

DANMARKS NATIONALBANK

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The response of household customers to negative deposit rates



Negative deposit rates more widespread

Negative deposit rates for household customers are now being applied by most banks in Denmark. Furthermore, the banks have gradually reduced the thresholds for when negative interest rates are imposed.

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Reduction in deposits following announcements

There are indications that household customers reduce their deposits when their bank announces negative interest rates. However, household customers' total deposits have increased during the period of negative deposit rates.

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Announcement increases demand for investments

Household customers appear to increase their demand for investment fund shares and switch their deposits to pool schemes when faced with prospects of negative deposit rates.

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Low for long

Denmark was the first country to introduce negative monetary policy rates in 2012. Since then, Switzerland, Sweden, Japan and the euro area have followed suit.

Very low and in some cases negative interest rates have characterised the past decade across the advanced economies. There are several reasons why interest rates have fallen to the current low levels. Low interest rates reflect the fact that inflation has been subdued in many countries, but structural changes in household and corporate savings and investment behaviour are also part of the explanation.

These developments have brought monetary policy and the economy into uncharted waters, which is why Danmarks Nationalbank will be issuing a series of publications on the topic.

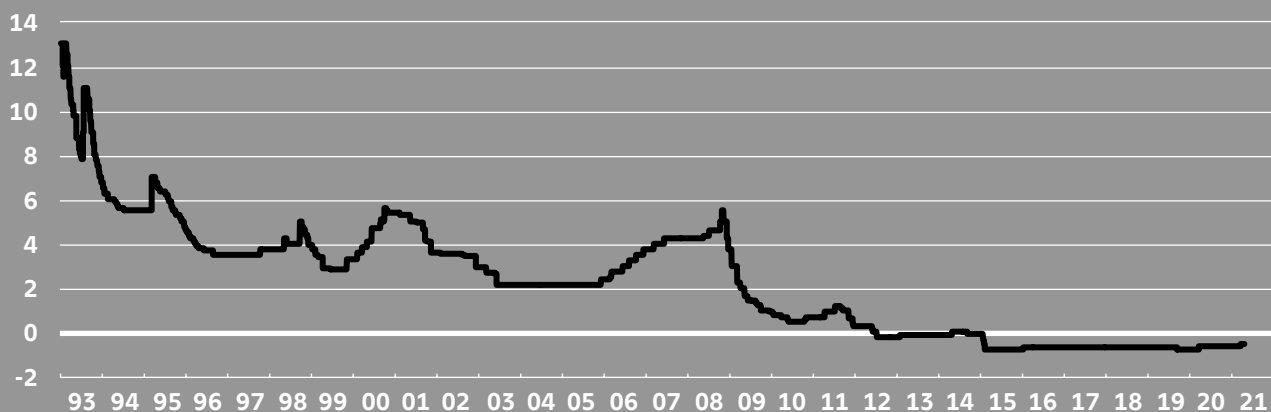
ABOUT THIS ANALYSIS

Most banks in Denmark have now introduced negative deposit rates for household customers. Furthermore, the banks have gradually reduced the thresholds for when negative interest rates are payable.

There are indications that household customers reduce their deposits when their bank announces negative interest rates. Household customers also appear to react to the prospects of negative deposit rates by increasing their demand for investment fund shares and by switching their deposits to pool schemes.

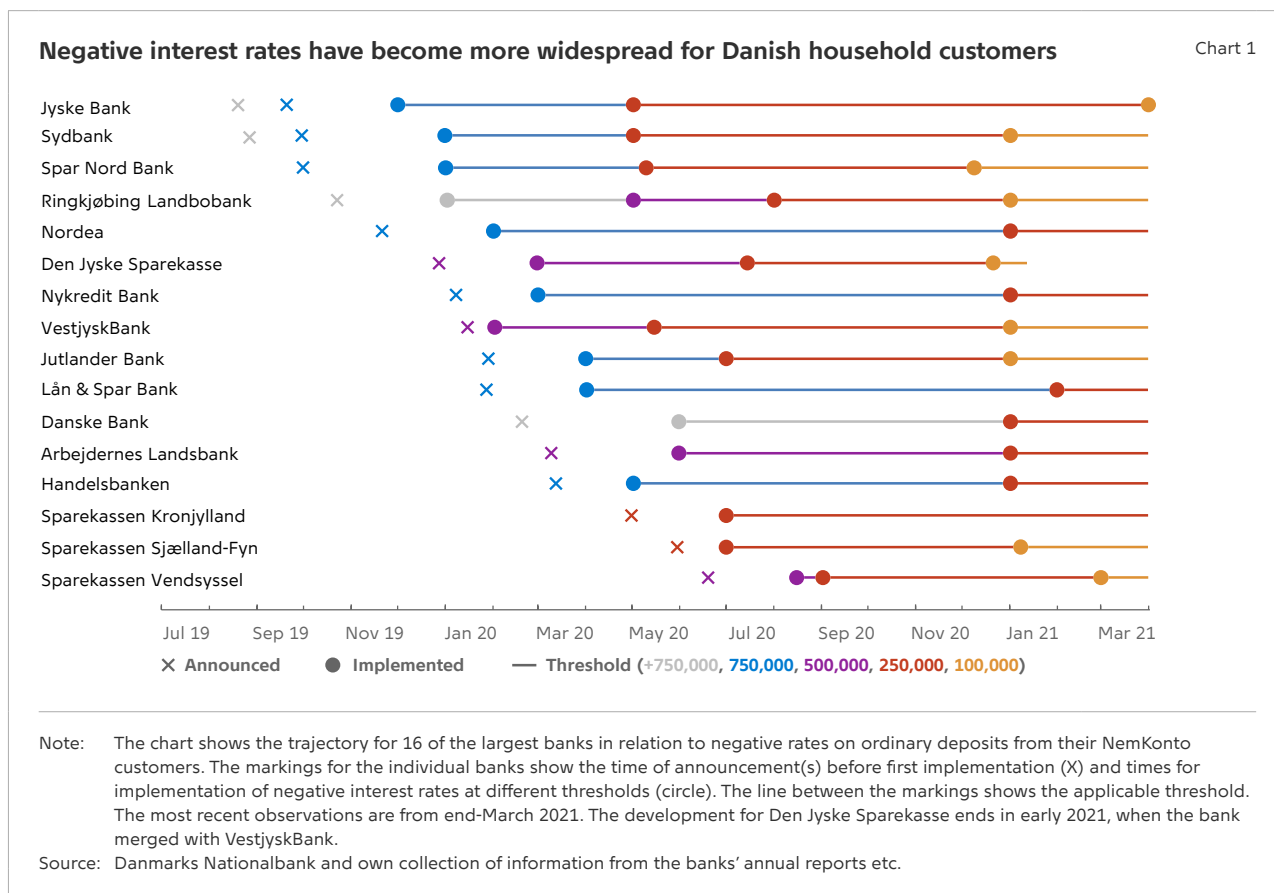
Danmarks Nationalbank's interest rate

Per cent



Danmarks Nationalbank's key interest rate has been negative since the summer of 2012, with the exception of a brief period in 2014.





The benchmark monetary policy interest rate in Denmark has mostly been negative since July 2012. Negative monetary policy rates were introduced by Danmarks Nationalbank to maintain the fixed exchange rate of the Danish krone against the euro. However, negative interest rates influence the financial sector and the economy more broadly.¹ Whereas banks started introducing negative deposit rates for corporations in early 2015 as a reaction to negative monetary policy rates, they have been more reluctant to follow suit for their household customers. In August 2019, Jyske Bank announced as the first bank in Denmark that it would introduce negative deposit rates for household customers with effect from December 2019, see Chart 1.

Negative deposit rates were initially applied to deposits over kr. 750,000.² Most banks in Denmark

have subsequently introduced negative deposit rates, including 16 of the largest banks. At the same time, the thresholds have been gradually reduced, so that negative interest is typically added if a household customer's deposits exceed kr. 100,000 or kr. 250,000, see Chart 1. These thresholds apply if the customer is a NemKonto customer with the bank. Otherwise, the thresholds are usually lower. The increased use of negative deposit rates is an indication that negative monetary policy rates are increasingly being transmitted through the banking sector as is the case with positive rates.

Large increase in proportion of household customers' deposits subject to negative interest

In many banks, the latest reductions of the thresholds for negative interest rates entered into force at

1 See, for example, Krogstrup et al. (2020) for a discussion of the Danish experience with negative interest rates ([link](#)).

2 In connection with the first announcement, the threshold was kr. 7.5 million. However, this threshold was never implemented.

the beginning of 2021, see Chart 1. The reductions meant that the volume of deposits subject to negative interest rates more than doubled from December 2020 to January 2021. Danmarks Nationalbank's latest survey on the prevalence of negative deposit rates³ shows that 35 per cent of household customers' deposits (excluding pool schemes) were subject to negative interest rates in February 2021, see Chart 2. This is equal to kr. 294 billion. The share of household customers that experience negative interest rates is lower than the prevalence of negative interest rates would immediately suggest. Supplementary information from 10 of the surveyed banks⁴ shows that at least 20 per cent of household customers paid negative deposit rates on parts of their deposits in February 2021.

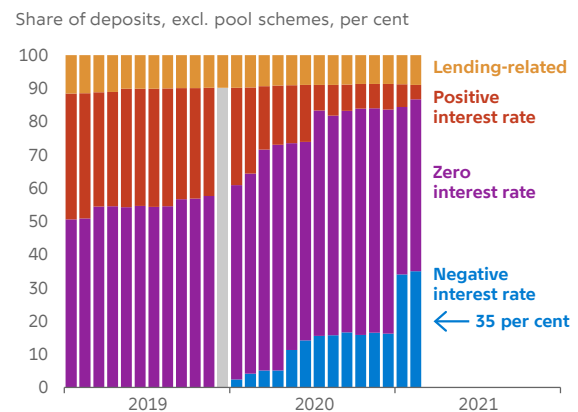
The lower share of household customers who are subject to negative deposit rates reflects that deposits are unevenly distributed. The latest figures for individual deposits from the end of 2019 thus show that only 34 per cent of household customers held deposits (excl. pool schemes) in excess of kr. 100,000, while just 17 per cent held deposits in excess of kr. 250,000, see Chart 3. Nevertheless, nearly half of the total deposits were above a threshold of kr. 250,000.

Particular effects on customer behaviour may be linked to negative nominal interest rates

While it is a new situation that household customers' deposits bear negative interest, there has long been a negative real return on bank deposits, in terms of inflation-adjusted interest. The negative real return reflects that inflation has exceeded average deposit rates since 2017, see Chart 4. The same was largely the case in the 1970s.⁵

The real return on savings is the relevant factor for the ability of household customers to plan their spending profile over time. In principle, spending and savings decisions should therefore be expected to reflect the development in real returns. However, a separate effect on household customers' behaviour

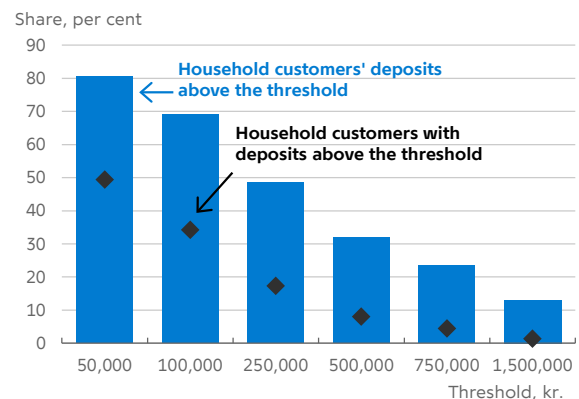
Chart 2
Large increase in share of deposits subject to negative interest rates in 2021



Note: Lending-related deposits are demand deposits that are offset by the undrawn portion of the limit of, for example, a mortgage-like bank loan and which typically bear interest as loans. The distribution for December 2019 is not shown due to confidentiality.

Source: Danmarks Nationalbank.

Chart 3
Limited share of household customers with deposits above the most widely used thresholds



Note: Deposits for adult household customers (18 years or above). The columns show the share of household customer's total deposits (excl. pool schemes) that is above the threshold. The dots show the share of customers in relation to the total adult Danish household customers with deposits above different thresholds. Stylised calculations based on register data for household customers' total deposits (excl. pool schemes) at year-end 2019. The share of deposits above the threshold is not directly comparable with the share of deposits with negative interest rate in Chart 2.

Source: Own calculations based on data at personal level from Statistics Denmark.

³ The survey covers 90 per cent of household customers' (employees, pensioners etc.) total deposits (excl. pool schemes) in February 2021.

⁴ The 10 banks together cover 72 per cent of household customers' total deposits (excl. pool schemes) in February 2021.

⁵ The trend would be even clearer if interest rates were adjusted for the related tax payments.

may be triggered when the nominal interest rate becomes negative. For example, there are indications for corporations that they change banks to a greater extent if they are charged negative deposit rates.⁶ One possible effect is thus that household customers also react by changing banks or that they restructure their portfolios towards other assets than deposits. Corporations also respond to negative interest rates by investing and hiring employees to an extent that goes beyond what the size of the interest rate reduction would normally warrant. It is correspondingly conceivable that household customers will react by increasing their spending or investing more in housing.

Household customers reduce deposits with banks that announce negative interest rates

Data for 16 of the largest banks indicate that household customers reduce their deposits with a bank when it announces negative deposit rates.⁷ Chart 5 shows the development in the banks' deposits before and after the announcement of negative deposit rates relative to the development in deposits with the banks which had not yet announced negative deposit rates at the time in question. Seen across the banks that announced negative interest rates, deposits fell by an average of approximately 2 per cent in the first four months after the announcement, where deposits had generally been increasing in the run-up to the announcement. The decrease is in contrast with the other banks, which generally saw increasing deposits in the same periods.⁸

The change in deposit growth is broadly based, with the 16 banks in the analysis all having had a lower average monthly growth in deposits in the four months immediately following the announcement of negative interest rates relative to the preceding six months, see Chart 6. There are also indications that the reaction has been most pronounced for the banks that announced the lowest thresholds for

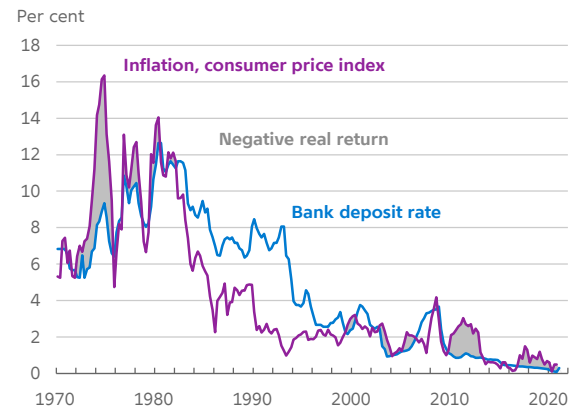
⁶ See Abildgren and Kuchler (2020) for an analysis of how Danish corporations react to negative deposit rates ([link](#)).

⁷ The delimitation vis-à-vis the largest banks reflects that monthly data are only available for these banks.

⁸ It cannot be ruled out that a bank's deposits also decrease to some extent following an interest rate reduction in positive territory. Based on the analysis, it is not possible to isolate the effect that is due to negative interest rates from the overall effect on deposits from an interest rate reduction.

Real return on deposits has previously been negative

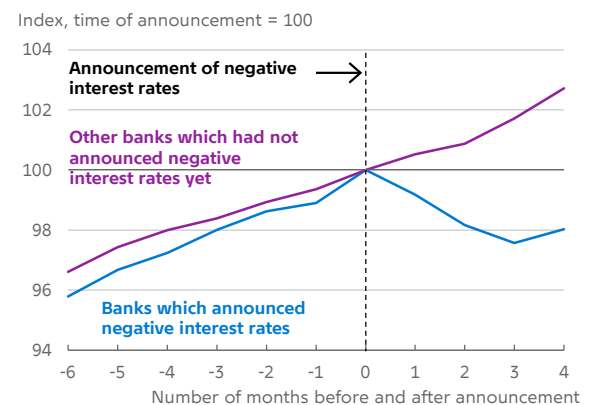
Chart 4



Note: Data on bank deposit rates up to and including 2002 include both households and corporations, while data from 2003 are for households and sole proprietorships.
Source: Abildgren (2020), Danmarks Nationalbank and Refinitiv Eikon.

Banks' deposits fell after announcement of negative interest rates

Chart 5



Note: The chart shows the average development in deposits around the time of the announcement of negative interest rates. In the trajectory for banks that announced negative interest rates, these negative rates were announced between time 0 and 1. The trajectory for the other banks comprises banks that only announce negative interest rates later on. The chart is based on data for 16 of the largest Danish banks, where the trajectory for banks that announced negative interest rates reflects the average trajectory of the 10 banks that first announced negative interest rates. The deposits are exclusive of pool schemes and seasonally adjusted. See also appendix for further details on data and methodology.

Source: Danmarks Nationalbank and own calculations.

negative interest rates. Seen in isolation, the lower growth in deposits in the four months following the announcement corresponds to an overall decrease in the 16 banks' deposits (excl. pool schemes) of approx. kr. 25 billion.⁹

The banks announced their negative interest rates at different times. This makes it possible to compare developments for the banks that announced negative interest rates with those that did not. The different announcement times reduce the probability that the decrease in deposit growth after announcement of negative deposit rates is due to another event that has an effect across banks. It is therefore highly likely that the different developments in deposits can be attributed to the announcement of negative deposit rates. This behavioural effect of negative interest rates is confirmed by several banks in their annual reports or in written reports to Danmarks Nationalbank.¹⁰

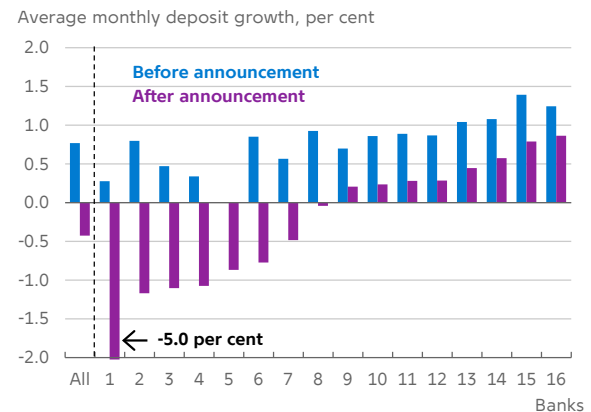
Household customers' total bank deposits have increased

Although household customers react by reducing their deposits with their bank in the months following an announcement of negative deposit rates, their total deposits in the banking sector as a whole have increased during the period with negative interest rates. The increase in household customers' demand deposits was kr. 50.4 billion in 2020, which is an increase on a par with the previous years, see Chart 7.

The continued increase in deposits should be seen in light of a number of factors, including that household customers' savings have increased. One reason for the increase in savings is that the lockdown of Danish society due to the coronavirus pandemic has reduced household spending opportunities, and another reason is that Danish households have received significant disbursements of frozen holiday pay funds. In addition, customers may reduce their deposits with their bank without this reducing

After announcement, growth in deposits fell in all 16 banks in the analysis

Chart 6

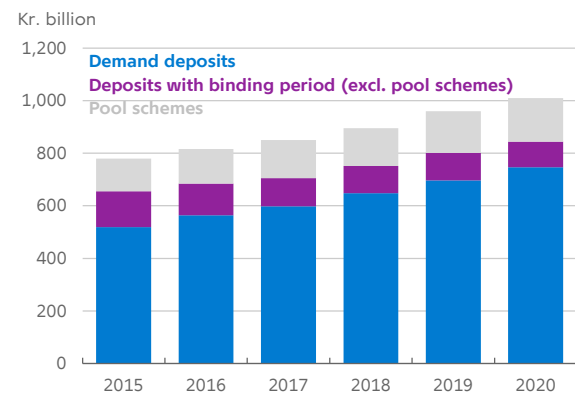


Note: Average monthly growth in employees' and pensioners' seasonally adjusted deposits, exclusive of pool schemes, for 16 of the largest banks. The banks are ranked based on their deposit growth after announcement. The period before announcement is six months and the period after announcement is four months.

Source: Danmarks Nationalbank and own calculations.

Total deposits have increased despite prevalence of negative interest rates in 2020

Chart 7



Note: Deposits year-end for Danish household customers (employees and pensioners et al.).

Source: Danmarks Nationalbank.

9 On the assumption that the growth in deposits before and after the announcement had been the same in a scenario without the announcement of negative interest rates.

10 See, for example, Jyske Bank's annual report for 2020: "To an increasing degree, the negative interest rate environment was reflected in deposit rates for personal clients. More clients began to invest instead of holding cash deposits."

household customers' total deposits.¹¹ For example, some customers may have moved their deposits to other banks.¹² While deposits will be reduced in the bank that announces negative interest rates, it has no effect on household customers' total deposits. Likewise, the purchase of a new home, for example, will typically lead to a decrease in the buyer's bank deposits, while, other things being equal, the seller's deposits will increase.

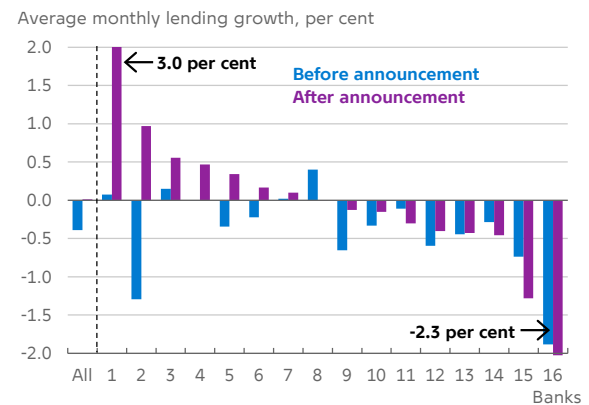
Household customers have not reduced their total bank debt

If household customers react to negative interest rates by reducing their debt, this will reduce both deposits and lending. Such a reaction is seen for corporations that are faced with negative interest rates.¹³ However, there are no indications that lending to household customers decreases when banks announce negative deposit rates. On the contrary, for 11 of the 16 banks in the analysis, lending growth increased in the months immediately following the announcement, see Chart 8. The increase may reflect that some customers have reacted to negative deposit rates by acquiring durable consumer goods such as a car, buying a more expensive home or improving their current home. These expenses may be financed by a combination of a reduction in deposits and raising of new debt.

The incentive for households to reduce their deposits through repayments on their debt depends on the deposit rate relative to the lending rate. On this basis, the incentive to make repayments on debt is not greater than what has normally been the case. The margin between the banks' average deposit rate and lending rate is currently 3.6 percentage points. This is low relative to the period since 2003 seen as a whole, see Chart 9. The narrowed margin reflects the reluctance of the banks to introduce negative deposit rates for household customers, whereas the decrease in monetary policy interest rates has had a larger impact on lending rates.¹⁴ The prevalence

Banks' lending growth has generally increased since the announcement

Chart 8

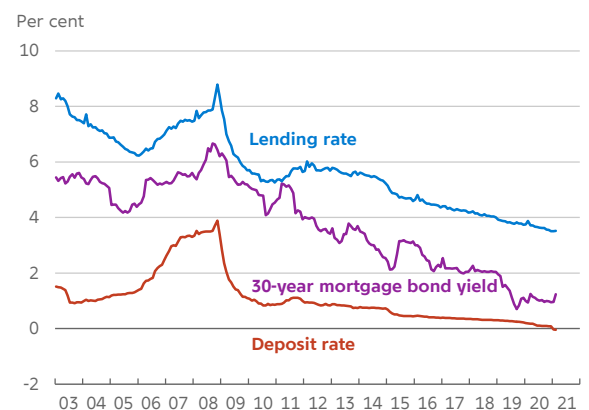


Note: Average monthly growth in seasonally adjusted bank lending for 16 of the largest banks. Periods follow the notes in previous charts. Ranked by highest lending growth after announcement.

Source: Danmarks Nationalbank and own calculations.

Lending rates have fallen more than deposit rates since 2012

Chart 9



Note: Household deposit and lending rates are incl. sole proprietorships. The 30-year mortgage rate is excl. administration margin.

Source: Refinitiv Datastream and Danmarks Nationalbank.

11 See also Box 4 in Danmarks Nationalbank (2021) for a discussion of factors affecting household customers' total bank deposits ([link](#)).

12 Abildgren and Kuchler (2020) find that some corporations change banks when they are charged negative deposit rates ([link](#)).

13 See Abildgren and Kuchler (2020) ([link](#)).

14 See Adolfsen and Spange (2020) for an analysis of how bank lending rates have responded to negative monetary policy interest rates ([link](#)).

of negative interest rates on deposits thus reflects a gradual normalisation of the banks' interest rate pass-through.

Even based on the assumption of an annual deposit rate of -0.6 per cent, which is typically the banks' lowest rate, there is a margin to the banks' average lending rate of 4.1 percentage points. This is lower than the average difference between the banks' average deposit and lending rates to household customers since 2003. The margin between deposit rate and long-term interest rates, expressed as the yield on a 30-year mortgage bond, is also at a low level.¹⁵

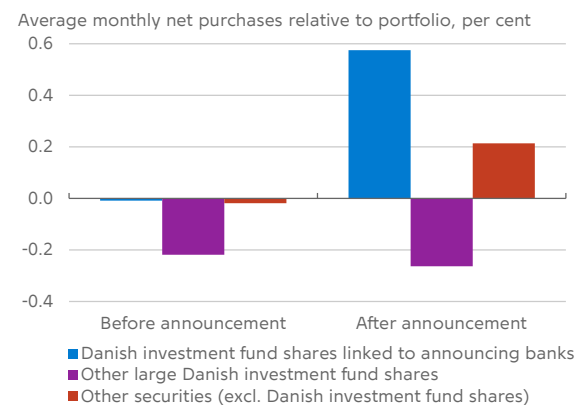
Increased demand for investment products

There are indications that some household customers have reacted to the prospects of negative deposit rates by buying investment fund shares. Overall, household customers have purchased securities for kr. 49 billion net in 2020, which is high relative to previous years. A significant part of these purchases have been made with investment funds. Investments tend to increase in the investment funds that are attached to banks that announce negative deposit rates, see Chart 10. There is a greater increase here than in the other large Danish investment funds. Seen in isolation, this corresponds to additional purchases of investment fund shares in investment funds attached to banks with negative interest rates amounting to net kr. 6.7 billion after announcement of negative interest rates. The additional purchases of kr. 6.7 billion can be compared with the banks experiencing a decrease in deposits (excl. pool schemes) of kr. 25 billion in the period around the announcements.

The increase in purchases of investment fund shares in investment funds attached to banks announcing negative interest rates is also stronger than for investments in other types of securities as a whole, which have also increased after these announcements. For other securities, household customers have especially increased their net purchases of foreign equities. If households as a whole react to negative deposit rates by buying securities, this will reduce their total deposits.

More investments in investment funds attached to banks using negative interest rates

Chart 10



Note: The blue columns show the average net purchases in investment funds under the management companies directly attached to the five largest banks in the periods before and after the banks' announcement of negative interest rates. Periods follow the notes in Chart 5. The purple and red columns show the net purchases for the same periods, however, the issuers do not have an attached bank which announces negative interest rates during the period. *Net purchases* are stated as share of portfolio in January 2020. The purchases can be regarded as an overestimate, as reinvested dividends are included as purchases in the statistics. The picture shown by the chart is robust to different methods of correcting for reinvestments. Data for Danish investment funds are based on investment fund shares issued by the seven largest investment funds, which together constitute approximately 90 per cent of household customers' direct holdings of IF shares. See also the appendix for more details on data and methodology.

Source: Danmarks Nationalbank and own calculations.

¹⁵ The low long-term interest rates reflect a number of factors, including the European Central Bank's asset purchase programmes, which have pushed down long-term interest rates in the euro area. As a result of the Danish fixed exchange rate policy, the asset purchase programmes have an approximately corresponding effect on Danish interest rates.

There are also signs that some household customers have chosen to move some of their demand deposits to pool schemes (e.g. pension pools, savings pools for children and grandchildren etc.). A pool scheme is a savings scheme with a binding period in which the deposit is invested in securities, and the addition of interest therefore reflects the market return generated by the pool. In practice, this means that deposits linked to a pool scheme are to be regarded as an investment product.¹⁶ Eight in 12 of the big banks, among which pool schemes are a widespread product, have experienced higher monthly growth in pool schemes following the announcement of negative interest rates.¹⁷

Concluding reflections

Negative deposit rates for household customers are another relatively new phenomenon, which may become more widespread in the future. For example, Jyske Bank reduced its negative deposit rate threshold from kr. 250,000 to kr. 100,000 with effect from 31 March 2021, and the effect of this reduction is not yet included in the statistics for the share of deposits that are subject to a negative interest rate. Household reaction may also develop in line with households getting used to a situation with possible negative interest rates. The effect of negative deposit rates is therefore an area with a significant scope for future analysis as more data becomes available.

Literature

Abildgren, Kim Padkjær (2020), A Chart & Data Book on the Monetary and Financial History of Denmark, *Working Paper*, June.

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Krogstrup, Signe, Andreas Kuchler and Morten Spange (2020), Negative interest rates: The Danish experience, www.VoxEU.org, 2 October.

16 Statistically, pool schemes are included in the deposits, and a switch from demand deposits to a pool scheme therefore has no effect on the figures for total deposits.

17 Valuation effects are disregarded here, as the focus of the analysis is on household customers' transactions.

Appendix

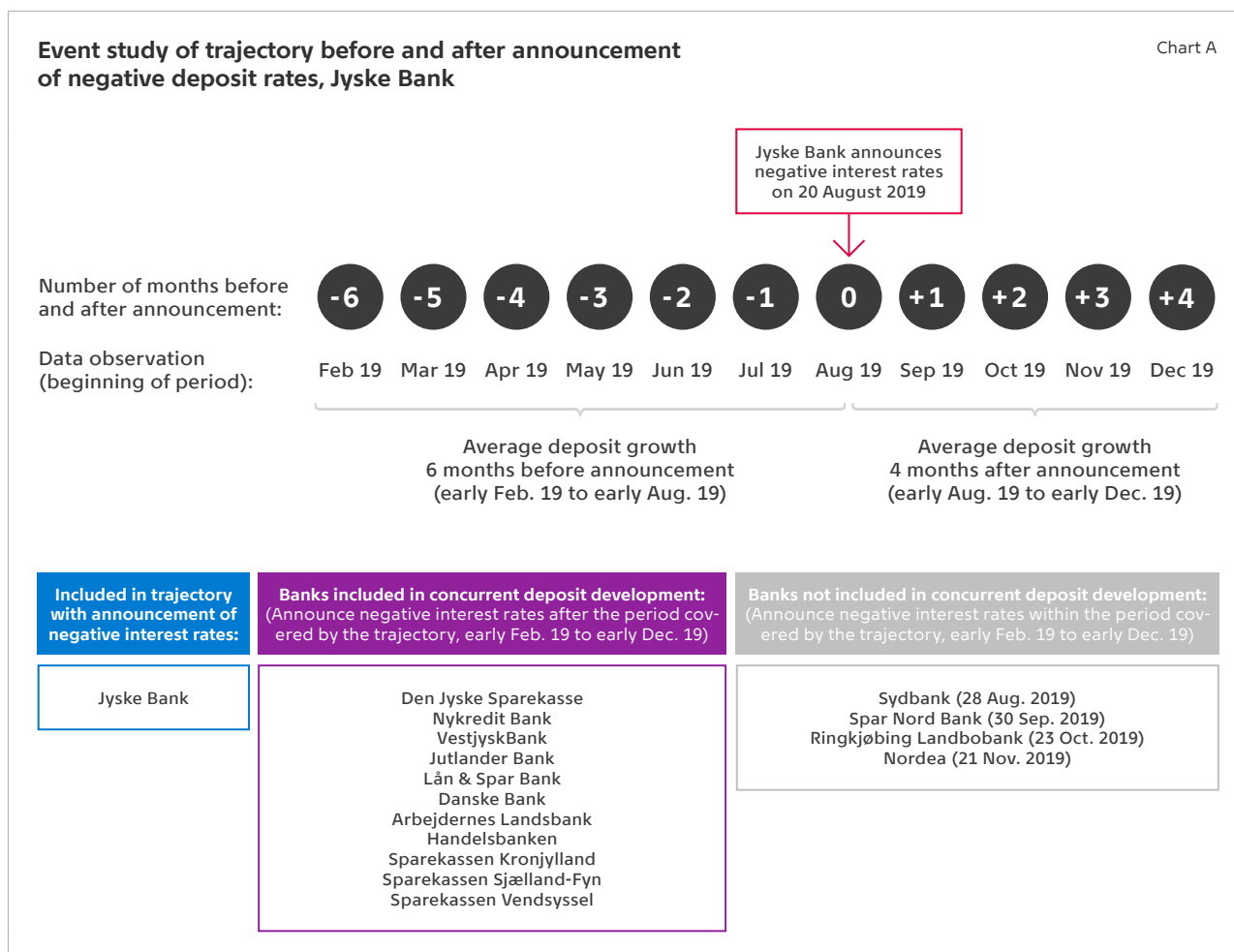
Event study of trajectory before and after announcement of negative deposit rates

Chart 5 of the analysis uses an event study to analyse the evolution in deposits in banks that announce negative interest rates, compared with the concurrent development in other banks. The study is based on monthly data for 16 of the largest Danish banks, see Table A. For each bank that announces negative interest rates, a trajectory is constructed for deposits around the announcement time for the bank itself and for a group of 'other banks which had not announced negative interest rates yet'. The blue and purple series in the chart have been calculated as averages across banks.

A bank is included in the trajectory for 'other banks' if it does not announce negative interest rates until at least four months after the announcement date of the announcing bank. The curves for the deposits

for the announcing bank and other banks in Chart 5 of the analysis largely coincide prior to the time of the announcement. The identification of the effect of the announcement of negative interest rates is based on two assumptions: firstly that the deposit trajectory for 'other banks' is not affected by negative interest rates, and secondly that the difference between the two curves in the period after the time of announcement is thus an expression of the effect of announcing negative interest rates. See Chart A for an example based on Jyske Bank.

The number of banks involved in the trajectory of announcement of negative interest rates (the blue curve in Chart 5) is limited to 10. The reason for this is that there is too narrow a basis of comparison for the six banks that have most recently announced negative interest rates. Den Jyske Sparekasse, Nykredit Bank, VestjyskBank, Jutlander Bank and Lån & Spar Bank are included both under their own trajectory with announcement of negative interest rates (blue series) and at times when they have not



yet announced negative interest rates themselves (purple series).

Chart 10 of the analysis uses a corresponding event study to examine the development in household customers' own investments in securities, in particular investment fund shares. For the analysis of household customers' own investments through investment funds run by management companies attached to a bank that announces negative interest rates, it has been exploited that several of the large banks

have their own management company for investment funds. The connectedness between the investment funds' management companies and the banks is shown in Table B. The focus is on the large Danish management companies for investment funds, which cover approximately 90 per cent of household customers' own investments in Danish investment funds. The same procedure as for the banks' deposits has been used to illustrate the concurrent trajectories for other large Danish investment funds.

Data basis for calculations of deposit trajectories in Chart 5

Table A

	Trajectory with announcement of negative interest rates (blue line)	Concurrent trajectory without announcement (purple line)
Jyske Bank	X	
Sydbank	X	
Spar Nord Bank	X	
Ringkjøbing Landbobank	X	
Nordea	X	
Den Jyske Sparekasse	X	X
Nykredit Bank	X	X
VestjyskBank	X	X
Jutlander Bank	X	X
Lån & Spar Bank	X	X
Danske Bank		X
Arbejdernes Landsbank		X
Handelsbanken		X
Sparekassen Kronjylland		X
Sparekassen Sjælland-Fyn		X
Sparekassen Vendsyssel		X

Note: The colour mentioned in brackets refers to the entity having been used to calculate the series in question in Chart 5. The banks are ranked according to date of announcement of negative deposit rates.

Data basis for calculations of investment trajectories in Chart 10

Table B

	Trajectory for investment fund attached to one specific bank (blue column)	Concurrent trajectory for purchases of other Danish large investment fund shares (purple column)
Jyske Invest Fund Management (Jyske Bank)	X	
Syd Fund Management (Sydbank)	X	
Nordea Funds (Nordea)	X	
Sparinvest and Nykredit Porteføljefølg Administration (Nykredit Bank)	X	X
Danske Invest Management (Danske Bank)	X	X
BI Management (Multiple banks)		X

Note: The colour mentioned in brackets refers to the entity having been used to calculate the series in question in Chart 10.

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