DANMARKS NATIONALBANK

ANALYSIS | Monetary and financial trends
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Monetary policy is tight and dampens inflation

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Danmarks Nationalbank's monetary policy interest rates have remained unchanged since September 2023. The significant monetary policy interest rate hikes since 2022 continue to impact the Danish economy. Most of the pass-through to Danish households' and companies' interest expenses has now taken place. Monetary policy is considered to be tight and contributes to a dampening of economic growth and inflation in Denmark.

Central banks have maintained monetary policy interest rates

The European Central Bank and Federal Reserve in the US have maintained their monetary policy interest rates. Inflation in the euro area and the US is gradually approaching the 2 per cent target. Against this backdrop, long-term market rates have fallen since their peak in October 2023.

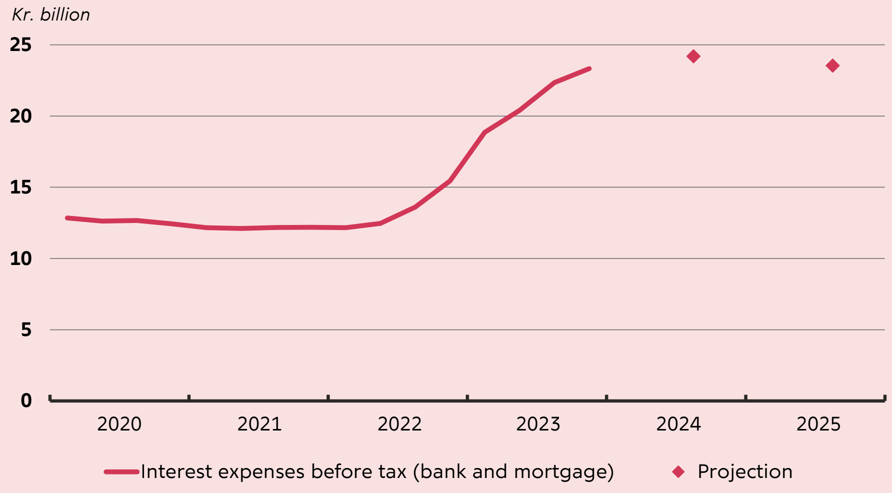
The krone exchange rate against the euro has remained stable near the central parity rate

Danish non-financial companies have been buying kroner against foreign currencies. The purchase mainly comes from the exchange of their turnover in foreign currencies. At the same time, foreign market participants have been selling. The balance between market participants has contributed to a stable exchange rate.

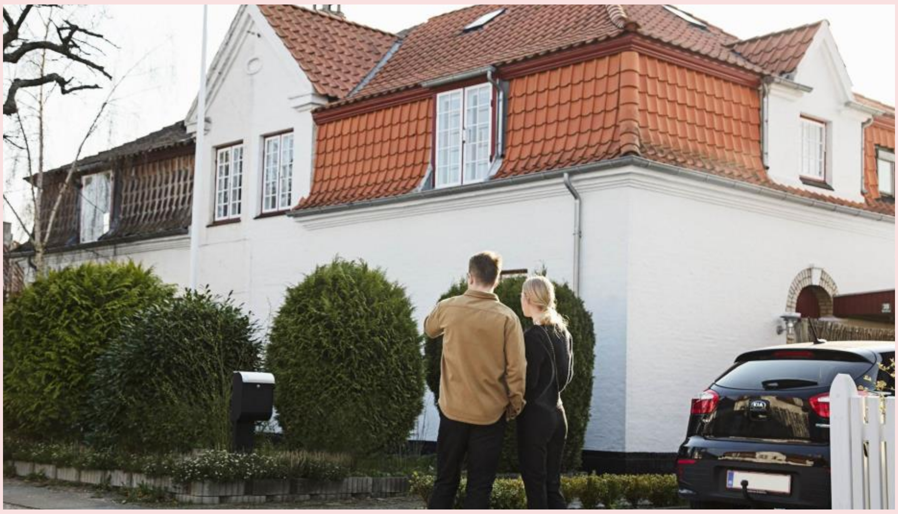
Higher interest costs, but there are signs of interest costs levelling off

Interest rates on new loans are close to the highest level since 2009, and interest costs have increased for more and more households and companies in Denmark. There are signs that total interest expenses are levelling off.

Main chart: Household interest expenses have roughly doubled since the monetary tightening began



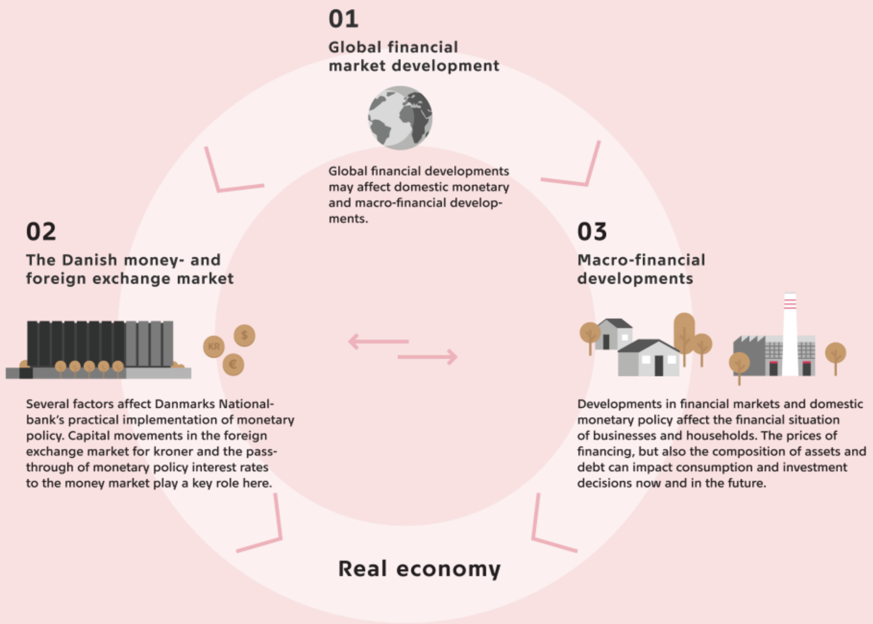
Note: Quarterly interest expenses before tax on bank and mortgage debt for Danish households and non-profit institutions serving households. The projection of interest expenses is based on implicit market expectations for the loan segments “F-kort” (short-term adjustable rate mortgage loans), F1, F3, F5 (adjustable rate mortgage loans with interest fixation periods of 1, 3 and 5 years, respectively) and fixed-rate loans. The pass-through to bank loans is assumed to be 60 per cent of the change in the rate on “F-kort”, and a constant turnover of 5 per cent is assumed for fixed-rate loans in each quarter. It is also assumed that the loan composition is constant during the projection period, corresponding to the composition in December 2023, and therefore repayments and credit growth are disregarded. For more details, see the explanation around Chart 26 in the chapter *Macro-financial developments*.
Source: Danmarks Nationalbank, Refinitiv Eikon and own calculations.



Why is it important?

The Danish fixed exchange rate policy creates a framework for low inflation in Denmark in the medium term. The fixed exchange rate policy means that monetary policy is designed to ensure a stable exchange rate against the euro. The fixed exchange rate policy means that Danmarks Nationalbank generally follows the interest rate decisions of the European Central bank, the ECB. Therefore, monetary policy in the euro area has a bearing on financial and economic developments in Denmark. So do global financial developments, as Denmark is a small open economy closely integrated into the international financial system. Both factors are analysed in chapter 1. Global financial developments may also affect the demand for kroner and thus Danmarks Nationalbank's conduct of the fixed exchange rate policy. This is one of the elements touched upon in chapter 2. An important element in chapter 3 of the analysis is the assessment of how the fixed exchange rate policy, interacting with global financial developments, affects macro-financial conditions in Denmark. These conditions are important for Danmarks Nationalbank's assessment of the current and expected development in the Danish economy.

The analysis is published twice a year in March and September.



Keywords

Banking and mortgage lending | Home financing | Central banks
Fixed exchange rate policy | Financial markets | Households and companies
Monetary and financial trends | Monetary policy | Foreign exchange market

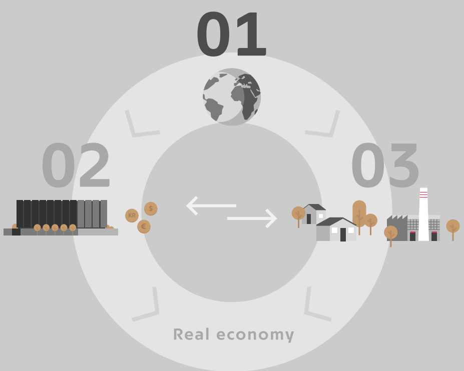
01
Global financial market developments

Since the latest Monetary and financial trends in September 2023, the European Central Bank, the ECB, and the US Federal Reserve have continued their tight monetary policy by maintaining the level of monetary policy interest rates and reducing their bond holdings.

Inflation has generally fallen faster than expected by financial market participants. Short-term inflation expectations derived from financial instruments have fallen in line with inflation, and are close to the central banks' inflation target of 2 per cent. Inflation expectations indicate that risks associated with future inflation are balanced for the euro area.

Due to the falling inflation, financial market participants expect that a less tight monetary policy can ensure stable price developments in the future. They therefore expect central banks to begin a series of interest rate cuts soon. This has caused market interest rates to fall and the price of risky assets such as equities to rise.

Chapter 01 and connection with the rest of the analysis
This chapter (01) provides a status on the global financial market developments and the significant tightening of monetary policy since 2022, which led to rising interest rates. In the face of falling inflation, the ECB has kept interest rates unchanged since September 2023, and market rates have even fallen slightly. The Danish fixed exchange rate policy (02) means that Danmarks Nationalbank has followed the ECB and maintained its policy interest rates. The fixed exchange rate policy and the fact that Denmark is a small open economy imply that the monetary policy of the euro area and global financial developments (01) are important for the financial and economic conditions of Danish households and firms (03).



Continued tight monetary policy contributes to lower inflation

Since the last Monetary and financial trends in mid-September 2023, a main focus in the financial markets has been the development of inflation and expectations for monetary policy interest rates in e.g., the euro area and the US. Bond yields have reacted strongly to key macroeconomic indicators and communication from central banks and have fallen overall during the period. The decline in inflation has created expectations among market participants that the European Central Bank, the ECB, and the US Federal Reserve will begin a series of interest rate cuts this summer.

The ECB and the Federal Reserve have not changed their monetary policy interest rates since autumn 2023, and both central banks are still reducing their bond holdings. Both central banks expect to maintain the level of their monetary policy interest rates until there is greater certainty that inflation in the euro area and the US will return to the 2 per cent target in a sustainable manner.

Inflation in the euro area and the US is gradually approaching the 2 per cent target

Inflation in the euro area and the US has continued to fall throughout autumn and winter 2023-24. The decline in inflation has generally been in line with, or faster than, market participants' expectations. Core inflation remains high in both the euro area and the US.[1,2] Core inflation in February was 3.1 per cent in the euro area and 2.8 per cent in January in the US.[3]

The ECB and the Federal Reserve have kept monetary policy interest rates at the highest level in more than two decades

Since the last Monetary and financial trends from September 2023, the ECB and the Federal Reserve have not changed their monetary policy interest rates, see chart 1.[4] In the euro area, the interest rate on the ECB's deposit facility is 4 per cent, and in the US, the range for the federal funds rate is 5.25–5.50 per cent.[5,6] Monetary policy interest rates are at their highest level in more than two decades. Danmarks Nationalbank has not changed the monetary policy interest rates since September, see the chapter *The Danish money and foreign exchange market.* Danmarks Nationalbank's current account interest rate is 3.6 per cent.

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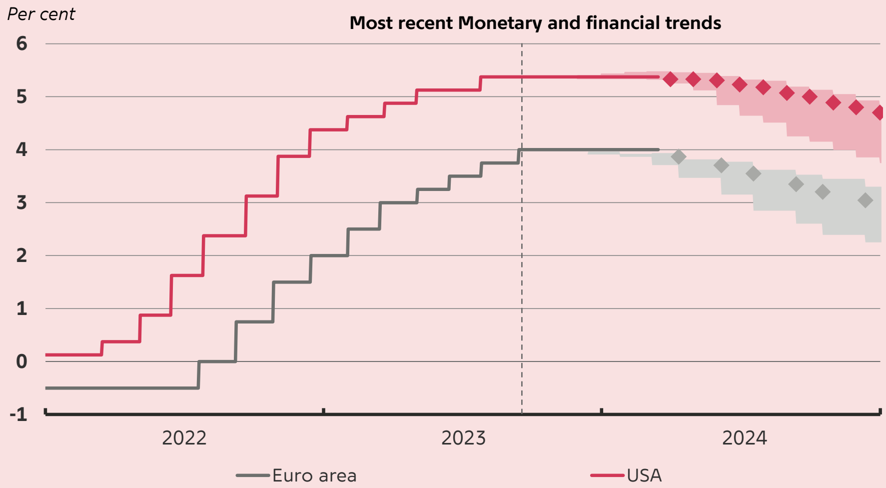
Monetary policy rates are at their highest level in more than two decades.

The ECB and the Federal Reserve have communicated that it is appropriate to maintain their respective monetary policy interest rates at the current level. They expect to maintain monetary policy interest rates until there is greater certainty that inflation in the euro area and the US will return to the 2 per cent target in a sustainable manner.[7]

[1] Both the ECB and the Federal Reserve have mandates to ensure price stability. The ECB aims for an inflation rate of 2 per cent in the medium term (measured by the Harmonised Index of Consumer Prices, HICP). The Federal Reserve has what is often referred to as a dual mandate, and hence aim at both securing low inflation and high employment. The Federal Reserve aims for an inflation rate of 2 per cent (measured by the Personal Consumption Expenditure Price Index, PCE).
[2] Core inflation measures general price increases, minus direct effects of energy and food, and is often used as the most common measure of underlying price pressures. For the euro area, HICP excluding energy and food is used, and for the US, PCE excluding energy and food is used.
[3] In the euro area, inflation was 2.6 per cent in February 2024, measured by the annual increase in the HICP index, and in the US, inflation in January was 2.4 per cent, measured by the annual increase in the PCE index.
[4] The ECB last increased its deposit facility rate by 0.25 percentage points on 14 September 2023 and the Federal Reserve increased its federal funds rate by 0.25 percentage points on 26 July 2023.
[5] The Federal Reserve sets a target range for the federal funds rate on unsecured overnight deposits and loans in the US money market.
[6] On 13 March 2024, the ECB announced changes to the framework for the implementation of monetary policy, including the control of short-term money market rates; see the ECB's press release (*link*) and Nationalbanken's press release(*link*) from March 13th 2024. .
[7] See ECB press release 7 March 2024 and Federal Reserve press release 31 January 2024.

CHART 1

Monetary policy interest rates have been maintained, and market participants expect rate cuts during the summer of 2024



Note: The chart shows the ECB's deposit facility rate (grey line) and the midpoint of the Federal Reserve's federal funds target range (red line). Furthermore, the current expected interest rate paths (red diamonds for the US, grey diamonds for the euro area) as well as the lowest and highest expected path since 20 September 2023 (light grey area for the euro area and pink area for the US) are shown. The expected paths for monetary policy rates are based on €STR swaps and federal funds futures. The current interest rate path is from 15 March 2023.
Source: Refinitiv Eikon and Danmarks Nationalbank.

In their conduct of monetary policy, central banks monitor a wide range of economic and financial data to assess the dynamics of underlying inflation.[8] This includes a significant focus on the strength and speed of monetary policy transmission as well as the magnitude of the derived effects on inflation from the continued high wage growth. Wage growth in the euro area and the US is expected to gradually slow down over the coming years. Currently, wage growth in the euro area and the US is at a higher level than what is compatible with a stable inflation rate of 2 per cent, see the chapter *High wage increases will contribute to a certain level of inflationary pressure in the coming years* in the *Outlook for the Danish economy*.[9]

Financial market participants expect monetary policy interest rates to be reduced during the summer of 2024

As inflation has fallen faster than expected, market participants have brought forward their expectations of when the ECB and Federal Reserve will cut monetary policy interest rates. There have been major shifts in expectations for central bank interest rate cuts during the period, see the fluctuation bands in chart 1.[10] Current market expectations for monetary policy interest rates and inflation suggest that market participants believe that inflationary pressures have eased and that the ECB and Federal Reserve will reduce monetary policy interest rates within a few months. Market participants expect the ECB and the Federal

[8] Underlying inflation tells us where inflation is heading once the temporary drivers disappear. See, for example, the speech by ECB Chief Economist Philip Lane, Underlying Inflation, 6 March 2023.
[9] See Danmarks Nationalbank, Inflation is on track but some inflationary pressure persists, *Danmarks Nationalbank Analysis (Outlook for the Danish economy)*, No. 2, March 2024.
[10] The shaded area in the chart indicates the range of expectations since 20 September 2023. Market participants' expectations for monetary policy interest rates peaked around 20 September 2023 for both the US and the euro area, while they bottomed out on 28 December 2023 (euro area) and 12 January 2024 (US) respectively.

Reserve to start cutting monetary policy interest rates this summer and that the rate cuts will happen at a slightly faster pace than market participants expected in September 2023. Market participants expect the midpoint of the Federal Reserve's federal funds rate to be around 4.7 per cent by the end of 2024 and the ECB's deposit facility rate to be around 3 per cent.

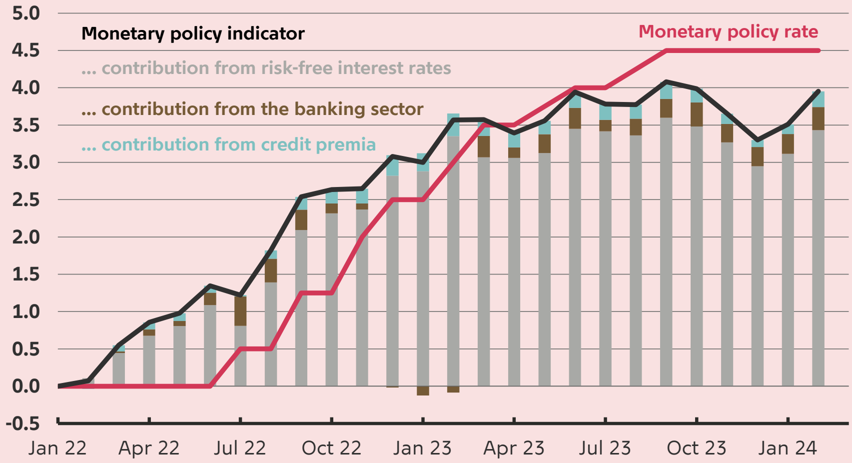
Central banks have continued to reduce their bond holdings

The ECB and the Federal Reserve are in the process of reducing their holdings of bonds from their asset purchase programmes. In June 2022, the Federal Reserve began reducing its bond holdings and since March 2023, the ECB has also been reducing its holdings from its Asset Purchase Programme, APP. At the December 2023 monetary policy meeting, the ECB announced that they will also bring forward the scaling down of the bond holdings from their Pandemic Emergency Purchase Programme, PEPP. Seen in isolation, the winding down of the asset purchase programmes helps to lift medium- and long-term bond yields and may have spill-over effects on Danish bond yields, see box 1.[11]

CHART 2

Monetary policy indicator for the euro area points to roughly unchanged financial conditions since September 2023

Percentage points, cumulative change since January 2022



Note: The monetary policy indicator, or proxy policy rate, summarises the development of nominal financial conditions expressed as a monetary policy interest rate. The chart shows the aggregate tightening of the monetary policy indicator in the euro area since January 2022. The indicator summarises the development of the monetary policy interest rate, the shape of the risk-free yield curve (German government bond yields) as well as credit spreads and the spread to bank lending rates. The 'contribution from risk-free interest rates', 'contribution from the banking sector' and 'contribution from credit premiums' columns add up to the 'monetary policy indicator' line. The 'monetary policy interest rate' series shows the actual development of the deposit facility rate in the euro area. See box 1 in Danmarks Nationalbank, Monetary policy has been tightened further, *Danmarks Nationalbank Analysis (Monetary and financial trends)*, No. 12, September 2023, for a description of the indicator. The most recent observation is February 2024.

Source: Refinitiv Eikon, Eurostat and Danmarks Nationalbank.

[11] A new study of the effects of a number of central banks' balance sheet reductions, also known as Quantitative Tightening (QT), shows that the QT programmes have so far been weakly supportive of the central banks' tightening of financial conditions. Cf. W. Du, K. Forbes and M. Luzzetti, Quantitative Tightening Around the Globe: What Have We Learned?, Prepared for 2024 US Monetary Forum, February 2024.

Monetary policy remains restrictive

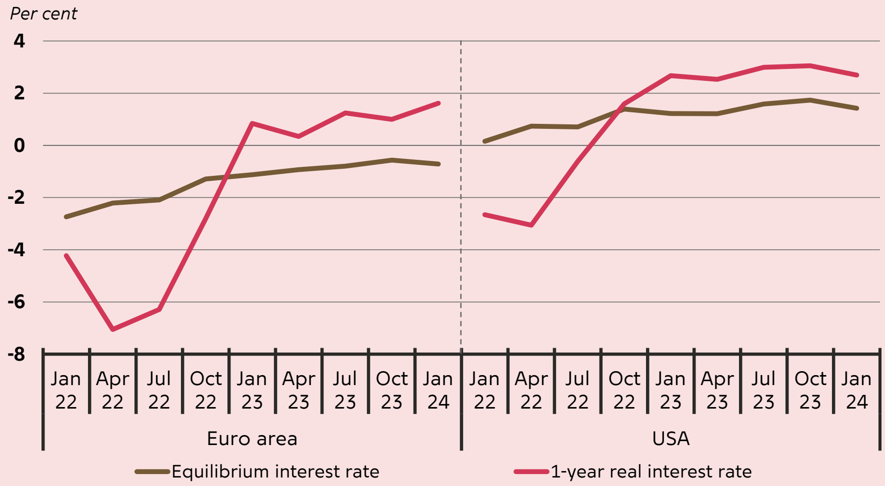
Market participants' expectations of lower monetary policy interest rates have led to lower interest rates on government bonds (risk-free interest rates) as well as lower credit risk premiums and higher equity prices, see below. In particular, lower nominal risk-free interest rates across maturities have contributed to slightly more relaxed nominal financial conditions during the autumn and winter of 2023-24. This is shown by the development of the monetary policy indicator for the euro area in chart 2.[12] As German government bond yields, among others, have risen in 2024, the monetary policy indicator has risen again. At the end of February, the monetary policy indicator was at approximately the same level as in the autumn of 2023. The monetary policy indicator summarises the development of nominal financial conditions expressed as a monetary policy interest rate. Based on the indicator, financial conditions in the euro area have tightened significantly since 2022.[13]

Although nominal market rates have fallen across maturities in both the euro area and the US, market-based real interest rates have not fallen to the same extent.[14] This is because the expectation for future inflation has also fallen, see next section. Short-term real interest rates in the euro area have risen slightly since October 2023, while in the US they have fallen slightly, see chart 3.[15] At present, short-term real interest rates remain at a higher level than estimated equilibrium interest rates for the euro area and the US, respectively.[16] Equilibrium interest rates are estimated using econometric models and are subject to considerable uncertainty. The fact that the level of short-term real interest rates exceeds the equilibrium interest rate is an indication that the current monetary policy, seen in isolation, is contributing to a dampening of economic activity and inflation in the euro area and the US.[17] Measured by this method, monetary policy in the euro area has tightened since September, even though the ECB has maintained the level of their monetary policy interest rates. Currently, modelling estimates indicate that short-term real interest rates are approximately 2 percentage points higher than the estimated equilibrium interest rate in the euro area. If short-term interest rates follow the path illustrated in chart 1 until the end of 2024, and inflation in the euro area and the US remains close to 2 per cent (see next section), monetary policy will, all else being equal, still be in restrictive territory in real terms at that time.

[12] According to the monetary policy indicator, it is mainly the decline in risk-free interest rates across maturities that has contributed to less tight nominal financial conditions in the euro area.
[13] A similar development can be seen in the corresponding indicator for the US; see "Proxy Policy Rate" at the San Francisco Federal Reserve Bank.
[14] Here, "ex ante" real interest rates are used, defined as the nominal interest rate minus expected inflation. Alternatively, one can also consider the "ex post" real interest rate, defined as the nominal interest rate minus realised inflation over the period in question.
[15] The reason why real interest rates have not fallen to the same extent as nominal interest rates is inflation expectations, which have fallen across maturities as inflation has fallen; see the following section.
[16] The equilibrium interest rate is the real interest rate that is compatible with a stable price and wage development when actual economic activity is at its structural level. If the short-term real interest rate is higher (lower) than the equilibrium interest rate, monetary policy is restrictive (supportive) for economic activity; see for example Simon Thinggaard Hetland, Rasmus Bisgaard Larsen, Marcus Mølbak Ingholt and Morten Spange, Real interest rates in the context of inflation and higher government debt, *Danmarks Nationalbank Analysis*, No. 2, February 2023.
[17] There are many methods for estimating equilibrium interest rates, all of which are subject to significant uncertainty. Other popular methods include semi-structural econometric models (e.g. Holston, Laubach and Williams, Measuring the Natural Rate of Interest: International Trends and Determinants, *Journal of International Economics*, 108, 2017) or pure market measures (based on five-year overnight-indexed swap rates starting in five years, minus the rate on inflation swaps with the same maturity). These estimates also suggest that monetary policy is restrictive for economic activity in the euro area and the US.

CHART 3

Model estimates suggest that monetary policy remains restrictive in the euro area and the US



Note: The chart shows a one-year expected real interest rate and an estimated equilibrium real interest rate for the euro area and the US, respectively. The one-year real interest rates are calculated as the interest rate on a one-year overnight-indexed swap minus the interest rate on a one-year inflation swap. The equilibrium real interest rate is based on, respectively, a German and US government bond yield starting in 5 years and expiring in 10 years, adjusted for an estimated term premium and subtracting the ECB's and Federal Reserve's inflation targets of 2 per cent. See footnotes 16 and 17. The term premium is an estimate of the additional return investors require to take on the higher risk of owning long-term bonds over short-term bonds. The term premium is estimated as the average of two dynamic interest rate models. See Jens Christensen, Francis X. Diebold and Glenn D. Rudebusch, The arbitrage-free class of Nelson-Siegel term structure models, *Journal of Econometrics*, 164.1, pp. 4-20, 2011, and Tobias Adrian, Richard K. Crump and Emanuel Moench, Pricing the term structure with linear regressions, *Journal of Financial Economics*, 110.1, pp. 110-138, 2013. All observations are at the end of the month.

Source: Refinitiv Eikon, San Francisco Federal Reserve Bank and Danmarks Nationalbank.

Measures of inflation expectations suggest inflation close to 2 per cent going forward

Various indicators suggest that short-term inflation expectations for the euro area have been declining since the latest Monetary and financial trends was published in September 2023, see chart 4. Overall, survey-based inflation expectations suggest a slower decline in inflation in the euro area than market-based indicators suggest. The market-based indicators of inflation expectations, without correction for risk premia, suggest that inflation in the euro area will hit 2 per cent in the near future.[18] Professional forecasters (ECB Survey of Professional Forecasters) expect inflation to be 2 per cent in 2025. Households (ECB's Consumer Expectations Survey) expect it to take a little longer to get back to 2 per cent, and that inflation will be slightly above 2 per cent in early 2027.

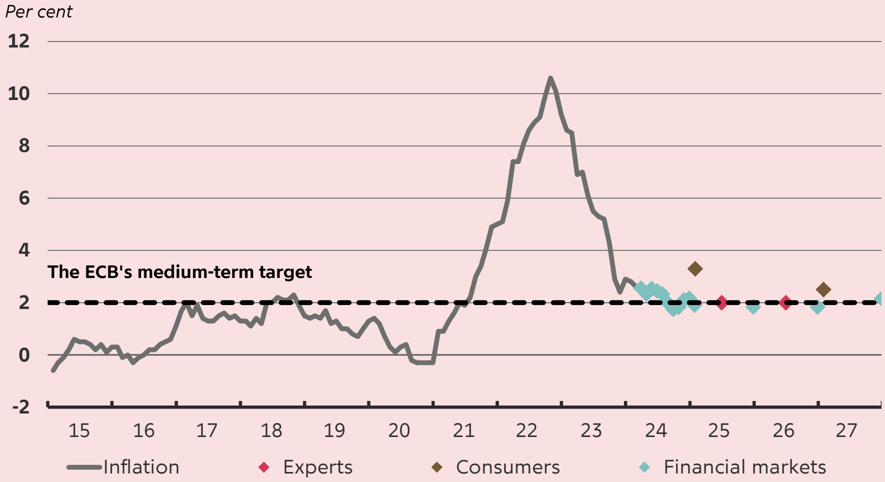
A similar picture holds for the US. Professional forecasters and market-based indicators suggest that inflation in the US will be around 2 per cent in 2025.

[18] When discussing future inflation levels and the perceptions of market participants and survey respondents, it is important to emphasise that the development of the various indicators of inflation expectations rarely predict large fluctuations in future inflation. Survey responses from professional forecasters tend to be marginally better at predicting future inflation compared to market participants and households; see for example Randal Verbrugge and Saeed Zaman, Whose Inflation Expectations Best Predict Inflation?, *Cleveland Federal Reserve Economic Commentary*, 19, October 2021.

Households expect inflation to remain above target for a longer period of time, with inflation at 2.7 per cent at the start of 2027.[19]

CHART 4

Inflation expectations for the euro area suggest an imminent return to 2 per cent



Note: The chart shows the inflation rate in the euro area, as measured by the HICP index, alongside three different measures of inflation expectations. The latest observation for the HICP index is February 2024. 'Consumers' is the median response from the ECB's Consumer Expectation Survey from January 2024. 'Experts' indicates the average response from the ECB's Survey of Professional Forecasters from the first quarter of 2024. 'Financial markets' indicates market prices (not adjusted for risk premiums) to hedge inflation risk. From 0-11 months, market participants' expectations are measured by inflation fixings and then by forward-starting inflation swaps. The latest observation for inflation swaps is 15 March 2024.
Source: Refinitiv Eikon, Bloomberg and Danmarks Nationalbank.

Medium-term inflation expectations for the euro area point to more balanced risks associated with future inflation developments

Market-based indicators for even longer horizons have also declined over the past six months. For example, the interest rate for receiving the average inflation rate in the euro area in five years from now over the following five years, a so-called 5Y5Y inflation swap, has fallen to approximately 2.3 per cent per year, see chart 5.[20] A model-based decomposition that splits the inflation swap rate into the expectation of future inflation and an inflation risk premium indicates that the inflation risk premium is positive, but has been declining over the past six months. This has happened as inflation in the euro area has slowed. Medium-term inflation expectations decreased slightly when corrected for the inflation risk premium and is around the ECB's target of 2 per cent.

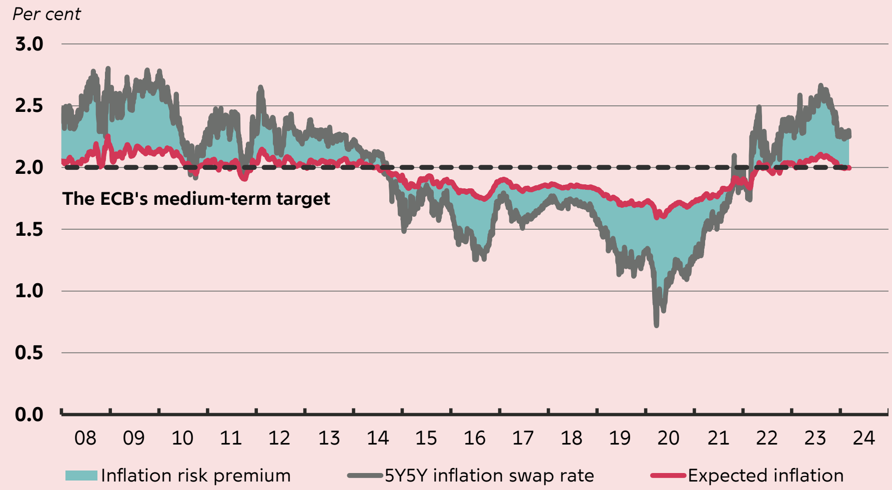
The decrease in the inflation risk premium can be interpreted as risks associated with future inflation being more balanced now than in the autumn of 2023. Among other things, the ECB pays attention to downside inflation risks. For example, the restrictive monetary policy may mean that the downturn in

[19] Household expectations are from the New York Federal Reserve Bank's Survey of Consumers and professional forecasters' expectations are from the Philadelphia Federal Reserve Bank's Survey of Professional Forecasters.
[20] In the US, the interest rate on 5Y5Y inflation swaps has also fallen over the past six months, albeit to a slightly lesser extent. The interest rate on a 5Y5Y inflation swap in the US is currently 2.6 per cent.

economic activity and inflation in the euro area is happening faster than expected. However, there are still upside risks as well. Among these is heightened geopolitical risk in the Middle East that could push up energy prices and freight rates in the short term, leading to higher inflation, see the chapter *The risk landscape is particularly linked to geopolitics and the impact of higher interest rates*in *Outlook for the Danish economy*.[21] Another upside risk is higher-than-expected wage increases in the euro area, which could also lead to higher inflation.

CHART 5

Medium-term market-based inflation expectations are 2 per cent after correcting for risk premia



Note: The chart shows expected inflation in the euro area, derived from forward starting inflation swaps, in five to ten years from now. The difference between the red and grey lines is the inflation risk premium (green area). Decomposed using an arbitrage-free Nelson-Siegel model. See Jens Christensen, Francis X. Diebold and Glenn D. Rudebusch, The arbitrage-free class of Nelson-Siegel term structure models, *Journal of Econometrics*, 164.1, pp. 4-20, 2011. The most recent observation is 15 March 2024.
Source: Bloomberg and Danmarks Nationalbank.

Long-term government bond yields have fallen

Shifting expectations for monetary policy and changes in government debt issuance have led to fluctuations in US government bond yields

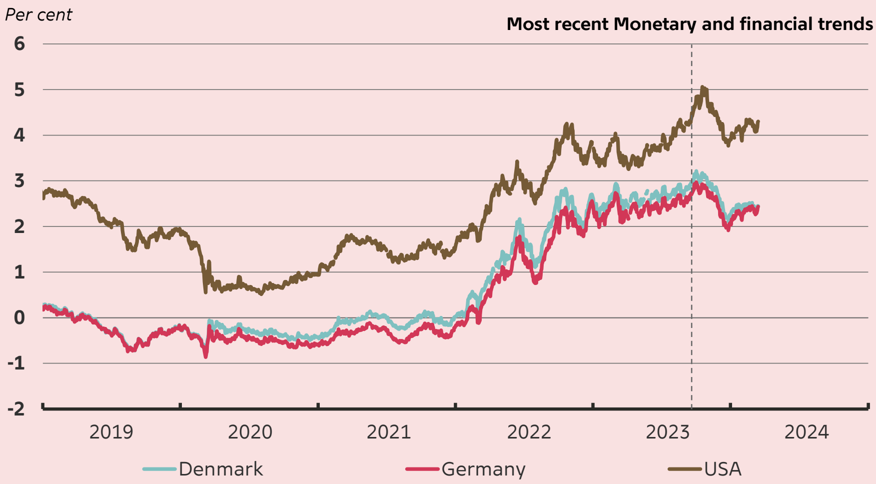
The autumn was characterised by large fluctuations in US government bond yields, in particular. From mid-September to mid-October, the 10-year US government bond yield rose by about 0.7 percentage points to 5 per cent, see chart 6. This is the highest level since the financial crisis in 2007-08. Since then, the increase has been reversed and the 10-year US government bond yield is now around 4.3 per cent.

[21] Danmarks Nationalbank, Inflation is on track but some inflationary pressure persists, *Danmarks Nationalbank Analysis (Outlook for the Danish economy)*, No. 2, March 2024.

The rise and subsequent fall in the 10-year US government bond yield should be seen in the context of inflation developments, monetary policy expectations and the outlook for government debt issuance. In October, the US Treasury surprised market participants by announcing that it would increase the issuance of long-term government debt more than expected. Given the high level of US government debt, combined with the prospects of continued fiscal deficits, the announcement resulted in a discussion on fiscal sustainability.[22,23] This may have contributed to the term premium rising through October, see the model-based decomposition in chart 7.[24] In November, the US Treasury again surprised market participants by announcing that it would reduce issuance in the long segments and increase issuance in the short segments. This may have contributed to the term premium in the 10-year government bond yield subsequently falling. As mentioned previously, the continued decline in inflation has led market participants to bring forward their expectations that the Federal Reserve will soon start cutting interest rates. This has also contributed to the 10-year government bond yield falling since the peak in October 2023, see the model-based decomposition in chart 7.

CHART 6

Long-term government bond yields have fallen

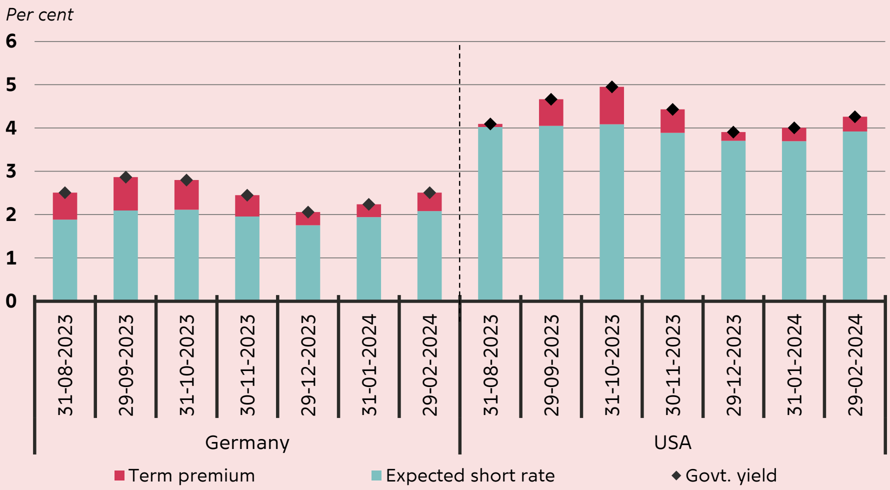


Note: Zero coupon rate on 10-year government bonds. The most recent observation is 15 March 2024.
Source: Refinitiv Eikon and Danmarks Nationalbank.

[22] In its latest forecast from February 2024, the US Congressional Budget Office expects the US national debt to reach 116 per cent of GDP in 2034 and the fiscal deficit to be approximately 6 per cent per year from 2024 until the end of their forecast in 2034.
[23] See Bank of International Settlements, BIS Quarterly Review, December 2023.
[24] The term premium is an estimate of the extra return investors require to take on the higher risk of owning long-term bonds over short-term bonds.

CHART 7

The decline in 10-year government yields reflects both lower term premia and expectations for monetary policy interest rates



Note: 10-year zero-coupon government yields decomposed into an interest rate risk premium (the term premium) and the expected average short-term interest rate. The decomposition uses the average of two dynamic interest rate models. See Jens Christensen, Francis X. Diebold and Glenn D. Rudebusch, The arbitrage-free class of Nelson-Siegel term structure models, *Journal of Econometrics*, 164.1, pp. 4-20, 2011 and Tobias Adrian, Richard K. Crump and Emanuel Moench, Pricing the term structure with linear regressions, *Journal of Financial Economics*, 110.1, pp.110-138, 2013.
Source: Refinitiv Eikon, San Francisco Federal Reserve Bank and Danmarks Nationalbank.

Decline in German government bond yields should be seen in light of a slightly lower term premium

German government bond yields have fallen overall since September. The longer German government bond yields, such as the 10-year one, have fluctuated significantly during the autumn and winter, see chart 6. The autumn and winter movements in 10-year German government bond yields should be seen in the light of market participants' changing expectations for monetary policy interest rates and a slight decline in the term premium, see the model-based decomposition in chart 7. Currently, 10-year German government bond yields are at around 2.4 per cent.

The 10-year Danish-German government bond yield spread has narrowed since autumn 2023

Danish government bond yields have followed German ones closely, see chart 8. In the slightly longer maturities, such as the 10-year segment, the spread has narrowed from 21 basis points in autumn 2023 to approximately zero.[25] The narrowing of the 10-year Danish-German government bond yield spread should be seen in light of the winding down of the ECB's asset purchase programmes (see box 1), and increasing debt issuance in Germany.[26]

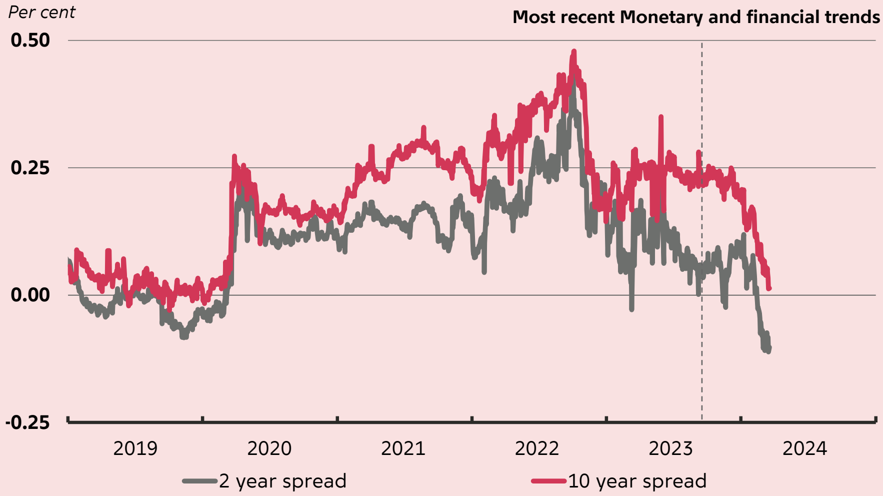
[25] See Danmarks Nationalbank, Central government borrowing and debt 2023, *Danmarks Nationalbank Report*, No. 1, February 2024.
[26] Other factors that have previously explained movements in the Danish-German government bond yield spread, such as the duration of the Danish bond market and differences in liquidity, have had no significant effect on the 10-year Danish-German government yield spread since September 2023. See Asger Munch Grønlund, Jonas Ladegaard Hensch and Simon Thinggaard Hetland, Explaining the Danish-German sovereign yield spread, *Danmarks Nationalbank Economic Memo*, No. 7, June 2022.

The ECB is winding down its asset purchase programmes. In recent years, the ECB's bond holdings have contributed to the demand for German government bonds exceeding the available supply in the bond market. This pushed down interest rates on, for example, 10-year German government bonds.[27] In isolation, the end of the asset purchase programmes and the current unwinding contribute to raising government bond yields in the euro area and may have contributed to a narrowing of the Danish-German government bond yield spread. In addition, the German Ministry of Finance issued a record amount of new government debt in 2023 and plans to do the same in 2024. The high net issuance is helping to raise yields on German government bonds. The spread between German government bond yields and other highly-rated euro area countries, such as the Netherlands and Finland, has also narrowed slightly since September, but to a lesser extent than the Danish-German spread.

At the 2-year point, the Danish-German sovereign spread has narrowed since the autumn and is now around -11 basis points.

CHART 8

The Danish-German government bond yield spread has fallen since the autumn



Note: The chart shows the 2-year and 10-year government yield spreads to German government bonds. Zero-coupon interest rates. The most recent observation is 15 March 2024.
Source: Refinitiv Eikon and Danmarks Nationalbank.

Lower market rates on corporate and mortgage bonds

Credit spreads have narrowed in the US and euro area

Credit spreads on both corporate bonds and mortgage bonds have narrowed since September 2023, see chart 9. The narrowing of spreads likely reflects lower

[27] See, for example, Fabian Eser, Wolfgang Lemke, Ken Nyholm, Sören Radde and Andreea Liliana Vladu, Tracing the impact of the ECB's asset purchase programme on the yield curve, *International Journal of Central Banking*, 19.3, pp. 359-422, 2023.

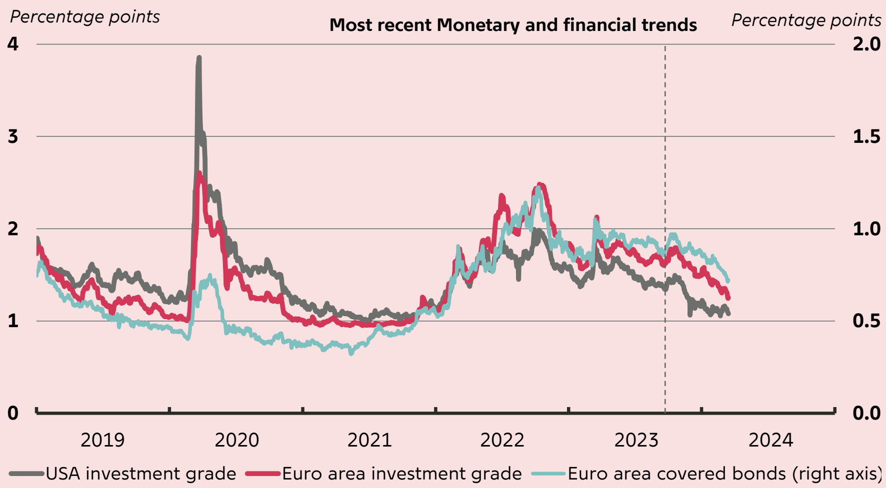
credit risk premiums, e.g. as a result of the more balanced risks associated with future inflation, growth and monetary policy, see the above.[28]

Credit spreads are an expression of the additional cost that, for example, companies or banks pay in addition to a reference rate (e.g. a government bond yield) when they issue debt. A positive credit spread reflects a higher credit and liquidity risk compared to, for example, government bonds. The development in credit spreads can therefore be seen as an indicator of risk perception and risk appetite among bond investors.

Credit spreads are at their lowest level since the ECB and the Federal Reserve started talking about an upcoming monetary policy tightening in 2022 and subsequently started raising monetary policy rates. In isolation, the narrowing of credit spreads is helping to ease nominal financial conditions for companies in the euro area and the US.

CHART 9

Credit spreads have narrowed in both the US and the euro area



Note: iBoxx index. Spreads are in excess of government bond yields. The most recent observation is 15 March 2024.
Source: Refinitiv Eikon and Danmarks Nationalbank.

Danish short-term mortgage rates have fallen due to expectations of monetary policy rate cuts

Following large increases since the end of 2021, Danish mortgage rates have fallen slightly over the past six months on market expectations of upcoming monetary policy rate cuts. For example, the yields on the bonds behind adjustable rate mortgage loans with an interest rate fixation period of 1 and 5 years (F1 and F5 loans) have fallen by 0.3 and 0.5 percentage points respectively since mid-September 2023 to approximately 3.4 and 2.9 per cent, see chart 10. Interest rates on short-term adjustable-rate mortgage loans (F-kort) have also fallen, but to a lesser extent. The interest rate underlying F-kort loans, primarily a 6-month Cita swap rate, has fallen by 0.2 percentage points to approximately 3.6

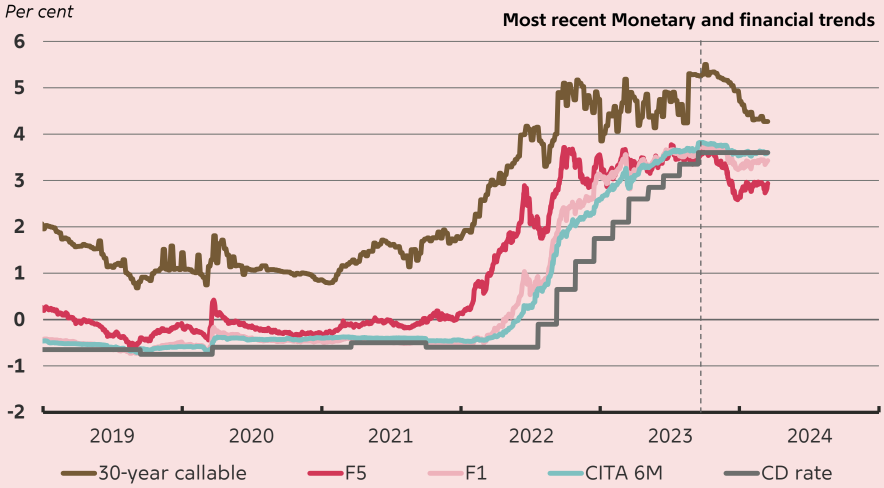
[28] Another possible explanation is that the relatively low credit spreads may reflect companies' high earnings and large cash holdings; see for example Bank of International Settlements, *BIS Quarterly Review*, December 2023.

per cent. Although the interest rates on the bonds behind adjustable-rate mortgages have been falling over the past six months, homeowners with, for example, F3 and F5 mortgages will have to pay higher interest rates when the interest rate on their loans are reset, see the chapter *Developments in macro-financial conditions.*[29]

Over the past six months, net issuance has primarily been in short-term mortgage bonds. This is a continuation of the trend seen in 2022. The large shift in net issuance of mortgage bonds should be seen in light of the fact that short-term mortgage rates rose more slowly than the interest rates on the bonds behind the 30-year fixed-rate loans. This contributed to many homeowners switching to adjustable-rate loans in connection with the conversions of their fixed-rate loans.[30]

CHART 10

Expectations of future interest rate cuts have led to lower mortgage rates in Denmark



Note: The 30-year callable mortgage bond rate is Finance Denmark's long-term mortgage rate. The series is calculated as the average effective bond yield for new issues over the week in question. The interest rate on short term adjustable rate mortgage loans (F-kort) is determined as the CITA 6M interest rate plus an adjustable-rate surcharge. The most recent observation is 15 March 2024.

Source: The Association of Danish Mortgage Banks, Nordea Analytics, Refinitiv Eikon and Danmarks Nationalbank.

Change of coupon rate and lower credit spreads have led to lower yields on callable fixed-rate mortgage bonds

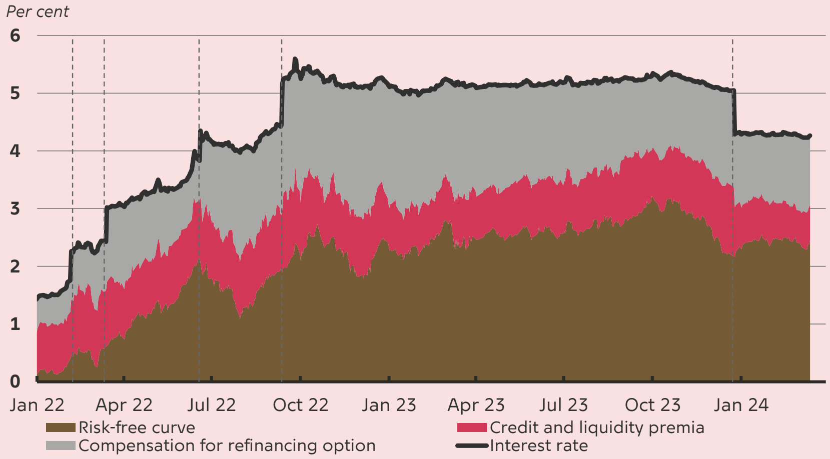
Long-term fixed-rate mortgage bond yields have fallen since the autumn. Currently, the market rate on a 30-year callable mortgage bonds is around 4.3 per cent. During December, issuance has shifted from a coupon rate of 5 per cent to a coupon rate of 4 per cent.

[29] The interest rate on adjustable rate loans, such as F1, F3 and F5 loans, varies over the term of the loan. For example, the interest rate on an F5 loan is adjusted every 5 years as the underlying bonds mature and are replaced by new ones.
[30] Read more in Henrik Yde Andersen, Erik Grenestam, Marcus Bjerregaard Læssøe, Alexander Meldgaard Otte and Sigurd Anders Muus Steffensen, Refinancing behaviour by households in Denmark when mortgage rates rise, *Danmarks Nationalbank Economic Memo*, No. 2, February 2023.

The interest rate on long-term mortgage bonds is affected by market participants' expectations of future monetary policy, credit and liquidity risk premiums and expected market fluctuations.[31] The fall in long-term mortgage rates over the past six months should be viewed in the light of lower risk-free interest rates and slightly lower credit spreads, see chart 11. Compensation for the households' right to redeem the bonds at par (the refinancing right) is approximately unchanged since September. Compensation is directly affected by the size of expected future market movements, also roughly unchanged since September.[32]

CHART 11

The decrease in 30-year callable mortgage bond yields primarily reflects lower risk-free interest rates and credit spreads



Note: The chart shows the current yield on 30-year callable mortgage bonds, decomposed into a contribution from risk-free interest rates, a credit risk premium and the compensation for the right to redeem at a price of 100. Vertical dotted lines indicate coupon changes. The most recent observation is 15 March 2024.
Source: Bloomberg, Refinitiv Eikon, Scanrate Rio and Danmarks Nationalbank.

Equity price increases driven by lower interest rates and earnings expectations

Since mid-September, equity prices in Denmark, the euro area and the US have risen, see chart 12. The increase should be viewed in the light of lower market interest rates and expectations of higher future earnings for companies.

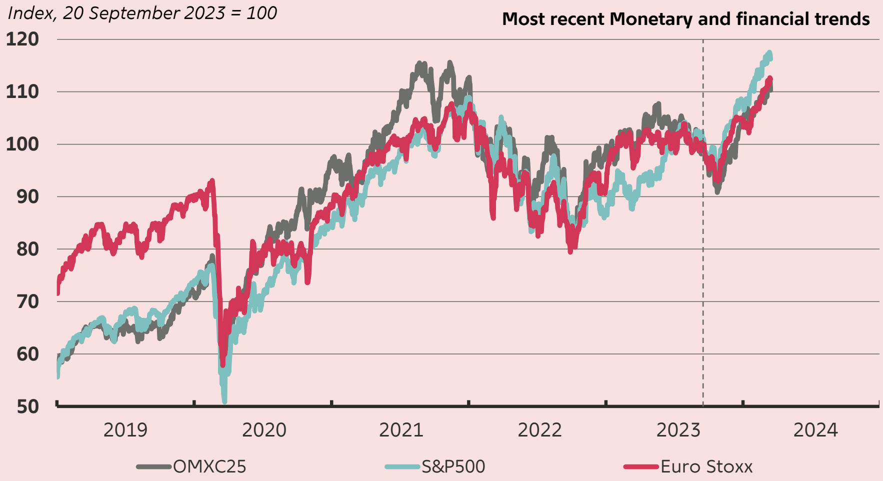
[31] Callable mortgage bonds are typically priced on the basis of a 'risk-free' yield curve, such as the government yield curve, to which are added a credit risk premium as well as compensation for the borrower's right to redeem the bond at a price of 100.
[32] As the borrower's right to redeem the bond at 100 is effectively an option, the interest rate on callable mortgage bonds is affected by market participants' expectations of future market fluctuations (measured by 'implied volatility'). The expected market fluctuations are roughly unchanged compared to September 2023.

The lower market rates have contributed positively to the equity price increases in Denmark, the euro area and the US, see chart 13, which decomposes the contribution to the development in equity prices from the end of September 2023 up to and including February 2024.[33] The expectation of relatively robust macroeconomic developments have meant that bank analysts' short-term earnings expectations for companies have increased overall since September. Medium-term earnings expectations have increased in the US and decreased in the euro area and Denmark. The equity risk premium, a measure of the excess return required to compensate for investing in a stock rather than, for example, a government bond, has increased slightly in the US since September 2023. The negative impact on equity prices from the slight increase in equity risk premiums has been more than offset by the fall in long-term interest rates and the rise in earnings expectations. In the euro area and Denmark, the equity risk premium has fallen slightly since September.

Lower market interest rates have contributed positively to equity price increases.

CHART 12

Equity prices have risen significantly since September

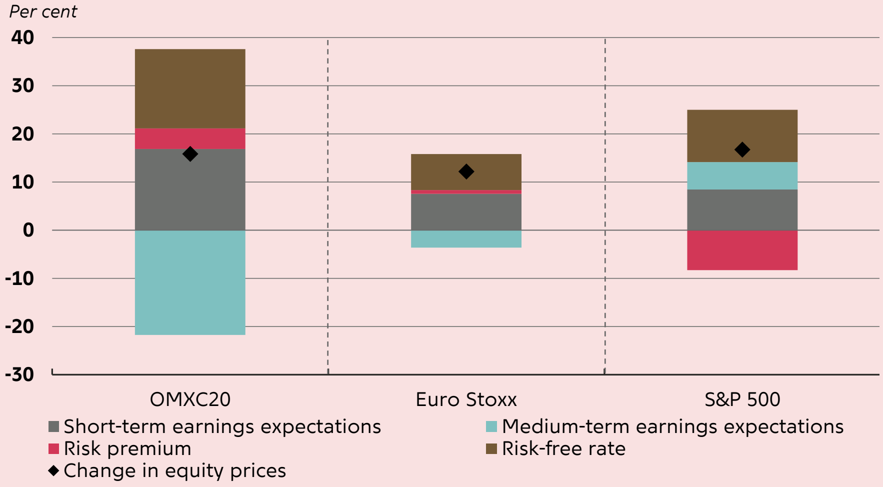


Note: The chart shows the development of the Danish OMXC25 stock index, the European Euro Stoxx stock index, and the US S&P500 stock index. The most recent observation is 15 March 2024.
Source: Refinitiv Eikon and Danmarks Nationalbank.

[33] All else being equal, lower interest rates lead to a higher (present) value of companies' future profits.

CHART 13

Equity returns have been driven by lower interest rates and higher short-term earnings expectations



Note: The chart decomposes the change in the three stock indices from 30 September 2023 to 29 February 2024. The contributions from the individual factors add up to the black square, which shows the total return over the period. The equity risk premium is a measure of the excess return required to compensate for the risk of investing in an equity rather than a risk-free asset, here represented by the interest rate on a 10-year government bond. The risk premium and the risk-free interest rate reflect the total discount rate used to discount the future expected profits. The equity risk premium and decomposition are calculated using a 3-phase dividend discount model from Fuller and Hsia, A Simplified Common Stock Valuation Model, *Financial Analysts Journal*, Vol. 40, no. 5, Sep.-Oct, 1984.

Source: Datastream and Danmarks Nationalbank.

The Danish krone has weakened slightly against a broad range of currencies

Since the latest Monetary and financial trends in September 2023, there have generally been small fluctuations in the krone exchange rate against a number of currencies, see chart 14. The small fluctuations should be viewed in light of the fact that since September 2023, monetary policy rates have remained largely unchanged across countries, expectations for future monetary policy have remained largely unchanged and inflation has developed in a relatively uniform manner.[34] However, the value of the Danish krone against the Swedish krona has fallen significantly since September. This should be viewed in light of the fact that, in September, the Swedish krona was at its lowest level since the early 1990s, meaning that the Swedish krona is still at a low level compared to the Danish krone.[35] The US dollar has weakened slightly against both the krone and a wide range of currencies. Despite the weakening of the dollar, it is still at a high level compared to the last decade. The dollar exchange rate is important for

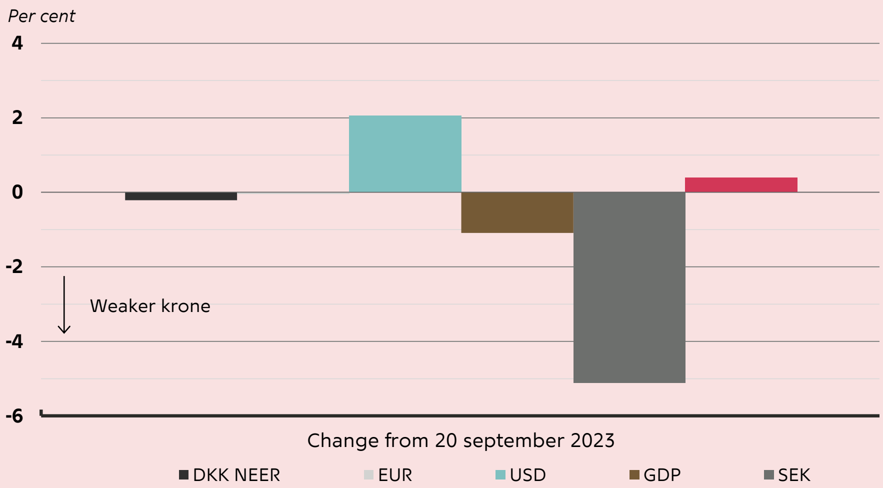
[34] According to economic theory, macroeconomic indicators such as interest rates, inflation and productivity should determine exchange rates, but in practice this correlation can be difficult to find; see for example Barbara Rossi, Exchange Rate Predictability, *Journal of Economic Literature*, vol. 51(4), pp. 1063-1119, 2013.

[35] It is the assessment of Sweden's central bank, the Riksbank, that the Swedish krona is below the structural level and that fundamentals indicate that the Swedish krona will be strengthened going forward; see Riksbanken, The Krona will strengthen in the medium term, *Monetary Policy Report,* 21 September 2023.

global financial conditions, and the Federal Reserve's interest rate hikes have helped strengthen the dollar over the past two years.[36]

CHART 14

Slight weakening of the Danish krone against a broad range of currencies



Note: DKK NEER is the nominal effective exchange rate of the Danish krone against a broad range of currencies, measured monthly. USD is the exchange rate of the krone against the US dollar, SEK is the exchange rate of the krone against the Swedish krona, and NOK is the exchange rate of the krone against the Norwegian krone. Most recent observation is 15 March 2024.
Source: Refinitiv Eikon, Bank for International Settlements and Danmarks Nationalbank.

BOX 1

The ECB has brought forward the scaling down of its balance sheet, contributing to a reduction of excess liquidity in the Eurosystem

The European Central Bank (ECB) is reducing its balance sheet as part of the tightening of its monetary policy. The ECB does this partly by reducing the portfolio of bonds purchased in connection with the asset purchase programmes and partly by redeeming the ECB's long-term loans to banks, Targeted Longer-term Refinancing Operations (TLTROs).

The ECB has accelerated the scaling down of its bond portfolio
With the Asset Purchase Programme (APP) from January 2015, the ECB focused on reducing long-term interest rates in the euro area to support inflation. During the COVID-19 pandemic, the ECB introduced its second asset purchase programme, the Pandemic Emergency Purchase Programme (PEPP), in March 2020. The purpose of the PEPP was both to help ease monetary policy and at the same time help stabilise financial markets, which were characterised by considerable turmoil. The asset purchase programmes were introduced at a time when the ECB's monetary policy was constrained by short-term policy interest rates possibly being around an effective lower bound. Long-term interest rates reflect all expected short-term monetary policy rates over the given maturity, but also credit and liquidity premiums as well as the supply and demand for safe securities over the given maturity.

Continues

[36] During periods when the dollar is strong against a wide range of currencies, financial conditions for developing economies in particular are tighter, which, all else being equal, can drag down economic growth; see for example Maurice Obstfeldt and Haonan Zhou, The Global Dollar Cycle, *Brookings Papers on Economic Activity*, vol. 2022(2), pages 361–447, 2022.

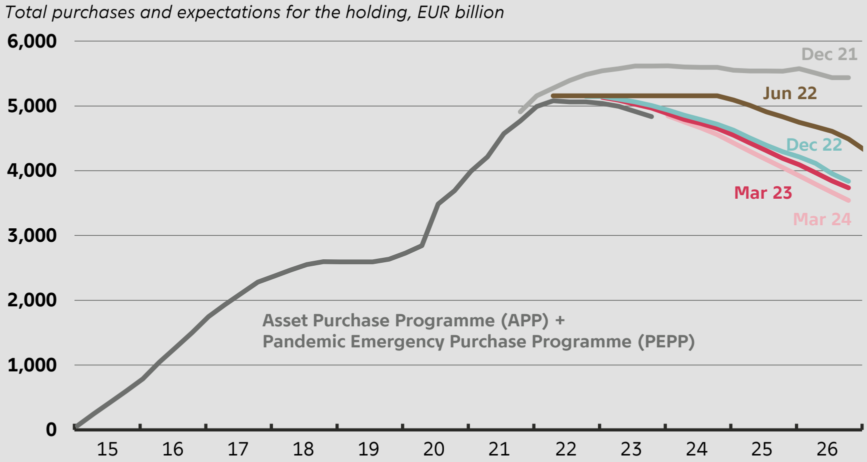
Continued

Bond purchases affect all three components, i.e. expectations, credit and liquidity premiums, and the supply of bonds in the market. Bond purchases reduce the supply in the market, which increases bond prices, resulting in lower interest rates. Conversely, a reduction in the central bank's bond holdings will help increase the supply of bonds in the market and increase interest rates, thereby supporting the ECB's tightening of monetary policy. According to the March 2024 ECB Survey of Monetary Analyst, analysts expected the ECB's balance sheet to be reduced to EUR 3,500 billion by the end of 2026, see chart A. Analysts' expectations for the scaling down of the balance sheet have been brought forward significantly since the summer of 2022.

The ECB began scaling down the APP bond portfolio in March 2023, allowing EUR 15 billion of bonds to mature per month between March and June 2023, equivalent to 0.3 per cent of the size of the bond portfolio.[1] As of July 2023, the central bank has allowed all APP bonds to mature without reinvesting coupon payments and principal amounts. From July 2023 to February 2024, the APP portfolio was thus reduced by an average of EUR 26 billion per month (see chart B), which corresponds to 0.5 per cent of the size of the bond portfolio at the time the scaling down began.[2] The ECB's reduction of the bond portfolio was thus relatively slow to begin with, but at the monetary policy meeting in December 2023, the ECB announced that in the second half of 2024 they will begin scaling down the PEPP portfolio. Thus, during the second half of 2024, the central bank will reduce the PEPP portfolio by an average of 7.5 billion euros per month and from the beginning of 2025 will refrain from reinvesting the maturing bonds. This will significantly increase the pace of the bond portfolio downscaling.

CHART A

The expectation for the ECB's bond portfolio downscaling has been moved forward significantly since the summer of 2022



Note: Expectations based on responses to the ECB's Survey of Monetary Analysts (SMA) for the time periods indicated. Prior to the introduction of the ECB's APP from 2015, the central bank purchased securities through its Securities Market Programme (SMP) from 2010 and covered bonds through its three Covered Bond Purchase Programmes, CBPP1, CBPP2 and CBPP3, from 2009, 2011 and 2014 respectively.
Source: Datastream and ECB.

Continues

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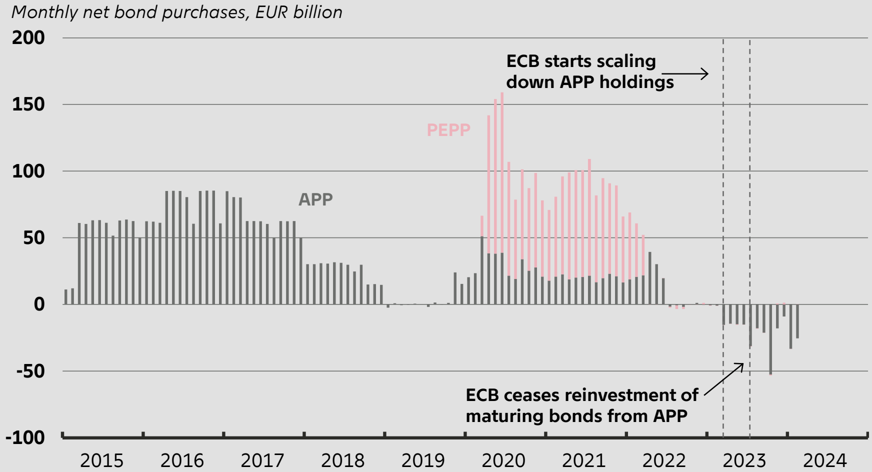
CHART B

APP bond holdings have decreased by 26 billion euros per month on average since July 2023



Note: Net purchases under the ECB APP starting from 2015 and under the ECB PEPP starting from March 2020. The total purchases under the APP include purchases under the ECB's four purchase programmes: the Public Sector Purchase Programme (PSPP), the Corporate Sector Purchase Programme (CSPP), the Asset-backed Securities Purchase Programme (ABSPP) and the Third Covered Bond Purchase Programme (CBPP3). The latest data point is for February 2024.

Source: ECB.

Reduction of long-term loans to banks

In addition to scaling down its bond holdings, the ECB has reduced its balance sheet by reducing the amount of long-term loans to banks, the so-called TLTROs. This has happened in line with the regular maturities of TLTRO loans, while the ECB has also allowed European banks to repay TLTRO loans early. The majority of TLTRO loans have either expired or been repaid early. A total of 392 billion euros of TLTRO loans are currently outstanding, corresponding to approximately 18 per cent of the volume of TLTRO loans when they peaked in November 2021 at 2,208 billion euros. The last TLTRO loans will expire during 2024, and at the end of March, for example, TLTRO loans totalling 216 billion euros will expire.[3]

The balance sheet reduction contributes to reducing excess liquidity and increasing long-term interest rates

The ECB's balance sheet reduction has two main implications for financial conditions in the euro area. *Firstly*, the balance sheet reduction contributes to reducing the excess liquidity in the Eurosystem, which is defined as the difference between the total liquidity injected into the banking system and the banks' reserve requirements. The ECB's asset purchase programmes and the extension of TLTROs have provided a significant amount of excess liquidity to the euro area banking system in the period 2015-22, which is now decreasing as a consequence of their rollback. Despite the ECB's reduction of its bond holdings and the rollback of TLTRO loans, the amount of excess liquidity in the euro area remains significant in a historical context. *Secondly*, the bond purchases were made in order to reduce long-term interest rates.[4] The effects of a reduction in the central bank's bond holdings will not necessarily be the exact opposite of the effects of the bond purchases. For example, there are indications that there is an additional effect of asset purchase programmes during periods of increased market turmoil, such as during the COVID-19 pandemic. Nevertheless, the reduction in bond holdings is expected to help reverse some of the narrowing of risk premiums that has resulted from the ECB's asset purchase programmes. In doing so, the winding down contributes to increasing medium- and long-term bond yields in the euro area.[5] This can have spill-over effects on Danish bond yields.[6]

Continues

Continued

[1] In Q2 2023, the ECB's holdings of bonds from the APP programme amounted to EUR 3,341 billion, while the PEPP holdings amounted to EUR 1,675 billion.
[2] In comparison, the Federal Reserve matures USD 95 billion worth of bonds per month, which corresponds to 1.1 per cent of the size of the bond portfolio at its peak in April 2022.
[3] See ECB, Open market operations (*link*).
[4] The ECB estimates that the bond purchases have had a significant downward effect on long-term interest rates in the euro area. However, studies do not provide a clear answer to the size of the effects. See e.g. Eser et al, Tracing the impact of the ECB's asset purchase programme on the yield curve, *ECB Working Paper Series,* no. 2293, 2019, and Altavilla et al, Asset Purchase Programs and Financial Markets: Lessons from the Euro Area, *International Journal of Central Banking*, October 2021.
[5] See speech by Isabel Schnabel, Quantitative Tightening: rationale and market impact, 2 March 2023 (*link*). For studies on the effects of QT, see for example W. Du, K. Forbes and M. Luzzetti, Quantitative Tightening Around the Globe: What Have We Learned?, Prepared for 2024 US Monetary Forum, February 2024, and A. Lee Smith and Victor J. Valcarcel, The financial market effects of unwinding the Federal Reserve's balance sheet, *Journal of Economic Dynamics and Control*, 146, January 2023.
[6] See Jensen et al., The ECB's unconventional monetary policy and the role of exchange rate regimes in cross-country spillovers, *Danmarks Nationalbank Working Paper, n*o. 119, October 2017.

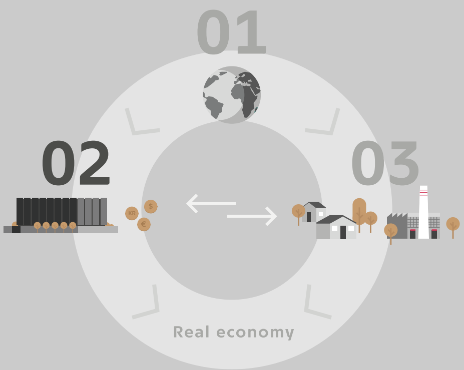
02
The Danish money and foreign exchange market

Since the latest Monetary and financial trends in September 2023, Danmarks Nationalbank has maintained the level of the monetary policy interest rates because of unchanged monetary policy interest rates in the euro area and a stable krone exchange rate against the euro.

New data show that the interest rate on money market loans, where money is lent against collateral in the form of a security, closely follows Danmarks Nationalbank's monetary policy interest rates. The monetary tightening during 2022-23 was thus transmitted smoothly to the secured Danish money market.

The exchange rate of the Danish krone against the euro has remained stable near the central parity rate. Danish non-financial corporations have made net purchases of Danish kroner since the latest Monetary and financial trends in September 2023. Purchases of kroner come mainly from companies that produce in Denmark and export abroad. Foreign market participants have net sold kroner during the period, partly due to increases in the value of their Danish assets.

Chapter 02 and connection with the rest of the analysis
This chapter (02) provides a status on developments in the krone exchange rate and the Danish fixed exchange rate policy. The chapter analyses, among other things, how the monetary policy tightening since 2022 (01) has passed through to the Danish money market. The pass-through to the money market is crucial for the monetary policy transmission further into the economy, which is analysed in chapter (03). Due to the Danish fixed exchange rate policy, developments in the krone market are key to how the ECB's monetary policy is passed through to Danish financial conditions. Therefore, chapter (02) also analyses capital flows in the foreign exchange market.



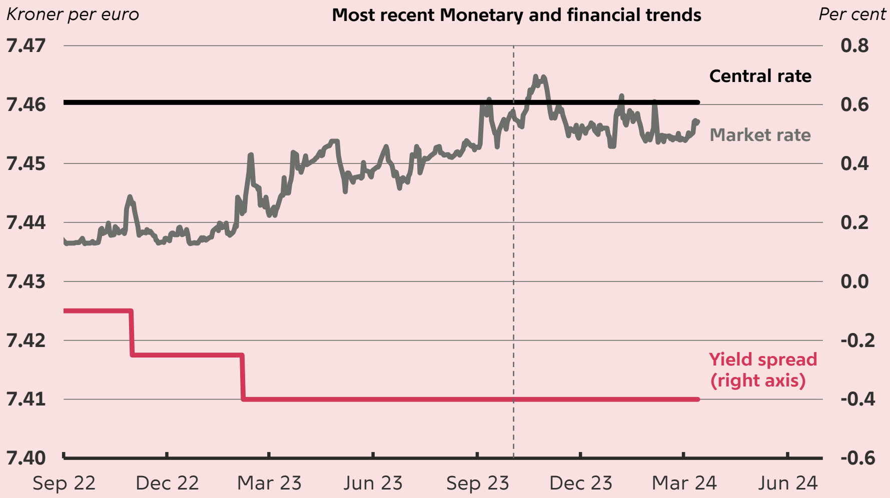
Stable exchange rate against the euro and unchanged monetary policy interest rates

Since the last Monetary and financial trends in September 2023, the ECB has kept monetary policy interest rates unchanged, see the chapter *Global financial market developments.* Danmarks Nationalbank has also maintained its monetary policy interest rates at the same level during the period. Danmarks Nationalbank has raised interest rates 10 times by a total of 4.2 percentage points since monetary tightening began in 2022.

The exchange rate of the Danish krone against the euro has been stable around the central rate, see chart 15. Against this background, Danmarks Nationalbank has neither intervened in the foreign exchange market nor changed the monetary policy interest rate spread to the ECB over the past six months. The monetary policy interest rate spread was last widened from -0.25 to -0.4 percentage points on 3 February 2023. The widening of the spread occurred in connection with the ECB's monetary policy rate hike and in the wake of a series of interventions in the foreign exchange market by Danmarks Nationalbank. Following the widening of the monetary policy interest rate spread, the krone weakened moderately against the euro.[37]

CHART 15

The krone exchange rate against the euro has remained stable around the central rate



Note: Exchange rate of the krone against the euro. The most recent observations are from 15 March 2024. The official fluctuation bands for the exchange rate are 7.62824 and 7.29252 kroner per euro as per the ERM2 agreement. The monetary policy interest rate spread is defined as the difference between the ECB's deposit facility and Danmarks Nationalbank's current-account interest rate. For more, see Toftdahl and Spange, Fixed exchange rate in Denmark, *Danmarks Nationalbank Monetary Review*, 1st Quarter, 2014.
Source: Refinitiv Eikon and Danmarks Nationalbank.

Unsecured money market rates closely follow Danmarks Nationalbank's rates

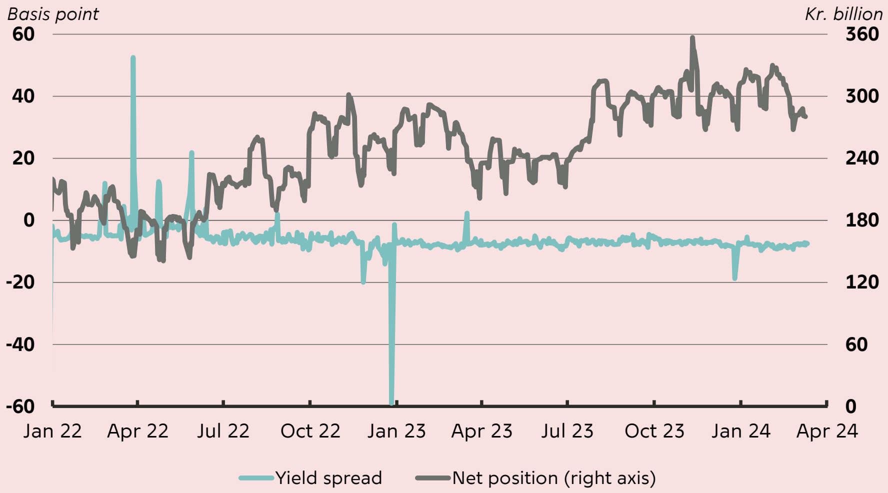
The Danish money market interest rate, Denmark Short-term Rate, DESTR, closely follows Danmarks Nationalbank's interest rates and has over the past six months

[37] See Danmarks Nationalbank, Monetary policy will cool down the economy, *Danmarks Nationalbank Analysis (Monetary and financial trends)*, No. 3, March 2023.

remained stable at around 7 basis points below the current-account rate, see chart 16. DESTR is a short-term, transaction-based reference rate for the Danish money market and is based on unsecured overnight deposit transactions between reporting banks and other banks as well as other financial institutions. DESTR fell slightly relative to the current-account interest rate at the turn of 2023-24, which was a so-called year-end effect. Year-end effects in the money market can occur when banks adjust their balance sheets leading up to year-end in preparation for financial reporting and the calculation of regulatory key ratios.[38]

CHART 16

High net position contributes to a stable spread between DESTR and the current-account rate



Note: The difference between Danmarks Nationalbank's current-account rate and the Denmark Short-term Rate, DESTR, as well as the net position. The most recent observations are from 15 March 2024. The banks' net position vis-à-vis Danmarks Nationalbank is defined as monetary policy counterparties' holdings of certificates of deposit and current-account balances less their holding of monetary policy loans. The current-account rate is the interest rate on the monetary policy counterparties' current-account deposits. DESTR is the short-term, transaction-based reference rate for the Danish money market.
Source: Danmarks Nationalbank and Refinitv Eikon.

The negative yield spread between DESTR and the current-account interest rate is partly due to the high net position. The high net position implies a large amount of available krone liquidity in the Danish money market. The net position is around kroner 300 billion, partly due to Danmarks Nationalbank's interventions in the foreign exchange market in the second half of 2022. This is the highest level for the net position since 2015, when Danmarks Nationalbank also intervened to weaken the krone against the euro.[39] When the net position is high, banks will typically offer an interest rate below Danmarks Nationalbank's current-account rate for receiving unsecured money market deposits from other

[38] See Danmarks Nationalbank, DESTR is a robust anchor in the Danish capital market, *Danmarks Nationalbank Analysis, no.* 5, March 2023.
[39] When Danmarks Nationalbank weakens the krone rate by selling kroner against foreign currency at a bank, both the foreign exchange reserve and the net position increase, the latter through an increase in current account deposits, see Danmarks Nationalbank, *Monetary Policy in Denmark*, 3rd edition, 2009.

market participants. This puts downward pressure on short-term money market interest rates.[40]

The secured and unsecured Danish money market

The Danish money market is crucial for the transmission of Danmarks Nationalbank's monetary policy interest rates to both the krone exchange rate and the financial conditions in Denmark. Among other things, money market interest rates form the basis for setting reference rates that determine the interest rate on financial products, including certain mortgage loans. Money market loans are categorised as secured or unsecured depending on whether a security is exchanged as collateral when the contract is entered into. Since the financial crisis in 2007-08, an increased focus on liquidity and credit risks has led to a shift from unsecured to secured loans among money market participants and entails that secured money market loans now account for the majority of turnover in the Danish money market. Most of the turnover in the unsecured money market consists of overnight contracts, while secured money market loans are often of slightly longer maturities, though typically less than one month.

Smooth transmission to secured Danish money market interest rates

New data on banks' transactions in the money market show that secured money market interest rates generally follow Danmarks Nationalbank's interest rates closely, and that the monetary policy tightening in 2022-23 was transmitted smoothly to the secured money market interest rates in Denmark, see chart 17. Secured money market loans are repurchase agreements, or repos, where money is borrowed against collateral in the form of a security, typically bonds, see box 2. Banks' counterparties in repo contracts include a number of financial institutions such as banks, pension funds and investment funds, which use secured loans to obtain liquidity.

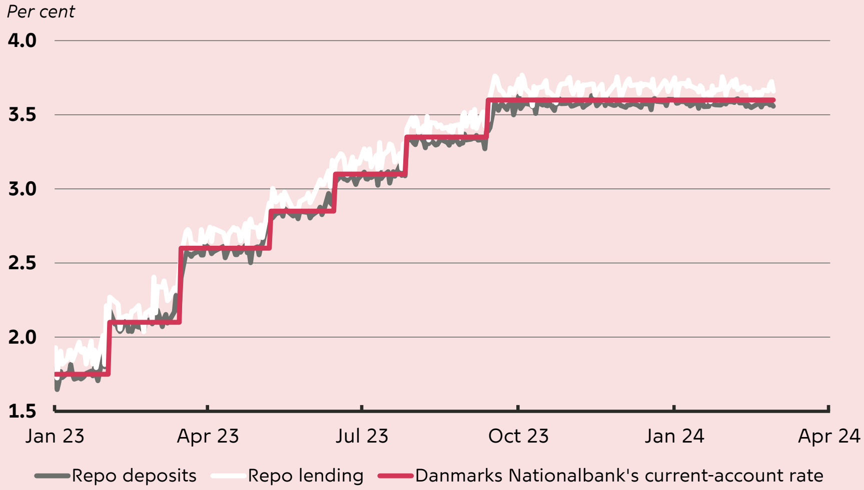
"

Secured money market interest rates generally follow Danmarks Nationalbank's rates closely.

[40] See Danmarks Nationalbank, Monetary policy has been tightened further, *Danmarks Nationalbank Analysis (Monetary and financial trends)*, No. 12, September 2023, and box 3 in Danmarks Nationalbank, Tighter monetary policy has made financing more expensive, *Danmarks Nationalbank Analysis (Monetary and financial trends)*, No. 10, September 2022.

CHART 17

The interest rate on new repo loans closely follows Danmarks Nationalbank's current-account interest rate



Note: The interest rate on new repo-deposits and repo-lending in Danish kroner as seen from the reporting banks. Average repo rates in per cent are annualised and weighted by contract size.
Source: Danmarks Nationalbank's money market statistics and own calculations.

BOX 2

Unique micro data enables analyses of the secured Danish money market

Since 2023, Danmarks Nationalbank has collected high-frequency, transaction-based money and foreign exchange market data for Foreign Exchange and Money Market Statistics (FXMMSR). The data consists of spot trades, forward contracts and swap agreements made through the 9 most active banks in the Danish money and foreign exchange market. Parts of the data material can be accessed on Danmarks Nationalbank's website, where the published statistics, among other things, contain information on the turnover in the money market broken down by loan characteristics.

The unique data allows Danmarks Nationalbank to analyse the Danish money and foreign exchange market, including the part of the market for secured money market loans that goes through the reporting banks. Secured money market loans consist of repo contracts where a given security is sold in exchange for an agreement to repurchase the security at a certain point in the future. These contracts can be cleared through a central counterparty or be entered into directly between market participants. The purpose of the contract is either to exchange liquidity or to obtain a specific underlying security. When banks enter into a repo loan, the interest rate depends on whether the contract is entered into in order for the counterparty to provide liquidity or for the bank to provide a specific security. The interest rate in the contract will typically be lower when the reporting bank has a desire to obtain a specific security.[1]

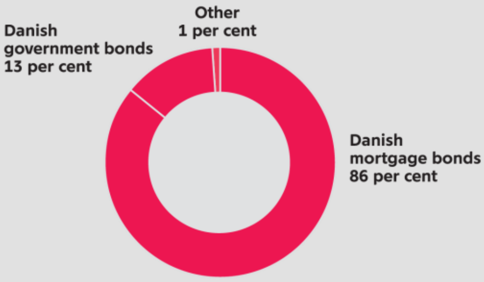
The data shows, among other things, that Danish mortgage bonds have been used as collateral in 86 per cent of the secured loans in kroner that were entered into during the period covered by the statistics, see Chart A. After this, Danish government bonds have mainly served as collateral. The relationship between mortgage bonds and government bonds should be seen in light of the fact that the market for Danish mortgage bonds is larger than the market for Danish government bonds.[2]

Continues

Continued

CHART A

Secured loans broken down by collateral types



Note: The chart covers secured money market loans in kroner from April 2023 up to and including January 2024, broken down by collateral types. The calculation is based on transactions made through the Danish banks that report to the foreign exchange and money market statistics. No adjustment has been made for double counting, i.e. reporting of the same trade for two reporting counterparties. 'Other' covers all securities other than Danish mortgage bonds and Danish government bonds. Transactions with households and transactions under 5,000,000 kr. are not included in the statistics.

Source: Danmarks Nationalbank.

[1] See for example ECB, Euro money market study 2022 – money market trends as observed through MMSR data, 2022 (*link*).

[2] See www.nationalbanken.dk (link).

Solid daily turnover in the money market during the period of high net position

In a situation like today, with a high net position and thus high bank liquidity, banks' need for money market transactions is lower, all else being equal. This can dampen turnover in the money market.[41] However, turnover in the Danish money market is solid, which reflects that a large part of the turnover is based on transactions between banks and other market participants who do not have access to Danmarks Nationalbank's monetary policy instruments. This supports the smooth transmission of monetary policy interest rates to money market interest rates. Among other things, this is achieved by ensuring that the calculation of the transaction-based reference rate DESTR is based on a solid foundation.[42] The daily turnover behind the calculation of DESTR, unsecured overnight deposits, has averaged just under 5 billion kr. since DESTR was introduced in 2022. Turnover in secured money market loans is significantly higher than in the unsecured segment. On average, the daily turnover in secured money market deposits has been 21 billion kr. over the last year for which data is available in the money market statistics.

[41] See Åberg et al., Demand for central bank reserves and monetary policy implementation frameworks: the case of the Eurosystem, *ECB Occasional Paper Series*, 2021.

[42] See Danmarks Nationalbank, DESTR is a robust anchor in the Danish capital market, *Danmarks Nationalbank Analysis*, March 2023.

Balance between market actors resulted in a stable krone exchange rate against the euro

Trading between actors in the Danish krone market has been balanced since the last Monetary and financial trends in mid-September 2023. The largest net buyers have been Danish non-financial companies. The Danish insurance and pension sector has also made net purchases of Danish kroner during the period, due to increases in the value of Danish pension assets invested abroad. Meanwhile, foreign market participants have been net sellers of kroner, which among other things may reflect increased hedging of kroner, as their holdings of Danish securities have increased in value.

Danish export companies account for the majority of net kroner purchases

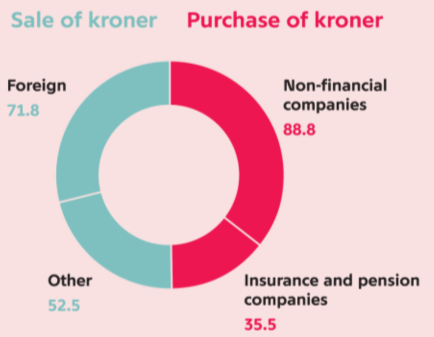
Danish non-financial companies continue to be the largest net buyers in the Danish krone market, and have since September bought kroner for a net total of 88.8 billion kr. through Danish banks, see chart 18. While import companies have been net sellers of kroner during the period, the purchases of kroner come from Danish companies that export abroad. This is especially from export companies that produce goods in Denmark, see the category 'Goods that cross the border' in chart 19.[43] These companies exchange a significant part of their foreign turnover to pay their production costs in Danish kroner, see box 3.

"

The krone purchases mainly come from companies that produce goods in Denmark for export.

CHART 18

Total net trading in the Danish krone market since September 2023



Note: Total net krone trading from September 2023 up to and including February 2024 in billions of kroner. Net krone purchases are based on spot and forward trades made through Danish banks that report to the money and foreign exchange market statistics. The 'Foreign' category contains all foreign market participants, which are primarily foreign banks and companies. The 'Other' category includes Danish investment funds, Danish banks, etc.
Source: Danmarks Nationalbank and own calculations.

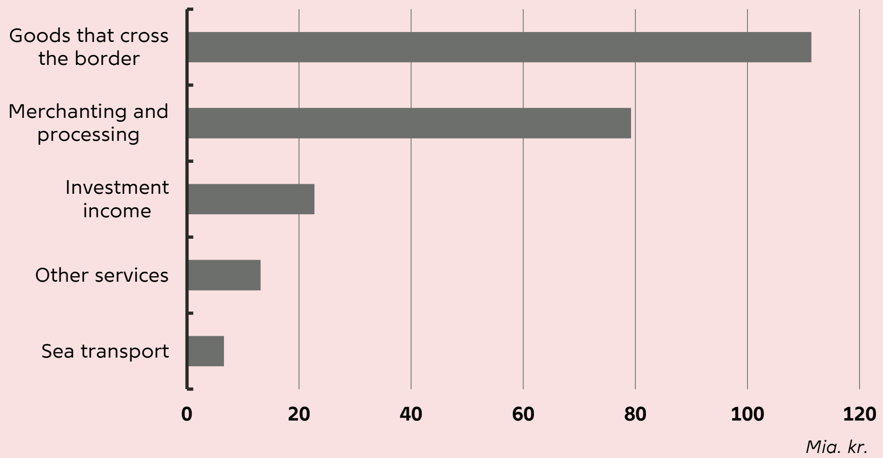
Another major source of krone purchases are exporting companies with production located abroad.[44] For companies with production abroad,

[43] The net exporting companies in Chart 19 have purchased a total of 233 billion kr. in 2023. This figure exceeds the sector's total net figure of 88.8 billion kr. in Chart 18, as this calculation also includes sales of kroner from net importing companies and covers a different, shorter reference period.
[44] The output of these companies has made an increasing and significant contribution to the Danish economy and account surplus in recent years, see Danmarks Nationalbank, Inflation is on track but some inflationary pressure persists, *Danmarks Nationalbank Analysis (Outlook for the Danish economy)*, No. 2, March 2024.

production costs are typically incurred in foreign currency. For this reason, all other things being equal, these companies have less need to buy kroner than companies with production costs in kroner. Although these companies do not convert their currency to kroner to the same extent to pay production costs, profits are converted to kroner, partly so they can be shared with the company's shareholders. This applies, e.g., to companies in the 'Merchanting and processing' category (see chart 19), where Danish companies pay foreign companies to produce goods that are sold directly to foreign consumers. The same applies to companies in the 'Investment income' category, where Danish companies own foreign companies that own and produce the goods sold to foreign consumers.[45] One thing that these companies have in common is that their profits are high, giving rise to significant purchases of kroner.

CHART 19

Export companies with production in Denmark buy the most kroner



Note: Total net purchases of kroner from Danish export companies in 2023. The 'Goods that cross the border' category primarily covers goods produced in Denmark and exported abroad. The 'Investment income' category covers companies that do not export themselves, but own foreign companies and receive the profits from these in the form of dividends. The category "Other services" covers all other services except sea transport. The companies' net krone purchases are divided by balance of payments categories according to how much of the company's net exports the category represents. For example, the krone purchase from a company where net exports are made up equally of 'Goods crossing the border' and 'Investment income' will be split equally between the two categories.
Source: Danmarks Nationalbank and Statistics Denmark.

BOX 3

Production costs are an important factor in the amount of kroner companies buy

Danish companies' net exports result in a large turnover in foreign currency, which is converted into Danish kroner to varying degrees depending on how the companies are organised. Company turnover is used for three overall purposes: 1. payment of costs and investments related to the production of goods or services, 2. sharing of profits with company owners, or 3. to save profits. The company converts foreign currency into kroner if kroner are used to fulfil one or more of these three purposes.

Continues

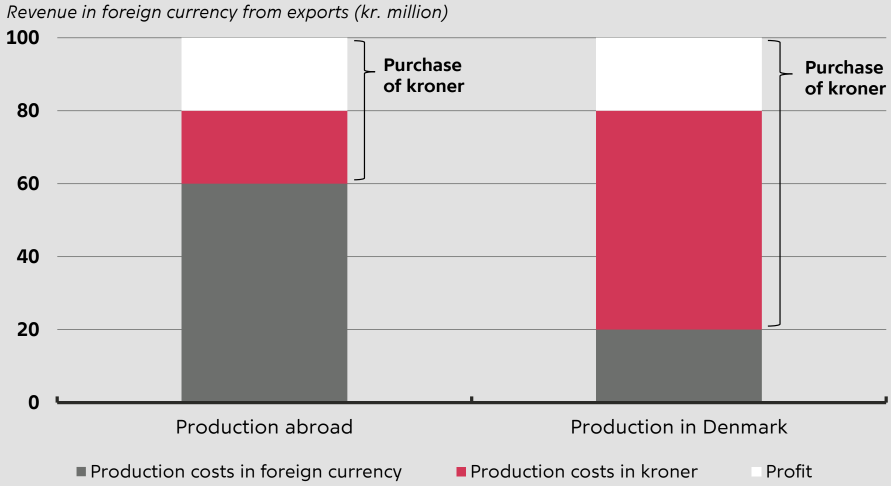
[45] Share buy-backs and dividend payments may subsequently result in a sale of kroner to the extent that the money accrues to foreign owners, see Danmarks Nationalbank, Monetary policy has been tightened further, *Danmarks Nationalbank Analysis (Monetary and financial trends)*, No. 12, September 2023.

Continued

The location of a company's production has a significant impact on the company's purchase of kroner. This is illustrated by the example in chart A. The location of production matters because the majority of a company's turnover goes towards paying production costs. Companies typically store cash in the same currency as their production costs are settled in, as this eliminates the exchange rate risk. Thus, companies that produce goods and services in Denmark both convert part of their current turnover from foreign currency to Danish kroner (see above), while future corresponding turnover is hedged to Danish kroner with forward contracts.[1] This happens because companies need kroner to pay Danish suppliers, pay Danish wages and for investments in Denmark. Additionally, with production in Denmark, there is typically a need for larger investments in land, facilities, employees, etc. as the company grows. This means that companies with production in Denmark exchange a larger proportion of their total turnover in foreign currency into Danish kroner, compared to a Danish company that produces abroad.

CHART A

Illustration of how companies with a turnover of 100 million kr. in foreign currency use the turnover to pay for costs in kroner and foreign currency depending on the location of production



Note: The chart is a simplified and fictitious example of how two similar companies with a turnover of 100 million kr. may have different needs to buy kroner due to the location of their production. Companies with production in Denmark must exchange more of their foreign currency turnover into Danish kroner to finance production (e.g. to pay suppliers and wages), while companies with production abroad do not exchange to the same extent, as production is paid in foreign currency.

When a Danish company produces its goods and services abroad, a large part of the foreign turnover will be used to pay for production costs in foreign currency. Danish companies with the majority of their production abroad thus only have limited costs in kroner. Companies with production abroad are companies whose net exports are categorised as merchanting/processing, sea transport or investment income. Once the companies' costs have been paid, the remaining part of the turnover is profit. Despite the fact that production costs are denominated in foreign currency, Danish companies whose accounting currency is the Danish krone will typically hedge the currency risk of their profits with forward contracts to exchange currency for kroner in the future. The conversion to kroner is done, among other things, in connection with profit sharing. Regardless of the type of production, companies will often share a large part of their profits with their owners, either through dividends or by buying back their own shares. In 2023, Danish C25 companies have bought back own shares for a total of 56 billion kr. and paid out dividends for 158 billion kr.

Production abroad is increasingly used by Danish companies, which has a major impact on their cash flows and thus their need for foreign currency. More foreign direct investment flows from Danish companies contribute to a larger share of Danish companies' profits coming from production abroad. Companies with production in Denmark and a need to scale up their production in the short term may also look abroad, e.g. if this can quickly increase the available specialised workforce. When companies locate their production abroad, it will only slightly increase their need for kroner, as large parts of the turnover will remain in foreign currency to pay for the production.

[1] From there, turnover can be further distributed and potentially sent abroad again if, for example, the group's foreign subsidiaries need liquidity in foreign currency.

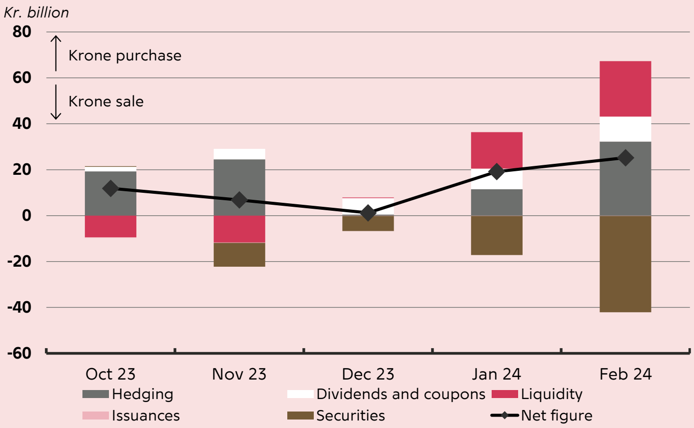
Currency hedging behind net purchases from the insurance and pension sector

Over the past six months, the Danish insurance and pension sector (IP) made net purchases of 35.5 billion kr., see chart 20. The purchase of kroner during the period is particularly driven by currency hedging (see chart 20), as IP increased its hedging of the US dollar due to increases in the value of its US equity holdings. Since the last Monetary and financial trends in September 2023, US stock prices increased by around 19 per cent, see the chapter *Global financial market developments.* IP typically hedges dollar exposures with a fixed percentage.[46] When the market value of US securities increases, IP's exposure to the dollar increases. In order to maintain the same hedge ratio, companies in the sector have therefore entered into new forward contracts to exchange dollars for kroner, which has resulted in krone purchases in the foreign exchange market.

There is dispersion in whether currency hedging has given rise to purchase or selling of kroner from individual pension companies since September, see chart 21. While price increases in US equities over last six months have resulted in krone purchases, the krone sales are primarily due to a reduction in euro hedging. The latter should be seen in the context that Danmarks Nationalbank's negative monetary policy interest rate to the ECB increases the price hedging euro to kroner. The monetary policy interest rate spread was last widened from -0.25 to -0.4 percentage points on 3 February 2023.[47]

CHART 20

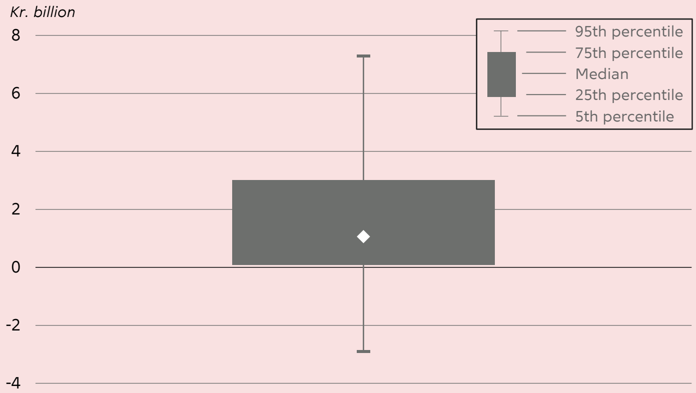
Especially currency hedging has resulted in purchases of kroner from IP



Note: Accumulated net krone purchases and net krone sales by direct reason for the transaction. Figures are adjusted for major internal reallocations of assets between IP and investment funds. 'Hedging' includes net krone trading related to hedging of exposures in all foreign currencies, including both euro and dollar.
Source: Danmarks Nationalbank.

CHART 21

Dispersion in krone purchases from currency hedging



Note: The chart shows the dispersion in IP krone purchases and sales due to changes in currency hedging since October 2023 up to and including February 2024. The figures cover hedging of all currencies, including euro and dollar, expressed as percentiles. The 95th percentile indicates the number that 95 per cent of the krone purchases are equal to or less than, with 5 per cent of the krone purchases being greater than this number. The same explanation applies to the other percentiles.
Source: Danmarks Nationalbank.

[46] See e.g. Danmarks Nationalbank, Tighter monetary policy has made financing more expensive, *Danmarks Nationalbank Analysis (Monetary and financial trends)*, No. 10, September 2022, and Danmarks Nationalbank, Rising inflation and Russian invasion increased volatility, *Danmarks Nationalbank Analysis (Monetary and financial trends)*, No. 4, March 2022. While the sector as a whole maintains a fixed hedge ratio, there can be differences in how individual companies choose to hedge currencies.
[47] See Danmarks Nationalbank, Monetary policy will cool down the economy, *Danmarks Nationalbank Analysis (Monetary and financial trends), no.* 12, September 2023.

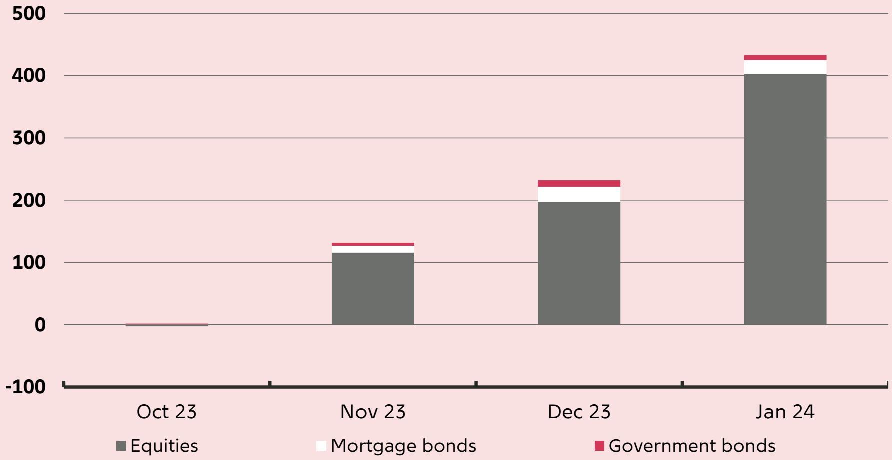
Increases in the value of Danish securities led to krone sales from abroad

Since the last Monetary and financial trends, foreign market participants have sold 71.8 billion kr. through Danish banks, see chart 18. The sale of the Danish krone should be seen in light of the fact that the value of Danish securities, including shares and mortgage and government bonds, has increased significantly, see the chapter *Global financial market developments.* When the market value of Danish securities rises, it can give rise to sales of Danish kroner in connection with currency hedging. This can happen if foreign investors want to reduce the increased exposure in kroner from the value increases and therefore enter into new forward contracts to sell kroner against foreign currency. In total, the value of foreign holdings of Danish securities increased by 433 billion kr. during the period, see chart 22. Foreign market actors have also divested holdings of Danish securities totalling 50 billion kr.[48] To the extent that the securities are not fully hedged to foreign currency, the divestment leaves the foreign shareholders with kroner, which are to a certain extent subsequently converted into foreign currency.[49]

CHART 22

Foreign holdings of Danish securities have increased significantly in value

Accumulated change in value of foreign-held portfolio of Danish securities, kr. billion



Note: Accumulated changes in value of foreign holdings of Danish equities, mortgage and government bonds in billions of kroner.
Source: Danmarks Nationalbank.

[48] Of this, shares worth 21 billion kr. and government and mortgage bonds worth 36 billion kr. have been sold. In the same period, they have bought investment fund units for 7 billion kr.
[49] See Danmarks Nationalbank, Monetary policy has been tightened further, *Danmarks Nationalbank Analysis (Monetary and financial trends),* No. 12, September, 2023.

03 Macro-financial developments

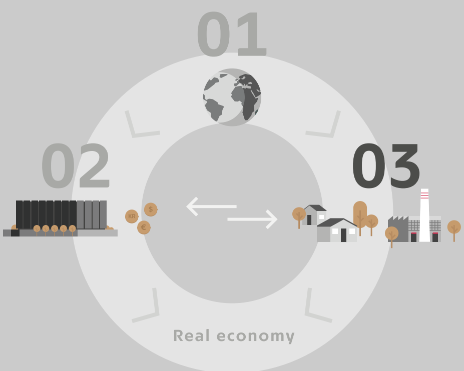
Monetary policy remains tight and the effects of the previous monetary policy tightening are still working their way through to the borrowing conditions for households and companies, albeit at a slightly slower pace than before. This reflects the fact that most of the pass-through from previous monetary policy tightening to the borrowing conditions has occurred, and that there have been no further rate hikes since September 2023.

The higher level of monetary policy interest rates contributed to the fact that interest rates on new loans for Danish households remain at a high level relative to recent decades. The high interest rates on loans have led to a significant increase in interest expenses for Danish households. However, increases in disposable incomes mean that households have been able to increase both savings and consumption at the same time.

Danish companies are feeling the monetary policy tightening through significant increases in their total financing costs, and the inflow of total external financing has fallen significantly through the second half of 2023.

Chapter 03 and connection with the rest of the analysis

This chapter (03) provides a status on the transmission of monetary policy to borrowing conditions for households and firms. Developments in global financial markets (01) and domestic monetary policy (02) affect the macrofinancial conditions for Danish firms and households (03). The substantial increases in policy rates since 2022 imply that borrowing rates for Danish households and firms are at a relatively high level, which, viewed in isolation, dampens growth and inflation in 2024. The macrofinancial conditions are important for Danmarks Nationalbank's assessment of the current state and expected developments of the Danish economy and thus also for the recommendation for fiscal policy.



Tight monetary policy continues to dampen economic growth and inflation

The monetary policy tightening since 2022 has been forceful in Denmark, the euro area and globally. Since the last Monetary and financial trends in September 2023, inflation has fallen, putting downward pressure on longer-term market interest rates. Monetary policy interest rates have been maintained at the same level, and previous tightening measures mean that monetary policy remains tight, which is estimated to reduce economic growth and inflation in Denmark, see *Outlook for the Danish economy*, March 2024, and the chapter *Global financial market developments*. The transmission of monetary policy proceeds in a controlled manner, both through the banking system and through funding via the financial markets.

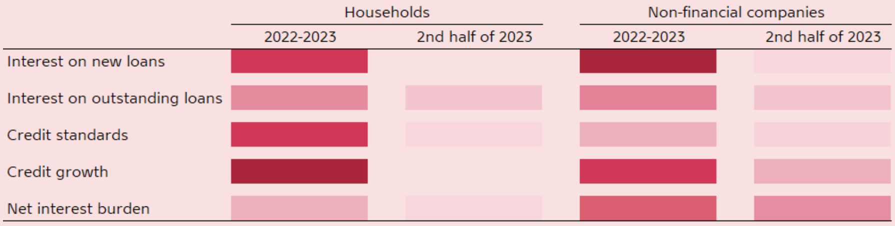
The contractionary effects are still working their way through to credit conditions, albeit at a slower pace than before

There has been a strong pass-through of the higher interest rates to Danish households and non-financial companies since 2022. In the second half of 2023, the transmission of monetary policy has continued, albeit at a slower pace. This has happened partly because monetary policy interest rates have been kept low. The sharp increases in interest rates on new loans since 2022 have levelled off, but the higher interest rates are still gradually impacting outstanding loans through ongoing loan turnover. Credit growth is still negative for Danish households, loan demand is more subdued and credit standards are tighter than before 2022. Chart 23 summarises the key insights from the rest of this chapter and shows that the tightening has been significant for both households and companies, and that the effects are still working their way through to borrowing conditions, albeit at a more moderate pace than in 2022 and the first half of 2023.

> **Compared to the last twenty years, interest rates on new bank and mortgage loans are at a high level for both households and companies.**

CHART 23

Monetary policy remains tight, but the pass-through of previous rate hikes to borrowing conditions is now happening at a slower pace than before



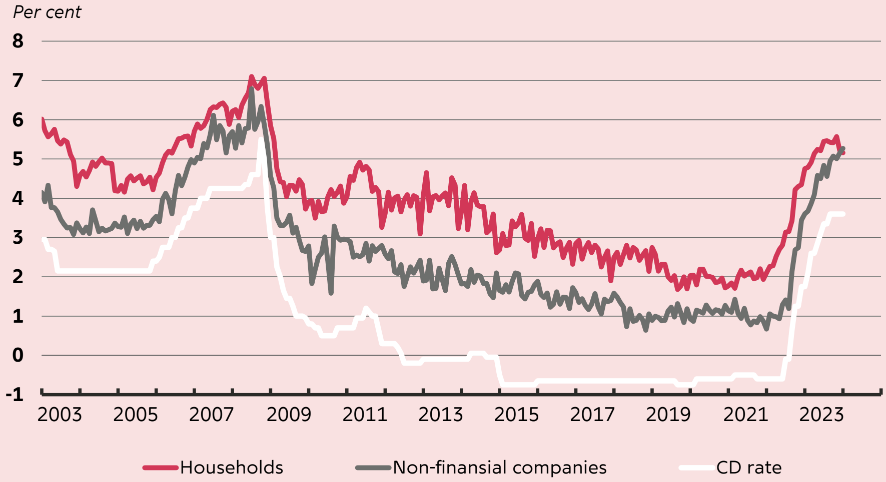
Note: The heatmap shows the change in the specified variables. The darker the colour, the stronger the contractive effect on the given variable. The heatmap is a stylised illustration and summarises insights from the rest of this chapter. The development of the individual variables is discussed in more detail later in this chapter.

Tight monetary policy has a dampening effect on growth in 2024

Monetary policy is still considered to be tight, and compared to the past twenty years, interest rates on new bank and mortgage loans are at a high level for both households and companies, see chart 24. The last time interest rates were higher was just before and during the financial crisis of 2007–08.[50] In addition to the effect of direct interest payments for borrowers, the interest rate on new lending also has an impact on economic decisions, e.g. in the housing market and on company investments.

CHART 24

Monetary policy is tight and interest rates on new loans are at the same level as in early 2009



Note: Effective interest rate including fees for new loans from the MFI sector. Households include non-profit institutions serving households.
Source: Danmarks Nationalbank.

Overall, the financial situation of households is positively supported by rising wages and continued high employment. Rising house prices, rising equity values and falling inflation are supporting continued growth in private consumption in 2024, see *Outlook for the Danish economy* March 2024. This is despite the higher interest expenses in 2024 compared to 2022 and 2023. In the second half of 2023, companies' total financing costs have increased, and for the first time in this monetary tightening cycle, the inflow of external financing has decreased. The central banks' interest rate hikes and the slowdown in growth in the Danish economy are expected to dampen investments in 2024, see *Outlook for the Danish economy*, March 2024.

[50] If the interest rate on new lending is adjusted for expected inflation, the real interest rate on new lending has increased more moderately since 2022 than the increase in nominal interest rates as shown inChart 24.

Danish households have increased consumption and savings despite rising interest costs

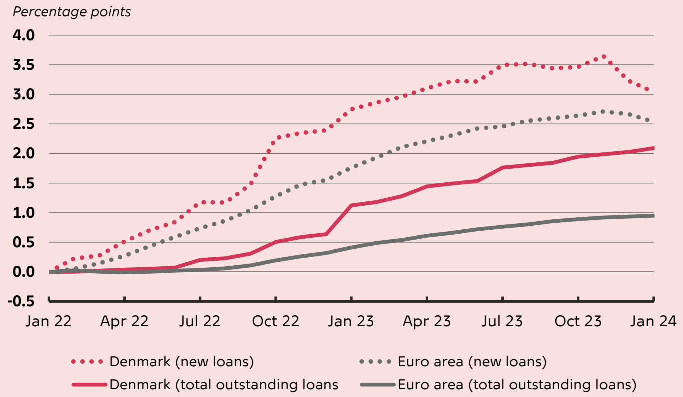
Lending rates on new loans for Danish households have declined through the second half of 2023

The average interest rate on new loans to Danish households has fallen in the second half of 2023. This has happened as bond market yields fell in the fourth quarter of 2023, see the chapter *Global financial market developments*. The fall in interest rates on new loans comes on the back of sharp increases since the beginning of 2022, see chart 25. Further, the difference between interest rates on new loans in Denmark and the euro area has narrowed throughout the second half of 2023.

The average interest rate on total outstanding loans continues to rise, see chart 25. This is because higher interest rates on new bank and mortgage loans are only gradually passed through to the average interest rate on total outstanding loans, as new loans are issued and interest rates on existing adjustable-rate loans are adjusted on an ongoing basis.

CHART 25

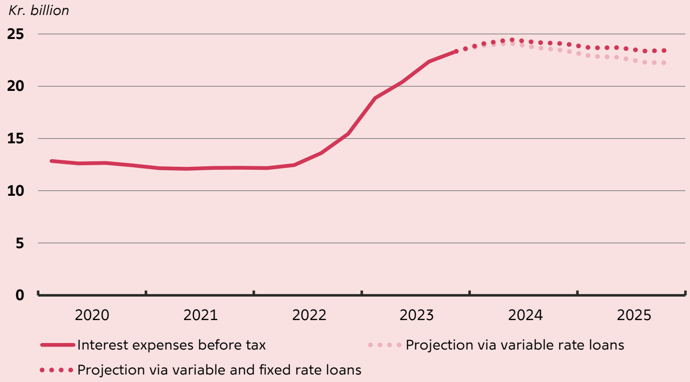
Lending rates on new loans have fallen in the second half of 2023



Note: Accumulated change in effective lending rate including fees for total MFI debt with housing purposes (to banks and mortgage credit institutions) for households and non-profit institutions serving households.
Source: Danmarks Nationalbank and the ECB.

CHART 26

Gross interest expenses have increased significantly, but projections based on market expectations indicate that expenses are levelling off



Note: Quarterly interest expenses before tax on bank and mortgage debt for Danish households and non-profit institutions serving households.
Source: Danmarks Nationalbank and the ECB.

Market expectations indicate that some loan segments will see lower interest expenses, while others will continue to see higher interest expenses

Interest rate projections based on current market expectations indicate that there will be significant differences in how interest payments for different loan segments will be affected over the coming years. The interest rate on F1 loans is approximately at the same level as a year ago, see the chapter *Global financial market developments.* If F1 interest rates fall over the coming years, as the market is currently pricing in, F1 borrowers will experience falling interest costs. Conversely, borrowers with F3 and F5 loans will experience significant increases in interest expenses, even though market interest rates have fallen slightly, as described in the chapter *Global financial market developments.* This is because these borrowers are facing upcoming rate repricing for the first time since interest rates have risen. Around 23 per cent of total lending to households is made up of F3 and F5 loans.

In the second half of 2023, Danish households' accrued gross interest expenses before tax amounted to around 7 per cent of their disposable income, compared to around 4 per cent in the second half of 2021.[51] Gross interest expenses are expected to increase further until mid-2024 and then stabilise at around double the level of mid-2022. The majority of the pass-through to households' interest expenses is therefore now estimated to have occurred.[52] This is shown by a projection of interest expenses based on market-implied interest rate expectations and information from Danmarks Nationalbank's credit register on the timing and size of planned interest rate repricing and the distribution of the respective loan types, see chart 26.[53] Over the same period, both incomes and inflation have risen considerably, which has contributed to erode the effect of the increase in gross interest expenses shown in Chart 26. The projection also shows that, if current market expectations of falling interest rates are realised, this will not lead to significant decreases in interest expenses for households overall over the next two years.[54] This is partly due to the fact that gradually lower interest rates on short-term adjustable-rate loans are partially offset by higher interest rates on fixed-rate loans as the loans are continuously replaced.

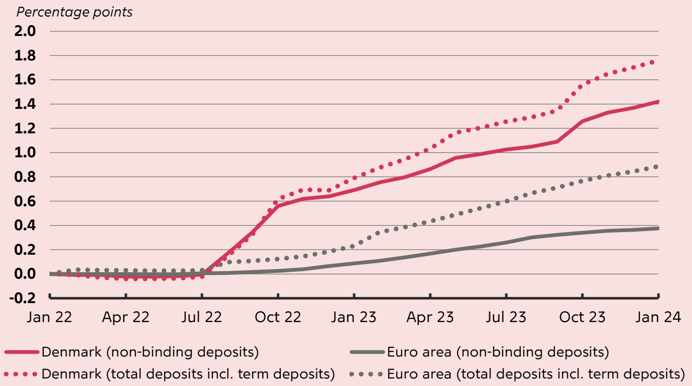
Deposit rates for Danish households continue to rise more than in the euro area

In the second half of 2023, deposit rates have continued to rise more in Denmark than in the euro area, see chart 27. In January 2024, the average interest rate on overnight deposits was 1.2 per cent in Denmark. This is higher than in the euro area, where it was 0.4 per cent.[55] The stronger increase in deposit rates in Denmark since 2022 should be seen in light of the fact that Danish deposit rates came from a lower level than in the euro area.[56] The rise in Danish deposit rates contrasts with the development in lending rates on new loans, which have fallen in the second half of 2023.

[51] Interest expenses and interest income are not equally distributed across the income distribution, which is why both gross interest expenses and net interest expenses are relevant for monetary policy transmission. See Danmarks Nationalbank, The household cash-flow effects of monetary policy in Denmark and the euro area, *Danmarks Nationalbank Economic Memo* No. 1, 2024.
[52] The same is estimated to be the case for non-financial companies, as their interest rate fixation periods are generally shorter than those of households, and credit growth for non-financial companies has also levelled off in the second half of 2023.
[53] The projection of interest expenses is based on implicit market expectations for the loan segments F-short (short-term adjustable-rate mortgage loans), F1, F3, F5 and fixed-rate loans. The *'Projection via adjustable-rate loans'* series takes into account the change in interest expenses for both bank debt and F-loans when interest rates are adjusted on an ongoing basis. In this series, a fixed interest rate is assumed on the fixed-rate loans, and the pass-through to bank loans is assumed to be 60 per cent of the change in the F-short rate, corresponding to the observed pass-through in the current interest rate cycle. In the series *'Projection of adjustable-rate and fixed-rate loans'*, in addition to interest rate adjustments, a replacement of 5 per cent of fixed-rate loans in each quarter is assumed, which receive a new fixed rate, corresponding to the implicit market expectation for the 30-year interest rate in the quarter in question. The loan turnover of 5 per cent is roughly equivalent to the quarterly replacement of fixed-rate loans since 2003, excluding periods with large waves of refinancing and in the absence of credit growth. A possible wave of refinancing to lower fixed-rate mortgages during the projection period is thus disregarded. It is also assumed that the loan composition is constant during the projection period, maintaining the composition in December 2023, and therefore any effects from payments made and credit growth are excluded.
[54] There is considerable uncertainty associated with the projection, both in terms of market developments and refinancing behaviour among fixed-rate borrowers.
[55] If the interest rate on Danish demand deposits is adjusted for lending-related deposits, such as mortgage-like bank loans (prioritetslån), the interest rate is slightly lower. In the latest observation from November 2023, the adjusted deposit rate was around 0.8 per cent. Without correction, it was 1.1 per cent in November.
[56] See Danmarks Nationalbank, The household cash-flow effects of monetary policy in Denmark and the euro area, *Danmarks Nationalbank Economic Memo* No. 1, 2024.

CHART 27

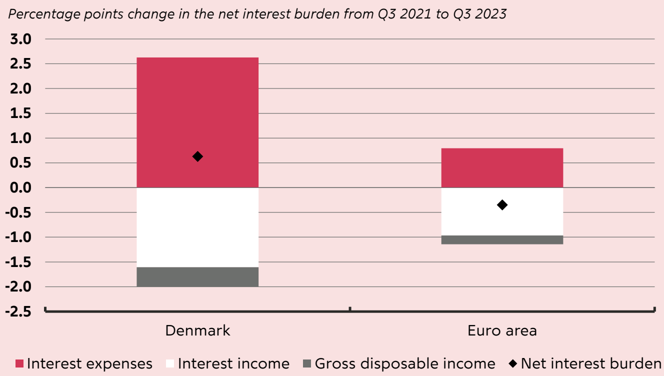
Deposit rates have increased more in Denmark than the euro area



Note: Accumulated change in the average deposit rate for households and non-profit institutions serving households.
Source: Danmarks Nationalbank and the ECB.

CHART 28

Net interest burden rises for Danish households, but falls for euro area households



Note: Decomposition of the change in the net interest burden for households and non-profit institutions serving households. The net interest burden is defined here as net interest expenses as a share of gross disposable income. Interest expenses and interest income are before FISIM allocation.
Source: Danmarks Nationalbank, ECB and own calculations.

In the euro area, deposit accounts with a fixed term are more common than in Denmark. Banks typically pay a somewhat higher interest rate on these types of accounts than on overnight deposits. Chart 27 also shows a weighted deposit rate including deposits with a fixed term. The weighted deposit rate has also increased more in Denmark than in the euro area, although the difference is slightly smaller. Since mid-2022, the share of euro area deposits held in fixed-term accounts has increased from around 38 per cent of total deposits to around 44 per cent by the end of 2023. In Denmark, the share has remained more stable at around 25 per cent from mid-2022 to mid-2023, before rising to 29 per cent in the second half of 2023.

The net interest burden for Danish households is rising – in the euro area it is falling

Since the ECB and Danmarks Nationalbank began raising monetary policy interest rates in 2022, the net interest burden for Danish households has increased by 0.6 percentage points, see chart 28. As a result, households now spend a larger proportion of their income on net interest expenses than they did two years ago. In Q3 of 2023, Danish households spent 3.5 per cent of their disposable income on net interest expenses. Six months earlier, this figure was 3.1 per cent.

In the euro area, the opposite trend is seen, as households now spend a smaller share of their income on net interest expenses than two years ago. This is because euro area households have more deposits in the bank than they have debt.[57] Therefore, their net interest income increases when interest rates rise. In Denmark, households have significantly more debt than bank deposits. Therefore, this cash flow effect of monetary policy transmission has been stronger in Denmark than in the euro area and, all else being equal, has

"

Households now spend a larger proportion of their income on net interest expenses.

[57] See Danmarks Nationalbank, The household cash-flow effects of monetary policy in Denmark and the euro area, *Danmarks Nationalbank Economic Memo,* No. 1, 2024, and ECB, Net interest income of households and firms, *ECB Economic Bulletin*, issue 8/2023.

contributed to inflation falling faster in Denmark than in the euro area. However, Danish households have significantly higher pension savings than households in the euro area. These assets are not directly interest-bearing and are not as liquid as deposits. The cash flow channel is one of many channels and therefore does not provide an complete picture of the monetary policy transmission, see Box 1 in the thematic analysis *Effects of increases in monetary policy rate*.[58]

Continued tight credit standards for Danish households and low loan demand

In the second half of 2023, Danish banks and mortgage credit institutions reported that credit standards for households have remained roughly unchanged. This means that credit standards have now stabilised at a tighter level on the back of significant tightening throughout 2022 and the first quarter of 2023. Loan demand from Danish households remains subdued, although it increased slightly in the second half of 2023. The slight increase in loan demand comes on the back of a prolonged period of relatively large drops in demand in the wake of monetary tightening.

In the euro area, as in Denmark, unchanged credit standards were reported in the second half of 2023, whereas in the US, significant tightening of credit standards continued to be reported. Unlike in Denmark, the demand for loans from households in both the euro area and the US continued to decline.

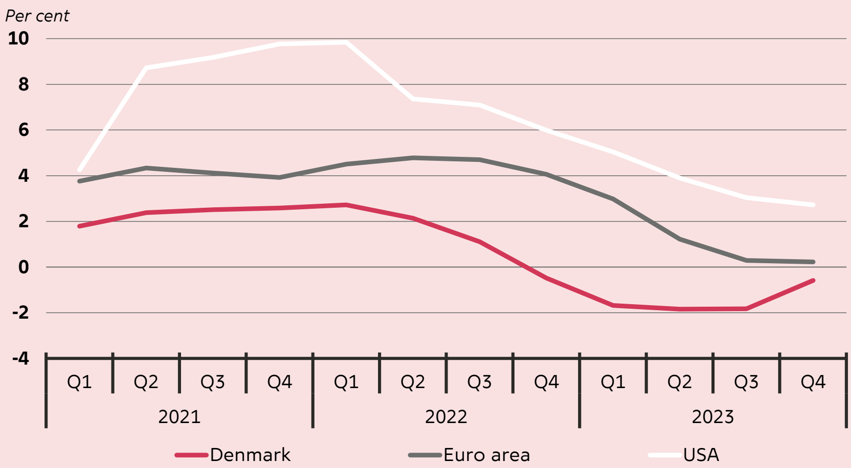
Credit growth for Danish households is negative

Annual credit growth in bank and mortgage lending continued to be negative in the second half of 2023. The fourth quarter of 2023 marked the fifth consecutive quarter of negative annual credit growth, see chart 29. The large drop in credit growth from the beginning of 2022 to mid-2023 was reversed in the fourth quarter of 2023. Since monetary tightening began in 2022, credit growth has fallen by 3.3 percentage points in Denmark. Around 0.7 percentage points of this decrease is due to the direct effect of households reducing their debt through refinancing of mortgages.[59]

[58] See Danmarks Nationalbank, Effects of increases in monetary policy rates*, Danmarks Nationalbank Analysis,* No. 5, March 2024.
[59] See Danmarks Nationalbank, Monetary policy has been tightened further, *Danmarks Nationalbank Analysis (Monetary and financial trends)*, September 2023.

FIGUR 29

Negative credit growth throughout 2023, but slight increase in the fourth quarter



Note: Year-on-year growth in total lending from the MFI sector to households and non-profit institutions serving households. Based on nominal value of loans.
Source: Danmarks Nationalbank, Federal Reserve Bank of St. Louis and the ECB.

Danish households have increased their net wealth through savings

Based on the continued savings, a total of 29 billion kr. has been added to household financial assets in deposits, bonds, shares and investment fund certificates in the second half of 2023, see chart 30. Deposits in particular have increased significantly by 39 billion kr. over the period. In addition, households have sold shares and investment fund units totalling around 21 billion kr. At the same time, households have bought bonds for around 11 billion kr. This is an increase in the households' bond portfolio of around 17 per cent, which means that the households' savings overall have been shifted towards investments with a traditionally more conservative risk profile.

Throughout the second half of 2023, households' accrued net interest expenses have been around 40 billion kr. before tax. Despite increases in net interest expenses, households have been able to increase both their consumption and savings in the second half of 2023. This is because significant increases in household income more than offset increases in interest expenses.[60] Consumption in the second half of 2023 has increased by approximately 20 billion kr. compared to the same period the year before.

Private consumption is supported by growth in real wages and potentially by excess savings since 2020

Private consumption is expected to increase during 2024 in line with real wage growth, see *Outlook for the Danish economy*, March 2024. Further tailwinds for private consumption could potentially come from the accumulated excess

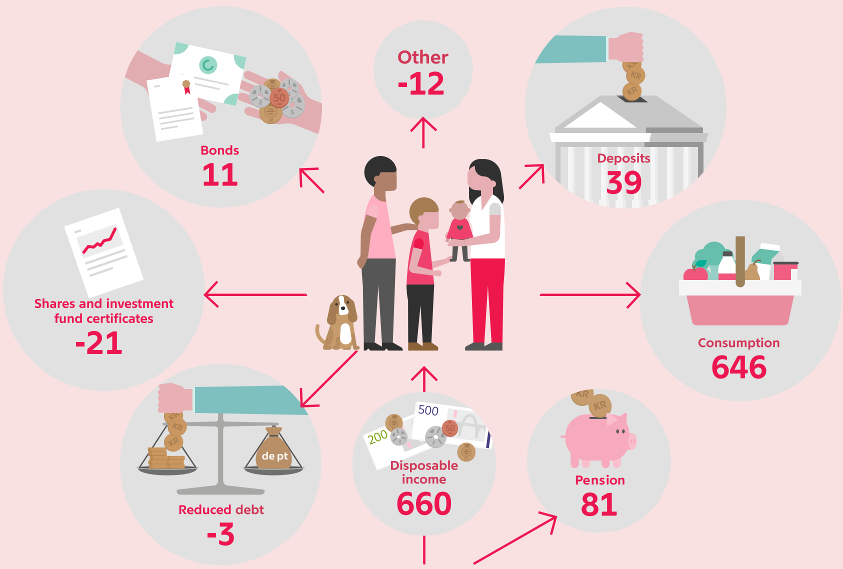
[60] The annual nominal disposable income for Danish households has increased by 85 billion kr. from Q3 2022 to Q3 2023, corresponding to an increase of 7 per cent. Over a two-year period, this increase is 220 billion kr., corresponding to an increase of 20 per cent. The increases reflect both salary increases and extraordinarily high dividends from shareholdings in private equity portfolios. In the period from Q3 2022 to Q3 2023, annual real disposable income increased more modestly by around 1.5 per cent.

savings since 2020, where Danish households have saved more than they did on average in the years 2016-2019, see Box 1 in *Outlook for the Danish economy*, March 2024. The excess savings are created by both ongoing savings and asset value appreciation, which have been considerable in recent years. The value of households' listed equities and investment fund units under direct ownership has appreciated by approximately 52 billion kr. through the second half of 2023. Of this, increases in Novo Nordisk's share value account for approximately 47 billion kr.[61] However, these significant increases in the value of stock portfolios are not evenly distributed across income groups.[62]

CHART 30

Danish households' net financial transactions during the second half of 2023

Billion kr.



Note: Financial transactions for households and non-profit institutions serving households in billion kr. Disposable income for Q4 of 2023 is an estimate based on a forecast, cf. *Outlook for the Danish economy*. 'Other' includes changes in cash holdings, real investments, individual pension deposits and other unpaid balances from the national accounts.
Source: Danmarks Nationalbank, Statistics Denmark and own calculations.

[61] During January and February 2024, Novo Nordisk's share price has increased by around 22 per cent, corresponding to an additional increase in value of 53 billion kr. during 2024 for Danish households assuming unchanged position holdings.
[62] Most of household equity holdings are concentrated in the top income decile, which also typically has a relatively lower marginal propensity to consume. See box 2 in *Outlook for the Danish economy*, March 2024, and Danmarks Nationalbank, Monetary policy has been tightened further, *Danmarks Nationalbank Analysis (Monetary and financial trends)*, September 2023.

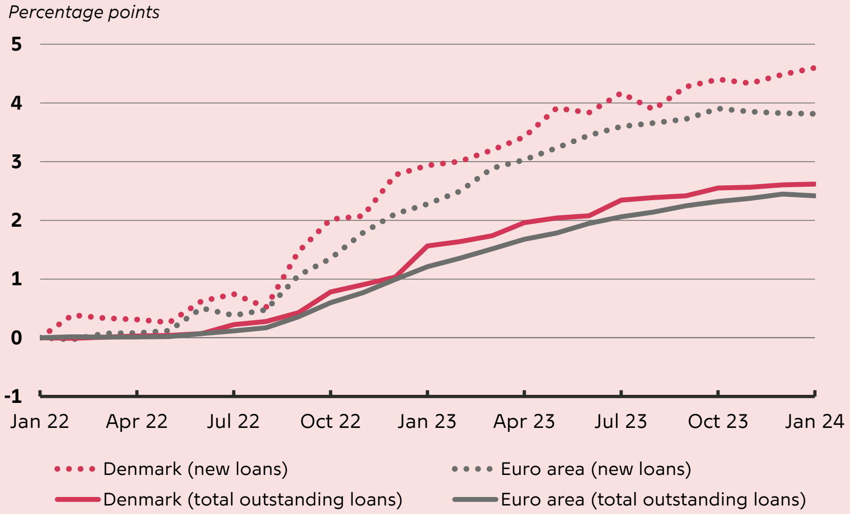
Companies' financing costs have increased significantly

Corporate lending rates continue to rise, but at a slower pace

Lending rates on new bank and mortgage loans for companies in Denmark have increased slightly through the second half of 2023, see chart 31. The pass-through to the average interest rate companies pay on total outstanding loans has levelled off slightly in the second half of 2023, and in general, corporate lending rates in Denmark and the euro area track more closely than lending rates for households in Denmark and the euro area.

CHART 31

Corporate lending rates have increased slightly in the second half of 2023



Note: Accumulated change in the average lending rate for non-financial companies.
Source: Danmarks Nationalbank and the ECB.

Danish companies' total external financing costs have increased

The price of Danish companies' total external financing has increased throughout the second half of 2023. The development is particularly driven by an increase in the required return on equity, see chart 32.[63] The average price of funding is a key input in companies' investment decisions and is therefore an important part of the overall monetary policy transmission.

Corporate interest expenses continue to rise

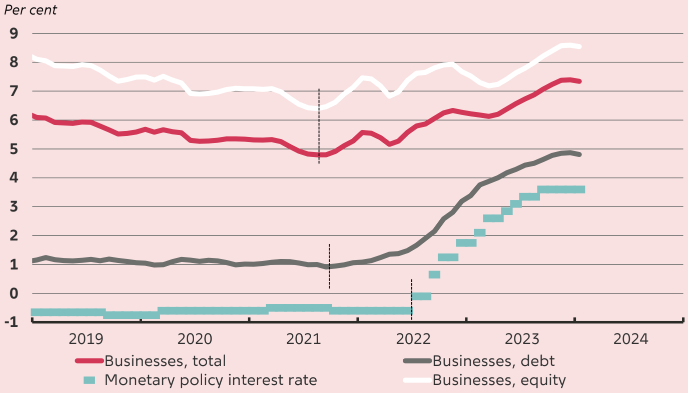
In the second half of 2023, Danish companies had net interest expenses of approximately 22 billion kr. to Danish banks and mortgage credit institutions. This corresponds to an increase of around 70 per cent compared to the same period the year before. Companies' net interest burden, defined as 'net interest expenses as a share of gross value added', have increased by approximately 2.9 percentage points over the past two years, see chart 33. The increase has been

[63] In the euro area, however, the required rate of return has fallen slightly over the same period. The increase in Denmark may therefore reflect extraordinarily high expectations for higher dividend payouts in a few large Danish companies.

higher in Denmark than in the euro area. This should be seen in light of the fact that Danish companies have more interest-bearing gross debt in banks and mortgage credit institutions compared to companies in the euro area, see the thematic analysis *Effects of increases in monetary policy rates*, March 2024.

CHART 32

Companies' external financing costs have increased in the second half of 2023

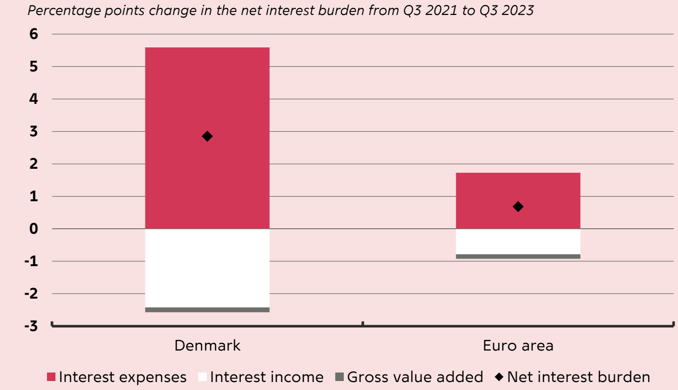


Note: The chart shows a measure of the cost of external financing for companies. The cost is calculated as a balance sheet weighted average based on interest on debt financing and an estimated required equity return on equity financing (three-month moving average). The monetary policy interest rate is the certificate of deposit rate. The measure of the cost of external financing is based on the methodology in box 1 in Danmarks Nationalbank, Decline in interest rates and refinancing boom, *Danmarks Nationalbank Analysis (Monetary and financial trends)*, No. 19, September 2019.

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

CHART 33

The net interest burden has increased more for Danish companies than for companies in the euro area



Note: The net interest burden is defined here as net interest expenses as a share of gross value added. Interest expenses and interest income are calculated based on total debt and are before FISIM allocation.

Source: Danmarks Nationalbank and the ECB.

Slightly increasing loan demand among Danish companies and modest tightening of credit standards

Overall, banks' and mortgage credit institutions' credit standards for Danish companies have been tightened slightly in the second half of 2023. The tightening has been particularly pronounced among mortgage credit institutions. Overall, the banks and mortgage credit institutions surveyed have reported minor tightening of credit standards in most quarters over the past four years. However, Danish companies do not report financial production constraints to a significant degree.[64]

Loan demand has continued to increase slightly among Danish companies in the second half of 2023. Banks and mortgage credit institutions have reported increases in loan demand in every quarter since 2020. However, in the second half of 2023, only mortgage credit institutions reported an increase in loan demand, as demand from banks has fallen.

Total credit growth for Danish non-financial companies has continued to decline

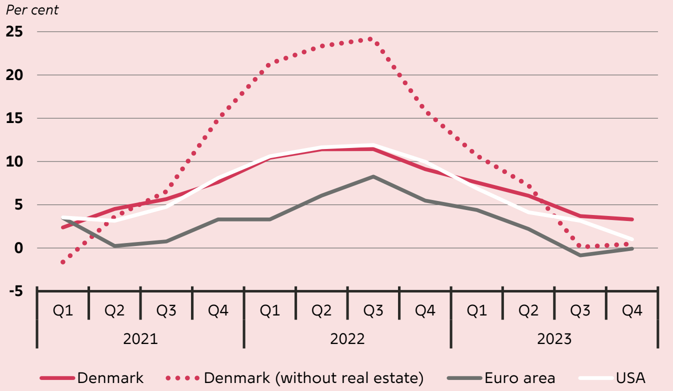
In the second half of 2023, the annual growth in lending from banks and mortgage credit institutions to Danish companies has declined, and the trend

[64] See Statistics Denmark's business trend barometer for corporations. Financial constraints are only cited as a factor limiting production by a small proportion of companies.

since mid-2022 has thus continued, see chart 34. Credit growth for Danish companies at the end of 2023 was around 3.3 per cent. As a result, credit growth for companies remains positive, in contrast to credit growth for Danish households. Corporate credit growth is now at roughly the same level as in the years leading up to the pandemic. Overall, companies are therefore showing more appetite for borrowing than households, although growth is slowing down. When excluding the real estate sector, the decline in credit growth for non-financial corporations has been relatively sharp in the second half of 2023, see chart 34.[65]

CHART 34

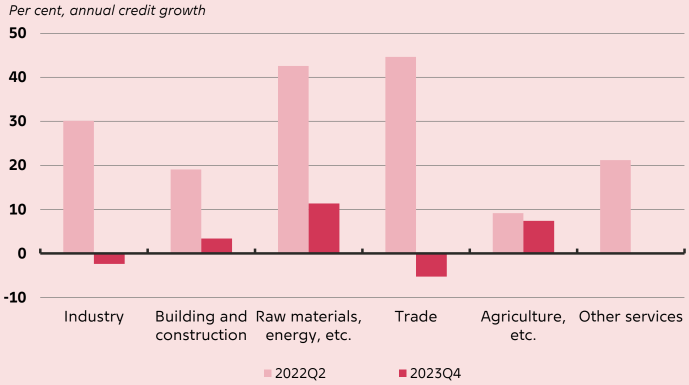
The downward trend in credit growth for Danish companies has continued in the second half of 2023



Note: Year-on-year growth in lending (banks and mortgage credit institutions) to non-financial companies. Lending is stated at nominal value. The dotted series excludes the real estate sector, which accounts for almost half of the total loans for non-financial companies in Denmark.
Source: Danmarks Nationalbank, Federal Reserve Bank of St. Louis and the ECB.

CHART 35

Large declines in credit growth in several industries and negative credit growth for 'industry' and 'trade'



Note: Annual credit growth for selected non-financial companies by industry. The 'agriculture etc.' sector stands out in that a significant part of the lending is in sole proprietorships, which are not included in the statistics for non-financial corporations. If lending to sole proprietorships is included, credit growth in agriculture etc. was -0.4 per cent and -0.7 per cent in Q2 2022 and Q4 2023, respectively.
Source: Danmarks Nationalbank.

In the euro area, credit growth for companies is lower than in Denmark, which is the opposite of credit growth for households. Credit growth for companies in the euro area has been around zero in both the third and fourth quarters of 2023. Similar negative credit growth for European companies has not been seen since 2014. In the US, corporate credit growth has also fallen to around zero by the end of 2023. Overall, there is therefore a significant slowdown in credit growth for companies in the euro area and the US.

Credit growth is negative for the 'trade' and 'industry' sectors

In the 'trade' and 'industry' sectors, the decline in credit growth has been particularly significant since mid-2022, and credit growth is now negative in both sectors, see chart 35. However, the outlook for Danish manufacturing is expected to improve in 2024 in line with renewed growth in Danish export markets, see *Outlook for the Danish economy*, March 2024. Part of the decline in credit growth is due to base effects from extraordinarily high credit growth in 2022. The high credit growth in 2022 should be seen in light of supply chain challenges, rising

[65] The real estate sector typically has minor real economic importance relative to the size of the balance sheet. The sector accounts for around 60 per cent of the total MFI debt of non-financial companies.

commodity and energy prices, and pandemic related tax and VAT loan repayments.[66]

Danish companies' flow of external funding has decreased significantly in the second half of 2023

The net flow of external financing for Danish companies fell significantly in the second half of 2023, from 82 billion kr. to -27 billion kr., see chart 36. This is the first decrease in the use of external financing since monetary policy interest rates were raised in 2022. Since the start of 2022, net borrowing via bank and mortgage debt has steadily decreased. However, until mid-2023, this source of financing was replaced by the issuance of more shares and corporate bonds, so that the net effect on the flow of total external financing has been increasing in the period since 2022. Chart 36 shows that there has been a significant lag from the time monetary policy interest rates were raised to the decline in corporate external financing. The decline in the second half of 2023 coincided with an increase in companies' required return on equity.

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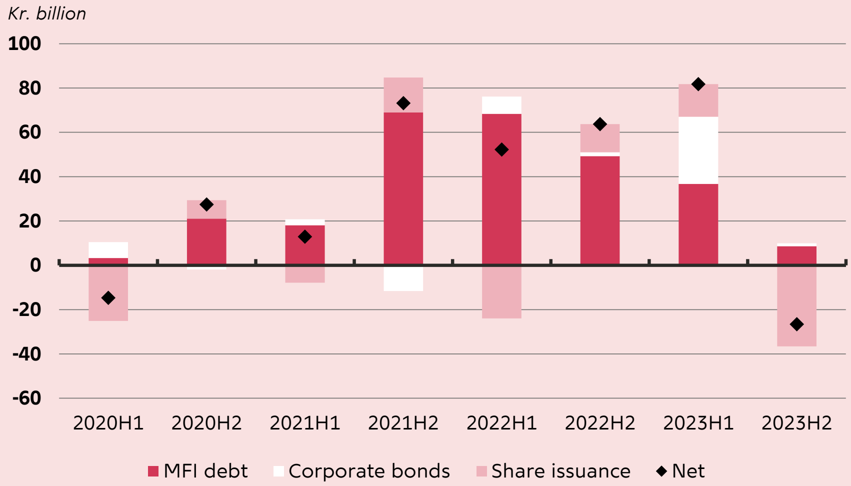
The net flow of external financing for Danish companies fell significantly in the second half of 2023.

CHART 36

The flow of external funding for Danish companies decreased significantly in the second half of 2023



Note: Danish non-financial corporations' net borrowing via banks and mortgage credit institutions, and net issuance of corporate bonds and shares. Until third quarter of 2023 the data is based on the financial accounts while data for the fourth quarter of 2023 is based on the primary input statistics. Hence, private equity shares are excluded from 'share issuance' in the fourth quarter of 2023

Source: Danmarks Nationalbank and Statistics Denmark.

The slowdown in growth in the Danish economy and the implemented monetary policy tightening measures are expected to dampen corporate investments in 2024, see *Outlook for the Danish economy*, March 2024. However, other factors are supporting investment activity. The investment decisions of a few very large companies can have a relatively large impact on the development of total investments. For example, Novo Nordisk has announced major investment plans for the coming years. In addition, the change in the global geopolitical situation

[66] See Danmarks Nationalbank, Interest rate hikes affect the banks and their customers, *Danmarks Nationalbank Analysis (Financial Stability)*, No. 6, June 2023.

over the past few years has generally led to an increased focus on investing in more secure and resilient supply chains.

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