross debt ratios in the individual subgroups where each subgroup is weighted by its share of total income after tax.

The change in the aggregate gross debt ratio from year *t-h* to year *t* can thus be decomposed as:

$$\begin{aligned} \Delta BGK_{t-h,t} &= \sum_j s_t^j \cdot BGK_t^j - \sum_j s_{t-h}^j \cdot BGK_{t-h}^j \\ &= \sum_j s_{t-h}^j \cdot \Delta BGK_{t-h,t}^j + \sum_j \Delta s_{t-h,t}^j \cdot BGK_t^j \end{aligned}$$

The expression on the right-hand side of the above equation consists of two sums, each of which can be given an economic interpretation. The first sum denotes the contribution from changes in the gross debt ratios within each subgroup, given the income distribution between the groups. This expresses how large the change in the aggregate gross debt ratio would have been, given an unchanged income distribution between the subgroups relative to year *t-h*. The total effect of this is calculated as the sum of contributions from the individual subgroups. The contribution from each subgroup is calculated as the change in the subgroup's gross debt ratio weighted by its income share in the starting year.

The other sum on the equation's right-hand side captures the effect of changes in the income distribution between the subgroups, given their gross debt ratios. The size of the sum can be seen as a counterfactual expression of how much the aggregate gross debt ratio would have changed if the gross debt ratios of the individual subgroups had been the same in year *t-h* as they are today. This contribution becomes positive if it is generally the case that the income shares for subgroups with large gross debt ratios have increased, while they have diminished for subgroups with small gross debt ratios.

CONTINUED Box 2

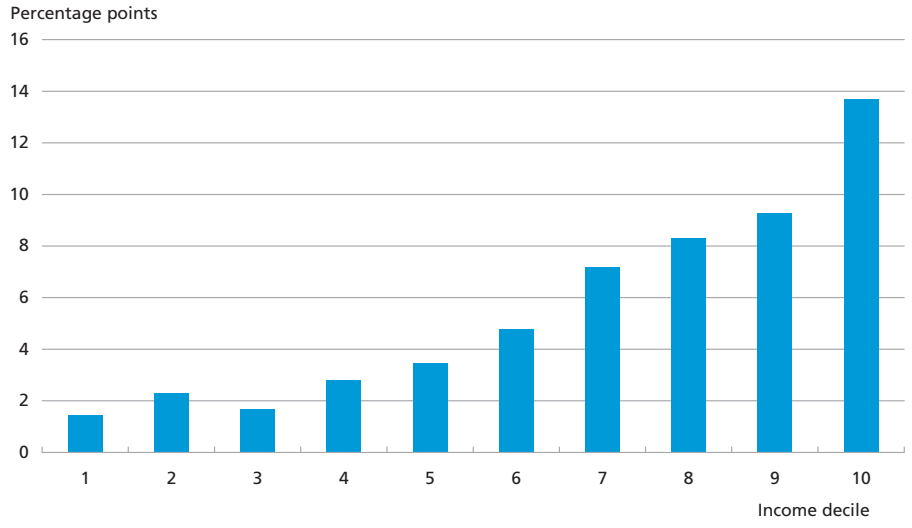
The decomposition can be made for any division into subgroups. For example, the families may be grouped by income or age. For all the groupings we have made, the groups' shares of total income after tax are almost unchanged over the period under review. The contribution from changes in the income distribution between the groups is thus negligible relative to the contribution from changes in the subgroups' gross debt ratios.

The reason is that both income and gross debt are lower in absolute terms for this group of families than for families in higher income deciles. Their overall economic impact is therefore limited.

The previously mentioned modest drop in the gross debt ratio from 2009 to 2010 is primarily attributable to families in the top income decile reducing their gross debt ratio.

In Chart 11, families are instead distributed by age. The picture from this breakdown is less clear than that emerging from a breakdown by income. The Chart shows that the largest contribution to the increase in the aggregate gross debt ratio is the result of families in the 35-39 age group having larger gross debt relative to income in 2010 than in 2002.

CONTRIBUTIONS TO CHANGE IN AGGREGATE GROSS DEBT RATIO, 2002-10, BY INCOME DECILE Chart 10

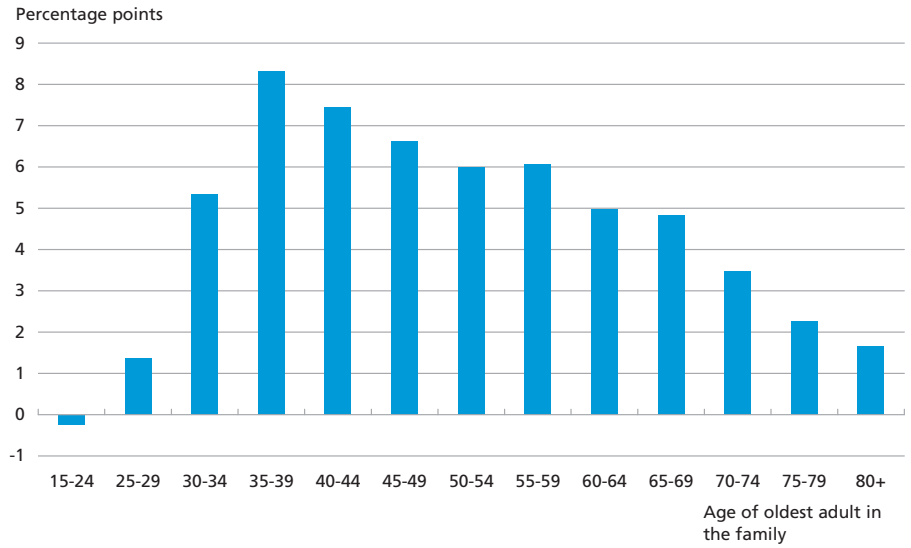


Note: The contribution from each income decile has been calculated as the change in the gross debt ratio since 2002, weighted by the share of total income after tax in 2002, cf. Box 2. The grouping of families into income deciles has been made for each year. This results in dynamic grouping, i.e. the same family does not necessarily appear in the same decile in different years.

Source: Own calculations on the basis of register data from Statistics Denmark.

CONTRIBUTIONS TO CHANGE IN AGGREGATE GROSS DEBT RATIO, 2002-10, BY AGE GROUP

Chart 11



Note: The contribution from each age group has been calculated as the change in the gross debt ratio since 2002, weighted by the group's share of total income after tax in 2002, cf. Box 2. The grouping of families into age groups has been made for each year. Consequently, a family will move upwards through the age groups as its members age.

Source: Own calculations on the basis of register data from Statistics Denmark.

From here, the size of the contributions diminishes with age. It is notable, however, that even the highest age groups have accounted for contributions of non-negligible size. Out of the total increase by 57 percentage points in the aggregate gross debt ratio, 12.5 percentage points can thus be attributed to an increase in the ratio of gross debt to income after tax for families with members over 64 years.

4. FAMILY ASSETS

When assessing family finances, it is not enough only to look at income and gross debt. As a result of the tax system, the costs of simultaneously holding debt and assets may be modest. As regards pension savings and owner-occupied housing, the tax system is designed with certain incentives to acquire such assets for borrowed funds. This means that most families have both gross debt and assets, some of which are easy to realise. However, in this study it is only possible to include owner-occupied housing in Denmark, real property abroad, financial assets and pension wealth. Cash and durable consumer goods such as cars, boats, household effects and art are not included in the registers used.

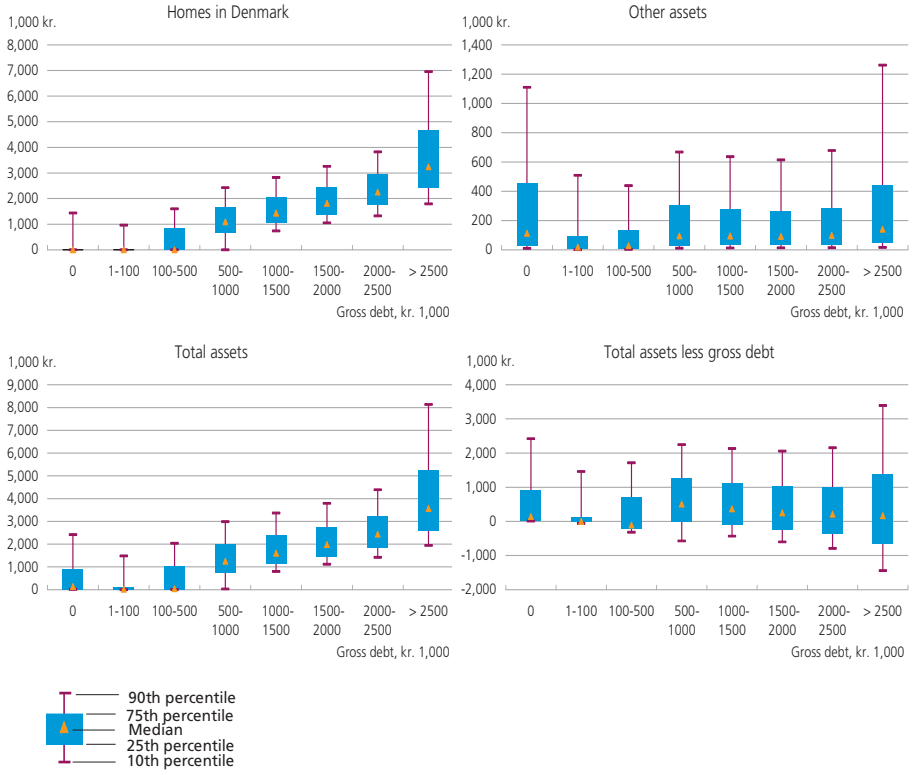
The value of the excluded assets is not inconsiderable. According to the national accounts, the value of consumer vehicles at end-2010 was approximately kr. 280 billion. Whereas the value of these vehicles is not included on the assets side, debt incurred in connection with the purchase of the vehicles is included in families' gross debt.

The calculation of the value of families' real property in Denmark, excluding the value of private cooperative housing, is described in Box 3. 204,000 families live in private cooperative housing.

Chart 12 shows the value of some of the most important assets, but not pension wealth, in various gross debt intervals. It is not surprising that the approximated market price for family housing in Denmark is higher, the larger the gross debt, cf. the top left-hand part of the Chart. This can be seen as a counterpart of the fact that the predominant part of the families' gross debt is debt to mortgage banks.

As regards other assets, i.e. financial assets and real property abroad, the correlation between assets and gross debt is U-shaped, cf. the top

DISTRIBUTION OF FAMILY ASSETS, EXCLUDING PENSION WEALTH, ACROSS GROSS DEBT INTERVALS, 2010 Chart 12



Source: Own calculations on the basis of register data from Statistics Denmark.

CALCULATION OF APPROXIMATED MARKET VALUES OF FAMILY HOUSING WEALTH (EXCLUDING PRIVATE COOPERATIVE HOUSING) Box 3

In register data from Statistics Denmark, each family's housing wealth is calculated on the basis of the official property valuation made by SKAT (Danish tax authority). But the official property valuation does not always show a true picture of the market value of a home. An approximated market value needs to be calculated in order to get a more accurate measure.

Statistics Denmark publishes quarterly statistics for average cash prices for sold properties relative to the average official property valuation. These statistics are compiled on the basis of property sales statistics from SKAT and are broken down by geography and property category. This relationship between sales prices and appurtenant property valuations can be used for calculation of an approximated market value using the following formula:

$$\tilde{M}_t^{ij} = EV_t^{ij} \cdot \left(\frac{\overline{KS}_t^j}{\overline{EV}_t^j} \right) \quad (1)$$

Here $\tilde{M}_t^{ij}$ denotes the approximated market value and EV_t^{ij} the official property valuation of property i, subgroup j, year t. $\overline{KS}_t^j$ denotes the average sales price and $\overline{EV}_t^j$ the average property valuation, both for subgroup j year t. Each subgroup represents a certain combination of geography and property category. So the approximated market value is calculated by adjusting the official valuation of the individual property by a common factor for the subgroup to which the property belongs. This factor is published by Statistics Denmark.

An assumption in the above formula is that the factor published by Statistics Denmark reflects the ratio between average sales prices and average valuations in the same year. That is not always the case, however. For example, Statistics Denmark calculates the average sales price from property transactions in 2005 relative to the average official property valuation from 2004. In the years when the purchase price is compared to the property valuation in the previous year, it is exploited that the market value in year t can be written as:

$$M_t^{ij} = EV_t^{ij} \cdot \frac{M_t^{ij}}{EV_t^{ij}} = EV_t^{ij} \cdot \frac{M_t^{ij}}{EV_{t-1}^{ij}} \cdot \left(\frac{EV_t^{ij}}{EV_{t-1}^{ij}} \right)^{-1}$$

In such years, the approximated market value is thus calculated as:

$$\tilde{M}_t^{ij} = EV_t^{ij} \cdot \left(\frac{\overline{KS}_t^j}{\overline{EV}_{t-1}^j} \right) \cdot \left(\frac{\overline{EV}_t^j}{EV_{t-1}^j} \right)^{-1} \quad (2)$$

In contrast to formula (1), in formula (2) we adjust for the average increase in property valuations in each subgroup relative to the previous year.

right-hand part of the Chart. As mentioned previously, almost 25 per cent of the families have no debt at all. These families are distributed as a very large group that does not have substantial financial assets either,

cf. that the median value is around kr. 112,000, and another group with actual wealth, since 10 per cent of the debt-free families have financial assets of kr. 1.1 million or more. It should be emphasised that pension wealth is not included in these figures. In all gross debt groups, the median family has relatively modest financial assets, etc. This probably reflects that, for most families, having both gross debt and financial assets over a relatively limited size involves costs.

All in all, the relationship between gross debt and the assets under review is dominated by the value of real property in Denmark, cf. the left-hand part of Chart 12.

The bottom right-hand part of Chart 12 shows the size of assets, excluding pension savings, less gross debt. The median value of this net wealth peaks for gross debt of between kr. 500,000 and kr. 1 million. The dispersion of net wealth is strongest for families whose gross debt exceeded kr. 2.5 million. This is illustrated by both the 75th and the 90th percentiles being higher in this group than in the other groups, while both the 10th and the 25th percentiles are lower than in the other groups. This indicates that both the most affluent families and the families with the highest gross debt are to be found in the group of families with gross debt exceeding kr. 2.5 million. In 2010, around 5 per cent of the families had gross debt exceeding kr. 2.5 million, cf. Chart 3, so the 10th and 90th percentiles in this group will delimit approximately 0.5 per cent of the families. This corresponds to around 12,500 families having net wealth of at least kr. 3.4 million despite gross debt in excess of kr. 2.5 million. A corresponding number of families with such gross debt have so few assets that their net debt exceeds kr. 1.4 million.

Pension savings

Most Danish families have assets in the form of pension savings. In most cases, pension wealth is illiquid in the sense that there may be legislative barriers or large costs associated with realising it before retirement age, and pension savings are not normally included as assets in the case of bankruptcy or enforced sale.

If the purpose of the analysis is to examine how family finances influence financial stability, these factors seem to support that pension wealth should not be included on the families' assets side. On the other hand, it is clear that pension wealth, by its sheer size, plays a key role in many families' financial decisions. It is therefore highly relevant to include pension wealth as an asset for the family when analysing these decisions.

The calculation of the value of family pension wealth is described in Box 4. The value of civil servants' public service pensions is not included

CALCULATION OF FAMILY PENSION WEALTH, 2003-10 Box 4

In this article family pension wealth is the result of own calculations, because Danes' pension wealth is not compiled in existing registers. Pension wealth excluding civil servants' public service pensions is calculated on the basis of extraordinary reported data on Danes' pension wealth and register-based data on contributions to and disbursements from pension schemes. We have endeavoured to calculate our statistics in the same way as in previous analyses (including Jørgensen (2007), Welfare Commission (2006) and Danish Economic Councils (2008)).

The method for calculation of Danes' pension wealth in company pension schemes and individual personal schemes is based on a data set with pension wealth at individual level in 2003 collected in connection with the Welfare Commission's work (Welfare Commission, 2006). We have thus been given access to individual data for wealth in safe custody at end-2003 in a number of life insurance companies, pension funds and banks.[1] Together with Statistics Denmark's register data for contributions and disbursements, Danes' individual pension wealth in company pension schemes and individual personal schemes has been projected each year from 2003 up to and including 2010.

An individual's pension wealth in a pension company in year *t* equals the sum of the pension wealth in the previous year *t-1*, net contributions to the company in year *t* adjusted for estimated operating costs and return and capital gains on the individual's pension custody account in year *t*. This corresponds to the following identity for individual *i* in year *t*:

$$wealth_{i,t} = wealth_{i,t-1} + net\ contributions_{i,t} + return_{i,t}$$

Starting in 2004, individual pension wealth in the preceding year is known from the Welfare Commission's 2003 data and net contributions are known from Statistics Denmark's register data. On the other hand, return and capital gains on individual pension wealth are unknown. Instead, the return and capital gains are calculated residually at company level as the difference between total provisions in a given company and the sum of individuals' wealth excluding return and capital gains in the same company:

$$return_{s,t} = wealth_{s,t} - \left(\sum_{i=1}^{N_S} wealth_{i,t-1} + \sum_{i=1}^{N_S} net\ contributions_{i,t} \right)$$

where $wealth_{s,t}$ denotes the total pension provisions of company S, and N_S indicates the number of persons in the company. Total pension provisions in year *t* have been found on the basis of the company's financial statements. Thus, the weighted average rate of return has been calculated for each company, and this rate is applied to all persons with wealth in safe custody in a given company. Hence, the projection does not take into account that different schemes in the same company may have different rates of return – e.g. guaranteed interest rates and unit link schemes. Moreover, in the projection, the companies' unallocated reserves are distributed proportionally on all persons independently of age.

CONTINUED Box 4

The amounts allocated to pensioners with life annuities are thus too small if the reserves have contributed especially to ensuring guaranteed benefits in a period of steady longevity increases. In addition, we use data on Danes' pension rights at ATP in the years 2003-10 in the form of data on annual disbursements to which an ATP pension right holder would be entitled at the age of 65, given that no further contributions are made to the scheme. These entitlements are converted to corresponding wealth at the age of 65 as follows:

$$wealth_{i,t}^{65} = \sum_{t=1}^{T_i-65} \frac{entitlement_i}{(1+r)^t}$$

where $T_i - 65$ is the remaining life expectancy after age 65, $rettighed_i$ is the person's annual pension right, and r is the annual return, which is assumed to be 6 per cent. For persons under 65 the wealth at age 65 is discounted to their current age.

Finally, we also use information on individuals' wealth in safe custody at the Employees' Capital Pension Fund, the Special Pension Savings Scheme (SP) and the supplementary labour-market pension scheme for the years 2003-10. Projected pension wealth in company pension schemes and individual personal schemes is added to the wealth in custody under these schemes, and finally a macro revaluation is made for total pension wealth excluding public service pensions, where the sum of individuals' wealth is compared with macro figures for household pension wealth excluding public service pensions each year in the period according to the quarterly national accounts for Denmark. The difference between the macro figure and the summed wealth in safe custody is distributed proportionally on all persons in the population.

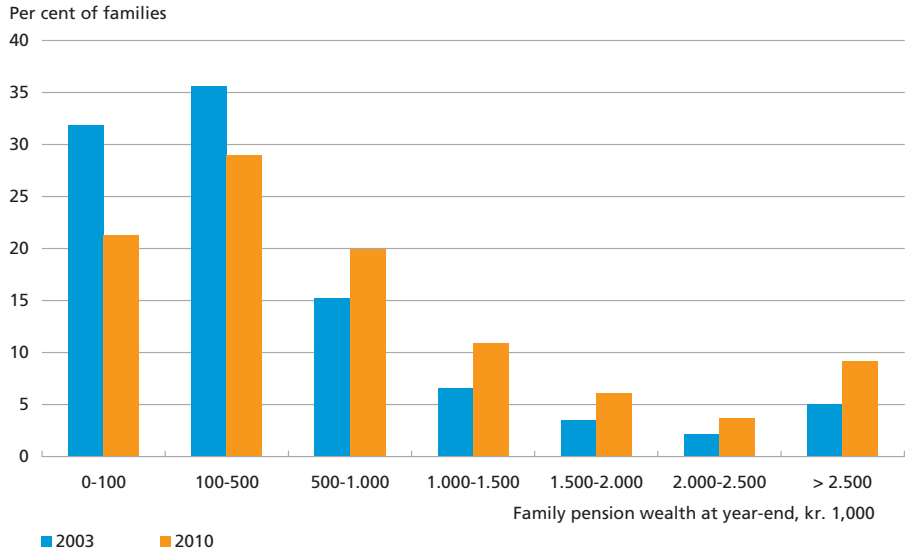
[1] The data set from the Welfare Commission is not exhaustive, so it has been necessary to make certain imputations, which generally follow the description in Jørgensen (2007). The imputations concern disability pensioners and disbursement of unallocated reserves. In addition, we have sought to impute reporting gaps by means of contribution and disbursement flows to company pension schemes and individual personal schemes. In this connection, the authors would like to thank Michael Andersen (DREAM) and Frederik Hansen (Ministry of Economic Affairs and the Interior).

in the calculation. According to the calculations of the Agency for the Modernisation of Public Administration, the value of civil servants' public service pensions totalled approximately kr. 430 billion at end-2009.

The current expansion of labour-market pensions has led to a substantial shift towards rising pension wealth, cf. Chart 13. In 2003, around one out of three families had pension wealth exceeding kr. 500,000. In 2010, this figure had increased to around one out of two, and 30 per cent of the families had pension wealth exceeding kr. 1 million, of which almost 10 per cent had more than kr. 2.5 million. However, the development from 2003 to 2010 also reflects that the general price level was approximately 15 per cent higher at end-2010 than at end-2003.

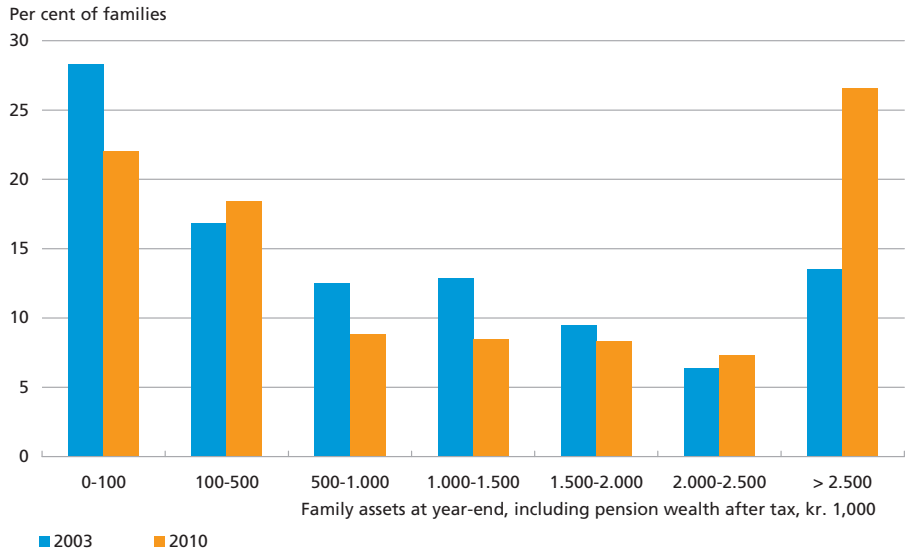
Since almost all pension wealth is taxed on disbursement, the figures are not comparable with other assets, which are generally not taxed. This is partly taken into account in Chart 14, where 60 per cent of the

DISTRIBUTION OF TOTAL FAMILY PENSION WEALTH Chart 13



Note: Pension wealth has been calculated before tax.
Source: Own calculations on the basis of register data from various institutions, cf. Box 4.

DISTRIBUTION OF FAMILY ASSETS INCLUDING PENSION WEALTH AFTER TAX Chart 14



Note: Pension wealth has been calculated after tax, i.e. with deduction of estimated future income tax on disbursements. The value of family pension wealth thus becomes comparable with other financial savings, which are not deductible and thus not taxable.
Source: Own calculations on the basis of register data from Statistics Denmark and other institutions, cf. Box 4.

GROSS DEBT STOCK BY SIZE OF FAMILY ASSETS, INCLUDING PENSION WEALTH, EXCLUDING HOMES IN DENMARK

Chart 15

Note: Pension wealth has been calculated after tax, i.e. with deduction of estimated future income tax on disbursements. The value of family pension wealth thus becomes comparable with other financial savings, which are not deductible and thus not taxable.

Source: Own calculations on the basis of register data from Statistics Denmark and other institutions, cf. Box 4.

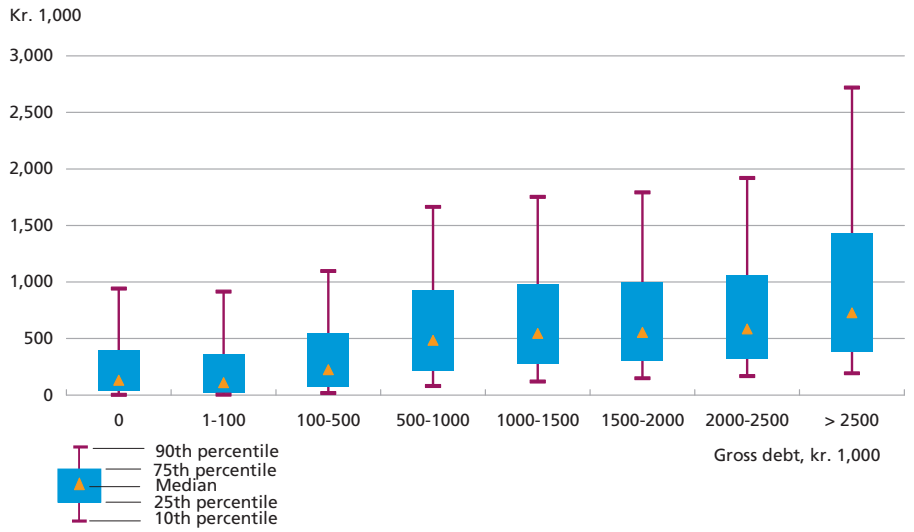
pension wealth is added to the value of other assets, corresponding to a tax rate of 40 per cent on disbursement. According to this calculation, more than one out of four families had assets exceeding kr. 2.5 million in 2010.

Chart 15 shows that gross debt is primarily found among the families with most financial assets, including pension wealth after tax. This trend was somewhat more pronounced in 2010 than in 2003. This picture differs from the picture emerging after exclusion of pension wealth, cf. the top right-hand part of Chart 12. But the overall impression that debt is generally concentrated in families who have the funds to meet the related obligations is reinforced.

Below we take a closer look at the link between pension wealth and gross debt. Pension wealth tends to be higher, the larger the family's gross debt, cf. Chart 16. But this relationship is weaker than that for the other assets, as illustrated in Chart 12. The positive correlation between gross debt and pension wealth first and foremost reflects that pension schemes are predominantly mandatory, in that a certain percentage of income has to be contributed to the scheme, and at the same time high gross debt is found particularly among high-income families.

However, it cannot be ruled out that there is also a direct causal link between the size of pension wealth and gross debt, particularly for fam-

DISTRIBUTION OF FAMILY PENSION WEALTH AFTER TAX ACROSS GROSS DEBT INTERVALS, 2010 Chart 16



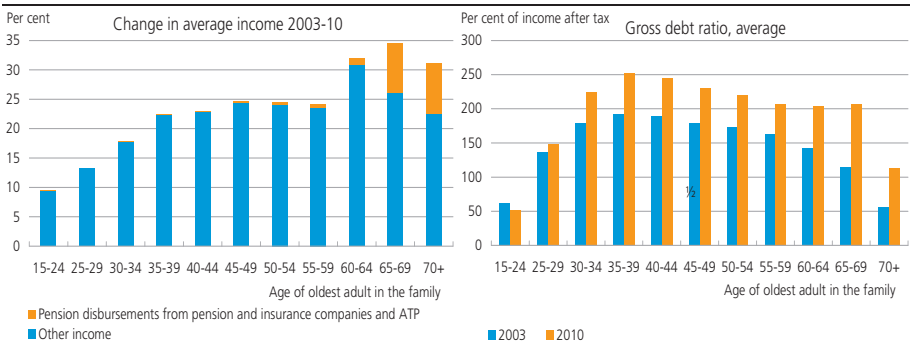
Note: Pension wealth has been calculated after tax, i.e. with deduction of estimated future income tax on disbursements. The value of family pension wealth thus becomes comparable with other financial savings, which are not deductible and thus not taxable.

Source: Own calculations on the basis of register data from Statistics Denmark and other institutions, cf. Box 4.

ilies around retirement age. Large pension wealth thus ensures higher current income after retirement than if no pension scheme had applied. This will enable many families to service the debt far into their retirement.

Chart 17 compares the changes since 2003 in gross debt and income, respectively, for different age groups. The families in the top age groups are the ones accounting for the strongest increase in the debt-to-income ratio relative to 2003, cf. the right-hand part of the Chart. At the same

CHANGE IN INCOME AND GROSS DEBT RATIO, 2003-10, BY AGE GROUP Chart 17



Source: Own calculations on the basis of register data from Statistics Denmark.

RELATIONSHIP BETWEEN GROSS DEBT RATIO AND PENSION WEALTH RATIO AMONG FAMILIES IN THE SAME INCOME AND AGE GROUPS Table 5

Gross debt ratio, per cent of income after tax, median	Pension wealth ratio (quartile)			
	1	2	3	4
Family's oldest adult 60-61 years				
1st income quartile	13.5	44.4	41.9	86.5
2nd income quartile	37.7	60.6	48.5	45.9
3rd income quartile	152.3	161.7	158.7	159.6
4th income quartile	209.4	197.6	194.1	184.7
Family's oldest adult 62-63 years				
1st income quartile	8.4	45.2	48.3	87.9
2nd income quartile	40.0	55.2	52.3	65.1
3rd income quartile	154.7	163.6	153.7	161.1
4th income quartile	209.6	197.5	195.9	177.0
Family's oldest adult 64-65 years				
1st income quartile	7.0	34.1	38.3	104.8
2nd income quartile	35.1	49.9	48.4	77.0
3rd income quartile	157.8	157.3	162.7	158.2
4th income quartile	206.6	195.2	183.6	180.5

Note: The Table shows the median for the gross debt ratio for various combinations of age, income, and pension wealth ratio (pension wealth as a percentage of income after tax). Families have been grouped according to pension wealth ratio on a quartile basis. The quartiles have been established within each age and income group. Consequently, the limits between quartile groups vary across age and income groups, so it is not immediately possible to make comparisons in the vertical dimension of the Table. A criterion for the selection of families is that at least one adult member of the family has a job.

Source: Own calculations on the basis of register data from Statistics Denmark and other institutions, cf. Box 4.

time, the growth in income from 2003 to 2010 was highest for this group of families, which can be attributed especially to higher pension disbursements, cf. the left-hand part of the Chart. However, this does not immediately provide for concluding that the rise in gross debt for this group of families was caused by expansion of pension wealth. Many other factors influencing gross debt have changed since 2003, including in particular house prices.

Table 5 examines the link between pension wealth and gross debt in 2010 among families in the same age and income groups who are active in the labour market. Both pension wealth and gross debt are here seen as ratios of income after tax. If there is a direct causal effect from the size of pension wealth to gross debt, families with a large pension wealth ratio will, all else equal, have a higher gross debt ratio than other families in the same age and income groups. Among families in the bottom income quartiles, such a positive link is actually indicated since the gross debt ratio (measured by the median) increases with the ratio of pension wealth to income after tax in all age groups. This can be interpreted as an indication that the growing pension wealth has contributed to the rise in gross debt in this group of families. But the link is not very strong in the second income quartile and there are no

signs of a link among the families in the upper income quartiles, no matter which age group is considered. All in all, there is no clear basis for concluding that direct causality exists between the accumulation of pension wealth and the increased gross debt. But the accumulation of pension wealth has enabled a reversal of Denmark's foreign debt to net foreign assets at the same time as the increase in family gross debt.

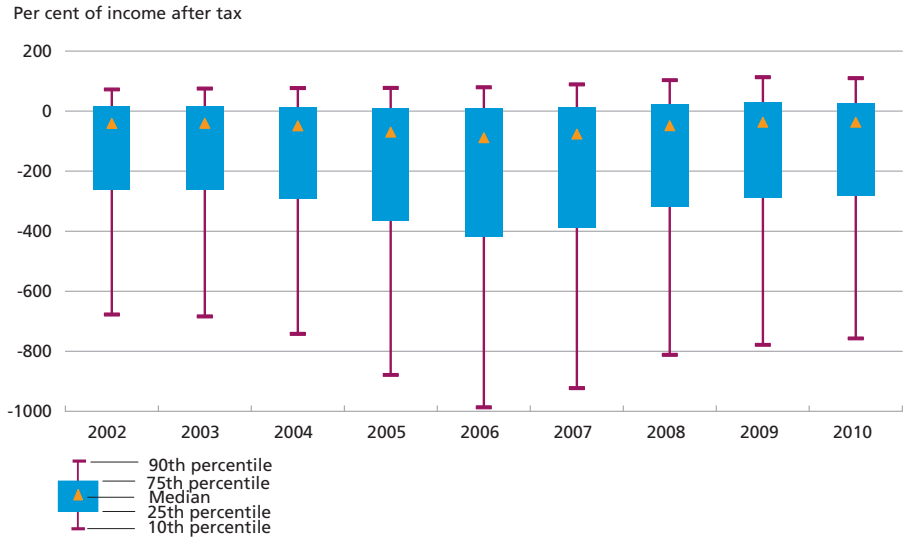
5. FAMILY NET DEBT

Net debt excluding pension wealth

Family net debt is the value of their gross debt less the value of their assets, excluding pension wealth. Chart 18 shows the development over time in the net debt ratio, i.e. net debt as a ratio of income after tax.

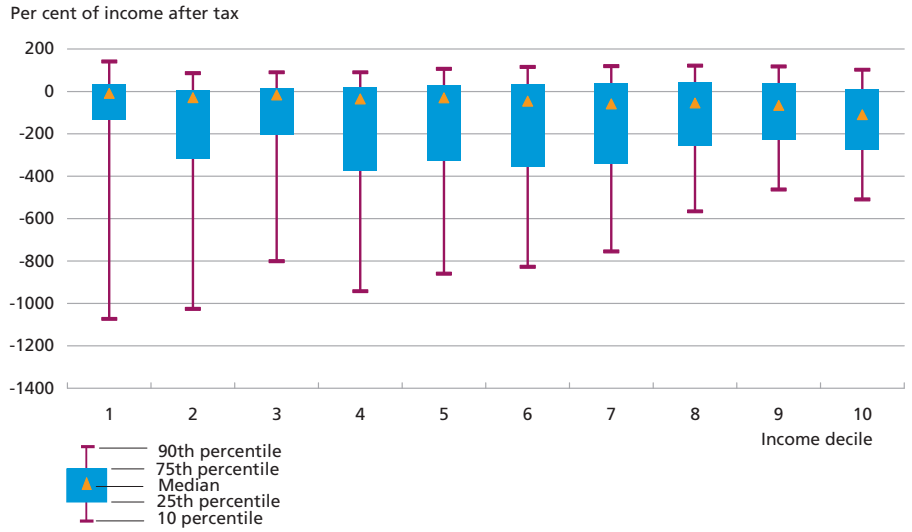
A clear pattern appears in that most families have net wealth, which is shown as negative net debt in the Chart. However, at least one out of three families has net debt, and for the 10 per cent most heavily indebted families, net debt has grown more than income in the period under review, so that in 2010 net debt amounted to more than 100 per cent of the annual income after tax. It should be emphasised that wealth does not include pension wealth or durable consumer goods such as cars. Among the 10 per cent of the families with the largest net wealth (smalllest net debt), wealth increased from being at least 6.8 times the size of income in 2002 and 2003 to at least 9.9 times in 2006 and then it

DISTRIBUTION OF FAMILY NET DEBT RATIO OVER TIME — Chart 18



Source: Own calculations on the basis of register data from Statistics Denmark.

DISTRIBUTION OF FAMILY NET DEBT RATIO ACROSS INCOME DECILES, 2010 Chart 19



Source: Own calculations on the basis of register data from Statistics Denmark.

fell back to just under 8 times the size of income after tax in 2010. This particularly reflects property price developments in this period.

The net debt ratio is not strongly dependent on income, cf. Chart 19. The median families have a falling net debt ratio (rising net wealth ratio) with increasing income despite the fact that the gross debt ratio grows with income, as shown above. High-income families' large gross debt is thus generally offset by their acquisition of assets. Another observation is that the wealth-to-income ratio is very high for the 10 per cent most affluent in the lowest income decile, but this probably reflects that this group comprises a relatively high number of elderly with low income and some wealth, not necessarily large wealth in absolute terms.

At end-2010, more than one out of three families had net debt. Families with net debt deviate from families with net wealth in several respects, cf. Table 6.

Families with net debt include a relatively high number of young people and relatively few homeowners. At the same time, these families have been harder hit by prolonged periods of unemployment than other families. The average gross debt in this group was kr. 180,000 larger than that of other families, while assets were, on average, around kr. 1,200,000 lower, which can be attributed to the relatively small share of homeowners, among other factors. This is also reflected in the fact that the gross debt of families with net debt is primarily debt to banks, while the other families' gross debt is primarily debt to mortgage banks.

DESCRIPTIVE STATISTICS FOR FAMILIES WITH NET DEBT RELATIVE TO OTHER FAMILIES, 2010 Table 6

	Families with net debt	Other families
Number of families	862,371	1,708,147
Age, family size and housing type		
Average age of oldest adult in family	41.5	56.3
Share of families with two adults, per cent	42.7	48.2
Average no. of children in family	0.6	0.4
Share of homeowners, per cent	27.5	55.5
Income, assets and liabilities, etc.		
Average income after tax, kr.	297,861	311,652
Share of total liabilities at year-end, per cent	39.5	60.5
Share of total assets at year-end, per cent	12.8	87.2
Average liabilities, kr.	806,392	624,735
Average assets, excl. pension wealth, kr.	500,827	1,720,979
Avg. assets, excl. pension wealth and housing in DK, kr.	48,183	147,120
Average net assets, kr.	-305,564	1,096,244
Gross debt ratio, median, per cent	117.6	27.0
Net debt ratio, median, per cent	61.6	-168.0
Average contributions to pension schemes, kr.	33,240	37,906
Average pension wealth after tax, kr.	318,685	712,015
Composition of liabilities		
Bank debt as share of total liabilities, aver. percentage	77.0	41.0
Bond debt as share of total liabilities, aver. percentage	22.2	58.6
Social and economic events		
Share of families affected by divorce or death of spouse within the last two years, per cent	3.6	3.2
Share of families affected by at least six months' unemployment within the last two years, per cent	5.7	2.6

Note: The calculation of average pension contributions includes all families in each group, including families who do not contribute to pension schemes. The calculations of the average shares of bond debt and bank debt, respectively, relative to the family's total debt do not include debt-free families. Unemployment figures at individual level are only available up to and including 2009. The share of families who have been affected by at least six months' unemployment within the last two years has therefore been calculated as at the end of that year. For example, the figure in the first column indicates the number of families affected by at least six months' unemployment in the years 2008-09, relative to the number of families with net debt at end-2009.

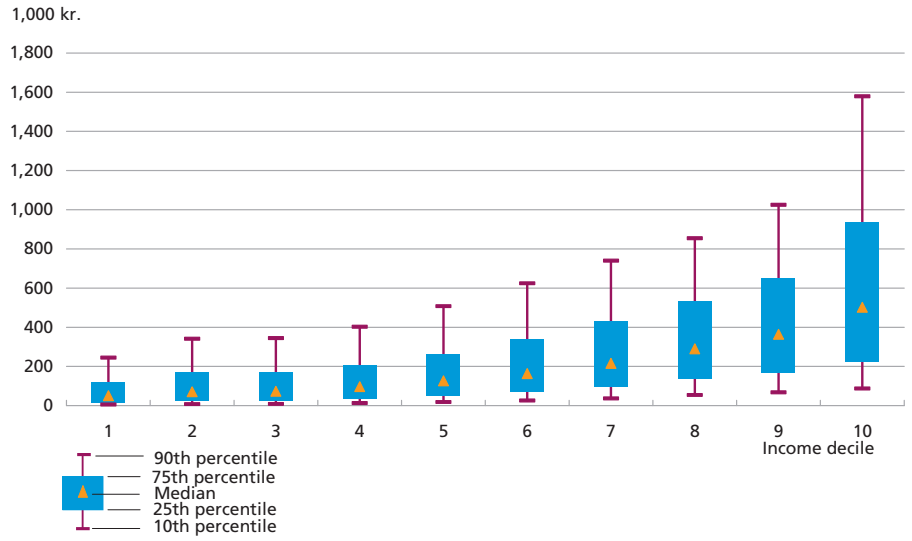
Source: Own calculations on the basis of register data from Statistics Denmark and other institutions, cf. Box 4.

Only families with net debt are considered in Chart 20. Among these families, net debt increases with income after tax. This Chart does not show debt as a ratio of income after tax, but the absolute size of the debt.

In 2010, the net debt of families with net debt totalled just under kr. 265 billion. This net debt is concentrated in families with the highest incomes after tax, since families in the two top income deciles account for around kr. 100 billion of this amount, cf. Chart 21. The Chart shows for each income decile how much of this net debt is attributable to families with net debt living in cooperative housing, since these families' assets in the form of the value of the cooperative housing are not in-

DISTRIBUTION OF FAMILY NET DEBT, ONLY FAMILIES WITH NET DEBT, 2010

Chart 20

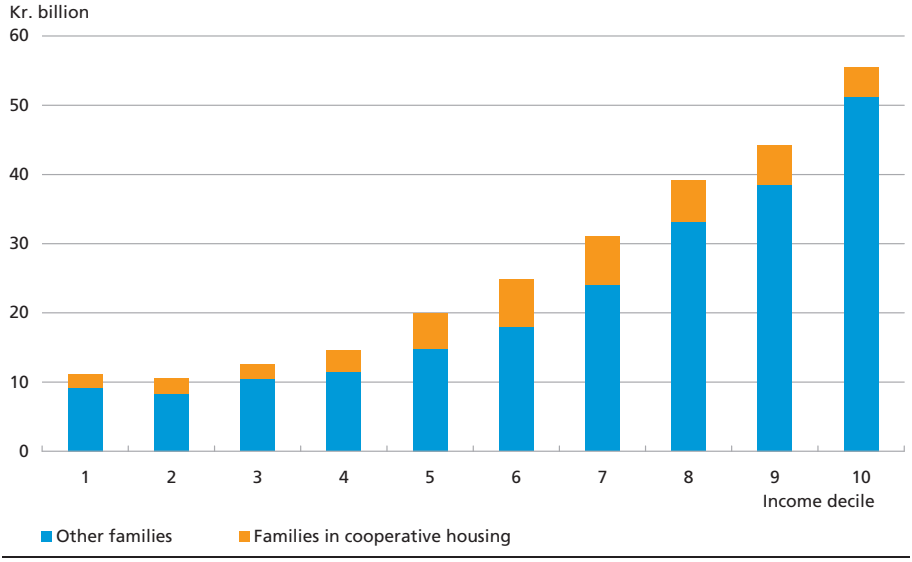


Source: Own calculations on the basis of register data from Statistics Denmark.

cluded in the calculation. As a result, families living in cooperative housing tend to have net debt in this calculation to a higher degree than other families. Almost exactly half of the families living in cooperative housing have net debt, compared with one third of all families.

TOTAL NET DEBT BY INCOME DECILE AND OWNERSHIP OF FAMILY HOME, ONLY FAMILIES WITH NET DEBT, 2010

Chart 21



Source: Own calculations on the basis of register data from Statistics Denmark.

SHARE OF FAMILIES WITH NET DEBT BY AGE AND INCOME DECILE Table 7

Per cent of all families in same age group and income decile	Income decile									
	1	2	3	4	5	6	7	8	9	10
Oldest member										
15-24 years	37.6	43.2	49.0	53.1	53.0	55.5	59.9	64.2	55.2	32.8
25-29 years	61.5	61.0	60.8	61.5	62.2	62.6	64.8	66.7	62.8	51.8
30-34 years	67.3	66.1	60.6	60.9	62.3	62.1	62.1	62.3	58.0	49.6
35-39 years	65.7	63.7	56.5	55.6	56.6	56.4	55.3	53.0	48.9	40.2
40-44 years	63.1	60.8	54.1	50.8	51.6	51.5	49.1	45.8	41.0	33.8
45-49 years	61.1	57.9	52.6	48.2	46.4	46.3	43.1	39.6	34.6	28.5
50-54 years	57.0	50.9	48.8	42.6	40.5	39.6	37.3	32.3	27.8	22.8
55-59 years	46.4	41.1	42.8	36.4	32.0	31.8	29.6	23.6	20.2	17.2
60-64 years	30.8	22.9	32.8	28.1	21.6	20.1	16.8	14.5	13.4	12.5
65-69 years	14.3	18.0	24.2	14.6	12.7	12.3	10.4	9.4	8.5	8.8
70+ years	3.5	7.1	9.6	5.1	8.6	5.8	4.8	4.1	3.4	3.4

Source: Own calculations on the basis of register data from Statistics Denmark.

Table 7 shows a more detailed breakdown of the propensity to have net debt in various age and income intervals. There is generally a clear pattern.

Firstly: the higher the age of the family, the lower the frequency of net debt. This applies to all income deciles. However, the very young stand out in that fewer of these families have net debt compared with the 25-29 age group. Debt raised for education purposes is one of the explanations of the high prevalence of net debt among young families. To this should be added, of course, debt incurred in connection with purchases of durable consumer goods and cooperative housing. The general pattern should therefore be regarded as natural. This entails that households with net debt generally have a number of years in the labour market ahead of them.

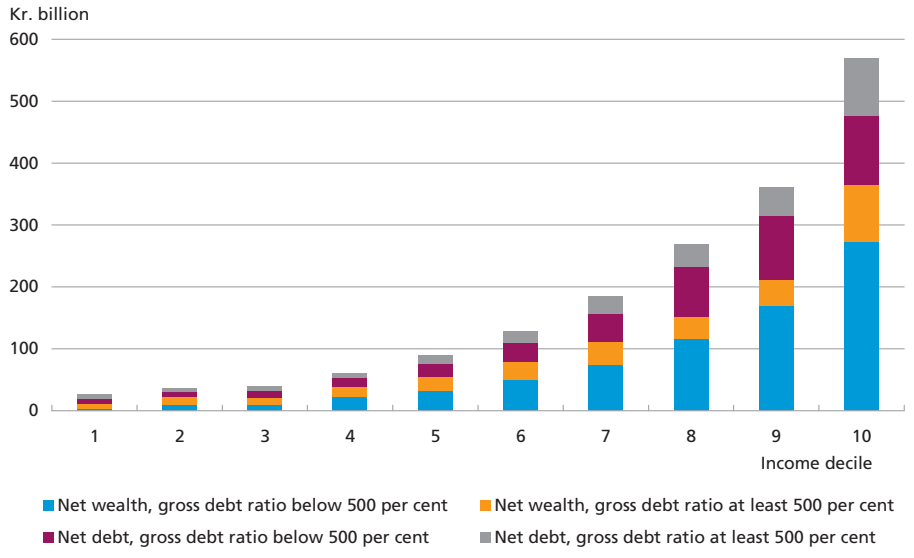
Secondly: in almost all age groups, the frequency of net debt declines with income after tax. It is more difficult to have an opinion on this pattern beforehand. However, the share of families with net debt is rather high in all income deciles as long as the oldest member is below 50. This pattern is different from the one observed for gross debt.

It should be emphasised that the number of families in each combination of age group and income decile varies. As appeared from Table 3, the youngest and oldest families are overrepresented in the low income deciles, while the 30-59-year-olds are overrepresented in the high income deciles.

Chart 22 shows the distribution of total gross debt on families in different income deciles, depending on whether or not the family has net debt and whether the gross debt is over or under five times the size of the family income after tax.

COMPOSITION OF GROSS DEBT STOCK BY FAMILY CHARACHTERISTICS, 2010

Chart 22



Source: Register data from Statistics Denmark and own calculations.

In an assessment of the financial sector's risk of losses, families with net debt play a key role, and within this group especially families with a high ratio of gross debt to income. As appeared from e.g. Chart 8, the gross debt of the 10 per cent of families with the largest gross debt tends to be more than around 5 times the size of income after tax in most age and income groups. A distinction is therefore made between families with gross debt of over or under five times the size of income after tax. In 2010, families with both net and gross debt of more than five times their income after tax accounted for a total of around kr. 260 billion of total family gross debt of kr. 1,763 billion. These families had net debt of around kr. 80 billion all in all. As the Chart clearly shows, gross debt is concentrated in the three top income deciles, and this is also the case for net debt.

The drop in house prices from 2006-07 to 2010 has prompted special interest in homeowners' wealth and vulnerability. Table 8 shows some characteristics of homeowners broken down by families with net debt and other homeowners.

General characteristics of families who own their home while having net debt are that they are far younger than other homeowners, consist of two adults with children and that their incomes are considerably higher than those of other homeowners. Their average income after tax is in the second highest income decile.

DESCRIPTIVE STATISTICS FOR FAMILIES WITH NET DEBT RELATIVE TO OTHER FAMILIES, ONLY HOMEOWNERS, 2010 Table 8

	Homeowner families with net debt	Other homeowner families
Number of families	236,916	948,234
Age, family size and housing type		
Average age of oldest adult in family	43.1	57.9
Share of families with two adults, per cent	79.9	68.7
Average no. of children in family	1.1	0.6
Share of homeowners, per cent	100.0	100.0
Income, assets and liabilities, etc.		
Average income after tax, kr.	468,391	394,321
Share of total liabilities among homeowner families, per cent	33.2	66.8
Share of total assets among homeowner families, per cent	12.8	87.2
Average liabilities, kr.	2,107,081	1,058,754
Average assets, excl. pension wealth, kr.	1,609,762	2,742,954
Avg. assets, excl. pension wealth and housing in DK, kr.	91,730	220,347
Average net assets, kr.	-497,319	1,684,200
Gross debt ratio, median, per cent	402.9	235.5
Net debt ratio, median, per cent	76.7	-327.4
Aver. contributions to pension schemes, kr.	65,333	55,057
Aver. pension wealth after tax, kr.	574,859	983,327
Composition of liabilities		
Bank debt as share of total liabilities, aver. percentage	26.1	26.7
Bond debt as share of total liabilities, aver. percentage	72.5	72.9
Social and economic events		
Share of families affected by divorce or death of spouse within the last two years, per cent	3.1	2.7
Share of families affected by at least six months' unemployment within the last two years, per cent	4.4	2.6

Note: The calculation of average pension contributions includes all families in each group, including families who do not contribute to pension schemes. The calculations of the average shares of bond debt and bank debt, respectively, relative to the family's total debt do not include debt-free families. Unemployment figures at individual level are only available up to and including 2009. The share of families who have been affected by at least six months' unemployment within the last two years has therefore been calculated on the basis of data from that year.

Source: Own calculations on the basis of register data from Statistics Denmark and other institutions, cf. Box 4.

The average net debt among homeowners with net debt is kr. 500,000 per family. Particularly in this group of high-income families many have bought a home in recent years, when house prices were higher than they are now, and have had expenses for renovation of their homes and for durable consumer goods, including cars. In the present macro-economic climate, these families are not very likely to have problems servicing their loans, but at the same time, families in this group will be vulnerable in case of long periods of unemployment or rapidly increasing interest rates.

Significance of certain social events

Table 9 shows that families affected by long periods of unemployment deviate from other families in several respects. Incomes after tax are almost 10 per cent lower than those of other families despite the fact that many of these families include two adults. The average gross debt does not differ much, but the average asset value is almost kr. 500,000 lower. There are relatively fewer homeowners among families who are affected by long periods of unemployment, and the debt tends to be bank debt to a higher degree.

Table 10 shows corresponding conditions for families affected by divorce or the death of a spouse in 2009 and 2010. Naturally, far fewer of these families consisted of two adults at end-2010. Consequently, their family income is about half the income of other married couples and registered partners. Accounting for the difference in the number of

DESCRIPTIVE STATISTICS FOR FAMILIES AFFECTED BY AT LEAST SIX MONTHS' UNEMPLOYMENT WITHIN THE LAST TWO YEARS RELATIVE TO OTHER FAMILIES, 2009

Table 9

	Families affected by unemployment	Other families
Number of families	92,276	2,456.98
Age, family size and housing type		
Average age of oldest adult in family	43.2	51.5
Share of families with two adults, per cent	53.2	46.3
Average no. of children in family	0.7	0.5
Share of homeowners, per cent	37.8	46.1
Income, assets and liabilities, etc.		
Average income after tax, kr.	271,731	295,053
Share of total liabilities at year-end, per cent	3.3	96.7
Share of total assets at year-end, per cent	2.4	97.6
Average liabilities at year-end, kr.	621,777	674,564
Average assets at year-end, kr.	833,993	1,297.57
Average net assets at year-end, kr.	212,216	623,009
Gross debt ratio, median, per cent	109.0	85.4
Net debt ratio, median, per cent	6.4	-40.0
Average contributions to pension schemes, kr.	22,990	41,423
Composition of liabilities		
Bank debt as share of total liabilities, aver. percentage	66.1	56.6
Bond debt as share of total liabilities, aver. percentage	33.0	42.9
Social and economic events		
Share of families affected by divorce or death of spouse within the last two years, per cent	3.1	3.4

Note: The calculation of average pension contributions includes all families in each group, including families who do not contribute to pension schemes. The calculations of the average shares of bond debt and bank debt, respectively, relative to the family's total debt do not include debt-free families.

Source: Own calculations on the basis of register data from Statistics Denmark.

DESCRIPTIVE STATISTICS FOR FAMILIES AFFECTED BY DIVORCE OR DEATH OF SPOUSE WITHIN THE LAST TWO YEARS RELATIVE TO OTHER FAMILIES, 2010 Table 10

	Families affected by divorce or death of spouse	Other families, total	Other married couples or registered partners
Number of families	85,015	2,466,298	915,807
Age, family size and housing type			
Average age of oldest adult in family	55.7	51.3	55.5
Share of families with two adults, per cent	14.5	47.5	100.0
Average no. of children in family	0.5	0.5	0.9
Share of homeowners, per cent	38.6	46.6	77.4
Income, assets and liabilities, etc.			
Average income after tax, kr.	257,570	309,281	456,448
Share of total liabilities at year-end, per cent	3.1	96.9	64.8
Share of total assets at year-end, per cent	3.1	96.9	64.0
Average liabilities at year-end, kr.	637,396	690,327	1,204,917
Average assets at year-end, kr.	1,223,216	1,321,200	2,277,043
Average net assets at year-end, kr.	585,820	630,873	1,072,126
Gross debt ratio, median, per cent	90.9	85.4	216.4
Net debt ratio, median, per cent	-41.4	-37.9	-136.8
Average contributions to pension schemes, kr.	27,379	36,766	62,470
Composition of liabilities			
Bank debt as share of total liabilities, aver. percentage	58.1	56.7	37.8
Bond debt as share of total liabilities, aver. percentage	41.2	42.8	61.7
Social and economic events			
Share of families affected by at least six months' unemployment within the last two years, per cent	3.3	3.6	7.0

Note: The calculation of average pension contributions includes all families in each group, including families who do not contribute to pension schemes. The calculations of the average shares of bond debt and bank debt, respectively, relative to the family's total debt do not include debt-free families. Unemployment figures at individual level are only available up to and including 2009. The share of families who have been affected by at least six months' unemployment within the last two years has therefore been calculated on the basis of data from that year.

Source: Own calculations on the basis of register data from Statistics Denmark.

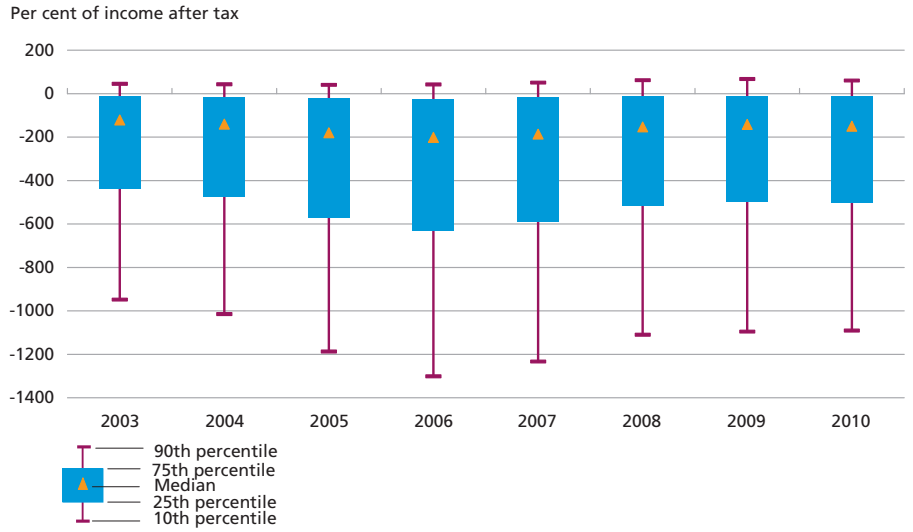
adults, there is no clear systematic, negative development in wealth for families affected by divorce or the death of a spouse.

Net debt with pension wealth as an asset

If family pension wealth after deduction of deferred tax is included in the calculation, cf. Chart 23, less than one in four families had net debt in 2010. Excluding pension wealth, this is one out of three, as mentioned earlier. The median family had net wealth (negative net debt) of 1.5 times its income after tax, compared to 0.4 times its income if pension wealth is not included, which appeared from Chart 18. Whether or not it is relevant to include pension wealth depends on the purposes of the

DISTRIBUTION OF FAMILY NET DEBT RATIO INCLUDING PENSION WEALTH OVER TIME

Chart 23



Note: Pension wealth has been calculated after tax, i.e. with deduction of estimated future income tax on disbursements. The value of family pension wealth thus becomes comparable with other financial savings, which are not deductible and thus not taxable.

Source: Own calculations on the basis of register data from Statistics Denmark and other institutions, cf. Box 4.

analysis, but pension savings are of such magnitude that they are likely to be considered in many families' consumption and debt decisions, so they cannot be disregarded with reference to their illiquid nature.

As appears from Chart 24, pension wealth entails that the net wealth ratios of median families tend to rise with increasing income (the negative net debt ratio becomes numerically larger). This is opposed to the pattern in Chart 19, which excludes pension wealth. In the five top income deciles, median families have net wealth of 2-3 times their annual income after tax.

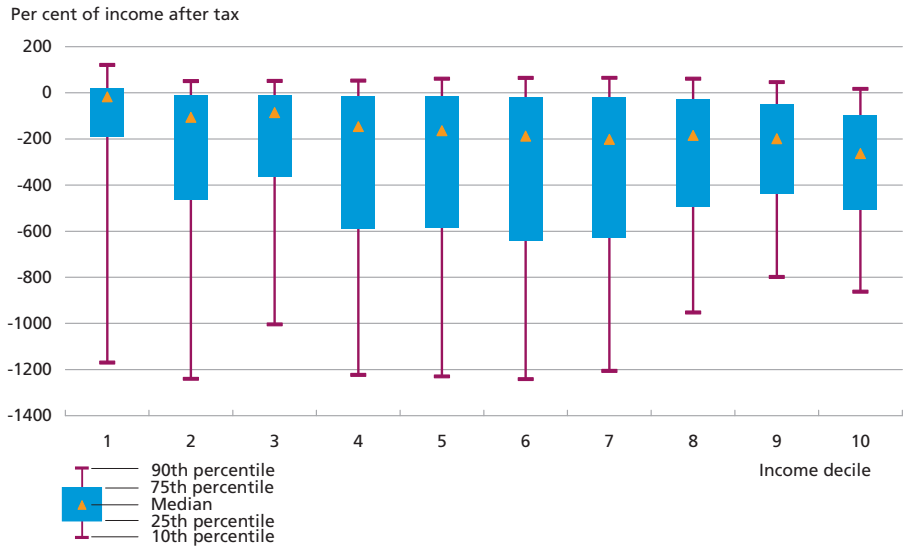
Chart 25 clearly shows that the distribution of wealth becomes strongly dependent on age when including pension wealth on the assets side, which is also to be expected. However, this underlines that a considerable share of the families have assets of such value that they will easily be able to service their gross debt also after retirement.

Change in debt and wealth items since 2003

Table 11 shows that Danish families taken as one have increased their financial net assets since 2003.[1] Although gross debt has increased by kr.

[1] Income and wealth data based on notices of assessment go back to 2002 in our data set, whereas pension wealth data is only available back to 2003. In this section we therefore consider the development since 2003.

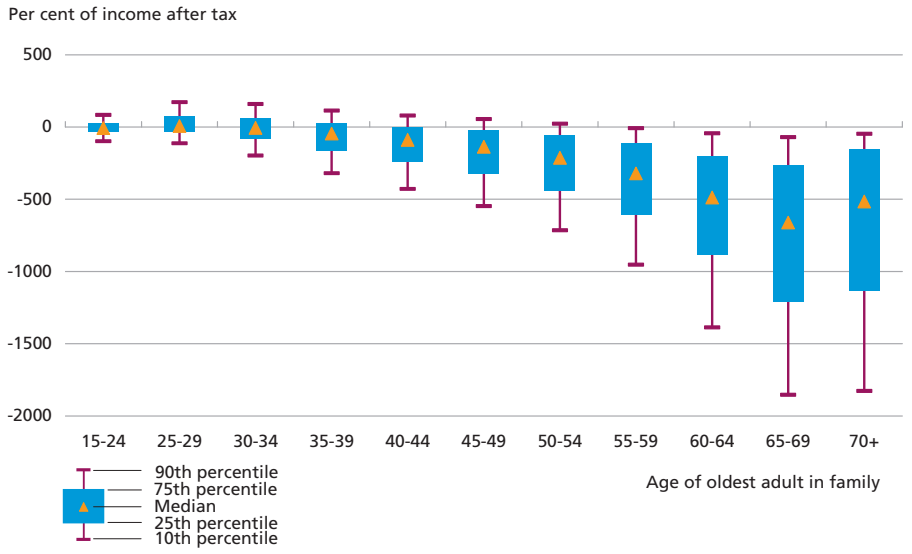
DISTRIBUTION OF FAMILY NET DEBT RATIO INCLUDING PENSION WEALTH ACROSS INCOME DECILES, 2010 Chart 24



Note: Pension wealth has been calculated after tax, i.e. with deduction of estimated future income tax on disbursements. The value of family pension wealth thus becomes comparable with other financial savings, which are not deductible and thus not taxable.

Source: Own calculations on the basis of register data from Statistics Denmark and other institutions, cf. Box 4.

NET DEBT RATIO INCLUDING PENSION WEALTH, BY AGE, 2010 Chart 25



Note: Pension wealth has been calculated after tax, i.e. with deduction of estimated future income tax on disbursements. The value of family pension wealth thus becomes comparable with other financial savings, which are not deductible and thus not taxable.

Source: Own calculations on the basis of register data from Statistics Denmark and other institutions, cf. Box 4.

CHANGE IN DEBT AND WEALTH ITEMS 2003-10, SELECTED GROUPS — Table 11

Kr. billion	All families	10th income decile	10th gross debt decile	Families with positive net debt before pension wealth
Gross debt	734	240	348	346
Assets excluding pension wealth after tax	1,212	360	411	212
- housing in Denmark	930	284	346	192
- other assets	282	77	65	20
Assets incl. pension wealth after tax	1,740	487	520	329
- pension wealth after tax	528	127	110	117

Note: The Table shows the absolute changes from 2003 to 2010 in the sum for the variable in question among the families in each of the segments shown. For example, the figure in the top right-hand corner of the Table indicates the absolute difference between total gross debt in 2010 among families with positive net debt at end-2010 and the corresponding sum in 2003 for families with positive net debt that year.
Source: Own calculations on the basis of register data from Statistics Denmark and other institutions, cf. Box 4.

734 billion, pension wealth after tax has risen by kr. 528 billion, and assets other than housing, i.e. predominantly financial assets, have grown by kr. 282 billion. This implies an improvement in the net financial position by approximately kr. 75 billion, and in addition the value of housing has increased by kr. 930 billion.

However, the overall picture masks substantial differences between the individual families, as shown in the previous sections. Since 2003 the gross debt in families with net debt (excluding pension wealth) has increased by kr. 346 billion, which is almost half the increase in total gross debt. At the same time, such families have increased their financial assets by kr. 20 billion, and their pension wealth after tax has risen by kr. 117 billion. Even including pension wealth, the net financial position has thus deteriorated by kr. 210 billion in the period under review, a somewhat stronger deterioration than the growth in the value of their owner-occupied homes.

Despite the generally positive development in wealth since 2003, some groups are thus showing different and far more negative patterns.

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