

# DANMARKS NATIONALBANK

22 SEPTEMBER 2021 — NO. 23

MONETARY AND FINANCIAL TRENDS – SEPTEMBER 2021

## Accommodative financial conditions strengthen the upswing



### The economic upswing is backed by low interest rates and rising equity prices

The recovery has contributed to higher corporate earnings in Denmark and increasing equity prices. Danish long-term bond yields have increased slightly since March 2021, but remain at a low level. Financial conditions are accommodative for growth in GDP.



### Moderate increase in aggregate credit growth during 2021

Borrowing has risen, reflecting, in particular, increased mortgage borrowing without amortisation among homeowners. Credit growth is in line with GDP growth, but in the longer run higher housing prices could lead to additional credit growth.



### The Danish krone remains strong and the money market spread is relatively high

Banks that have historically been less active in the money market have had a larger share of the net position since March 2020. This may have contributed to maintain relatively high money market spreads against the euro area, and consequently contributed to a continued strong krone.

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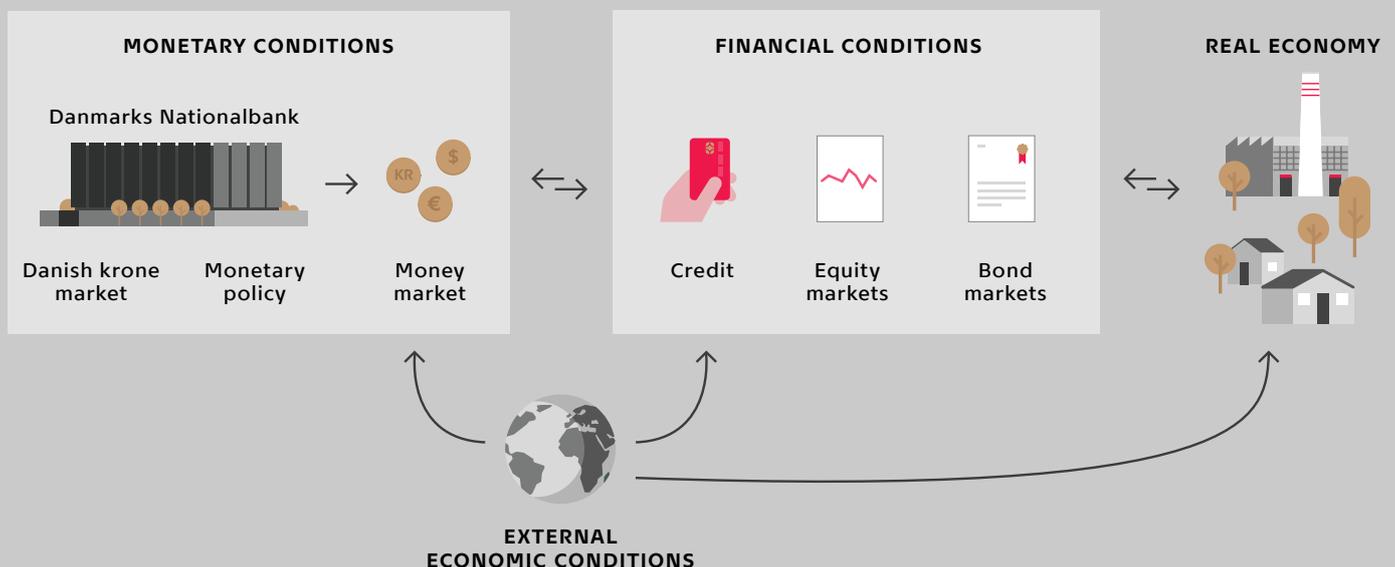
## Danmarks Nationalbank analyses monetary and financial conditions

Danmarks Nationalbank publishes the analysis Monetary and financial trends twice a year. The analysis covers e.g. the development in key fixed income and equity markets and the development in credit and in the Danish krone market.

Monetary and financial conditions are relevant to Danmarks Nationalbank for several reasons. First and foremost, the development in the money market is decisive for the Danish krone and hence the implementation of the fixed exchange rate policy towards the euro. In addition, the analysis of the financial conditions strengthens Danmarks Nationalbank's assessment of the current development of the Danish economy and of whether macro-financial imbalances are developing. An important element is the assessment of how Danmarks Nationalbank's monetary policy affects the financial and economic conditions in Denmark.

The most recent development in the real economy has been described in the analysis *Outlook for the Danish Economy*, which also contains Danmarks Nationalbank's forecast.

### Financial linkages



## Highlights

### DANISH KRONE

The last half year, the Danish krone has continued to be stable against the euro on the strong side of the central rate. Danmarks Nationalbank made intervention purchases of foreign exchange totalling about kr. 50 billion from February to July 2021.

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### MONEY MARKET

The strength of the Danish krone should, i.a., be seen in light of a positive spread between money market rates in Denmark and the euro area. Danish money market rates have declined slightly since March, but are close to Danmarks Nationalbank's lending rate.

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### EURO AREA MONETARY POLICY

The European Central Bank, ECB, has reviewed its monetary policy strategy and strengthened its forward guidance. This may have contributed to lowering market participants' expectations of future monetary policy interest rates over the summer.

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### BOND MARKET

Danish long-term bond yields have picked up slightly since mid-March. Interest rates increased during the recovery in the spring, but the rise was partly reversed over the summer. The interest rate drop during the summer should, i.a., be seen in the context of lower expectations for the ECB monetary policy interest rates.

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### EQUITY MARKET

The Danish C25 stock index has been increasing substantially since March, reflecting, among other things, a slight decrease in investors' required rate of return. Also, short-term earnings expectations have picked up, especially for transport operators.

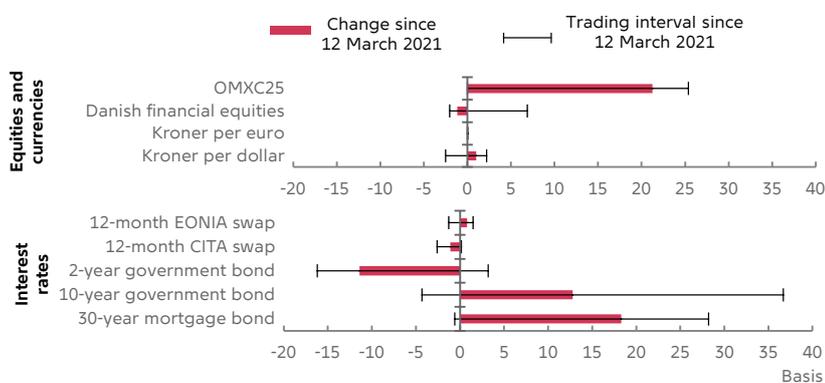
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### CREDIT AND MONEY

Negative deposit rates for household customers have become more prevalent. In July, several large banks lowered their limits for when negative rates kick in to kr. 100,000. Credit growth has picked up moderately since March, driven by, i.a., increased mortgage lending to households.

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### Higher equity prices and slightly higher long-term interest rates since March



Note: The endpoints of the black lines indicate the largest and smallest changes, respectively, over the period. The period is from 12 March until the cut-off date on 15 September 2021.  
 Source: Refinitiv Datastream og Eikon, Nordea Analytics and Danmarks Nationalbank.



Despite a slight increase since March, Danish long-term interest rates are low. The Danish economic upswing is supported by accommodative financial conditions.

## Economy and financial conditions

### During the spring, economic recovery and higher inflation helped push long-term interest rates higher

The pace of the economic recovery after the covid-19 lockdowns in early 2021 has been fast, both in Denmark and in the United States and the euro area.<sup>1</sup> The fast pace has put global supply chains under stress, contributing to higher transport, energy and commodity prices. This has been a contributing factor in the rise in consumer price inflation, see Chart 1.

Market participants' longer-term inflation expectations have also risen, bringing forward their expectations of monetary policy rate hikes by both the European Central Bank, ECB, and the Federal Reserve during the spring. On this background, long-term government bond yields increased in the United States until March and in the euro area and Denmark until mid-May, see Chart 2.<sup>2</sup>

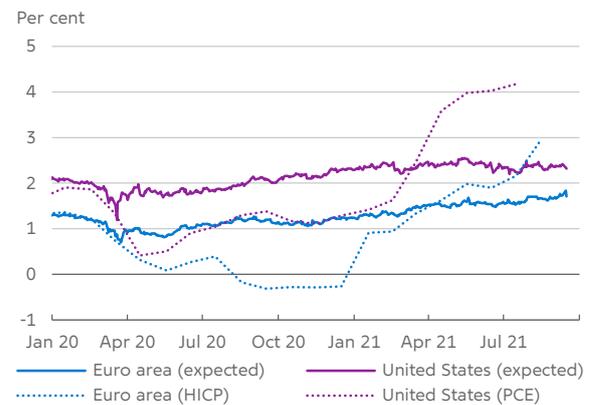
### Central bank communication regarding inflation may have contributed to interest rate declines over the summer

The Federal Reserve and the ECB have assessed that higher inflation in the United States and in the euro area is driven mainly by temporary factors. The central banks have also communicated that the currently higher inflation rates will not cause them to increase their monetary policy rates earlier than anticipated. This may have led to a partial reversal of the rise in long-term interest rates seen in the beginning of the year in the United States, the euro area and in Denmark over the summer.

The decline in interest rates should also be seen in the context of concerns related to rising covid-19 infections, particularly in June and July. Market participants believe that new covid-19 variants are among the greatest risk factors for the economic

Increased inflation and inflation expectations

Chart 1

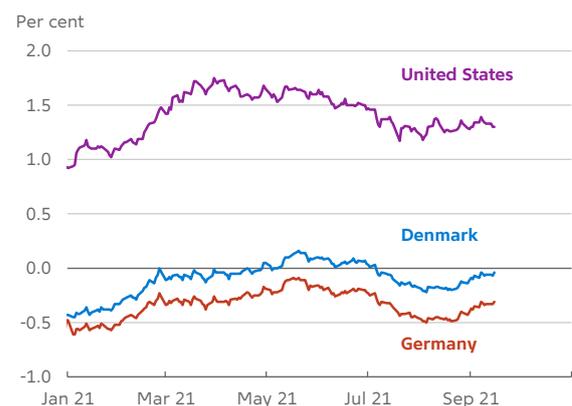


Note: Solid lines indicate 5-year market-based inflation expectations starting five years from now. Broken lines indicate realised inflation figures based on the EU Harmonised Index of Consumer Prices, HICP, for the euro area and the Personal Consumption Expenditures, PCE, deflator for the United States, respectively.

Source: Refinitiv Datastream and own calculations.

Long-term government bond yields increased in spring

Chart 2



Note: 10-year government bond yields with constant maturity.  
 Source: Nordea Analytics.

1 See Danmarks Nationalbank, The economy heading back towards a moderate boom, *Danmarks Nationalbank Analysis (Outlook for the Danish economy)*, No. 24, September 2021.

2 For more details, see Danmarks Nationalbank, Accommodative financial conditions support the real economy, *Danmarks Nationalbank Analysis (Monetary and financial trends)*, No. 6, March 2021.

recovery.<sup>3</sup> The surge in delta variant infections over the summer, along with the slower vaccination pace in the United States, may have fostered concerns about the strength of the economic recovery and thus have contributed to lower long-term interest rates in the United States, the euro area and in Denmark.<sup>4</sup> Moreover, US and European economic indicators suggest that the pace of the economic recovery is starting to decline. Economic indicators were still positive, but they were falling over the summer relative to consensus expectations.<sup>5</sup>

### ECB expects price pressures to rise only slowly

According to the ECB, underlying price pressures in the euro area are only building up slowly, and therefore considerable monetary policy stimulus is still needed. Through, for instance, its revised monetary policy strategy, the ECB has strengthened its forward guidance and conducted high net asset purchases from April to July, see the *Monetary policy and the money market* section. This may have contributed to lower long-term interest rates in the euro area and in Denmark over the summer.

At the latest ECB monetary policy meeting on 9 September, the ECB announced that asset purchases will subsequently be conducted at a moderately lower pace than in the previous two quarters. In the run-up to the meeting, interest rates in the euro area and Denmark had edged up slightly as expectations of a reduction in the pace of asset purchases were gradually building among market participants.

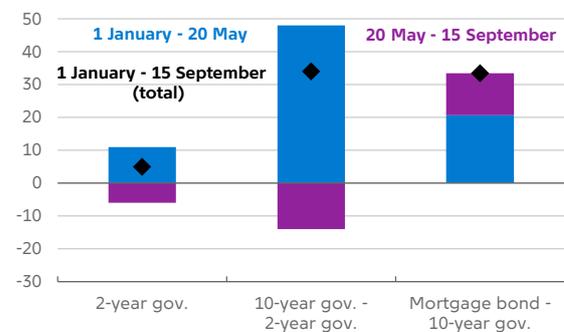
### Changed slope of the Danish yield curve

The development of the Danish 10-year government bond yield in 2021 reflects primarily changes in the slope of the yield curve. The spread between the 10-year and 2-year Danish government bond yields (the slope of the yield curve) increased until May and fell over the summer, see Chart 3.

### Changes in long-term interest rates reflect changes in the slope of the yield curve in particular

Chart 3

Decomposition of changes in Danish interest rates in 2021, basis points



Note: Elements in a decomposition of a Danish option-adjusted mortgage rate. The columns at the centre and to the right show yield spread changes. The period division reflects that the Danish 10-year government bond yield peaked this year on May 20. Government bond yields are constant maturity yields. The mortgage credit spread reflects the option-adjusted spread (OAS) to a Danish government bond yield based on Nykredit's Danish Mortgage Bond index.

Source: Nordea Analytics, Danmark Nationalbank, Nykredit and own calculations.

Furthermore, the option-adjusted spread between the yield on long-term fixed rate mortgage bonds and long-term government bonds has increased, possibly related by the decline in foreign investor demand for long-term Danish mortgage bonds in 2021, see the *Bond market* section. Relative to early January, the yield on the 30-year 1 per cent bond has increased by 42 basis points.

### Accommodative financial conditions in Denmark have supported the real economy

Higher Danish government bond yields and mortgage rates until May implied slightly less accommodative financing conditions. But interest rates

3 In an opinion poll conducted by Reuters in July 2021, 79 per cent of the 200 respondent economists said that spread of new covid-19 variants pose the greatest risk to global economic growth this year.

4 See European Central Bank, *Economic Bulletin*, Issue 5, 2021.

5 Since 2003, there has been close covariation between the outcome of economic indicators and consensus expectations measured by the Citi Surprise Index and the trend of long-term government bond yields in the US and the euro area, respectively.

have remained low, and financing conditions have remained accommodative *overall*, see Chart 4.<sup>6</sup> This should also be seen in the context of higher Danish equity prices in 2021.

Based on Danmarks Nationalbank's financial conditions model, these are being accommodative. The financial conditions are estimated to have supported annual GDP growth by about 1 percentage point in the 2nd quarter of 2021 and are expected to have a similar impact in the 3rd quarter.<sup>7</sup> In addition to the contribution from low interest rates and higher equity prices, GDP growth is also buoyed up by continued growth in housing prices. There are indications, however, that house price growth has declined slightly over the summer.<sup>8</sup>

### Household and corporate financing costs are low

Higher Danish long-term mortgage rates resulted in a small increase in total household financing costs during the spring, see Chart 5. But households and business corporations still have access to very cheap external debt financing. Total financing costs, including equity financing, for business corporations have decreased a little, reflecting a slightly lower equity risk premium, which makes the financing costs of equity issuance lower.

### Real interest rates have become more negative and may support consumption and investment

Because of the fixed exchange rate policy, Danish real interest rates follow the real interest rates in the euro area closely.<sup>9</sup> Real interest rates in the United States and the euro area increased temporarily in the spring, but have subsequently fallen back, see Chart 6. The low level is due to a larger decline in long-term inflation expectations than in nominal interest rates.<sup>10</sup>

6 See appendix 1 for further information.

7 The estimate is based on a structural VAR model from Jakob Roager Jensen and Jesper Pedersen, Macro-financial linkages in a SVAR-model with application to Denmark, *Danmarks Nationalbank Working Paper*, No. 134, January 2019.

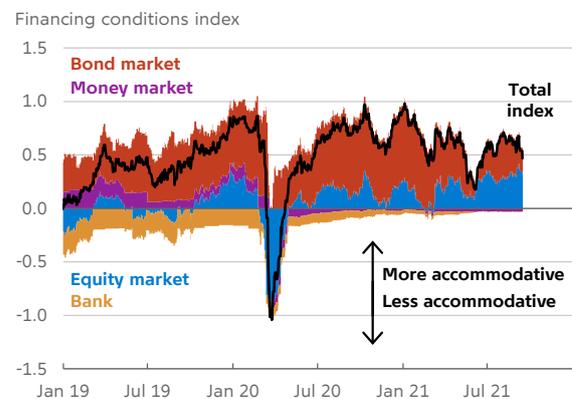
8 See Danmarks Nationalbank, The economy heading back towards a moderate boom, *Danmarks Nationalbank Analysis (Outlook for the Danish economy)*, No. 24, September 2021.

9 Long-term interest rates in Denmark follow the interest rates in highly rated euro area countries such as Germany closely.

10 The real interest rate is measured as the difference between the nominal interest rate and inflation expectations. See Chart 6 for further details.

### Accommodative financing conditions reflect lower interest rates and increasing equity prices

Chart 4

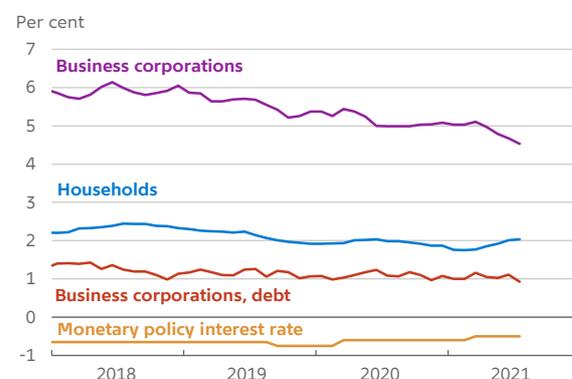


Note: Daily index. Latest data are for 15 September 2021. See appendix 1 for further details.

Source: Danmarks Nationalbank, Refinitiv Eikon and Datastream, Nykredit and own calculations.

### Total financing costs are low, but have increased slightly for households

Chart 5



Note: Costs of external financing for households and business corporations. Business corporations rely heavily on equity financing, which goes a long way towards explaining their relatively high costs. Latest month is July 2021. For further details on the methodology, see box 1 in Monetary and Financial Trends – Decline in interest rates and refinancing boom, *Danmarks Nationalbank Analysis*, No. 19, September 2019.

Source: Danmarks Nationalbank, Statistics Denmark, Refinitiv Datastream and Eikon and own calculations.

This means that the real financing cost of borrowing and the real return on investments in bonds are low. Other things being equal, this increases the incentives for households and business corporations to borrow, consume and invest rather than to save.<sup>11</sup> Hence, low real interest rates may support the economic upswing.

## Monetary policy and the money market

### Technical adjustment of monetary policy instruments has strengthened the pass-through of monetary policy

Since Danmarks Nationalbank's technical adjustment of its monetary policy instruments in March 2021, money market rates have generally moved in the spread between Danmarks Nationalbank's lending and deposit rates and been more stable, see Chart 7.<sup>12</sup>

Money market rates have been stable, although the net position has varied somewhat.<sup>13</sup> This should be seen in the context that the adjustment has introduced one single deposit rate and one single lending rate, while the spread between the two has been narrowed. The adjustment has ensured that the net position level has become less significant for the level of money market interest rates, see Chart 8. Hence, the adjustment has served its purpose and helped to ensure a more efficient monetary policy transmission.

### Larger net position fluctuations since March

The net position increased considerably from early March until and including July. This was driven,

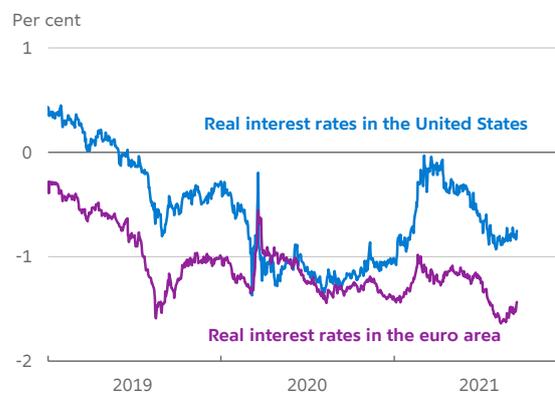
11 See Mikkel Bess, Jakob Feveile Adolfsen and Jesper Pedersen, Real interest rates are affected by inflation expectations, *Danmarks Nationalbank Analysis*, No. 19, October 2020.

12 Danmarks Nationalbank adjusted its monetary policy instruments in March 2021 to ensure better management of short-term money market rates. See Danmarks Nationalbank, Technical adjustment of the monetary policy instruments, *Danmarks Nationalbank Analysis*, No. 5, March 2021.

13 The net position refers to the total net deposits of monetary policy counterparties with Danmarks Nationalbank. Generally, the higher the net position, the closer money market rates are to Danmarks Nationalbank's deposit rate. However, a positive spread between, on the one hand, the certificate of deposit (CD) rate and the current account rate and, on the other, the money market rate is natural because the former is a deposit rate and the latter is based on the T/N rate, which is a lending rate.

Low real interest rates in the United States and the euro area

Chart 6

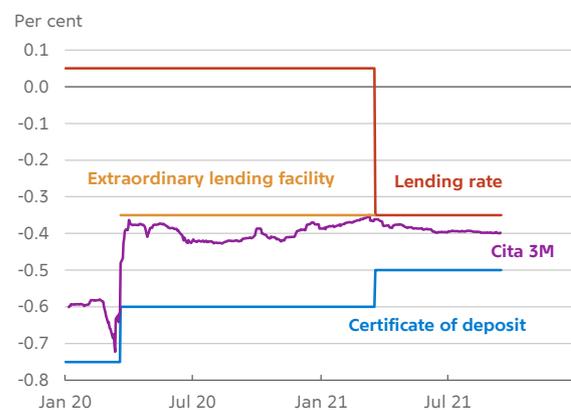


Note: 5-year real interest rates starting five years from now (5Y5Y forwards). The nominal interest rate is a 5Y5Y Eonia (Fed funds) forward for the euro area (United States). Inflation expectations based on 5Y5Y euro (dollar) inflation swaps. The real interest rate measures the difference between the two.

Source: Bloomberg, Refinitiv Eikon and Datastream and own calculations.

More stable money market rates since March 2021

Chart 7



Note: Cita 3M is the Cita swap rate with a maturity of three months. Cita is short for *Copenhagen Interbank Tomorrow/Next Average*.

Source: Refinitiv Eikon and Danmarks Nationalbank.

in particular, by Danmarks Nationalbank's interventions in the foreign exchange market, buying foreign exchange worth about kr. 50 billion, and by the positive liquidity impact of the central government budget during the period, see Chart 9. The latter included the second round of the disbursement of frozen holiday pay funds in the spring, deferred payments of taxes (A-taxes) and loan schemes. In the course of August, the net position declined by about kr. 50 billion, which should be seen in light of tax payments by companies and pension funds.

### Change in the distribution of the net position may have contributed to higher money market rates

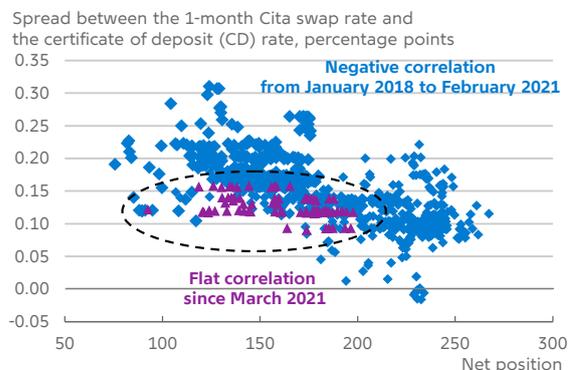
Following Danmarks Nationalbank's foreign exchange interventions in relation to the covid-19 outbreak in March 2020, a larger share of the net position has been held by a group of banks having historically been less active in the money market, see Chart 10. This share has remained largely unchanged following the increase in the net position over the past six months. Overall, the net position for these banks has almost doubled relative to two years ago.

Each bank has several options when it comes to allocating its liquidity and so may impact its net position with Danmarks Nationalbank. In addition to allocating its liquidity as deposits with Danmarks Nationalbank, the bank may, for instance, lend funds to other banks in the money market or buy short-term securities. If banks with lower money market activity have excess liquidity and choose to allocate this liquidity at Danmarks Nationalbank, for a given overall net position, this will imply that the net position of the remaining banking sector is reduced. The reason is that the development of the *overall* net position is not affected by the individual bank's allocation of liquidity; rather it is determined by Danmarks Nationalbank's interventions and the difference between the central government's incoming and outgoing payments.<sup>14</sup>

The smaller share of the net position held by banks that have historically been active in the money market may have caused the supply of krone liquidity in

### Money market spread has become less sensitive to the net position

Chart 8

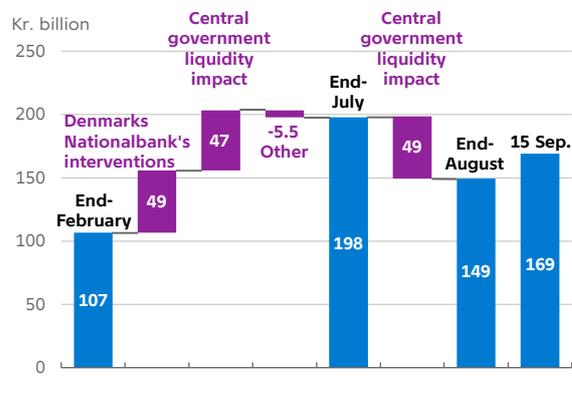


Note: Daily level since 2018. The broken circle includes all observations since March 2021 (purple) when the technical adjustment of Danmarks Nationalbank's monetary policy instrument was effected.

Source: Danmark Nationalbank and own calculations.

### Higher net position in particular due to Danmarks Nationalbank's interventions in the foreign exchange market

Chart 9



Note: Decomposition of the net position development from end-February 2021 until end-August 2021 based on Danmarks Nationalbank's foreign exchange, liquidity and monthly balance sheet. The central government's liquidity impact reflects the central government's contribution to the net position in a given period, measured by the difference between the central government's gross financing requirement and its domestic borrowing.

Source: Danmarks Nationalbank.

14 For more details, see here ([link](#)).

the money market to remain relatively low, despite the increase in the net position.<sup>15</sup> Other things being equal, lower money market liquidity could suggest higher money market rates. In spite of the higher net position, money market spreads to euro both in the swap and forward markets have remained relatively high over the past six months, see Chart 11. The distribution of the net position across banks is a possible explanation for the limited decline in Danish money market rates in the period.

### The ECB has revised its monetary policy strategy

The ECB has kept its monetary policy interest rates unchanged. Because of Denmark's fixed exchange rate policy, this is one of the reasons why Danmarks Nationalbank's monetary policy interest rates have remained unchanged since March 2021.

On 8 July, the ECB announced changes to its monetary policy strategy, including the introduction of a symmetric inflation target of 2 per cent replacing the previous target of inflation below, but close to, 2 per cent. The ECB also announced that during periods when monetary policy interest rates are close to the effective lower bound, it will keep monetary policy exceptionally accommodative using, for instance, forward guidance<sup>16</sup> and asset purchase programmes. When monetary policy interest rates are close to the effective lower bound, the ECB will also be able to allow inflation to moderately overshoot the 2 per cent target for a transitory period. One objective of the changes is to help better anchoring inflation expectations.

The changes to the ECB's monetary policy strategy will not impact the way Danmarks Nationalbank conducts its fixed exchange rate policy. The changes are, however, believed to potentially have small positive implications for the Danish economy, as they may lead to more stable economic growth.<sup>17</sup>

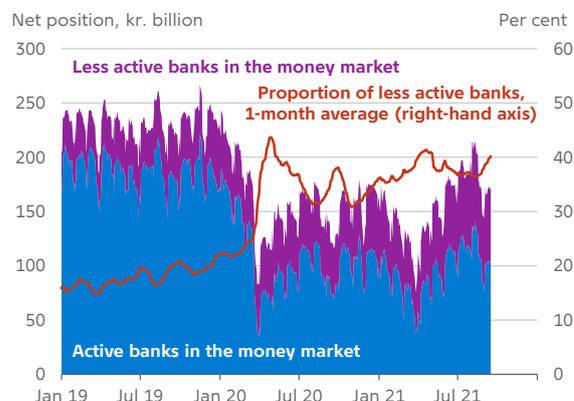
15 Relatively few institutions account for a large portion of money market transactions. In 2017, the three banks with the highest interbank market activity accounted for 86 per cent of the overall transaction volume. See Jan Lund Sørensen and Simon Hajaj Ruby Harmat, A number of small participants dominate the interbank market, *Danmark Nationalbank Analysis*, No. 12, June 2019.

16 The ECB's expected future monetary policy is referred to as *forward guidance*.

17 See Nastasija Loncar and Jesper Pedersen, New ECB strategy and the Danish economy, *Danmarks Nationalbank Analysis*, No. 21, September 2021.

**Net position has increased since March 2021, but the share of active banks in the money market is low**

Chart 10

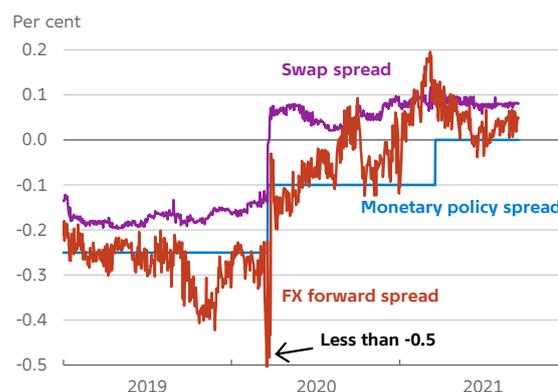


Note: 'Active banks in the money market' are banks reporting to Danmarks Nationalbank's money market statistics and their consolidated mortgage credit companies. The following banks are included: Danske Bank, Nordea, SEB, Spar Nord, Jyske Bank, Nykredit Bank, Sydbank, Handelsbanken, Arbejdernes Landsbank and Sparekassen Kronjylland. 'Less active banks in the money market' are the remaining monetary policy counterparties, comprising most of the remaining Danish banks and mortgage credit institutions.

Source: Danmarks Nationalbank and own calculations.

**Relatively high money market spreads**

Chart 11



Note: The monetary policy interest rate spread is the difference between Danmarks Nationalbank's and the ECB's key deposit rates. The swap spread is the difference between 3-month overnight index swaps. The forward spread is the implied 3-month yield on a forward contract where Danish kroner are bought against euro.

Source: Refinitiv Datastream and Eikon and own calculations.

### Following the ECB's announcements, market participants expect monetary policy interest rates to remain low for longer

The new ECB monetary policy strategy and its strengthened forward guidance have led market participants to expect the ECB's monetary policy interest rates to remain low for longer.<sup>18</sup> Short-term forward rates in the euro area dropped following the announcement on 8 July, see Chart 12. Forward rates had already been declining since mid-May when the ECB communicated its assessment that the rise in inflation was driven mainly by temporary factors.

### The ECB increased its asset purchases over the summer

During the spring and over the summer, the ECB increased its asset purchases to foster accommodative financial conditions in the euro area. As a result, monthly net purchases under the pandemic emergency purchase programme, PEPP, have been at their highest level since the first few months after the launch of the PEPP in March 2020, see Chart 13. During this period, net purchases were in line with or higher than the net issuance of government bonds in the euro area. In other words, the ECB's purchases at least corresponded to the net inflows of bonds to the market. High net purchases and lower forward rates were contributory factors to the decline in long-term government bond yields in the euro area over the summer. At the monetary policy meeting in September, the ECB announced a moderately lower pace of net asset purchases going forward, see above.

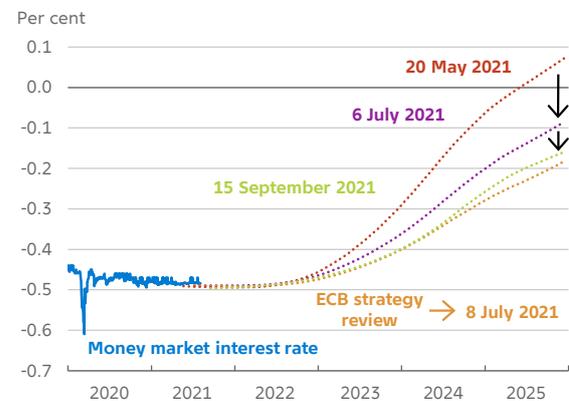
## Danish krone market

### Danmarks Nationalbank has purchased foreign exchange to stabilise the Danish krone

Since April 2020, the Danish krone has been stable on the strong side of the central rate, see Chart 14. From early March 2021 until end-August, Danmarks Nationalbank intervened in the foreign exchange market, purchasing foreign exchange worth about kr.

### Market participants' expectations of the ECB's monetary policy rates have decreased

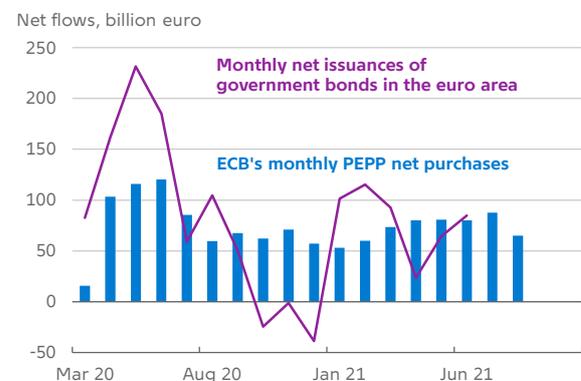
Chart 12



Note: 3-month Eonia swap rates. The dashed curves indicate 3-month implied forward interest rates on the specified dates. Eonia is short for Euro OverNight Index Average.  
Source: Rio Scanrate and Thomson Reuters Datastream.

### The ECB has increased PEPP net purchases since January 2021

Chart 13



Note: PEPP is short for pandemic emergency purchase programme. However, historically about 98 per cent of PEPP net purchases have been of government bonds. Latest data of issuances and purchases are from June and August 2021, respectively.  
Source: ECB and own calculations.

<sup>18</sup> At the monetary policy meeting of the ECB's Governing Council on 22 July, the ECB implemented its new forward guidance. Under the forward guidance, monetary policy interest rates will remain at their present or lower levels until expected inflation in the euro area reaches 2 per cent well ahead of the end of the ECB's projection horizon.

50 billion. The interventions were evenly distributed over the period and conducted under calm market conditions.

**Interventions caused the foreign exchange reserve to rise, but was offset by lower government debt in foreign exchange**

Viewed in isolation, Danmarks Nationalbank’s foreign exchange interventions have led to a corresponding increase in the foreign exchange reserve. The increase in the foreign exchange reserve following Danmarks Nationalbank’s foreign exchange purchases this year was partly offset by the central government’s prepayment of foreign exchange loans worth kr. 35 billion during the same period.<sup>19</sup> In August 2021, a new allocation of Special Drawing Rights, SDR, from the IMF caused the foreign exchange reserve to increase by about kr. 30 billion, see Chart 15.<sup>20</sup>

At end August, the foreign exchange reserve amounted to about kr. 483 billion, or more than at the end of February 2020, just before the outbreak of the pandemic.

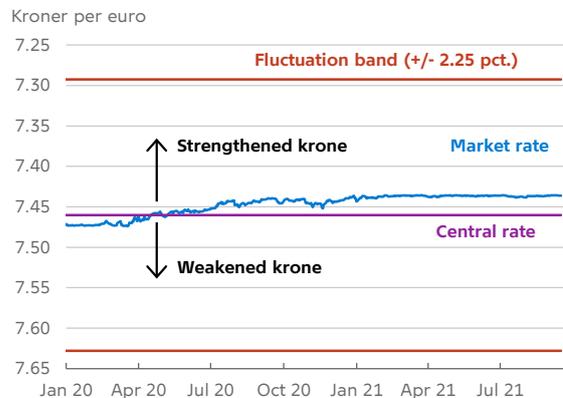
**Dollar hedging has increased the insurance and pension sector’s krone demand**

Danmarks Nationalbank’s foreign exchange purchases reflect that, overall, private agents have had a demand for Danish kroner. Currency hedging by Danish insurance and pension companies has boosted the private sector’s total krone purchases over the past six months. Pension funds increased their currency hedging to kroner by kr. 36 billion from the end of February 2021 until the end of July 2021. Increased dollar hedging was the primary driver of the rise, see Chart 16.

The increased dollar hedging activity is related to high returns on US equities during the year, see the *Equity market* section. This results in higher dollar exposure of pension funds, and therefore greater need for currency hedging because they hedge a relatively fixed proportion of their dollar exposures.

**The krone is on the strong side of the central rate**

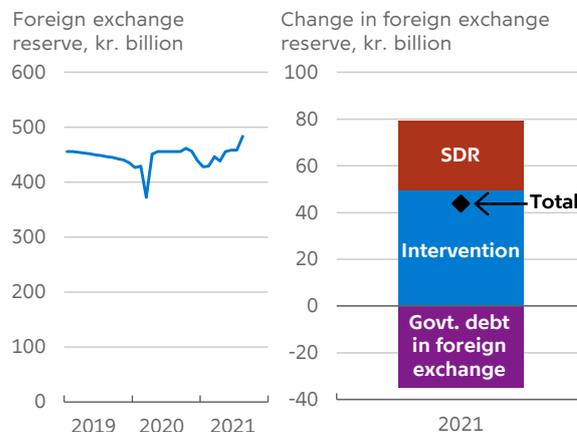
Chart 14



Note: Exchange rate of the krone vis-à-vis the euro. Reverse y-axis.  
Source: Refinitiv Datastream.

**Lower central government debt in foreign exchange offsets the effect of interventions on the foreign exchange reserve**

Chart 15



Note: SDR is short for Special Drawing Rights allocated by the IMF. Outstanding central government debt in foreign exchange primarily comprises commercial papers with a maturity of up to one year. The latest data point for 2021 is August.  
Source: Danmarks Nationalbank and own calculations.

19 When the central government raises foreign debt in foreign exchange, the foreign exchange reserve increases because Danmarks Nationalbank exchanges the central government’s proceeds into Danish kroner. Conversely, when the central government’s foreign debt matures, the foreign exchange reserve will be reduced.

20 Danmarks Nationalbank’s liabilities have risen by an equivalent amount. See further details in Danmarks Nationalbank’s press release here ([link](#)).

**Positive money market spreads may have contributed to a strong Danish krone**

The 3-month swap spread to the euro area has been stable at just under 10 basis points during 2021, see Chart 11 in the *Monetary policy and the money market* section.

The implied yield spread in the forward exchange market (the forward spread) between Danish kroner and euro has been positive throughout most of the year, peaking in March when the net position was particularly low. This increased the cost of borrowing Danish kroner in the foreign exchange market. The forward spread has remained relatively unchanged since early May.

Compared with the years leading up to the pandemic, current money market spreads are high, reflecting that the monetary policy rate spread to the euro area has narrowed. The high swap and forward spreads make it more attractive to have liquidity in Danish kroner relative to euro. This could be a contributing reason why the krone is on the strong side of the central rate.

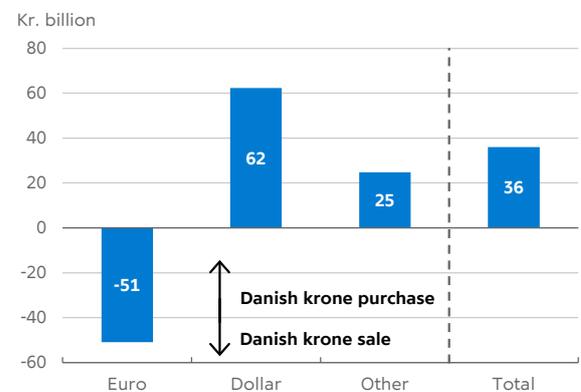
**Bond market**

**Wider 10-year government bond yield spread to Germany**

This year, the 10-year yield spread between Danish and German government bonds has widened slightly, see Chart 17.

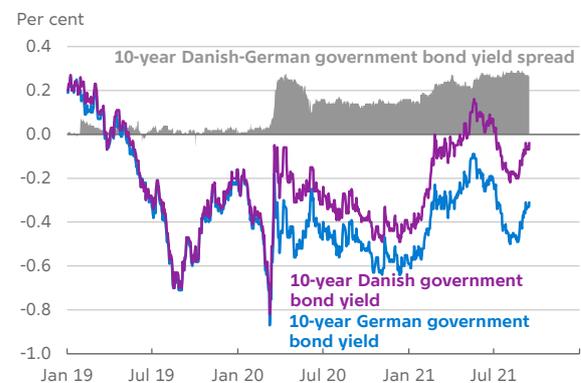
The widening of the yield spread to Germany this year also applies to other European government bonds such as French and Dutch bonds, reflecting a particularly strong decline in German interest rates over the summer. One explanation could be that German bonds are the highest rated bonds in Europe, and so constituted a safe haven asset while concerns over rising delta coronavirus infections were elevated.<sup>21</sup>

**Increased foreign currency hedging in the insurance and pension sector is reflected in krone demand** Chart 16



Note: Changes in the insurance and pension sector's foreign currency hedging calculated by currency, end-February 2021 until end-July 2021.  
 Source: Danmarks Nationalbank.

**This year, the 10-year government bond yield spread has widened** Chart 17



Note: Government bond yields are estimated constant maturity yields.  
 Source: Nordea Analytics and own calculations.

<sup>21</sup> The investors' willingness to pay a premium for holding very safe bonds exerted downward pressure on German government bond yields. There are indications that the premium has increased since the 2011-12 European sovereign debt crisis, see, for instance, A.C. Paret and S. Weber, German Bond Yields and Debt Supply: Is There a "Bund Premium"? *IMF Working Paper*, November 2019.

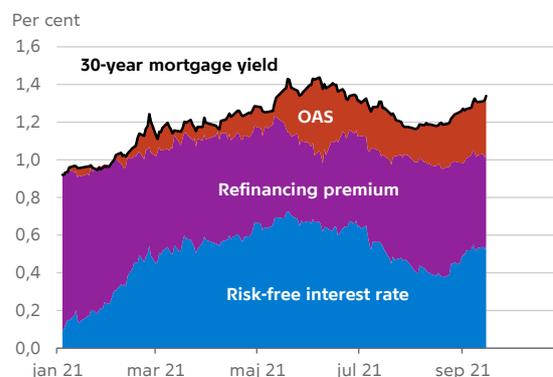
However, due to a more pronounced widening of the Danish spread in February and March, the Danish government yield spread has increased more than in other countries. During these months, the duration – or interest rate sensitivity – of callable Danish mortgage bonds increased considerably and has remained high.<sup>22</sup> Increased duration may reduce investor demand for long-term bonds. This may be one explanation why, overall, Danish pension companies have reduced their demand for long-term Danish government bonds this year and potentially have been contributing to widening the government bond yield spread.<sup>23</sup>

### Higher US interest rates and increased duration may have contributed to higher mortgage rates

Like the Danish government bond yield, the yield on the 30-year benchmark for callable mortgage bonds declined over the summer and then picked up slightly, see Chart 18.<sup>24</sup> This occurred following an increase of about 50 basis points from January to June. The option-adjusted spread (OAS) of callable mortgage bonds, a measure of the credit and liquidity premia on these bonds, has been rising gradually during the year. The highest increase in the spread was seen in May when the duration of callable mortgage bonds was also elevated and still rising.

Over the course of the first six months of 2021, US long-term government bond yields increased more than the Danish option-adjusted 30-year mortgage rate, see Chart 19, reflecting a larger steepening of the US yield curve. This may have had a bearing on the decline in demand for Danish callable mortgage bonds by foreign investors.<sup>25</sup> This year, for the first time since 2014, Japanese investors as a whole have

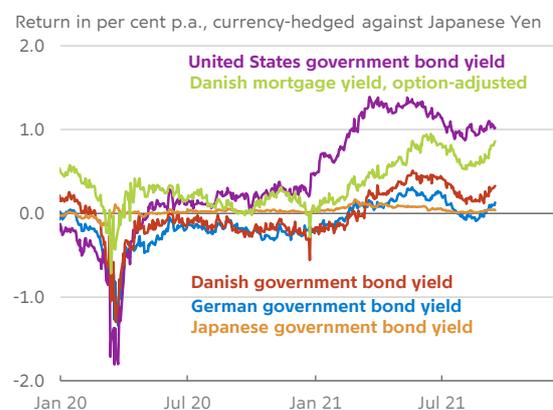
Part of the increase in the long-term mortgage rate has been reversed Chart 18



Note: Decomposition of the yield to maturity of a 30-year fixed rate mortgage bond with a 1 per cent coupon. The risk-free interest rate reflects the Cibur swap rate with a maturity corresponding to the option-adjusted maturity of the mortgage bond. OAS is short for option-adjusted spread.

Source: Refinitiv Eikon, Rio Scanrate and own calculations.

Higher returns for Japanese investors in the United States than in Denmark in 2021 Chart 19



Note: All bond yields have been hedged against Japanese yen via 3-month forward contracts. Government bonds are 10-year benchmark yields. 'Danish mortgage rate' is a constructed long-term mortgage rate with a maturity of about 10 years where the option component is disregarded for comparability reasons.

Source: Refinitiv Eikon, Rio Scanrate and own calculations.

22 Duration expresses the interest rate risk of bonds. Earlier in the year, the duration of callable mortgage bonds increased as long-term interest rates rose.

23 In 2021 (until and including July), Danish pension companies' monthly net purchases of long-term Danish government bonds totalled kr. 0.3 billion, down from kr. 3.0 billion in 2020 and kr. 1.2 billion in 2019.

24 The development in interest rates may be divided into a risk-free interest rate measured by a swap rate, a refinancing premium and an option-adjusted spread (OAS).

25 Foreign investors' average monthly net purchases of long-term Danish mortgage bonds totalled kr. 0.8 billion in 2021 (until and including July), down from kr. 7.7 billion in 2019 and 4.2 billion in 2020. Japanese investors accounted for a large proportion of net purchases from 2016-2020. However, net purchase data indicate that Japanese investors have reduced their holdings by about kr. 7.0 billion in 2021 (until and including July).

been selling callable mortgage bonds. Their dampened interest in Danish callable bonds may have exerted upward pressure on the OAS, and so on the 30-year mortgage rate this year. Foreign demand may also have been dampened by a slightly lower return on hedging krone exposures to the yen, dollar and euro, among other currencies, in 2021 relative to 2018-19.

## Equity market

### Strong rise in earnings and equity prices during the economic recovery

In 2021, Danish equity prices have increased by about 18 per cent, which is in line with the development in US and European equity prices. The Danish equity prices increased particularly from March when the reopening from the covid-19 lockdown gained momentum, see Chart 20. With the recovery of western economies, earnings of many companies outperformed equity analysts' expectations in the 1st and 2nd quarters.<sup>26</sup>

On the back of strong earnings growth and broader economic growth, equity analysts' earnings expectations for Danish companies for this year and the next couple of years have risen substantially, see Chart 21. Growth in the Danish equity market and higher earnings expectations since March are particularly strong for manufacturing goods transporters. This should be seen in the context that high freight rates have supported earnings of Maersk and DSV, among others.<sup>27,28</sup>

### Slight decline in required rate of return on equities

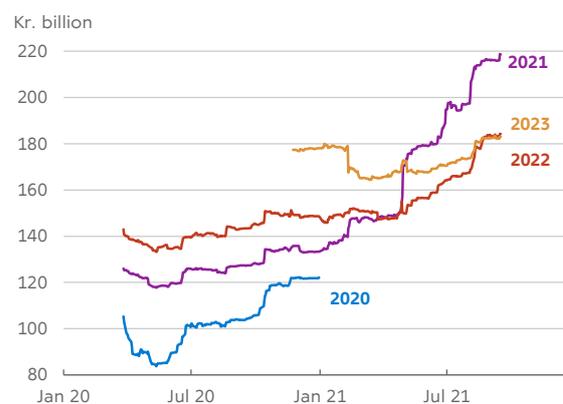
Changes in expected short-term earnings have, however, a limited impact on the fundamental equity

**Danish equities have increased in line with foreign equities in 2021** Chart 20



Note: Total return includes dividends paid and capital gains.  
 Source: Refinitiv Datastream and own calculations.

**Surging earnings expectations for 2021-22** Chart 21



Note: Equity analysts' expectations of total earnings of the companies in the Danish C25 stock index for 2020-2023. The time series for the individual year does not start until there are expectations for all companies.  
 Source: Refinitiv Eikon and own calculations.

<sup>26</sup> In the 2nd quarter, 90 per cent of the companies in the US S&P 500 index beat equity analysts' expectations. For the companies in the Danish C25 index, this proportion was about 52 per cent.

<sup>27</sup> In mid-September, Maersk upgraded its 2021 guidance for earnings before tax and interest to kr. 18-19 billion dollars, up from kr. 4.2 billion dollars for 2020.

<sup>28</sup> See Danmarks Nationalbank, The economy heading back towards a moderate boom, *Danmarks Nationalbank Analysis (Outlook for the Danish economy)*, No. 24, September 2021.

value.<sup>29</sup> The fundamental value is more sensitive to investors' future required rates of return. Model estimates of the required rate of return show that it has declined slightly this year, thereby contributing to higher equity prices in Denmark, see Chart 22. The decline in the required rate of return should especially be seen in light of a lower equity risk premium on pharmaceutical companies, accounting for a great part of the C25 index, see box 1.

In recent years, the equity risk premium has been declining. But in a longer historical perspective, the equity risk premium is not particularly low. The reason is that although risk-free interest rates have declined sharply, investors require largely the same expected return on equities as they did before the financial crisis.<sup>30</sup>

## Credit and money

### Lending growth has risen but is in line with underlying economic growth

Annual growth in lending by banks and mortgage credit institutions to households and business corporations has increased in 2021, totalling 3.2 per cent in July, see Chart 23. Credit growth is at a 10-year high, but is largely in line with annual nominal GDP growth. The primary driver of the increase in credit growth is higher household mortgage debt, with annual growth in July totalling 5.1 per cent, which is in line with growth prior to the covid-19 outbreak.<sup>31</sup>

### Growth in corporate bank lending has returned to its pre-covid-19 level

In spring 2020, lending from banks to business corporations declined, and demand for bank loans remained subdued for the rest of 2020. Low corporate

**Slight decline in the required rate of return due to lower equity risk premium**

Chart 22

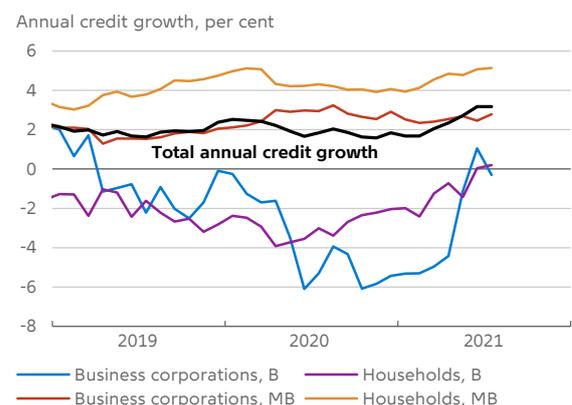


Note: Based on the C20 stock index. The required rate of return is the sum of the Danish 10-year government bond yield and an estimated risk premium. The equity risk premium is a measure of the additional return required as compensation for investing in equity rather than a risk-free asset, here represented by a Danish government bond. The required rate of return reflects the total discount rate at which future expected earnings are discounted using a dividend discount model of equity prices.

Source: Refinitiv Eikon and Datastream and own calculations.

**Annual credit growth has been picking up in 2021**

Chart 23



Note: Lending by banks (B) and mortgage banks (MB) to households and business corporations based in Denmark in all currencies. Here, households are employees and pensioners etc., while business corporations cover both non-financial corporations and sole proprietorships. The latest data point is for July 2021.

Source: Danmarks Nationalbank.

<sup>29</sup> According to conventional dividend discount models, short-term earnings expectations have little impact on the fundamental equity value. For further details, see Danmarks Nationalbank, Stable financial markets support economy in recession, *Danmarks Nationalbank Analysis (Monetary and financial trends)*, No. 17, September 2020.

<sup>30</sup> See Søren Lejsgaard Autrup and Jonas Ladegaard Hensch, Do equity prices reflect the ultra-low interest rate environment?, *Danmarks Nationalbank Economic Memo*, No. 1, February 2020.

<sup>31</sup> Bank lending accounts for about 21 per cent of total lending in 2021. Therefore, the contribution to total lending growth from higher growth in bank lending to business corporations is limited.

## Substantial increase in manufacturing and pharmaceutical equity prices, but only slight decline in equity risk premia

Box 1

### Economic conditions may explain higher manufacturing and pharmaceutical equity prices

Substantial increases in Danish equity prices are a result of some variation across industries. Equity prices for manufacturing and pharmaceutical companies have increased considerably, see Chart A.

Estimates of equity risk premia for manufacturing companies show some fluctuations since January 2021, but over the entire period the risk premium has declined only slightly, see Chart B. The slight decrease may indicate that manufacturing companies' equity price developments may be explained by fundamentals such as growing earnings expectations going forward.

Risk premia of pharmaceutical equities are slightly lower than before the covid-19 outbreak. This could reflect that investors regarded these equities as a relatively safe investment during the covid-19 crisis because pharmaceutical companies' expected future earnings are less sensitive to lockdowns and cyclical fluctuations in general. Pharmaceutical equities account for about 45 per cent of the market value of the Danish index. So, the decline in the equity risk premium of pharmaceutical equities explains much of the fall in the equity risk premium of Danish equities.

### New methodology applied for estimating equity risk premia across industries

Equity risk premia are unobservable and may, for instance, be estimated using a dividend discount model. Previously, Danmarks Nationalbank calculated equity risk premia using the so-called H-model.<sup>1</sup> This model is an approximation of the dividend discount model, estimating the equity risk premium under the assumption that expected dividend developments reflect equity analysts' expectations of future short and medium-term earnings and that earnings growth gradually converges towards the long-term rate of economic growth.

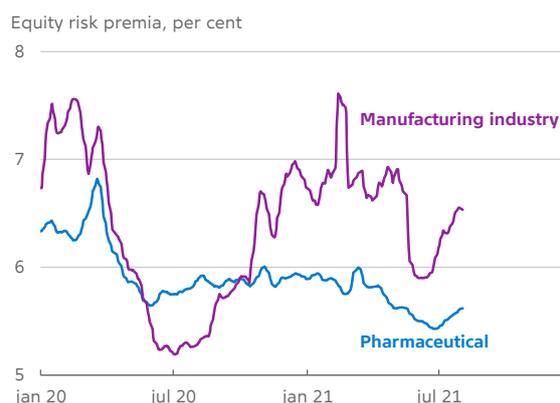
The H-model is typically best suited for estimating equity risk premia of a broad mix of equities such as large stock indices. One reason is that the model is capable of capturing to a lesser extent only short-term earnings expectations, and these typically vary greatly from one year to the next for small equity portfolios. To address this issue, a new dividend discount model has been developed which is capable of estimating equity risk premia for small equity portfolios, for instance industries, more accurately. The new model uses information about expected short and medium-term cash flows.

**Chart A:**  
**Substantial price increases for manufacturing and pharmaceutical equities**



Note: Total returns for Danish companies in selected industries.  
 Source: Refinitiv Datastream and own calculations.

**Chart B:**  
**Small decline in equity risk premium of manufacturing companies during covid-19**



Note: Estimated equity risk premia at industry level. 2-week moving averages.  
 Source: Refinitiv Eikon and Datastream and own calculations.

<sup>1</sup> See Søren Lejsgaard Autrup and Jonas Ladegaard Hensch, Do equity prices reflect the ultra-low interest rate environment?, *Danmark Nationalbank Economic Memo*, No. 1, February 2020.

demand for bank loans during the covid-19 pandemic could be due to the high degree of consolidation among Danish business corporations, building liquidity, in the years leading up to the pandemic. Moreover, during the pandemic, a substantial amount of liquidity has been injected into the corporate sector in the form of, for instance, deferred tax and VAT payments and tax and VAT loan schemes.<sup>32</sup> Since March 2021, annual growth in bank lending to corporations has become less negative, and growth has essentially returned to its pre-covid-19 level, see Chart 23.

### Household lending growth is moderate, but may occur with a lag

High housing market activity since spring 2020 has led to substantial house price increases.<sup>33</sup> In comparison, growth in total household lending has been moderate since the outbreak of covid-19. However, this may represent considerable differences across households and geographical areas. Also, credit growth may occur with a lag relative to growth in house prices.<sup>34</sup> However, households have increased their savings over recent years, reflected in higher net lending, which may contribute to a dampening of their credit needs.<sup>35</sup>

### Growth in mortgage lending driven by issuance of more loans without amortisation

Increased growth in household mortgage lending mainly reflects a higher prevalence of fixed rate

mortgage loans *without amortisation*, see Chart 24. Increased uptake of loans without amortisation frees up liquidity for homeowners, which could affect aggregate private consumption. At the same time, a higher prevalence of loans without amortisation can increase the vulnerability to a subsequent drop in housing prices.<sup>36</sup> In the 2nd quarter of 2021, loans without amortisation constituted a share of 53 per cent of new mortgage debt, corresponding to an increase of 7 percentage points since the 2nd quarter of 2020.

### Higher uptake of loans without amortisation in 2020 among homeowners with high LTV ratios

In 2020, lending without amortisation was to a large extent evenly distributed between homeowners with loan-to-value (LTV) ratios above and below 60 per cent, respectively, see Chart 25. In 2020, the primary drivers of the *increase* in borrowing without amortisation were borrowers with LTV ratios above 60 per cent. In 2020, this borrower segment raised debt *without amortisation* totalling kr. 18 billion more than in 2019, and hence doubling the 2019 amount. During the same period, their borrowing *with amortisation* declined by kr. 14 billion, which should be seen in the context of the refinancing activity in 2020 following declines in interest rates in 2019 and 2020.<sup>37</sup>

32 According to data from the Danish Tax Authority, companies excluding self-employed individuals had raised tax and VAT loans totalling kr. 21 billion at the end of May 2021. In September, the deadline for repayment of VAT loans was extended from 1 November 2021 and 1 February 2022 until 1 April 2022 to provide corporations with more time to repay their debt.

33 Prices of one-family homes and owner-occupied flats increased by 13 and 12 per cent, respectively, from the 2nd quarter of 2020 to the 2nd quarter of 2021. Over the summer, there have been early indications of more subdued housing market activity relative to spring 2021. See Danmarks Nationalbank, The economy heading back towards a moderate boom, *Danmarks Nationalbank Analysis (Outlook for the Danish economy)*, No. 24, September 2021.

34 Previously, a time lag of close to two years has been observed, see Grinderslev, Oliver Juhler, Paul Lassenius Kamp, Anders Kronborg and Jesper Pedersen (2017), Financial cycles: what are they and what do they look like in Denmark, *Danmarks Nationalbank Working paper*, No. 115.

35 After two years of declining interest rates, mortgage rates have stabilised and even increased slightly since the turn of the year. Against that backdrop, a low level of extraordinary prepayments of fixed rate mortgage loans are expected for the October 2021 pay date, which could lead to expectations of more subdued additional borrowing by homeowners.

36 See Danmarks Nationalbank, Build-up of risks in credit institutions, *Danmarks Nationalbank Financial Stability – 1st half 2021*, May 2021.

37 One out of five homeowners who refinanced their loans in 2020 opted for loans without amortisation. See Danmarks Nationalbank, Build-up of risks in credit institutions, *Danmarks Nationalbank Financial Stability – 1st half 2021*, May 2021.

### Homeowners with low LTV ratios already increased borrowing without amortisation in 2019

Homeowners with LTV ratios below 60 per cent already began to take an increased interest in loans without amortisation from 2018 to 2019. This should be seen in the light of the introduction of new loan types by mortgage credit institutions in recent years, allowing deferred amortisation for up to 30 years; initially in the form of variable rate loans in 2017 and, since the end of 2020, in the form of fixed rate loans. These loans may be offered to customers with LTV ratios up to 75 per cent, but deferred amortisation only kicks in at an LTV ratio below 60 per cent.

In 2019, borrowing without amortisation among homeowners with LTV ratios below 60 per cent increased by kr. 22 billion, see Chart 25. During the same period, these homeowners reduced loans *with* amortisation by an amount equivalent to kr. 16 billion. This means that increased borrowing among these homeowners was affected almost exclusively by way of mortgage loans without amortisation in 2019 and 2020.

Another characteristic of borrowers opting for loans without amortisation in addition to low LTV ratios, is age. In 2019, particularly homeowners over 60 took an increased interest in loans without amortisation. In 2020, loans without amortisation were also raised by other age groups, see box 2.

### An increasing share of household deposits is subject to negative interest rates

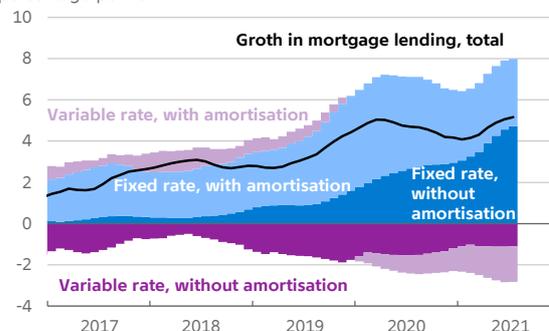
Since March 2021, a number of Danish banks, including several of the largest banks, have reduced their thresholds for negative interest on household deposits further, lowering the typical threshold to kr. 100,000 kr. As a result, kr. 310 billion worth of household deposits, equivalent to 30 per cent, were subject to negative interest in May, see Chart 26.<sup>38</sup>

Despite the negative interest carried by an increasing proportion of household deposits, total deposits have increased. During the period between January and July 2021, total household deposits with Danish

### Growth in mortgage lending is driven primarily by fixed rate loans without amortisation

Chart 24

Contribution to annual growth in mortgage lending, percentage points

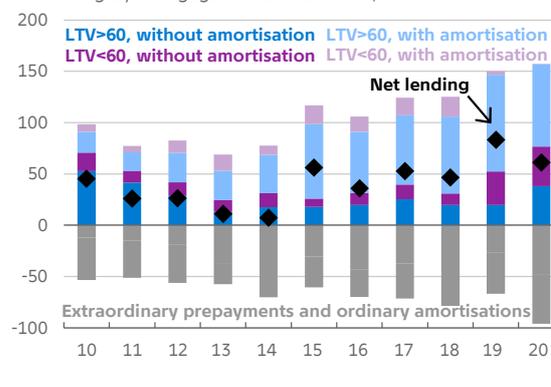


Note: Lending by mortgage banks for owner-occupied dwellings and cottages in all currencies to Danish households. The latest data point is for July 2021.  
 Source: Danmarks Nationalbank.

### In 2020, lending without amortisation was largely evenly distributed between homeowners with LTV ratios above and below 60 per cent, respectively

Chart 25

Net lending by mortgage credit institutions, kr. billions



Note: Extraordinary prepayments and ordinary amortisations comprise borrowers who do not raise new debt in the year in question. In the other columns, extraordinary prepayments related to refinancing are netted. Total net lending may deviate slightly from the MFI statistics due to population differences.  
 Source: Statistics Denmark and Danmarks Nationalbank.

38 With the lowering of the thresholds, effective from July for most banks, a surge is expected over the coming months in both the proportion and the volume of deposits carrying negative interest. Data from six of the largest banks show that 38.8 per cent of household customer deposits carried negative rates in July.

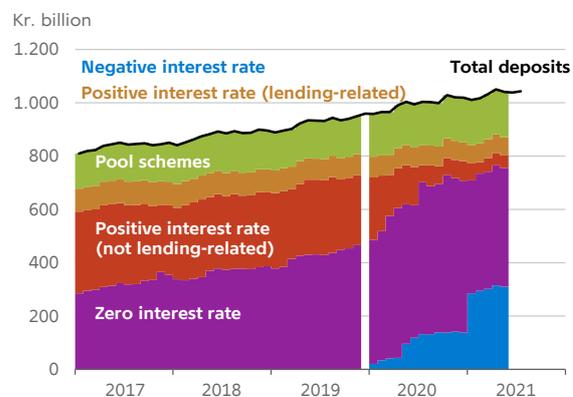
banks increased by kr. 32 billion, equivalent to a rise of 3 per cent. This should be seen in the context of the disbursement of frozen holiday pay funds and limited consumption opportunities due to lockdowns at the beginning of the year.

### Negative deposit rates may have prompted households to reduce deposits

There are indications that household customers with banks that announced negative deposit rates in 2019 reduced the part of their deposits that exceeded the announced thresholds for negative deposit rates at the end of 2019. Relative to previous years, the proportion of customers with deposits below the kr. 750,000 threshold in 2019 increased at banks that had announced negative deposit rates, see Chart 27.<sup>39,40</sup> For 2017 and 2018, the concentration of customers just below kr. 750,000 was also relatively high, which should be seen in the context of the limit of the deposit guarantee scheme. 2019 also saw a decline in the proportion of customers with deposits above kr. 800,000. Overall, this indicates that household customers may have responded to the announcement of negative deposit rates in 2019.<sup>41</sup>

### Increased prevalence of negative interest rates for household deposits

Chart 26

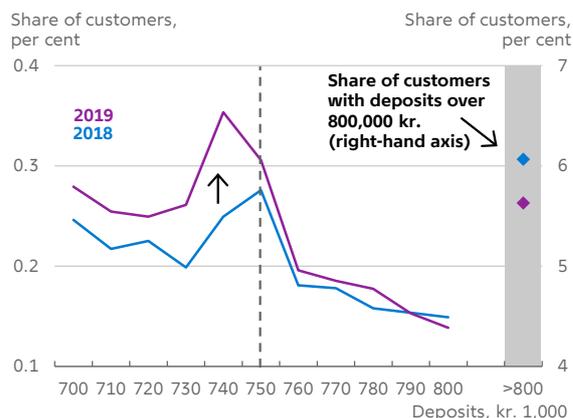


Note: Share of average balance for employees, pensioners etc., broken down by type of return. Observations for December 2019 are confidential and not displayed in the Chart. Lending-related deposits are demand deposits that are offset by the undrawn portion of the limit of, for example, a mortgage-like bank loan and which typically bear interest as loans. The latest data point for the breakdown by deposits is May 2021, while aggregate deposit data run until July 2021.

Source: Danmarks Nationalbank.

### Indications that households responded to the announcement of negative interest rates in 2019

Chart 27



Note: The Chart is based on banks announcing negative deposit rates for household customers in 2019 or earlier. The typical threshold at which negative deposit rates kicked in at these banks was kr. 750,000. Customers with total deposits below kr. 50,000 are not included.

Source: Own calculations based on data from Statistics Denmark.

39 Calculations at the individual level is possible until 2019 when few banks had announced negative deposit rates. According to an analysis based on data on household customers' total deposits with each bank, there are indications that deposits have declined for banks announcing negative deposit rates shortly after the announcement was made. See Alexander Meldgaard Otte, Morten Spange and Rasmus Kofoed Mandsberg, The response of household customers to negative deposit rates, *Danmarks Nationalbank Analysis*, No. 9, April 2021.

40 Some banks had initially announced even higher thresholds. However, at the end of 2019, the typical threshold applied by Danish banks was kr. 750,000.

41 The underlying data are based on total deposits with the banks affected. So, developments may reflect both that existing customers reduce their deposits and that banks attract fewer new customers with deposits above the threshold in question.

## Both homeowners with high LTV ratios and elderly borrowers with low LTV ratios have taken out mortgage loans without amortisation in recent years

Box 2

### New loans without amortisations have been popular among homeowners with high LTV ratios

In 2020, about one fourth of all new mortgage debt was taken out by borrowers with LTV ratios of around 80 per cent. In this borrower segment, the deferred amortisation portion of lending remained largely unchanged at 55-60 per cent during the years 2018-2020, see Chart A. This is only slightly lower than in 2009, indicating that the preference of these homeowners for loans without amortisation has remained essentially unchanged since the financial crisis.

### Growing interest in lending without amortisation among borrowers with low LTV ratios in recent years

In 2019 and 2020, homeowners with LTV ratios below 60 per cent increasingly opted for loans without amortisation. In this group of borrowers, the portion of loans without amortisation averaged 44, 50 and 56 per cent in 2018, 2019 and 2020, respectively, see Chart A.

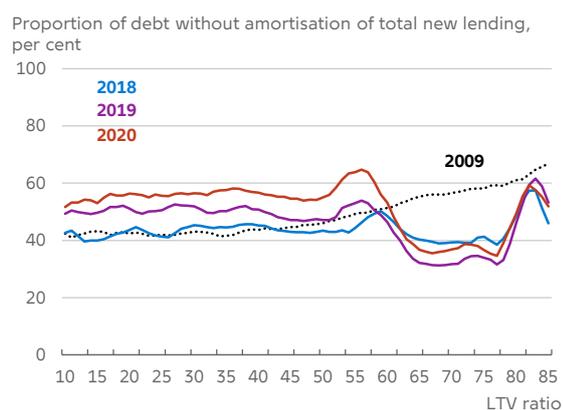
Homeowners with LTV ratios between 60 and 80 per cent also increasingly opted for loans without amortisation from 2019 to 2020. On the other hand, interest in loans without amortisation for this homeowner segment has been considerably lower than in 2009. This may be the result of the Supervisory Diamond, including, in particular, credit

institutions' rationing of lending without amortisation.<sup>1</sup> Since 2014, credit institutions have been imposing a surcharge on the administration margin for loans without amortisation. Marginal borrowing costs increase particularly strongly when the amount of the loan exceeds 60 per cent of the home's value. That may have caused homeowners to change their borrowing behaviour.

### Loans without amortisation have been particularly popular with elderly borrowers

In 2019, the portion of loans without amortisation of new mortgage debt increased considerably for homeowners over 60 years relative to the previous year, see Chart B. The increased interest in loans without amortisation continued among elderly homeowners in 2020, but a growing portion of debt without amortisation was also raised by other age groups. The gravitation towards loans without amortisation among borrowers over 60 has had limited pass-through to total borrowing because borrowers in this age group account for only about 20 per cent of new mortgage debt. Recently introduced loans types, allowing deferred amortisation for up to 30 years, may be attractive to some customer groups, for instance elderly homeowners with high home equity interested in lower savings in the form of home equity.

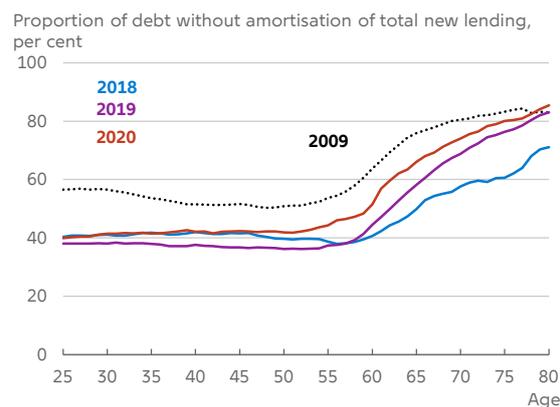
**Chart A:**  
 Interest in loans without amortisation has been high among homeowners with high LTV ratios



Note: The LTV ratio is calculated based on the total mortgage debt of each homeowner. When raising new mortgage debt, the homeowner can usually finance the capital loss over the loan, thereby enabling the total LTV ratio to exceed 80 per cent, the maximum mortgage debt ratio for owner-occupied homes.

Source: Statistics Denmark and Danmarks Nationalbank.

**Chart B:**  
 Homeowners over 60 years in particular have been opting for loans without amortisation in recent years



Source: Statistics Denmark and Danmarks Nationalbank.

<sup>1</sup> For more information about the Supervisory Diamond, see for instance ([link](#)) (in Danish only).

## High frequency index for financing conditions

Appendix 1

The covid-19 pandemic has emphasised the need for high frequency indicators to provide a current overall picture of financial market developments. Against that backdrop, Danmarks Nationalbank has developed a high frequency index that is used for continuous oversight of the development of Danish financing conditions. The index is generally updated monthly, but with a few modifications it can show day-to-day developments. The index is a simple average of a number of prices of various types of financing that are believed to impact the macroeconomy. The index compares current financing conditions with their historical levels. The index is a supplement to the SVAR model from Jensen and Pedersen (2019)<sup>42</sup>, used by Danmarks Nationalbank to quantify the impact of financial conditions on the macroeconomy. This model is calculated quarterly only with some time lag as, for instance, GDP data are included in the model.

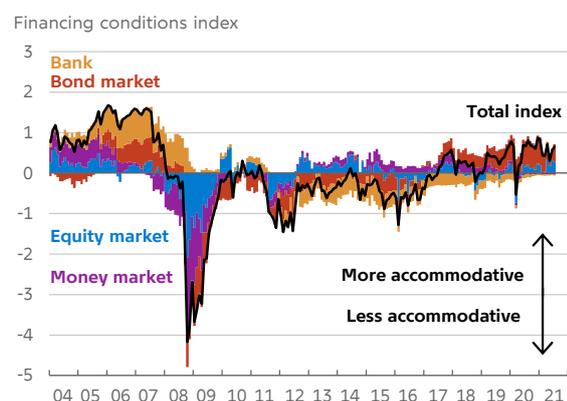
### Construction of the financing condition index

Both the index and all variables included are standardised with a mean value of 0 and a standard deviation of 1. This ensures that the index value is easier to interpret and that various units do not impact the contribution of the individual variable to the index. The index is an average of four variables, each of which is an average of a number of sub-variables.<sup>43</sup>

The sign of each variable indicates whether an increasing value is assessed to translate into more accommodative (+) or less accommodative (-) financing conditions. The variables are:

1. Money market (daily frequency)
  - 3-month Cita swap rate less Danmarks Nationalbank's latest estimate of the natural short-term nominal interest rate,  $i^*$  (-)<sup>44</sup>
  - Difference between 3-month Cita and Eonia swaps (-)
  - Difference between 3-month Cibor and Cita swaps (-)
2. Equity market (daily frequency)
  - Annual return in the Danish equity market (+)
  - Volatility of the Danish equity market (-)
3. Bond market (daily frequency)
  - Option-adjusted mortgage bond yield spread (-)
  - Difference between 10-year and 2-year Danish government yields (-)
4. Bank lending conditions (monthly frequency)
  - Average lending rate less the 3-month Cita rate for households and companies, respectively (-)
  - Average administration margins for households and companies, respectively (-)

### Chart A: Financing condition index



Note: Calculated monthly from January 2004 to July 2021.  
 Source: Danmarks Nationalbank, Refinitiv Eikon and Datastream, Nykredit, Pedersen (2015) and own calculations.

### Interpretation of the index

The index is constructed from 2004 until today. Because the index variables are standardised, an index value of 0 means that, overall, financing conditions are as accommodative as their average since 2004. Positive values indicate more accommodative financing conditions, while negative values indicate less accommodative financing conditions relative to the entire period. Changes in index values directly indicate whether financing conditions will become more or less accommodative. As illustrated in the run-up to the financial crisis, accommodative financing conditions are not necessarily positive for the economy.

### The index captures historical fluctuations

The index shows that, during the financial crisis, financing conditions became considerably less accommodative in a short space of time. A similar pattern was seen during the 2011-2012 European sovereign debt crisis, although less pronounced. In March 2020, when the pandemic struck with full force and many countries went into lockdown, financing conditions briefly became less accommodative. On the other hand, the index points to especially accommodative financing conditions in the pre-financial crisis years.

42. Jakob Roager Jensen and Jesper Pedersen, Macro-financial linkages in a SVAR-model with application to Denmark, *Danmarks Nationalbank Working Paper*, no. 134, January 2019.

43. A similar method is applied in Jan Alsterlind, Magnus Lindskog og Tommy von Brömsen, An index for financial conditions in Sweden, *Sveriges Riksbank Staff Memo*, February 2020.

44. Based on Jesper Pedersen, The Danish natural real rate of interest and secular stagnation, *Danmarks Nationalbank Working Paper*, No. 94, March 2015.

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### REPORT

Reports comprise recurring reports and reviews of the functioning of Danmarks Nationalbank and include, for instance, the *Annual report* and the annual publication *Danish government borrowing and debt*.



### ECONOMIC MEMO

An Economic Memo is a cross between an Analysis and a Working Paper and often shows the ongoing study of the authors. The publication series is primarily aimed at professionals. Economic Memos are published continuously.



### WORKING PAPER

Working Papers present research projects by economists in Danmarks Nationalbank and their associates. The series is primarily targeted at professionals and people with an interest in academia. Working Papers are published continuously.

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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