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Expiring interest-only mortgages have implications for household expenditure



Nearly half of Danish mortgages are interest-only

Interest-only mortgages became very popular in Denmark after their introduction in 2003. About 45 per cent of the outstanding mortgage volume is currently without amortization.

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Some borrowers reduce spending upon expiration

A small share of the borrowers may struggle to begin repaying their loans after ten years of deferred amortization. These homeowners need to cut expenditure in order to fund the increased mortgage installments.

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Overall effect on the Danish economy is very limited

The reduction in expenditure is substantial for the affected homeowners. However, the overall effect on the Danish economy is small.

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Interest-only mortgages are very popular in Denmark, currently making up 45 per cent of outstanding mortgage volumes. These loans allow homeowners to postpone repayment on the mortgage principal – typically for up to 10 years after origination – thereby reducing monthly installments for a period of time.

However, debt servicing ratios rise significantly when the interest-only period comes to term. At this point, homeowners either need sufficiently robust personal finances to fund the increased installments or they must be granted a new interest-only mortgage in order to keep their consumption ratio unaffected.

A small share of borrowers reduces expenditure when loan amortization begins, as the increased mortgage repayments impose a significant cost on their budgets. However, since this reduction in

expenditure affects only a modest number of consumers, this analysis concludes that expiring interest-only mortgages do not currently pose a macroeconomic risk to the Danish economy.

Affected homeowners cut expenditure permanently when amortization begins

A recent Working Paper by Danmarks Nationalbank finds that interest-only borrowers whose interest-only period came to term between 2013 and 2017 cut expenditure by DKK 14,000 per year when amortization started (Andersen et al., 2020).

These borrowers may not have planned for the increase in installments, or they may have tried to obtain a new interest-only loan without success.

To put things into proportion, Chart 1 illustrates the consumption basket of the average household in Denmark in 2017. For goods and services categorized as groceries, transportation, or holidays, average annual spending amounts to DKK 44,000, DKK 25,000, and DKK 23,000, respectively. The former two are arguably considered as necessities, and quantities consumed are less sensitive to changes in disposable income. Holiday and recreation expenses are more likely to be reduced if liquid cash-in-hand declines. This simplified comparison indicates that when the interest-only period expires, the affected borrowers cut their expenditure by an amount corresponding to about 60 per cent of average expenses for holidays and recreational purposes.¹ This implies that the reduction in expenditure may have a significant impact on borrowers' spending patterns.

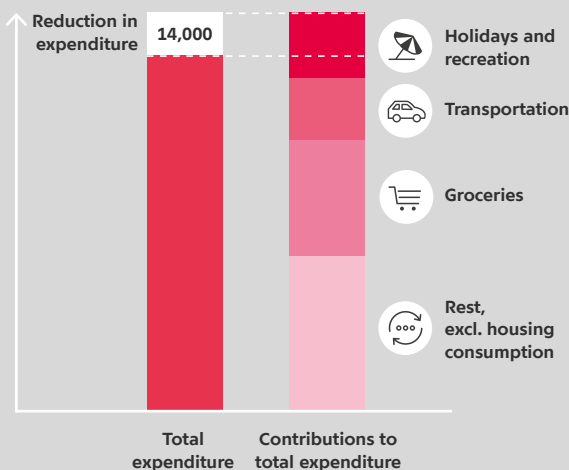
Four out of ten mortgages are interest-only

Since their introduction in October 2003, interest-only mortgages have been used extensively by Danish households. Chart 2 shows that many borrowers opted for these mortgages already during the mid-2000s.² The share of mortgages with deferred amortization peaked in September 2013, reaching 56 per cent of the outstanding mortgage stock.

Chart 1

Expenditure cut of DKK 14,000 when interest-only period expires

Expenditure cut corresponds to e.g. 60 per cent of Danish households' holiday expenses



Source: Statistics Denmark, Household Budget Survey 2017.

1 These simplified comparisons are based on the assumption that the mix of goods and services consumed is identical across households and over time.

2 Interest-only mortgages also became popular in the United States shortly before the Great Recession, increasing from 2 per cent of originations in 2003 to 30 per cent in 2005-07 (Amromin et al., 2018).

However, fewer borrowers appear to be opting for interest-only today than in the past. The left-hand panel of Chart 3 shows that 75,000 interest-only mortgages originated in 2018 – exactly half the number of originations in 2009. Fluctuations in numbers may reflect year-specific macroeconomic conditions, such as changes in mortgage rates. The share of interest-only loans as a proportion of total mortgage originations, depicted in the right-hand panel of Chart 3, confirms a decline in the popularity of this mortgage type, beginning in 2011.

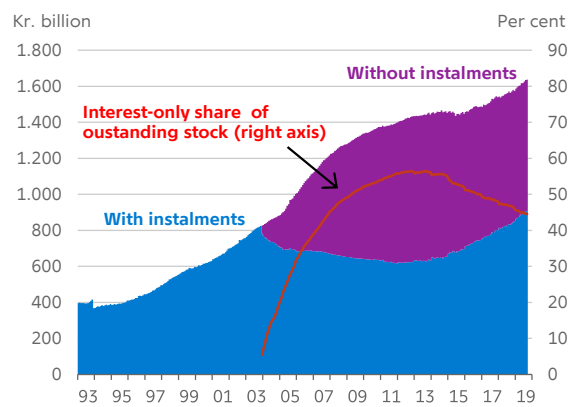
Multiple explanations for the relative decline in the interest-only share over the past decade

These developments could have multiple explanations. First, household saving rates generally increased after the latest financial crisis, possibly reflecting a widespread deleveraging process among Danish consumers (Hviid and Kuchler, 2017). As a result, fewer borrowers may have opted for deferred amortization following the economic downturn. Second, the price of interest-only options increased for several years, starting in 2011. The mortgage credit institutions raised the administration fees connected to this mortgage type, potentially inducing borrowers to shift away from these loans.

Third, access to interest-only mortgages has been restricted since the crisis due to changes in supervisory practices. In 2013, the Danish FSA introduced guidelines stipulating that borrowers should be able to service a 30-year fixed rate mortgage with

Interest-only mortgages have been used widely since their introduction in 2003

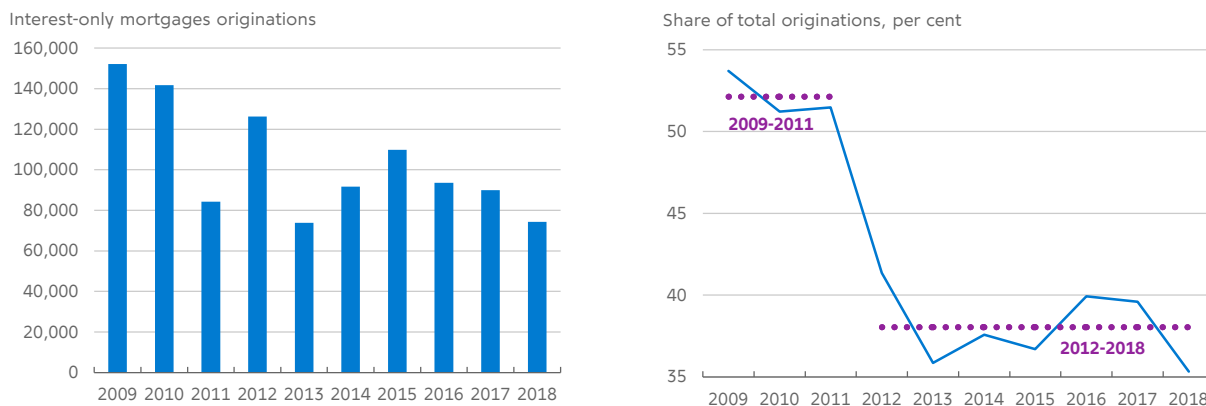
Chart 2



Note: The blue and purple areas measure the outstanding volume of mortgages with and without amortization, respectively. The red line shows the share of interest-only mortgages of the total outstanding volume.
Source: Danmarks Nationalbank.

About four out of ten new mortgage originations in 2012-18 were interest-only

Chart 3



Note: The left-hand panel shows the number of mortgage originations with interest-only. The right-hand panel illustrates the share of interest-only mortgages out of total originations in every year. The dashed, purple lines show averages for the years stated.
Source: Own calculations based on register data from Statistics Denmark.

amortization even if they eventually chose another, riskier mortgage, such as an interest-only loan. Also, the supervisory diamond for mortgage banks, announced in 2014, and the rules applicable from 2018 restrict the mortgage product supply for the most heavily indebted borrowers. None of these revisions to supervision guidelines and regulations limit lending to consumers; instead they seek to restrict access to interest-only mortgages to borrowers with relatively robust personal finances.

Fourth, the sharp drop in the share of interest-only mortgage originations from 2011 to 2013 can possibly be attributed to a refinancing boom. During 2012, mortgage rates declined substantially and many fixed-rate mortgage borrowers had an incentive to refinance into a new mortgage to lock in a lower interest rate (Danmarks Nationalbank, 2019). In this connection, some homeowners may have opted for a new mortgage with amortization, while prepaying their old interest-only mortgage.

Despite the measures taken by regulatory authorities and mortgage credit institutions, interest-only mortgages remain relatively popular among Danish borrowers, making up 35 per cent of new originations in 2018.

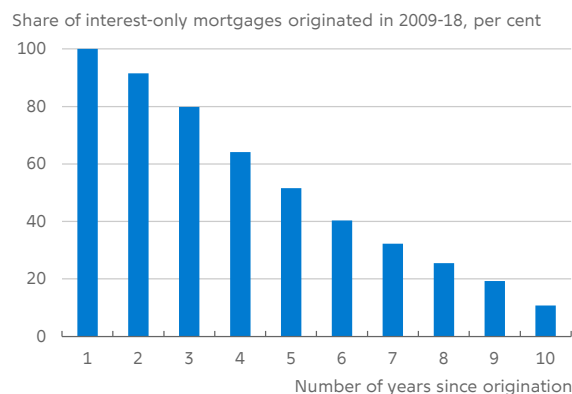
Only a small share of interest-only mortgages survives to the tenth year

Chart 4 illustrates that only 50 per cent of interest-only mortgages originated since 2009 are kept for at least 5 years.³ The attrition rate is fairly stable, at around 10 per cent per year. This indicates that borrowers either utilize only a fraction of the available 10 years without amortization, or that they refinance into new mortgages before the non-amortization period expires.

Homeowners who keep the same interest-only mortgage for 10 years or more constitute only 10 per cent of the population of borrowers within this period. The number of people using the non-amortization option may, however, be higher, since others may refinance into a new interest-only mortgage before reaching the tenth year of their original loan.

About 10 per cent of interest-only mortgages exist for 10 years, 2009-18

Chart 4



Note: The bars illustrate the number of years since mortgage origination that the loan survives, calculated on the basis of interest-only mortgage originations in 2009-18. Homeowners included do not buy or sell property in the sample period analyzed.

Source: Own calculations based on register data from Statistics Denmark.

Borrowers who keep their loans for a long period of time appear to be in similar financial health compared to the general population of interest-only borrowers (Andersen et al., 2020). The two groups have very similar LTV ratios, at 78 and 76 per cent, respectively, at the time of origination, and their incomes and liquid wealth are almost identical. This is an indication that borrowing constraints were equally binding for the two groups, at least at the time of mortgage origination.

Upon expiration, many homeowners do not roll over into a new interest-only mortgage

The design of Danish interest-only mortgages dictates that amortization must begin after 10 years.⁴ In the tenth year, borrowers must decide whether to begin amortizing, which would increase their debt servicing costs considerably, or to apply for a new mortgage, with or without deferred amortization.

The majority of homeowners start repaying their mortgages when the interest-only period expires

³ The calculations are based on a group of homeowners who stay in the same home for a minimum of 10 years from the time of mortgage origination.

⁴ Some Danish banks introduced a new type of interest-only mortgages with deferred amortization for up to 30 years in 2017.

after the tenth year. Specifically, Table 1 shows that 66 per cent of borrowers who have used their interest-only option for ten years hold on to their mortgages and begin to amortize. 13 per cent refinance into new interest-only mortgages, while 16 per cent refinance into new mortgages with amortization. The last 5 per cent fully prepay their original loans.

The rationale for deferring amortization varies across homeowners

Homeowners who defer amortization for 10 years have different reasons for doing so. Some borrowers find it optimal not to begin amortization immediately after mortgage origination. By postponing repayments for a period of time, homeowners have the opportunity to settle down with their families, repay more expensive debt or invest in durable goods, such as cars and home improvements.

These borrowers are aware that the mortgage repayments will increase in the future, and prepare accordingly. Others experience anticipated income growth during the period of deferred mortgage repayments. This will also prepare them for the increase in debt servicing cost upon interest-only expiration.

However, a third type of homeowner may not be able to face the rise in installments. When amortization begins, the average borrower is faced with an annual increase in mortgage repayments worth 9 per cent of income. Some borrowers act as if they were not fully anticipating this rise in installments and cut spending when amortization begins.⁵ On average, the reduction in expenditure is worth 3 per cent of annual disposable income. The adjustment occurs exactly in the tenth year from loan origination and persists for several years thereafter. Moreover, these borrowers reduce liquid savings by 2.6 per cent of income and increase non-mortgage debt by 1.5 per cent of income.

Such behavior is at odds with the notion that consumers dislike large variations in their spending capacity. One possibility, however, is that these borrowers have been planning to obtain a new interest-only loan when the original one came to term.

Majority of homeowners hold on to their mortgages when repayments begin

Table 1

Action upon interest-only expiration	
Hold on to old mortgage	66
Refinance into interest-only	13
Refinance into amortization	16
Prepay the mortgage	5

Source: Own calculations based on Andersen et al. (2020).

Highly leveraged households drive the effect

Chart 5 shows that only homeowners with high LTV ratios reduce expenditure when amortization begins. Most likely, these borrowers planned to roll over their interest-only loans into new mortgages with deferred amortization. However, since their LTVs are close to or above the regulatory limit required to refinance their old loans into new loans with deferred amortization, they are likely to be denied such a request. As a result, they adjust to the new regime by cutting spending.

Overall household expenditure falls by less than DKK 100 million per year in 2019-28

Interest-only expirations have a substantial impact on homeowners who must revise their spending patterns upon expiry. However, the expirations have very limited effect on macroeconomic developments in Denmark.

Chart 6 shows that, in any given year between 2019 and 2028, expenditure in Denmark will fall by less than DKK 100 million due to the interest-only expirations. This estimation is based on the average expenditure cut per household, DKK 14,000, projected with the expected income growth and multiplied by the number of households who may cut spending when their interest-only periods expire. These calculations suggest that the aggregate

⁵ Consumers also fail to smooth consumption in anticipation of negative shocks to their discretionary income in other instances, such as expiration of unemployment benefits or retirement. See for example Ganong and Noel (2019) or Olafsson and Pagel (2018).

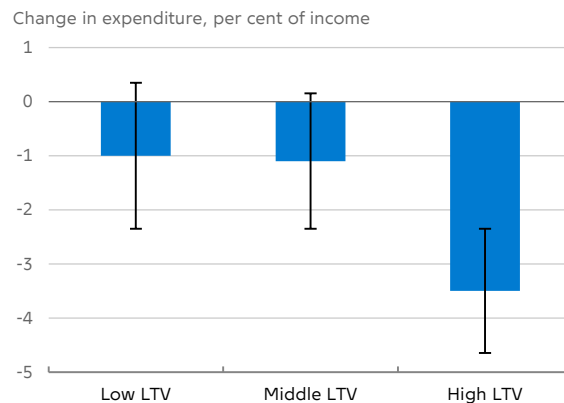
consumption implications of this channel are likely to be fairly small.

Even if a very extreme scenario is assumed, in which up to 50 per cent of all interest-only borrowers want to have more than 10 years of deferred amortization but are unable to be granted this by their banks, this channel still poses a relatively limited macroeconomic risk. In this scenario, the total expenditure cut by Danish households would be about DKK 1-1.5 billion each year in 2019-28, corresponding to less than 0.1 per cent of annual aggregate household expenditure in Denmark.

Adverse housing market developments or tightening of regulation could increase the number of interest-only borrowers who are prevented from rolling over into a new period of deferred amortization. Viewed in isolation, however, the overall robustness of the Danish economy will be almost unaffected by interest-only expirations.

Borrowing-constrained homeowners are the ones who cut expenditure

Chart 5

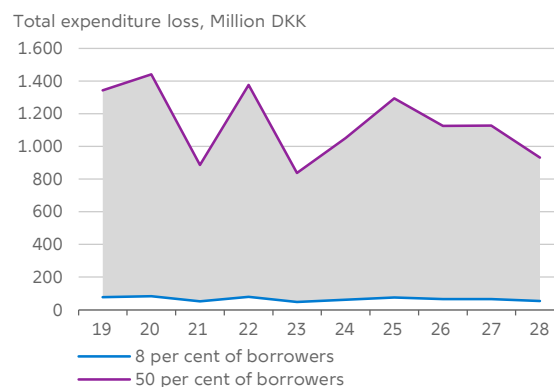


Note: Error bars indicate 5 per cent confidence bands. Loan-to-value (LTV) is measured one year prior to interest-only expiration. Low, Middle and High correspond to the first quintile, first quintile to median, and above median, respectively.

Source: Andersen et al. (2020).

Macroeconomic impact would remain low even if 50 per cent of interest-only borrowers were denied rollover

Chart 6



Note: The calculations are based on an average consumption cut per borrower multiplied by number of interest-only loans that will expire in any given year, based on the new originations presented in Chart 3. Income growth is assumed fixed at 3 per cent per year (Danish Ministry of Finance, 2019).

Source: Own calculations based on Andersen et al. (2020) and Statistics Denmark.

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ABOUT ANALYSIS



As a consequence of Danmarks Nationalbank's role in society we conduct analyses of economic and financial conditions.

Analyses are published continuously and include e.g. assessments of the current cyclical position and the financial stability.

The analysis consists of a Danish and an English version. In case of doubt regarding the correctness of the translation the Danish version is considered to be binding.

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