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FINANCIAL STABILITY

Financial stability means that the financial system is equipped to withstand shocks to the economy and financial markets, to mediate credit and payments, and to redistribute risks appropriately.

The purpose of the Central Bank of Iceland's *Financial Stability* report is:

- to promote informed dialogue on financial stability; i.e., its strengths and weaknesses, the macroeconomic and operational risks that it may face, and efforts to strengthen its resilience;
- to provide an analysis that is useful for financial market participants in their own risk management;
- to focus the Central Bank's work and contingency planning;
- to explain how the Central Bank carries out the mandatory tasks assigned to it with respect to an effective and sound financial system.

Symbols:

*	Preliminary or estimated data.
0	Less than half of the unit used.
-	Nil.
...	Not available.
.	Not applicable.

Icelandic letters:

ð/Ð (pronounced like th in English this)
þ/Þ (pronounced like th in English think)
In this report, ð is transliterated as d and þ as th in personal names, for consistency with international references, but otherwise the Icelandic letters are retained.

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Financial Stability in a nutshell

The monetary stance has been tightened in recent months, both in Iceland and abroad, with declining inflation and unchanged interest rates. It is expected that interest rates have peaked, and developments in asset markets suggest that investors are more optimistic than before. Global economic uncertainty remains, however, not least because of armed conflict. GDP growth has slowed markedly in Iceland. Rising real interest rates and increased debt service burdens put a damper on the domestic economy, and high financing costs put constraints on companies' operations.

Growth in tourism, Iceland's leading export sector, has slowed. Indicators suggest that tourist's average stays are shorter than before and that they spend less while in the country. Higher prices are certainly a contributing factor, as Iceland is now a more expensive destination than before. Furthermore, the volcanic activity on the Reykjanes peninsula has cut into demand, at least in the short run. Even so, there have seldom been as many flight offerings to and from Iceland as there are now. Icelandic airlines' operating performance has deteriorated, and increased supply of flights is expected to show in more competition, lower airfares, and reduced passenger load factors.

Housing market activity has picked up again. Turnover has increased, whereas the supply of new homes for sale has been virtually flat recently. A growing share of home purchases are financed with CPI-indexed loans, which support market activity despite high interest rates and borrower-based restrictions. The deviation of home prices from long-term trend has narrowed in tandem with a gradual decline in real house prices. The Government buy-up of homes in Grindavík could somewhat affect the market for home purchases and rentals.

The financial position of the large commercial banks is strong. Their capital ratios are high, returns on regular operations are sound, and private sector arrears are at a low. The banks have maintained their strong foreign liquidity position by issuing bonds in foreign credit markets. The banks are well cushioned against external shocks. Impairment could increase in coming months, however, as many borrowers' debt service burdens have increased concurrent with a slowdown in economic activity. Furthermore, fixed-rate periods on many mortgage loans are set to expire in the next 12-18 months, ultimately pushing debt service burdens higher for the affected households.

It is important to ensure that financial institutions can provide uninterrupted service and to safeguard the operational security of financial market infrastructure to the maximum extent possible. Operational risk is on the rise, owing to technological innovation, attempted cyberattacks and cyberfraud, and other causes. It is vital to continue harmonising responses and communications among official entities, particularly during emergencies, so as to delineate clearly the division of tasks, responsibilities, and authorisations. It is also essential to continue shoring up the resilience of financial market infrastructure by strengthening possible substitute methods for domestic payment intermediation, whether it be with cash or with an independent domestic retail payment solution.

Financial Stability: Developments and prospects

I

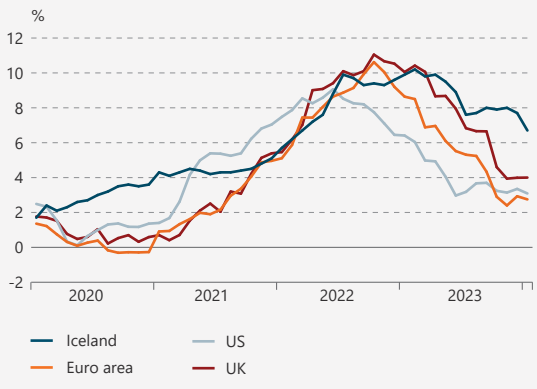
Risks associated with the external position and currency flows

Inflation is subsiding

Central banks in neighbouring countries have been cautious about changing interest rates since last autumn. Economic activity has lost pace in most regions, although in the US it has gained steam. GDP growth was broadly flat in the euro area, for instance, and negative in Denmark and Sweden.[1] Inflation has tumbled at the same time, led by falling energy prices. Real interest rates have surged; therefore, the monetary stance is still growing tighter. In major advanced economies, central banks' balance sheets have continued to contract. Nevertheless, it is generally expected that interest rates have peaked, as can be seen in the recovery of asset markets. Growth in credit to households and businesses has eased. There are signs of increased supply chain bottlenecks and higher shipping costs due to attacks on shipping vessels in the Red Sea. Furthermore, oil prices spiked again in January because of the war in the Middle East. The global economic outlook is up in the air, and uncertainty will probably spread to domestic export sectors, particularly tourism.

Chart I-1

Annual inflation



Sources: OECD, Refinitiv Datastream, Statistics Iceland.

Output growth measured 4.1% in 2023, only half the rate seen in 2022. According to the Central Bank's most recent macroeconomic forecast, published in *Monetary Bulletin* 2024/1, GDP growth is projected to keep slowing, to 1.9% for the year as a whole. Concurrent with weaker GDP growth, inflation has subsided to 6.6% as of February. The inflation outlook has improved accordingly, and economic activity looks set to slow more decisively than previously anticipated. Private consumption contracted in H2/2023, and payment card turnover data indicate that developments in the past few months have been consistent with that trend. Furthermore, goods and services exports lost considerable momentum in H2/2023. There are strong indications that prospects for tourism in 2024 have worsened, partly because of the seismic activity on the Reykjanes peninsula, as is discussed in greater detail later in this chapter. Labour market tightness has eased, and the jobless rate is up slightly. Firms' recruitment plans are still above the historical average, however, according to survey results. Terms of trade for goods and services deteriorated in 2023. Marine product export prices declined and import prices rose, although the króna has appreciated somewhat.

1. GDP growth in Denmark, adjusted for the effects of Novo Nordisk.

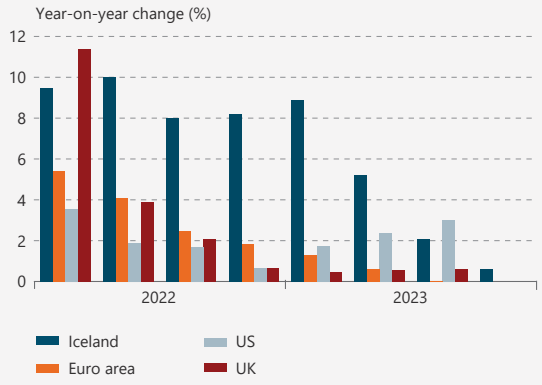
Market agents expect rate cuts in the near future

Forward yield curves in the bond market suggest that market agents think central bank interest rates in major advanced economies have peaked and will start falling in H1/2024. This increased optimism can be seen, for instance, in declining Treasury bond yields and rising share prices, as is explored further in the section entitled *Risk associated with domestic asset markets*.

According to the Central Bank's January market expectations survey, respondents in Iceland are of the opinion that the policy rate has peaked and will start to fall in Q2/2024. Forward yield curves point in the same direction. In this respect, then, financial conditions in Iceland and abroad are improving.

Chart I-2

GDP growth



Sources: Refinitiv Datastream, Statistics Iceland.

The changes made in the application of macroprudential tools in Europe since September 2023, when the last issue of *Financial Stability* was published, have tended to ease requirements rather than tightening them. That said, countercyclical capital buffer rates have been increased in Belgium, Latvia, and Slovenia, and several countries have introduced sectoral systemic risk buffers. On the other hand, the authorities in some countries – Estonia, the Czech Republic, and Portugal, for instance – have relaxed borrower-based measures. These decisions have generally been supported by evidence that residential and commercial real estate markets are cooling markedly.

Net IIP improves markedly between years …

At the end of 2023, Iceland's net international investment position (NIIP) was positive by 38% of GDP and had improved by 14 percentage points between years. The financial account balance – i.e., residents' net capital outflows exceeded non-residents' net capital inflows – was positive by 2.6% of GDP during the year.

Despite last year's outflows, the improvement in Iceland's external position was driven mainly by rising foreign securities prices. The MSCI index, for instance, increased 22% during the year. At the same time, however, the Iceland's OMXI15 index fell marginally. Iceland's net securities position improved by just over half during the year, or by 13% of GDP, with roughly ⅗ of the increase stemming from the pension funds' foreign securities portfolios.

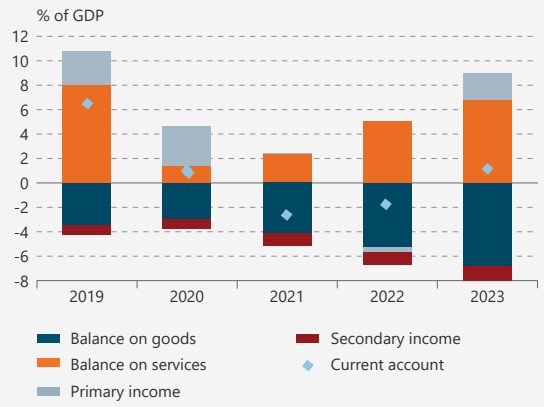
… and the current account flipped from deficit to surplus

The current account balance was positive by 41 b.kr., or 1% of GDP, in 2023, as compared with a 1.7% deficit in 2022.

The balance on goods and services trade was close to zero, as the 88 b.kr. goods account deficit was fully offset by a larger surplus on services trade, with net revenues from tourism growing by 128 b.kr. year-on-year.

Chart I-3

Current account balance



Sources: Statistics Iceland, Central Bank of Iceland.

Imports and exports had grown virtually without interruption since the beginning of 2021 but began to shrink over the course of 2023. Goods imports contracted by 53 b.kr. year-on-year during the last four months of 2023, mainly because of commodities imports (including fuels), whereas goods exports had begun to decline earlier in 2023, contracting by 87 b.kr. year-on-year in the last three quarters. Most components of goods exports contracted between years. Exports of aluminium and aluminium products weighed heavily in the downturn, as prices had fallen from their March 2022 peak. Even so, aluminium prices are still considerably higher than before the pandemic.

Net factor income was positive by 1% of GDP in 2023, after being negative by 1.5% in 2022. Year-to-

year volatility in factor income stems primarily from the operating performance of foreign-owned Icelandic subsidiaries. In 2022, the aluminium companies generated considerable profits, which then contracted significantly in H1/2023 and flipped to losses in H2, in tandem with the decline in aluminium prices. Iceland's foreign-owned pharmaceuticals companies generated sizeable losses in both 2022 and 2023.

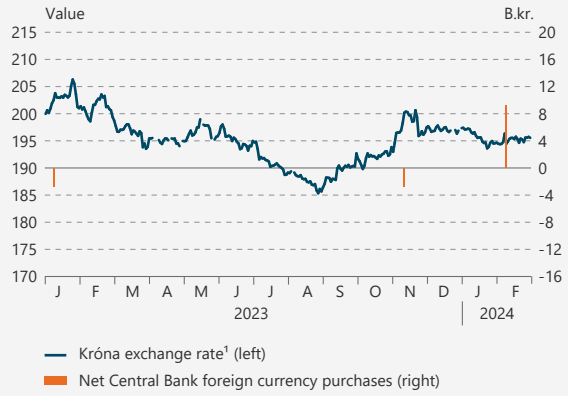
Swings in exchange rate expectations

The króna appreciated by 1.5% in 2023, strengthening more or less uninterrupted through end-August, or by 7.6%, and then retreating in the autumn. The banks' forward foreign currency position shrank markedly in August and September, when forward contracts with the króna declined by 40% and the number of counterparties to those contracts fell by 30%. The forward position has increased again in recent months, however, and the króna is almost 1% stronger than at the turn of the year.

Chart I-4

Exchange rate of the króna and Central Bank foreign exchange market activity

January 2023 - February 2024



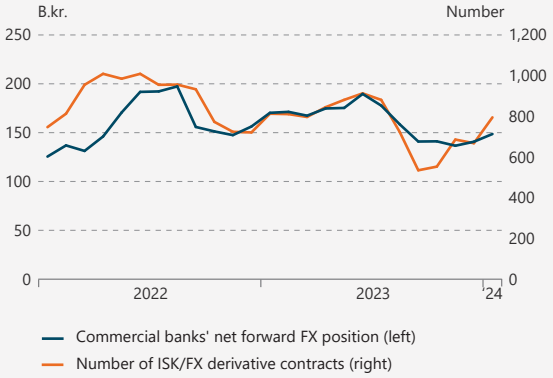
1. Narrow trade-weighted exchange rate of the króna (1%).

Source: Central Bank of Iceland.

Exchange rate volatility increased somewhat last autumn, as uncertainty about the effect that seismic activity in the Reykjanes area would have on the Icelandic economy grew markedly in November, concurrent with the evacuation of the town of Grindavík. The króna rose sharply upon the announcement that food and beverage industry company John Bean Technologies Corporation (JBT) was considering making an offer for all share capital in Marel hf. Interbank foreign exchange market turnover grew with the rise in volatility and nearly trebled month-on-month in November. That same month, the Central Bank intervened in the market, selling currency for 2.8 b.kr. In other respects, turnover in the interbank market has been relatively modest recently, and volatility has been historically low, indicating reasonably well balanced flows in the market.

Chart I-5

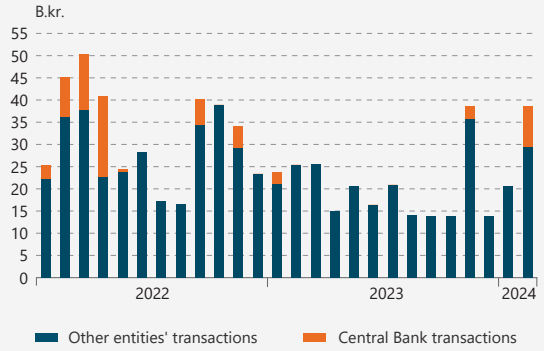
Commercial banks' forward exchange position involving the króna against foreign currency



Source: Central Bank of Iceland.

Chart I-6

Turnover in the interbank foreign exchange market



Source: Central Bank of Iceland.

In 2024 to date, the Central Bank has traded in the interbank foreign exchange market once, buying foreign currency for just over 9 b.kr. in February in an *ad hoc* transaction. That same day, Government Debt Management auctioned two Treasury bond series – RIKB 26 and RIKB 35 – for about 21 b.kr., including around 15 b.kr. bought by foreign investors.

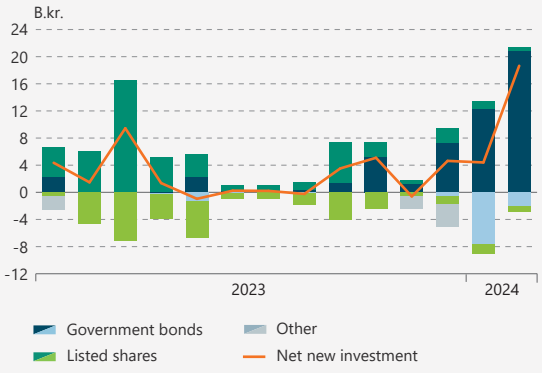
Non-residents step up their investments in Icelandic Treasury bonds

Net new investment was positive by nearly 27 b.kr. in 2023, including 17 b.kr. in net foreign inflows for investment in listed equities. About half of the total was due to non-residents' investment in domestic commercial bank shares. On the other hand, foreign investors'

trading in domestic listed securities has been limited in 2024 to date.

Chart I-7

Registered new investment[1]



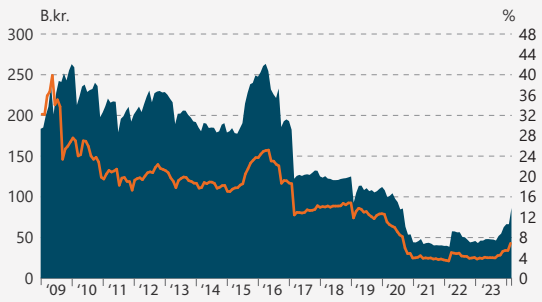
1. Data on new investments represent inflows of foreign currency converted to Icelandic krónur for investment in Iceland. Total investment, new investment, and reinvestment. Inflows in dark colours; outflows in light colours.

Source: Central Bank of Iceland.

Inflows into Treasury securities began to increase in late 2023, and over the year as a whole, foreign investors bought Treasury bonds for 18 b.kr. Most of the bonds had short residual maturities, and some of the transactions represented reinvestment following sales of the banks' covered bonds that were approaching maturity. Thus far in 2024, foreign investors have been shifting farther out the yield curve, buying long-term Treasury bonds and simultaneously selling shorter bonds. Non-residents' net investment in Treasury bonds totalled 24 b.kr. in the first two months of 2024, with most of the transactions taking place in February.

Chart I-8

Government bonds and bills held by non-residents[1]



1. Market value.

Sources: Nasdaq Iceland, Central Bank of Iceland.

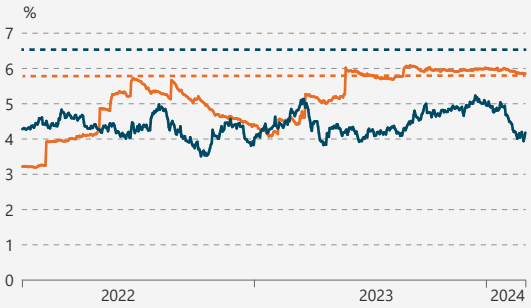
As a result, foreign investors' share of issued Treasury bonds has increased in the recent term. At the end of February, their holdings totalled 86 b.kr., or 7% of the issued Treasury bond stock, and their share in total ownership has doubled since March 2022. Even so, their holdings remain low in historical and international comparison: for instance, non-residents held 13% of issued Treasury bonds before the pandemic, and earlier on, their proportional holdings were even larger. However, that period reflects offshore króna holdings that were locked in because of the capital controls then in place in Iceland. Foreign investors have shown little interest in Treasury bills since the capital controls were lifted.

The surge in their interest in Treasury bonds is due in part to the wider short-term interest rate differential with abroad as measured by three-month interbank rates. In May 2023, the interest rate spread was broadly the same as in mid-2015, when carry trade in Treasury securities increased sharply. Carry trade remained strong until June 2016, when the Bank introduced special reserve requirements on capital inflows for investment in bonds and high-yield deposits. The long-term interest rate spread as measured by the difference between yields on 10-year Treasury bonds has not increased to the same degree; in fact, it has fallen by nearly a percentage point since the turn of the year.[2]

Chart I-9

Interest rate differential between Iceland and Germany[1]

January 2022 - February 2024



1. Dotted lines show June 2015 averages. 2. Based on three-month interbank rates. 3. Based on 10-year government bonds.

Sources: Reuters Datastream, Central Bank of Iceland.

Increased foreign investment in domestic Treasury bonds has a positive effect on the domestic bond market, if it is accompanied by greater activity and liquidity in the market. At the same time, it increases the economy's external debt, thereby exacerbating balance of payments risk, as highly liquid króna-denominated assets held by non-residents could give rise to outflow

2. Interest rate differential versus Germany. The short-term spread between Iceland and the US has followed a similar path but is still about 1 percentage point from its June 2015 value.

pressures at short notice. This could happen in times of mounting uncertainty in global financial markets and capital flight to safe assets; for instance, the foreign-owned stock of Treasury securities shrank from 110 b.kr. to 40 b.kr. in 2020-2021, when uncertainty spiked because of the pandemic.

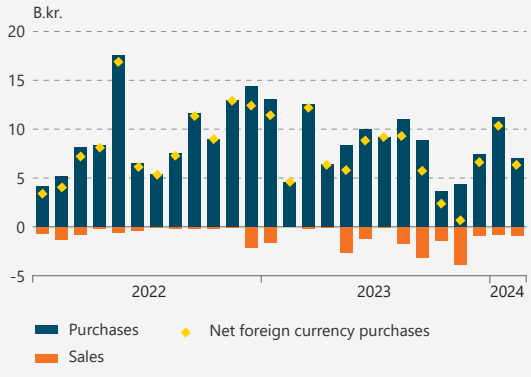
Because turnover in the domestic foreign exchange market is limited, large-scale inflows and sudden outflows from foreign entities can have a major impact on the exchange rate of the króna. However, this impact depends on responses by the Central Bank, which can intervene in the foreign exchange market to mitigate exchange rate volatility

Pension funds scaled down their currency purchases in late 2023

The pension funds' net foreign currency purchases totalled 83 b.kr. in 2023, or 21 b.kr. less than in 2022. Their gross foreign exchange sales more than doubled between years, to 17 b.kr. in 2023. The funds' net purchases averaged only 3 b.kr. per month in Q4/2023, some 8 b.kr. less than in the same quarter of 2022. This is probably due in part to a year-on-year contraction in foreign currency inflows for inward foreign direct investment during the quarter. The pension funds stepped up their currency purchases again in 2024, buying for 16 b.kr. in January and February combined.

Chart I-10

Pension funds' foreign exchange transactions



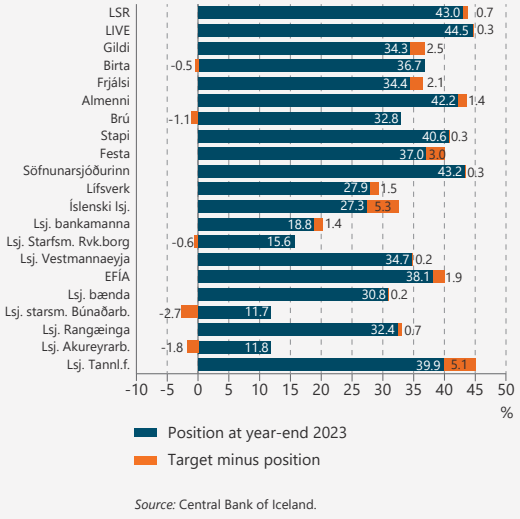
Source: Central Bank of Iceland.

The cap on pension funds' foreign-denominated assets is currently 51.5%, after rising by 1.5 percentage points in January, in accordance with recent amendments to the relevant legislation on pension funds. As is stated in that legislation, the share will rise in increments to 65% by 2036. Furthermore, pension funds are authorised to breach the maximum if price movements and exchange rate fluctuations cause such an increase, provided that the funds do not increase their foreign exchange risk while they are in excess of the cap.

Chart I-11

Foreign-denominated assets as a share of total pension fund assets

End-2023 position and targets according to 2024 investment strategy



Source: Central Bank of Iceland.

The legislation in question was passed in March 2023. In December 2023, the pension funds issued investment strategies for 2024, specifying their medium-term targets for the ratio of foreign-denominated asset to total assets. The statutory amendment does not appear to have had a material effect on pension funds' investment plans, as the weighted target in their 2024 investment strategies provided for 39.2% in foreign-denominated assets. This represents an increase of 0.8 percentage points from the prior year and therefore remains well below the statutory maximum. About half of the pension funds lowered their targets or held them unchanged year-on-year.

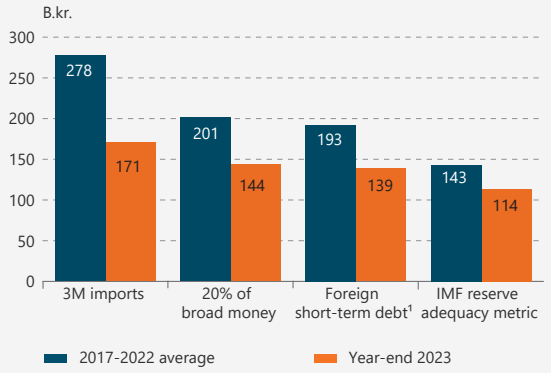
At the end of 2023, the funds' foreign-denominated assets accounted for 38.5% of total assets. The ratio was 40% for the five largest pension funds, which accounted for approximately ⅔ of total pension fund assets.

International reserves shrink but remain above key adequacy benchmarks

The Central Bank of Iceland's international reserves totalled 790 b.kr. at the end of 2023, or 19% of GDP. They have shrunk somewhat in the recent term, owing both to the appreciation of the króna and to the Bank's foreign exchange transactions with the Treasury, some of which involved repayment of foreign debt. Nonetheless, the reserves are still above all key reserve adequacy criteria.

Chart I-12

Ratio of international reserves to primary reserve adequacy metrics



1. Based on remaining maturities.
Source: Central Bank of Iceland.

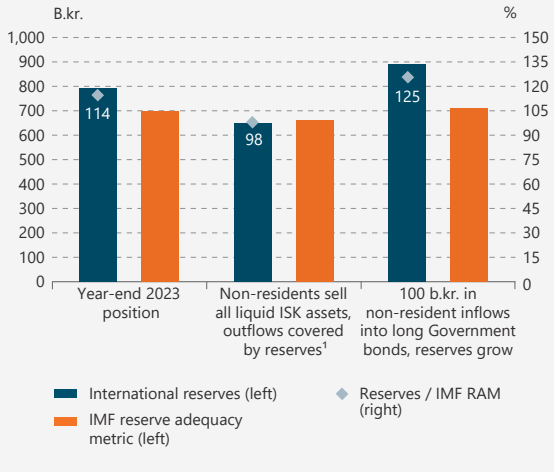
For example, they equalled 114% of the IMF's Reserve Adequacy Metric (RAM), which has a lower threshold of 100%. This ratio rose by 5 percentage points quarter-on-quarter in Q4/2023, mainly because of the depreciation of the króna and a marginal decline in Iceland's short-term foreign liabilities. The ratio of the international reserves to Iceland's short-term external liabilities was 139%, well above the Guidotti-Greenspan threshold of 100%.

A simple sensitivity analysis of the ratio of the reserves to the IMF's reserve adequacy metric shows that, all else being equal, if outflows of foreign-owned liquid króna assets, (estimated at 144 b.kr. at the end of 2023) were covered with sales from the international reserves, the ratio of the reserves to the RAM would fall to 98%, breaching the lower threshold specified by the IMF. Conversely, the ratio rises to 125% if foreign inflows into long-term Treasury bonds equal 100 b.kr. and foreign exchange purchases increase the international reserves by the same amount.

Chart I-13

Ratio of international reserves to IMF reserve adequacy metric

Sensitivity analysis



1. Deposits and Government bonds and bills held by non-residents.
Source: Central Bank of Iceland.

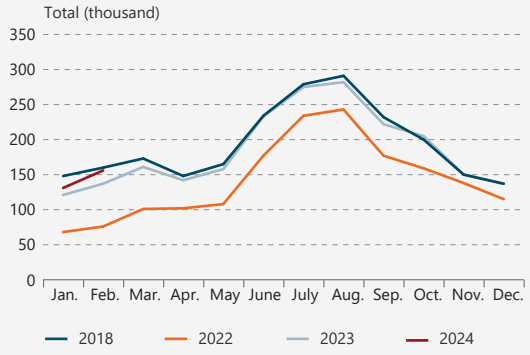
To the extent that the Central Bank bought foreign currency in order to mitigate short-term market volatility, thereby increasing the international reserves in response to non-residents' Treasury bond investments in February, the inflows made a positive impact on the reserves relative to key adequacy benchmarks – and therefore on the Central Bank's ability to respond to sudden outflows in the future.

Tourism still on the rise

The tourism industry grew apace in 2023. Foreign nationals' departures via Keflavík Airport exceeded 2.2 million, an increase of 30% relative to the prior year and only marginally below the 2018 record. As before, Americans comprise the largest nationality group among tourists, followed by the British. As expected,

Chart I-14

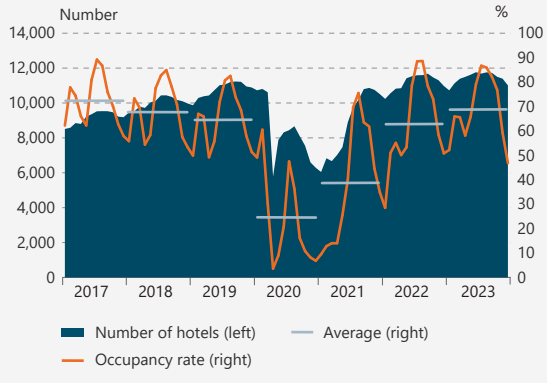
Foreign nationals' departures from Iceland via Keflavík Airport



Source: Icelandic Tourist Board.

Chart I-15

Number of Hotels and Occupancy rate



Source: Statistics Iceland.

2023 was a record year in terms of cruise ship passengers, whose numbers jumped more than 92% year-on-year, to 938,000.

Total bed-nights at registered accommodations equalled around 7.8 million in 2023, an increase of 18.5% relative to the prior year. Foreign tourists' overnight stays in unlisted accommodations during the year are estimated to have been 20% fewer than in 2018, as regulations on short-term rentals have been tightened. The hotel occupancy rate averaged 69% in 2023, slightly higher than in 2022. Over the summer, however, the occupancy rate declined marginally year-on-year.

Airlines seat availability to and from Iceland in H1/2024 looks set to exceed H1/2023 numbers by more than 14%, approaching or even reaching an all-time high. The supply of flights has increased markedly, however, particularly to major destinations, which could lower passenger load factors and airfares in the coming term. This would have a detrimental effect on airlines' operating performance. Q4/2023 proved a challenging period for Icelandic airlines. In November, both Play and Icelandair withdrew their financial year-end guidance for 2023. In early February, concurrent with the publication of its annual accounts, Play announced plans for a share capital offering. The company has secured subscription commitments for the equivalent of 4 b.kr., subject to shareholder approval of a share capital increase at the company's annual general meeting later this March. The domestic airlines are of major importance to the domestic tourism industry, as they account for an estimated half of tourist arrivals via Keflavík Airport.

Are tourists shortening their stays in Iceland?

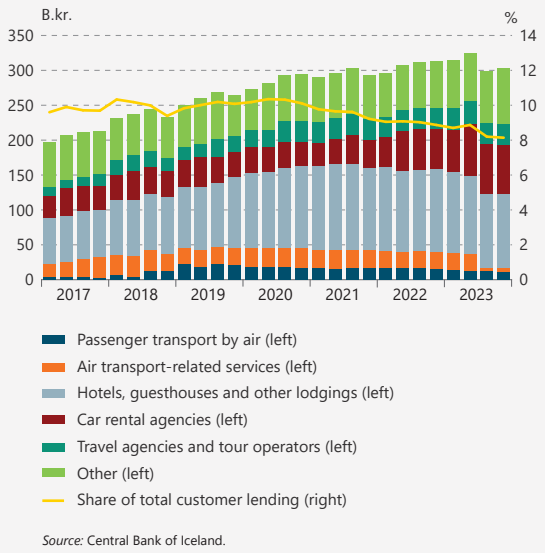
Prospects for the tourism industry are much more uncertain than before, but it is clear that growth could subside markedly in 2024. Even though January tourist numbers increased by 8% year-on-year, foreign nationals' bed-nights declined by 10% between years. The volcanic activity on the Reykjanes peninsula appears to have affected the industry more strongly than was initially expected. Media coverage abroad, especially in the UK, exaggerated the situation in Iceland, giving rise to various concerns, including fears that flights would be unavailable. The Blue Lagoon is in keen demand as a destination, and uncertainty about the situation there affects travel to Iceland. Developments in prices make an impact as well, and domestic price hikes have made Iceland an even more expensive travel destination. Forecasts indicate that visitor numbers will equal or perhaps exceed those in 2023, but high prices in Iceland could cause tourists to shorten their stays and cut back on spending while in the country. This would have a negative impact on the industry and weaken tourism operators' operating performance.

Impairment of tourism industry loans declines

The domestic systemically important banks' (D-SIB) lending to tourism companies totalled 302 b.kr. at the end of 2023, a contraction of 3.7% from the prior year. In August, Isavia issued a foreign bond and used the proceeds to refinance older debt, including loans from the D-SIBs. This is the main reason for the decline in lending in 2023.

Chart I-16

D-SIB lending to the tourism industry



Source: Central Bank of Iceland.

Chart I-17

Ratio of impairment to claim value of tourism industry loans

Source: Central Bank of Iceland.

Loans to tourism companies now account for 8% of the banks' total customer lending and nearly 18% of their lending to companies. The banks' recognised impairment of loans to tourism operators has contin-

ued to decline and is now around 3% of the claim value of the loan portfolio, which is below the pre-pandemic level. This suggests that tourism companies' financial position is stronger than before.

Risk associated with domestic asset markets

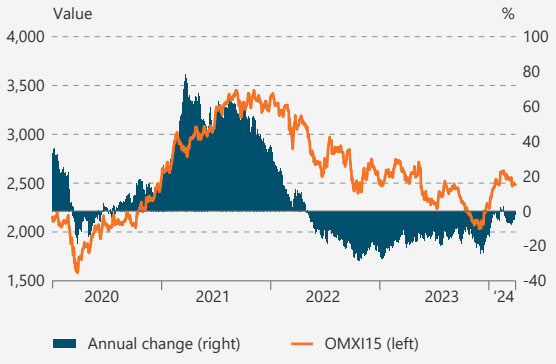
Turnaround in the domestic equity market following informal takeover bid for Marel

Share prices kept falling over the first ten months of 2023, continuing the pattern set in autumn 2021. In November, however, the situation changed abruptly when US company John Bean Technologies Corporation (JBT) submitted an informal bid to take over all share capital in Marel hf.[3] The bid did not only affect the price of Marel shares, which jumped 20% that day, but pushed prices upwards throughout the Main Market. The OMXI15 index surged nearly 6.4%, the largest single-day rise in nearly 15 years. From the presentation of the takeover bid until the end of February, the OMXI15 rose 19.3%, or 21.6% adjusted for dividend payments.[4]

Chart I-18

OMX Iceland 15 Index

2 January 2020 - 8 March 2024



Source: Nasdaq Iceland.

Share price movements in 2023 can more or less be divided into two periods: before and after the Marel takeover bid. Before the bid was submitted, only six of the 25 companies in the Main Market had risen in price. Two companies stood out during the period: shares in Amaroq Minerals had risen the most (nearly 30%), followed by Ölgerðin (20.1%). On the other hand, other companies' share prices either rose or held broadly unchanged from the time the bid was submitted until the end of the year. The biggest change was in Marel shares, which rose in price by 35%, after having fallen by 28.3% within the year. The OMXI15 rose by 18.2% over the same period, including a 10.5% rise in December alone, its largest monthly rise since January 2013, more than 11 years earlier. It is likely that other factors combined to affect the late-2023 rise in share prices, including the expectation that inflation and interest rates had topped out, the emergence of buying opportunities in the market due to the previous months' price developments, and expectations that Alvotech would receive marketing authorisation in the US.

In 2024 to date, the OMXI15 has been rather changeable. In January, it rose by 6.9%, reflecting price hikes in the months beforehand, but in February it fell by 5.6%.

Equity market turnover shrank despite an increase in the number of companies in the market

In 2023, one company, Ísfélag Vestmannaeyja, was listed on the market whose shares were admitted for trading in December. Furthermore, three companies – Amaroq Minerals, Hampiðjan, and Kaldalón – moved from the First North growth market to the Main Market. In addition, Icelandic Salmon, parent company of Arnarlax, was listed on the First North market in September, and Origo was delisted from the Icelandic stock exchange in April.

Even though the number of companies listed on the Main Market increased, turnover amounted to 785 b.kr. in 2023, down by a fourth from the 2022 total of 1,051 b.kr. Furthermore, Icelandic stocks were accorded about one-third more weight in the FTSE Russell indices in March 2023.

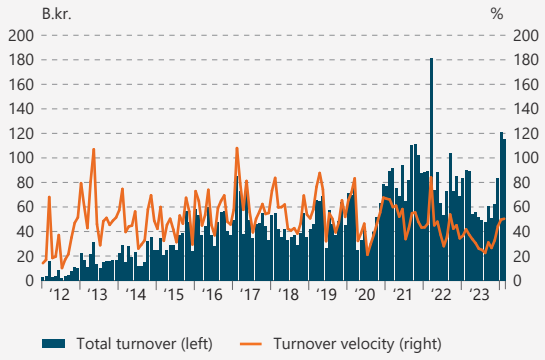
In the first two months of 2024, turnover with listed shares came to 236 b.kr., a year-on-year increase of 36%. Of that total, trading in Alvotech shares equalled 55 b.kr., or nearly a fourth of total turnover for the two-month period, as the company received marketing authorisation in the US in February. In January, turnover hit its highest monthly total since the 2008 financial crisis, apart from March 2022, when Íslandsbanki share capital offering took place. As a result, stock liquidity as measured by the trade velocity of listed shares surged to 50% in January.[5] In comparison, the total trade velocity of listed shares was 30.7% in Denmark, 44.3% in Sweden, and 39.8% in Finland over the same period.

3. This occurred on the night preceding Friday 24 November 2023.
4. The number of companies included in the OMXI15 increased from 10 to 15 on the first business day of this year.
5. Trade velocity – i.e., the ratio between transaction amounts and market capitalization of the respective firm – gives an indication of how actively shares are traded.

Chart I-19

Total turnover and turnover velocity

January 2012 - February 2024



Source: Nasdaq Iceland.

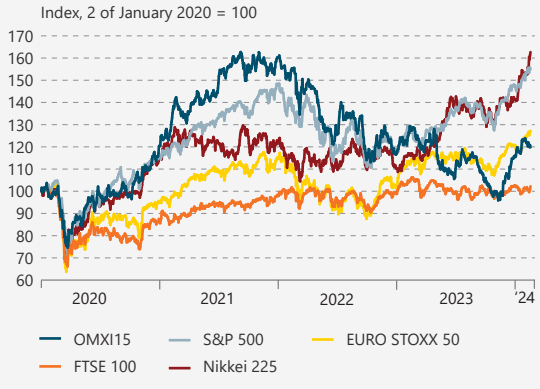
Strong rises in foreign equity markets in 2023

Foreign stock price indices rose overall in 2023, after remaining flat or declining in 2022. Expectations that policy interest rates had peaked were probably a major factor. The Japanese Nikkei 225 index rose the most, or 28%, supported by strong earnings reports and inflows of foreign capital. US indices showed comparable increases in 2023, with the S&P500 rising by 24%, driven largely by technology companies. Of that amount, the index rose nearly 16% in the last two months of the year, after the US Federal Reserve Bank announced that further policy rate hikes were unlikely. Furthermore, the European EURO STOXX 50 index rose 19% in 2023.

Chart I-20

Development of stock prices in Iceland and internationally

2 January 2020 - 29 February 2024



Source: Macrobond.

Market uncertainty as measured by the VIX implied volatility index is at its lowest in four years, since January 2020. Limited volatility over a long period of time can boost investors' optimism and risk appetite, which could cause asset prices to rise and prompt investors to take on additional debt. Recent developments are consistent with the perception that interest rates have probably peaked, however, and investors think it is more likely than not that rates will fall in the coming term.

In the first two months of 2024, the Nikkei 225 rose by 17%, hitting its all-time high in late February. Over the same period, the S&P 500 rose 6.8% and the Euro Stoxx index by 7.9%

Domestic bond market yields rose in 2023

In the past two years, nominal yield curves have been downward-sloping; i.e., yields on bonds with a short duration have been higher than yields on longer bonds. In mid-2023, the indexed yield curve inverted as well. A downward-sloping yield curve could reflect investors' expectations of a forthcoming contraction and of lower interest rates in the future.

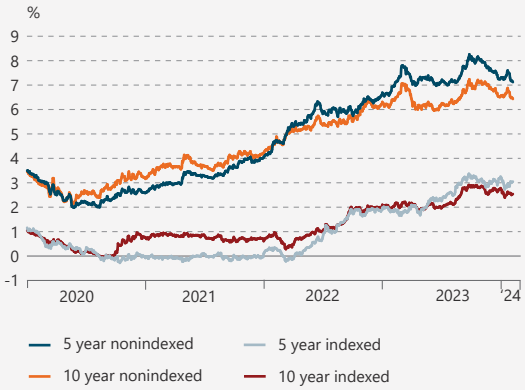
In 2023, yields on nominal and indexed Treasury bonds rose concurrent with the increase in the Central Bank's policy rate, especially after the August policy rate hike. Yields on nominal Treasury bonds sagged slightly in the last two months of the year, however, when the seismic activity on the Reykjanes peninsula started to intensify, whereas indexed yields were virtually unchanged. The yield on five-year nominal Treasury bonds was 7.2% at the end of 2023, after rising by 0.65 percentage points during the year, while the yield on five-year indexed bonds was 3.2% and had risen 1.29 percentage points.

Yields on both nominal and indexed Treasury bonds had softened slightly in the first two months of 2024, particularly the yield on five-year indexed bonds, which had fallen by 0.45 percentage points. The yield

Chart I-21

Treasury bond yields[1]

2 January 2020 - 29 February 2024



1. Based on the zero-coupon yield curve, estimated with the Nelson-Siegel method, using money market interest rates and Government-guaranteed bonds.

Source: Central Bank of Iceland.

on five-year nominal Treasury bonds fell by 0.27 percentage points over the same period.

As in Iceland, bond yields in other advanced economies have tapered off in recent months, as it is widely expected that policy rates have peaked in most trading partner countries. In October 2023, the yield on ten-year US Treasury bonds rose to more than 5%, its highest since 2007. Since then, it retreated to about 4.3% as of end-February 2024. Yields on ten-year government bonds issued by France, Germany, and the UK have developed broadly in line with US bond yields in the recent term. Last October, yields were all at a ten-year high, but since then they have eased at roughly the same pace as US yields have.

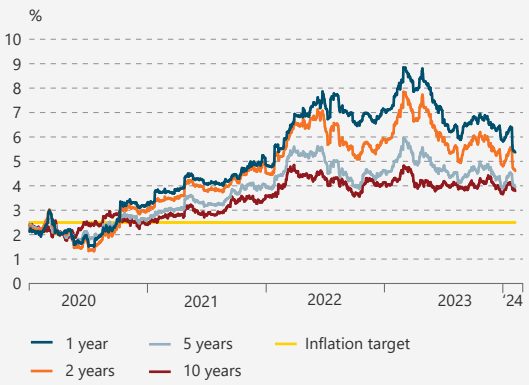
The breakeven inflation rate in the bond market has fallen since spring 2023

The breakeven inflation rate in the bond market fell in 2023, in spite of a relatively steep rise early in the year – particularly to include the short-term breakeven rate. The five-year breakeven rate was 3.9% at the end of 2023, after falling by 0.7 percentage points during the year, while the ten-year breakeven rate was 3.7% and had fallen by 0.5 percentage points over the same period. In the first two months of 2024, the five-year breakeven rate rose by 0.2 percentage points, to 4.1% as of end-February. The one-year rate declined by 0.17 percentage points, however, to 5.7% at the end of February.

Chart I-22

Breakeven inflation rate

2 January 2020 - 29 February 2024



Source: Central Bank of Iceland.

Bond market turnover increased in 2023. Total turnover amounted to 1,981 b.kr., giving a daily average of 7.9 b.kr., as compared with the 2022 total of 1,213 b.kr., or 5.2 b.kr. per day. According to the Nasdaq Iceland exchange, this was the largest turnover in the bond market since 2015. Turnover has continued to rise in 2024. In the first two months of this year, it has averaged 10.5 b.kr. per day, up by 44% from 7.3 b.kr. per day over the same period in 2022.

In February, the Minister of Finance and Economic Affairs announced, on behalf of ÍL Fund and the Government of Iceland, as well as representatives from the 18 pension funds that own the largest share of bonds issued by the ÍL Fund, that discussions on the settlement of the Fund's bonds would commence. The aim of the discussions is to reach an agreement providing for full settlement of the bonds and the creation of conditions to wind up the ÍL Fund.[6]

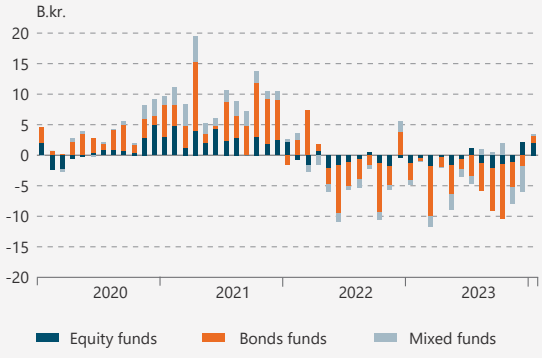
Equity funds rebound after a spate of redemptions

Outflows from investment funds totalled 123 b.kr. in 2023, almost a third higher than the 2022 total of 97 b.kr.[7]

Bond funds saw the strongest outflows, or 49 b.kr., a marked increase between years, even though the Nasdaq OMX Iceland Benchmark Bond index (NOMXIBB) rose 4% during the year. The same is true of mixed funds, which invest in equities and bonds according to an investment strategy. Net outflows from these mixed funds totalled 11.8 b.kr. in 2023, as compared with 6.7 b.kr. in 2022.

Chart I-23

Net flow of funds



Source: Central Bank of Iceland.

Outflows from equity funds were sizeable as well, at 8.3 b.kr., but were broadly unchanged year-on-year. Declining inflation and expectations of interest rate cuts this year have supported stock markets in the recent term. In the final months of 2023, net inflows

6. For further information, see the statement issued by the Ministry of Finance and Economic Affairs and the pension funds, dated 23 February 2024.
7. Investment funds include equity funds, bond funds, mixed funds, money market funds, real estate funds, hedge funds, alternative investment funds, and others.

into equity funds were positive, after a nearly two-year period of all but uninterrupted outflows. Sales of unit shares in excess of redemptions came to 2.1 b.kr. in December 2023.

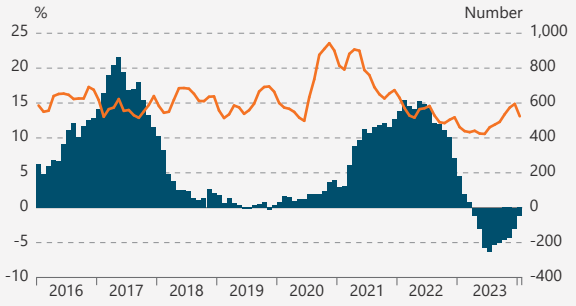
In January 2024, however, the situation reversed, and net flows were positive by 9.9 b.kr., after a steady stream of outflows in 2023. In January 2023, for instance, net outflows had totalled 9.1 b.kr. Net equity fund inflows were positive for the second month in a row, at 2.0 b.kr. in January.

Housing market turnover picks up again

The number of purchase contracts for residential property has increased considerably since mid-2023. In greater Reykjavík, an average of 430 contracts per month were finalised in H1/2023, and in H2 that number had risen to more than 540. This is somewhat below the pre-pandemic average. With the increase in purchase contract numbers, housing market turnover in the capital area rose from an average of 32 b.kr. per month in H1/2023 to an average of 46 b.kr. per month in H2. As in recent years, turnover contracted in January 2024, to just over 28 b.kr. Concurrent with the increase in turnover, the decline in real house prices has receded, to 1.3% year-on-year at the end of January 2024. This is due to declining inflation and a moderate rise in nominal house prices in recent months.

Chart I-24

Real house prices and number of purchase agreements in greater Reykjavík[1]



1. Number of purchase agreements shown as a three-month moving average.

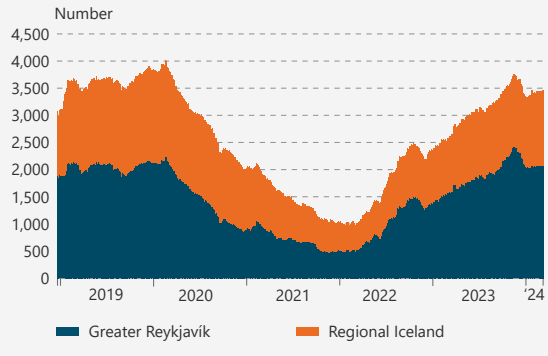
Sources: Housing and Construction Authority, Statistics Iceland, Central Bank of Iceland.

Concurrent with the pick-up in housing market activity, buyers have increasingly financed their home purchases with indexed loans. Indexed mortgage loans have a considerably lower debt service burden at the beginning of the loan period than non-indexed loans do, enabling more households to enter the market. Furthermore, the terms on equity loans intended for households below a given income threshold were updated last summer to include an increase in the reference price of homes eligible for the loans. Since then, a large number of these equity loans have been granted, most of them for homes in the capital area. Furthermore, the number of first-time buyers surged in H2/2023, although only partly because of an increase in equity loans, which are available only to first-time buyers (for further information, see the Box entitled Equity loans). Because of the increased number of first-time buyers, more purchase contracts made contingent upon the sale of another property can be concluded, thereby boosting market turnover. Furthermore, support for residents of Grindavík, including purchases of homes by leasing companies Bríet and Bjarg for rental to Grindavík residents, has bolstered market activity. These purchases took place mainly in December 2023 and January 2024.

The number of homes advertised for sale declined in December 2023, after rising steadily from mid-2022 onwards. The downturn in December is due both to the seasonal pattern, which usually features a reduction in the number of properties on the market, and also to stronger market activity. Included in this is the Government's purchase of 89 new properties for Grindavík residents in the final months of the year, as the number of new homes for sale fell by nearly 100 in December. In 2024 to date, the number of homes for sale has risen slightly once again.

Chart I-25

Number of properties listed for sale nationwide



Sources: Fasteignir.is, Housing and Construction Authority, Central Bank of Iceland.

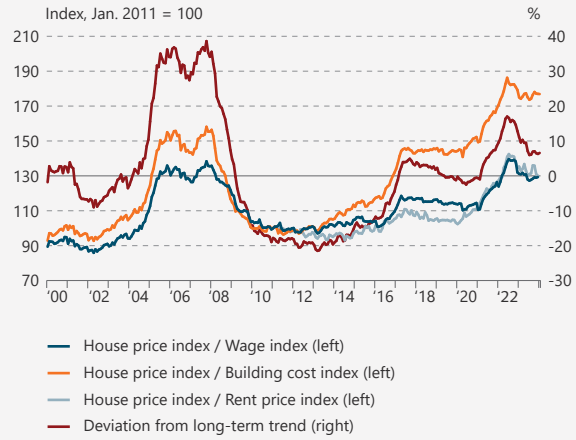
Is the housing market correction over?

Since mid-2022, house prices have fallen marginally relative to fundamentals. The deviation of house prices from their long-term trend measured just under 7% this January, somewhat less than in January 2023,

when the deviation was more than 11%. The ratio of house prices to wages has held relatively stable in the past year, after falling rather quickly just over a year ago. The ratio of house prices to both building costs and rent prices has followed a similar pattern, falling from H2/2022 until mid-2023. Since then, both of these ratios have fluctuated somewhat between months, without any clear upward or downward trend. As a result, the assessment of house prices is broadly unchanged since the last *Financial Stability* report, as prices remain high by most measures. At the moment, it is not yet clear whether the housing market correction is over or whether further real declines are in the offing. Developments in house prices in the coming term will probably be determined by future developments in inflation and interest rates, developments in wages and the effects of Government support for Grindavík residents.

Chart I-26

Capital area house prices and their determinants[1]



1. Long-term trend estimated using the capital area house price index, deflated with the CPI. Trend is determined using a Hodrick-Prescott filter with a multiplier of λ =32,400,000, in accordance with Ravn, M.O., and Uhlig, H. (2002). Notes on adjusting the Hodrick-Prescott filter for the frequency of observations. Review of Economics and Statistics.

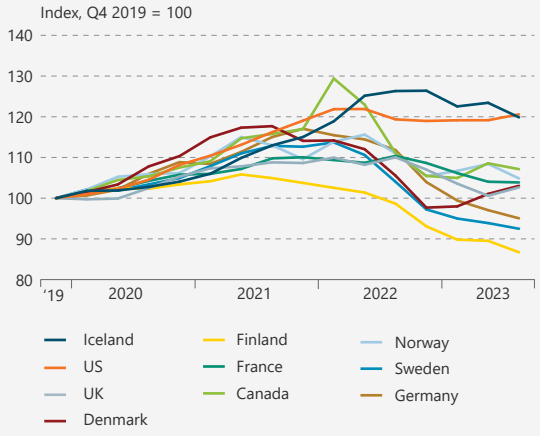
Sources: Housing and Construction Authority, Statistics Iceland, Central Bank of Iceland.

House price correction modest in comparison with other countries

The rapid correction of house prices that has occurred widely in Europe has not materialised in Iceland. An examination of developments in real house prices in several advanced economies since the beginning of 2020 shows that Iceland stands out, as does the US, in that real prices are still considerably higher than at the beginning of the pandemic. In most countries, real prices have fallen 10-20% from their pandemic-era peak and are now broadly back to the levels seen at the beginning of 2020.

Chart I-27

Real house prices in selected countries



Sources: Bank for International Settlements, Central Bank of Iceland.

Strong increase in number of new fully finished homes

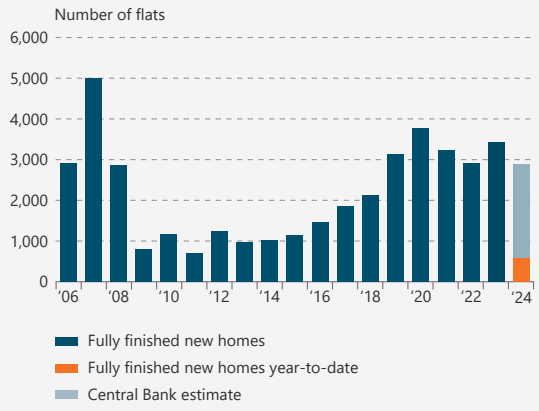
The number of homes grew strongly last year, despite challenging conditions in the construction market. The total number of fully finished homes grew by more than 3,400 in 2023. This is 18% larger than the increase in 2022, and the third-biggest single-year increase on record, after 2007 and 2020. New home construction appears to have eased, however, according to the Housing and Construction Authority's (HMS) autumn 2023 tally. The slowdown could stem in part from higher financing costs, which may provide a greater incentive for contractors to finish projects already underway. A large number of homes are currently under construction – about 7,200 as of the beginning of March 2024 – slightly less than at the end of 2022 and around 1,100 more than the average of the past five years. Of that total, about 2,300 are listed as more than 50% complete, and nearly 600 have already been finished this year. Assuming that it takes two years to build a home from start to finish, and assuming linear progress, it can be expected that roughly 2,900 fully finished homes will be put on the market nationwide this year.

Construction market turnover increased by nearly 10% in real terms in 2023, and the ratio of annual turnover to GDP was at its highest since 2008. The real growth rate eased somewhat in H2, however. It should be noted here that turnover includes not only residential property but also, in part, the construction of the new Landspítali hospital. The number of workers employed in the construction industry has risen sharply in recent years. On average, the construction industry workforce was roughly 9% larger in 2023 than in 2022. Furthermore, the share of job vacancies in the

construction sector exceeds that in most other sectors of the economy.

Chart I-28

Fully finished homes nationwide[1]



1. Fully finished housing units are those in construction stages 7 and 8. The total for 2024 as a whole is estimated based on the number of homes finished by the beginning of March and the progress of homes under construction according to the Housing and Constuction Authority's provisional assessment.

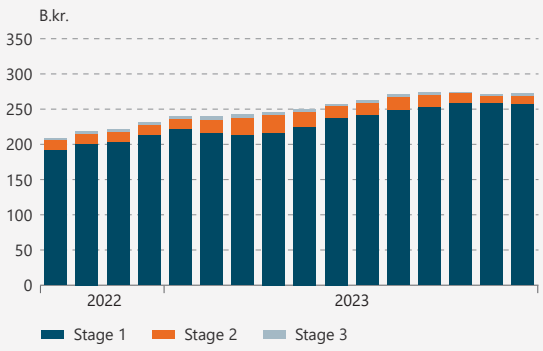
Sources: Housing and Construction Authority, Central Bank of Iceland.

The construction industry remains financially strong

Lending from the D-SIBs to construction companies increased in real terms by 18% in 2023, mostly due to more sluggish sales of new properties, which resulted in a slower rate of construction loan repayment. Construction companies sought out CPI-indexed loans in greater measure in 2023, and the sector's share of indexed loans rose from 2.5% to 10.7% over the course of the year. This shift from non-indexed to indexed loans is probably due to rising interest rates on non-indexed debt. In spite of higher debt service levels, the non-performing loan ratio in the construction sector is still very low. Furthermore, the share of loans classified as stage 2 or stage 3 in terms of impairment contracted slightly in 2023. As a result, the financial position of the construction industry still appears strong in spite of high interest rates, as companies in the sector have accumulated significant equity in recent years, concurrent with steep rises in the price of housing.

Chart I-29

D-SIBs lending to the construction sector, by impairment stage[1]



1. Debtors in ÍSAT 2008 categories 41-43. Claim value of loans by impairment stage. At constant December 2023 prices, deflated with the CPI.

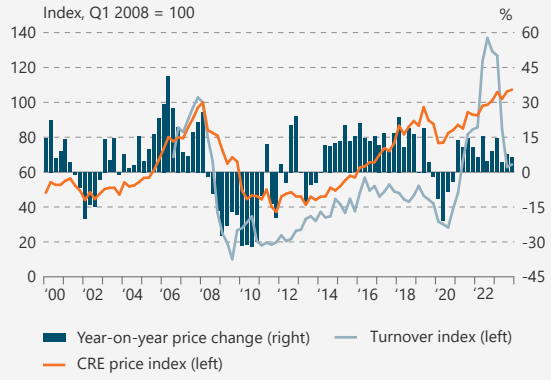
Sources: Statistics Iceland, Central Bank of Iceland.

Commercial real estate price index still rising

The index of commercial real estate (CRE) prices in greater Reykjavík rose in real terms by 6.2% in 2023. It was the third year in a row to see a sizeable increase in the index, which is up nearly 28% at constant prices since the end of 2020. At the end of 2023, the CRE index was 16.6% above its estimated long-term trend, as compared with 13.1% above trend at the end of 2022. Turnover in registered CRE transactions in the capital area contracted year-on-year by 50% in real terms in 2023, after an unusually strong 2022, and in comparison with the years before then, 2023 turnover was significant.

Chart I-30

Capital area commercial real estate: real prices and turnover[1]



1. CRE price index, deflated with the CPI. The index shows a weighted average of industrial, retail, and office property prices. The most recent observation is preliminary. The turnover index shows a four-quarter moving average, deflated with the CPI. With the October 2020 amendment to legislation on registration of documents, it was required to include the purchase price with the change of title to the property. The number of registered purchase agreements increased when that change took effect.

Sources: Housing and Construction Authority, Statistics Iceland, Central Bank of Iceland.

The total number of square metres of commercial property advertised for leasing was virtually unchanged year-on-year at the end of 2023, the majority of it office space, as was the case at year-end 2022. The vacancy ratio – i.e., available space as a share of fully finished property – has declined markedly in all categories since 2019, however. Furthermore, demand appears to have spiked temporarily, particularly for industrial and warehouse space, in the wake of the seismic activity in Grindavík.[8]

8. Based on an analysis of the capital area commercial property market, carried out by Reykjavík Economics for the Central Bank at the beginning of 2024.

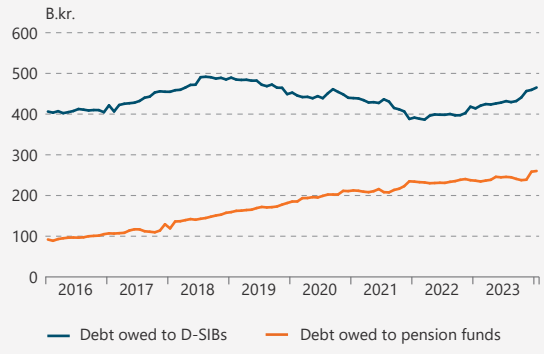
Demand for commercial property has grown in recent years but is expected to ease in the coming term. Economic activity has lost momentum in recent months, and job creation has slowed. This indicates strongly that demand for various types of commercial property could weaken, particularly for retail and office space.

Real estate firms' debt levels have risen

Real estate companies' debt to the D-SIBs totalled just under 465 b.kr. at the end of January 2024. At that time, it was up 12% year-on-year in real terms and had risen by nearly 19% in the previous two years.[9] There was a noticeable shift from non-indexed financing to indexed financing in 2023. At the beginning of 2023, some 30% of the D-SIBs' loans to real estate firms were indexed, but by the end of the year, that share had risen to 43%. Despite high interest rates, loan quality in the sector still appears strong. At the end of December 2023, 1.9% of loans were in arrears by more than 30 days, as compared with 1.6% a year earlier, and the share of loans classified as stage 2 or stage 3 in terms of impairment was virtually unchanged at just under 8% over the same period. Real estate firms' debt to pension funds, virtually all of it in the form of marketable bonds, totalled nearly 260 b.kr. at the end of January 2024, after increasing by 10% year-on-year in real terms.

Chart I-31

Real estate firms' debt to D-SIBs and pension funds[1]



1. Firms in ÍSAT 2008-categories 68.10 and 68.20. At constant December 2023 prices, deflated with the CPI.

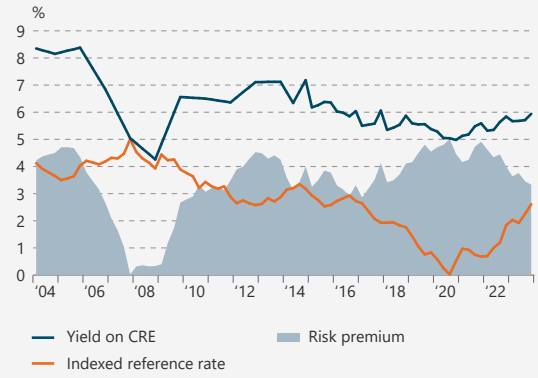
Sources: Statistics Iceland, Central Bank of Iceland.

Returns in excess of the risk-free rate are declining

In real terms, leasing income earned by the large CRE companies – Eik, Reginn, and Reitir – grew by a combined 3.2% year-on-year in 2023. Returns on the companies' investment assets rose marginally over the same period, from 5.6% to 5.8%. The calculated risk premium declined during the period, however, owing to higher yields on indexed Treasury bonds. It measured 3.3% in Q4/2023 after having fallen virtually without interruption since Q4/2021, when it measured 4.9%.

Chart I-32

Yield and risk premium on commercial real estate[1]



1. The yield is defined as annualised net operating income divided by average investment assets over the accounting period. The indexed reference rate shows the yield on a bond with a long maturity and negligible counterparty risk. Yields are as follows: IBN 38 until Q2/2004, HFF 44 from Q3/2004 through Q2/2017, RIKS 30 from Q3/2017 through Q4/2020, RIKS 33 through Q1/2021 to Q1/2022, and RIKS 37 from Q2/2022 onwards. The risk premium is defined as the yield in excess of the reference rate.

Sources: Leading real estate firms' annual and interim financial statements, Government Debt Management, Central Bank of Iceland.

In general, a large share of the CRE firms' investment assets were leased out at the end of the year, apart from one company that had relatively large leases expire during the year and renovated some of the properties concerned. The combined change in investment asset valuations was nearly 25 b.kr. in 2023, about 6.5 b.kr. more than in 2022. Valuation adjustments were significantly positive in H1/2023, but negative in H2. The revaluation reflected the positive impact of price level changes and the negative impact of higher yields. The weighted average yield on the companies, as measured by the weighted average cost of capital (WACC), increased by roughly 0.3 percentage points year-on-year in 2023 and had risen by 0.7 percentage points in the previous two years. The CRE firms' net financing expense continued to increase marginally in 2023, after a steep rise in 2022.

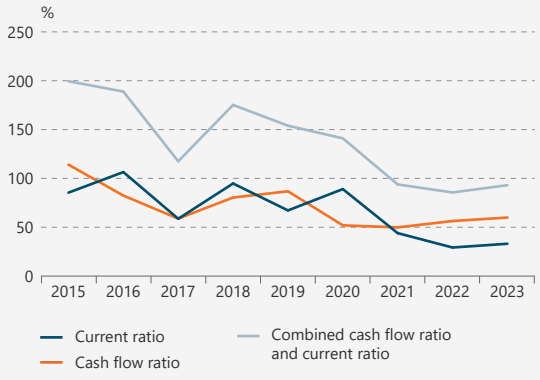
In real terms, the large CRE firms' debt level has been relatively stable in recent years. Their combined loan-to-value ratio was 63% at the end of 2023, the same as in 2022. Their combined equity ratio was also unchanged between years, at just under 32%. Their interest coverage ratio is still below 1, although it rose slightly year-on-year in 2023. If indexation is excluded,

9. At the end of January 2023, debt owed by CRE leasing companies accounted for about 74% of real estate firms' debt to the D-SIBs. Real estate firms' debt accounted for some 27% of corporate debt owed to the D-SIBs at that time.

however, it measured nearly 2.6 at the year-end.[10] Net cash from operations shrank in real terms by just under 1% year-on-year in 2023, albeit offset by higher interest expense and stronger operating profits. The companies' combined current ratio was 33% at year-end 2023, virtually the same as at the end of 2022. Their cash flow ratio was 60% in 2023, and their combined current ratio and cash flow ratio was therefore less than 1. The low ratios in recent years are due largely to a high ratio of interest-bearing debt maturing within one year, as the companies shifted their financing increasingly to short-term non-indexed bond issues after interest rates were lowered during the pandemic. These bonds have matured in recent years and, for the most part, have been refinanced with longer-term indexed debt. As a result, the companies will face limited refinancing risk in coming years.

Chart I-33

Leading CRE firms' cash flow solvency[1]



1. Combined ratios for commercial real estate firms Eik, Reginn, and Reitir. The current ratio is the ratio of current assets to current liabilities. The cash flow ratio is the ratio of annualised free cash flow from operations to current liabilities.

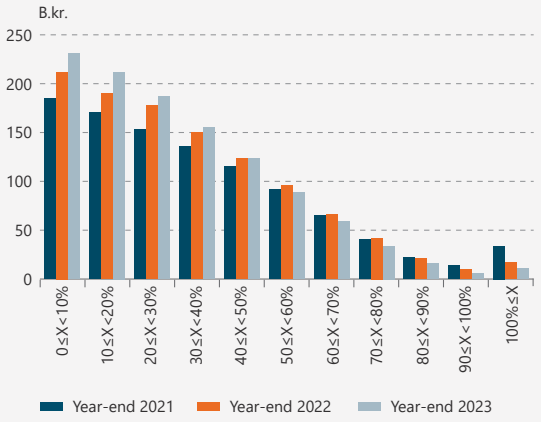
Sources: Annual and interim financial statements from Eik, Reginn, and Reitir; Central Bank of Iceland.

Arrears on CRE-backed loans continue to decline

Deposit institutions' CRE-backed loans totalled just over 981 b.kr. at the end of 2023, after increasing by 5.3% year-on-year in real terms.[11] As in 2022, growth was strongest, 14% year-on-year, in loans to companies in real estate and construction, the largest sector in terms of CRE-secured loans. The non-performing ratio on CRE-backed loans fell for the third year in a row, to 0.9% at the end of 2023. This was due mainly to the decline in NPL ratios on loans to construction and real estate companies, which fell from 1.2% to 0.6% between 2022 and 2023, although NPL ratios on loans to operators of guest accommodations fell from 3.9% to 0.8% over the same period. Partially offsetting this, NPL ratios on loans to companies in manufacturing and wholesale increased from 0.3% to 2.9%. The weighted average LTV ratio on CRE-backed loans was 39% at the end of 2023, about 1 percentage point lower than at the end of 2022. The decline between years is due to an increase in non-CRE collateral used to secure the same loans as commercial property. If the amount of each CRE-backed loan is broken down into LTV brackets and

Chart I-34

CRE-backed mortgages, by LTV ratio[1]

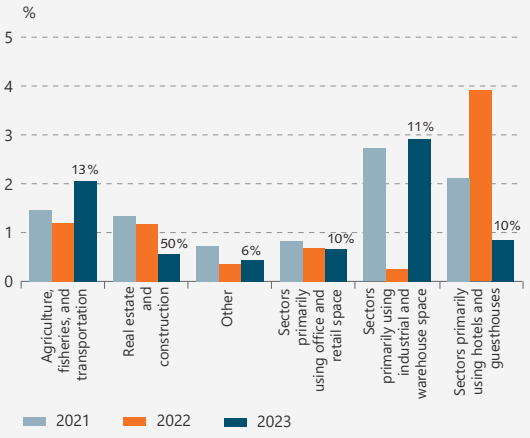


1. CRE-backed mortgages issued by commercial banks, at constant December 2023 prices, by LTV ratio. Each loan is divided into LTV buckets, and the sum of each bucket is then calculated.

Sources: Statistics Iceland, Central Bank of Iceland.

Chart I-35

NPL ratios on CRE-backed loans issued by commercial banks[1]



1. Year-end figures. Facility-level non-performing loan ratios; i.e., based on 90-day arrears. Debtors are broken down into housing segments according to the Central Bank's assessment of the type of property they are most likely to use, based on their ÍSAT2008 sectoral classification. The figures above the columns for 2023 represent the outstanding balance of loans in each category, expressed as a share of all CRE-backed loans.

Source: Central Bank of Iceland.

10. Unlike conventional interest expense, indexation is added to the principal of indexed loans and is not paid immediately. As a result, it can be argued that indexation should be excluded from the calculation of the interest coverage ratio.
11. Loans to the agriculture, fishing, and transport and shipping sectors are excluded, as they are generally secured by collateral other than commercial real estate. If these sectors are included, loans totalled 1,122 b.kr. at the end of 2023, an increase of 1.7% year-on-year in real terms.

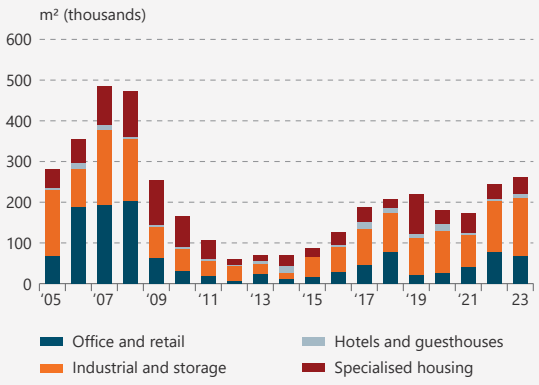
the total in each bracket is summed up, it can be seen that the amount of loans with an LTV ratio over 90% has shrunk by nearly 2/3 in the past three years, from 42 b.kr. at the end of 2020 to less than 16 b.kr. by the end of 2023. The total amount of loans with an LTV ratio exceeding 90% was about 1.6% of the CRE loan stock as of year-end 2023.

More commercial real estate under active construction

The CRE stock grew by 1.8% nationwide in 2023. This was its fastest single-year growth rate since 2016 but considerably slower than during the period before the 2008 financial crisis. As before, the biggest increase was in fully finished hotel and guesthouse space, at 4%, while fully finished manufacturing and warehouse space grew by 2.4%. As of year-end 2023, just under 700,000 square metres of commercial property were under construction, about the same as at the end of 2022. Of that total, some 260,000 square metres were under active construction, the largest total since 2008.[12]

Chart I-36

Commercial real estate under active construction[1]



1. Property in construction stages 1-6 nationwide. The classification of commercial property as "under active construction" each year excludes properties that are at the same stage of construction as they were in the prior year.

Sources: Housing and Construction Authority, Central Bank of Iceland.

The domestic CRE market appears better balanced than many markets abroad

Systemic risk associated with commercial property has increased in many parts of the world. CRE occupancy rates have declined in other countries, particularly for office space, owing to the increase in remote working brought on by the pandemic. Furthermore, large amounts of CRE-backed loans are set to mature in the next few years, especially in Europe and the US. Higher interest rates have a strong impact on the CRE market, and property prices have been on the decline in most countries. The European Central Bank's January 2024 lending survey indicated that terms have deteriorated more on CRE loans than loans to other sectors in recent years, and that European banks expect the trend to continue in H1/2024. The survey also suggests that European banks are of the opinion that the credit quality of CRE loans has deteriorated in the recent term.[13] Even though interest rates have risen steeply in Iceland, the CRE price index was at a historical high in late 2023. The slow pace of commercial development ever since the 2008 financial crisis has supported prices in the market. By the same token, domestic economic developments – with rapid growth in population and private consumption – have supported demand for commercial property in recent years. That said, it is important that the financial system continue to safeguard its resilience against potential declines in commercial property prices, as overall economic activity has begun to slow down and conditions in the general economy are closely linked to those in the CRE market.

Risk associated with private sector debt

Private sector debt-to-GDP ratio still on the decline[14]

Private sector debt totalled 147% of GDP at the end of 2023, after falling by 5.6 percentage points during the year. The decline was due to a contraction in real credit paralell to a 4.1% GDP growth in the time period. Private sector debt shrank in real terms by 1.5% in 2023 but grew by 6.1% in nominal terms. In price- and exchange rate-adjusted terms, growth in debt was less than nominal growth, or 4%.[15] Exchange rate effects were limited in 2023 but price effects stronger. Private sector demand for credit contracted overall in 2023, as financing costs surged in both domestic and foreign credit markets.

12. The classification of commercial property as "under active construction" each year excludes properties that are at the same stage of construction as they were in the prior year.

13. See the Euro area bank lending survey.

14. The term *private sector* refers to households and commercial enterprises, including publicly owned commercial entities. Financial companies are excluded.

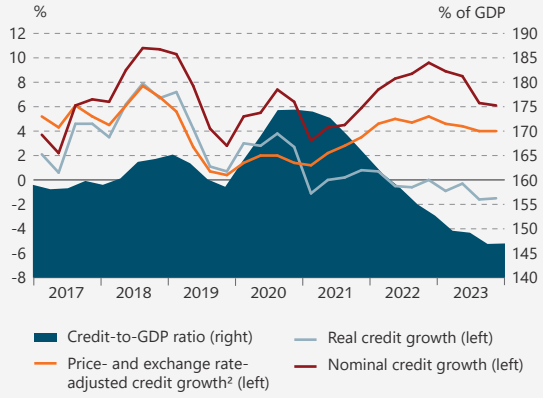
15. CPI-indexed debt at constant prices and exchange rate-linked debt at constant exchange rates.

Decline in household debt

Household debt increased 5.7% year-on-year in nominal terms in January 2024, which translates to a 0.9% contraction in real terms. At that time, the real growth rate had been negative for 14 consecutive months. Although declining inflation weakens the impact of price indexation on debt, it is offset in part by the recent rise in indexed loans as a share of total household debt. Adjusted for indexation, household debt was up 2.6% [year-on-year] in January, as compared with 4.5% in January 2023.[16]

Chart I-37

Private sector credit growth[1]

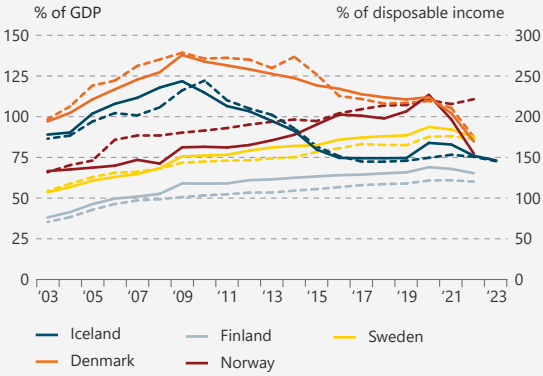


1. Lines show annual growth rates. 2. CPI-indexed credit at constant prices and foreign-denominated credit at constant exchange rates.

Sources: Statistics Iceland, Central Bank of Iceland.

Chart I-38

Household debt ratios in the Nordic countries[1]



1. Solid lines show household debt-to-GDP ratios on the left axis while dashed lines show debt-to-disposable income ratios on the right axis. Disposable income is income net of taxes.

Sources: Bank for International Settlements, Eurostat, Statistics Iceland, Central Bank of Iceland.

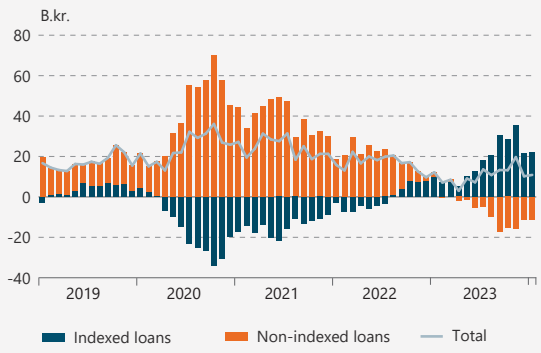
The household debt-to-GDP ratio declined by just under three percentage points year-on-year in 2023, to 73.1% at the year-end. The household debt-to-disposable income (DSTI) ratio fell by 5.4 percentage points in 2023, to 145.3% at the year-end. Household leverage therefore declined, and debt ratios are low, both in historical terms and relative to levels in neighbouring countries. In this context, it is worth noting that the share of home-owing Icelandic households is one of the highest among neighbouring countries. It is around 79% and has been rising in recent years. Real estate purchases are generally the main reason for household debt. Around 82% of household debt in Iceland stems from mortgage loans.

High interest rates and borrower-based measures curtail household demand for credit

Net new loans to households totalled 162 b.kr. at constant prices in 2023.[17] Of that total, 128 b.kr. were residential mortgages. In real terms, this represents a significant contraction compared to 2022, when net new loans to households totalled 246 b.kr., including 203 b.kr. in mortgage loans. Net new loans to households increased in H2/2023 but were still below the long-term average. High interest rates, in combination with rules capping DSTI ratios and loan-to-value (LTV) ratios on mortgages, have contained household demand for credit and curbed excessive leverage. Increased demand for credit in H2/2023 could reflect reduced uncertainty and increased expectations that interest rates and inflation had peaked. Inflation measured 6.6% in January 2024 and has been on the decline, while the Central Bank's key interest rate has been held steady at 9.25% since last August, after steep rate hikes in H1/2023.

Chart I-39

Net new household mortgages[1]



1. New loans less loan retirement and loan prepayments in excess of contractual requirements. Fixed prices. Figures include loans issued by deposit institutions, pension funds, the ÍL Fund, and the Housing Fund.

Source: Central Bank of Iceland.

16. Excluding the contribution of price indexation on indexed loans to the nominal growth rate.

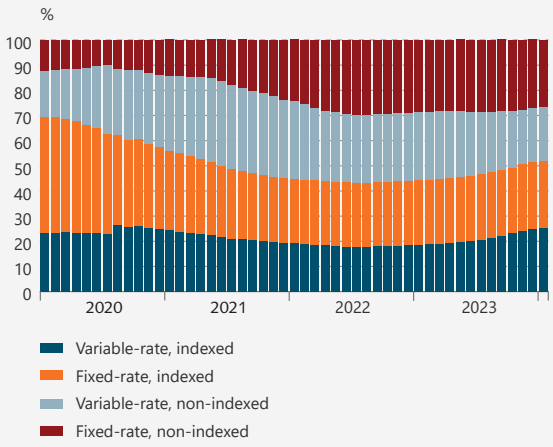
17. Net new loans are defined as new loans less debt retirement and prepayments in excess of contractual requirements. Overdraft loans are excluded. At constant January 2023 prices.

Households increasingly seek out indexed loans

High interest rates have caused most borrowers' debt service burdens to rise. The weighted average interest rate on non-indexed variable-rate mortgages was just under 10.9% at the end of January and had risen by over half a percentage point since the Central Bank's last rate hike, in August 2023. At the same time, the weighted average interest rate on indexed variable-rate mortgages had risen by 0.8 percentage points, in line with the rise in real rates. In many cases, interest rate hikes have caused a substantial rise in households' debt service, and a number of households have therefore taken measures to limit the burden; e.g., by refinancing non-indexed debt with new indexed loans. Furthermore, indexed loans have been chosen increasingly by individuals financing home purchases. The initial debt service burden on an indexed loan is lighter than on a non-indexed loan of the same amount. This makes indexed loans a convenient option for borrowers who wish to minimise their debt service at the outset and keep it equal over the lifetime of the loan.

Chart I-40

Consumer mortgages, by type[1]



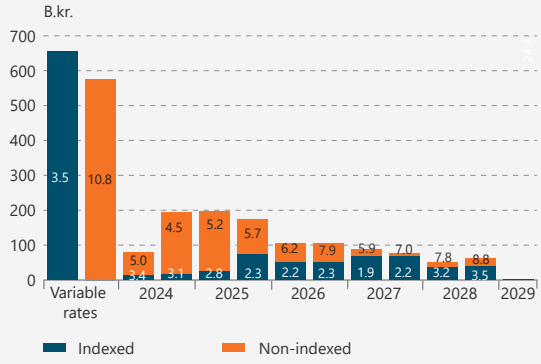
1. Proportional breakdown of consumer mortgages, by type, from the D-SIBs and the Housing and Construction Authority. Including loans from the largest pension funds from August 2020 onwards.

Source: Central Bank of Iceland.

Charts I-39 and I-40 illustrate the rise in household demand for indexed loans: net new non-indexed mortgages have declined since May 2023, while net new indexed mortgages have increased. This pattern intensified in H2/2023, and by the end of January 2024, indexed loans had grown to 51.7% of the outstanding mortgage stock, an increase of 8.6 percentage points since end-June 2022. At the end of January, 26.8% of outstanding mortgages were non-indexed fixed-rate loans. The fixed-rate clauses on a large share of these loans are set to expire in the next two years. The weighted average interest rate on these loans is far below the rates currently offered on comparable loans, and it can therefore be expected, all else being equal, that debt service on them will increase when the fixed-rate clauses expire. Year-end 2023 figures show that 67 b.kr. in non-indexed fixed-rate loans, or 2.9% of the outstanding mortgage stock, will be subject to interest rate reviews in H1/2024. Another 178 b.kr. in loans are scheduled for interest rate reviews in H2/2024, and a further 175 b.kr. in H1/2025. If interest rates remain high, it can be expected that a significant proportion of these loans will be partially or fully refinanced with new indexed loans, and that the share of indexed loans will increase accordingly.

Chart I-41

Outstanding amount of mortgage loans with an upcoming interest rate review and their weighted interest rate[1]



1. The figure shows the amount of variable-rate and fixed-rate mortgage loans with a scheduled interest rate review in coming years. The data cover all consumer mortgages issued by the systemically important banks, the Housing and Construction Authority, and the nine largest pension funds. Based on loan balance as of end-December 2023. Figures in columns show the weighted interest rate on the loan amount in question.

Source: Central Bank of Iceland.

Household overdraft loans contract, while overdraft interest burdens rise

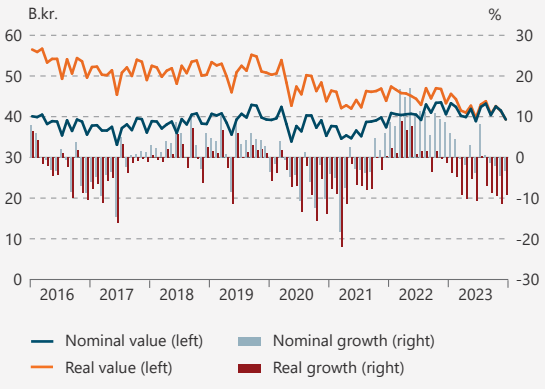
The Central Bank of Iceland publishes monthly statistics on deposit institutions' loans to households. These figures include the balance of household overdrafts, which totalled 96 b.kr. at the end of 2023.[18] Using other Central Bank statistics makes it possible to separate out overdrafts on current accounts with the domestic systemically important banks (D-SIB). Households overdrafts falling into this category totalled 39.3 b.kr. at the end of 2023 and had declined by 3.3% in nominal

18. As can be seen in the metadata for the statistics, these figures cover both overdrafts on current accounts and payment card debt, including outstanding month-end credit card balances. As a result, the data are not a reliable indicator of households' financial position, as changes in payment card use and household consumption strongly affect the patterns shown in the data. Furthermore, the data are not useful in assessing households' overdraft interest expense, as a significant share of the total amount is non-interest-bearing.

terms, or 10.4% in real terms. In addition, the overdraft loan amount had declined almost continuously relative to fundamentals such as GDP and disposable income over the previous decade. On the other hand, households' overdraft interest expense had been increasing in the recent term, in line with Central Bank interest rate hikes: the weighted average interest rate on overdraft loans was 16.1% at the end of 2023, after rising by 3.3 percentage points year-on-year

Chart I-42

Households' overdraft loans from the D-SIBs[1]



1. Overdraft loans are defined as a negative balance on a current account. Credit card debt is excluded.

Sources: Statistics Iceland, Central Bank of Iceland.

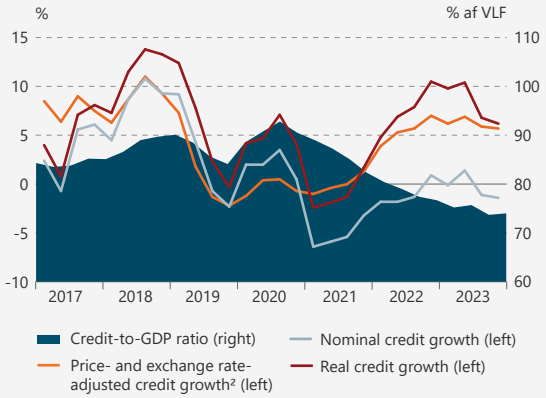
Corporate debt contracts in real terms

Corporate debt totalled 3,164 b.kr., or 74% of GDP, at the end of 2023,[19] after decreasing by 2.8 percentage points during the year. Over that period, it contracted in real terms by 1.4% but grew by 6.2% in nominal terms. Exchange rate movements had a limited impact on measured credit growth during the year, although the króna appreciated marginally against relevant currencies. Price- and exchange rate-adjusted growth measured 5.7%, as about a third of corporate debt is foreign-denominated.

Deposit institutions' corporate loans grew early in 2023, but growth eased as the year advanced. Net new lending to companies totalled 130 b.kr. in H2/2023, down from 178 b.kr. in H1.[20] Growth was most prominent in lending to construction companies, and also to real estate firms. The banks' corporate lending has picked up again in the past few months, and it appears that there is still considerable demand for credit despite high interest rates. According to the results of the Central Bank's lending survey, carried out in late January, the banks expect demand for corporate credit to increase in H1/2024.

Chart I-43

Corporate credit growth[1]



1. Lines show yearly growth rates. 2. CPI-indexed credit at constant prices and foreign-denominated credit at constant exchange rates.

Sources: Statistics Iceland, Central Bank of Iceland.

Companies respond to rising interest rates

Companies' interest expense has increased in line with rising interest rates in Iceland and abroad. Firms have responded to changed conditions in credit markets and are now seeking out indexed loans in greater measure. Since mid-2023 a majority of new corporate loans have been indexed. While this is the case for most sectors that rely on financing in Icelandic krónur, the trend has been strongest among companies in the real estate, construction, and services sectors. At the same time, corporate bond issuance has contracted, particularly among real estate companies. Increased demand for indexed bank loans can be attributed in part to a shift from indexed market financing to indexed loans from the banks. Nevertheless, indexed debt has been rising as a share of the corporate debt stock in the recent term, from 29.1% at year-end 2022 to 33.7% at the end of 2023. A shift in foreign-denominated financing from domestic lenders to foreign ones has also affected developments in credit in recent months, although only a few large companies are involved.

On the whole, the interest burden on corporate debt has not risen commensurate with the increase in the Central Bank's key rate, as corporate loans vary in their sensitivity to the policy rate, depending on the loan type in question. As is noted above, about one-third of corporate debt is in foreign currency, and the interest rate depends mainly on market rates for the currency concerned. Furthermore, interest terms on indexed loans and bonds keep pace with real rates rather than nominal rates. In addition to this is the portion of loans

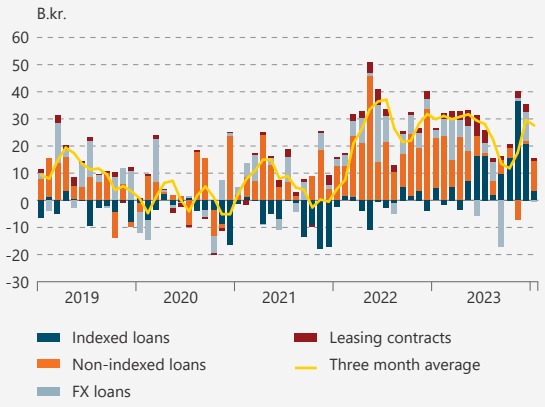
19. Debt to domestic and foreign financial institutions and issued marketable bonds.

20. Figures at constant prices. Data on net new loans to companies include loans from credit institutions and the Housing and Construction Authority (HMS).

and marketable bonds that bear fixed interest rates. Data on the interest expense on total corporate debt are not available, but according to the Central Bank's figures on loans issued by the D-SIBs, the weighted average corporate lending rate rose by 2.35 percentage points in 2023. The Central Bank's key rate rose by 3.25 percentage points over the same period. The rise in interest rates was noticeably small on loans to real estate firms, or just under 1.5 percentage points, as the share of indexed loans is far larger in that sector than in others. It should be noted that 55% of the D-SIBs' corporate loans are non-indexed and denominated in Icelandic krónur. This is a larger share compared to the stock of corporate debt, where indexed loans account for 33.4% of the total. Furthermore, an overwhelming share of these loans bear variable interest rates. As a result, the banks' corporate loans are more sensitive overall to changes in the Central Bank's key rate than other corporate debt is.

Chart I-44

Net new corporate loans[1]



1. Fixed prices. New loans less loan retirement and loan prepayments in excess of contractual requirements. Line shows three-month moving average. Figures include loans issued by deposit institutions, the ÍL Fund, and the Housing Fund.

Source: Central Bank of Iceland.

Risk associated with households' and businesses' position

Households and businesses defend against inflation

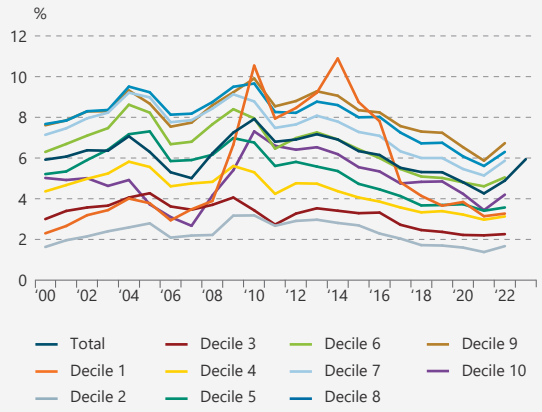
Interest rates and inflation are high, although inflation has fallen in recent months. Debt service burdens have grown heavier, and along with other cost increases, it has begun to test many households' and businesses' resilience. As is discussed in the section on developments in private sector debt, households and businesses have taken measures to lower their debt service burden, especially by taking indexed loans to refinance non-indexed debt. It is common that households mix loan types in order to lower debt service while diversifying risk and optimising real interest rates. Households have also taken advantage of other options such as amending loan terms, lengthening maturities, capping interest payments, and applying for temporary moratoria or freezes on their loans in order to shield themselves from higher debt service. They have cut back on spending as well: in Q4/2023, private consumption was down 2.3% year-on-year, the second quarterly decline in a row.

Resilience is still strong, and arrears have increased only marginally

Thus far, households' and businesses' strong resilience and cost consolidation have prevented arrears from rising sharply, and there are few signs as yet of widespread

Chart I-45

Mortgage interest expense as a share of households' disposable income[1]

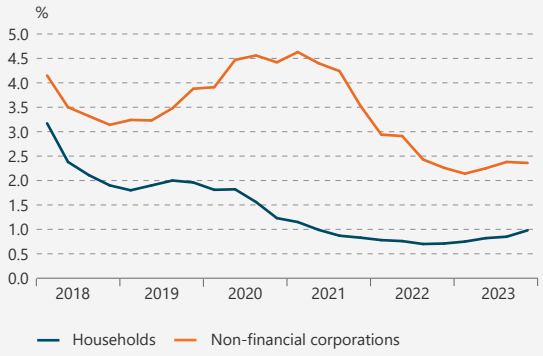


1. Household mortgage interest expense as a share of disposable income, by income deciles. Disposable income is income net of taxes. The 2023 value is a Central Bank estimate derived from data on developments in disposable income taken from the Bank's QMM database and interest payment data from the credit register.

Sources: Statistics Iceland, Central Bank of Iceland.

Chart I-46

D-SIBs: Non-performing loans ratio[1]



1. NPL ratio calculated according to EBA standards.

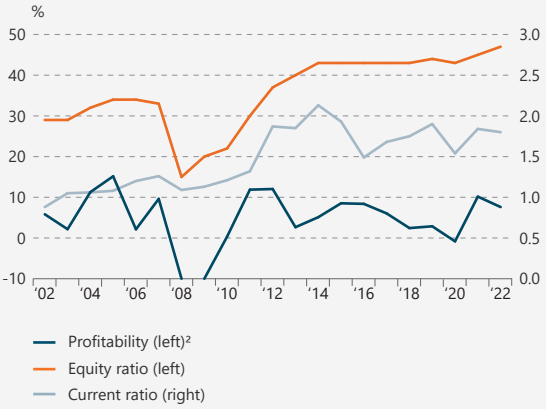
Source: Central Bank of Iceland.

financial distress. Household arrears increased in 2023 but are still historically low. The facility-level non-performing loan ratio on the D-SIBs' loans to households was just under 1% at the end of 2023, after rising by 0.3 percentage points during the year. Furthermore, overdrafts on households' current accounts have been on the decline. Households' equity was strong at the beginning of 2023, although the decline in real house prices during the year and the increased weight of indexed mortgage loans may have had a negative impact on equity. At the same time, however, household debt declined in real terms. Generous pay rises in recent years have supported households' debt service capacity, and real wages have largely held their ground despite high inflation, although developments have varied from one wage-earner group to another.

In December 2023, Statistics Iceland published summarised figures from companies' profit and loss accounts and balance sheets, which were compiled from 2022 tax returns. The numbers show that, across sectors, firms were generally strong at the beginning of 2023. Their returns were good during the year, and somewhat above risk-free returns, their liquidity was sound, and their equity was at an all-time high.[21] As a result, companies appear to be quite resilient, although the current situation and prospects for the future differ between sectors. Corporate arrears have not increased materially: the NPL ratio on the D-SIBs' corporate loans was just under 2.4% at the end of 2023 and had risen by only one-tenth of a percentage point during the year. As before, the NPL ratio was highest among companies in the hospitality industry, at 4.8%, although it fell by 0.8 percentage points in 2023, owing to a good year in the tourism sector.

Chart I-47

Corporate sector profitability, equity ratio and current ratio[1]

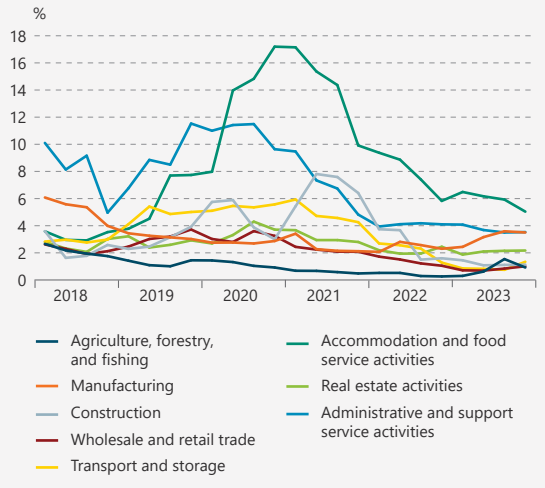


1. Ratios calculated from aggregate figures from balance sheet and income statement data compiled by Statistics Iceland from tax returns. 2. Return on equity less the yield of a 10 year government bond.

Sources: Statistics Iceland, Central Bank of Iceland.

Chart I-48

Non-performing loan ratio on D-SIBs' loans to non-financial corporations, by sector[1]



1. Consolidated figures for D-SIBs. NPL ratio according to EBA standards. NACE sector classification.

Source: Central Bank of Iceland.

Price stability supports financial stability

Inflation and persistently high interest rates undermine households' and businesses' resilience. If inflation proves persistent and interest rate remain high over a long period, widespread financial distress and arrears among households and businesses become more likely. If firms need to streamline their operations in response to cost increases and must cut back on their activities, they could be forced to scale down their plans for new hires or even lay off staff, and unemployment could rise as a result. The jobless rate has increased in recent months. Registered unemployment was 3.8% in January 2024 and had risen by 1 percentage point in six months' time. The forecast published by the Central Bank in *Monetary Bulletin* 2024/1 assumes that unemployment will continue to rise this year. A higher unemployment rate can be expected to bring increased household financial distress and arrears in its wake. It is therefore vital for households and businesses that inflation should decline, so that interest rates can be lowered again. Such a development would be favourable for financial stability.

21. The data extend back to 2002. Risk-free returns are based on the five-year Treasury bond yield.

The financial cycle and cyclical systemic risk

Despite signs that systemic risk is declining rather than increasing, the financial cycle continues to rise. All of its sub-cycles have risen in the recent term: the credit cycle and funding cycle are up slightly, while the housing cycle has risen rather briskly. As has previously been noted in discussions of the financial cycle in the Central Bank's *Financial Stability* reports, developments in the cycle should be interpreted with an eye to expert assessment; i.e., by examining developments in sub-cycles and the indicators on which they are based.

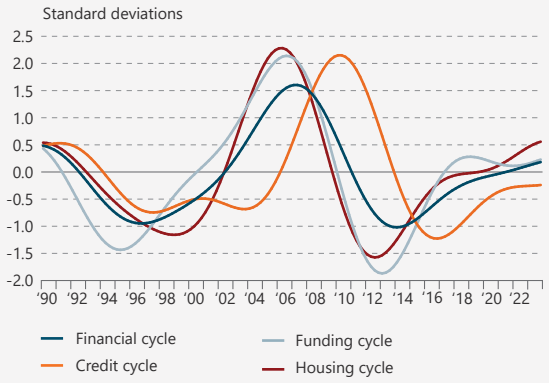
The funding cycle consists of two indicators that measure financial institutions' foreign liabilities, on the one hand, and their non-core funding, on the other. Both of these indicators can fluctuate significantly from one quarter to another. The real value of foreign liabilities has fallen somewhat in recent quarters, whereas the real value of non-core funding is broadly unchanged. The methodology used to estimate the financial cycle, which is based on a band-pass filter that aims to identify cycles of 8-30 years, indicates that the financial cycle is in a slow upward phase. The underlying data do not indicate, however, that systemic risk associated with funding in the banking system is on the rise at present. Similarly, other indicators that are considered in this context – the three large banks' liquidity ratios and net stable funding ratios, for instance – do not show signs of elevated systemic risk (for further discussion of these ratios, see Chapter II).

The credit cycle is based on three indicators: the private sector debt-to-GDP ratio, the real value of private sector credit, and the ratio of household debt to disposable income. All of these indicators have remained constant or fallen in the recent term. The debt-to-GDP ratio rose somewhat in 2020, owing to the pandemic-related contraction in GDP. It has tapered off a bit since then and is actually below the pre-pandemic level at present. The household debt-to-disposable income ratio has developed similarly, although it is marginally above its pre-pandemic level. The real value of private sector debt has been broadly unchanged since the beginning of 2020. The gradual rise in the credit cycle, which is still below zero, is therefore difficult to explain in terms of recent changes in overall private sector indebtedness. The increase in debt during the pandemic and the decline thereafter are considered short-term movements that are expressly ignored by the methodology underlying the financial cycle indicator. It is therefore appropriate to interpret a gradual rise in the credit cycle with caution, at least while it remains below its historical average.

The housing cycle is the only component of the financial cycle that appears to be in a relatively strong upward phase. However, all of the sub-indicators on which the housing cycle is based – real house prices, the ratio of house prices to construction costs, and the ratio of house prices to disposable income – have fallen somewhat since mid-2022. Because these sub-indicators had risen significantly since 2020, the methodology still suggests that the housing cycle is in an upward phase. If the three sub-indicators continue to decline in the coming term, the upward phase will probably be less pronounced in future measurements.

Chart I-49

Financial cycle and subcycles[1]



1. The financial cycle itself, the blue line, is the simple average of the subcycles. Each subcycle is the simple average of cyclical components from variables related to credit, housing and bank funding, respectively. Cyclical components are obtained with a Christiano-Fitzgerald band-pass filter with a frequency band of 8-30 years.

Sources: Housing and Construction Authority, Central Bank of Iceland.

In all, systemic risk as measured using the sub-components of the financial cycle has been on the decline, even though the cycle itself continues to rise. The increase in recent months and years therefore appears to be driven primarily by rapidly rising house prices. Given that real house prices have been falling in the past few months (even though the decline cannot yet be seen in the housing cycle), there are few signs as yet of a continuing rise in the financial cycle.

Cyclical systemic risk is on the decline

The composite domestic systemic risk indicator (d-SRI) continues to indicate that systemic risk is diminishing.[22] The d-SRI is based on estimates of individual indicators that have proven effective in predicting financial crises in Europe. Five of the six indicators capture changes

22. The d-SRI is discussed in greater detail in ECB Occasional Paper Series No 219 / February 2019.

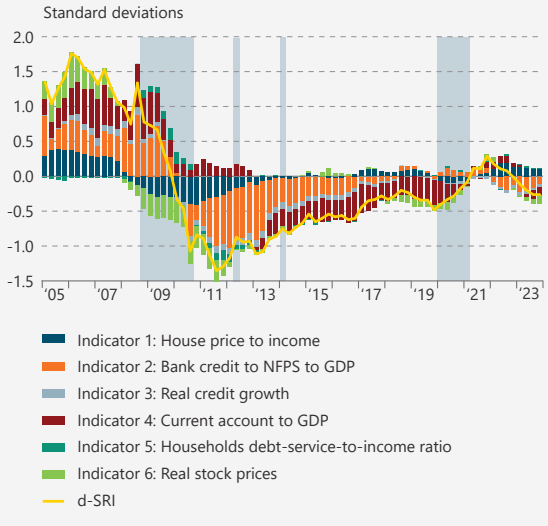
over a period of two or three years. As a result, they are less volatile than indicators based on changes between years, quarters, or even months.

This composite indicator captures recent developments more effectively than the financial cycle indicator does; therefore, it can give timelier signals of developments in systemic risk. The main reasons for declining systemic risk according to the composite indicator lie in a turnaround in four of the sub-indicators.

First of all, bank lending to the private sector as a share of GDP (indicator 2) has shifted from an average of 0.2 standard deviations above the historical mean during 2020-2021 to nearly 0.4 standard deviations below the historical mean during the past two years. Second, the ratio of the current account balance to GDP (indicator 4) was somewhat negative during the pandemic but has been positive in the past three quarters. According to this indicator, a positive current account balance dampens cyclical systemic risk. In fact, it is the second most important sub-indicator, with a weight of 20%. Third, the turnaround in the stock market has tended to reduce measured systemic risk. Real stock prices (indicator 6) rose sharply during the pandemic but fell more or less steadily from the beginning of 2022 until Q4/2023.

Chart I-50

Domestic systemic risk indicator (d-SRI)[1]



1. Shaded areas imply quarters with an economic contraction.

Sources: Statistics Iceland, Housing and Construction Authority, Central Bank of Iceland.

The fourth sub-indicator that is important in terms of recent developments in the d-SRI is the ratio of house prices to income (indicator 1). This sub-indicator was marginally below its long-term average during the pre-pandemic years but then rose rapidly in 2021 and 2022. Even though it has fallen somewhat since then, it is still above its long-term average, by about 0.6 standard deviations as of Q4/2023.

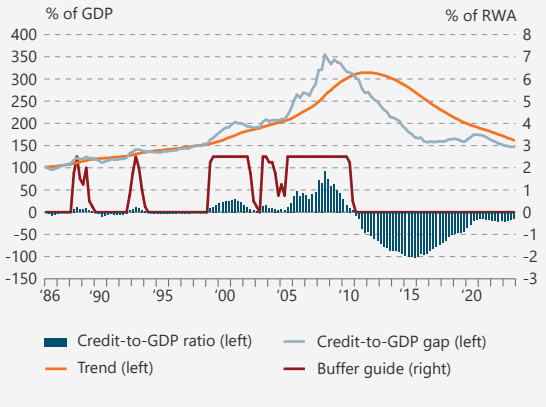
According to the above, the d-SRI lends some support to the opinion that cyclical systemic risk has been receding. Furthermore, it suggests, as does the financial cycle, that cyclical systemic risk is still in evidence in the housing market, although it is gradually declining.

Buffer guide still below zero

The ratio of private sector credit to GDP has continued to fall, to 147% at the turn of the year. At the end of 2019, just before the pandemic struck, it was nearly 159%, and the most recent measurement is the lowest since Q4/1997. The credit-to-GDP gap – i.e., the deviation of the ratio from its long-term trend – is still negative by 15%, and the buffer guide is therefore 0%. Little emphasis has been placed on the buffer guide, which must be considered in determining the countercyclical capital buffer, according to Article 85(a) of the Act on Financial Undertakings, no. 161/2002, as it has not been considered sufficiently illustrative of the cyclical systemic risk level since the 2008 financial crisis. Actually, research conducted by the European Central Bank (ECB), on which the d-SRI is based, and which is referenced above, shows that the credit-to-GDP gap is not necessarily the best single indicator of the cyclical systemic risk level or the best predictor of financial crises. According to that ECB study, the sub-indicators comprising the d-SRI are all as effective as the credit-to-GDP gap in predicting financial crises, and perhaps even more so.

Chart I-51

Credit-to-GDP gap and buffer guide[1]



1. Total credit to the non-financial private sector over GDP for the last four quarters. Trend component is obtained with a one-sided HP-filter with λ=400.000. The buffer guide is a linear projection of the credit-to-gdp gap.

Sources: Statistics Iceland, Central Bank of Iceland.

That said, the credit-to-GDP gap has proven useful at given times in the past in assessing excess credit growth in Iceland and elsewhere. When the effects of the financial crisis taper off in the estimation of the trend credit-to-GDP ratio, it is possible that the indicator can be an important element in assessing cyclical systemic risk.

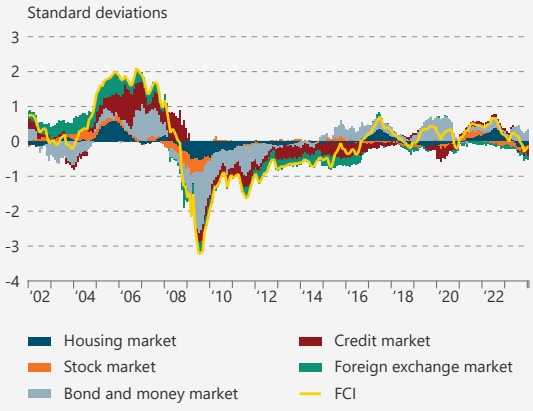
Domestic financial conditions

Since the publication of the Bank's last *Financial Stability* report, the financial conditions indicator has shifted from showing marginally positive financial conditions to showing marginally negative ones. Since mid-2023, financial conditions as measured by the indicator have deteriorated somewhat.

It is surprising that this indicator should not have fallen considerably more in the recent term, as the Central Bank's key interest rate has risen steeply in the past few years. The key factor that offsets deteriorating financial conditions in the housing, foreign exchange, credit, and stock markets is the bond and money market. Financial conditions in that market have been relatively accommodative in recent months, according to the indicator. Among the sub-indicators for assessing financial conditions in the bond and money market is the spread between ten-year and two-year government bonds, both indexed and non-indexed. The spread has been negative in the recent term and has tended to push the financial conditions index upwards, as it has a negative mathematical sign in the estimation of financial conditions. The impact of this on the estimation of financial conditions is discussed in *Financial Stability* 2023/2, and other versions of the indicator are examined as well.

Chart I-52

Financial conditions[1]



1. Financial conditions as measured using the financial conditions index (FCI); i.e., the first three principal components of selected indicators of financial conditions, scaled so that the mean is 0 and the standard deviation is 1. A lower index value indicates a deterioration in financial conditions. The estimation period is 2002-2023. A more detailed description can be found in a Box in *Financial Stability* 2023/1.

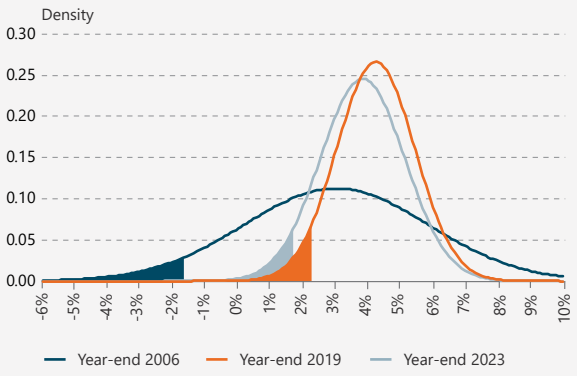
Sources: Statistics Iceland, Housing and Construction Authority, Central Bank of Iceland.

Growth-at-risk

The probability distribution of expected GDP growth over the next two years, shown in Chart I-53, has been broadly unchanged in the recent term. The distribution is estimated based on recent developments in GDP growth and the financial cycle position, as experience has shown that when the financial cycle rises steeply, unexpected shocks can have an even stronger impact on GDP growth. As a result, particular attention is paid to the 5% band in the probability distribution, often referred to as growth-at-risk. Growth-at-risk was virtually unchanged year-on-year, measuring -0.39% at the end of 2023, as opposed to -0.44% at the end of 2022. In other words, the most recent measurement indicates a 5% chance that GDP will contract by 0.79% or more in the next two years, which would translate to an average annual contraction of 0.39% over the two-year period. The economic expansion in H1/2023 caused estimated growth-at-risk to increase, but because output growth eased in H2, the risk has receded as well.

Chart I-53

Growth-at-risk[1]



1. Density function of GDP forecast for the next 24 months. Growth-at-risk is the 5% percentile, represented by the shaded portion of each density.

Sources: Statistics Iceland, Central Bank of Iceland.

Comparing the most recent estimate with the last one prior to the pandemic (+0.3%) shows that growth-at-risk has increased in the interim. In other words, the probability of an economic contraction in the near future was estimated to be very low in Q4/2019. In historical context, both of these measures are considered relatively moderate, as growth-at-risk has fluctuated from -5.5% to +3.2% since 1990. For historical comparison, the probability distribution as of end-2006, one of its lowest recorded values, is shown in Chart I-53.

As can be seen in the discussion of financial conditions, conditions have deteriorated somewhat,

which could affect the probability distribution. Work on adding financial conditions as an explanatory variable for growth-at-risk is underway, but preliminary results suggest that the impact lies primarily in the upper half of the probability distribution, not in the lower half. In sum, the probability of strong output growth has declined somewhat, while the likelihood of a strong contraction has increased.

The outlook

Most factors suggest that the financial cycle has peaked for the present and that cyclical systemic risk has tapered off in the recent term. Systemic risk associated with the housing market appears to have remained relatively high, however. It must be considered probable that short-term real interest rates will rise still further in coming months, in tandem with declining inflation, and will remain relatively high throughout the year. This should ease the upward financial cycle of recent years still further and could even cause it to turn downwards in coming quarters.

The situation is highly uncertain, however. Particularly pronounced is uncertainty about the housing market, which has remained quite strong despite high interest rates and tighter borrower-based measures, especially since mid-2023. Volcanic activity in the Reykjanes peninsula will increase short-term demand for housing; therefore, it could be argued that systemic risk in the housing market is more likely to increase rather than decrease in coming months.

Volcanic activity on the Reykjanes peninsula

Seismic activity has been ongoing in the Reykjanes area for more than three years. The first eruption began on 19 March 2021 in Geldingadalir, near Fagradalsfjall, after a series of strong earthquakes. It was followed by two eruptions in the same general area in August 2022 and July 2023. None of the three posed a threat to communities or infrastructure in the region, and in fact, they tended to attract tourists.

Last autumn, however, a new chapter began, with a spate of earthquakes and magma accumulation, topped off by an eruption near Svartsengi. The town of Grindavík was evacuated by mid-November and has been virtually uninhabited since. Commercial activities halted, but some companies have been able to move their businesses to other locations, and by now, a few companies have been able to resume operation in the town. Real estate and infrastructure in Grindavík and near-lying areas have been severely damaged. During the January eruption, lava flowed into the town itself. During the February eruption, lava flowed over roads close to Svartsengi and the geothermal pipes that distribute heat from Svartsengi to the municipalities in Reykjanesbær, Suðurnesjabær, and Vogar, causing temporary hot water shortages in the area. Levees and barriers protected structures owned by HS Orka and the Blue Lagoon from lava flows. The land under Svartsengi has continued to rise, and it is unlikely that volcanic activity in the region is at an end.

According to Registers Iceland, the town of Grindavík had 3,720 residents, comprising 0.9% of the national population, and 1,120 households on 10 November 2023. The official property value of residential housing in Grindavík is 72.5 b.kr., plus 25 b.kr. in commercial property and 7 b.kr. in infrastructure. This gives a combined property value of 105 b.kr., or 2.5% of GDP. Structures at Svartsengi are valued at 1.1% of GDP.

Official response

The Government has responded with a wide range of measures to protect infrastructure, compensate losses, and meet the needs of households and businesses in the area. Levees have been built both at Svartsengi and close to Grindavík, and broad-based measures have been taken to provide secure transmission of electricity and hot and cold water to the area.

Late in 2023, Parliament passed legislation providing temporary wage support and special housing subsidies for Grindavík residents. In February 2024, Parliament passed an act of law providing temporary operational support for companies in the area. After Grindavík residents were ordered to evacuate, financial institutions and pension funds offered to freeze their mortgage loans. Thereafter, financial institutions decided to cancel interest and indexation on Grindavík residents' mortgages, and pension funds followed suit, with Government intermediation.

In February, Parliament passed an act of law providing for the buy-up of residential property in Grindavík. According to that act of law, individuals who owned a home in Grindavík on 10 November 2023 are invited to sell their Grindavík property to a State-owned company, Fasteignafélag Þórkatla. With the sale, the company will assume the outstanding mortgage loans on the properties in question. The measure is estimated at a total of 61 b.kr.[1] The properties in question will be purchased at 95% of their fire insurance value, net of mortgage debt and compensation from Natural Catastrophe Insurance of Iceland (NTÍ). Current property owners have a pre-emptive purchase right to their properties for three years from the time the legislation enters into force.

In February, the Central Bank's Financial Stability Committee (FSN) decided to exempt those who owned residential property in Grindavík on 10 November 2023 from the borrower-based measures laid down in Central Bank Rules. The exemption, which is temporary, applies to these households' next home purchase.[2] Under the exemption, borrowers' debt service-to-income (DSTI) ratios will be 40% and their loan-to-value (LTV) ratios will be 85%.

Lending activity in the Reykjanes area

The domestic systemically important banks' (D-SIB) loans to households in postal codes 240 and 241 (Grindavík, Svartsengi, and environs) totalled 80 b.kr., or 1.47% of total assets and 1.93% of total lending as of end-December. Loans to companies accounted for 74% of bank loans in the region, and loans to individuals comprised the other 26%. In many instances, corporate loans are secured with

1. This amount assumes that all individuals falling under the scope of the bill of legislation exercise their rights and that no additional properties are deemed beyond repair.
2. See the Rules on Maximum Debt Service-to-Income Ratios for Mortgage Loans to Consumers, no. 216/2024, and the Rules on Maximum Loan-to-Value Ratios for Mortgage Loans to Consumers, no. 217/2024.

collateral that is easily transferred elsewhere. The D-SIBs' household mortgage loans totalled just over 18 b.kr., but it is likely that a large share of that debt will be assumed by Fasteignafélagið Þórkatla. The banks' shareholdings in companies in the region were insignificant.

The financial impact on the pension funds lies mainly in their shareholdings in companies in the region. The securities were valued at 67 b.kr. at the end of 2023, or 1% of the pension funds' holdings, although individual funds held larger amounts. Pension fund loans to homeowners in the region totalled 3.4 b.kr. at the end of 2023.

As yet, the seismic activity in the Reykjanes area has had limited impact on individual financial institutions and on the financial system as a whole. It is unlikely that the scope of the damage will threaten financial stability.

Impact on the real estate market

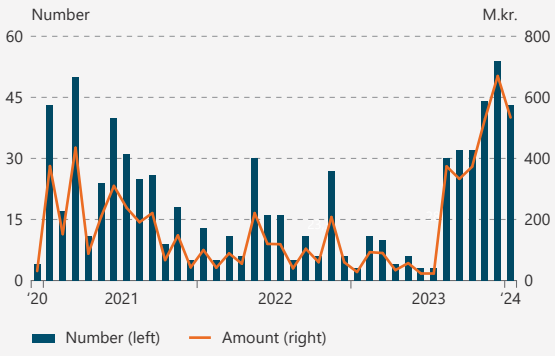
It is generally expected that most homeowners in Grindavík will look for new housing on the Suðurnes peninsula or in greater Reykjavík. These purchases are likely to push residential property prices upwards. On average, some 600 purchase contracts per month have been finalised in the area since mid-2023. About 900 Grindavík homeowners have the option of selling their properties to the State. Their entry into the market over a short period of perhaps 2-3 months would cause market turnover to spike temporarily. According to the Ministry of Finance and Economic Affairs' assessment of the economic impact of the Government buy-up of Grindavík properties, the temporary surge in demand could increase prices temporarily by 1.3% in excess of the level that would have prevailed in the absence of the geological activity in Grindavík.

Equity loans

Equity loans, sometimes referred to as participating loans, are loans that make it easier for people with limited equity and income below a given threshold to purchase their first home.[1] The loans are issued by the Housing and Construction Authority (HMS). In general, equity loans are capped at 20% of the purchase price of the underlying property, while the borrower must contribute at least 5% in equity.[2] The loans are interest-free and do not require monthly instalment payments. However, the loan amount changes in accordance with the market price of housing, and the loans are generally repaid when the underlying property is sold.[3] Equity loans are granted for new properties that have been approved by HMS and are deemed economical.[4] Because the measure extends only to newly built homes, it is intended as an increased incentive for the construction of residential housing.

Chart 1

Issued equity loans

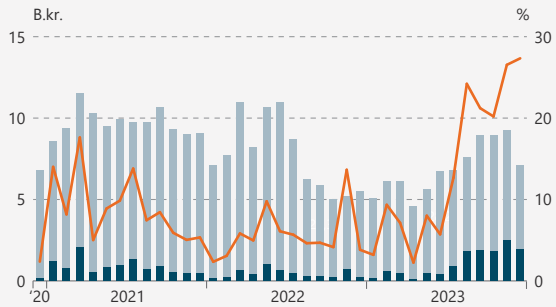


Sources: Housing and Construction Authority, Central Bank of Iceland.

About 730 equity loans have been issued from the time the application process was opened in H2/2020 until the end of January 2024. In July 2023, the maximum prices of homes complying with the requirements for equity loans were increased by 21-25%, the income thresholds were raised, and allocations increased. These changes were made in response to the surge in house prices and the general wage index after the benchmarks were last updated in February 2022. After the changes were implemented in July 2023, demand for equity loans surged, particularly for homes in the greater Reykjavík area, as steeply rising house prices had pushed prices of virtually all new homes in the region above the previous HMS price cap.

Chart 2

Financing of first-time buyers house purchases



Sources: Housing and Construction Authority, Central Bank of Iceland.

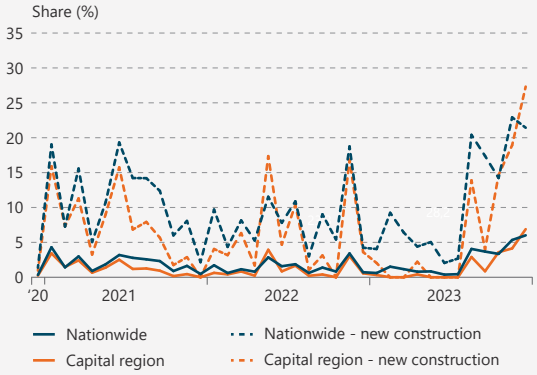
After the loan terms were updated, the number of applications rose to about 30 per month in August, and in the past several months the number has increased still further. The total amount of issued equity loans was 6.9 b.kr. at the end of January 2024. In addition to equity loans, lenders have provided over 23 b.kr. in loans for the purchase of these same properties. On the whole, nearly 8% of loans issued to first-time buyers between December 2020 and July 2023 were HMS-granted equity loans or other loans issued concurrently. With an increase in equity loan issuance from July 2023 onwards, the ratio rose to about one-fourth from August through the end of 2023. Stronger demand for equity loans in H2/2023 explains in part the increase in the share of first-time buyers from 27% in H1 to 32% in H2.

The impact of equity loans on house prices has been under discussion recently. In all likelihood, the loans have had a limited impact on house prices, as purchase agreements involving equity loan financing have been few relative to the total monthly number of contracts finalised,

1. Individuals who have not owned property in the past five years are also eligible to apply for an equity loan.
2. In some cases, low-income individuals can receive a 30% equity loan if they cannot finance the purchase with a 20% loan.
3. Equity loans are repaid either with the sale of the property or after a period of 10-25 years. They are originally issued for a period of 10 years, but it is possible to extend them for five years at a time, up to a maximum maturity of 25 years.
4. To be considered economical, an apartment must be below a maximum price determined by its location, number of rooms, and size in square metres.

Chart 3

House purchases finananced with equity loans as a share of total house puchase agreements



Sources: Housing and Construction Authority, Central Bank of Iceland.

although the share has been growing in recent months. However, an increased number of homebuyers entering the housing market via the home equity loan system could potentially cause a crowding-out effect in the market; i.e., with increased demand or a surge in overbidding from other buyers, pushing prices above the equity loan price cap. Stronger demand for equity loans could cause the house price index to rise, for instance, if the share of newly constructed homes increases, as the average price per square metre on newly built properties is generally higher than in the average purchase agreement. That said, equity loans are granted solely for the purchase of residential property below a specified maximum price; therefore, they will probably not cover properties with a high price per square metre, even though they may be more expensive than older properties in many cases. The above-mentioned crowding-out effect could also show in a rise in the price index.

In the comments on the bill of legislation amending the Act on Housing Affairs in 2020, when equity loans were enshrined in law, it is stated that the measure will affect an estimated 400-500 properties per year, that the amount of the loans in question will be 4 b.kr. per year, and that the measure is set to expire in 10 years. In recent months, both the number and the amount of equity loans have been at the upper end of the range provided for in the comments on the bill of legislation. It is important that the measure be restricted in scope and directed at a specific group of buyers, so as to contain the demand-side impact on a housing market characterised by high prices. Because of this, it is well to avoid major amendments to the terms on the loans such as those made last summer, but they increased demand for housing and likely helped cause house prices to rise higher in the short term than they would have otherwise. If the objectives of the equity loan programme are not adhered to, the demand-side effects on the housing market could be stronger than originally envisioned.

Mortgage loan types and their impact on households' financial position

Icelandic households can choose from among several types of loans to finance home purchases. The type of loan selected can strongly affect the risk faced by the household in question during the term of the loan. As is generally known, the principal of CPI-indexed loans can increase. Because of this, asset formation proceeds more slowly than it would if the borrower had taken a non-indexed loan, particularly when inflation is high. It can therefore be said that housing equity risk is greater if the borrower chooses an indexed loan rather than one that is non-indexed. On the other hand, the debt service burden on indexed loans is relatively stable over the term of the loan, especially if interest rates are fixed. In general, then, households are better able to meet their obligations if they have indexed loans rather than non-indexed, and debt service risk is generally lower for households with indexed loans than for those with non-indexed loans. The loan type best suited to each household can vary over time and may differ from one individual to another. It must therefore be deemed positive that borrowers have available to them a range of loan types that address different risks over time.

The Central Bank has set rules that put limits on the risk borrowers can take when they take out a mortgage. These rules, often called borrower-based measures, involve capping borrowers' loan-to-value (LTV) ratios and debt service-to-income (DSTI) ratios at the time the loan is issued.[1] The purpose of the rules is to bolster borrowers' and lenders' resilience, and to mitigate the systemic risk that can develop in an environment of excess growth in household debt and rapidly rising house prices.[2] These two ratios are reliable metrics for borrower risk: the LTV ratio indicates equity risk, and the DSTI ratio indicates debt service risk.[3] The rules only apply at the time a new loan is taken, however, and do not guarantee that the borrower's LTV or DSTI ratio will rise or fall over the term of the loan.

By using the house price index to calculate developments in house prices, the general wage index to calculate developments in disposable income, the CPI and movements in indexed interest rates to determine developments in debt service and amounts of indexed loans, and movements in non-indexed interest rates to determine developments in debt service and loan amounts of non-indexed loans, it is possible to construct an example showing how specified individuals' LTV and DSTI ratios would have developed over time under various loan types. The examples below are based on the assumption that loans follow an annuity amortization schedule, as such loans are considerably more common than those that are paid in equal instalments. In order to enable an impartial comparison, both the loan amount and the LTV ratio are always the same in the examples, and furthermore, when comparisons are made between indexed and non-indexed loans, the initial DSTI ratio is always the same.

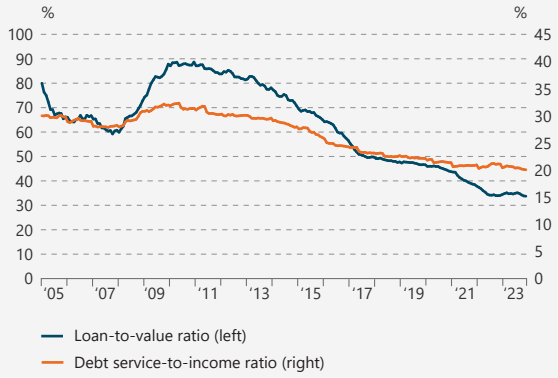
Chart 1 shows an indexed amortised 40-year loan taken at the beginning of 2005. The initial LTV ratio was 80% and the initial DSTI ratio 30%. The interest rate on the loan was 4.15% and was held constant for the entire term of the loan, as this was a commonly available option at that time. The LTV ratio fell rather quickly until the beginning of 2008, as house prices rose sharply over that period. Thereafter, the LTV ratio surged, peaking at 89% in April 2010, because of falling house prices and high inflation during the prelude to the 2008 financial crisis and in its immediate aftermath. The LTV ratio then fell in tandem with rising house prices and lower inflation, to 34% by November 2023. This occurred even though the loan principal increased in krónur terms for more or less the entire period, and was about 78% higher in November 2023 than at the time the loan was taken. The borrower's DSTI ratio, originally 30%, declined slightly at the outset but then increased again, as did the LTV ratio, owing to inflation well in excess of wage growth during the post-crisis period. The DSTI peaked at around 32% in May 2010 and then started to fall once more. It is likely that the borrower in this example would be able to handle such an increase in debt service, as the DSTI ratio never exceeds 40%. A DSTI ratio above 40% has been generally considered to indicate elevated risk of financial distress.

1. For further information, see: Rules on Maximum Loan-to-Value Ratios for Mortgage Loans to Consumers, no. 217/2024, and Rules on Maximum Debt Service-to-Income Ratios for Mortgage Loans to Consumers, no. 216/2024.
2. European Systemic Risk Board (2014). The ESRB Handbook on Operationalising Macro-prudential Policy in the Banking Sector.
3. See, for example, Conor O'Toole and Rachel Slaymaker. (2021). Repayment capacity, debt service ratios and mortgage default: An exploration in crisis and non-crisis periods, Journal of Banking & Finance, 2021, No. 133, 106271; and Erlend Nier, Radu Popa, Shamloo Maral, and Voinea Liviu. (2019). Debt Service and Default: Calibrating Macroprudential Policy Using Micro Data, IMF Working Papers, 2019(182), A001, and Wong, J., Fung, L., Fong, T., & Sze, A. (2004). Residential mortgage default risk and the loan-to-value ratio. Hong Kong Monetary Authority *Quarterly Bulletin*, 4, 35-45.

Chart 1

Developments in loan-to-value and debt service-to-income ratios[1]

Indexed 40-year mortgage with 4.15% fixed interest rate



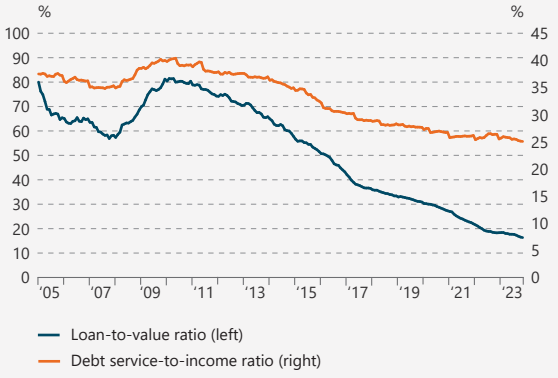
1. It is assumed that the borrower takes an indexed loan with an 80% LTV ratio and a 30% DSTI ratio in January 2005. House prices move in line with the capital area house price index. Developments in mortgage principal and debt service over time are calculated using the CPI. The borrower's disposable income changes in line with the wage index.

Sources: Housing and Construction Authority, Statistics Iceland, Central Bank of Iceland.

Chart 2

Developments in loan-to-value and debt service-to-income ratios[1]

Indexed 25-year mortgage with 4.15% fixed interest rate



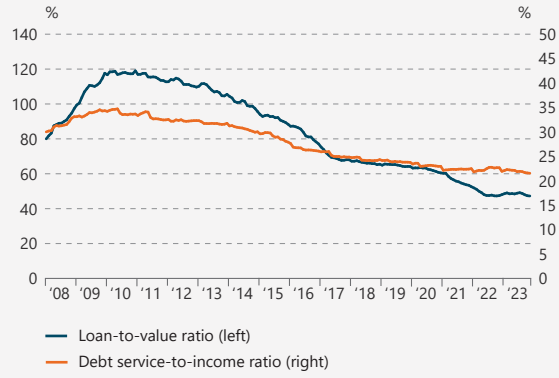
1. It is assumed that the borrower takes an indexed loan with an 80% LTV ratio and a 37.5% DSTI ratio in January 2005. House prices move in line with the capital area house price index. Developments in mortgage principal and debt service over time are calculated using the CPI. The borrower's disposable income changes in line with the wage index.

Sources: Housing and Construction Authority, Statistics Iceland, Central Bank of Iceland.

Chart 3

Developments in loan-to-value and debt service-to-income ratios[1]

Indexed 40-year mortgage with 4.15% fixed interest rate



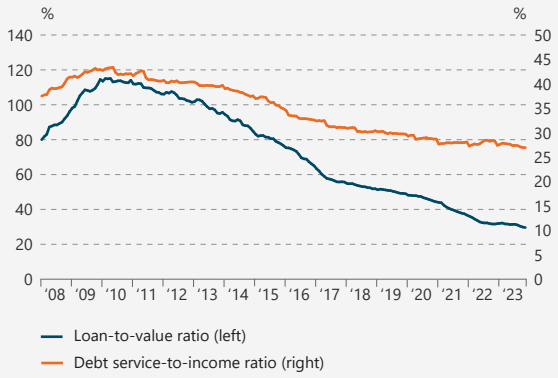
1. It is assumed that the borrower takes an indexed loan with an 80% LTV ratio and a 30% DSTI ratio in January 2008. House prices move in line with the capital area house price index. Developments in mortgage principal and debt service over time are calculated using the CPI. The borrower's disposable income changes in line with the wage index.

Sources: Housing and Construction Authority, Statistics Iceland, Central Bank of Iceland.

Chart 4

Developments in loan-to-value and debt service-to-income ratios[1]

Indexed 25-year mortgage with 4.15% fixed interest rate



1. It is assumed that the borrower takes an indexed loan with an 80% LTV ratio and a 37.5% DSTI ratio in January 2008. House prices move in line with the capital area house price index. Developments in mortgage principal and debt service over time are calculated using the CPI. The borrower's disposable income changes in line with the wage index.

Sources: Housing and Construction Authority, Statistics Iceland, Central Bank of Iceland.

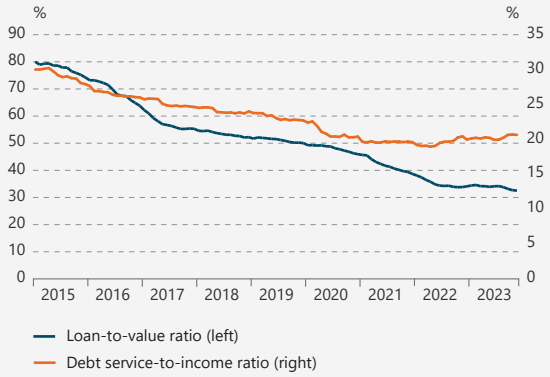
Chart 2 depicts developments in the same loan, with the loan term set at 25 years instead of 40. As could be expected, the loan principal developed in largely the same way as in the first example. However, in this case, the LTV ratio fell more to begin with and rose less during the financial crisis, peaking at 81% in April 2010. From that time onwards, the LTV ratio declined to around 16% by November 2023, driven by rising house prices, as in the first example. The DSTI ratio on the 25-year loan was 37.5% at the time the loan was taken, or about a fourth higher than on the 40-year loan. This is the main reason the loan principal – and therefore the LTV ratio – rose less during financial crisis than the LTV ratio on the 40-year loan. Higher debt service also explains why, unlike the 40-year loan, the loan principal declined in krónur terms and was 14% lower in November 2023 than at the beginning of the loan period. The DSTI ratio on the 25-year loan began at 37.5% and rose to 40% during the financial crisis before starting to decline again. In this example, the borrower's debt service risk is somewhat greater than in the 40-year example.

Examining Charts 1 and 2 reveals that over this period, the worst time for households to take on debt was

Chart 5

Developments in loan-to-value and debt service-to-income ratios[1]

Indexed 22.25-year mortgage with variable interest rates



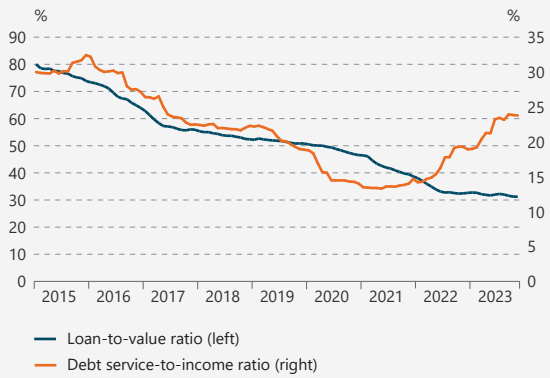
1. It is assumed that the borrower takes an indexed loan with an 80% LTV ratio and a 30% DSTI ratio in January 2015. Interest rates move in line with the weighted average rate on new indexed mortgage loans issued by the systemically important banks. House prices move in line with the capital area house price index. Developments in mortgage principal and debt service over time are calculated using the CPI. The borrower's disposable income changes in line with the wage index.

Sources: Housing and Construction Authority, Statistics Iceland, Central Bank of Iceland.

Chart 6

Developments in loan-to-value and debt service-to-income ratios[1]

Non-indexed 40-year mortgage with variable interest rates



1. It is assumed that the borrower takes a non-indexed loan with an 80% LTV ratio and a 30% DSTI ratio in January 2015. Interest rates move in line with the weighted average rate on new non-indexed mortgage loans issued by the systemically important banks. House prices move in line with the capital area house price index. The borrower's disposable income changes in line with the wage index.

Sources: Housing and Construction Authority, Statistics Iceland, Central Bank of Iceland.

shortly before the financial crisis; i.e., at the beginning of 2008. Charts 3 and 4 show how LTV and DSTI ratios would have developed if the borrower had taken a loan in January 2008, assuming that all other variables are unchanged. Chart 3 shows that the LTV ratio surged to 120% during the first two years and that the borrower was exposed to significant equity risk. The DSTI rose from 30% to 35% over the same period but then began to fall. Even though the property was over-leveraged, the borrower would probably have been able to handle the debt service burden and would not have ended up in financial distress. An examination of Chart 4, which depicts a 25-year loan, shows that the LTV ratio rises less and, by November 2023, is considerably lower than in the case of the 40-year loan.

However, the DSTI ratio rises more and, as before, from a higher initial position. It peaks at 43%, which indicates that the risk of financial distress is considerably greater than for a 40-year loan.

The discussion thus far focuses on developments in LTV and DSTI ratios for indexed loans taken before the 2008 financial crisis. But it is also possible to examine how these same ratios would have developed in the case of indexed and non-indexed loans taken more recently. The Central Bank's Economic Indicators give information about average rates on new mortgage loans from January 2015 onwards.[4] It is interesting to keep track of how LTV and DSTI ratios have developed since then. Let us assume that a borrower has considered choosing between indexed and non-indexed loans, both of which follow an annuity amortization schedule bearing variable interest rates. Let us assume also that the borrower is choosing between two loans with the same initial debt service burden. In order to equalise the initial debt service burden, the loans have varying maturities. The non-indexed loan has a term of 40 years, while the indexed loan has a term of 22 years and three months. This gives the same initial DSTI ratio – 30% in both instances. The initial LTV ratio is 80%.

The LTV ratios on the two loans would have developed very similarly, as can be seen in Charts 5 and 6, and as a result, the loan principal would have done so as well. In November 2023, the LTV ratio on the indexed loan was 33%, as compared with 31% for the non-indexed loan. The DSTI ratios on the two loans developed very differently, however. In the case of the indexed loan, the ratio fell quite steadily from January 2015 through January 2021. It held stable until mid-2021 and then rose from 19% to 21% by November 2023. The non-indexed loan was more volatile: the DSTI ratio rose from 30% to 32% in the first year, concurrent with rising interest rates, and then fell rather swiftly, bottoming out at 13% in early 2021. It remained there while interest rates were at their most favourable and then rose rapidly as interest rates climbed, to 24% by November 2023.

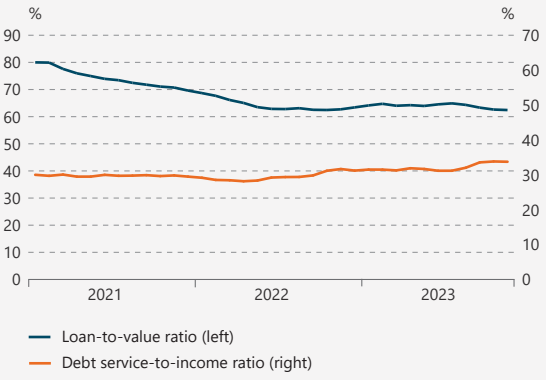
From this, it appears that the borrower's position today would have been very good, regardless of whether that borrower had selected an indexed or non-indexed loan at the beginning of 2015. The borrower's equity position would be

4. See Charts VII-23 and VII-24 in the Central Bank's *Economic Indicators*.

Chart 7

Developments in loan-to-value and debt service-to-income ratios[1]

Indexed 30.5-year mortgage with variable interest rates



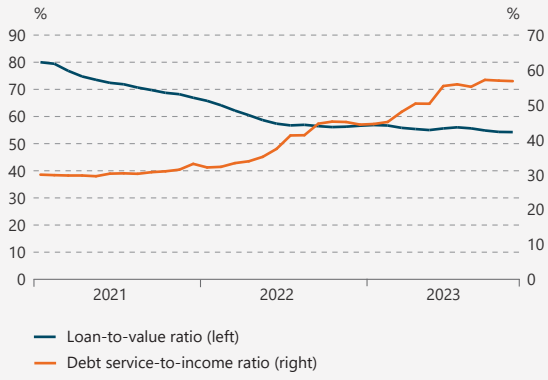
1. It is assumed that the borrower takes an indexed loan with an 80% LTV ratio and a 30% DSTI ratio in January 2021. Interest rates move in line with the weighted average rate on new indexed mortgage loans issued by the systemically important banks. House prices move in line with the capital area house price index. Developments in mortgage principal and debt service over time are calculated using the CPI. The borrower's disposable income changes in line with the wage index.

Sources: Housing and Construction Authority, Statistics Iceland, Central Bank of Iceland.

Chart 8

Developments in loan-to-value and debt service-to-income ratios[1]

Non-indexed 40-year mortgage with variable interest rates



1. It is assumed that the borrower takes a non-indexed loan with an 80% LTV ratio and a 30% DSTI ratio in January 2021. Interest rates move in line with the weighted average rate on new non-indexed mortgage loans issued by the systemically important banks. House prices move in line with the capital area house price index. The borrower's disposable income changes in line with the wage index.

Sources: Housing and Construction Authority, Statistics Iceland, Central Bank of Iceland.

very strong, and the DSTI ratio would never have been close to 40%, implying little likelihood of financial distress.

Finally, let us consider a comparable example assuming that the loan was taken at the beginning of 2021. As before, the borrower can choose an indexed or non-indexed loan. If the initial debt service burden is to be comparable, an indexed loan would have a maturity of 30 years and six months, while the non-indexed loan maturity would be 40 years. Other variables are unchanged. As before, Charts 7 and 8 show how the LTV and DSTI ratios on the two loans would have developed. In this case, the loan type selected is highly important. The LTV ratio declined in both cases: from 80% to 62% for the indexed loan, and from 80% to 54% in the non-indexed case. On the other hand, the DSTI ratio rose in both cases: from 30% to 34% for the indexed loan and from 30% to 57% in the non-indexed case. The borrower's position differed greatly, depending on the loan type selected. A borrower who had chosen a non-indexed loan would have more equity, but the debt service burden would have increased enough to pose a significant risk of financial distress. If the same borrower had chosen an indexed loan, the debt service burden would have been more manageable, but at the expense of equity accumulation.

The discussion above makes clear that the selection of loan type can be of vital importance to borrowers. The timing of the loan can also be important, as the examples above indicate. There are other loan types available than those examined here, and borrowers are usually offered the chance to combine different loan types when financing a home purchase. It is possible to take a loan with equal instalments instead of amortised loan payments. The debt service on such equal instalment loans is higher at the outset, and the principal declines faster, all else being equal. The LTV ratio declines accordingly. It is also possible to fix interest rates in order to limit debt service risk over the fixed-rate period. In general, interest rates on indexed or non-indexed loans can be fixed for a period of three or five years, although this may differ from one lender to another. In addition, most of Iceland's pension funds have offered the option of fixing interest rates on indexed loans for the lifetime of the loan. The question of which loan type is most appropriate at any given time is subject to change and depends on the borrower's needs. Before the 2008 crash, borrowers selected the maturity of their loans, not whether their loans were CPI-indexed or not. Shorter loan maturities entailed reduced equity risk but increased debt service risk. After the financial crisis, non-indexed loans have been offered as well, giving borrowers more ways to diversity risk and adapt their debt service to current circumstances.

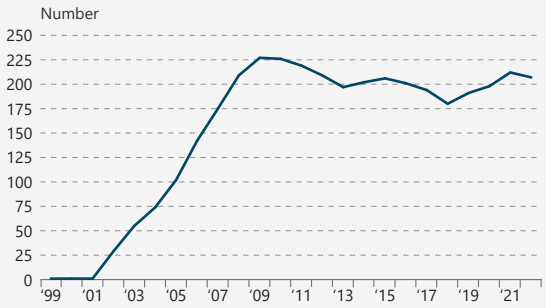
Corporate accounting in foreign currencies

According to the Annual Accounts Act, Icelandic companies are required to maintain their bookkeeping and annual accounts in Icelandic krónur. On the other hand, they may seek authorisation to use a foreign currency as their accounting currency, if that so-called functional currency is the one that weighs heaviest in their operations.[1] Only a small share of Icelandic firms maintain their accounts in foreign currencies. According to the Directorate of Internal Revenue, 248 companies were authorised to compile their accounts in foreign currencies in 2022, or 0.5% of the roughly 50,000 firms engaged in economic activities nationwide.[2] [3] At the end of January 2024, a total of 207 firms whose accounts are in foreign currencies had submitted annual accounts for the 2022 operational year.[4] In the past decade, there have been 200 or more such companies, and their number increased steadily in number from the turn of the century.

Chart 1

The number of companies in the Creditinfo Register of Annual Accounts that keep their accounts in foreign currency

As of end-January 2024



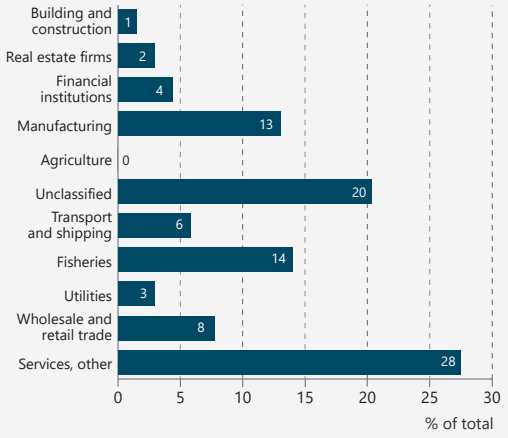
Sources: Creditinfo Register of Annual Accounts, Central Bank of Iceland.

Naturally, a large share of them are export companies with significant foreign-denominated revenues, not only because they satisfy the statutory requirements but also because the accounting practices in question reduce volatility and give a clearer picture of their operations. Furthermore, some of the companies concerned are part of foreign conglomerates, and it is therefore natural that they should choose to keep their accounts in the same currency as the parent company.

Most companies that keep accounts in foreign currency are in services sectors (i.e. in tourism), fishing or industry. In addition, a large percentage are unclassified, including so-called captive financial institutions, which often include companies that have limited or non-existent activities but serve only as shells for other companies, or investment companies.

Chart 2

Sectoral classification of companies that kept accounts in foreign currency in 2022



Sources: Creditinfo Register of Annual Accounts, Central Bank of Iceland.

Currency mismatches generate fluctuations in operating performance

When a company's revenues are largely in foreign currency and at least some of its expenses are in Icelandic krónur, currency mismatches can develop. Such mismatches are accompanied with exchange rate risk but can vary, depending on how volatile the underlying currencies are. In order to hedge against such exchange rate risk, companies can enter into currency derivatives contracts, thereby fixing exchange rates for a limited period of time. This makes operations more predictable and reduces uncertainty about

1. As is stated in the Annual Accounts Act, the functional currency is the currency that weighs heaviest proportionally in the company's economic environment; i.e., the currency that has the greatest impact on its cash balance. Consideration is also given to revenues, expenditures, and financing, as well as investments. The Register of Annual Accounts conducts monitoring to ensure that foreign-denominated accounting complies with set requirements. It can revoke an authorisation to enter accounts in a foreign currency if a company no longer satisfies the requirements laid down in Article 8 of the Annual Accounts Act, but companies shall maintain the same methodology for five years. For further information, see Articles 7-9 of the Annual Accounts Act, no. 3/2006.
2. For further information, see the Minister of Culture and Business Affairs' response to a query on the authorisation to keep accounts and compile annual accounts in foreign currency.
3. Based on companies engaged in economic activities. This excludes sole proprietorships, homeowners' associations, volunteer organisations, and other operational forms.
4. If consideration is given to the fact that some of these companies are within the same consolidated entity, the number decreases.

operating results. On the other hand, derivatives are expensive, and the cost increases with the time and amount involved. As a result, companies often choose to hedge only a portion of their risk, and over short periods of time, based on expectations about currency exchange rate movements. The larger the currency mismatches in company operations, the greater the cost of mitigating uncertainty via derivatives transactions.

Another way to mitigate exchange rate risk would be to match revenues and expenses more effectively by financing operations in foreign currency. On the other hand, this could give rise to currency mismatches in the balance sheet if the accounting currency is the Icelandic króna. If the local currency depreciates and foreign-denominated debt balances rise in krónur terms, a negative equity position can result.

Shifting foreign exchange risk can reduce the need for hedging

For Icelandic companies with substantial external trade, a situation could arise where the company's activities and operations are linked more strongly to a foreign currency than to the Icelandic króna. When that portion of its operations is large enough, it may be more beneficial to prepare accounts in foreign currency rather than in Icelandic krónur, even if the company is located in Iceland and pays its employees in Icelandic krónur.

Switching the accounting currency does not eliminate all exchange rate risk, as currency mismatches will still exist; switching currencies merely shifts it. Instead of hedging against changes in the exchange rate of their functional currency, companies protect against exchange risk involving other currencies, which is most likely smaller, including the Icelandic króna. For instance, if a company pays wages in Icelandic krónur, it incurs exchange rate risk because of the mismatch in its accounts.

Improved access to foreign capital

Other circumstances can also prompt companies to enter their accounts in foreign currencies. Companies engaged in international trade must consider presenting their accounts in a manner that gives the clearest picture of their operations. This can be highly important for decision-making within the organisation and can affect foreign investors' and lenders' perceptions of the company.

Making financial comparisons with foreign companies is easier when accounts are in foreign currencies, particularly in currencies often used in international trade such as the US dollar and the euro. Simply preparing accounts in foreign currency can make it easier for Icelandic companies to obtain foreign financing, potentially lowering their financing costs and bolstering their competitive position. It is worth noting, though, that companies can always present their accounts in any currency they wish – the so-called presentation currency – and can rely on international standards in converting them.

Domestic companies that obtain financing through foreign bond issues or foreign long-term loans are few in number, however – only around 40. About half of these firms present their accounts in foreign currency. But the number of foreign shareholders in Icelandic companies is much larger: in 2022, some 160 legal entities and nearly 1,100 individuals owned holdings in Icelandic firms, some with holdings in several companies. Of that total, 72 companies were directly owned by foreign entities.[5]

Foreign currency accounting can enhance stability

Firms make decisions on their accounting currency from a long-term perspective – a minimum of five years, according to the Annual Accounts Act – partly because there can be costs associated with the decision. The selection is based on companies' long-term interests, but preparing accounts in the functional currency can help mitigate operational fluctuations and reduce the cost of hedging. It can also lower financing costs by improving access to foreign markets.

This does not change the fact that companies must consider operational risk as a whole, as their economic environment remains unchanged even if they change their reporting currency. Companies remain part of the Icelandic economy and must comply with Icelandic statutory and regulatory provisions. Moreover, their operating results depend on developments in domestic costs, including wages and public levies. As a result, domestic inflation affects firms' performance, both directly and indirectly, although in some cases the impact can be mitigated if the company obtains financing abroad.

Authorising companies to keep their accounts and prepare their financial statements in foreign currency mainly gives a clearer view of operations, as well as fostering greater resilience and thus financial stability.

5. Direct ownership in which a foreign investor controls a total of 10% or more of voting rights in the company concerned, according to preliminary figures.

The financial system

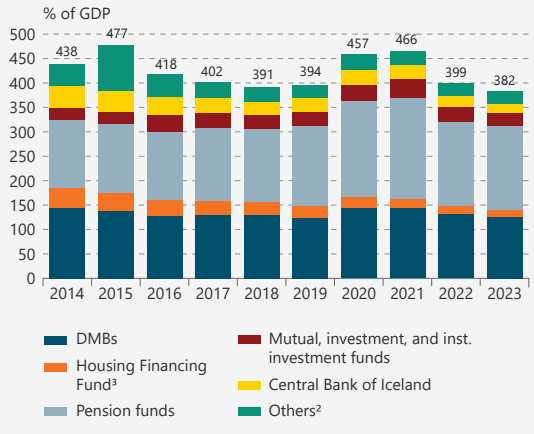
II

Financial system assets totalled 382% of GDP at the end of 2023, down 17 percentage points relative to the prior year, because GDP grew more rapidly than assets did. In nominal terms, financial system assets grew by 5.5% in 2023, whereas they contracted by 2% in real terms.

Deposit institutions' assets accounted for a third of total financial system assets at the end of 2023 and were unchanged year-on-year. In nominal terms, deposit institutions' assets increased by 5.6% in 2023, to 5,391 b.kr. at the year-end.[1] It is noteworthy that while the four commercial banks' assets increased by 5.4% during the year, the savings banks' assets grew over the same period by 45%, to nearly 50 b.kr. at the end of 2023. This surge in savings banks' assets is due primarily to Indó savings bank, which was established in 2022. Its assets totalled 12.4 b.kr. at the end of 2023, up from 0.8 b.kr. at the end of 2022.

Chart II-1

Financial system: Assets as % of GDP[1]



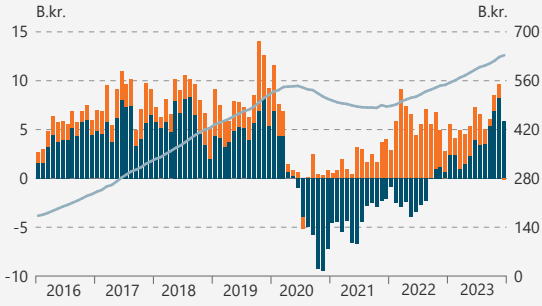
1. Parent companies. 2. Other: Failed financial institutions that have undergone composition are included with other financial institutions as of the time their composition agreements were approved. The Central Bank of Iceland Holding Company ehf. (ESÍ) is also included with other financial institutions from its establishment in December 2009 until its dissolution in February 2019. 3. The Housing Financing Fund (HFF) merged with the Iceland Construction Authority on 1 January 2020. HFF assets from 2020 onwards are the assets of the ÍL Fund, which took over the processing of the HFF's assets and liabilities.

Sources: Statistics Iceland, Central Bank of Iceland.

Chart II-2

Loans to pension fund members[1]

January 2016 - December 2023



1. Figures are based on balance sheet summaries submitted to the Central Bank by the pension funds. Net new loans are new loans less loan retirement and loan prepayments in excess of contractual requirements.

Source: Central Bank of Iceland.

The pension funds own nearly 45% of total assets, an increase of almost 2 percentage points year-on-year. The pension funds have steadily increased their share of financial system assets over the past decade, as they held 30% of assets in the system at year-end 2013. Their share of total financial system assets can be expected to keep growing in coming years. as inflows into the funds are well in excess of paid-out pension benefits.

1. Based on deposit institutions' assets at the parent company level.

Pension fund assets totalled 7,287 b.kr. at the end of 2023, after increasing by 10% during the year. Nearly two-thirds of the increase was due to foreign assets. Foreign assets accounted for 37.6% of total assets at the end of 2023, an increase of 2.6 percentage points during the year. The share of foreign assets held by the pension funds is at an all-time high. Almost 97% of the funds' foreign assets are in foreign equities and unit shares, an increase of nearly 19% in these assets during the year. Domestic equities and unit shares accounted for 14.4% of total assets at the end of 2023, about 1.2 percentage points less than at the beginning of the year. Domestic marketable bonds and bills comprised 33.8% of the pension funds' total assets, a decline of 1.3 percentage points during the year. On the other hand, the share of loans to pension fund members increased by 0.4%, to 8.8% at the year-end.

At the end of 2023, the stock of loans to fund members totalled 633 b.kr. and had increased by 85 b.kr. during the year. Early in 2023, the interest rates offered on pension funds' mortgage loans were in most cases more favourable than rates offered by the banks, particularly for non-indexed mortgages. It is therefore no surprise that the pension funds' mortgage loan stock grew more rapidly in 2023, or by 15.5%, as against a 4.3% increase in the banks' mortgage loan stock. The difference between the two was wider than in 2022, when the pension funds' mortgage loan stock grew by 12.8% and that of the banks by 9.6%. At the beginning of 2024, the difference between mortgage lending rates offered by the pension funds and those offered by the banks was narrower than in 2023; for instance, variable rates on indexed mortgages – which have been most in demand in recent months – were broadly unchanged. The smaller differential between interest rates on mortgages granted by the pension funds versus the banks will probably result in a more similar developments in lending by these parties.

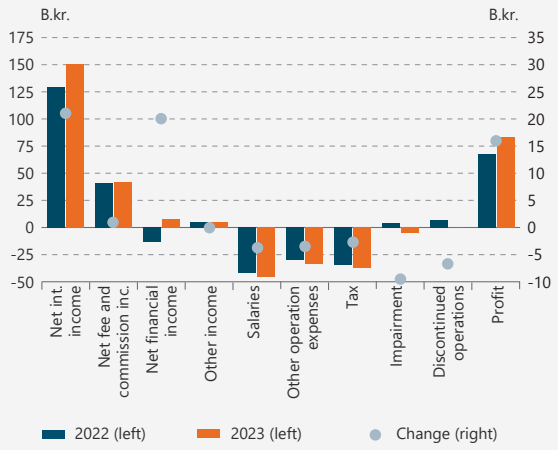
Profitability

The domestic systemically important banks (D-SIB) generated sound profits in 2023. Their core operations have grown much stronger in the past decade, and streamlining, cost consolidation, and balance sheet expansion have contributed to more profitable operations. Higher interest rates in the recent term and larger balance sheets have widened their interest rate spreads and bolstered interest income. At the same time, loan impairment has been limited. Loan losses are likely to increase in the near future, however, owing to tighter financial conditions, and further ahead, the banks' interest rate spreads can be expected to narrow. The banks' scope for streamlining through downsizing and reduced branch numbers has grown more limited. As a result, uncertainty about further improvements in operations has grown.

Despite greater uncertainty about economic developments, the banks' profits and resilience are likely to remain strong, as their capital and liquidity ratios are well above the Central Bank's minimum requirements. It is important that the banks keep dividend payments and share buybacks in check, so that they can write off and restructure debt and grant new loans without jeopardising their position and resilience.

Chart II-3

Change in D-SIBs' profit in the years 2022/2023[1]



1. Domestic systemically important banks, consolidated figures. The chart shows the difference between income and expenses in year 2023 compared to 2022.

Sources: Commercial banks' financial statements.

The D-SIBs generated an operating profit of 83.5 b.kr. in 2023, as compared with 67.5 b.kr. in 2022. Their return on equity was 12.1%, an increase of 1.9 percentage points year-on-year. High interest rates generated increased interest income and a turnaround in financial income. The banks' income grew by 26% in 2023, while their costs rose 10%. All three banks' core operations continued to strengthen, as core income rose in excess of expenses. Their return on equity from underlying operations, excluding one-off items, rose from 12% in 2022 to 13.2% in 2023.[2]

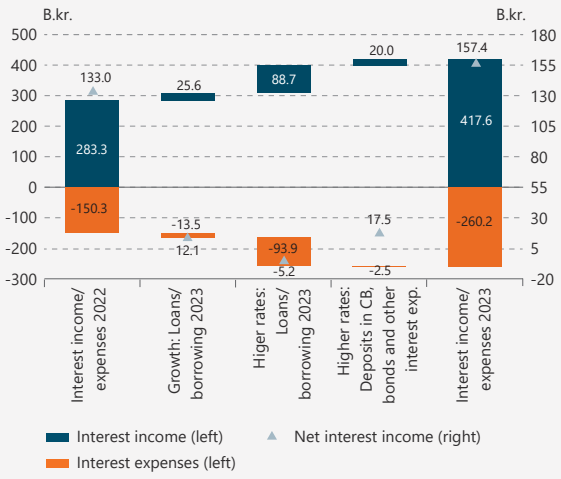
The interest rate differential on the D-SIBs' total assets was 3% in 2023, about 0.19 percentage points more than in 2022. It narrowed in H2, owing to

2. Underlying returns are defined here as returns on regular income, which are based on net interest income and net fees and commissions, less regular expenses apart from one-off cost items. The tax rate of 20% is based on the average balance of capital.

increased interest expense on the banks' market funding. All else being equal, interest rate spreads have peaked. On the other hand, fixed-rate mortgages have only been funded in part with covered bonds or fixed-rate deposits. The banks' interest rates spreads should widen upon the expiry of fixed interest rate clauses on non-indexed loans taken when interest rates were far lower than they are now. Whether that weighs heavier than increased funding costs and possible potentially lower interest rates has yet to come to light. As a result, the banks' interest spreads will probably remain large in the coming term.

Chart II-4

D-SIB: Changes in net interest income year 2023[1]



1. Domestic systemically important banks, consolidated figures. The chart shows the difference between interest income and expenses in year 2023 compared to 2022. Borrowing consist of deposits and issued bonds of the banks in ISK and foreign currencies. Interest income of marketable securities at fair value are partly estimated.

Sources: Commercial banks' financial statements.

Chart II-4 gives an approximation of changes in net interest income between 2022 and 2023, assuming that loans are funded with deposits or bond issues. On average, 82-83% of the banks' assets took the form of loans in 2023, and the same share stemmed from borrowings through deposits and bond issues. Other key assets (apart from loans) are liquid assets such as marketable bonds and deposits with the Central Bank. These assets are offset on the D-SIBs' balance sheet by capital (nearly 14%) and other liabilities (3.4%), such as public levies or debts due to trade settlement. Interest-bearing assets always somewhat exceed interest-bearing liabilities.

The D-SIBs' net interest income grew by 24.4 b.kr. in 2023.[3] About 12.1 b.kr. can be attributed to an increase in D-SIB lending and another 17.5 b.kr. to higher interest income on liquid assets. The smaller spread between lending rates and funding rates led to a 5.2 b.kr. year-on-year decline in net interest income. The wider interest rate spread and higher interest income in 2023 can be attributed entirely to balance sheet growth and higher returns on liquid assets. Net commission and fee income grew in nominal terms by 1.6% year-on-year in 2023, to 41.8 b.kr., although it declined somewhat in real terms. Had it not been for a 16% year-on-year increase in income from payment intermediation, fee and commission income would have contracted in 2023. The D-SIBs' regular income – i.e., net interest and fees – totalled a record high of 192.6 b.kr. in 2023. It increased by 22 b.kr. relative to 2022 and accounted for nearly 94% of the banks' total income.

Net income from financial activities was positive by 7.4 b.kr. in 2023, which represents a turnaround of 20 b.kr. relative to the prior year. As Chart II-3 indicates, the turnaround in financial income, plus increased interest income, contributed the most to the 16 b.kr. rise in profit between years. Other operating income fell by 0.6 b.kr. year-on-year, to 5.4 b.kr. in 2023. Finally, income from discontinued operations declined by 6.7 b.kr. year-on-year, owing entirely to Arion Bank's 2022 sale of its subsidiary Valitor; however, the banks' income from this item was insignificant in 2023.

The banks' intermediation of the key interest rate is effective

As is stated above, rising interest rates have widened interest rates and increased the D-SIBs' net interest income, delivering stronger profits and returns. Since mid-2021, returns on banking operations have grown throughout Europe, and in many countries (in the Nordic region, for instance) they have grown more strongly than in Iceland. The main reason for stronger returns is the same as in Iceland: wider interest rate spreads have prompted a surge in net interest income. As is noted above, in the case of Iceland's banks, the larger interest rate spread is due mainly to increased interest income on liquid assets. In Europe, however, wider interest rate spreads are due mainly to the fact that lending rates have increased more than deposit rates; i.e., monetary policy transmission has been more effective through the lending channel than through the deposit channel.

Chart II-5 illustrates the transmission of Central Bank interest rates via deposits and loans.[4] Deposit

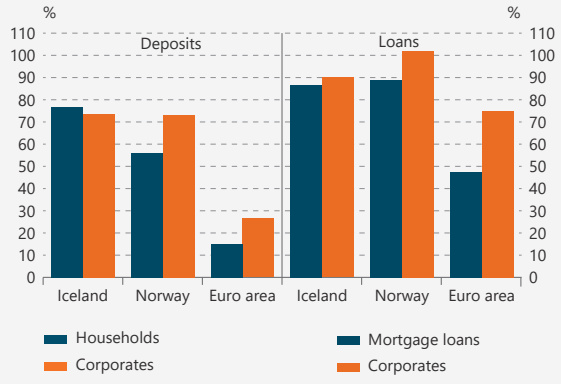
3. Bond interest income at fair value is partly estimated for the calculation of net interest income and interest rate spreads, as some of the banks recognise it as financial income rather than interest income.

4. The period on which the calculations are based starts when interest rates began to rise in the wake of the pandemic and extends through November 2023.

rates in Iceland have risen more relative to policy interest rates than deposit rates in Norway and the eurozone. It is particularly noteworthy how limited monetary policy transmission has been in the eurozone. Calculations of the proportional increase in deposit rates are based on all private sector deposits. In both Iceland and in Europe, it can be said that deposits can be divided into two categories: sight deposits bearing low interest rates and other deposits, which bear higher rates. The transmission of monetary policy via current account deposits, which in Iceland comprise debit card accounts and wage accounts, is usually limited. According to Central Bank data, current account deposit rates in Iceland rose by 32% of the increase in the Bank's key rate. In Norway, the corresponding increase relative to the key rate was 53%, as compared with 8% in the eurozone and only 3% in Estonia and Ireland. In general, banks view current deposits as cheap funding, particularly when interest rates are high. In the eurozone, transmission of the key interest rate via current deposits is virtually non-existent. When other household deposits bearing higher interest rates are examined, the increase in interest rates has been much higher, and most pronounced in Iceland, or 88% since rates began rising. Elsewhere, interest rates have risen by 73% in Norway, 69% in the euro area, 80% in Estonia, and 53% in Ireland.

Chart II-5

Relative increase in interest rates compared to the increase in the central bank's policy rate[1]



1. Calculations of the relative increase in interest rates on deposits take into account all deposits to households and companies. Calculations for loans take into account loans with variable interest rates. The period on which the calculations are based on, is from when interest rates started to rise following the epidemic and until November 2023.

Sources: Statistics Norway, European Central Bank, Central Bank of Iceland.

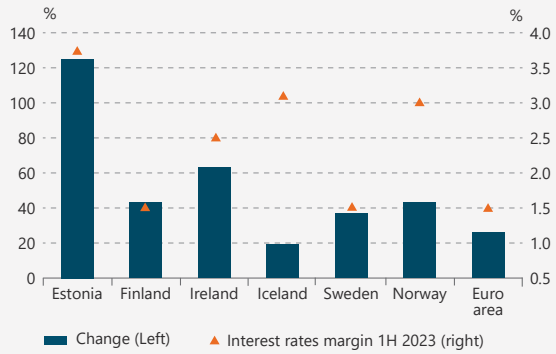
In Iceland, most high-yielding deposits have no minimum commitment period, and terms on the accounts are often dependent on their having been established via smartphone app. In other countries, it is most common that higher deposit rates can be had only under certain conditions; for instance, subject to a specified commitment period, a redemption fee, or redemption after a specified notice period. Because the share of household deposits bearing high interest rates is far higher in Iceland than in Europe, the transmission of policy rates to household deposits is generally strongest in Iceland. For instance, the share of high-yielding deposits in the euro area is very low, indicating that transmission of monetary policy to deposits is limited in the region.

Chart II-5 shows that in Norway and the eurozone, monetary policy transmission to corporate deposit rates is stronger than to household deposit rates. The reverse is true for Iceland. This may be due mainly to the fact that competition for deposits is greater in Iceland than in Europe. The chart also shows that monetary policy transmission to variable-rate loans is generally stronger than transmission to deposits, and that transmission is weaker in the eurozone than in Iceland and Norway.

Chart II-6 shows the proportional change in the interest rate differential on total assets from its narrowest, in 2021, through H1/2023. According to European Banking Authority (EBA) data covering 28 countries, the interest rate differential in the banking system increased proportionally more in 25 countries than in Iceland during the period captured by Chart II-6. Only in France and the Czech Republic was the change in the interest rate spread less pronounced than in Iceland. This is consistent with the foregoing discussion indicating that monetary policy transmission has been generally more effective in Iceland than in most other European countries. Even though the Icelandic banks' interest rate spreads have not increased appreciably in comparison with those in other countries, they are still

Mynd II-6

Net interest margin and relative change from 12M 2021 to 6M 2023[1]



1. Net interest margin on total assets.

Source: European Banking Authority.

wide. In general, foreign banks' analysts are of the view that their funding costs will rise and their interest rate spreads will narrow, thereby cutting into their returns. As in Iceland, loan losses have been low overall, but they are expected to increase in the coming term as a result of higher interest rates.

Costs rising again

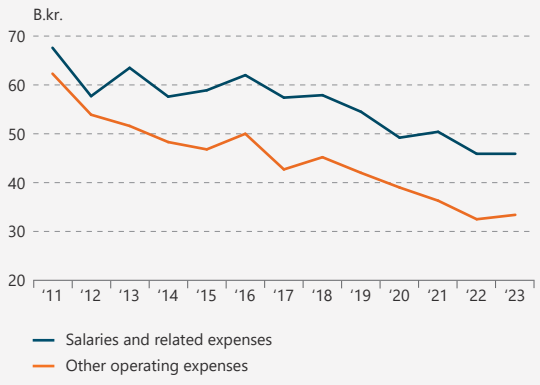
The D-SIBs' combined operating expenses totalled 79.3 b.kr. in 2023, an increase of 7.1 b.kr. between years. In real terms, costs increased by 1.9%, while wage costs rose 0.8% and other operating expenses by 3.5%.

Since 2011, the D-SIBs' real expenses have fallen by 39%, which is a significant decline given that Iceland's population has grown by 25% and the banks' balance sheets have grown by 80% over the same period. The D-SIBs' staffing levels increased by 70 full-time position equivalents in 2023, to 2,403 at the year-end. The banks' staffing levels totalled just over 3,400 full-time position equivalents at the end of 2016 and have therefore declined markedly in the interim. As a result, there seems to be limited scope for further downsizing, as last year's staffing increase shows.

The D-SIBs' expense ratio remained fell by 6 percentage points year-on-year in 2023, to 39%. Their expense ratio relative to regular income – i.e., excluding net income from financial activities and other operating income – was just under 41% in 2023, after falling by 1 percentage point year-on-year.

Chart II-7

D-SIB: Operating expenses[1]



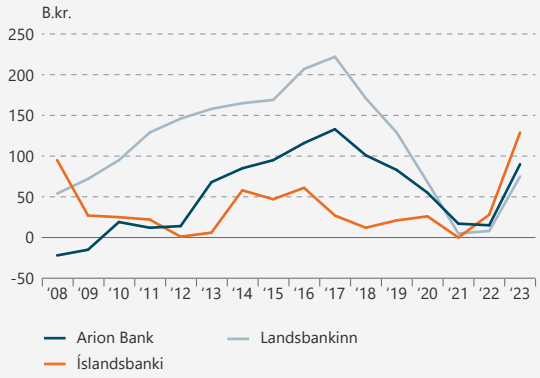
1. Domestic systemically important banks, consolidated figures. Operating expenses are at 2023 prices and do not include loan impairment and tax payments.
Sources: Commercial banks' financial statements, Statistics Iceland.

Indexation imbalance increases

The stock of D-SIB loans to households and businesses totalled 3,712 b.kr. at the end of 2023. This represents an increase of 5% in nominal terms and a contraction of nearly 3% in real terms during the year. Owing to the tightening of the monetary and macroprudential stance, growth in lending to private sector borrowers lost pace during the year, after increasing by over 11% in 2022. Developments in lending were broadly similar for households and businesses: at the end of 2023, household lending totalled 2,015 b.kr., an increase of 4.3% between years, while loans to companies totalled 1,697 b.kr. and had grown by 5.5% year-on-year. What is most noteworthy is that the entire increase in lending (and more besides) is due to indexed loans – i.e., the D-SIBs' indexed loans increased by 333 b.kr. in 2023, or 42%, while foreign-denominated loans declined by 54 b.kr. (-10.4%) and non-indexed loans declined by 108 b.kr. (-5%).

Chart II-8

Indexation imbalance[1]



1. Domestic systemically important banks, consolidated figures.
Sources: Commercial banks' financial statements.

High inflation and increased demand for indexed loans caused the D-SIBs' indexation imbalance – the difference between indexed assets and liabilities – to increase by 240 b.kr. in 2023. The banks' indexation imbalance was positive by 295 b.kr. at the end of 2023, and while it increased markedly during the year, it has often been higher. In 2016 and 2017, for instance, it totalled 380 b.kr. Furthermore, the three largest banks' capital and balance sheets have grown, and the imbalance was therefore even smaller in proportional terms at the end of last year than in the past. Finally, the Central Bank's SREP assessment of the banks' capital requirement indicates that they need additional reserves to cover their indexation mismatches.[5] In mid-2023, the reference was changed so that, instead of using a zero position as the reference, deviations are

5. In assessing additional capital requirements for the supervisory review and evaluation process (SREP), the Central Bank has set required reserves at 3.53% for a positive indexation imbalance and 6.46% for a negative one.

now measured in terms of the imbalance relative to the Central Bank's assessment of the banks' capital requirement.[6]

Loan impairment increases

GDP growth was strong in H1/2023, but the effects of tighter monetary policy showed clearly in H2, in a lower GDP growth and a downturn private consumption. In spite of tighter financial conditions, households' and businesses' arrears are still low. At the turn of the year, the non-performing loan (NPL) ratio on household loans was 1% and had increased by 0.3 percentage points during the year. For corporate loans, the NPL ratio was 2.4% and had risen by 0.1 percentage points year-on-year.[7] Households' and businesses' arrears have reached a turning point and are likely to keep trending upwards in the coming term.

The change in borrowers' position can also be seen in the change in IFRS-9 classification. At the end of 2023, 5.3% of loans were in impairment stage 2, an increase of 0.6 percentage points during the year. The rise is due in part to loans moved from stage 1 to stage 2 because of the seismic activity in Grindavík.[8] The same can be said of stage 3 loans, which are viewed as non-performing. At the end of 2023, 1.6% of loans were in impairment stage 3, an increase of 0.2 percentage points during the year.

The balance of forborne loans improved during the year: the share of D-SIB loans classified as forborne and performing was 3% at the end of 2023 (56 b.kr.), down from 7.3% (129 b.kr.) at the end of 2022. The decline is due largely to loans that had been classified as forborne during the pandemic, as the minimum forbearance period is 24 months. About 1% of loans to individuals (20 b.kr.) were forborne and performing, and the balance remained broadly unchanged during the year.

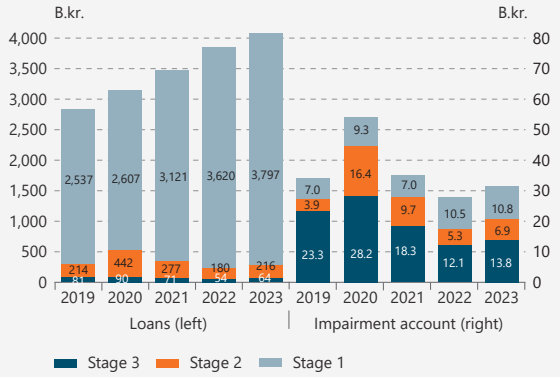
Capital ratio rises

The D-SIBs' capital equalled 728 b.kr. at the end of 2023, after increasing by just over 6% year-on-year, in spite of dividend payments and share buybacks totalling nearly 38.7 b.kr. during the year. The banks' combined capital ratio at the end of 2023 was 24.3% and had increased by 0.6 percentage points between years, after adjusting for planned dividends in the amount of 44.4 b.kr. to be paid in 2024. If these proposed dividends are added to the capital base, the end-2023 capital ratio rises to 25.7%. Profits increased the capital ratio by 2.7 percentage points in 2023, while dividend payments and share buybacks lowered it by 1.3 percentage points and capital instruments lowered it by a further 0.1 percentage points. Furthermore, the increase in risk-weighted assets during the year lowered the ratio by 0.7 percentage points.

The overall capital ratio required of the D-SIBs by the Central Bank ranges between 19.3% and 20.2%.

Chart II-9

D-SIB: Loans and impairment account[1]

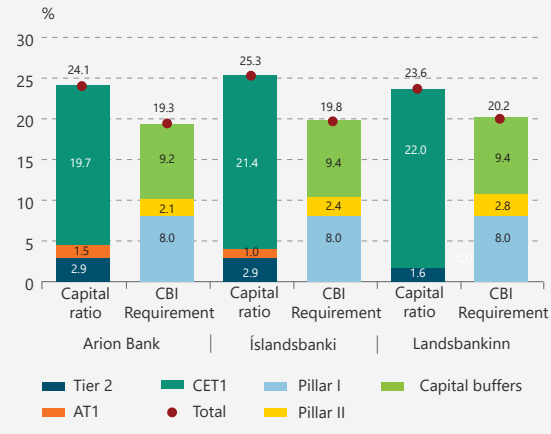


1. Domestic systemically important banks, consolidated figures. IFRS-9 classification of loans to individuals and corporates.

Sources: Commercial banks' financial statements.

Chart II-10

D-SIB capital requirements and capital adequacy ratios at the end of 2023[1]



1. Domestic systemically important banks, consolidated figures. In calculating the capital ratio, the portion of 2023 profit to be paid as a dividend in 2024 has been deducted from the capital base.

Sources: Commercial banks' financial statements and other published materials.

6. According to the D-SIBs' year-end 2023 balance sheets, the reference position for reserves to cover indexation imbalances was 20-25% of capital. Because of the change, the reference for indexation imbalance risk was 150-180 b.kr. at the end of 2023, as compared with 295 b.kr. according to the previous reference.
7. This refers to non-performing loans as defined by the European Banking Authority (EBA).
8. Loans are moved from stage 1 to stage 2 if credit risk has increased significantly relative to the initial position. Loans are moved to stage 3 if they are in serious default and impairment can be expected. Impairment must be based on expected credit losses over the lifetime of the loan.

At the end of 2023, the banks' capital ratios were 3-5 percentage points above the Central Bank minimum, after adjusting for dividend payments in 2024 and for the increase in the countercyclical capital buffer from 2% to 2.5% of domestic risk-weighted assets, set to take effect in March 2024. If adjustments are made for management buffers, the banks' capital ratios are 1-3 percentage points above the Central Bank minimum plus the management buffer.[9]

The countercyclical capital buffer was set at 0% in 2020, at the beginning of the pandemic, and macroprudential policy has focused on bolstering the banks' resilience in the recent term. It is important to safeguard the banks' resilience and ensure that capital buffers are in place so that they can be eased if conditions in the financial system warrant it.

At the end of February 2024, Landsbankinn issued a 15 b.kr. subordinated bond classified as Tier 2 capital. With that issue, the large banks have utilised their scope for Tier 2 issuance. On the other hand, it would be possible to increase the D-SIBs' capital base by issuing additional Tier 1 equity instruments. Landsbankinn has the greatest scope for such issuance, as it has not previously issued such securities. Íslandsbanki has utilised about half of its authorisation for additional Tier 1 issuance, and Arion Bank has utilised about three-fourths of its authorisation.

The D-SIBs' leverage ratio was 13.2% at the end of 2023, after increasing by 0.3 percentage points during the year. Individual banks' leverage ratios ranged between 12.4% and 13.6%.[10]

MREL

The Act on Resolution of Credit Institutions and Investment Firms, no. 70/2020, authorises the Central Bank of Iceland's Resolution Authority to determine minimum requirements for financial undertakings' own funds and eligible liabilities. These requirements, generally referred to as MREL, represent the own funds and eligible liabilities a financial undertaking must hold so as to ensure that it can absorb unforeseen losses and recapitalise its activities without Government support if it should be deemed failing or likely to fail.[11] According to the Resolution Authority's most recent MREL requirements, from September 2022, the D-SIBs' own funds and eligible liabilities shall equal at least double the minimum own funds requirement (i.e., two times Pillar I and Pillar II). The banks must also satisfy a combined capital buffer requirement. At the end of June 2023, the three systemically important banks' MREL lay between 29.4% and 31% of their risk-weighted assets. The banks' MREL funding ranged between 37.8% and 41.3% of their risk-weighted assets.

Liquidity and funding

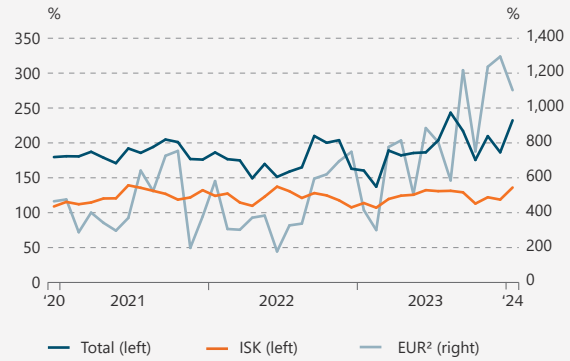
The banks' liquidity is sound

The large commercial banks' liquidity position is sound, and their liquidity ratios have risen year-on-year. Their liquidity coverage ratio (LCR) rose early in 2023 but then tapered off slightly during the autumn.

At the end of January, the domestic systemically important banks' (D-SIB) combined liquidity ratio in all currencies was 232%, well above the 100% minimum required under Central Bank rules. The liquidity ratio in foreign currencies was 711% at the same time, whereas the ratio in Icelandic krónur was 136%. The liquidity ratio in euros was 1102% at the end of January but varies from bank to bank. A minimum liquidity ratio of 80% in euros was introduced at the beginning of 2023.[12] As a result of that change, there is no longer a required liquidity ratio for all foreign currencies combined.

Chart II-11

D-SIB: Liquidity coverage ratio[1]



1. Consolidated figures. 2. Rules no. 1520/2022 took effect on 1 January 2023, they stipulate a 80% liquidity ratio in euros if euro-denominated liabilties constitute 10% or more of a credit institution´s total liabilites.

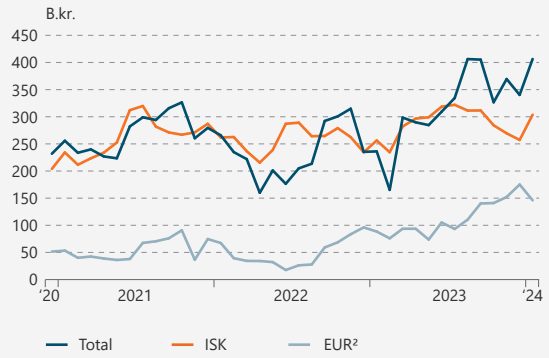
Source: Central Bank of Iceland.

The banks' liquidity in excess of requirements for all currencies combined totalled 406 b.kr. at the end of January. In the past twelve months, excess liquidity has increased by 170 b.kr. The banks' internal criteria

9. The management buffer is an internal prudential buffer defined by the banks themselves.
10. The leverage ratio, computed in accordance with the Act on Financial Undertakings, no. 161/2002, is calculated as Tier 1 capital divided by exposures. The minimum leverage ratio is 3%.
11. MREL stands for minimum requirement for own funds and eligible liabilities. Further discussion of the Central Bank of Iceland's MREL policy can be found in Box 9 of *Financial Stability* 2022/1.
12. The minimum liquidity ratio in euros for credit institutions whose euro-denominated liabilities equal 10% or more of their total liabilities.

determine the scope they have for disposition of liquid assets. Based on a minimum liquidity ratio of 120%, liquidity in excess of internal criteria was 344 b.kr. at the end of January. Holding excess liquidity gives the banks greater scope to issue new loans, cover unexpected withdrawals of deposits, pay dividends, and buy back their own shares.

Chart II-12
D-SIB: Liquidity in excess of requirements[1]



1. Consolidated figures. 2. Monthly average exchange rate. Rules no. 1520/2022 took effect on 1 January 2023, they stipulate a 80% liquidity ratio in euros if euro-denominated liabilties constitute 10% or more of a credit institution´s total liabilites
Source: Central Bank of Iceland.

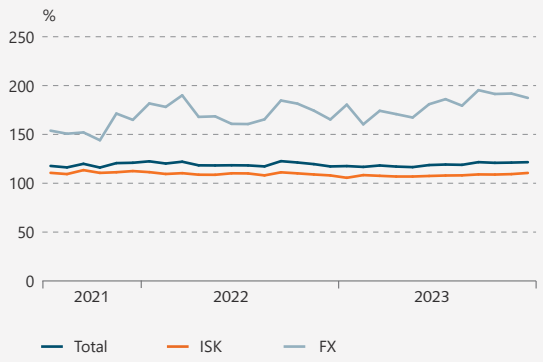
The banks' high-quality liquid assets consist mainly of government bonds, government bills, and deposits with the Central Bank. At the end of January, the banks held 713 b.kr. in high-quality liquid assets in all currencies combined. This represents an increase of 86 b.kr. over the previous twelve months. Their high-quality liquid assets in Icelandic krónur totalled 480 b.kr. at the end of January, while their high-quality foreign-denominated assets totalled 233 b.kr. The banks' ratio of high-quality liquid assets to total assets rose by one percentage point year-on-year, to 14% at the end of January.

Continuing challenges with króna-denominated market funding

The majority of the banks' funding is in the form of deposits and marketable bonds. In the past twelve months, deposits have grown by 180 b.kr., although the pace slowed in H2/2023. Deposits owned by individuals grew steadily over the period, by 150 b.kr., while deposits owned by large companies, pension funds, and financial market participants increased by 30 b.kr. Foreign-denominated deposits account for 12% of the banks' total deposits and have remained virtually unchanged at that level in the past year.

About 74% of the banks' deposits are sight deposits, and around half are insured by the Financial Institutions' Insurance Fund's (TVF) deposit division. The share of insured deposits has been stable in recent years and is far higher, for instance, than at the US banks Silicon Valley Bank, First Republic Bank, and Signature Bank, which failed in spring 2023. It is well to monitor developments in deposits closely, as they account for a large share of the banks' domestic funding. If the banks step up their lending without obtaining additional market funding at the same time, their liquidity position could deteriorate.

Chart II-13
D-SIB: Net stable funding ratio[1]



1. Consolidated figures.
Source: Central Bank of Iceland.

The D-SIBs' net stable funding ratio (NSFR) for all currencies combined was 122% at the end of December 2023,[13] and therefore well above the minimum required under Central Bank rules. At that time, the funding ratio in all foreign currencies combined was 187%, whereas the ratio in Icelandic krónur was 111%. The total ratio has been fairly stable in recent months, whereas the ratio in foreign currencies has been more volatile.

As in recent years, the banks' króna-denominated bond issues have been limited, apart from covered bonds. They issued four bonds in 2023: subordinated bonds in the amount of 22 b.kr. and other bonds totalling nearly 14 b.kr. In addition to these, they issued 90 b.kr. in króna-denominated covered bonds. The banks' outstanding covered bonds in Icelandic krónur totalled 554 b.kr. at the end of December 2023. Some 83 b.kr. in króna-denominated covered bonds matured in 2023. Their net new covered bond issues in Icelandic krónur therefore totalled 7 b.kr. during the year. In 2022, however, their net new covered issuance was negative. In comparison with króna-denominated covered bonds, the banks' net new lending to households increased

13. Effective 1 January 2024, NSFR reports must be submitted on a quarterly basis.

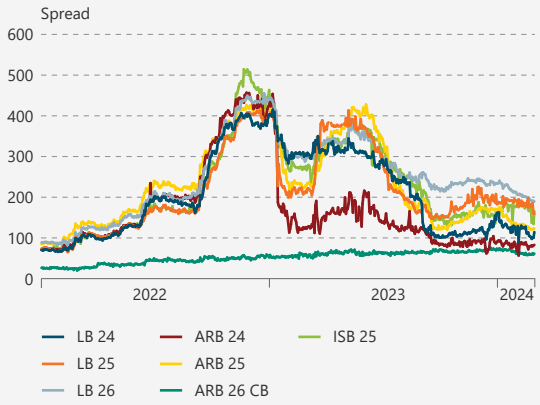
by 77.3 b.kr. in 2023.[14] They have continued to issue covered bonds in 2024. In late February, Landsbankinn issued Tier 2 bonds totalling 15 b.kr. and Íslandsbanki issued senior preferred bonds totalling 5.3 b.kr. in early March. Króna-denominated covered bonds in the amount of 80 b.kr. are scheduled to mature in 2024. If the call provisions on the bonds are exercised at the earliest opportunity, this total will increase to 99 b.kr. Landsbankinn has the largest maturity during the year, at 39 b.kr. In 2025, covered bonds in the amount of 94 b.kr. are set to mature: Landsbankinn with 56 b.kr., and Arion Bank with 38 b.kr..

Foreign refinancing risk has subsided

Interest rate premia on the D-SIBs' bond issues rose sharply in H1/2023; however, by September they had fallen once again and were broadly back to the level seen at the onset of the pandemic. Premia rose slightly in October, owing to increased uncertainty abroad and the war in the Middle East.

Chart II-14

D-SIB: Spread on listed foreign bonds, EUR[1]



1. Spread on Euro benchmark curve.
Source: Refinitiv Datastream.

Higher interest rate spreads have pushed Icelandic banks' funding costs upwards. The Icelandic banks are not unique in this regard, however. Banks in the euro area also saw funding costs rise in H2/2023. Liquidity contracted in the eurozone in 2023, owing to the maturity of the third series of the targeted longer-term refinancing operations scheme (TLTRO III) and the European Central Bank's July 2023 decision to discontinue reinvestments under its asset purchase program (APP).

The Icelandic banks issued foreign-denominated bonds for 218 b.kr. in 2023, as compared with 213 b.kr. in 2022. A total of 140 b.kr. in foreign currencies matured during the year. The banks' net new foreign bond issuance therefore totalled 78 b.kr. Foreign issuance was limited in Q4/2023. Íslandsbanki issued a bond for 500 million Swedish kronor in November. The bond has a three-year maturity and bears a premium of 270 points over and above three-month STIBOR rates. Then, in January 2024, Íslandsbanki issued another bond for 500 million Swedish kronor, plus a bond for 500 million Norwegian kroner. Both of them have a three-year maturity and bear a premium of 235 points over and above three-month STIBOR and NIBOR rates. In early March, Landsbankinn issued a new green bond series totalling 300 million euros. The bonds have a four-year maturity and bear a premium of 225 points above mid-swap market rates. A portion of the issue will be allocated for the repurchasing of bonds maturing this year and next year. Arion Bank has not issued any foreign bonds in 2024 to date.

In November, Standard & Poor's upgraded its ratings on Iceland's systemically important banks to A-2/BBB, with a stable outlook. It also upgraded the rating on the D-SIB covered bond issues from A to A+, with a positive outlook, following the upgrade of Iceland's sovereign rating to A+, with a stable outlook. In December, Moody's issued its first long-term credit rating for Arion Bank as an issuer of euro-denominated covered bonds. The bank was assigned a rating of Aa2, which is the highest credit rating of any Icelandic issuer.

In all, the D-SIBs have sold euro-denominated covered bonds for 1,100 million euros in recent years. They have used most of the proceeds to refinance unsecured foreign bond issues. The banks have also issued covered bonds for their own use, allocating the proceeds to repo transactions with foreign banks in order to strengthen their foreign liquidity.

Some 99 b.kr. in foreign bonds issued by the D-SIBs are scheduled to mature in 2024. If the call provisions on the bonds are exercised at the earliest opportunity, this total will increase to 113 b.kr. Next year, however, the banks have large eurobond maturities, as well as smaller maturities in Nordic currencies, for a total of 220 b.kr.

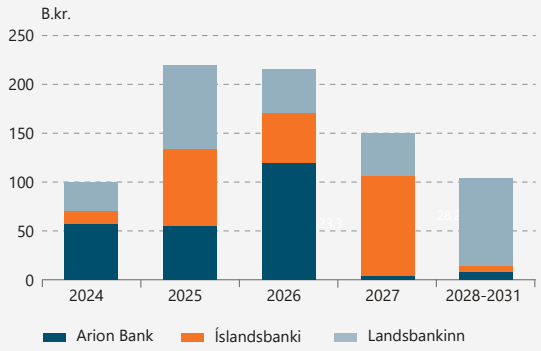
The banks' foreign liquidity is very strong at present, and they have enough liquid assets to pay all of their 2024 foreign bond maturities without violating the Central Bank's liquidity rules. Their refinancing risk has therefore diminished. Because of minimum requirements for own funds and eligible liabilities (MREL), the

14. Net new loans are defined as new loans less debt retirement and prepayments in excess of contractual requirements.

banks must issue bonds that satisfy specified conditions pursuant to Article 17, Paragraph 2 of the Act on Resolution of Credit Institutions and Investment Firms, no. 70/2020. In general, unsecured bond issues with a maturity of one year or longer are considered eligible liabilities. Bonds maturing within one year do not satisfy these conditions, and the minimum requirement therefore puts greater pressure on the banks to refinance earlier than before.

Chart II-15

D-SIB: Bonds by maturity[1]



1. Consolidated figures. At 5.3.2024 exchange rate. AT1 issues from the banks are missing from the graph.

Source: Nasdaq Iceland.

The banks must continue to maintain strong liquidity

Stress tests of the banks' liquidity and funding are carried out on a regular basis. At the end of January 2024, all of the banks had enough high-quality liquid assets to cover withdrawals by their largest depositors; i.e., large firms, financial institutions, pension funds, and non-residents.

Their liquidity position is sound, and the outlook is good as well. All else being equal, the banks are unlikely to experience liquidity difficulties this year, even if they do not obtain additional foreign funding. Their short-term position is strong, but they are still dependent on developments in foreign credit markets. In order to limit their refinancing risk, it would be beneficial for the banks to increase their króna-denominated funding in unsecured bonds that satisfy MREL requirements. An active market for such issues would ease the pressure on the banks to issue securities in foreign credit markets. Dividend payments and share buybacks concurrent with challenging conditions in credit markets can cause the D-SIBs' liquidity to shrink. The banks must therefore continue to monitor their liquidity closely.

Target services

The European Central Bank (ECB) has developed and implemented payment systems and services for interbank settlement of securities transactions and real-time payments. As a group, these systems are called Target Services (Target). They comprise the T2 (Target 2) gross payment system, the T2S (Target 2 Securities) system for payments related to securities settlement, and TIPS (Target Instant Payments Services) for retail payments. The objective is that the systems should work together and support the flow of liquidity, payments, securities, and collateral within the eurozone. The next system – the Eurosystem Collateral Management System (ECMS) – is to be brought into use in autumn 2024. Services aimed at supporting the efficacy of the system and meeting participants' needs have been added as well, including those involving central bank liquidity management and access to data.

Target was originally the real-time gross settlement system for countries that use the euro as their currency, but the newest versions of the Target systems enable other currency areas to participate as well. Among other benefits, the most recent changes provide for fewer systems, lower costs, and support for operational efficacy and efficiency. All transactions routed through Target systems are settled using central bank money.

Nordic policies

At present, the central banks of Denmark, Norway, and Sweden all use real-time gross settlement systems from the provider used by the Central Bank of Iceland. The central banks cooperate actively on system operation, although each country always makes independent decisions on the operation of financial market infrastructure based on its own premises. The three countries have decided to switch from their current systems to one or more Target services, or are contemplating doing so. All of the countries concerned are small, open economies with independent currencies and monetary policy. Finland is currently a member of the eurozone and is therefore a participant in Target.

The Danish central bank has decided that it will have fully implemented T2 and TIPS for the Danish krone by 2025 and that the Target systems will have replaced the current systems by that time. Denmark's connections to ECB systems are stronger and extend further back in time than those of the Swedish, Norwegian, and Icelandic central banks, which currently participate in T2S for the euro and the Danish krone.

The Swedish central bank has implemented TIPS for Swedish kroner and linked it to the country's real-time gross settlement system. The Swedish central bank is currently considering whether to follow the same path as Denmark in terms of T2 and T2S and has signed a memorandum of understanding with the ECB.

The Norwegian central bank is engaged in formal discussions with the ECB on the potential implementation of TIPS in Norwegian kroner.

The Central Bank of Iceland and Target

The Central Bank of Iceland's interbank payment system (mbk) is a systemically important infrastructure component, and its operation is a prerequisite to the settlement of securities transactions, payment card transactions, and retail payments in central bank money. As such, it is the foundation for effective payment intermediation in Icelandic krónur. Any decision on whether to renew such infrastructure requires an assessment of currently operating infrastructure and an assessment of the systems that could potentially function as replacements. A full-scale needs analysis would be required, and in the case of the Central Bank of Iceland, domestic conditions must be considered.

The ECB's Target system could replace the current interbank system (mbk). The Central Bank has begun examining the system. The project is broad in scope and involves not only technological design but also the regulatory environment, administrative considerations, monetary policy, financial stability, costs, scope, and not least, participants' interests. The purpose of examining Target is primarily to understand more fully what implementing it would entail as regards the above-listed points.

The next step would be to sign a memorandum of understanding (MoU) with the ECB. Such an MoU is not legally binding but nevertheless indicates a genuine interest in adopting Target services. Thereafter, work with the ECB could begin, including the examination of technological factors and other functions of the system.

Artificial intelligence

The *Fourth Industrial Revolution (4IR)* is a term used to describe the technological advances that have taken place in recent years and can be expected in the near future. It refers in particular to increased automation and to phenomena such as artificial intelligence (AI), robotics, self-driving vehicles, the internet of things (IoT), and so forth. Unlike previous industrial revolutions, it is said that 4IR, which is built on a digital foundation, could bring about previously unknown fundamental changes in economies and communities, thereby affecting all of our lives.

Both AI and machine learning (ML) have developed extremely rapidly in the recent term. The advent of so-called large language models (LLM) and generative artificial intelligence (Gen-AI), a sub-field of AI, has made a strong impact as well. While there is no single, unequivocal definition of AI, the underlying technology is based on algorithms, and machines are used to carry out tasks that were previously the sole province of human bazeings.

In view of this rapid technological evolution, companies, institutions, and governments the world over azare trying to analyse its impact. It is considered important not only to analyse and harness the opportunities it entails, but also to understand the potential risks involved. Central banks and financial supervisors are actively examining the opportunities and challenges that AI could bring to bear on their activities and roles. The Central Bank attempts to keep close track of developments in Iceland, among its Nordic peers, and internationally.

Opportunities created by AI

AI is already used in the financial market for decisions previously made by human beings, such as for credit assessments of individuals and companies and for decisions on lending.

At present, central banks and financial supervisors see significant opportunities in using AI to gather and analyse data. Central banks typically have broad authorisations to gather information that will enable them to carry out the tasks entrusted to them, including reporting and economic research, as well as promoting financial stability and a healthy financial system. If AI is to be used for this purpose, and if decisions are to be made on the basis of it, it is vital to use the technology in a secure and reliable manner. Doing so could lower the cost of analysis, deepen understanding of the topic, and generate results more quickly.

The European Central Bank (ECB) has been examining how the data in its possession are classified and used for decision-making, and how AI could be used to improve the process. The ECB also envisions opportunities to use ML to process the vast amount of data compiled in connection with financial supervision and the decisions made by supervisory bodies. The ECB collects a large amount of data in real time using a technique called *web scraping*, including gathering data on goods prices in EU countries in order to analyse price movements. Until now, however, this data collection has been rather haphazard, and the information it yields has not been optimal for analysis. The ECB has therefore been studying how AI could be of use in improving such analytical work.[1]

The Bank of England (BoE) has decided to begin examining the impact of AI and ML on financial stability. These technologies could certainly bring a range of opportunities for the financial sector – for instance, they could boost operational efficiency, aid in risk management, and give rise to new products in the financial services industry. But there are also challenges and risks, some of which could jeopardise financial stability if they produce a herd mentality, exacerbate cyberthreats, or generate contagion because of system integration. The aim of the BoE's examination is to safeguard the British financial system's resilience against these risks.

In a recent article, experts from the Bank for International Settlements (BIS) in Basel pointed out that central banks' main opportunities in using AI currently lie in the following: a) information collection and the compilation of official statistics; b) macroeconomic and financial analysis to support monetary policy; c) oversight of payment systems; and d) supervision and financial stability.[2] It is also worth noting that the BIS Innovation Hubs have been working on projects examining how AI and ML can be used to shore up defences against money laundering and terrorist financing.[3] It can be expected that future projects undertaken by the Innovation Hubs will focus increasingly on AI and ML.

1. For further information, see: Careful embrace: AI and the ECB.
2. For further information, see: https://www.bis.org/publ/bisbull84.pdf
3. cf. Project Aurora, an ongoing project of the BIS Innovation Hub Nordic Centre in Stockholm, in which the Central Bank of Iceland is a participant. For further information, see: https://www.bis.org/publ/othp66.pdf

Challenges associated with use of AI

AI brings with it a range of challenges and risks, both overall and in the particular context of central banking.

In most cases, AI relies on a vast amount of information, some of which may be identifiable (i.e., traceable to individuals). It is vital to take care to ensure compliance with the regulatory provisions on personal data protection and the sanctity of private life, which are enshrined in Iceland's Constitution. It is possible, for instance, to use AI to monitor individuals' emotional state on the basis of their behaviour and facial expressions and to monitor employees' performance. Because of this, the European Data Protection Board (EDPB) and the European Data Protection Supervisor (EDPS) have demanded that it be banned to use AI under certain circumstances.

The links between AI and ethics have been prominent in public discourse in recent years. One topic raised in this context is called *embedded AI bias*, which means that data used by AI could be biased or skewed, and that this bias could cause decisions made on the basis of AI-generated information to be discriminatory. The United Nations Educational, Scientific, and Cultural Organization (UNESCO) issued a recommendation on the ethics of artificial intelligence in 2021, in which it presented a range of recommendations for member states.[4]

It has been pointed out that because central banks thus far have used AI particularly for data analysis and processing, it is of paramount importance to ensure the reliability of the information to be processed using AI. The less reliable the data, the less credible the results of AI-backed analysis and processing will be. Furthermore, it could be difficult for central banks to explain their methods and conclusions if their work is based on complex AI-based methods.

Cyberattacks have grown substantially more common in recent years, and cybercrime is now an established part of organised crime and warfare. Today, some cyberattacks are based on the use of AI, and it can be assumed that continued tech advances will be accompanied by new cybersecurity- and AI- associated risks. The European Union Agency for Cybersecurity (ENISA) has reported that it considers AI one of the top cybersecurity challenges of the future.[5]

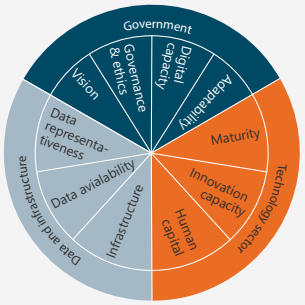
Finally, it is worth noting that concentration and oligopoly among AI service providers could entail significant operational and reputational risk for financial market participants, and could even threaten financial stability. An equipment malfunction experienced by any of these few service providers could prevent central banks from carrying out their roles properly.

Iceland, AI, and governmental artificial intelligence readiness indices

In April 2021, Iceland adopted an AI policy based on three pillars: first, that AI shall be for the benefit of all; second, that the Government's actions and priorities shall support the digital transformation of the economy, thereby supporting its competitive position; and third, that the educational system shall support constructive, ethical development in the adoption and use of AI in the years and decades to come. The aim of the policy is to provide for Iceland a strong, collective ethical foundation for the development and use of AI, based on thorough knowledge of the technology and the security challenges associated with it.[6]

Chart 1

The Pillars of the Government AI Readiness Index



Source: Oxford Insights (December 2023).

Oxford University's annual *Oxford Insights* reports include what is called the *governmental artificial intelligence readiness index*. This index is intended to enable a comparison of countries' ability to introduce AI in the public interest. The index comprises the following three pillars:

- the Government pillar
- the Technology Sector pillar
- the Data and Infrastructure pillar.

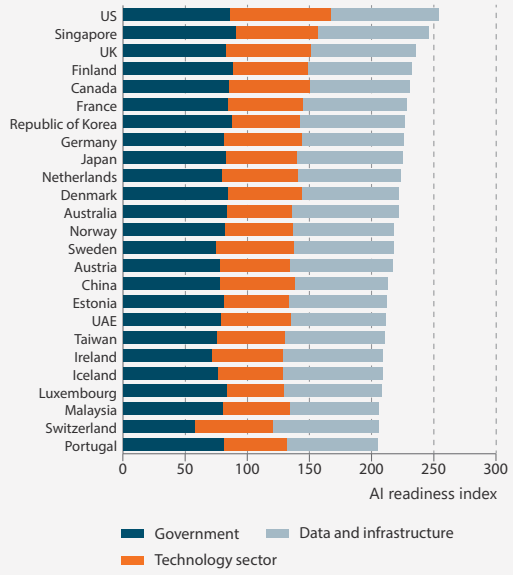
The pillars are further divided into ten dimensions, which are depicted in Chart 1. According to the 2023 Oxford Insights report, which includes 193 countries,

4. For further information, see: Recommendation on the Ethics of Artificial Intelligence.
5. For further information, see: ENISA AI Threat Landscape Report Unveils Major Cybersecurity Challenges.
6. The policy can be found here.

Iceland places 21st, see Chart 2 and has risen slightly in the rankings in recent years.[7]

Chart 2

Government AI readiness index[1]



1. The 25 countries that score highest on the adoption of AI in the public interest according to the Oxford Insights government AI readiness index.

Source: Oxford Insights (December 2023).

The International Monetary Fund (IMF) has also developed its own *AI Preparedness Index*, which is designed to help countries to set policy on AI. According to the IMF's report, AI is likely to affect approximately 40% of jobs, but to varying degrees, depending on how well developed the economies in question are. It is pointed out that inequality between countries could be exacerbated by the difference in their technological infrastructure and the capacity of their labour force to harness AI.[8]

In December 2023, the European Parliament and the Council reached an agreement on a regulatory framework for AI, which is intended to apply throughout the EEA. It will be the first such framework in the world. The aim is to ensure that AI systems marketed and used in Europe are secure and consistent with human rights objectives and other European values. The framework is also intended to stimulate AI-related investment and innovation in Europe. The next step is to finalise the draft Regulation on which the agreement is based, with the aim of implementing it in approximately two years' time. Presumably, it will be incorporated into the EEA Agreement and then into Icelandic law.[9]

Conclusion

This Box gives a brief overview of developments in artificial intelligence, which are moving rapidly at present. It is clear that AI brings with it a host of opportunities, some of which are already used by central banks to some extent. For the future, it is important to analyse further and harness the opportunities offered by AI and the technology on which it is based. It is no less important to consider and understand the challenges and risks associated with AI. The Central Bank will make every endeavour to be at the forefront in these efforts.

7. Within the three pillars and the ten dimensions are 39 indicators, which are covered more thoroughly in the report: https://oxfordinsights.com/ai-readiness/ai-readiness-index/.
8. The report can be found here: Gen-AI: Artificial Intelligence and the Future of Work.
9. See further the draft Regulation.

Appendix

Tables

Table 1 Financial system assets[1]

Assets, b.kr	31.12.2019	31.12.2020	31.12.2021	31.12.2022	31.12.2023	Change from 31.12.2022,%
Central Bank of Iceland	840	844	964	875	828	-5.0
Deposit-taking corporations excluding the Central Bank	3,775	4,212	4,700	5,103	5,391	6.0
Commercial banks	3,748	4,183	4,669	5,069	5,341	5.0
Savings banks and other deposit-taking corporations	26	28	31	34	50	45.0
Money market funds	144	145	128	138	128	-7.0
Non-MMF investment funds2	766	846	1,125	1,071	1,058	-1.0
Other financial intermediaries3, 4	290	258	221	232	255	10.0
Treasury	936	1,064	1,064	1,048	1,014	-3.0
– Housing Financing Fund	718	703	669	646	581	-10.0
Financial auxiliaries	25	54	59	56	73	32.0
Insurance corporations	259	290	320	314	323	3.0
Pension funds	4,975	5,732	6,747	6,626	7,287	10.0
Total assets	12,010	13,445	15,328	15,464	16,357	6.0

1. Including the old banks' holding companies from 31 December 2015 onwards.
2. Effective 31 December 2016, specialised investment companies are included with equity, investment, and institutional investment funds.
3. Effective 31 December 2015, after finalisation of composition agreements, the old banks' holding companies are classified as other financial corporations.
4. Beginning on 27 February 2019, Byr, ESÍ, the Framtíðin credit fund, and Sparisjóðabankinn (SPB) are classified among other financial institutions. Data are as follows: for Byr, from January 2016 onwards; for ESÍ, from December 2009 onwards; for Framtíðin, from May 2017 onwards; and for SPB, from February 2016 onwards.

Source: Central Bank of Iceland.

Table 2 DMB assets

Assets, m.kr.	31.12.2019	31.12.2020	31.12.2021	31.12.2022	31.12.2023	Change from 31.12.2022, %
Cash and deposits with Central Bank	329,923	213,003	281,653	279,738	289,861	4
Deposits in domestic deposit-taking corporations	633	1,736	3,627	3,141	3,520	12
Deposits in foreign deposit-taking corporations	63,887	85,059	80,358	120,225	69,337	-42
Domestic credit	2,784,748	3,070,639	3,409,643	3,817,885	4,034,698	6
Foreign credit	137,546	168,636	150,557	179,281	214,004	19
Domestic marketable bonds and bills	104,980	306,068	277,500	269,183	234,105	-13
Foreign marketable bonds and bills	145,433	146,996	183,058	170,722	285,808	67
Domestic equities and unit shares	121,132	123,347	191,208	141,481	133,498	-6
Foreign equities and unit shares	2,622	2,262	4,593	4,639	7,496	62
Other domestic assets	67,047	74,048	108,794	103,730	98,396	-5
Other foreign assets	16,693	19,845	9,229	13,221	18,853	43
Total	3,774,645	4,211,637	4,700,220	5,103,245	5,389,576	6

Source: Central Bank of Iceland.

Table 3 Other credit institutions' assets[1]

Assets, m.kr.	31.12.2019	31.12.2020	31.12.2021	31.12.2022	31.12.2023	Change from 31.12.2022, %
Cash and deposits with Central Bank	21,067	0	0	0	0	0
Deposits in domestic deposit-taking corporations	8,639	16,822	9,734	10,881	5,753	-47
Deposits in foreign deposit-taking corporations	28,597	24,927	15,945	3,887	1,519	-61
Domestic credit	154,903	178,680	162,245	176,866	194,046	10
Foreign credit	17,413	17,847	15,559	14,820	14,082	-5
Domestic marketable bonds and bills	1,430	5,037	9,818	12,373	15,452	25
Foreign marketable bonds and bills	0	350	268	335	363	8
Domestic equities and unit shares	29,765	521	1,145	2,385	3,537	48
Foreign equities and unit shares	6,681	1,451	76	135	3,279	2,324
Other domestic assets	18,126	8,849	3,599	4,155	4,744	14
Other foreign assets	3,445	2,650	2,771	5,743	12,142	111
Total	290,065	257,136	221,159	231,580	254,917	10

1. Beginning on 27 February 2019, Byr, ESÍ, the Framtíðin credit fund, and Sparisjóðabankinn (SPB) are classified among other financial institutions. Data are as follows: for Byr, from January 2016 onwards; for ESÍ, from December 2009 onwards; for Framtíðin, from May 2017 onwards, and for SPB, from February 2016 onwards.

Source: Central Bank of Iceland.

Table 4 Pension fund assets

Assets, m.kr.	31.12.2019	31.12.2020	31.12.2021	31.12.2022	31.12.2023	Change from 31.12.2022, %
Deposits in domestic deposit-taking corporations	151,522	164,821	170,092	164,592	146,036	-11
Deposits in foreign deposit-taking corporations	24,174	34,230	22,717	13,418	12,300	-8
Domestic credit	522,485	511,516	491,083	553,909	639,070	15
Foreign credit	378	495	423	629	719	14
Domestic marketable bonds and bills	1,970,450	2,105,645	2,305,830	2,324,959	2,463,515	6
Foreign marketable bonds and bills	8,516	8,568	7,578	20,226	24,837	23
Domestic equities and unit shares	805,115	987,843	1,336,313	1,234,146	1,261,947	2
Foreign equities and unit shares	1,465,596	1,887,539	2,384,949	2,287,003	2,700,648	18
Domestic insurance and pension assets	22,118	20,989	21,651	24,357	26,794	9
Foreign insurance and pension assets	48	50	30	62	31	-50
Other domestic assets	4,149	5,690	5,987	4,848	10,570	116
Other foreign assets	0	46	334	1,352	374	-72
Total	4,974,551	5,727,434	6,746,988	6,629,499	7,286,841	10

Source: Central Bank of Iceland.

Table 5 Insurance company assets

Assets, m.kr.	31.12.2019	31.12.2020	31.12.2021	31.12.2022	31.12.2023	Change from 31.12.2022, %
Cash and deposits with Central Bank	440	2,574	3,097	4,175	774	-81
Deposits in domestic deposit-taking corporations	10,166	6,985	6,441	8,823	11,703	33
Deposits in foreign deposit-taking corporations	48	28	0	0	0	0
Domestic credit	2,490	1,819	1,454	3,739	2,776	-26
Foreign credit	0	0	0	0	0	0
Domestic marketable bonds and bills	112,194	137,759	151,058	145,202	161,766	11
Foreign marketable bonds and bills	23,770	24,601	25,815	26,287	26,781	2
Domestic equities and unit shares	65,790	74,850	72,283	67,784	75,835	12
Foreign equities and unit shares	10,200	12,168	14,590	13,652	16,173	18
Domestic insurance and pension assets	24,772	25,786	27,550	29,181	7,511	-74
Foreign insurance and pension assets	6,997	6,311	6,614	5,673	9,577	69
Other domestic assets	7,183	7,721	10,411	9,580	10,081	3
Other foreign assets	750	319	200	134	91	-32
Total	264,800	300,922	319,512	314,230	323,067	3

Source: Central Bank of Iceland.

Table 6 D-SIB: Income and expenses

Income and expenses, m.kr.	31.12.2019	31.12.2020	31.12.2021	31.12.2022	31.12.2023	Change from 31.12.2022, %
Arion Bank hf.						
Operating income	47,998	50,764	58,225	57,198	64,181	12
Net interest income	30,317	31,158	32,063	40,277	44,685	11
Net fee and commission income	9,950	11,642	14,673	16,065	16,389	2
Other operating income	7,731	7,964	11,489	856	3,107	263
Operating expenses	26,863	24,441	25,875	26,911	25,701	-4
Change in loan values	382	5,044	-3,169	-144	1,348	-1,036
Income tax	6,698	4,532	8,298	11,558	11,391	-1
Net after-tax gain from discontinued operations	-12,955	-4,278	1,394	6,543	-4	-100
Profit	1,100	12,469	28,615	25,416	25,737	1
Íslandsbanki hf.						
Operating income	45,165	43,153	50,172	57,236	64,237	12
Net interest income	32,822	33,371	34,043	43,126	48,611	13
Net fee and commission income	10,899	10,525	12,849	14,053	14,234	1
Other operating income	1,444	-743	3,280	57	1,392	2,342
Operating expenses	25,424	23,425	23,884	24,083	27,603	15
Change in loan values	3,480	8,816	-3,018	-1,576	1,015	-164
Income tax	7,437	4,060	6,802	10,343	11,069	7
Net after-tax gain from discontinued operations	-370	-97	1,221	149	35	-77
Profit	8,454	6,755	23,725	24,535	24,585	0
Landsbankinn hf.						
Operating income	56,344	50,273	55,293	50,780	76,968	52
Net interest income	39,670	38,074	38,953	46,464	57,559	24
Net fee and commission income	8,219	7,638	9,483	10,623	11,153	5
Other operating income	8,455	4,561	6,857	-6,307	8,256	-231
Operating expenses	28,196	25,646	23,864	23,763	25,958	9
Change in loan values	4,827	12,020	-7,037	-2,473	3,120	-226
Income tax	5,086	2,086	9,547	12,493	14,723	18
Net after-tax gain from discontinued operations	0	0	0	0	0	0
Profit	18,235	10,521	28,919	16,997	33,167	95
D-SIB						
Operating income	149,507	144,190	163,690	165,214	205,386	24
Net interest income	102,809	102,603	105,059	129,867	150,855	16
Net fee and commission income	29,068	29,805	37,005	40,741	41,776	3
Other operating income	17,630	11,782	21,626	-5,394	12,755	-336
Operating expenses	80,483	73,512	73,623	74,757	79,262	6
Change in loan values	8,689	25,880	-13,224	-4,193	5,483	-231
Income tax	19,221	10,678	24,647	34,394	37,183	8
Net after-tax gain from discontinued operations	-13,325	-4,375	2,615	6,692	31	-100
Profit	27,789	29,745	81,259	66,948	83,489	25

Source: Commercial banks' financial statements.

Table 7 D-SIB: Key ratios

%	31.12.2019	31.12.2020	31.12.2021	31.12.2022	31.12.2023
Return on equity	4.5	4.8	12.4	10.1	12.1
Return on assets	0.7	0.7	1.9	1.5	1.7
Expenses as a share of net interest and commission income	57.8	54.1	51.8	43.8	41.1
Expenses as a share of total assets	2.1	1.8	1.7	1.6	1.6
Net interest and commission income as a share of total income	88.2	91.8	86.8	103.3	93.8
Net interest income as a share of total assets	2.7	2.6	2.4	2.8	3.0
Capital ratio	24.2	24.9	25.4	23.7	24.3
Foreign exchange as a share of the capital base	2.1	0.3	0.1	0.7	1.8
Liquidity coverage ratio (LCR), total	165.9	179.7	176.1	163.0	187.0
Liquidity coverage ratio (LCR), FX	508	481.3	514.3	519.0	741
Net stable funding ratio (NSFR), total	117	118.7	121	117.0	122
Net stable funding ratio (NSFR), FX	141.2	147	118.4	165.0	187

Source: Central Bank of Iceland.

Table 8 Commercial banks' foreign bond issues, last 12 months (28 February 2022 - 28 February 2024)

Issuer	Date	Currency	Amount (b.kr.)	Maturity (years)	Premium on interbank rate[1] %
Arion bank	Mar.23	SEK	4.0	3.0	3.00
	Mar.23	NOK	2.7	2.0	2.55
	May 23	EUR	44.7	3.0	4.07
Samtals			51.4		
Islandsbanki	Apr.23	SEK	6.6	3.0	3.65
	May 23	EUR	44.7	3.0	4.21
	Nov. 23	SEK	6.6	3.0	2.7
	Jan.24	SEK	6.7	3.0	2.36
	Jan.24	NOK	6.7	3.0	2.36
Samtals			71.3		
Landsbankinn	Mar.23	EUR2	42.0	5.0	0.9
	Aug. 23	SEK	5.4	2.0	3.05
	Aug. 23	NOK	12.4	2.0	3.05
	Mar.24	EUR	44.7	4.2	2.25
Samtals			147.5		

1. Interest premium on three-month interbank rate in the relevant currency unless otherwise specified.
2. Covered bond.

Source: Nasdaq Iceland.

Table 9 Capital buffers

Capital buffer	FME decision/ announcement[1]	Value %	Effective date
Systemic risk buffer, O-SII banks	8.4.2020	3	8.4.2020
Systemic risk buffer, other DMBs	8.4.2020	3	8.4.2020
Other Systemically Important Institutions buffer	8.4.2020	2	8.4.2020
Countercyclical capital buffer	14.3.2023	2.5	16.3.2024
Capital conservation buffer		2.5	1.1.2017

1. Effective 1 January 2020, the Central Bank of Iceland sets rules on capital buffers, subject to prior approval from the Financial Stability Committee (FSC).

Source: Central Bank of Iceland

Table 10 Indicators pertaining to the international investment position

	Unit	Frequency	2019	2020	2021	2022	2023
Net IIP	% of GDP	Q	20.0	34.2	43.4	24.0	37.7
External debt[1]	% of GDP	Q	78.0	84.9	86.5	78.6	71.6
Net external debt[2]	% of GDP	Q	21.4	22.4	30.0	29.9	25.2
Short-term debt based on remaining maturity[3]	% of GDP	Q	13.9	11.3	15.3	13.0	13.3
Treasury FX debt as a share of total debt	%	M	21.1	20.1	23.9	20.0	14.2
Commercial banks' foreign-denominated bonds	% of GDP	Q	19.3	22.0	22.2	20.7	19.1
Current account balance[4]	% of GDP	Q	6.5	0.9	-2.7	-1.7	1.0
International reserves	% of GDP	M	27.2	27.9	28.2	21.6	18.5
International reserves financed in krónur	% of GDP	M	20.2	18.4	14.9	12.7	11.4
International reserves/IMF RAM	%	Q	153.4	151.9	144.9	123.9	113.6
Terms of trade[5]	Value	Q	93.8	91.3	98.5	94.1	88.7
Nominal exchange rate[6]	Value	M	179.7	200.5	195.6	199.8	196.9
Real exchange rate[7]	Value	M	91.4	84.9	87.0	85.8	91.2
Treasury's highest credit rating	Rating	-	A2/A	A2/A	A2/A	A2/A	A1/A+

1. External liabilities with a known payment profile; i.e., excluding equity securities, unit shares, derivatives, and FDI in corporate equity.
2. External debt, net of comparable assets.
3. Short-term liabilities based on original maturity, plus foreign long-term loans and marketable bonds maturing within 12 months, and non-residents' holding in CBI2016 certificates of deposit, Treasury bonds, and Housing Financing Fund bonds maturing within 12 months.
4. The quarterly value is based on the last four quarters.
5. Index. Q1/2000 = 100.
6. Trade-weighted exchange rate index – narrow trade basket (1%).
7. Index. March 2005 = 100. In terms of relative consumer prices.

Sources: Statistics Iceland, Central Bank of Iceland.

Definitions

Account information service:
A direct-line service that provides consolidated information on one or more payment accounts as a user of payment services either from another payment service provider or from more than one payment service provider; cf. the Payment Services Act, no. 114/2021.

Account-to account (A2A):
A retail payment solution based on electronic payments transferraed from the buyer's bank account to the seller's bank account.

Acquirer:
A provider of payment services that offers acquiring service; cf. the Payment Services Act, no. 114/2021.

Acquiring service:
One type of payment service described in the Payment Services Act, no. 114/2021.

Authorisation:
Approval for payment granted by an entity, usually a deposit institution or a third party acting on the institution's behalf. Even though a request for authorisation is approved, it does not necessarily confirm the legitimacy of the transfer.

Balance on goods:
The balance on goods (goods account balance) is the difference between the value of exported and imported goods.

Balance on income:
The balance on income (income account balance) is the difference between revenues and expenses due to primary income and secondary income.

Balance on services:
The balance on services (services account balance) is the difference between the value of exported and imported services.

BCBS:
Basel Committee on Banking Supervision.

Bill:
A debt instrument with a short maturity, generally less than one year.

BIS:
Bank for International Settlements.

Block chain:
Technology that administers digital accounting or distributed ledgers.

Blockchain technology:
A type of distributed ledger technology that records all changes in a ledger in so-called blocks, in chronological order.

Bond:
A written instrument acknowledging the issuer's unilateral and unconditional obligation to remit a specified monetary payment.

Book value of a loan
The nominal value or outstanding balance of a loan once haircuts or loan loss provisions have been deducted.

Buy-now-pay-later (BNPL):
A payment method allowing the buyer to pay at a later date, usually through a payment system that administers all claims for creditors.

Calculated return on equity:
The profit for a given period as a percentage of average equity over the same period.

Capital base:
The sum of Tier 1 and Tier 2 capital after adjusting for deductions according to the CRR; cf. the Act on Financial Undertakings, no. 161/2002.

Capital buffers:
Additional capital requirements that financial undertakings must satisfy in accordance with the Act on Financial Undertakings, no. 161/2002. The countercyclical capital buffer, the buffer for domestic systemically important banks (D-SIB buffer), and the systemic risk buffer are determined through Central Bank rules upon prior approval by the Financial Stability Committee. The capital conservation buffer applies to certain financial undertakings according to Act no. 161/2002.

Capital ratio:
The ratio of the capital base to risk-weighted assets (risk base).

Cash:
Physical currency; i.e., banknotes and coin issued by a central bank.

Central bank money:
A claim against a central bank, either in the form of cash (banknotes and coin) or as a deposit held in an account with a central bank.

Central securities depository:
A licensed and supervised entity according to the Act on Central Securities Depositories and Settlement and Electronic Registration of Financial Instruments, no. 7/2020. Central securities depositories own and operate securities registration and settlement systems.

Claim value of a loan:
The nominal value or outstanding balance of a loan.

Clearing:
Intermediation, netting and, in some instances, confirmation of payment orders before settlement takes place.

Commercial bank:
A credit institution that has been granted a licence to operate as a commercial bank according to the Act on Financial Undertakings, no. 161/2002.

Commercial bank money:
A claim against a commercial bank or savings bank in the form of a deposit held in an account with the institution concerned.

CPMI:
Committee on Payments and Market Infrastructures, located at the Bank for International Settlements (BIS).

Credit institution:
A financial undertaking (commercial bank, savings bank, or credit undertaking) that accepts deposits or other repayable funds from the public and grants loans on its own account.

Cross-default non-performing loans:
This refers to non-performing loans according to the cross-default method, according to which all of a borrower's loans are considered non-performing if one loan is frozen or in arrears by 90 days or more, or if the borrower is deemed unlikely to pay their obligations when due.

Cryptocurrencies:
Electronic or digital currencies have not been defined in a harmonised manner, but the terms *virtual currency(-ies)* and *virtual asset(s)* have been used in Icelandic law.

CSDR:
Regulation (EU) no. 909/2014 on improving securities settlement in the European Union and on central securities depositories; cf. the Act on Central Securities Depositories and Settlement and Electronic Registration of Financial Instruments, no. 7/2020.

Current account balance:
The sum of the goods, services, and income account balances.

Debt service-to-income (DSTI) ratio:
The ratio of all mortgage loans carried by a given consumer or consumers in accordance with credit scores and credit assessments to the same party's disposable monthly income; cf. Rules no. 216/2024.

Debt multiplier:
Debt as a percentage of the book value of capital.

Deposit institution:
A financial undertaking (commercial bank or savings bank) authorised to accept deposits.

Digital cash:
A digital claim against a central bank (i.e., central bank digital currency, CBDC), which, if issued, can function as a standard currency.

Digital wallet provider:
An individual or legal entity that offers custodial services relating to the storage of virtual currency owners' payment information, using software, systems, or other types of media to manage, store, or transfer virtual currency; cf. the Act on Measures against Money Laundering and Terrorist Financing, no. 140/2018.

Disposable income:
Expected permanent income net of direct taxes and levies in accordance with the Act on Mortgage Lending to Consumers, no. 118/2016.

Distributed ledger technology (DLT):
Technology that has emerged in recent years and is based on the idea that encrypted information is stored in a secure, traceable manner in a distributed system instead of a centralised database. It has been used, among other things, to

develop cryptocurrencies such as Bitcoin. The blockchain does not include information on owners, and despite its traceability properties, there are certain restrictions on access.

Block chain:
Technology that administers digital accounting or distributed ledgers.

Domestic systemically important banks (D-SIB):
Banks that, due to their size or the nature of their activities, could have a significant impact on the stability of the financial system and the general economy, in the opinion of the Central Bank of Iceland Financial Stability Committee. Currently, Arion Bank hf., Íslandsbanki hf., and Landsbankinn hf. are classified as D-SIBs in Iceland.

Electronic money (e-money):
Monetary value in the form of a claim against the issuer, which is stored in an electronic medium, issued in exchange for funds for the purpose of remitting payment, and approved as such by parties other than the issuer; cf. the Act on the Issuance and Treatment of Electronic Money, no. 17/2013.

Encumbrance ratio:
The percentage of a bank's assets that are hypothecated for funding.

Equity:
Assets net of liabilities.

European supervisory bodies:
European Banking Authority (EBA), European Insurance and Occupational Pensions Authority (EIOPA), European Securities and Markets Authority (ESMA), and European Systemic Risk Board (ESRB); cf. the Act on the European System of Financial Supervision, no. 24/2017.

Expense ratio:
The ratio of operating expense net of the largest irregular items to operating income, excluding loan valuation changes and discontinued operations.

Facility-level non-performing loans:
According to the facility-level non-performing loan ratio, a customer's loan is classified as non-performing if it is in arrears by 90 days or more.

Financial market infrastructure:
A multilateral system among participating institutions, including the operator of the system, used for the purposes of clearing, settling, or recording payments, securities, derivatives, and/or other financial transactions; cf. the PFMI Core Principles.

Financial system:
Deposit institutions; miscellaneous credit undertakings (including the ÍL Fund); investment firms; pension funds; insurance companies; mutual, investment, and institutional investment funds; alternative investment funds; and State credit funds.

Financial technology (fintech):
Any type of innovation in financial services that is based on technology and can give rise to new business models, software, processes, or products in the area of payment services, and could affect the financial market, financial services, and the way in which financial services are provided.

Foreign exchange balance:
The Central Bank of Iceland has set the Rules on Foreign Exchange Balance, no. 784/2018. According to the rules, neither the overall foreign exchange balance nor the open position in individual currencies may be positive or negative by more than 10% of a systemically important bank's capital base. For other credit institution, the ratio is set at 15% of the capital base.

Foreign exchange imbalance:
A foreign exchange imbalance (or mismatch) is the difference between assets and liabilities in foreign currencies.

FSB:
Financial Stability Board.

Funding rules:
Funding rules according to the CRR (cf. the Act on Financial Undertakings, no. 161/2002) stipulate that credit institutions shall maintain a minimum net stable funding ratio (NSFR) of 100% in all currencies combined. The rules are based on international criteria developed by the BCBS. The rules on funding ratios are intended to restrict the degree to which the credit institutions can rely on unstable short-term funding to finance long-term foreign-denominated lending.

Holding company:
A company whose sole objective is to acquire stakes in other companies, administer them, and pay dividends from them without participating directly or indirectly, albeit with reservations concerning their rights as shareholders.

Indexation imbalance:
An indexation imbalance or mismatch is the difference between indexed assets and indexed liabilities.

Interbank market:
A market in which deposit institutions lend money to one another for a period ranging from one day to one year.

Interbank payment intermediation:
Payments routed between participants (financial undertakings) in interbank systems that are generally operated by central banks.

Internal payment system / In-house payment intermediation:
Payments between customers of a single payment service provider.

International investment position (IIP):
The value of residents' foreign assets and their debt to non-residents. The difference between assets and liabilities is the net international investment position (NIIP), also referred to as the net external position.

International reserves:
Foreign assets that are managed by monetary authorities and considered accessible if necessary.

Interest burden:
Interest payments as a percentage of disposable income.

Interest premium:
A premium on a base interest rate such as the interbank rate.

Intraday liquidity:
According to the BCBS definition, intraday liquidity refers to liquid assets that can be accessed during the business day, usually to enable banks to make payments in real time.

Key interest rate (policy rate):
The interest rate that is used by the Central Bank in its transactions with credit institutions and is the most important determinant of developments in short-term market interest rates. The rate that has the strongest effect on short-term market rates and is therefore considered the Central Bank's key rate may change from time to time.

Large exposure:
A financial institution's exposure to a given customer or group of related customers is considered a large exposure if it equals or exceeds 10% of the Tier 1 capital.

Legal tender:
Banknotes and coin that are issued by the Central Bank and must be accepted for all payments at full nominal value; cf. the Act on the Central Bank of Iceland, no. 92/2019, and the Act on Iceland's Currency, no. 22/1968.

Liquidity ratio (liquidity coverage ratio):
The ratio of high-quality liquid assets to potential outflows over a 30-day period under stressed conditions according to the Rules on Credit Institutions' Liquidity Ratios, no. 1520/2022; cf. Commission Delegated Regulation (EU) 2015/61.

Liquidity rules:
Rules no. 1520/2022 implement Commission Delegated Regulation (EU) 2015/61 on liquidity coverage requirements for credit institutions, which is based on international criteria developed by the BCBS. Credit institutions must maintain a 100% liquidity coverage ratio (LCR) in all currencies combined and must monitor ratios in significant currencies; i.e., individual currencies in which total obligations equal or exceed 5% of the institution's total liabilities. Furthermore, credit institutions shall satisfy a minimum 50% liquidity ratio in Icelandic krónur. They must also satisfy at least 80% of their liquidity ratio in euros if euro-denominated liabilities constitute 10% of more of their total liabilities.

Loan-to-value (LTV) ratio:
A debt as a percentage of the value of the underlying asset (for instance, mortgage debt as a percentage of the value of the underlying real estate); cf. Rules no. 217/2024.

Net stable funding ratio (NSFR):
The ratio of available stable funding to required stable funding according to the CRR; cf. the Act on Financial Undertakings, no. 161/2002.

Netting:
The process of forwarding, harmonising, and sometimes confirming payment instructions before settlement takes place, often by netting out obligations between parties without transferring funds between them.

Network interface:
A network termination point that is a physical connection point where a user is granted access to the network interface owner's computer system; for instance, a payment service provider's network interface.

Payment card turnover balance:
The difference between foreign nationals' payment card use in Iceland and Icelandic nationals' payment card use abroad.

Payment initiation:
Activation of payment instructions at the request of a user of payment services, as regards a payment account held with another payment services provider; cf. the Payment Services Act, no. 114/2021.

Payment institution:
A legal entity licensed to operate payment services in Iceland or another member state of the European Economic Area (EEA); cf. the Payment Services Act, no. 114/2021.

Payment instrument:
Equipment and/or procedures restricted to a named person on which a provider and user of payment services agree and which the user uses to give payment instructions; cf. the Payment Services Act, no. 114/2021.

Payment services:
Payment services are defined in Point 22 of Article 3of the Payment Services Act, no. 114/2021. They include deposits of cash to a payment account, electronic transfers of funds between payment accounts, issuance of a payment instrument, or execution of a money transfer. Also included is payment initiation, a new type of payment service.

Payment service provider:
A licensed and supervised entity that provides payment services according to the Payment Services Act, no. 114/2021.

PFMI:
The Principles for Financial Market Infrastructures, issued by CPMI/BIS and IOSCO.

PSD/PSD2:
The EU Payment Services Directive, implemented in Iceland with the Payment Services Act, no. 114/2021.

RB claim system:
The name given to a centralised database operated by RB hf. and administering all claims for creditors.

Real exchange rate:
Relative developments in prices or unit labour costs in the home country, on the one hand, and in trading partner countries, on the other, from a specified base year and measured in the same currency The real exchange rate is generally expressed as an index.

Real wage index:
An index showing changes in wages in excess of the price level. It is the ratio of the general wage index to the consumer price index (CPI).

Reserve adequacy metric (RAM):
The reserve adequacy metric (RAM) was developed by the International Monetary Fund (IMF) as a criterion for desirable size of international reserves, which can be determined with respect to a number of factors that affect a country's balance of payments and could provide indications of potential capital outflows. The RAM consists of four components: i. Export revenues: Reflect the risk of contraction in foreign currency accumulation. ii. Money holdings (broad money): Reflect potential capital flight in connection with liquid assets. iii. Foreign current (short-term) liabilities: Reflect the economy's refinancing risk. iv. Other foreign liabilities: Reflects outflows of portfolio assets. The RAM is the sum of 30% of foreign current liabilities, 15% of other foreign liabilities (20% for fixed exchange rate regimes), 5% of money holdings (10% for fixed exchange rate regimes), and 5% of export revenues (10% for fixed exchange rate regimes).

Risk-weighted assets:
Assets adjusted using risk weights according to the CRR; cf. the Act on Financial Undertakings, no. 161/2002.

Risk-weighted assets (risk base):
The sum of the weighted risks of financial undertakings (e.g., credit risk, market risk, operational risk, etc.), according to Regulation (EU) no. 575/2013 (the Capital Requirements Regulation, CRR); cf. the Act on Financial Undertakings, no. 161/2002.

Shadow bank:
Shadow banking is defined as credit intermediation involving entities and activities outside the regular banking system. Shadow banks include money market funds, bond and equity funds, investment funds, specialised investment companies, investment firms, brokers, specialised funds, and miscellaneous creditors. They do not include public financial institutions, pension funds, insurance companies, and financial auxiliaries.

Stablecoin:
A type of virtual asset whose value is pegged to the price of other assets or fiat currencies so as to prevent the price volatility that otherwise characterises virtual currency or cryptocurrency. Examples of types of stablecoin are Ether (pegged to the US dollar) and Diem (previously Libra), which Facebook is planning to launch.

Systemically important infrastructure:
Infrastructure that, according to a decision by the Central Bank Financial Stability Committee, is of such a nature that its operation could affect financial stability.

Terms of trade:
The price of goods and services imports as a percentage of the price of goods and services exports.

Trade-weighted exchange rate index (TWI):
The index measuring the average exchange rate in terms of average imports and exports based on the narrow trade basket.

Virtual assets (crypto-assets):
Any type of value held in digital form that can be used for payment or investment and can be transferred, but is not classified either as electronic money in the sense of Act no. 17/2013 or as currency issued by a central bank or other authority; cf. the Act on Measures to Prevent Money Laundering and Terrorist Financing, no. 140/2018. A virtual asset is an electronic representation of monetary value, issued by a party that is neither a central bank nor a supervised entity in the sense of the law, whose unit value is determined by the issuing party. The best-known virtual asset system is Bitcoin.

VIX implied volatility index:
The expected volatility of the S&P 500 index according to the pricing of options related to it. It gives an indication of investors' risk appetite or risk aversion.

Yield:
The annualised return that an investor requires on funds invested.

Yield curve:
A curve that plots financial market yields at set points in time.

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