

# DANMARKS NATIONALBANK

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## Positive pass-through from negative rates



### International debate on the impact of negative rates

A number of countries have introduced negative monetary policy interest rates. Concern has been expressed that negative rates could, in some cases, have undesirable effects on bank lending rates.

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### Negative rates stimulate lending in Denmark

In Denmark, the pass-through to bank lending rates remains positive, and there are no indications to suggest that negative rates have weakened bank lending.

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### Lower pass- through for banks with high risk

The pass-through of monetary policy interest rates to bank lending rates slowed around the financial crisis, driven primarily by the banks with the highest risk exposure before the crisis.

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## Positive pass-through from negative rates

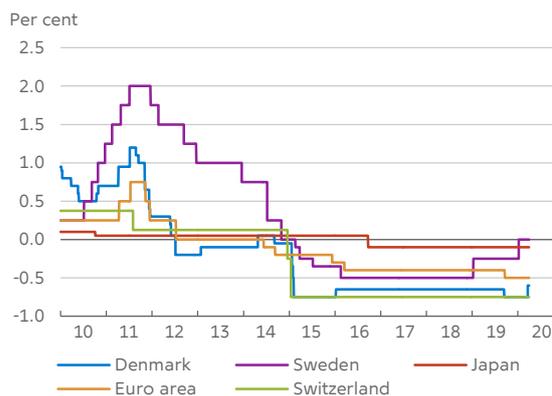
Except for a few months in 2014, Danmarks Nationalbank's key monetary policy interest rate – the rate of interest on certificates of deposit – has been negative since July 2012. Monetary policy interest rates are also negative in the euro area, Switzerland and Japan, while Sveriges Riksbank recently raised the repo rate to zero after almost five years in negative territory, cf. Chart 1.

Negative rates in a number of countries have triggered a debate over whether negative rates have, in some cases, led to higher bank lending rates and lower lending growth. In the normal transmission of monetary policy, banks respond to a lowering of monetary policy interest rates by cutting deposit and lending rates, which stimulates lending.<sup>1</sup> Therefore, it is being debated whether the impact of monetary policy has reversed. However, a study based on Danish banks does not indicate that the interest rate pass-through has reversed, cf. Adolfsen and Spange (2020).<sup>2</sup> Instead, negative rates have led to a further reduction in bank lending rates, and there are no indications either that negative rates have been contractionary for lending. Consequently, in Denmark, the pass-through of negative rates to lending rates has been similar to what follows from very low – but positive – interest rates.<sup>3</sup> But the pass-through has slowed.

The idea that negative rates could impair lending is based on the assumption that negative rates squeeze banks' earnings, thereby reducing their capital. Generally, banks' net interest income has declined as a result of negative rates. This, to a great extent, reflects that banks have been reluctant to pass on negative deposit rates to depositors. In a Danish context, this is mainly the case for household deposits, while firms have been charged negative deposit rates for quite some time, cf. Chart 2. In

**Negative monetary policy interest rates in several countries**

Chart 1



Note: Key monetary policy interest rates.  
 Source: Thomson Reuters Datastream and Danmarks Nationalbank.

other words, the overall pass-through to deposit rates has clearly been reduced.

According to a model-based analysis, weaker bank earnings could cause banks to cut down on lending.<sup>4</sup> In theory, there could be a lower bound on the monetary policy interest rate, below which further interest rate cuts will lead to higher bank lending rates and be contractionary for lending. In the literature, this bound has been dubbed the 'reversal rate'. A monetary policy rate decrease below the reversal rate means that any further cuts will act as a tightening of monetary policy.

A number of studies have examined how banks in various countries have responded, in practice, to

1 In Denmark, negative rates have been introduced to keep the Danish krone stable against the euro – not in order to stimulate lending.

2 This approach follows the study conducted by Eggertsson et al. (2019).

3 See also Jensen and Spange (2015) for a review of how the introduction of negative rates in Denmark affected the interest rate pass-through and the demand for cash.

4 See Brunnermeier and Koby (2019).

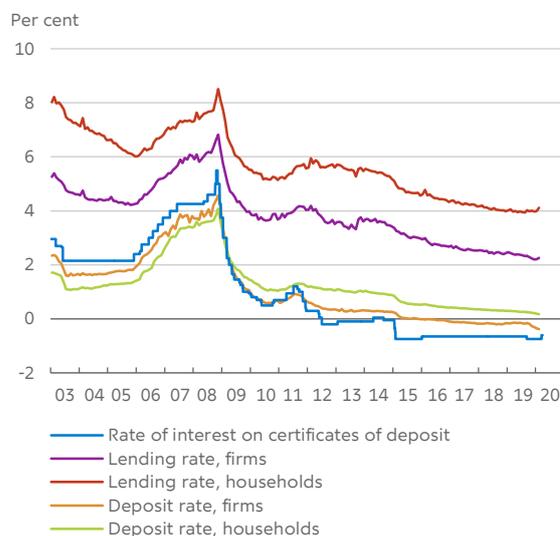
negative monetary policy interest rates. The findings are not uniform across studies. One study based on Swedish banks argues that banks have responded to cuts in monetary policy interest rates by raising lending rates and cutting down on lending – i.e. a reversal of the normal monetary policy transmission.<sup>5</sup> Conversely, an analysis by Sveriges Riksbank argues that negative rates have helped to stimulate the Swedish economy.<sup>6</sup> A number of studies have also found that negative rates have helped to stimulate bank lending in the euro area or in selected euro area member states.<sup>7</sup> In its official communication, the European Central Bank (ECB) has also stressed that negative rates have stimulated the economy.<sup>8</sup>

## Interest rate pass-through and lending growth in Denmark

Denmark was the first country to introduce negative monetary policy interest rates. Consequently, in view of the discussion above, it is relevant to analyse bank behaviour at negative rates in Denmark. An analysis based on data for 23 large and medium-sized Danish banks shows a continued positive relationship between monetary policy interest rates and bank lending rates to households and firms – also after the introduction of negative monetary policy interest rates. The findings of the analysis are illustrated in Chart 3, showing the pass-through from monetary policy interest rates to bank lending rates before and after the introduction of negative rates.<sup>9</sup> But following the transition to negative rates, banks have been slower in passing on changes in monetary policy interest rates to borrowers.

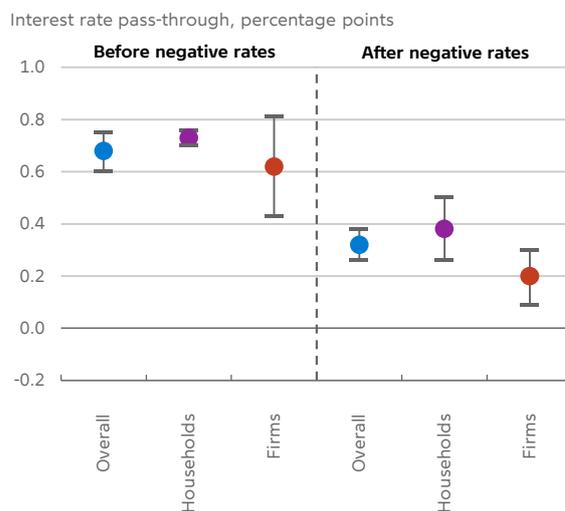
In Denmark, banks' reluctance to pass on negative deposit rates to households has negatively impacted bank earnings and this could, according to the

**Banks have been reluctant to pass on negative deposit rates to households** Chart 2



Note: Average bank interest rates and Danmarks Nationalbank's rate of interest on certificates of deposit.  
 Source: Danmarks Nationalbank.

**Interest rate pass-through remains positive** Chart 3



Note: Overall pass-through from a 1 percentage point change in the rate of interest on certificates of deposit to bank lending rates after three months. 'Overall' is a weighted average of bank rates to households and non-financial corporations. The circles represent the estimated interest rate pass-through, and the brackets indicate a 95-per cent uncertainty band attached to the estimate.  
 Source: Adolfsen and Spange (2020).

5 See Eggertsson et al. (2019). Heider et al. (2018) argue that the euro area has seen a similar pattern.

6 See Erikson and Vestin (2019).

7 See Altavilla et al. (2019), Bottero et al. (2019), Eisenschmidt and Smets (2018) and Demiralp et al. (2019).

8 See, for example, Lane (2019).

9 See Adolfsen and Spange (2020) for an elaboration on the methods and data underlying the findings presented in this analysis.

theory, cause them to tighten lending. Against that backdrop, especially banks that fund themselves extensively from household deposits are expected to see their earnings reduced as a result of the negative monetary policy interest rates. However, there is no clear relationship between bank deposit ratios and their interest rate pass-through, cf. Chart 4 illustrating the monetary policy interest rate pass-through to lending rates for banks with high and low household deposit ratios, respectively. The absence of a clear relationship is seen both before and after the introduction of negative monetary policy interest rates.<sup>10</sup>

Nor has the deposit ratio had an impact on the lending growth of individual banks during the negative interest rate period, cf. Chart 5 illustrating the average annual lending growth for banks with high and low household deposit ratios, respectively. Overall, in a Danish context, the analysis does not indicate that the transmission of negative monetary policy interest rates has reversed.

## Robust bank earnings despite negative rates

A key element of the hypothesis of the reverse pass-through from monetary policy interest rates to bank lending rates is that bank earnings come under pressure. But while, as anticipated, bank net interest income has declined following the introduction of negative rates, in a Danish context this decline has essentially been offset by higher earnings from fees and administration margins on mortgage loans, cf. Chart 6. Moreover, loan impairment charges have been very low for a number of years, reflecting, inter alia, low lending rates.<sup>11</sup> Internationally, there are also indications that negative rates have not significantly challenged bank earnings.<sup>12</sup>

There is a lower bound on bank deposit rates. This reflects that, in principle, it is always possible for a

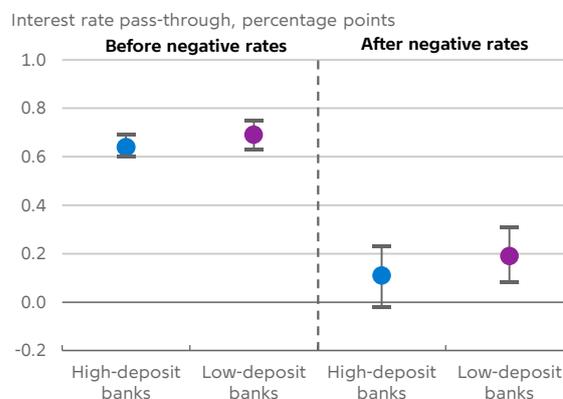
<sup>10</sup> The differences are not statistically significant at the five per cent level.

<sup>11</sup> See Danmarks Nationalbank (2019) for an elaboration of the impact of negative rates on bank earnings.

<sup>12</sup> See Lopez et al. (2019).

**Interest rate pass-through does not depend on bank deposit ratios**

Chart 4

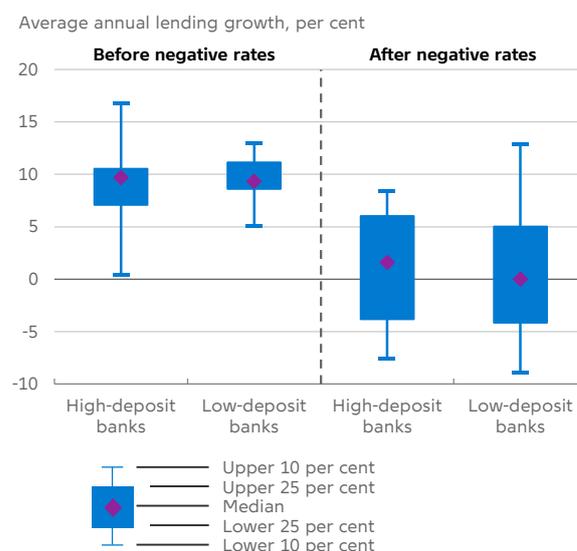


Note: Overall pass-through from a 1 percentage point change in the rate of interest on certificates of deposit to weighted bank lending rates to households and non-financial corporations after three months. High-deposit banks have a ratio of household deposits on their balance sheets that exceeds the median ratio – and vice versa for low-deposit banks. The circles represent the estimated interest rate pass-through, and the brackets indicate a 95-per cent uncertainty band attached to the estimate.

Source: Adolfsen and Spange (2020).

**Lending growth does not depend on bank deposit ratios**

Chart 5



Note: Average annual growth in bank lending to households and non-financial corporations. High-deposit banks have a ratio of household deposits on their balance sheets that exceeds the median ratio – and vice versa for low-deposit banks.

Source: Adolfsen and Spange (2020).

household or firm to have its deposit paid out in cash with a zero rate of interest. But storing and using large amounts of cash entail substantial practical challenges. In other words, the lower bound on interest rates is not set in stone. Firms have been charged negative deposit rates for several years, cf. Chart 7 (right). This is particularly the case for financial corporations such as insurance companies and pension funds.

In August 2019, Jyske Bank was the first Danish bank to announce that it would start charging negative rates on large household deposits, effective from December 2019. Since then, a number of other banks have followed suit. If negative rates are increasingly charged on household deposits, this is expected to reduce the impact of negative rates on bank earnings. The introduction of negative household deposit rates may further support the normal pass-through of interest rates. This means that bank deposit and lending rates are reduced and lending is stimulated as monetary policy interest rates are lowered.

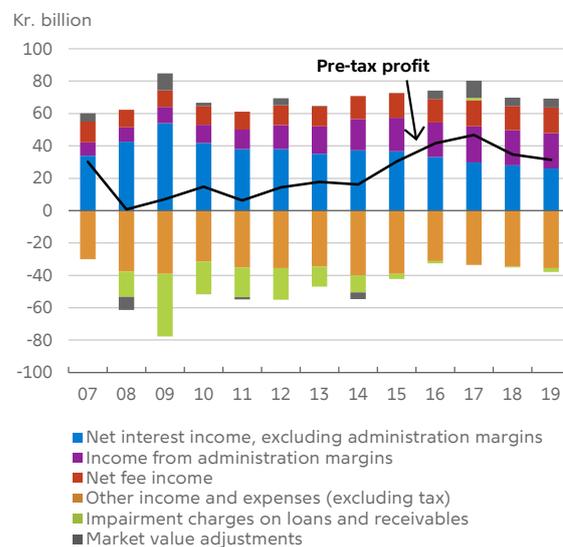
### Reduced pass-through since the financial crisis reflects compensation for risk

While the interest rate pass-through has remained positive, it has declined twice since the financial crisis, cf. Chart 8 illustrating the interest rate pass-through before and during the financial crisis and after the introduction of negative rates, respectively. A previous study of Danish banks has shown that the interest rate pass-through declined already in connection with the financial crisis in 2008-09, before interest rates moved into negative territory.<sup>13</sup> The pass-through decreased further in connection with the introduction of negative rates.

While the characteristics of individual banks, for instance their deposit ratios, do not seem to offer an explanation for major changes in pass-through following the transition to negative rates, one factor seems to have a significant impact on the decline in pass-through since the financial crisis: the risk profile

**High bank profitability despite lower net interest income**

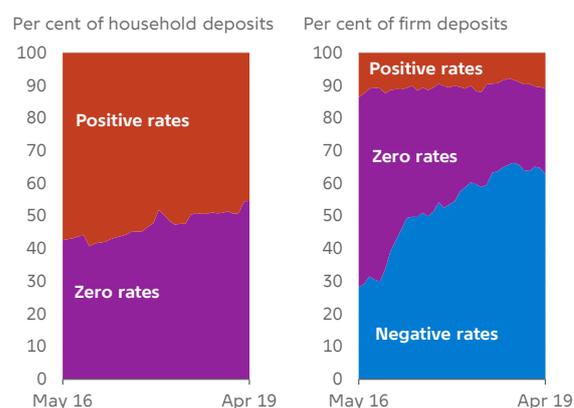
Chart 6



Note: Results for systemic banks (SIFI banks).  
 Source: Danmarks Nationalbank.

**Negative deposit rates to firms, but reluctance to charge households negative rates**

Chart 7



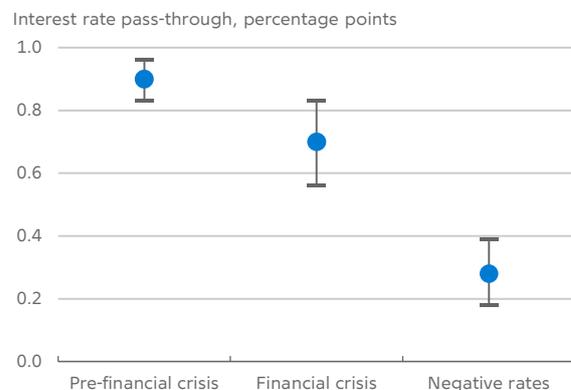
Note: Ratios of deposits with positive, zero and negative rates for households (left) and non-financial corporations (right).  
 Source: Danmarks Nationalbank.

13 See Drejer et al. (2011).

of banks' lending portfolios. There is a clear tendency for the decline in the interest rate pass-through in connection with the financial crisis to be driven by banks with relatively high lending risk.<sup>14</sup>

Prior to the financial crisis, there were no major differences in lending rates between high-risk and low-risk banks, cf. Chart 9. But in connection with the financial crisis, there was a clear tendency for banks that had accumulated a relatively more risky lending portfolio to be especially reluctant to lower lending rates in sync with the lowering of monetary policy interest rates. This could reflect that some banks failed to take sufficient account of their lending risk prior to the financial crisis and subsequently demanded higher compensation for higher risk. The difference in lending rates between high-risk and low-risk banks has been very persistent. In other words, the increased risk in bank lending portfolios in the aftermath of the financial crisis may have contributed to slower decline in bank lending rates than in monetary policy interest rates since 2009.

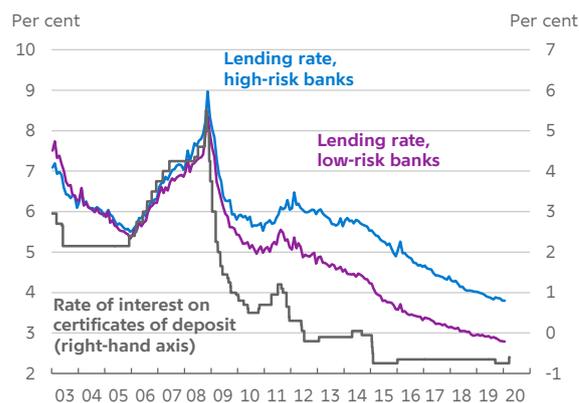
**Lower interest rate pass-through during the financial crisis and with negative rates** Chart 8



Note: Overall pass-through from a 1 percentage point change in the rate of interest on certificates of deposit to weighted bank lending rates to households and non-financial corporations after three months. 'Pre-financial crisis' indicates the period before November 2008, after which time the rate of interest on certificates of deposit started to decline. The circles represent the estimated interest rate pass-through, and the brackets indicate a 95-per cent uncertainty band attached to the estimate.

Source: Adolfsen and Spange (2020).

**Banks with a high risk on their lending portfolios buoyed up interest rates in the wake of the financial crisis** Chart 9



Note: Banks are divided into two equally large groups based on their lending risk profiles. Each bank's lending growth in 2006-07 is used to indicate their lending risk during and after the financial crisis. Subsequently, lending growth during this period has been found to be a good indicator of problems in the banking sector in the subsequent financial crisis, cf. Rangvid (2013). Moreover, lending growth in the immediate run-up to the financial crisis was strongly correlated both with the lending ratio outside the classification of good credit quality loans and with bank loan impairment charges in subsequent years.

Source: Danmarks Nationalbank and Adolfsen and Spange (2020).

<sup>14</sup> Each bank's lending growth during the years 2006-07 is used to express its lending risk. See Adolfsen and Spange (2020) for details.

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