2021|2

FINANCIAL STABILITY

SEÐLABANKI ÍSLANDS

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.

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Statement of the Financial Stability Committee 29. September 2021

The economic recovery of the past few months, coupled with an accommodative monetary and macroprudential stance, has supported households and businesses. On the other hand, asset prices – equity securities and real estate prices in particular – have risen markedly.

The three large banks are strong, their capital and liquidity are well above regulatory minima, and they have ready access to liquidity in both krónur and foreign currencies. As a result, they are highly resilient.

In recent months, the rapid rise in house prices has gone hand-in-hand with increased household debt. Therefore, with the aim of containing long-term systemic risk, the Financial Stability Committee (FSN) has decided to adopt rules on maximum debt service-to-income (DSTI) ratios, as is provided for in Article 27 of the Act on Mortgage Lending to Consumers, no. 118/2016. In general, the maximum DSTI ratio shall be 40% for first-time buyers and 35% for all other borrowers. The ratio shall be calculated based on a specified maximum loan maturity. Lenders are granted an exemption from the rules for up to 5% of the total amount of new mortgage loans issued each quarter.

Uncertainty about financial institutions' position has receded, and loan quality has improved. As a result, financial institutions are resilient enough to lend to households and businesses. In the FSN's opinion, the scope it had granted to financial institutions after the pandemic reached Iceland, in the form of a reduction in the countercyclical capital buffer (CCyB), is no longer needed. The FSN is of the view that the combination of rapidly rising asset prices and increased household debt has already raised cyclical systemic risk to at least the pre-pandemic level. As a consequence, in view of the build-up of cyclical systemic risk, the FSN has decided to increase the CCyB from 0% to 2%. This decision will take effect twelve months from now, in accordance with the rules that apply to the countercyclical capital buffer. The CCyB proved its worth during the pandemic, and the Committee has given consideration to what a neutral buffer value should be in the future.

The FSN has concluded its annual review of the capital buffer for systemic importance (O-SII buffer) and has decided to hold it unchanged at 2% for all exposures at the parent company and the group level. The review of systemically important financial institutions, carried out in accordance with European Banking Authority methodology, confirmed the systemic importance of Arion Bank hf., Íslandsbanki hf., and Landsbankinn hf.

In view of recent cyberattacks and operational disruptions in payment intermediation, the FSN urges operating entities to examine the security of their systems and take steps to ensure business continuity. The Committee is of the view that, alongside payment cards, Iceland needs to have in place a domestic electronic retail payment solution that is independent of international financial infrastructure. This will bring increased operational security and efficacy. The Central Bank is preparing for the implementation of such a solution.

The Financial Stability Committee will continue to use every tool at its disposal to safeguard financial stability in Iceland.

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 domestic asset markets have rebounded strongly in the past twelve months, with a surge in turnover and a rapid rise in prices. There are many signs that imbalances are growing quickly in Iceland's asset markets, and uncertainty about the future has increased. Share prices have risen by 57% in the past twelve months and are relatively high by some measures. For instance, the asset price gap – the deviation of prices from long-term trend – is at its widest since 2008. Property prices have also risen sharply. The real rise in the capital area house price index was 11.6% year-on-year at the end of August: 10% for condominiums and 15% for detached housing. The number of properties advertised for sale fell 45% year-on-year in August, the average time-to-sale is close to its historical low, and a large share of homes sell at a premium on the asking price. The asset price gap in the housing market is now nearly 14%, its widest since 2008. Market prices have also risen in excess of determinants such as wages and construction costs.

The surge in property prices and housing market turnover has been a driver of household credit growth, which has gained pace in recent months, measuring 6.8% in real terms at the end of July, as compared with 4.3% at the end of April. There are signs that the quality of new mortgage loans is deteriorating, as loan-to-value and debt service-to-income ratios have risen despite the steep increase in property prices and disposable income. This could be because borrowers are refinancing less and taking on more debt. Rapidly rising asset prices concurrent with growing indebtedness gives cause for concern, as this pattern implies an increase in systemic risk.

The banks' profitability has grown in tandem with the economic recovery and stronger GDP growth, and household and corporate arrears have declined. The banks' non-performing loan ratios are now roughly where they were before the pandemic. In recent quarters, the banks have reversed a portion of the impairment recognised in 2020. As of end-June 2021, their impairment account stood at 1.34% of the loan portfolio, about the same as at year-end 2019, and had fallen from 1.84% since the end of 2020.

Despite strong growth in household lending in recent months, the banks' liquidity is very strong. At the end of August, their liquidity in excess of the minimum required by the Central Bank totalled around 290 b.kr., an increase of 43 b.kr. year-on-year. Credit spreads on their foreign bond issues have remained low, and the banks have ready access to foreign credit markets. Their króna-denominated market funding has declined somewhat.

Operational risk associated with financial market infrastructure, particularly electronic retail payment intermediation, has materialised in several instances in recent weeks. It is essential that each and every operating entity examine the security of their systems and put in place appropriate contingency plans to ensure business continuity. It is also important to strengthen the framework for the system as a whole and coordinate action plans in response to increased risk in this area. At present, a large share of Iceland's electronic retail payment intermediation is routed through foreign payment card infrastructure. Iceland needs to have in place a domestic electronic retail payment solution that is independent of international infrastructure. Such a solution could serve as a backstop or alternate route for the domestic retail payment intermediation system.

Financial Stability: Developments and prospects

I

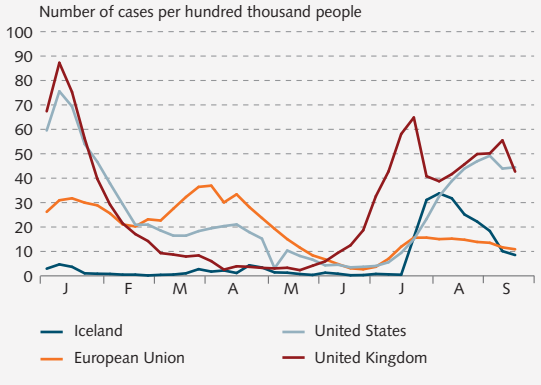
The domestic economic outlook has improved, but pronounced uncertainty remains

Iceland saw strong GDP growth in Q2/2021, in line with falling COVID-19 case numbers, relaxation of public health measures, and rising tourist numbers. Domestic infection rates rose for a while during the summer, fuelled by the spread of the Delta variant of the virus. Case numbers have fallen again, and public health measures have been eased further. As a result, the outlook is for a continued economic recovery, with GDP growth forecast to measure 4% for 2021 as a whole. This reflects the offsetting impact of a faster-than-expected increase in tourist arrivals versus weaker growth in domestic demand. There is considerable economic uncertainty in Iceland and abroad, and developments will depend to a large degree on how successful efforts to manage the pandemic prove to be. Although a large percentage of Iceland's population has been fully vaccinated, the current vaccines' effectiveness against the Delta variant and its potential successors remains uncertain.[1]

Chart I-1

Daily new confirmed COVID-19 cases[1]

1 January - 20 September 2021



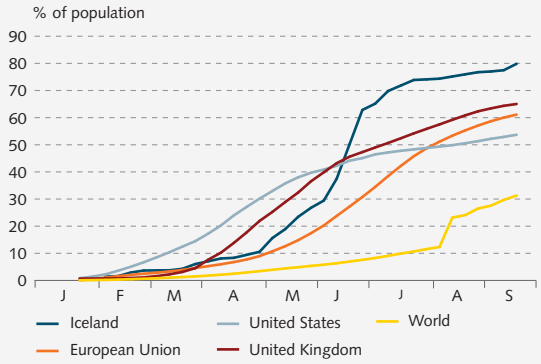
1. Seven day moving average.

Source: Our World in Data.

Chart I-2

Share of the population fully vaccinated

1 January - 20 September 2021



Source: Our World in Data.

Terms of trade improved in Q2/2021, after having deteriorated in Q1, and the outlook is for an improvement of 2% in 2021 as a whole.[2] This is due to an improved outlook for the price of exported marine products and aluminium, which rose more in Q2 than was previously expected. Higher oil and commodity prices pull in the opposite direction. The real exchange rate fell by 1% month-on-month in August but was 9% higher than in August 2020.

1 See the Central Bank's macroeconomic forecast in *Monetary Bulletin* 2021/3.

2 See *Monetary Bulletin* 2021/3.

According to the International Monetary Fund's (IMF) July forecast, global GDP growth is projected to measure 6% in 2021.[3] While this is broadly in line with the previous forecast, the Fund now expects a more rapid recovery in advanced economies and a slower one in emerging and developing countries. The divergence stems mainly from different levels of access to COVID-19 vaccines. According to the Fund's report, most developed countries can expect a return to more or less normal economic activity later this year. On the other hand, the IMF has expressed concern about the position of other countries further ahead, noting that they are at risk of having to struggle with further spread of the virus at a time when advanced economies are expected to tighten their monetary stance. Many emerging countries have seen their debt increase during the pandemic, and less favourable financial conditions could erode their position still further.

Many countries have tightened their macroprudential policy stance again

Most European countries eased their macroprudential policy stance following the spread of COVID-19 in a bid to boost financial system resilience, but in recent months, many central banks have tightened it again so as to limit systemic risk. A major factor in this is the widespread low-interest environment that has stimulated asset markets, real estate markets in particular. The Norwegian finance ministry increased the countercyclical capital buffer to 1.5% in June, owing to steep rises in both property prices and household debt. The Czech National Bank made a similar decision, raising the countercyclical capital buffer to 1% in May and to 1.5% in August. In June, the Danish Systemic Risk Council recommended to the Ministry of industry, Business, and Financial Affairs that the requirement be increased to 1%. Furthermore, the Swedish Financial Supervisory Authority has announced plans to make a decision on increasing the countercyclical capital buffer at the end of September 2021.

In addition to having been a determinant of specific macroprudential policy decisions in the recent term, the pandemic has widely prompted governmental authorities to consider their overall macroprudential policy. The Swedish financial supervisor recently announced a revised policy on the application of the countercyclical capital buffer, which entails that in a normal economic climate, the buffer requirement shall generally be set at 2%[4]. Henceforth, the supervisor aims to increase the buffer requirement soon after the situation normalises in the wake of a shock or contraction, irrespective of whether or not leading indicators suggest that cyclical systemic risk is accumulating. Earlier this year, the vice-president of the European Central Bank drew attention to the need for even more countercyclical application of capital buffer requirements than is currently provided for under the European regulatory framework.[5] There is reason to increase the weight of variable capital buffers such as capital conservation buffers and countercyclical capital buffers, while reducing the weight of non-cyclical requirements such as systemic risk buffers, but without changing their overall scope in a normal economic climate.

Various countries have tightened borrower-based measures, which are generally applied if it is believed that imbalances in the real estate market could jeopardise financial stability. At the beginning of the year, debt service-to-income (DSTI) ratios were capped in France, and limits were imposed on loan maturities. In Iceland, the Central Bank Financial Stability Committee decided in June to lower the maximum loan-to-value (LTV) ratio on consumer mortgages from 85% to 80%.[6] In addition, the Bank has raised its key interest rate by a total of 0.50 percentage points in two equal increments since the last *Financial Stability* report was published, bringing the key rate to 1.25%.

Current account deficit

Iceland's current account balance was negative by 54 b.kr., or 3.5% of GDP, in H1/2021, as compared with a surplus measuring 0.3% of GDP for the same period in 2020. The goods account deficit grew by 2% of GDP between years, owing to strong growth in imports, particularly to include goods for private consumption and inputs for tourism and investment.[7] The services account showed a surplus [in H1] despite a deficit in Q1, owing mainly to the surge in tourist arrivals in Q2 and intellectual property export revenues in the pharmaceuticals industry. The deficit on combined goods and services trade equalled 3.9% of GDP during the period, the largest single-half deficit since H1/2008. The balance on income was positive by 0.3% of GDP, but the surplus shrank markedly between years, partly because of reduced losses recorded by foreign-owned Icelandic subsidiaries.

3 International Monetary Fund, *World Economic Outlook*, July 2021.

4 Finansinspektionen. Finansinspektionen's approach to setting the countercyclical capital buffer. Memorandum dated 22 March 2021. Available at https://tinyurl.com/2ckyckwx.

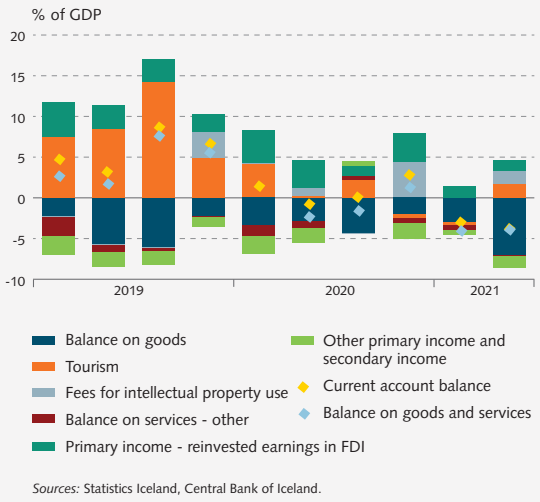
5 Speech by Luis de Guindos at a financial stability conference held by the Bank of France and the Paris Institute of Political Studies (Sciences Po), 1 March 2021. Available at https://www.bis.org/review/r210303d.pdf.

6 Minutes of the Financial Stability Committee meeting of 27 July 2021.

7 About half of the year-on-year increase is due to a domestic airline's leasing of three aircraft in June.

Chart I-3

Current account balance



Sources: Statistics Iceland, Central Bank of Iceland.

According to the Bank's new macroeconomic forecast, the outlook is for a turnaround in H2/2021, with the current account showing a surplus averaging around 2% of GDP in 2022 and 2023.[8]

Iceland's net international investment position (NIIP) was positive by 36.6% of GDP at the end of Q2/2021 and had improved by 2.1 percentage points in the first half of the year. About a third of the change is due to capital transactions and the remainder to price and exchange rate movements. Foreign securities appreciated by 12% over the period, offset by a 23% rise in domestic securities prices and a nearly 5% appreciation of the króna.

International reserves close to the upper end of the IMF reserve adequacy threshold

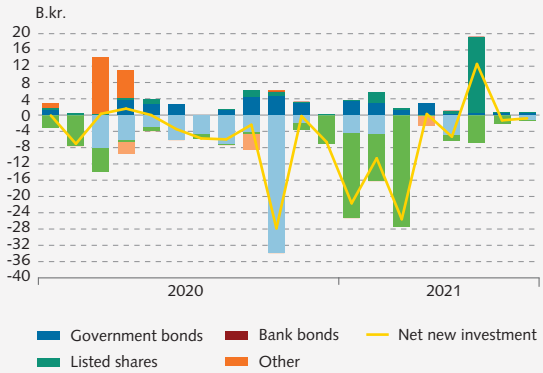
The Central Bank's international reserves totalled 931 b.kr. at the end of August, and the ratio of the reserves to the International Monetary Fund's (IMF) reserve adequacy metric (RAM) was 146% at the end of Q2. The reserves have increased by 74 b.kr. since the end of March, as a result of the IMF's allocation of special drawing rights (SDR) in an amount equivalent to 55.4 b.kr.[9] and net interbank foreign currency purchases by the Central Bank in the amount of nearly 15 b.kr. during the period.

Capital flows well balanced

Net foreign capital inflows for new investment have been broadly negative since H1/2020 and close to zero for the past two months. There were some inflows in June, mainly in connection with foreign investors' participation in Íslandsbanki's initial public offering (IPO). Furthermore, foreign index funds bought domestic shares after the Icelandic market was included in MSCI's Frontier Markets indices this past May. Outflows from Treasury bonds and other securities have been relatively limited in the recent term.

Chart I-4

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.

A number of barriers to foreign investment in Iceland have recently been removed. In June, restrictions on derivatives trading involving the Icelandic króna were lifted with the entry into force of the new Foreign Exchange Act, no. 70/2021, whereas such trades previously required confirmation by the Central Bank. For further discussion, see the Box entitled *Comprehensive review of the statutory framework for foreign exchange and full removal of capital account restrictions*. This change makes it easier for investors in the domestic securities market to manage their exchange rate risk and, all else being equal, should boost foreign investors' interest in Iceland.

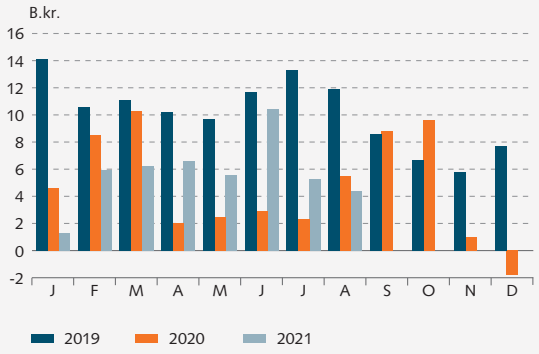
Icelandic pension funds' net foreign currency purchases totalled 32 b.kr. from April through the end of August, twice the total for the same period in 2020, when the funds temporarily scaled down their currency purchases. Since February, their net purchases have hovered around 6 b.kr. per month, except for June, when they bought currency for just over 10 b.kr. Despite this increase in 2021 to date, the pension funds have bought far less than in 2019, when their purchases averaged roughly 10 b.kr. per month. The recent rise in foreign securities prices appears to have temporarily reduced demand for currency, at least among those pension funds whose foreign assets are close to the upper threshold provided for in their investment strategies.

8 See *Monetary Bulletin* 2021/3.

9 For further information, see the press release posted on the Central Bank website in August: https://www.cb.is/publications/news/news/2021/08/27/IMF-general-allocation-expands-Icelands-international-reserves/

Chart I-5

Pension funds' net foreign currency transactions



Source: Central Bank of Iceland.

Sharp increase in flight offerings this summer

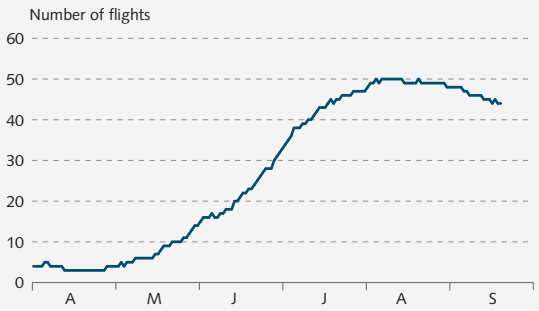
The Icelandic tourism industry has seen an upswing in activity in recent months. Flights to and from the country increased markedly in number this summer, and over 300,000 foreign tourists visited Iceland between June and August, as compared with 680,000 over the same period in 2019. Iceland's inclusion in the European Centre for Disease Prevention and Control's red list and the US Centers for Disease Control's designation of Iceland as a high-risk destination have not yet had a severely negative impact on visitor numbers. But with the spread of the Delta variant of the virus, the risk of new variants, and public health measures in place at the border, there is pronounced uncertainty about demand for travel to Iceland in coming months.

Non-residents' payment card use while in Iceland has increased rapidly, in line with the rise in tourist numbers. Between June and August, average card turnover per tourist was 45% higher in krónur terms than over the same period in 2019, or nearly 38% higher at constant exchange rates. As long as public health measures remain in place at the border, tourists will probably opt for longer stays than they have in the past instead of popping over for a brief trip. Luxury travel appears to be in demand as well.

Chart I-6

Number of flights to Keflavík airport[1]

7 April - 19 September 2021

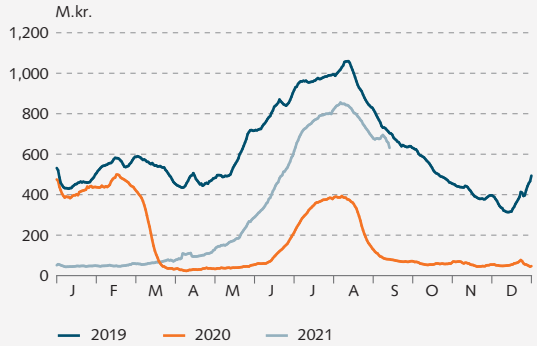


1. Seven-day moving average.

Sources: Isavia, Central Bank of Iceland.

Chart I-7

Foreign payment cards, daily turnover[1]



1. Seven-day moving average. Foreign credit and debit cards, total turnover in Iceland.

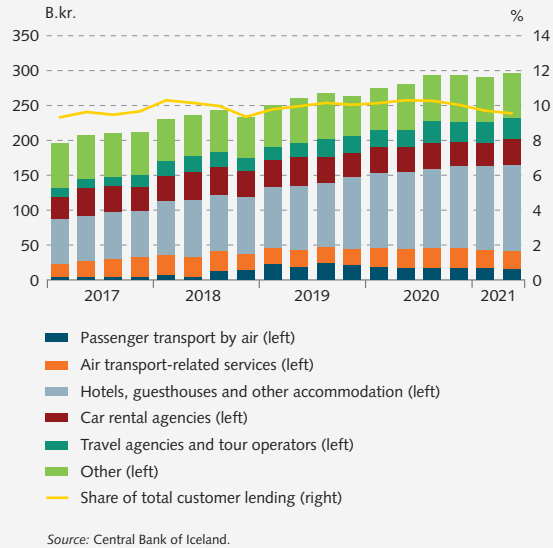
Source: Central Bank of Iceland.

Credit risk still discernible

Growth in tourism sector debt appears to have eased. Annual growth in the domestic systemically important banks' (D-SIB) lending to tourism companies, at claim value, measured 5.3% in nominal terms at the end of Q2/2021, down from 11.3% at the end of 2020. There is still some uncertainty about the operational viability of

Chart I-8

D-SIB lending to the tourism industry



Source: Central Bank of Iceland.

many tourism companies, as a large share of borrowers in the sector are still sheltered by financial institutions' special measures. A majority of loans to tourism companies are still classified with increased credit risk in the banks' loan books, and the D-SIBs' write-downs of loans to the sector measured 8.3% of claim value at the end of Q2.

It is difficult to forecast the future prospects for the Icelandic tourism industry, as uncertainty about vaccine efficacy is a significant risk factor. That said, the rapid rise in tourist numbers over the past few months shows that demand for travel to Iceland remains strong. In the next few years, the operating environment in the sector will depend in large part on how the pandemic develops in Iceland and neighbouring countries, and how quickly appetite for travel recovers.

The Central Bank bought large amounts of foreign currency this summer

The króna has depreciated by 0.7% since the April issue of *Financial Stability*, but exchange rate volatility has been limited. At the beginning of May, the Central Bank discontinued its regular foreign currency sales programme, under which it had sold currency for 71 b.kr. since mid-September 2020. The aim of the programme was to deepen the market and improve price formation after a period of reduced turnover and inefficient price formation following the spread of the pandemic.[10] The Bank has bought currency a few times this summer, particularly in June, in connection with Íslandsbanki's initial public offering (IPO) and the inclusion of the Icelandic stock market in MSCI's Frontier Markets indices. In September, concurrent with increased market volatility, the Bank has sold currency several times, for a total of nearly 5 b.kr. The Bank's net foreign currency purchases have been positive in the amount of just under 14 b.kr. since the last *Financial Stability* report was published.

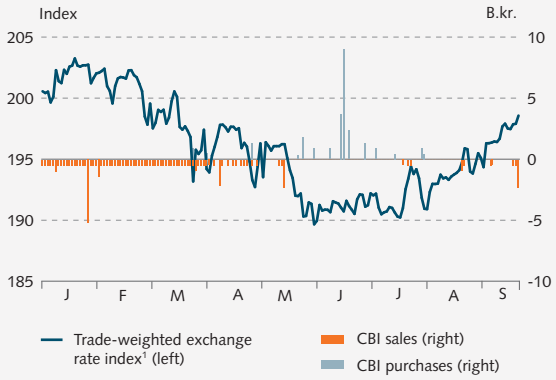
Soaring share prices

In recent weeks share price volatility has increased on the Nasdaq Iceland exchange, owing to uncertainty about the upcoming Parliamentary elections and spillovers from global stock markets, which have been shaken by the solvency problems facing Chinese real estate developer Evergrande. In the months prior, stock prices had risen rapidly, and the OMXI10 index had repeatedly hit new post-financial crisis highs. By mid-September the OMXI10 had risen by 108% from its March 2020 trough, and about 11% since the April *Financial Stability* report. These steep price increases have been driven in part by retail and institutional investors' interest in the potential for profit at the current interest rate level. This interest has been reflected in strong excess demand in IPOs over the past several months. The shareholder group has quadrupled in size since year-end 2019, and roughly one of every ten Icelanders, a post-crisis high, now owns shares listed on the exchange.[11] For further discussion of the equities market and its potential impact on financial stability, see the Box entitled *The equity securities market and financial stability*.

Chart I-9

Exchange rate of the króna and CBI transactions in the interbank FX market

4 January - 20 September 2021



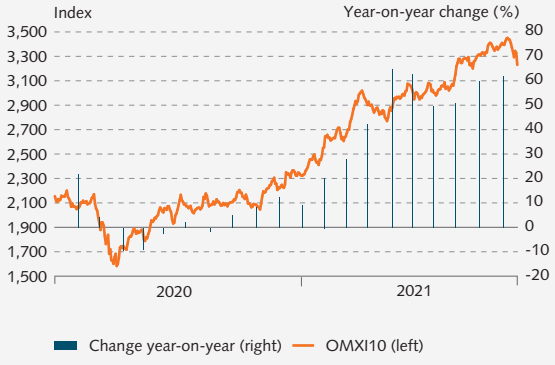
1. Narrow trade basket (1%).

Source: Central Bank of Iceland.

Chart I-10

OMXI10 index

1 January 2020 - 20 September 2021



Source: Refnitiv Eikon.

10 For further information, see press release posted on the Central Bank of Iceland website in April https://www.cb.is/publications/news/news/2021/04/30/Central-Bank-discontinues-regular-foreign-currency-sales/

11 The shareholder group has expanded from 8,000 to 32,000 since year-end 2019. Interview with Baldur Thorlacius, Managing Director of Nasdaq Iceland: https://www.visir.is/g/20212133690d.

Trading volume on the exchange has increased markedly between years. During the first eight months of 2021, turnover totalled 647 b.kr., about 75% more than over the same period in 2020. Direct pledging in the Icelandic market stood at just over 11% in June. The pension funds hold about 35% of listed Icelandic companies in terms of market value. The assets are not pledged. As a result, direct pledging of shares held by owners other than the pension funds totals 17%.12 In recent months, direct pledging of shares has declined to a level not seen since late 2017. The past few months' price increases therefore do not appear to be debt-driven.

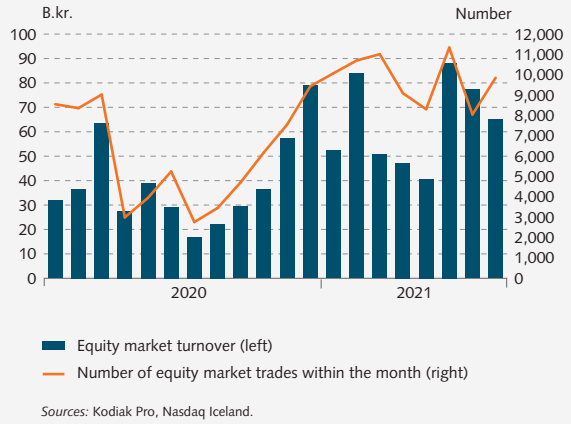
Four companies have been admitted for trading on the market since the last *Financial Stability* report: Síldarvinnslan and Íslandsbanki on the Main Market, and Fly Play and Solid Clouds on the First North growth market. In Síldarvinnslan's 30 b.kr. IPO, held in May, demand outstripped supply by a factor of two. Following the Íslandsbanki IPO, concluded in mid-June, a 35% stake in the bank was sold for 55.3 b.kr., leaving 65% of the bank's shares in the hands of the Icelandic Government. Demand exceeded supply by a factor of eight. Today Íslandsbanki is the third-largest company on the Main Market. Fly Play's 4.3 b.kr. IPO, which ended in late June, was oversubscribed eightfold, and Solid Clouds' offering of shares for 725 m.kr., also ending in late June, was oversubscribed fourfold.

The Icelandic stock market was included in MSCI's Frontier Markets indices in May, and Arion Bank and Marel were simultaneously included in the Frontier Markets index. At the same time, several smaller Icelandic firms were included in the MSCI Frontier Small Cap index. Icelandic companies were also included in MSCI's Frontier Markets 100 and Frontier Markets 15% Country Capped index. MSCI indices attract significant capital, and a number of foreign funds invest in accordance with them or use them as a benchmark. After the addition of Icelandic firms to the indices, there was a temporary surge of inflows from foreign index funds, particularly for investment in Arion and Marel shares.

Domestic share prices have risen steeply in comparison with most foreign indices, but stock prices have also risen markedly in many markets abroad, particularly in the US. Nevertheless, when comparing share price developments in Iceland and abroad, it is well to bear in mind that Iceland had greater scope to respond to the economic repercussions of the pandemic than many other countries did. The Central Bank lowered its key interest rate by two percentage points in the wake of the virus, whereas many other countries did not have the space to do likewise. As a result, it is possible that policy rate cuts stimulated the equity market more in Iceland than in other countries.

Chart I-11

Turnover and number of trades in the Icelandic equity market

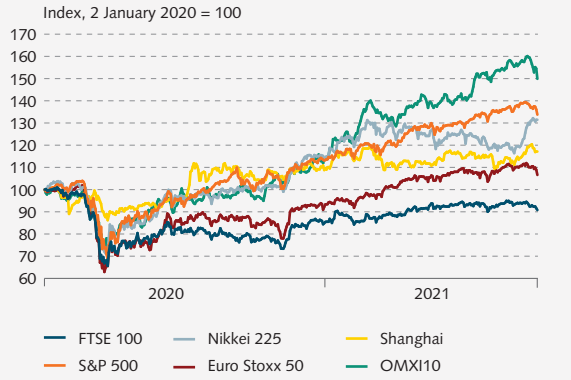


Sources: Kodiak Pro, Nasdaq Iceland.

Chart I-12

Selected equity markeet indices

1 January 2020 - 20 September 2021



Source: Refinitiv Eikon.

Yields on long-term nominal Treasury bond yields have risen

Since the April *Financial Stability* report, yields have risen on nominal Treasury bonds, particularly on short maturities, while yields on indexed Treasury bonds have fallen marginally. The five- and ten-year breakeven inflation rate in the bond market has therefore risen since April, albeit more on the short end. In the past few weeks, long-term nominal Treasury bond yields have risen in tandem with increased uncertainty such as that roiling the stock market

12 Direct pledging is the average percentage of pledged shares for all listed companies on both the Main List and the First North market, based on the relative weight of each company. Only direct pledges are considered; therefore, no account is given to general collateral in shares or indirect collateralisation via derivatives contracts. Therefore, pledging in the Icelandic equity market is probably higher.

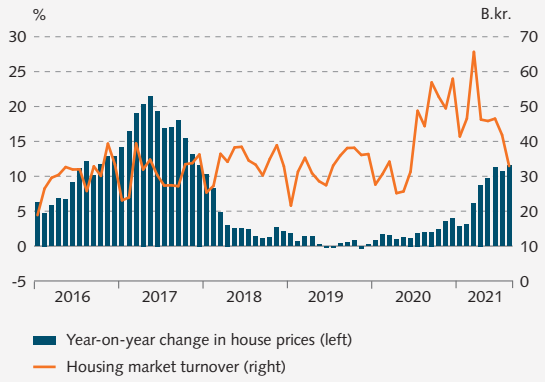
The bond market has been relatively quiet in recent months, with turnover for the first eight months of 2021 totalling 738 b.kr., which is 38% less than over the same period in 2020. The Central Bank of Iceland has bought Treasury bonds in the secondary market for 15 b.kr. in 2021 to date, and for 22.6 b.kr. since it began buying Treasury bonds in May 2020. At its August meeting, the Bank's Monetary Policy Committee agreed that the Bank should stop placing bids in the bond market for the present, yet keep the policy instrument at its disposal should circumstances call for it.[13]

House prices soaring …

Real house prices in the capital area have taken off since February, when the year-on-year rise measured 3.1%. Since then, prices have risen by nearly 9%, and the yearly change measured 11.6% at the end of August. Single-family home prices have risen considerably more than condominium prices in recent months, with August measurements showing increases of over 15% for detached housing and just over 10% for condominium housing.

Chart I-13

Real house prices and housing market turnover in greater Reykjavík[1]

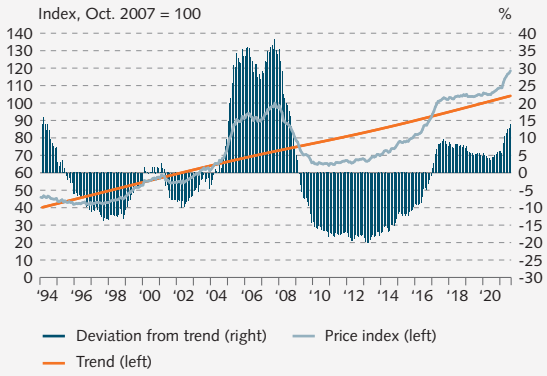


1. Housing market turnover, at constant December 2020 prices.
Sources: Registers Iceland, Statistics Iceland, Central Bank of Iceland.

Capital area turnover has declined somewhat from its March 2021 peak but is still historically high. In real terms, turnover increased by more than ⅔ year-on-year in Q2, but in July and August it was down between years. Likewise, the number of residential purchase agreements fell between years in July and August, the first year-on-year drop since May 2020. The decline in real estate market activity seems to be due mainly to a shortage of properties listed for sale, but on the other hand, demand appears to remain strong, the average time-to-sale has been near record lows in recent months, and a large share of properties are sold at a premium on the asking price.

Chart I-14

Real house prices in greater Reykjavík, deviation from trend[1]



1. Capital area house price index, deflated with the CPI. Trend is determined using a Hodrick-Prescott (HP) filter with the multiplier λ=32,400,000.
Sources: Registers Iceland, Statistics Iceland, Central Bank of Iceland.

… and the risk of a correction is growing

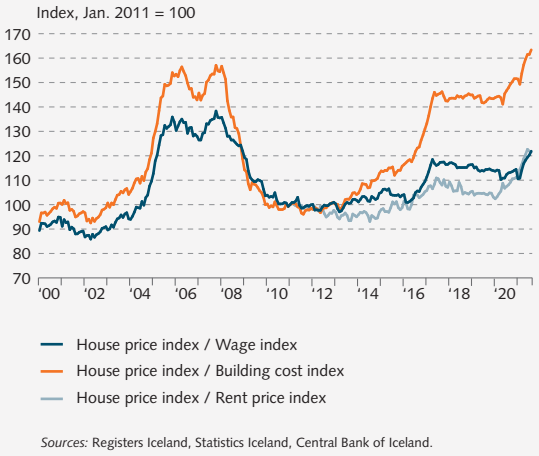
In 2021 to date, the real rise in the house price index has been well above its long-term trend. The index currently stands at a scant 14% above trend, as compared with 6% at the beginning of the year. This is the largest upward deviation from trend since 2008, and an indication that the risk of a house price correction is growing. Residential property prices have also risen somewhat in excess of their determinants in recent months. The twelve-month rise in the ratio of prices to wages measured nearly 8% at the end of August, and house prices have also risen somewhat more than disposable income. Other indicators of developments in house prices suggest as well that imbalances are growing.

While house prices have risen since the onset of the pandemic, there has been little change in capital area rent, and the ratio of house prices to rent has begun to show an imbalance. As of end-August, the price-to-rent ratio had risen by 12.4% year-on-year and was above its ten-year average by nearly a fifth. Even so, rent rose markedly in July and August, indicating that rent prices are starting to rebound. The number of registered leases declined by more than 10% year-on-year in the first eight months of 2021, but there was a noticeable increase in lease registration in 2020, following an increase in the number of flats available for rent.

13 See the minutes of the MPC meeting of 23-24 August 2021: https://www.sedlabanki.is/utgefid-efni/frettir-og-tilkynningar/frettasafn/frett/2021/09/08/Fundargerd-peningastefnunefndar-23.-til-24.-agust/

Chart I-15

Capital area house prices and their determinants



Sources: Registers Iceland, Statistics Iceland, Central Bank of Iceland.

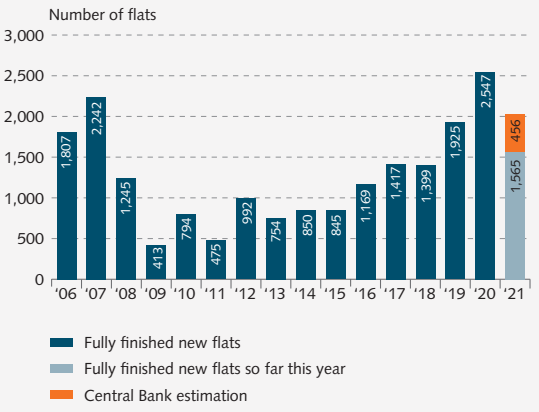
Access to cheap credit has fuelled demand for housing. House prices have risen steeply, as has household indebtedness, which could be a sign of growing risk. At its meeting in late June, the Central Bank Financial Stability Committee decided lower the maximum loan-to-value (LTV) ratio on consumer mortgages from 85% to 80% but left the LTV for first-time buyers unchanged at 90%. Further discussion of developments in the mortgage lending market can be found later in this chapter.

Newly built homes decline in number

Based on developments year-to-date, the number of housing starts in 2021 will be comparable to 2020, which saw a steep drop relative to 2019. Contractors appear to be prioritising completion of flats under construction, allowing new projects to proceed more slowly.

Chart I-16

Fully finished new flats in greater Reykjavík[1]



1. Fully finished flats are those in construction stages 7 and 8. The total for 2021 as a whole is estimated based on the number of finished flats by mid-September.

Sources: Registers Iceland, Central Bank of Iceland.

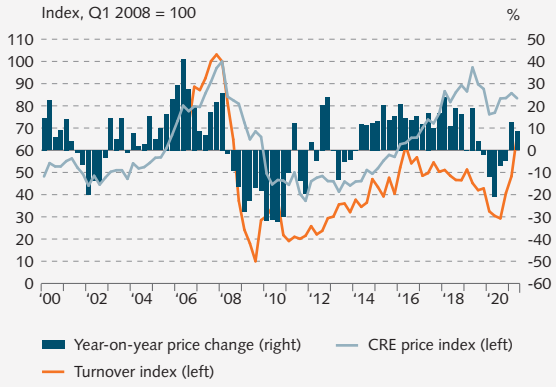
However, the outlook is for the number of newly built flats in greater Reykjavík to decline relative to 2020, when some 2,500 properties were completed. Based on the number of flats completed by mid-September, it can be assumed that roughly 2,000 properties will be completed this year, slightly above the Federation of Icelandic Industries' March estimate. A year-on-year decrease in the number of newly built homes alongside a sharp decrease in properties listed for sale indicates a continued mismatch between supply and demand in the housing market, which could push prices even higher.

Buoyant commercial property market

The commercial real estate (CRE) price index rose by 8.5% year-on-year in Q2/2021[14] and is now nearly 7% above its estimated long-term trend. The index held broadly unchanged in H1/2021 and is close to its pre-pandemic level (from end-2019). The COVID-19 shock has affected different sectors to varying degrees and in different ways. While some companies, primarily those in tourism and related sectors, have suffered severe negative effects, other firms have benefited from increased demand. Furthermore, the past few months' turnaround in the labour market, with the associated rise in job numbers, indicates that demand for commercial property has grown.

Chart I-17

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.

Sources: Registers Iceland, Statistics Iceland, Central Bank of Iceland.

Since 2018, CRE prices have developed broadly in line with determinants such as construction costs and overall economic activity. The ratios of the CRE price

14 The most recent CRE price index value is preliminary and could change if purchase contracts are registered late.

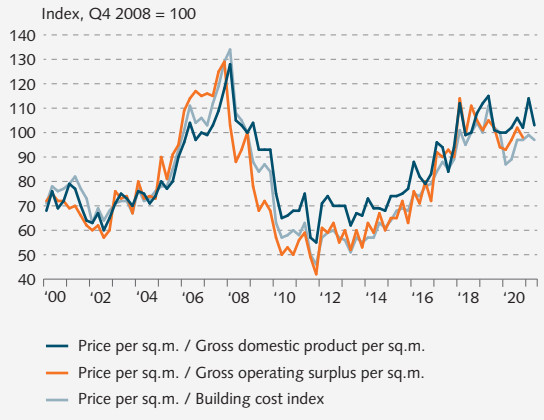
index both to gross operating surpluses and to GDP suggest that prices have not risen in excess of fundamentals over this period. Nevertheless, the ratios are somewhat above their average in the 21st century to date, as prices rose swiftly during the years after 2014. Much the same can be said of the ratio of CRE prices to the building cost index, which is nevertheless closer to its long-term average.

At first, the pandemic cut significantly into CRE market turnover, but towards the end of 2020 the market started to rebound, and since then turnover has been high in historical context. Turnover according to registered transactions in greater Reykjavík more than trebled year-on-year in real terms in the first seven months of 2021.

As long as public health measures remain in effect, tourism and various services – such as restaurants, pubs and dance halls, and cinemas – will suffer from reduced demand. The adverse effects of the pandemic on tourism are subsiding, however. If public health measures remain in place in the coming term, many companies' operational foundations could be affected, with the associated negative impact on the commercial property market.

Chart I-18

Commercial real estate prices in Greater Reykjavík and other economic variables[1]



1. Annual data for gross operating surplus are interpolated based on quarterly private consumption. Annual data for the housing stock are interpolated linearly by quarter.

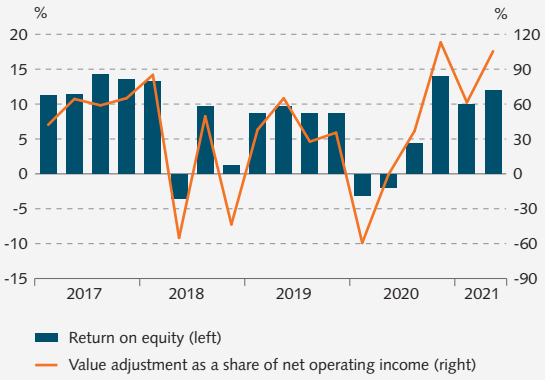
Sources: Registers Iceland, Statistics Iceland, Central Bank of Iceland.

Commercial real estate firms showing resilience

The effects of the pandemic on the operating results of Eik, Reginn, and Reitir, Iceland's three large commercial property firms, have been tapering off in recent months. The companies' most recent earnings reports showed positive valuation adjustments of investment assets, which have been an average of 20% higher than the companies' profits in the past three quarters. Their cash flows have increased again after sagging in 2020, with cash from operations rising nearly 60% year-on-year in real terms in H1/2021. Thus far, they have used lower interest rates as an opportunity to refinance rather than taking on additional debt. The three firms' combined equity ratio was 32.2% at the end of Q2, slightly higher than at the turn of the year. Despite positive signs, there is still pronounced uncertainty about the effect the pandemic will have on the CRE market in the coming term. Therefore, it is important that companies in the sector continue to safeguard their resilience. In the long run, the shift towards working from home, increased online shopping, and other factors could affect demand in the market.

Chart I-19

Return on equity and value adjustment of investment assets[1]



1. Combined ratios for commercial property firms Eik, Reginn, and Reitir. Return on equity shows annualised quarterly earnings divided by equity.

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

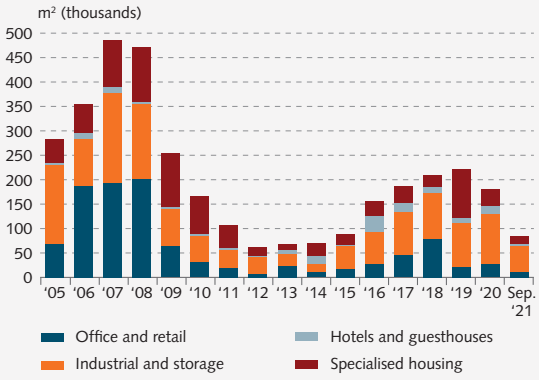
Decline in commercial property actively under construction

Construction of commercial property has slowed in recent years and appears likely to continue easing, based on the situation at the beginning of September. At that time, the stock of fully finished property had grown by 0.4% year-to-date. The amount of commercial property actively under construction shrank markedly over the first eight months of the year.[15] A large amount of guest accommodation space is still under construction in the capital area – about 13% of the currently available sup-

15 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. Part of the reduction in September 2021 stems from the fact that it represents a roughly eight-month period, while other values represent a full year.

Chart I-20

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. Part of the reduction in September 2021 stems from the fact that it represents a roughly eight-month period, while other values represent a full year.

Sources: Icelandic Property Registry, Central Bank of Iceland.

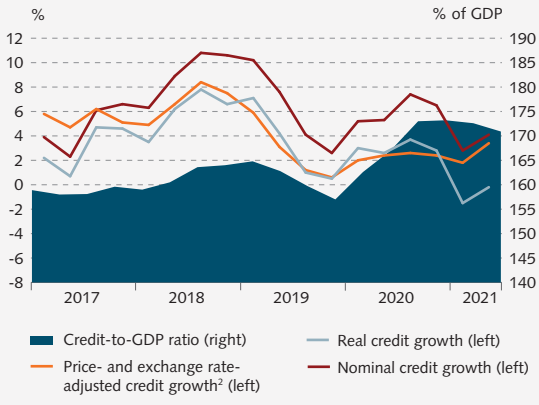
ply – but work has slowed on many of these projects. A smaller amount of commercial property under active construction now than during the post-crisis period reduces the likelihood that an overshooting of supply will push prices downwards in the coming term.

Private sector debt on the rise...

In real terms, private sector debt was unchanged year-on-year in Q2/2021, after having grown by 2.6% year-on-year in Q2/2020. Corporate and household debt have developed differently in the recent term: household debt has been rising, while corporate debt has contracted. The contraction in corporate debt is due in large part to the appreciation of the króna. Adjusted for price and exchange rate movements, private sector debt grew by 3.4%. At the end of Q2, private sector debt amounted to 170.9% of GDP, after falling markedly between quarters, as GDP grew more rapidly than debt.

Chart I-21

Private sector credit growth[1]



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

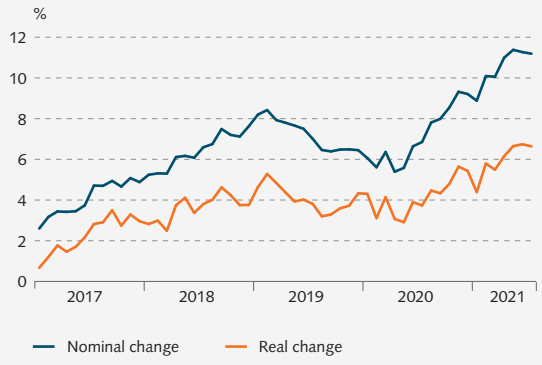
Sources: Statistics Iceland, Central Bank of Iceland.

... and growth in household debt has accelerated

Growth in household debt has gained pace in recent months, measuring 6,8% in real terms at the end of July, as compared with 6.1% at the end of April. Growth in debt is driven by strong household demand for mortgage loans, still available at historically favourable rates, while other debt, including consumer debt, has contracted. At the beginning of the year, there were signs that credit growth was easing, as monthly net new loans to households had declined from 30 b.kr. in October 2020 to 16 b.kr. in February 2021. But since then, they have increased once again, to 29 b.kr. in July.

Chart I-22

Household credit growth[1]



1. Year-on-year change in household total debt to domestic financial institutions.

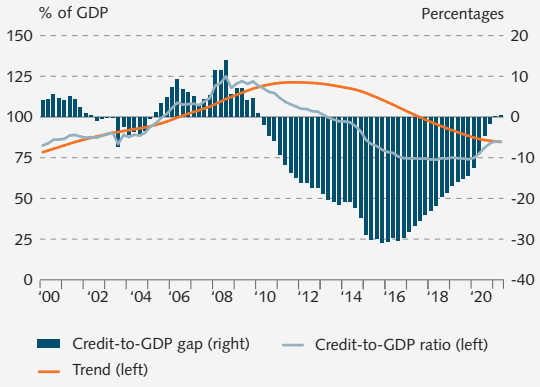
Sources: Statistics Iceland, Central Bank of Iceland.

The household debt-to-GDP ratio was just under 84.9% at the end of Q2/2021. It therefore stood virtually still between quarters but is now about 11 percentage points higher than at year-end 2019. It rose steeply in 2020, owing both to the contraction in GDP (which explains more than half of the increase) and to increased credit growth. This sharp rise means that the deviation of the ratio from its long-term trend is now positive for the first time since 2010.

The share of indexed household debt continues to decline. At the end of Q2, only 50% of household mortgage debt was indexed, down from 69% at the beginning of the pandemic. Low interest rates have made non-indexed mortgages a more desirable option for households. A growing number of households are choosing fixed-rate mortgages: just under 68% of net new

Chart I-23

Household credit-to-GDP ratio[1]



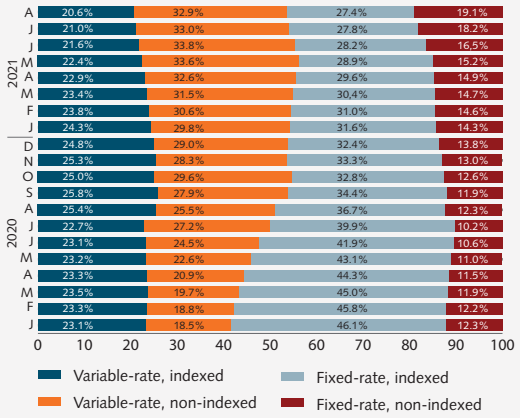
1. Credit to households at claim value divided by GDP of the last four quarters. Trend component is obtained with a one sided Hodrick-Prescott filter with λ=400.000.

Sources: Statistics Iceland, Central Bank of Iceland.

non-indexed mortgage loans granted in August bore fixed interest rates.[16] A majority of non-indexed mortgages still bear variable interest, however. This increased demand for fixed-rate loans is due to the Central Bank's 0.25 percentage point interest rate hike in May and the expectation of further rate increases to come. The rate hike in May was the first one following a series of rate cuts after the pandemic struck. As can be seen in Chart I-25, the May rate increase immediately affected rates on new mortgages issued in June. The Bank raised the key rate by another 0.25 percentage points in August, but the impact of that increase has not yet shown in Central Bank statistics.

Chart I-24

Consumer mortgages, by type[1]



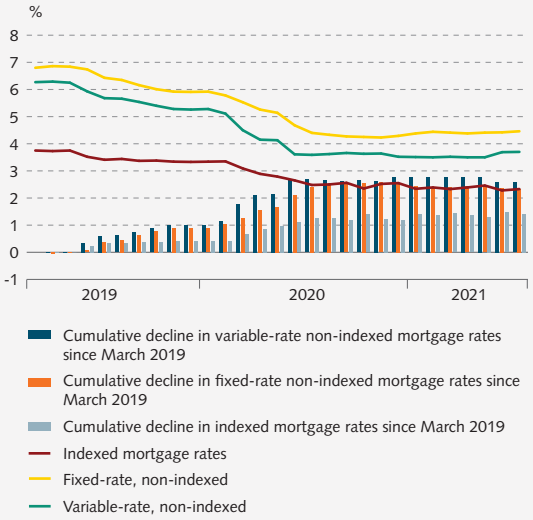
1. Proportional breakdown of consumer mortgages, by type, from the D-SIBs and the Housing and Construction Authority. Including loans from the largest pension funds from August 2020 onwards.

Source: Central Bank of Iceland.

16 Figures on interest rate clauses in new mortgage loans do not include pension fund loans.

Chart I-25

Developments in mortgage lending rates[1]

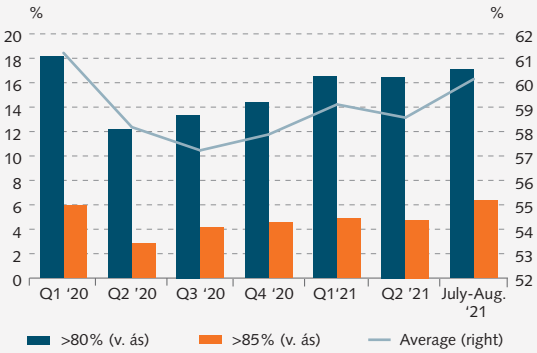


1. Weighted average rates on new household mortgages granted by the D-SIBs, within each month.

Source: Central Bank of Iceland.

Chart I-26

Developments in LTV ratios for consumer mortgages[1]



1. Average loan-to-value (LTV) ratio on new consumer mortgages issued by the D-SIBs and the Housing and Construction Authority and share of new loans with LTV ratio over 80% and 85%. Including new pension fund loans from August 2020 onwards. Data for August are preliminary.

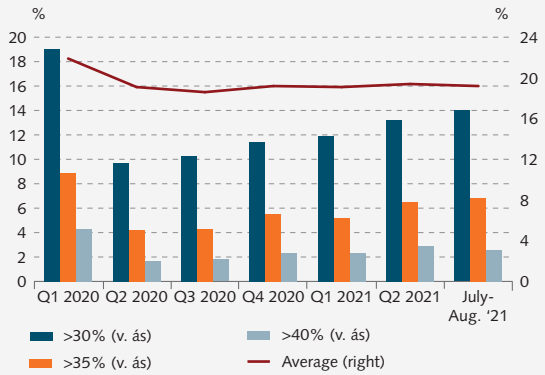
Source: Central Bank of Iceland.

Non-indexed variable-rate loans entail greater interest rate risk for borrowers than other types of loans do, as the debt service on such loans can spike suddenly when interest rates rise. Households are increasingly choosing fixed interest rates in order to hedge against interest rate risk, thereby limiting uncertainty about debt service in the next few years. This reflects their expectations about developments in interest rates.

There are signs that average loan-to-value (LTV) ratios on new mortgages are rising. The average declined markedly in spring 2020, as refinancing accounted for a large share of new lending at the time; however, it has been rising again in the recent term in line with a falling

Chart I-27

Developments in DSTI ratios on new consumer mortgages[1]



1. Average debt service ratio (DSTI) on new consumer mortgages issued by the D-SIBs and the Housing and Construction Authority and share of new loans with DSTI over 30%, 35%, and 40%. Including new loans from the largest pension funds from August 2020 onwards. Data for August 2021 are preliminary.

Source: Central Bank of Iceland.

share of refinancing and rising house prices.[17] Overall, the average debt service-to-income (DSTI) ratio on new mortgages has held relatively stable. The share of loans with high DSTI ratios has increased however and has this increase gone hand-in-hand with the growing share of non-indexed fixed-rate loans, rising interest rates and rising house prices.

Increased growth in household lending and a rising share of non-indexed variable-rate loans concurrent with steep house price increases imply increased risk. Borrowers could have greater difficulty servicing their debt if interest rates rise steeply and suddenly, with the associated contagion risk, which could affect, for instance, the price of assets and private consumption. It is therefore important that debt service on mortgage loans be kept within prudent limits that take account of potential interest rate increases.

Corporate debt still contracting

At the end of Q2/2021, corporate debt contracted by 6.2% year-on-year in real terms. Much of this contraction stems from the appreciation of the króna over the period, which lowered foreign denominated debt in krónur terms. The decline is much smaller, or 0.8%, if adjusted for price and exchange rate movements. Just over a third of Icelandic companies' debts are in foreign currencies; therefore, exchange rate movements have a significant impact on firms' debt position.

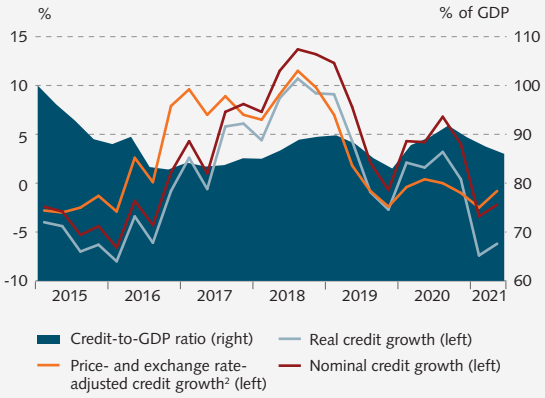
17 It could be imprudent to overinterpret developments in LTV and DSTI ratios between Q2 and Q3/2020, as data on pension fund loans first became available in Q3/2020.

Even though measurements show a contraction in corporate debt, indicators imply that credit growth may be picking up. For example, price- and exchange rate-adjusted growth in the D-SIBs' corporate loans measured -1% at the end of August compared to -4,5% in year end 2019. In addition, cumulative net new loans from deposit institutions to companies totalled 60 b.kr. in the first eight months of 2021. This is a turnaround relative to 2020, when cumulative net new loans were negative by 3 b.kr. over the whole year.

Developments in corporate debt in the recent term do not indicate that firms in general have needed to add on debt to withstand pandemic-related hardships. For instance, the commercial banks' corporate lending

Chart I-28

Corporate credit growth[1]

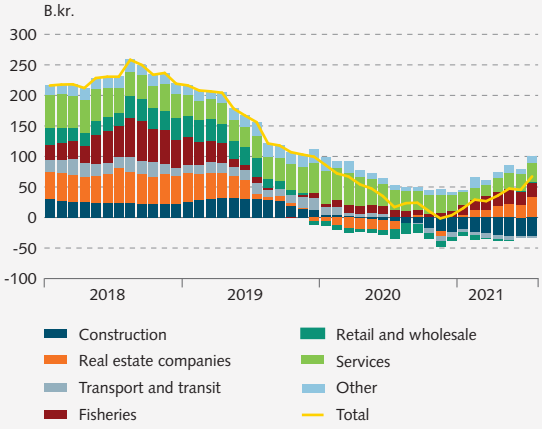


1. Lines show yearly growth rates. 2. CPI-indexed credit at constant prices and foreign-denominated credit at constant exchange rates.

Sources: Statistics Iceland, Central Bank of Iceland.

Chart I-29

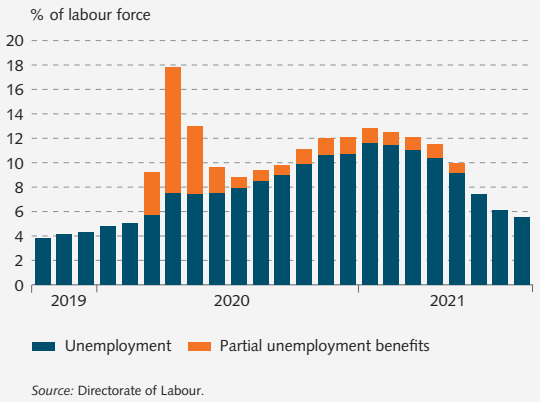
Net new corporate loans[1]



1. Twelve-month moving sum. New loans less loan retirement and loan prepayments in excess of contractual requirements. Figures at constant prices. Figures include loans issued by deposit institutions, the ÍL Fund, and the Housing Fund.

Sources: Central Bank of Iceland.

Chart I-30
Registered unemployment



Source: Directorate of Labour.

has contracted in nearly all sectors over the past twelve months, the only exception being the services sector, which recorded a real growth rate of just 3% at the end of August. Frozen loans are widespread in the sector, and this could add to growth in debt, as frozen loans are not paid down with contractual instalments and can accrue interest.

Households' position strong, arrears on the decline

The outlook for households' position has improved since the last *Financial Stability* report, and the economy is recovering more rapidly than previously expected. In spite of an uptick in domestic COVID-19 cases, it has been possible to ease public health restrictions significantly, not least because roughly 88% of Icelanders had been fully vaccinated by mid-September.[18]

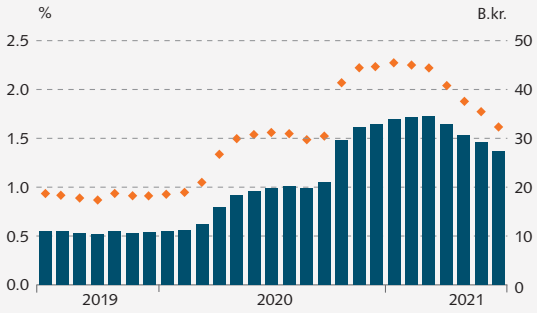
Wages have risen markedly in the recent term, with the general wage index up 7.9% year-on-year and the real wage index up 3.4% year-on-year as of end-August. Unemployment has fallen rapidly in recent months, and registered unemployment measured 5.5% in August. The number of unemployed persons has fallen in all key sectors, but by far the most in tourism and related industries. The jobless rate is now comparable to that seen at the beginning of the pandemic, after peaking at 11.6% in January 2021. Despite this positive development, unemployment remains high, as it had already risen somewhat before the pandemic struck. According to the Central Bank's forecast, it is expected to continue falling in the next few years.[19]

The pandemic-related surge in unemployment has not caused household arrears to increase. At the end of Q2, the D-SIBs' non-performing loan (NPL) ratio on household loans had fallen 0.8 percentage points year-on-year, to 1.0%.[20] The decline in the NPL ratio was due in part to an increase in D-SIB lending to households, although arrears had also fallen in krónur terms. The amount of frozen loans has also fallen somewhat in recent months, although it is still above the pre-pandemic total. At the end of August, some 1.7% of the D-SIBs' household loans were frozen, as compared with 1% in February 2020.[21] But given the magnitude of the economic contraction brought on by the pandemic, this has to be considered a modest increase.

Chart I-31
General wage index and real wage index[1]

1. Year-on-year change.
Source: Statistics Iceland.

Chart I-32
D-SIBs' frozen household loans[1]



1. Parent companies, claim value, constant prices. Frozen loans according to the cross-default method.
Source: Central bank of Iceland.

18 Based on the population aged 12 and over as of 1 January 2021.

19 *Monetary Bulletin* 2021/3.

20 The facility-level non-performing loan ratio is calculated according to European Banking Authority (EBA) standards. Under this method, a customer's loan is classified as non-performing if it is in arrears by 90 days or more.

21 The summarised figures on frozen loans are based on the cross-default method. According to the cross-default method, 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.

Households were highly resilient at the onset of the pandemic, and on the whole, interest rate cuts and the various support measures introduced by the authorities have been successful in safeguarding that resilience. Government measures, together with credit institutions' willingness to grant distressed households temporary moratoria on payment, have kept arrears from rising, thereby promoting financial stability.

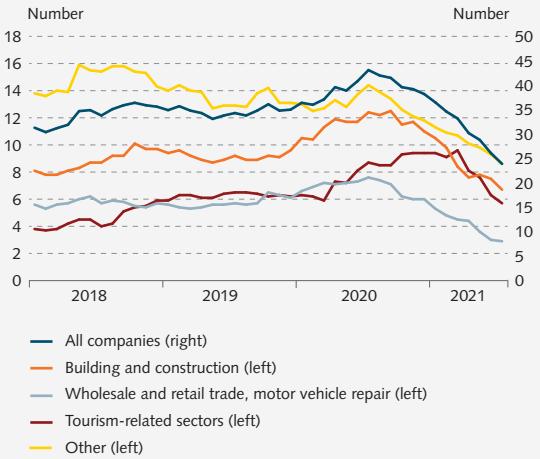
A sizeable share of corporate loans are still frozen

The uncertainty about firms' position that has prevailed since the pandemic struck has receded somewhat. Executives are now more positive in the wake of a successful vaccine rollout and relaxation of public health measures. The tourism industry bounced back rather strongly after restrictions on tourist arrivals were eased, and the effect on related sectors has been positive.

Chart I-33

Insolvencies of actively operating companies[1]

Twelve-month moving average



1. Number of insolvencies of companies deemed by Statistics Iceland to have been actively in operation in the year prior to insolvency.

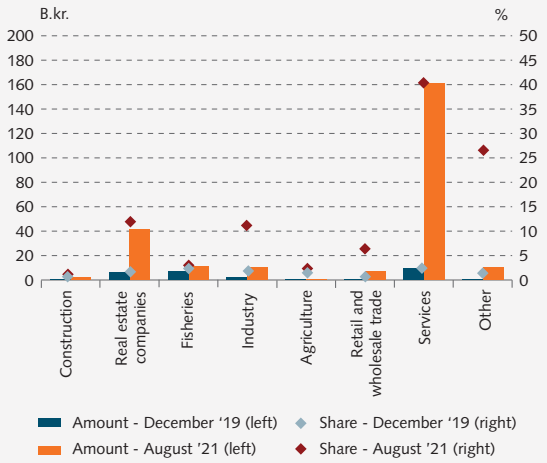
Sources: Statistics Iceland, Central bank of Iceland.

Even though many firms suffered severe revenue losses as a result of the pandemic, there has not been a discernible increase in corporate NPLs. The D-SIBs' NPL ratio was 4.4% at the end of Q2, only half a percentage point higher than in Q1/2020. The pace of new additions to the corporate default register has slowed, and the number of company insolvencies has fallen steadily since the beginning of the pandemic.[22]

A sizeable share of corporate loans are still frozen, however. At the end of August, 15.1% of the D-SIBs' loans to businesses were frozen. This ratio has fallen marginally in recent months but remains far above the 4.5% measured at the onset of the pandemic. It is highest by far – 40.3% – in the services sector, which includes most of the tourism industry. It is still uncertain how large a share of these loans will end up in default and how much the banks will ultimately recover on them.[23]

Chart I-34

D-SIBs' frozen corporate loans[1]



1. Parent companies, book value. Frozen loans according to the cross-default method.

Source: Central Bank of Iceland.

A broadly applicable measure of cyclical risk

On the whole, the financial cycle is still in an upward phase, albeit a slow one. As is discussed above, it is driven primarily by growth in household debt, which propels the credit cycle.

The graphic representation of the financial cycle in Chart I-35 is based on eight variables associated with developments in credit, property prices, and the banks' funding and are considered to move in line with cyclical systemic risk.[24] This presentation can be useful in integrating information and interpreting its significance for financial stability. One possible interpretation of Chart I-35 is that if the financial cycle is above zero and rising, it signals the accumulation of cyclical systemic risk, which could jeopardise financial stability within a few years if no action is taken. But it is important to avoid drawing sweeping conclusions without closely examining each underlying variable, as well as a range of other information on financial and economic developments. Another important factor in this interpretation is how far

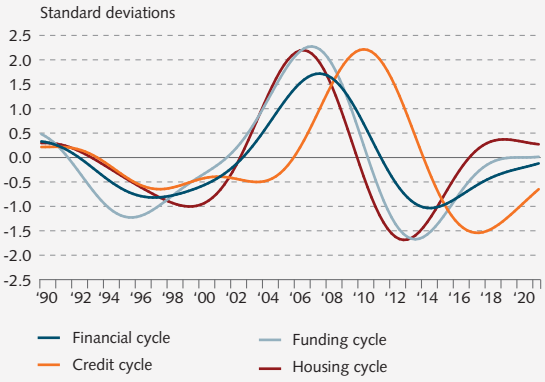
22 Creditinfo: https://blogg.creditinfo.is/vanskilum-heldur-afram-ad-faekka/

23 Figures on sectoral classification of frozen loans are based on the book value of the loans concerned.

24 Some variables are measured in percentage points, while others are measured in billions of Icelandic krónur. The assessed cycle for each one is therefore standardised before the variables are combined to create a single indicator. The deviation of the cycle from zero is expressed in standard deviations.

Chart I-35

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: Registers Iceland, Statistics Iceland, Central Bank of Iceland.

above zero the cycle rises and how long the situation has persisted. The higher it moves and the longer it remains high, the stronger the signal.[25]

The underlying components of the cycle are in different phases at present, and they are not entirely consistent with the most recent developments in the data. It is therefore appropriate to examine each individual component separately.

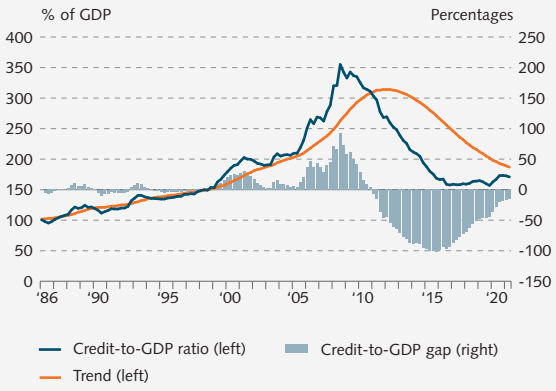
Credit cycle

As is mentioned above, growth in household debt is driving the credit cycle at present, as it contributes to the private sector credit-to-GDP ratio, real credit growth, and the ratio of household debt to disposable income.

The private sector credit-to-GDP ratio places the size of the financial system into the context of the real economy. A rise in the credit-to-GDP ratio above its long-term trend, termed the credit-to-GDP gap, can be used as a metric of whether credit has accumulated too quickly, and it can also function as an early indicator of financial shocks.[26] The European Systemic Risk Board (ESRB) has therefore issued a recommendation that defines the credit-to-GDP gap as a common starting point to guide member states' decisions on setting the countercyclical capital buffer rate. In accordance with the ESRB recommendation, the credit-to-GDP gap is show in Chart I-36.[27]

Chart I-36

Credit-to-GDP gap[1]

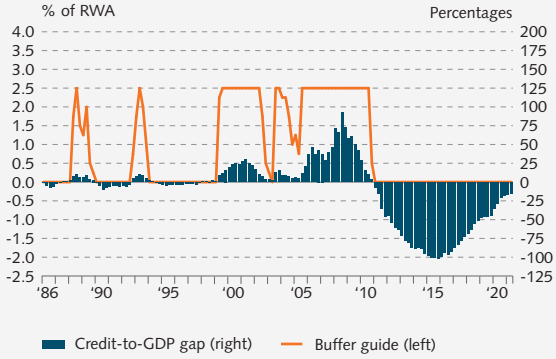


1. Total credit to the non-financial private sector over GDP for the last four quarters. Trend component is obtained with a one-sided HP-filter with λ=400.000.

Sources: Statistics Iceland, Central Bank of Iceland.

Chart I-37

The buffer guide[1]



1. The ESRB's buffer guide follows a linear projection of the credit-to-GDP gap.

Sources: Statistics Iceland, Central Bank of Iceland.

The credit-to-GDP ratio surged in 2020, even though growth in total household and corporate debt was manageable, as GDP, the denominator of the ratio, contracted sharply. The ratio has fallen marginally in 2021 to date, owing to increased economic activity. The credit-to-GDP gap was negative by just under 16 percentage points at the end of Q2. Because the cycle in the credit-to-GDP ratio was very pronounced in 2004-2015 and the Icelandic financial system underwent structural changes from 2008 onwards, interpreting the gap has been problematic for years.

The ESRB recommendation also defines a benchmark value for the countercyclical capital buffer; i.e., the buffer shall first be activated when the credit-to-GDP gap measures 2 percentage points and then increased linearly until the gap measures 10 percentage points or more. Chart I-37 shows the benchmark calculated back to 1986.

25 A financial cycle below zero is no guarantee that there is no cyclical systemic risk. Assessments of this type can be imprecise.

26 Drehmann et al. (2012). Anchoring countercyclical capital buffers: the role of credit aggregates. BIS *Working Paper* no. 355.

27 Further information on the determination of the countercyclical capital buffer can be found in Central Bank *Special Publication* no. 15, Eiginfjárkröfur og fjármálastöðugleiki [Capital requirements and financial stability] (in Icelandic), published on 16 June 2021.

House price cycle

The most recent assessment of the house price cycle, based on data through June, shows a gradual downward phase in the recent term. This is out of line with recent developments, as house prices have risen rapidly over the past several months, and well in excess of wages, building costs, and rent.

The reason for the discrepancy is that the method used to analyse long-term trend and the cyclicality of the data focuses on medium-term cycles, not short-term ones. As a result, there could be lags in updating the assessment as shown in Chart I-35 to reflect abrupt changes taking place in the space of only a few months. If the current price developments continue, however, the next update may show a significant change in the house price cycle.

Funding cycle

A sharp increase in unstable banking system funding, such as foreign short-term funding and wholesale deposits, could be a sign of elevated risk. If illiquid long-term loans are funded in this way to a large degree, banks can easily find themselves facing liquidity problems when access to capital markets tightens.

In recent years, the banks' unstable funding has grown significantly in real terms. In assessing the financial cycle, this shows as a movement towards zero following the last financial crisis and its aftermath. After that adjustment, from 2019 onwards, the cycle appears negligible. This could be temporary, but it gives rise to questions concerning whether the changed regulatory framework dampens the funding cycle more than other financial cycle components. In the wake of the financial crisis, minimum liquidity and stable funding requirements were tightened. The rules place significant restrictions on the possibility to increase unstable funding on the liabilities side of supervised entities balance sheets unless corresponding changes are made on the assets side; i.e., an increase in high-quality liquid assets. Even if unstable funding were to increase sharply and show as an upswing in the funding component of the financial cycle, the implications for financial stability might not be the same as they were before the financial crisis.

The financial cycle and cyclical systemic risk

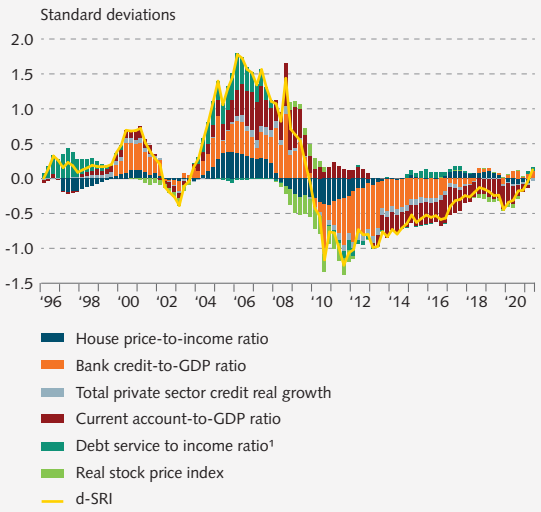
The financial cycle can serve as a leading indicator of risk.[28] The assessment above does not suggest that the financial cycle is giving warning signals of unsustainable accumulation of systemic risk at this time. This situation could change quickly, however, particularly if growth in household accelerates further and house prices keep rising rapidly, which could change the assessment of the credit cycle and house price cycle components.

Other composite indicators can also be useful. The domestic systemic risk indicator (d-SRI), shown in Chart I-38, is based on a weighted average of six variables shown by research to be associated with financial shocks.[29] The information set on which it is based overlaps to a degree with the set on which the financial cycle is based, but there are three variables that do not overlap: real equity securities prices, the household debt service-to-income ratio, and the ratio of the current account balance to GDP.

This indicator rose relatively steeply after the onset of the pandemic and, in 2021 to date, has been positive for the first time since mid-2009. For most of the past decade, the current account surplus and private sector deleveraging have kept the indicator low. The decline in debt ended in 2018, leaving the current account surplus as the most important determinant of the indicator's value. With the onset of the pandemic, the surplus narrowed, and this, together with rising asset prices, pushed the indicator up sharply. As yet, however, the warning signal is not unequivocal.

Chart I-38

Cyclical systemic risk indicator (d-SRI)



1. Estimates are used from Q1 2020.

Sources: Registers Iceland, Statistics Iceland, Central Bank of Iceland.

28 See, for example, Bjarni G. Einarsson *et al*. (2016) The long history of financial boom-bust cycles in Iceland. Part II: Financial cycles. (Central Bank of Iceland *Working Paper* no. 72), and Önundur Páll Ragnarsson et al. (2019). Financial cycles as early warning indicators: Lessons from the Nordic Region. (Central Bank of Iceland *Working Paper* no. 80).

29 The weights are based on an analysis by Lang *et al*. (2019). Anticipating the bust: a new cyclical systemic risk indicator to assess the likelihood and severity of financial crises. (Occasional Paper Series No. 219). European Central Bank.

The debt service-to-income ratio

House prices determine a large share of households' net assets, particularly in countries with high rates of home ownership. As a result, developments in house prices can have a major impact on households' consumption decisions, owing to the wealth effect.[1, 2] For example, private consumption can contract in the wake of a fall in real estate market prices. This can have a profound impact on firms' operational foundations, thereby affecting economic activity more generally. A lower employment rate caused by reduced economic activity can then lead to a further contraction in private consumption, eroding households' debt service capacity and increasing arrears in the financial system. Financial shocks that can be attributed to real estate bubbles and increased household leverage are generally longer and more severe than shocks caused by other factors.[3, 4] As a consequence, it can be argued that there is a significant economic advantage in preventing excessive growth in household debt, promoting a stable mortgage lending market, and smoothing out fluctuations in house prices.

Article 27 of the Act on Consumer Mortgages, no. 118/2016, authorises the Central Bank of Iceland to set rules that place a cap on mortgage debt service burdens. Income-related macroprudential tools have recently been honed and the Bank's authority to apply them clarified, including by defining relevant terminology and specifying the range within which the Bank may apply the tools.[5]

The debt service-to-income (DSTI) ratio measures the percentage of a borrower's disposable monthly income that is used to make monthly mortgage payments. It is calculated as follows:

$$DSTI = \frac{Monthly\ mortgage\ payments}{Monthly\ disposable\ income}$$

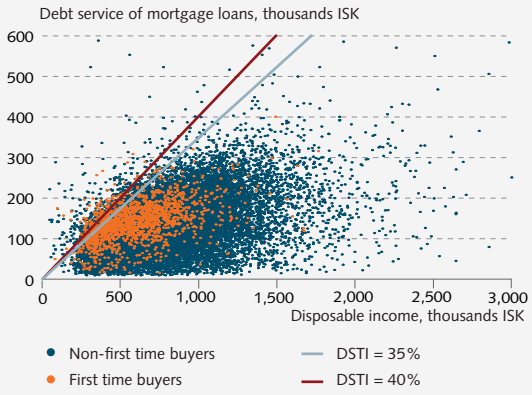
The debt service burden on a mortgage loan is defined as all monthly payments of instalments and interest on loans secured by real estate. Disposable monthly income is defined in the law as a borrower's expected sustained income, net of direct taxes and public levies. Although reference is made to disposable monthly income, this does not mean that it is sufficient to consider income for a single month. The usual practice in assessing a borrower's income for the purpose of a credit assessment is to consider a period of at least three months. Disposable monthly income is then the average income over the specified period, and the monthly debt service is determined based on that same period.

The Central Bank is authorised to restrict new lending by setting a maximum DSTI ratio in the 25-50% range. It is also permissible to take into consideration different consumer groups and loan types in the application of the DSTI ratio. Moreover, it is possible to specify a more detailed calculation of ratios in the rules, as well as providing for a general exemption expressed as a percentage of the total amount of new loans granted over a specified period. For example, it is possible to permit lenders to issue 5% of new loans in each quarter without reference to the cap specified in the rules. In addition, the Central Bank must ensure that the rules include provisions designed for first-time buyers.

Each dot on chart 1 represents one loan. The orange dots indicate loans issued to first-time buyers, and the blue dots indicate loans to all other borrowers. The lines show the boundaries where the DSTI ratio reaches 35% and 40%, respectively. Dots below a given line are therefore within the relevant boundary, and dots above the line are above the

Chart 1

Debt-Service-to-Income (DSTI)[1]



1. Debt service on consumer mortgages and disposable monthly income. Based on data from the D-SIBs and the Housing and Construction Authority from 1 Jan 2020 through 31 Aug 2021. From 1 Aug 2020 onwards, the data also include the eight largest pension funds.

Source: Central Bank of Iceland.

1 Case, K. E., Quigley, J. M., & Shiller, R. J. (2005). Comparing wealth effects: the stock market versus the housing market. Advances in macroeconomics, 5(1).

2 Carroll, C. D., Otsuka, M., & Slacalek, J. (2011). How large are housing and financial wealth effects? A new approach. Journal of Money, Credit and Banking, 43(1), 55-79.

3 Claessens S., Kose, M. & Terrones, M. (2008), What happens during recessions, crunches and busts?, IMF Working Paper, No. 08/274

4 Jordá, O., Schularick, M. & Taylor, A. (2015). Leveraged bubbles. Journal of Monetary Economics, no. 76 pp. S1-S20.

5 Act no. 68/2021 amending the Act on Consumer Mortgages, no. 118/2016.

boundary. All loans issued by the D-SIBs and the Housing and Construction Authority from 1 Jan 2020 and the eight largest pension funds from 1 Aug 2020.

Consumer mortgages that have been granted since the beginning of 2020 are generally below the threshold that is considered to indicate elevated risk, as Chart 1 shows. It should be borne in mind, however, that these loans were granted during a period of low interest rates, when many strong borrowers refinanced their debt. When interest rates rise, it can be assumed that borrowers' DSTI ratios will rise as well.

Research and practices abroad

Several European countries have gained considerable experience in the use of DSTI ratio; for instance, Lithuania and Romania (from 2011 onwards); Cyprus and Poland (from 2013); and Estonia, Hungary, and Slovakia (from 2014). Other countries have less experience, but in recent years Austria, France, and Portugal have all imposed caps on DSTI ratios so as to curb household indebtedness, which has increased markedly in many areas in Europe, in part because of very low interest rates. An overview of European DSTI rules can be seen in Table 1. Several countries outside Europe, particularly in East Asia, have long experience of such policy instruments, including Hong Kong, South Korea, and Malaysia.

Research on the impact of DSTI ratios on borrowers' and lenders' resilience indicates that loans with high DSTI ratios carry more risk and a higher probability of default.[6] Furthermore, the relationship between DSTI ratios and probability of default is non-linear, which means that at a certain DSTI level, the probability of default increases markedly.[7] Therefore, caps on DSTI ratios reduce the number of high-risk loans and foster greater stability in the mortgage lending market. A maximum DSTI ratio can function as a sort of handrail for the market in the long run and can contribute to improved mortgage loan quality, for the benefit of both borrowers and lenders.

Other countries' experience also shows that rules on DSTI ratios can put a damper on house price inflation and reduce debt accumulation.[8] When house prices rise, buyers generally need to take out larger loans, which – all else being equal – increases their debt service burden. If house prices rise faster than households' disposable income, DSTI ratios rise at the same time. This means that the number of loans subject to DSTI restrictions increases, and credit growth decreases as a result.[9] Capping DSTI ratios therefore has a more limiting effect during expansionary periods and reduces the likelihood of bubble formation in the real estate market.

Research has also indicated that, for the purpose of maintaining financial stability, capping DSTI ratios is more effective than capping loan-to-value (LTV) ratios, as DSTI caps have fewer negative side effects.[10,11] LTV ratios also have a weaker impact on property prices and are therefore less effective in curbing rapid rises in house prices than DSTI ratios.[12,13] The efficacy of both ratios is probably greatest, however, when they are applied simultaneously, as they address different risk factors.[14,15] Maximum DSTI ratios reduce the probability of default; i.e., they reduce the likelihood that borrowers will be unable to pay their debts. Maximum LTV ratios affect loss given default, thereby protecting lenders against losses in the event that borrowers cannot pay their debts. Therefore, these two macroprudential tools work in different ways. If only one of the ratios is in place, there could be scope for a group of risk-seeking borrowers to take on an excessive amount of risk. Capping both ratios makes it likelier that the restrictions will also extend to these groups, thereby reducing potential systemic risk.[16,17] It is therefore unsurprising that most of the European

6 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.

7 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.

8 Pau Rabanal (2018). An Estimated DSGE Model to Analyze Housing Market Policies in Hong Kong SAR. IMF Working Paper, WP/18/90.

9 Grodecka, A. (2020). On the Effectiveness of Loan-to-Value Regulation in a Multiconstraint Framework. Journal of Money, Credit and Banking, 52(5), 1231-1270.

10 Gelain, P., Lansing, K. J., & Mendicino, C. (2012). House prices, credit growth, and excess volatility: Implications for monetary and macroprudential policy. Forthcoming, International Journal of Central Banking, Norges Bank Working Paper, 8

11 Gross, M., & Población, J. (2017). Assessing the efficacy of borrower-based macroprudential policy using an integrated micro-macro model for European households. Economic Modelling, 61, 510-528.

12 See, for example, Luis I Jácome and Srobona Mitra. LTV and DTI Limits - Going Granular (July 2015). IMF Working Paper No. 15/154, Deniz Igan and Heedon Kang, Do Loan-to-Value and Debt-to-Income Limits Work? Evidence from Korea (December 2011). IMF Working Paper No. 11/297, 2011, and Ragnar Nymoen, Kari Pedersen, and Jon Ivar Sjåberg (2019), Estimation of Effects of Recent Macroprudential Policies in a Sample of Advanced Open Economies. Int. J. Financial Stud. 2019, 7, 23.

13 Kuttner, K. N., & Shim, I. (2016). Can non-interest rate policies stabilize housing markets? Evidence from a panel of 57 economies. Journal of Financial Stability, 26, 31-44.

14 Michel Dietsch and Cécile Welter-Nicol (2014) Do LTV and DSTI caps make banks more resilient? Banque de France, Débats économiques et financiers N°13.

15 O'Toole, C., & Slaymaker, R. (2021). Repayment capacity, debt service ratios and mortgage default: An exploration in crisis and non-crisis periods. Journal of Banking & Finance, pp 106-271.

16 Grodecka, A. (2020). On the Effectiveness of Loan-to-Value Regulation in a Multiconstraint Framework. Journal of Money, Credit and Banking, 52(5), 1231-1270.

17 Robert Kelly, Fergal McCann, and Conor O'Toole (2017). Credit conditions, macroprudential policy and housing prices. ESRB Working Paper Series No 36/February 2017.

Maximum debt service-to-income ratios in Europe

Country	Value	Comments
Austria	30-40%	Applied by recommendation. Lenders are to be cautious in assessing borrowers' income, and debt service should not exceed 30-40% of net income. Only confirmed, regular, sustained income is to be considered.
Estonia	50%	Ratio of mortgage debt service to net income. Based on the contractual interest rate plus a two-point surcharge or 6% annual interest, whichever is higher. General exemption provision amounting to 15% of the amount of loans granted each quarter.
France	35%	Ratio of mortgage debt service to net income. The loan maturity may not exceed 25 years, but there is a general exemption amounting to 20% of loans granted. The exemption is mainly for those buying property for their own use (80% of the total) and first-time buyers (30% of the total).
Cyprus	80%	Ratio of mortgage debt service to net monthly disposable income (disposable income less living expenses). Capped at 65% if the loan is in foreign currency.
Latvia	40%	Ratio of mortgage debt service to net monthly income (average over the last six months). General exemption amounting to 10% of the amount of consumer mortgages granted each quarter.
Lithuania	40%	Ratio of total debt service to net income. In addition, borrowers are stress-tested, and the debt service-to-income ratio may not exceed 50%, based on 5% annual interest. It is permissible to grant 5% of the amount of new loans with a debt service ratio of up to 60%.
Malta	40%	Ratio of mortgage debt service to net income. Exemption for the purchase of property valued at less than EUR 175,000. The ratio shall hold despite a 150-point surcharge on the contractual interest rate.
Poland	40/50%	Ratio of mortgage debt service to net income. A strict maximum debt service ratio requirement has been revoked, but banks are required to notify borrowers of the increased risk associated with taking loans above the debt service ratio. A 40% maximum applies to borrowers whose income is below the average for the area concerned, and 50% for those with above-average income.
Portugal	50%	Ratio of mortgage debt service to net monthly income. Monthly income is defined as the average over the past twelve months. It is permissible to grant 20% of loans with a debt service ratio of up to 60%, and 5% are entirely exempt from the rules, based on annual amounts.
Romania	40%	Ratio of total monthly debt service to net income. The ratio shall be 20% for foreign-denominated loans. Net loan refinancing is exempt. The ratio is 45% for first-time buyers. It is permissible to grant 15% of loans above the threshold.
Slovakia	60%	Ratio of total debt service to net monthly disposable income (disposable income less living expenses). Exemptions: 5% of new loans may have a ratio of up to 70%.
Slovenia	50-67%	Ratio of debt service on consumer loans to net income. If the borrower's net income is up to double the gross minimum income level, the ratio is 50%, and if the borrower's net income is more than double the gross minimum income level, it is 67%. Notwithstanding the maximum ratios, the borrower must retain at least 76% of the gross minimum income level each month, after servicing all loans. 10% of the loan amount may be granted in excess of the rules; however, the ratio may not exceed 67%.
Czech Republic	50%	Applied by recommendation. Ratio of total debt service to net annual income. It is permissible to grant 5% of loans above the threshold, provided that the probability of loan repayment is high. This was increased from 45% on 1 April 2020 and revoked on 1 July 2020.
Hungary	25-60%	Called the payment-to-income (PTI) ratio in Hungary. The ratio depends on the borrower's income and the length of the interest rate review period. The ratio is 15-30% for loans in euros and 5-15% for loans in other currencies.

countries that have capped DSTI ratios have set maximum LTV ratios as well.[18] The information in table 1 is based on the countries' notifications to the European Systemic Risk Board. In making comparisons between countries, it should be borne in mind that the definitions of the numerator and denominator of the ratios, as well as the conditions in each country, are important in determining the most appropriate maximum ratio. Furthermore, the macroprudential tools that central banks and financial supervisors have at their disposal vary greatly from one country to another. For instance, the Swedish financial supervisor may only restrict lending based on amortisation requirements. As a result, the Swedish supervisory has adopted rules requiring a 1% annual reduction in loan principal if the ratio of total debt to the borrower's income exceeds 4.5. An explicit statutory basis for the application of debt service-to-income ratios and loan-to-income ratios is lacking in Sweden, even though the Riksbank has strongly emphasised the need for it.[19,20,21,22]

18 European Systemic Risk Board (2015), Report on residential real estate and financial stability in the EU.

19 Sveriges Riksbank, 2015a, Financial Stability Report, 2015:1.

20 Emanuelsson, Melander, and Molin (2015). Financial risks in the household sector, Economic commentaries, Sveriges Riksbank, no. 6, 2015.

21 Guibourg and Lagerwall (2015). How is the economy affected by macroprudential policy measures?, Economic commentaries, Sveriges Riksbank, no. 9, 2015.

22 Alfelt, Lagerwall, and Ölcer (2015). An analysis of the debt-to-income limit as a policy measure, Economic commentaries, Sveriges Riksbank, no. 8, 2015.

The equity securities market and financial stability

In recent months, the low-interest environment that has developed in the wake of government responses to the COVID-19 pandemic and the shortage of interest-bearing investment options have led to a steep rise in asset prices, both in Iceland and abroad. The domestic equity securities market has not been excluded from this. Prices and turnover have soared, as is discussed more fully in the chapter I. This trend has given rise to increased discussion of whether imbalances have developed in the market, and what the potential impact on financial stability might be.

Price bubbles can be defined as situations when asset prices diverge strongly from fundamentals, although it can be difficult to identify price bubbles in real time. It is important to bear in mind that price hikes driven not by debt but by buoyant sentiment about the future need not jeopardise stability in the long run. On the other hand, share price bubbles that are accompanied by rapid credit growth and steeply rising house prices have historically had a stronger impact on financial stability.[1] In recent months, persistent questions have arisen, particularly abroad, about whether a share price bubble has developed.

Why is the equity market important for financial stability?

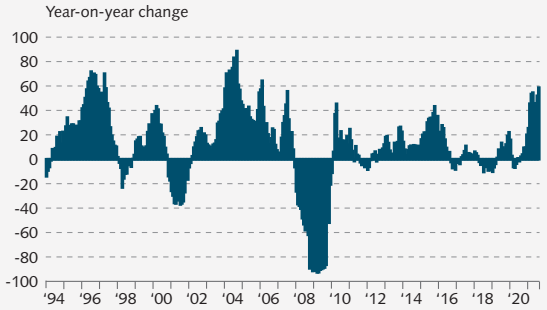
Equity markets play an important role in the financial system, and developments in those markets can affect financial stability, both directly and indirectly. Listed companies gain increased access to investors and capital in exchange for increased disclosure of information. However, shares of stock are a risky investment because their prices depend on a number of external factors, and it can often be difficult to assess the risk correctly. Market price increases can have a strongly negative impact if they reverse suddenly. This is particularly the case for leveraged stockholders who must absorb an abrupt drop in asset values while carrying an unchanged amount of debt.

The Icelandic shareholder group has grown swiftly in the recent term, and individuals have increasingly participated in companies' initial public offerings (IPO). This is positive for market efficiency but could give cause for concern from a financial stability perspective if risk is not assessed accurately. In Iceland, 40% of listed equities are owned by the pension funds. Another 27% are owned by financial institutions, UCITS funds, and investment funds. Other firms own 9%, and individuals hold around 5%.

Chart 1

Developments in the OMXI Main List[1]

January 1994 – August 2021



1. OMXI Main List, deflated with the CPI.

Source: Nasdaq Iceland.

What explains the rise in share prices in Iceland?

To some extent, the low-interest-rate environment that has developed in Iceland since the arrival of the COVID-19 pandemic has stimulated investors' risk appetite. Negative real interest rates on deposit accounts – the product of Central Bank interest rate cuts and higher inflation – have prompted depositors to seek out other investment options, as can be seen in the brisk activity in the real estate and stock markets. By the same token, lower yields in the bond market, together with households' increased propensity to save in the wake of the pandemic, could also contribute to this trend. Another possibility is that Iceland's inclusion in the MSCI Frontier Markets indices may have piqued investors' interest in Icelandic companies. Moreover, it is not impossible that a rise in prices was overdue after the tranquillity that had characterised the market in recent years. If so, the recent price increases may represent an adjustment to a new equilibrium and lower interest rates.

Trend analysis

Trend analyses can give an indication of whether imbalances have developed in the market. Borio and Lowe (2002) defined possible bubble formation as a situation in which real asset prices rise by a specific amount above their long-term

1 Several major economic crises have shaken equity markets, including the Great Depression in the 1930s and the Great Recession just over a decade ago.

Chart 2

Direct pledging of shares on the Nasdaq Iceland exchange[1]

January 2004 - June 2021

1. Direct pledging is the average percentage of pledged shares for all listed companies on both the Main List and the First North market, based on the relative weight of each company. Only direct pledges are considered; therefore, no account is given to general collateral in shares or indirect collateralisation via derivatives contracts. Therefore, pledging in the Icelandic equity market is probably higher.

Source: Nasdaq Iceland, Parliamentary Special Investigation Commission (SIC) report on the background and causes of the collapse of the Icelandic banks in 2008.

trend as calculated using a Hodrick-Prescott filter.[2] In Chart 3, signs of potential bubble formation can be seen when the deviation from trend, called the asset price gap, exceeds a defined threshold. This analysis gives a clear indication of bubble formation during the years before the 2008 financial crisis, but in the past few months there have also been signs that a bubble is developing. In Q1/2021, the asset price gap was proportionally similar to that in 2015, albeit below the defined threshold. In recent months, share prices have continued rising, and the gap is at its largest since the financial crisis. According to this analysis, there are signs that the stock market is overheating.

Bordo and Jeanne (2002) defined potential bubble formation as a situation in which the three-year moving average of price increases exceeds a defined threshold.[3] This analysis can be seen in Chart 4. In examining this approach, it is well to bear in mind that rapid price hikes like those characterising the stock market in recent months enter into the data with a lag, owing to the use of the three-year average. As a result, it takes longer for rapid price rises to affect the data. This method shows clear signs of bubble formation during the years before the financial crisis, but not in the past few years.

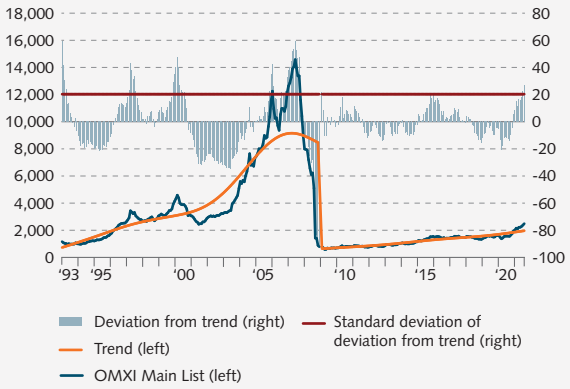
Are threats to financial stability accumulating?

Icelandic share prices are currently high in historical context, and the OMXI10 index has repeatedly hit new peaks since the financial crisis. But the level of hypothecation in the market does not suggest that the rise in share prices is debt-driven.[4] Furthermore, key ratios from listed Icelandic companies give an unclear picture of whether imbalances are developing in the market. The cyclically adjusted price-to-earnings (CAPE) ratio has risen rapidly in the recent term and is high in international comparison. This could indicate that

Chart 3

Share prices, deviation from long-term trend

January 1993 – August 2021



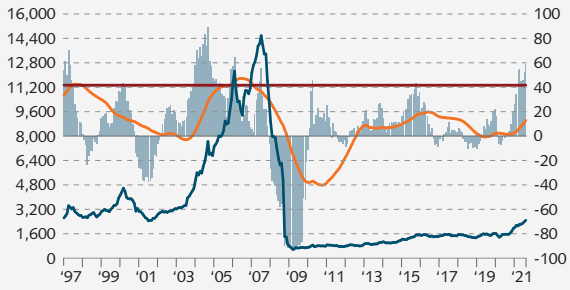
1. The OMXI Main List, deflated with the CPI. Trend analysis based on C. Borio og P. Lowe (2002). Trend is determined using a Hodrick-Prescott filter with a multiplier of λ=129,600, in accordance with Ravn, M.O., and Uhlig, H. (2000). Notes on adjusting the Hodrick-Prescott filter for the frequency of observations. Review of Economics and Statistics.

Sources: Nasdaq Iceland, Statistics Iceland.

Chart 4

Equity market, trend analysis

January 1997 – August 2021



1. OMXI Main List, deflated with the CPI. Trend analysis based on Bordo & Jeanne (2002).

Sources: Nasdaq Iceland, Statistics Iceland.

2 C. Borio and P. Lowe (2002). Asset prices, financial and monetary stability: exploring the nexus. BIS Working Paper no. 114.

3 M. Bordo and O. Jeanne (2002). Monetary Policy and Asset Prices: Does 'Benign Neglect' Make Sense?. Blackwell Publishers Ltd.

4 The level of hypothecation in the stock market – i.e., buying shares on margin and pledging the purchased shares as collateral for the loan – can indicate whether it is likely that developments in the market could jeopardise financial stability, as risk is more likely to build up when a rapid rise in share prices is debt-driven.

companies in Iceland may be overpriced.[5] On the other hand, the market-weighted price-to-book value ratio of companies on the Nasdaq Iceland Main List is still relatively well balanced, although it has risen marginally in recent quarters.[6]

One of the main threats the stock market poses to financial stability at present is that investors' risk is not assessed in full, given the risky nature of equity securities. This is particularly the case because households' increased participation in the market could put them in a vulnerable position if the price hikes of recent months reverse. Prices have developed very favourably in the past several months, and there is no guarantee that those gains are permanent. A sudden correction could potentially lead to margin calls, as happened in February and March 2020, thereby fuelling a further drop in prices. Sudden declines and corrections are often triggered by unexpected events or reversals of some sort. Such triggers could just as easily come from abroad as from within Iceland. Based on the factors described above, it can be assumed that equity market-generated risks to financial stability have increased in the recent term.

5 The CAPE ratio measures the real value of share price indices relative to average profit (earnings) over a ten-year period. It differs from the conventional price-to-earnings ratio in that the denominator of the ratio is ten-year average earnings, which should smooth out any temporary effects from individual earnings reports. This can be useful for smaller equity markets like that in Iceland. A high CAPE ratio means that a company's share price is higher than its earnings, which in turn suggests that the shares are overpriced. In general, the market can be expected to correct the price of such shares. The CAPE ratio of the Icelandic equity market can be found on Brynjar Örn Ólafsson's web page: https://notendur.hi.is/boo4/.

6 The price-to-book ratio compares the market value of a listed company's shares to the book value of its equity.

The financial system

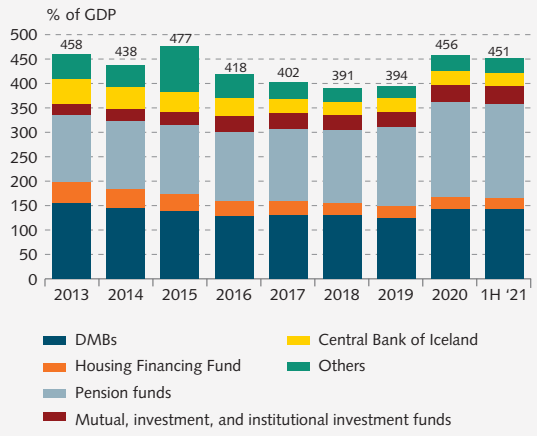
II

At the end of June 2021, the size of the financial system equalled 451% of GDP. Recent changes in financial system size are due in large part to exchange rate movements and changes in GDP. Deposit institutions' assets account for about a third of total financial system assets, and pension fund assets account for another 43%.

The pension funds' assets declined as a share of GDP in H1/2021, owing mainly to GDP growth and the appreciation of the króna. The relative distribution of pension fund assets remained broadly unchanged, although loans to fund members continued to decline. In recent months, though, this shift has slowed somewhat.

Chart II-1

Financial system: Assets as % of GDP[1]

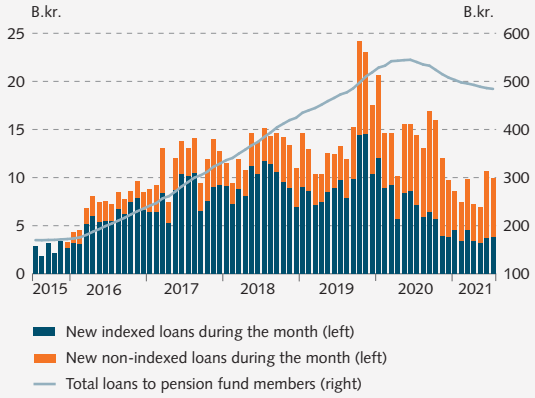


1. Parent companies. Other: Failed financial institutions that have undergone composition are included with other financial institutions as of the time their composition agreements were approved. The Central Bank of Iceland Holding Company ehf. (ESÍ) is also included with other financial institutions from its establishment in December 2009 until its dissolution in February 2019. The Housing Financing Fund (HFF) merged with the Iceland Construction Authority on 1 January 2020. HFF assets 2020 are the assets of the ÍL Fund, which took over the processing of the HFF's assets and liabilities at the beginning of 2020. Annual data. Data for the first two quarters of 2021. GDP for 2021 is based on the Central Banks' latest baseline forecast.

Sources: Statistics Iceland, Central Bank of Iceland.

Chart II-2

Loans to pension fund members[1]



1. Figures are based on balance sheet summaries submitted to the Central Bank by the pension funds.

Source: Central Bank of Iceland.

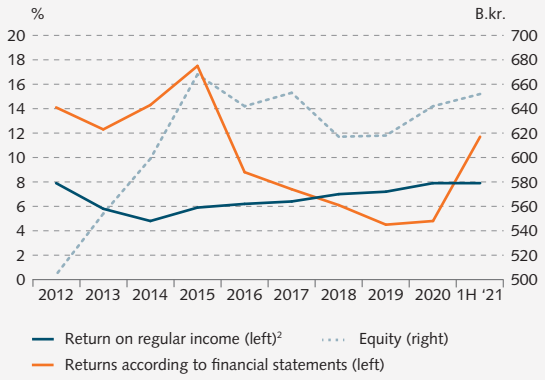
The pension funds are the largest investors in the Icelandic financial market. They are direct mortgage lenders as well as financing the banks' mortgage lending by buying their bonds, they finance businesses by buying corporate bonds, and they are the largest investors in the Icelandic stock market. They are also among the largest investors in Iceland's two publicly traded banks. The pension funds' investment strategies also assume that a large share of their asset portfolio is devoted to foreign assets. Because of their size, the pension funds' strategies and conduct have an enormous impact on other market agents and the economy as a whole.

Profitability

The domestic systemically important banks (D-SIB) recorded a profit of 37 b.kr. in H1/2021, as opposed to a loss of 0.7 b.kr. for the same period in 2020. Their return on equity was positive by 11.7% for the half, whereas it was negative by 0.2% in the same period of 2020. It can be said that operations were successful for all of the D-SIBs in H1/2021, as they all recorded a return on equity of 10% or more. Their profitability in H1 was due to positive loan valuation adjustments and a year-on-year increase in fees and commissions and net income from financial activities. The marked rise in asset prices has stimulated activity in the markets, thereby boosting income from fees and commissions.

Chart II-3

D-SIBs' returns[1]



1. Returns are calculated on average equity. Consolidated figures. 2. The return on regular income is based on net interest income and fee/commission income net of regular expenses. The tax rate is 20% and is based on average equity. Valitor is excluded in 2017-2020 and Borgun in 2020.

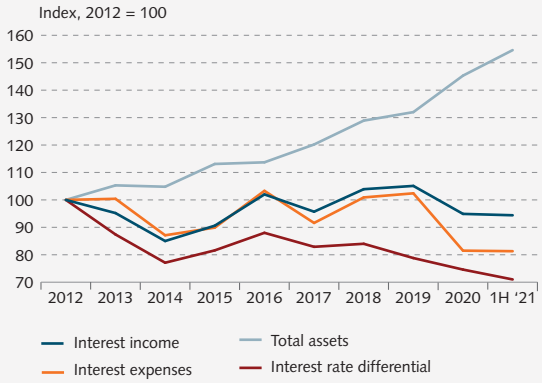
Sources: Commercial banks' financial statements.

The banks' interest rate spreads continue to narrow. In H1, the spread on D-SIBs' total assets was 2.44%, which is 0.17 percentage points less than in H1/2020. In spite of this, net interest income was unchanged year-on-year, at 51 b.kr., owing to an increase in interest-bearing assets, particularly loans to individuals.

The narrower interest rate spread is due mainly to lower interest rates and limited scope to cut funding rates to compensate. Lower interest rates have led to changes in the composition of the D-SIBs' loan portfolios, which has also contributed to a narrowing of interest rate spreads. The change has been significant. If the loan portfolio composition had been the same at the end of June 2021 as it was at year-end 2018, non-indexed mortgage loans would have been 550 b.kr. lower, indexed mortgages 160 b.kr. higher, and corporate loans 330 b.kr. higher than they actually were. According to Central Bank data, variable rates on non-indexed residential mortgages are 1.2

Chart II-4

D-SIB: Interest income, interest expenses, total assets, and interest rate differential[1]



1. Consolidated figures.

Sources: Commercial banks' financial statements.

percentage points below those on comparable corporate loans. Since year-end 2018, the indexation balance has declined by 200 b.kr., largely because households have shifted from indexed to non-indexed mortgages. Interest rates on non-indexed mortgages are now 2-2.5 percentage points below rates on indexed mortgages, after adjusting for inflation. If the composition of the D-SIBs' loan portfolio as of end-June 2021 had been comparable to that at year-end 2018, the interest rate spread on total assets would probably have been just over 2.6% instead of 2.44%. In 2018, the spread was nearly 2.9%; therefore, it can be said that over a third of the reduction in interest rate spread can be attributed to the changed composition of the loan portfolio. As interest rates rise, and assuming that premia remain unchanged and the current composition of the loan portfolio holds, it must be deemed unlikely that the D-SIBs' interest rate spread will return to its previous level of close to 3%.

Net fee and commission income totalled 17 b.kr. in H1/2021, an increase of 20% year-on-year. The rise is due mainly to increased asset management and corporate finance activity. Furthermore, with rising numbers of foreign tourists, fee and commission income can be expected to rise even further because of increased activity in payment intermediation. The banks' income from financial activities totalled 8.2 b.kr. in H1/2021, a marked turnaround relative to H1/2020, when it was negative by 0.9 b.kr. This year's income is the same as the H1/2019 total.[1] Other operating income came to 3 b.kr. in the first half, an increase of 1.3 b.kr. year-on-year.

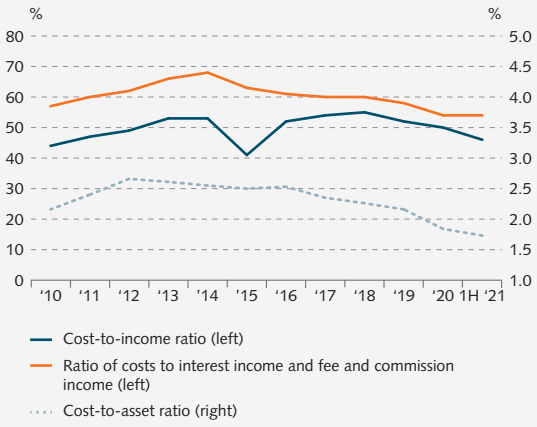
1 Increased income from financial activities is due primarily to share price movements.

Costs continue to fall

The D-SIBs' combined operating expenses totalled 37.1 b.kr. in H1/2021, an increase of 0.2 b.kr. between years. If adjustments are made for 0.7 b.kr. in one-off expenses incurred by Íslandsbanki in Q2 in connection with its initial public offering (IPO), operating expenses declined by 0.5 b.kr. year-on-year, or by 5.4% in real terms. The real decline in wage and salary expense measured 2.7%, and other operating expenses fell by 9% in real terms. The number of full-time position equivalents declined by 80 in H1, to an end-June total of 2,353. Further downsizing is planned.

Chart II-5

D-SIB: Cost-ratios[1]



1. Consolidated figures. Valitor excluded in 2017 - 2020 and Borgun in 2020. Operating expenses, adjusted for major irregular items, excluding loan revaluation changes and discontinued operations.

Sources: Commercial banks' financial statements.

The ratio of costs to income was 46% in H1/2021, 47.9% in Q1, and 44.2% in Q2.[2] It measured around 50% in 2020 and has therefore been trending downwards in the recent term.

The banks' ratio of costs to regular income has also been on the decline. In H1/2021 it was 53.7%, having fallen by 3 percentage points since H1/2020, 4.7 percentage points relative to H1/2019, and 9.5 percentage points relative to H1/2018.

Continued surge in mortgage lending

Loans to households and businesses rose by 5.6% in the first half of 2021, to a total of 3,072 b.kr. at the end of June. The increase is due almost entirely to residential mortgage lending, which rose by 177 b.kr., or 12%, in H1, whereas corporate lending declined by 1%. Because reserve requirements are considerably lower for mortgage loans than for corporate loans, the credit risk base as a share of loan values fell from 80% to 76% in H1.

One of the measures adopted by the Government to address firms' liquidity difficulties was to grant support loans with 85% and 100% Treasury guarantees and, for larger firms, supplemental loans bearing a 70% Treasury guarantee. Credit institutions oversaw the issuance of these loans. Issuance of supplemental loans was discontinued at the turn of the year, and support loans were discontinued at the end of May. Total issuance amounted to 2.8 b.kr. for supplemental loans and 10.1 b.kr. for support loans.

Positive loan valuation adjustments

In the wake of the pandemic, the banks supported businesses and households by offering payment moratoria and loan freezes, and in some instances borrowers have had the option of restructuring or refinancing their debt. In most cases, loans to borrowers who have taken advantage of these measures are classified as forborne and performing (i.e., not in arrears). According to special loan portfolio reports submitted to the Central Bank by the D-SIBs, 17.3% of corporate loans (295 b.kr.) and 2.2% of loans to individuals (33 b.kr.) were frozen at the end of January 2021.[3] However, the position of borrowers in need of special measures has improved in 2021 to date. At the end of August, 15.5% of corporate loans (263 b.kr.) and 1.6% of loans to individuals (28 b.kr.) were frozen. It should also be noted that customers with frozen loans have increasingly begun to make full or partial payments on them in recent months. In order for a loan to no longer be classified as frozen, the customer must make full payments on it for twelve months.

Increased economic activity and Iceland's favourable COVID vaccination rates have reduced the uncertainty associated with the position of customers who have needed special measures. In H1, the D-SIBs hoped their customers' situation would grow even clearer in Q3, but rising case numbers during the quarter have meant that it will take longer to gain that clarity. As a result, it is essential that the D-SIBs' impairment accounts be able to handle unforeseen shocks.

Because of the turnaround in the economy and the improved economic outlook in H1, all of the banks have reversed a portion of the impairment they entered last

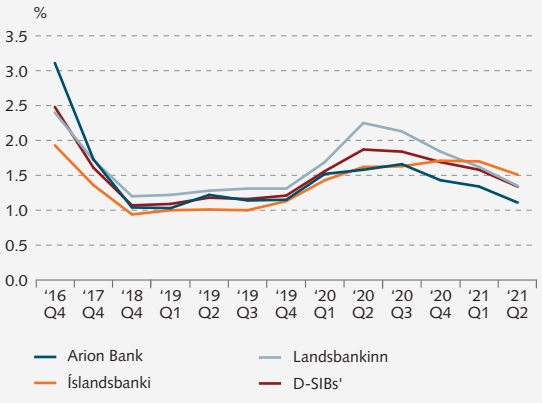
2 Excluding one-off expenses in the amount of 0.7 b.kr. in Q2, in connection with Íslandsbanki's IPO.

3 The amount is based on the cross-default method, according to which the outstanding balance of all of the customer's loans is defined as frozen if one loan has been frozen. Loan freezes can take different forms, as some customers may have frozen both instalments and interest, whereas others may have frozen only the instalments.

year, so that loan valuation adjustments were positive by 5.3 b.kr. during the half, as opposed to impairment in the amount of 26 b.kr. last year. The impairment account stood at 1.84% of the claim value of the loan portfolio at year-end 2020. As the impairment account has shrunk and the loan portfolio has grown, this ratio has fallen, to 1.34% as of end-June. As a percentage of the loan portfolio, the impairment account was only 0.13 percentage points higher at the end of June than at year-end 2019 – i.e., before the pandemic struck — and somewhat lower than at the end of 2016 and 2017. The change in composition of the D-SIBs' loan portfolio in the recent term – that is, the increased weight of mortgage loans, which carry lower risk of loss than, for instance, typical corporate loans – should reduce the need for impairment and result in lower impairment account balances.

Chart II-6

D-SIBs': Ratio of impairment account to total loans[1]



1. Consolidated figures. Loan claim value.
Sources: Commercial banks' financial statements.

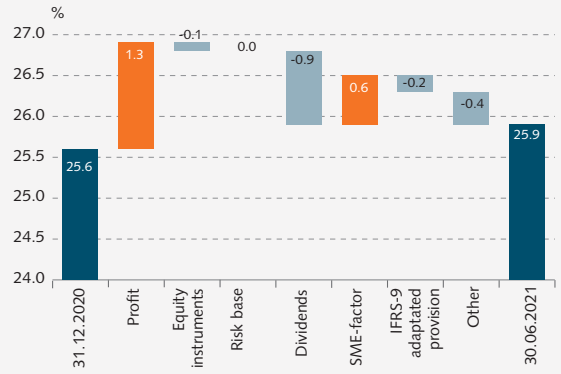
in Stage 3, the situation at the end of June was similar to that in mid-2019. The D-SIBs' NPL ratio is therefore broadly at the pre-pandemic level.

Strong capital position

The D-SIBs' capital amounted to 652 b.kr. at the end of Q2, after increasing by 10 b.kr. since the turn of the year. Their combined capital ratio was 25.9% at the end of Q2, an increase of 0.3 percentage points since end-2020.[5] Profits and discounts on risk weights for small and medium-sized enterprises (SME) led to an increase in the capital ratio in H1, although it was offset by dividend payments and share buybacks in the amount of 25.9 b.kr., a lower position in equity instruments due to the appreciation of the króna, and changes in the IFRS-9 treatment of impairment.[6]

Chart II-7

Change in D-SIBs' capital ratios in first half of 2021[1]



1. Consolidated figures.
Sources: Commercial banks' financial statements.

Concurrent with positive valuation adjustments and the turnaround in the economy, the amount of D-SIB loans classified as Stage 2 according to IFRS-9 declined by 36 b.kr., or 8%, in H1/2021, to 406 b.kr., or 12.1% of the loan portfolio, as of end-June. A large share of these loans are to tourism companies, and frozen loans are usually classified as Stage 2.[4] The amount of loans in Stage 3 came to nearly 86 b.kr. at the end of June, after declining by 4.7 b.kr. since the turn of the year. The share of loans in Stage 3 was 2.6% at the end of June, down from 2.8% at year-end 2020. If the non-performing loan ratio is based on the amount of loans

The minimum capital ratio required of the D-SIBs by the Central Bank ranges between 17.8% and 18.9%, based on the status of the banks at the end of 2020. At the end of June, their capital ratios were 5-9 percentage points above the required level, after adjusting for dividend payments planned for 2022. The D-SIBs' capital ratios are therefore well in excess of Central Bank

4 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 shall be based on expected credit losses over the lifetime of the loan.

5 According to the D-SIBs' interim earnings reports for Q2/2021, planned dividends in the amount of 26.4 b.kr. have been deducted from their capital base, but this has not been done here. If adjustments are made for the planned dividend payments, however, the end-Q2 capital ratio is one percentage point lower – 24.9% – and unchanged relative to year-end 2020.

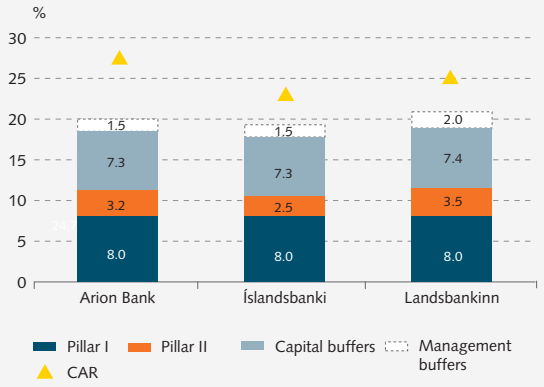
6 In 2020, the banks took advantage of the implementation of transitiona IFRS-9 rules that allow a portion of impairment to be classified as common equity Tier 1 (CET1) capital. Their year-2020 capital ratio increased by 0.3-0.4 percentage points as a result. The reversal of impairment in H1/2021 causes a reduction in impairment classified as CET1 capital..

requirements. Nevertheless, the banks must be prepared for an increase in capital requirements; for instance, with the re-activation of the countercyclical capital buffer.

The banks' leverage ratio declined by 0.9 percentage points in H1/2021, to 13.8% at the end of Q2. Individual leverage ratios ranged between 12.4% and 14.6% and fell by 0.5-1.2 percentage points during the first half of the year. The main reason for the decline is a 7.3% increase in total exposures in H1, while CET1 capital increased by 0.7% over the same period.[7] Although the leverage ratio fell somewhat in H1, it is far above the 3% minimum, and the Icelandic banks still have the highest ratios in the European Economic Area. The D-SIBs' excess CET1 capital in terms of the minimum leverage ratio was 495 b.kr., or 17.6% of risk-weighted assets, at the end of June, whereas at the same time, excess CET1 capital in terms of the minimum CET1 capital requirement was 193 b.kr., or 6.9% of risk-weighted assets. For the Icelandic banks, capital requirements are therefore far more binding than the minimum leverage ratio. In this context, it is worth noting that for the seven largest banks in Denmark, the end-2020 ratio of excess CET1 capital to risk-weighted assets was 9% in terms of the rules on leverage ratio and 8% in terms of capital requirements.

Chart II-8

D-SIB capital requirements and capital adequacy ratios at the end of Q2/2021[1]



1. Consolidated figures. When calculating the equity ratio, the share of the first half 2021 profit, which is assumed to be paid out in dividends in the year 2022, has been deducted from the equity base. If the proposed dividend payments are included in the capital base, the banks' capital ratios are as follows: Arion Bank 29.2%, Íslandsbanki 23.3% and Landsbankinn 25.8%.

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

Risk-weighted assets totalled 2,802 b.kr. at the end of Q2 and were unchanged since year-end 2020. Total assets increased by 261 b.kr., however, lowering the ratio of risk-weighted assets to total assets by 4.1 percentage points, to 64.5% at the end of June. Since year-end 2019, it has fallen by 6.2 percentage points.

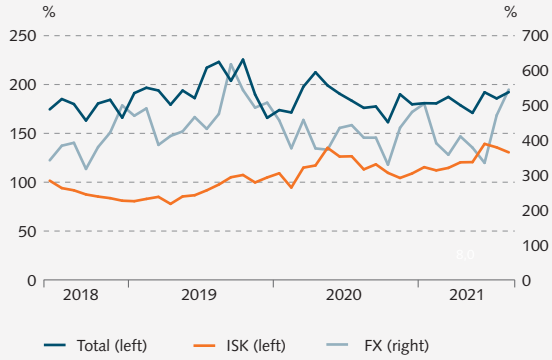
Liquidity and funding

D-SIBs' liquidity position still strong

The banks' liquidity ratios remain well above the minimum prescribed in Central Bank rules. Their liquidity ratios have risen slightly in 2021, after falling in H2/2020 in tandem with an increase in lending. A large share of the rise is due to increased individuals and Treasury deposits.

Chart II-9

D-SIB liquidity coverage ratio[1]



1. Consolidated figures.

Source: Central Bank of Iceland.

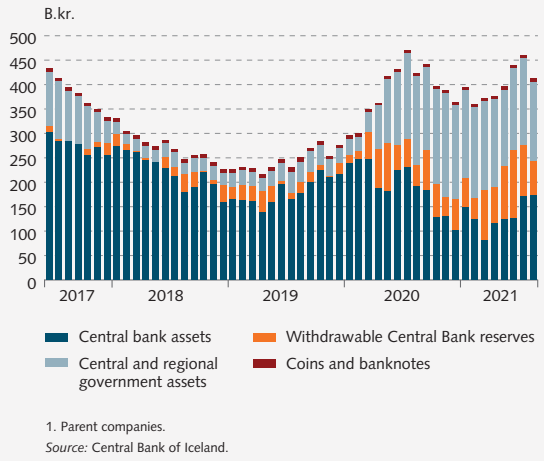
At the end of August, the D-SIBs' combined liquidity ratio in all currencies was 192%, well above the 100% minimum required under Central Bank rules. At that time, their liquidity ratio in foreign currencies was 545%, whereas the ratio in Icelandic krónur was 131%. Their disposable liquid assets were 291 b.kr. above the minimum required for all currencies combined according to Central Bank rules. Liquid assets over and above requirements have risen by 43 b.kr. in the past twelve months and have risen by 58 b.kr. in the past six months. The banks' scope for lending is based on regulatory requirements, but their internal benchmarks are the determining factor. Based on a 120% minimum liquidity ratio, for example, the banks' excess liquidity amounted to 228 b.kr. at the end of August.

The banks' liquid assets in krónur consist mainly of Treasury bonds, Treasury bills, and deposits with the Central Bank. At the end of August, their króna-

7 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%.

Chart II-10

D-SIB: ISK HQLA[1]



1. Parent companies.
Source: Central Bank of Iceland.

denominated liquid assets totalled 412 b.kr. The share of Treasury bonds and Treasury bills has remained high since mid-year, after the Central Bank stopped offering one-month term deposits so as to support monetary policy transmission. The share of Treasury bonds and Treasury bills was 39% at the end of August as compared with 11% in beginning of 2020. Foreign-denominated liquid assets consist solely of Treasury bonds. The ratio of liquid assets to total assets has also changed somewhat in the past year. It increased somewhat in 2019 and 2020, rising to around 20%, but in early 2021 it began to fall again.

In the coming term, the banks need to have access to enough liquidity to enable them to intermediate credit to households and businesses. If demand for króna-denominated loans significantly outpaces demand for the banks' market issues, their liquidity position could restrict the amount they can lend.

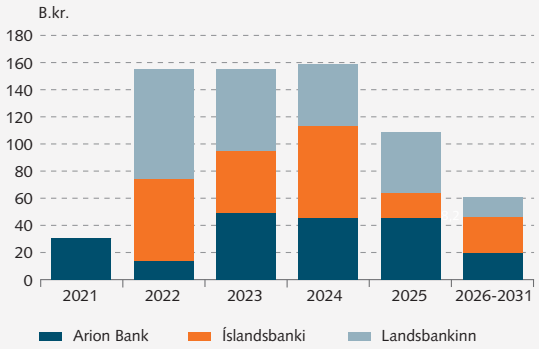
Limited market issuance in Iceland and new funding rules

New Rules on Net Stable Funding Ratios took effect at the end of June. The new Rules are discussed further in Box 3. The key ratios that indicate the banks' funding risk have remained stable in the recent term. The funding ratio for all currencies combined was 116% at the end of August, and the ratio for foreign currencies was 151%. The overall ratio is therefore somewhat above the new minimum, and the ratio for foreign currencies has risen by 4 percentage points since the turn of the year.

As before, the majority of the banks' funding is in the form of deposits and marketable bonds. At the end of June, deposits comprised about half of their funding. Deposits have increased by 8%, or 171 b.kr., in 2021, owing largely to increase in deposits held by individuals. If the composition of the deposit portfolio changes – if customers invest their savings elsewhere, for instance – the banks' liquidity position will be adversely affected. It is therefore important to keep close track of developments in the banks' deposits.

Chart II-11

D-SIB: Foreign bonds by maturity[1]



1. At 31.8.2021 exchange rate.
Source: Nasdaq Iceland.

The banks' domestic bond issuance has been limited in 2021, apart from covered bonds, but there has been very little demand for other domestic funding. In the first half of the year, the stock of outstanding covered bonds grew by 60 b.kr., while net new lending to households totalled 185 b.kr. over the same period. A large proportion of the covered bond issuance are bonds for their own use. Arion Bank, for example, has not issued any covered bonds this year. The large difference between covered bond issuance and net new lending has had a negative effect on the banks' liquidity. The banks must continue to reduce concentration risk in their funding.[8]

During the year, the banks have issued foreign-denominated bonds for a total of 201 b.kr. In July, Arion Bank issued a green eurobond in the amount of 45 b.kr., and in September Íslandsbanki issued a subordinated bond classified as Tier 1 capital in the amount of 11 b.kr. Also in September, Arion Bank issued a covered bond in euros, the first covered bond issued by an Icelandic bank in a currency other than the Icelandic króna. Several smaller bonds in Swedish kronor and Norwegian kroner have been issued as well in recent months..

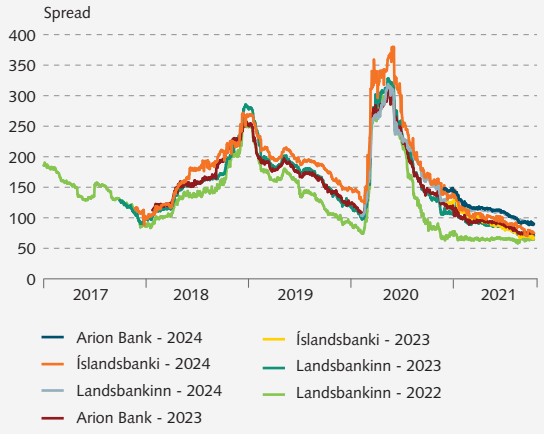
Foreign bonds issued by the D-SIBs that are scheduled to mature later this year amount to 30 b.kr., or 4%

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

of their foreign market funding as of end-August. The banks' ample foreign liquidity gives them the flexibility to retire all of this year's maturities without refinancing. Year-2022 maturities total 155 b.kr., and the banks need to consider refinancing to cover them. The banks' outstanding foreign-denominated bonds have declined markedly as a share of their balance sheet in the past few years, and their foreign refinancing risk has been reduced accordingly. After rising markedly in H2/2020, credit spreads on the banks' foreign issues have held relatively stable in recent months.

Chart II-12

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



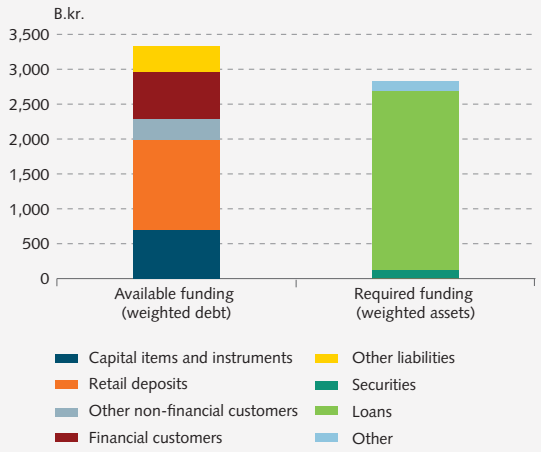
1. Spread on Euro benchmark curve.
Source: Refinitiv Datastream.

Rules on Credit Institutions' Minimum Net Stable Funding Ratio

The Central Bank's new Rules on Credit Institutions' Minimum Net Stable Funding Ratio, no. 750/2021, for all currencies combined, took effect on 28 June 2021, replacing the previous Rules on Stable Funding Ratios in Foreign Currencies, no. 1032/2014. The new Rules have a broader scope of applicability than their predecessor, and they now apply to all credit institutions and not only the commercial banks. They are based on the provisions of Regulation (EU) 2019/876 of the European Parliament and of the Council (CRR II) as regards the net stable funding ratio. The EU Regulation was implemented in Iceland with amendments to the Regulation on Prudential Requirements for Credit Institutions, no. 233/2017. Binding requirements for a minimum net stable funding ratio for credit institutions are among the key substantive changes provided for in CRR II.[1]

The aim of NSFR requirements is to restrict maturity mismatches between credit institutions' assets and liabilities and limit the extent to which credit institutions rely on unstable short-term funding to finance potentially illiquid long-term assets. The ratio is therefore intended to minimise the refinancing risk associated with over-reliance on short-term funding, as the requirements concerning the share of long-term funding depend on the composition of the asset portfolio. According to the Rules, credit institutions are required to maintain a total stable funding ratio of at least 100%, and they must ensure that the currency composition denomination of their funding is aligned with the currency denomination of their assets. The Rules do not specify a minimum ratio for all foreign currencies combined, as the previous Rules did.

Chart 1
Stable funding[1]
30.6.2021



1. Domestic systemically important banks, consolidated figure.
Source: Central Bank of Iceland.

The NSFR is calculated as the ratio of available stable funding to required stable funding. Required stable funding refers to assets and off-balance sheet items, multiplied by the appropriate weight. It varies directly with the share of long-term of illiquid assets. The loan portfolio, for instance, carries different weights, depending on loan type and maturity. The higher required stable funding is, the more available stable funding is needed. Available stable funding includes, for example, equity, liabilities with a residual maturity longer than one year, and other long-term funding.

According to the D-SIBs' balance sheets, a majority of their asset portfolio consists of loans to households and businesses. As a result, the net stable funding requirement is determined mainly by the loan portfolio. The D-SIBs' available stable funding consists of equity, foreign market funding, covered bonds, and deposits.

1 In accordance with Article 83, Paragraph 4 of the Act on Financial Undertakings, no. 161/2002, the Central Bank of Iceland sets rules on stable funding, wherein it is permissible to stipulate minimum net stable funding ratios (NSFR) in Icelandic krónur and in foreign currencies.

Comprehensive review of the statutory framework for foreign exchange and full removal of capital account restrictions

New Foreign Exchange Act

With the passage of the new Foreign Exchange Act, no. 70/2021, the capital controls introduced in November 2008 have been lifted in full. The entire statutory framework for foreign exchange is now simpler, clearer, and more accessible to the general reader, and the rules requiring that individuals, firms, and foreign investors submit notifications to the Central Bank have been eased. When the Act entered into force, the previous Foreign Exchange Act, no. 87/1992, was repealed, as were the Act on the Treatment of Króna-Denominated Assets Subject to Special Restrictions (also called the Offshore Króna Act), no. 37/2016, and various rules and regulations relating to the capital controls. This removed all remaining capital account restrictions pertaining to derivatives trading and offshore krónur.

The Act does not make large-scale changes to the substantive rules that were in effect before its passage. The fundamental principles are the same as before: foreign exchange transactions, cross-border movement of capital, and cross-border payments shall be unrestricted. Nevertheless, it is ensured that the Central Bank has at its disposal the measures needed to safeguard economic and financial stability if needed. These measures are of two types: on the one hand, preventative macroprudential policy instruments; and on the other, protective measures (controls) for use under extraordinary circumstances. The Act also contains provisions comparable to those in the previous law as regards intermediation in foreign exchange transactions and the obligation that certain parties submit notifications of foreign exchange transactions, cross-border movement of capital, and cross-border payments.

According to the Act, the macroprudential policy instruments are of three types. These measures are intended to prevent the build-up of risk that could jeopardise financial stability, and their application is intended to reduce the likelihood that it will be necessary to respond to severe disruptions to monetary and exchange rate stability by intervening with broad-based, costly measures such as capital controls. The first type of measure is the authorisation to impose special reserve requirements on inflows of foreign currency. This authorisation is subject to ministerial approval and is similar to the measure that was in place in 2016-2019. The second type is the authorisation to adopt rules on credit undertakings' foreign currency-linked lending to borrowers that are unprotected against foreign exchange risk. This measure is subject to the approval of the Central Bank Financial Stability Committee and is unchanged from the previous Act. No rules have been set on the basis of this authorisation. The third measure is the authorisation, also subject to approval by the Financial Stability Committee, to set rules imposing limitations on derivatives transactions where the Icelandic króna is used in a contract against foreign currency. On the basis of this authorisation, the Rules on Derivatives Transactions, no. 765/2021, were set in late June.

The protective measures provided for under the Act entail authorising the Central Bank to set rules that could, among other things, restrict or halt specified categories of capital movements or cross-border payments for up to 60 days, as well as restricting foreign currency transactions and requiring the repatriation of foreign currency. This authorisation, which is also subject to ministerial approval, applies only in emergencies that entail a severe risk that financial stability will be jeopardised by unrestricted movement of capital, and when other measures cannot be taken.

Moreover, the Act prohibits intermediation in foreign exchange transactions without explicit statutory authorisation. The corresponding provision in the previous Act has been amended, however, so that it is no longer possible to apply to the Central Bank for a generic licence to carry out such intermediation. On the other hand, the Bank may grant authorisation to operate a foreign exchange market, and the requirement for such authorisation is that the operation of the market must be conducive to increased transparency and more efficient price formation in the foreign exchange markets.

The provisions in the new Act concerning notification requirements for foreign exchange transactions, cross-border movement of capital, and cross-border payments apply primarily to those who carry out such transactions and transfers; i.e., financial institutions, payment institutions, electronic money institutions, and currency exchange centres operating in Iceland, as well as those who act as intermediaries in foreign exchange transactions. Furthermore, it is now stipulated that the police, the tax authorities, and Statistics Iceland shall have access to the information gathered by the Central Bank in order to carry out their statutory roles.

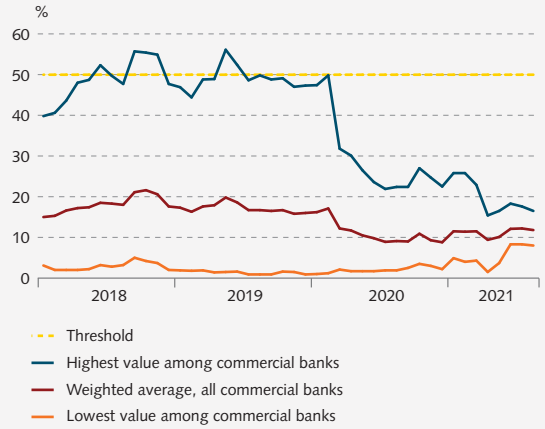
New Rules on Derivatives Transactions

According to the comments on the bill of legislation passed as the new Foreign Exchange Act, it was foreseeable that derivatives trading involving the Icelandic króna would be subject to some restrictions under the Central Bank's new authority to set rules, once the previous rules on such transactions were repealed along with the previous Foreign Exchange Act and Rules on Foreign Exchange. According to the previous regulatory instruments, derivatives transactions involving the Icelandic króna against a foreign currency were prohibited unless they were: 1) connected to specific transactions with goods and services; 2) between domestic commercial banks, savings banks, and credit institutions; or 3) used for hedging purposes (although not in connection with issuance of króna-denominated bonds abroad – so-called glacier bonds), and then only with confirmation from the Central Bank. Actually, it can therefore be said that the only prohibited derivatives transactions were those associated with speculation and glacier bond issuance.

The new Rules on Derivatives Transactions, no. 765/2021, greatly expand the authorisations for derivatives trading involving the Icelandic króna, which are no longer subject to restrictions relating to their purpose, nor do they require confirmation from the Bank. On the other hand, the Rules set limits on the total amount of such trading by domestic commercial banks in their derivatives books. These limits are intended specifically to prevent large-scale glacier bond issuance that could cause instability in and of itself, but they also aim to limit excessive speculation and position-taking in foreign exchange transactions that are generally conducive to undermining foreign exchange market stability. The restrictions fall into two categories. First of all, commercial banks' forward foreign currency position versus each individual counterparty shall never at any time be positive or negative by more than 10% of their capital base.

Chart 1

Commercial banks' derivatives books[1]



1. The commercial banks' gross position in derivatives involving the Icelandic króna against a foreign currency as a percentage of their equity base; cf. Rules no. 765/2021.

Source: Central Bank of Iceland.

This position consists of: 1) the position in forward contracts and currency swap agreements; 2) the delta value of options contracts; and 3) the market value of other derivatives contracts. Second, commercial banks' gross forward position, which comprises the absolute value of all forward positions vis-à-vis customers at any given time, may not exceed 50% of their capital base. All of the banks are currently well within these boundaries, as can be seen in Chart 1. It should be noted that this applies only to contracts involving the Icelandic króna against a foreign currency. In other words, contracts in which one foreign currency is swapped for another are unrestricted except insofar as they may fall under the Rules on Foreign Exchange Balance. These restrictions give the commercial banks considerable latitude to increase their derivatives trading relative to their current position without its being considered a threat to financial stability.

Central Bank stress test 2021

III

The Central Bank of Iceland's 2021 stress test focused on the banking system's resilience against a double-dip recession. The stress scenario assumes that it will prove difficult to bring the pandemic to an end, and that tourist numbers will not rise between 2020 and 2021. In this scenario, individuals' propensity to save remains high throughout the pandemic, causing private consumption to decline further. Based on these factors combined, GDP will contract in 2021, according to the stress scenario, and unemployment will remain high. Nevertheless, inflation and interest rates will be low, which will suffice to support house prices but not commercial property prices. According to the test results, the domestic systemically important banks' (D-SIB) capital ratios could fall by 2.8 percentage points in the stress scenario, which extends over a horizon from 2021 through 2023. At the beginning of the scenario, the banks' capital ratio was an average of 6.5 percentage points above capital requirements plus capital buffers. As a result, they are resilient enough to face the economic repercussions of the pandemic and could have withstood an even more severe situation than has materialised thus far.

The stress testing process

The Central Bank of Iceland conducts an annual stress test on the banking system. In the test, individual banks' resilience against shocks is assessed, as is the resilience of the banking system as a whole. Participants in the stress test are the three systemically important banks (D-SIB), which accounted for 97% of deposit institutions' total assets as of end-2020. The scenarios used in the test are based on an analysis of the key risks and challenges to financial stability. In general, the Bank uses cyclical stress scenarios whose severity increases when cyclical systemic risk is considered to accumulate.

During stress periods, increased weight is placed on determining whether the banks have enough capital to satisfy capital and liquidity requirements throughout an ongoing shock. When it became clear that an economic shock had struck in early 2020, the systemic stress test for that year was cancelled, as the stress scenario no longer reflected the challenges that lay ahead. Instead, the Bank conducted its own scenario analysis based on different post-pandemic outcomes. It published the results of this analysis in *Financial Stability* 2020/1 and the results of a reverse stress test in *Financial Stability* 2021/1.

Preparation for the 2021 systemic stress test began last November with scenario design. One of the objectives of this year's systemic stress test is to evaluate whether the banks are resilient enough to withstand the repercussions of the pandemic, even if it drags on longer than forecast, and whether they can maintain strong enough lending capacity to support the ensuing economic recovery.

The stress test is carried out in cooperation with the D-SIBs. The results published here give an indication of how their balance sheets could develop in the stress scenario, according to the Central Bank's estimation. The results were available in June, and they do not assume any mitigating action by the banks' senior management. This means that the relative composition of loan portfolios was not adjusted, no operational streamlining was assumed, and no equity instruments were issued to boost the banks' capital ratios.[1]

1 A more detailed description of the Central Bank stress test and the methodology used can be found in the report entitled *The Central Bank of Iceland's approach to stress testing the Icelandic banking system.*

The stress scenario

While the stress scenario is based on the shock that had already materialised, it also includes an assumed double-dip recession. Therefore, the economic recovery expected in 2021 does not occur until 2022 in the stress scenario. Although the forecasts available at the time the stress scenario was designed assumed a slow economic recovery, the economic outlook was especially uncertain. As a result, the macroeconomic forecast in *Monetary Bulletin* 2020/4 was accompanied by an analysis of several uncertainties that could have a major impact on the path of the economic recovery.

Two uncertainties were explored in some depth in the alternative scenarios accompanying the forecast published in that issue of *Monetary Bulletin*. One focused on how successful efforts to control the pandemic proved to be, both in Iceland and abroad. If they proved ineffective, public health measures could be expected to remain in place. This alternative scenario assumed that tourist numbers would remain flat year-on-year and that firms' appetite for investing and recruiting staff would dwindle. Domestic and foreign demand would remain weak, with the associated adverse impact on the domestic economy. The other uncertainty centred on households' propensity to save during the pandemic, as saving had already increased more than expected before that time. If households chose to be more cautious in their spending decisions and maintained a high saving ratio, private consumption would decline, thereby cutting further into domestic demand.

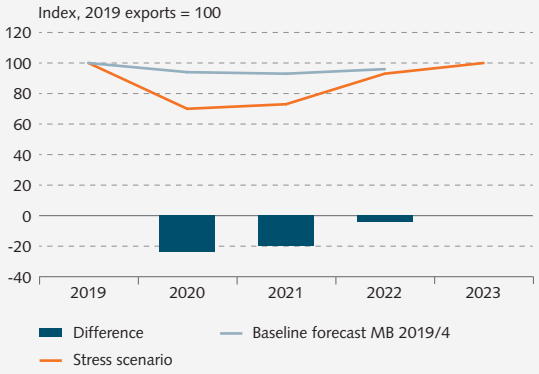
In order to create a double-dip recession scenario, it was decided to combine these two alternative scenarios and run them through the Bank's macroeconomic model. The result was that goods and services exports would not return to their 2019 level until 2023. In comparison with the Bank's last pre-pandemic macroeconomic forecast,[2] the total contraction in exported goods and services during the pandemic would amount to as much as 50% of year-2019 exports over the period from 2020 through 2022. The same type of calculation shows that the cumulative loss in output over the three-year period would be just over 30% of 2019 GDP. For comparison, the Bank's most recent macroeconomic forecast, published in *Monetary Bulletin* 2021/3, assumes that the loss in output over the period will total 18% of year-2019 GDP.

Because of the significant slack in the economy, the stress scenario assumes that interest rates will remain low but that the banks' market funding terms will deteriorate overall, as risk premia on their debt will rise. Iceland would not be alone in such a situation, as neighbouring countries would suffer a similar shock. As a result, no large exchange rate swings or inflation spurts are assumed.

When the scenario was designed, it was clear that the commercial real estate market was weak, unlike the residential property market. House prices had been strongly supported by favourable financing terms, but commercial property values were highly uncertain, as they had already declined significantly. For the scenario, it was assumed that interest rates would remain low and that residential investment would continue to contract, leaving house prices more or less unchanged, while commercial property prices would fall by over 43% in nominal terms from their mid-2019 peak. The price of guest accommodation would fall even more, or by 50.5% from the peak.

Chart III-1

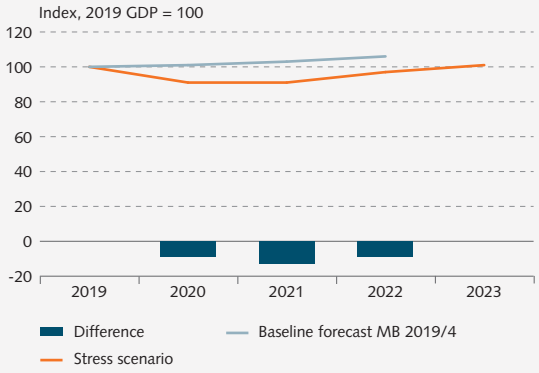
Exports of goods and services



Source: Central Bank of Iceland.

Chart III-2

Gross domestic product



Source: Central Bank of Iceland.

2 *Monetary Bulletin* 2019/4.

Table III-1: Key variables in the stress scenario[1]

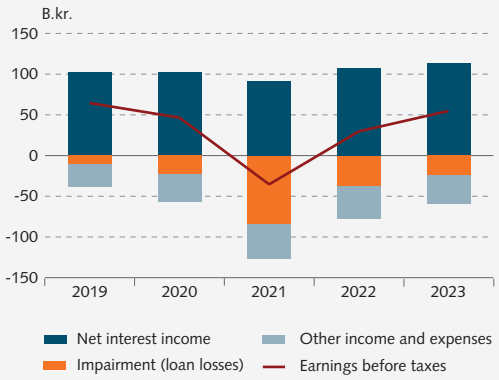
	2020 (assumption)	2021 (scenario)	2022 (scenario)	2023 (scenario)
Private consumption	-5.8	-2.4	5.1	4.5
Services exports	-49.6	9.7	59.5	12.4
GDP growth	-8.6	-0.8	7.4	5.0
Unemployment (average for the year)	5.9	8.7	6.8	5.9
Nominal house prices	4.1	-0.1	2.2	4.8
Nominal commercial property prices	-8.6	-26.7	-8.1	0.5
Nominal accommodation prices	-13.00	-34.0	-14.5	4.5

1 Change from prior year (%) unless otherwise specified.

Sources: Statistics Iceland, Central Bank of Iceland.

Chart III-3

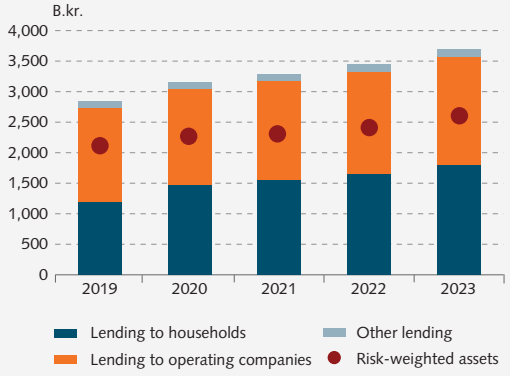
Stress scenario: D-SIB's income and expenses



Sources: Arion bank, Íslandsbanki, Landsbankinn, Central Bank of Iceland.

Chart III-4

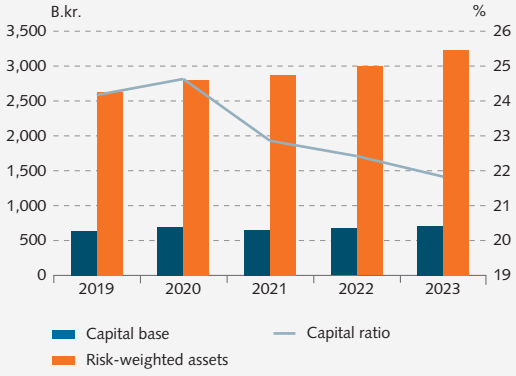
Stress scenario: D-SIB's lending



Sources: Arion bank, Íslandsbanki, Landsbankinn, Central Bank of Iceland.

Chart III-5

Stress scenario: D-SIB's capital and equity base



Sources: Arion bank, Íslandsbanki, Landsbankinn, Central Bank of Iceland.

Operating results

The Central Bank's estimate, which is based on statistical models, discussion with the banks, and expert assessment, is that in the stress scenario, the banks' corporate loan portfolio would be under particular pressure, with impairment amounting to as much as 6.5% of the average claim value of the portfolio in 2021-2023. The household loan portfolio would fare better, as a healthy collateral position and a manageable debt service burden would offset higher unemployment, with the result that mortgage loan impairment would only come to a scant 2% of claim value over the period.

In the stress scenario, the banks' interest rate spread will also be under pressure because of low interest rates. With deposit rates already close to zero at the beginning of the scenario, it would be difficult to lower interest expense to keep pace with interest income. Furthermore, the scenario assumes an increase in risk premia on bond issues. Net interest income would therefore contract in the first year of the scenario. Because of the expansion of the loan portfolio, net interest income would be higher than in 2020 as soon as the second year of the scenario, although the interest rate spread would not improve to any marked degree.

Other income, such as net commissions and net income from financial activities, would contract slightly, but not enough to make a decisive impact on the results. The Central Bank's assessment is that in this scenario, the D-SIBs would generate an operating loss of 35 b.kr. in 2021 but then return to positive territory thereafter, with profits of 30 b.kr. and 54 b.kr., respectively, in 2022 and 2023.

The denominator of the capital ratio, risk-weighted assets, is determined by developments in risk weights and the claim value of the banks' assets. Between 2019 and 2020, the banks' risk-weighted loans increased markedly, which could have caused the capital ratio to fall if their capital base had not grown even faster. The stress scenario assumes a robust economic recovery in the second and third years, which will lead to a steep rise in lending. The Bank's assessment is that risk-weighted loans could increase by 4.7% per year, on average, in this

scenario, although no marked increase in risk weights is assumed. Because the return on equity is estimated to be below 4.7%, this will cause capital ratios to fall.

Developments in the capital ratio in a stress situation

For the purposes of the stress test, the initial position is based on the banks' consolidated annual accounts as of end-2020. One change is made: the dividend that was to be paid in H1/2021 (totalling 26 b.kr.) is deducted from the capital base, but no further dividend payments are assumed in the scenario. The banks' capital ratio is strong at the outset, averaging 24.6%, which is 6.5 percentage points above the capital requirement plus capital buffers. The banks also satisfy CET1 capital requirements with room to spare, with a ratio of 21.6%, which is 8.2 percentage points above the capital requirement plus capital buffers.

The Bank's assessment is that in the stress scenario, the capital ratio will fall by 1.8 percentage points in 2021, owing mainly to operating losses due to recognised impairment and reduced net interest income. In 2022-2023, it will fall by another 1 percentage point even though the banks operate at a profit. This is because of the surge in lending assumed in the latter half of the horizon.

Because the banks have ample excess equity, all of them satisfy overall capital requirements, CET1 capital requirements, and minimum leverage ratio requirements for the entire period. Towards the end of the horizon, excess capital will have fallen from 6.5% to 3.7% above the requirement plus capital buffers.

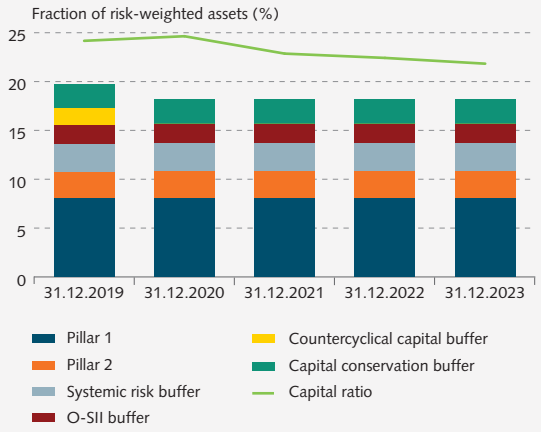
Conclusion

It no longer appears likely that a scenario like this one will materialise, as year-2020 GDP was revised after the stress testing process began, and the contraction is now estimated at 6.5% and not 8.5%. Asset prices have rebounded, the most recent measurements put commercial property prices 9.5% higher than at the beginning of the pandemic, and summer tourist arrivals developed much more favourably than was previously feared. The scenario analysis shows that the banks could have withstood a much more severe shock than actually materialised, and they could absorb fluctuations in demand for credit throughout the shock and the ensuing recovery.

The figures presented here assume that the banks' senior management will not take any action other than to suspend further dividend payments after H1/2021 in order to protect the banks' position. In an actual shock scenario, however, they could take a range of other measures to safeguard their operations. The banks' actual resilience is therefore underestimated in the stress scenario analysis.

Chart III-6

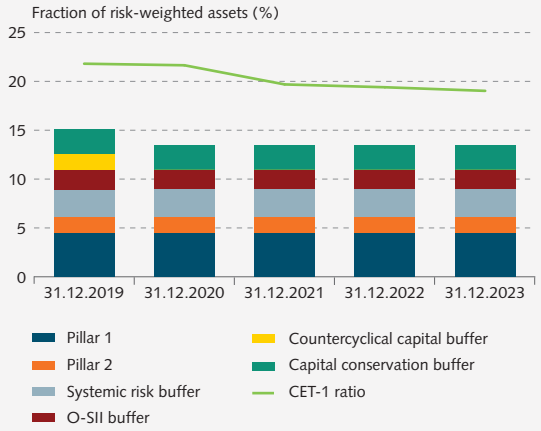
Stress scenario: D-SIB's capital ratio and requirements



Sources: Arion bank, Íslandsbanki, Landsbankinn, Central Bank of Iceland.

Chart III-7

Stress scenario: D-SIB's CET1 ratio and requirements



Sources: Arion bank, Íslandsbanki, Landsbankinn, Central Bank of Iceland.

Financial market infrastructure

IV

Systemically important financial market infrastructure

Financial market infrastructure is one of the three pillars of the financial system, the other two being financial institutions and financial markets. Financial market infrastructure connects customers to financial institutions and connects those institutions to one another, both directly and through markets, as the infrastructure includes systems used for payment intermediation, registration, and settlement. It is extremely important for the stability of the financial system and the domestic economy that its infrastructure be smooth-functioning, secure, and economical to operate.

The concept of financial market infrastructure

The term *financial market infrastructure* as such is not defined in Icelandic law. The Bank for International Settlements Committee for Payments and Market Infrastructures (CPMI/BIS) and the International Organization of Securities Commissions (IOSCO) define it as follows:[1]

> *The term financial market infrastructure (FMI) refers to 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. Such systems typically establish a set of common rules and procedures for all participants, a technical infrastructure, and a specialised risk management framework appropriate to the risks they incur. They provide participants with centralised clearing, settlement, and recording of financial transactions (…) to allow for greater efficiency and reduced costs and risks. (…) Financial market infrastructure can promote increased transparency in particular markets. Some FMI elements are critical to helping central banks conduct monetary policy and maintain financial stability.*

Financial market infrastructure can be either publicly or privately owned. Different criteria may apply to different infrastructure types; for instance, depending on whether the infrastructure element in question is, on the one hand, a payment service provider's own payment system in the sense of the Payment Services Act, no. 114/2021,[2] or on the other hand, what is commonly called systemically important financial market infrastructure. The latter category generally includes payment and settlement systems that, at any given time, could catalyse and/or spread system-wide disruption, thereby having a negative impact on financial stability.

Oversight of systemically important financial market infrastructure

The Central Bank oversees systemically important financial market infrastructure, as central banks generally do in Europe and elsewhere. This oversight role is based on the general provision found in Article 2 of the Act on the Central Bank of Iceland, no. 92/2019. The Bank also

1 See the Principles for Financial Market Infrastructures (PFMI), April 2012, Item 1.8, page 7. The PFMI are globally recognised criteria for best practice in connection with systemically important financial market infrastructure.

2 According to Article 3, Item 15 of the Act, the term payment system is defined as a system that transfers funds using a formal, standardised arrangement and collective rules on handling, netting, and/or settlement of payments.

relies on the general provisions in the Act on the Security of Transfer Orders in Payment Systems and Securities Settlement Systems, no. 90/1999, in conducting oversight of systems that are recognised under the provision of that Act, and it relies as well on the Act on Central Securities Depositories and Settlement and Electronic Registration of Financial Instruments, no. 7/2020. The Bank's oversight role primarily entails overseeing the operational framework for systemically important financial market infrastructure. An important aspect of this is assessing the security and efficacy of the systems on the basis of the law and the international guidelines found in the PFMI.

Recognition of systems pursuant to Act no. 90/1999

In general, payment and settlement systems are considered systemically important if they satisfy the requirements laid down in the Act on the Security of Transfer Orders in Payment Systems and Securities Settlement Systems, no. 90/1999. Act no. 90/1999 incorporated the provisions of EU Directive no. 98/26/EC on settlement finality in payment and settlement systems, generally referred to as the Settlement Finality Directive (SFD), into Icelandic law. According to the Act, upon receiving applications from entities that operate payment and settlement systems in Iceland, the Central Bank makes a recommendation to the Minister, specifying those systems that, in the Bank's opinion, satisfy the requirements in the Act and should be recognised. Briefly, in order to qualify for recognition according to the Act, the system in question must have three or more participants in addition to the system administrator and settlement agent, and it must have collective rules and a standardised arrangement for processing and execution of orders. Furthermore, recognition of the system must be considered desirable from a systemic risk perspective.

The significance of recognition – enhanced legal protection of orders

The main objectives of Act no. 90/1999 and the SFD are to attempt to prevent default by one participant in a systemically important payment or settlement system from spilling over into the financial system. This is done by providing greater legal protection for transfer orders in connection with the settlement of transactions in recognised systems, which in turn is done by ensuring that settlement taking place in recognised payment and settlement systems is protected from the general provisions on rescission as laid down in the Act on Bankruptcy, Etc., no. 21/1991. If a payment order from a participant has reached the system in question before a ruling has been handed down in insolvency proceedings involving that participant, the payment order is considered binding upon third parties. The protection under Act no. 90/1999 is not limited to orders and netting, as Article 8 stipulates that it shall also apply to collateral that an insolvent participant may have provided as security for settlement and finalisation of orders.[3]

The Central Bank's interbank system and the Nasdaq CSD SE securities settlement system are recognised systems

Upon the Central Bank's recommendation, the Minister of Finance and Economic Affairs has recognised the Central Bank's interbank system and the Nasdaq CSD SE securities settlement system and deemed them to be in compliance with the provisions of the Act on the Security of Transfer Orders in Payment Systems and Securities Settlement Systems, no. 90/1999. This entails that both systems have been notified to the EFTA Surveillance Authority (ESA) and the European Securities and Markets Authority (ESMA), in accordance with the Act. From the Central Bank's perspective, the importance of recognising the interbank system and the Nasdaq CSD SE system lies not least in the following:

- Payment flows in the two systems could involve very large sums of money; therefore, the need for recognition according to Act no. 90/1999 can be supported with reference to the Central Bank's role in safeguarding and promoting a safe, effective financial system, including domestic payment intermediation; cf. in particular Article 2, Paragraph 1 of the Act on the Central Bank of Iceland, no. 92/2019.

- Recognition according to Act no. 90/1999 fosters an even more solid framework for financial market infrastructure operations than would otherwise exist, not least as regards the preparation of procedures and contingency plans relating to participants' potential insolvency.

- The Bank is authorised to invoke Article 3, Paragraphs 3 and 4 of Act no. 90/1999 (information disclosure requirement), which, among other things, strengthens the Bank in its oversight and monitoring of the securities settlement system.

3 Such collateral is also subject to the provisions of the Act on Financial Collateral Arrangements, no. 46/2005.

In the Central Bank's opinion, formal recognition of the interbank and securities settlement systems in accordance with Act no. 90/1999 is conducive to ensuring secure, effective, and trustworthy payment intermediation and securities settlement in Iceland, as well as enhancing confidence in the Icelandic financial market. Such recognition is fully consistent with the Bank's objectives as laid down in Article 2, Paragraph 1 of Act no. 92/2019 and is of benefit to all participants in payment intermediation, issuers of financial instruments, and investors, as well as the economy as a whole.

Financial Stability Committee decisions on systemic importance

The tasks of the Central Bank's Financial Stability Committee include assessing systemic risk and financial stability and deciding which *supervised entities, infrastructure, and markets* shall be considered systemically important and of such a nature that their activities could affect financial stability.[4]

In 2020, the Financial Stability Committee decided to designate the Central Bank's new interbank system and the Icelandic branch of the Nasdaq CSD SE securities settlement system as systemically important infrastructure elements in the sense of Article 13(d) of no. 92/2019. In assessing the systemic importance of individual financial market infrastructure elements in Iceland, the Committee gave particular consideration to the provisions of Icelandic law, the PFMI, and other criteria, including practices at foreign central banks. These criteria involve factors such as trading volume; the number, size, and importance of participants; substitutability potential; links to other infrastructure elements; and points of contact with monetary policy and the real economy.

About the Central Bank of Iceland interbank payment system

The Central Bank's new interbank system was launched on 26 October 2020. It supplanted the real-time gross settlement (RTGS) system and the retail netting system, the latter of which was operated by Greiðsluveitan ehf., a company owned by the Central Bank.

The RTGS component of the new interbank system is based on a standardised system used by at least three Nordic central banks. The retail netting component is new and was developed expressly for the Central Bank so as to offer the same real-time payment intermediation that the former system offered. The interbank system has all of the normal business functionality that its predecessors had, plus a number of new features that enhance security and increase business potential. No changes were made to the collateral that the new system holds from participants, and at the time of the system launch, the participants were the same as in the previous systems. The interbank system has two components: the real-time gross settlement component, for large-value payments of 10 m.kr. or more; and the retail component, for payments of less than 10 m.kr. The retail component of the system is open year-round, 24 hours a day. An agreement was made with the Icelandic Banks' Data Centre (RB) concerning operation and service of the system. Such an agreement was also in effect for the operation of the Bank's previous interbank systems. The Central Bank has adopted the Rules on the Central Bank of Iceland Interbank Payment System, no. 1030/2020, which have been published in the *Law and Ministerial Gazette (Stjórnartíðindi)*.[5]

About the Nasdaq CSD SE securities settlement system

In autumn 2017, Nasdaq CSD SE was granted an operating license by the Latvian Financial and Capital Market Commission on the basis of Regulation (EU) no. 909/2014 of the European Parliament and of the Council on improving securities settlement in the European Union and on central securities depositories (CSDR).[6] On 20 May 2020, the Latvian Financial and Capital Market Commission granted Nasdaq CSD SE a licence to operate a branch in Iceland, in accordance with Article 19 of the CSDR. With a cross-border merger on 25 May 2020, Nasdaq CSD Iceland hf. and Nasdaq CSD SE combined their operations, and the activities of Nasdaq CSD Iceland were transferred to the Icelandic branch of Nasdaq CSD SE. Nasdaq CSD SE is subject to supervision by the Latvian Financial and Capital Market Commission in cooperation with the Central Bank of

4 These tasks were previously entrusted to the Systemic Risk Committee and the Financial Stability Council, cf. Act no. 66/2014, but the structure was changed with the entry into force of Act no. 92/2019; cf. Act no. 91/2019, which amended various other Acts in connection with the merger of the Central Bank and the Financial Supervisory Authority.

5 The Rules, which are set based on the authorisation contained in Article 46, Paragraph 2 of Act no. 92/2019, took effect on 26 October 2020, the day the new interbank system was launched. At that time, the Rules on the Central Bank of Iceland Real-Time Gross Settlement System, no. 703/2009, and the Rules on the Activities of Netting Systems, no. 704/2009, were repealed.

6 The CSDR was incorporated into Icelandic law with the passage of the Act on Central Securities Depositories and Settlement and Electronic Registration of Financial Instruments, no. 7/2020, which entered into force on 6 February 2020. According to Article 1 of the Act, the objective of the Act is to reduce systemic risk and promote financial stability and, to that end, improve securities settlement and make more stringent requirements of central securities depositories' operations.

Iceland Financial Supervisory Authority, in accordance with the provisions of the CSDR.

On 25 August 2020, Nasdaq CSD SE launched a new securities settlement system, called Depend, for its Iceland operations. The Depend system, which was already in use in Estonia, Latvia, and Lithuania, replaced the previous Nasdaq CSD Iceland hf. system. The system is based on Nasdaq CSD SE rules that took effect in the Baltics in September 2017 and apply to operations in Iceland as well. Furthermore, a separate chapter on the Icelandic securities settlement system and arrangements was added to the Nasdaq CSD SE rules. The system is also subject to requirements laid down in the CSDR; the Act on Central Securities Depositories and Settlement and Electronic Registration of Financial Instruments, no. 7/2020; the Regulation on Electronic Registration of Securities in a Central Securities Depository, no. 397/2000, with subsequent amendments; and the current contractual and procedural agreements between Nasdaq and the Central Bank of Iceland concerning settlement of securities transactions in Icelandic krónur.

Financial supervision and oversight of the Icelandic branch of Nasdaq CSD SE

As is noted above, the Nasdaq securities depository is now operated as a branch from Nasdaq CSD SE in Latvia, which is considered its home state in the sense of Regulation (EU) no. 909/2014 of the European Parliament and of the Council (CSDR), incorporated into Icelandic law with the passage of Act no. 7/2020. When a central securities depository provides service in a member state other than its home state, including by establishing a branch, the competent authority (financial supervisor) in the home state is primarily responsible for financial supervision, and the relevant authority (oversight body) in the home state is primarily responsible for oversight of securities settlement systems. Therefore, the Latvian Financial and Capital Market Commission is primarily responsible for financial supervision of Nasdaq CSD SE, including its Icelandic branch, and Latvijas Bank, the Latvian central bank, is primarily responsible for oversight of Nasdaq CSD SE securities settlement systems.

In addition to the branch in Iceland, Nasdaq CSD SE Latvia operates two other branches, one in Estonia and one in Lithuania. The supervisory and oversight bodies in these countries are parties to the Agreement on the Cooperation Framework for the Supervision and oversight of Nasdaq CSD SE. Although this agreement provides a framework for cooperation among the parties, each one is fully responsible for the tasks entrusted to it according to the CSDR and applicable national law. The objectives of the cooperation agreement include working together on the execution of supervisory and oversight projects, exchanging information, and promoting a shared understanding of the risks associated with Nasdaq CSD SE (risk-based supervision).

In accordance with the aforementioned cooperation agreement, the Central Bank of Iceland is currently participating in an extensive survey of cybersecurity in the Nasdaq CSD securities settlement systems, carried out by oversight bodies in Latvia, Estonia, and Lithuania on the basis of the Cyber Resilience Oversight Expectations (CROE), issued by the European Central Bank. This cooperative project is carried out under the leadership of Latvijas Bank and is scheduled for completion in May 2022.

Project on new real-time payment intermediation

Since the older RTGS and netting systems were brought into use, interbank communications have been custom-designed for them and the commercial banks' then-current deposit systems. Communications in interbank transactions includes the structure and order of the payment instructions sent to interbank payment systems, together with various special actions relating to interbank transactions, such as recalls, investigations of the basis for individual payment orders, handling of time limits for payments, etc. With the launch of the new interbank system and the replacement of the commercial banks' older deposit systems, scheduled for completion in February 2022, there is reason to standardise and harmonise payment orders in interbank transactions.

Just beginning is a project called "new real-time payment intermediation", which entails the adoption and implementation of standardised foreign handbooks for interbank transactions. More specifically, the adoption of the Nordic Payments Council (NPC)[7] manual called the *NPC Instant Credit Transfer Scheme Rulebook* is under consideration. NPC is an organisation established by several of the Nordic region's largest commercial banks, with the aim of harmonising interbank transactions. With the adoption of the NPC Rulebook, communications between interbank system participants will change significantly. Among other benefits, the Rulebook provides a known set of ground rules for the market, which means that new participants know in advance what requirements they must satisfy. It also offers greater security – that is, all of the systems function in the same way, and operating expenses will decline over time, even though some short-term initial expense must be incurred at the

7 https://www.nordicpaymentscouncil.org/

start. Last but not least, domestic commercial bank payment systems will be integrated with foreign payment solutions, which facilitates connection with systems such as real-time retail payment solutions (e.g., P27 and TIPS), the European Central Bank's Target2 real-time gross settlement system, or securities systems. Moreover, competition could increase, to the benefit of companies and individuals. The project entails cooperation across the key institutions in Iceland that own and operate financial market infrastructure. This will require, among other things, updating deposit systems and interbank systems, reviewing and revising procedures, changing end-of-day settlement, and redesigning many systems that connect to the above-mentioned infrastructure elements.

Scope and risk

Payments between accounts within the same bank are routed through the internal payment system of the bank in question and are therefore settled in electronic commercial bank money.[8] Payment card transactions in which the payer and recipient use the same bank are also routed through the bank's internal payment system. In terms of turnover, payments (outflows) from internal payment systems account for roughly 74% of total payment intermediation in Iceland, irrespective of whether or not the payment is deposited to a bank account owned by the same party. For payments deposited to accounts owned by another party, this ratio is just under 60%.[9] The Central Bank's interbank system ensures final settlement of all transfers of funds between deposit institutions in Iceland. Final settlement of securities transactions from the Nasdaq securities settlement system also takes place in the interbank system. All interbank system payments are made in electronic central bank money.[10]

The importance of the interbank system

The Central Bank interbank system is divided into two components, the gross settlement component (RTGS) and the retail netting component.[11] Interbank system participants are the Central Bank (which also serves as commercial bank for the Treasury), the domestic commercial banks and savings banks, and two foreign financial institutions. In the first six months of 2021, payments with an average daily value of 118 b.kr. were routed through the interbank system, including 96 b.kr. in large-value RTGS payments involving commercial banks and savings banks. This is about 3% more turnover than in the same period of 2020. Included in the large-value RTGS figures are the Central Bank's market transactions, which take place on Wednesdays, with the participation of commercial banks and savings banks. Chart IV-1 shows how RTGS turnover spikes on Wednesdays but is relatively stable on other weekdays when the RTGS component of the interbank system is open. RTGS payments solely between commercial banks and savings banks, excluding Central Bank transactions, averaged 32 b.kr. per day in H1/2021, in an average of 383 daily transactions.

Chart IV-1

Breakdown of interbank system settlement

Daily turnover, January - June 2021

Source: Central Bank of Iceland.

Settlement of large-value payments within time limits

More often than not, large-value payments settled between financial institutions are designated as time-critical payments. From the standpoint of operational security, it is very important that as many payments as possible be sent for settlement early in the day, so as to reduce strain on the payment systems and their staff if a serious incident occurs during the day. If payment intermediation via payment systems is severely disrupted, it could mean that households, businesses, and institutions cannot pay for goods and services.

In H1/2021, settlement of an average of 81% of RTGS component transactions was complete by 13:00 hrs. In previous Central Bank publications, it has been noted that large-value payments are often sent to the

8 Commercial bank money is a claim against a financial institution in the form of an account balance.

9 According to data from the Icelandic Banks' Data Centre (RB) and Central Bank calculations.

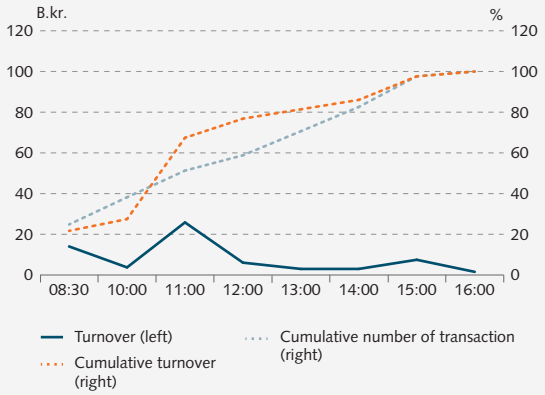
10 Electronic central bank money is a claim against the Central Bank in the form of a current account held by a financial institution or the Treasury.

11 Payments with a value of 10 m.kr. or more are settled in the RTGS component of the interbank system, while payments in amounts less than 10 m.kr. are settled in the retail netting component.

Chart IV-2

Banks' and savings banks' interbank system, by settlement time

Daily average January - June 2021



Source: Central Bank of Iceland.

system just before it closes.[12] Thus far in 2021, this has happened much less often, indicating that participants have improved their routing of payment orders to the interbank system.

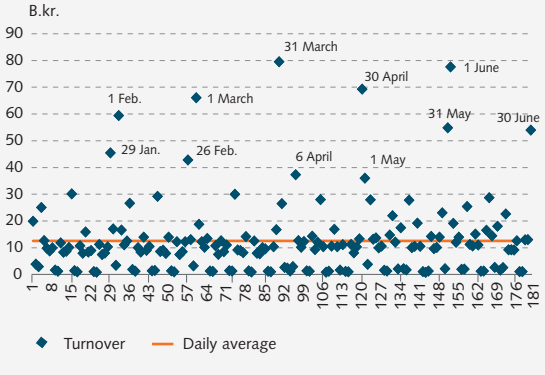
Retail component payments rise in value

An average of 142,000 transactions per day were routed through the retail component of the interbank system in H1/2021. This is a 16% contraction relative to the same period in 2020. The turnover represented by these transactions averaged 12.6 b.kr. per day, an increase of 12% year-on-year, well above the change in the general price level. Fewer transactions and reduced turnover led to a significant rise in the average transaction value, from 66,000 kr. in H1/2020 to 88,000 kr. in H1/2021.

Chart IV-3

Settlement of retail payments

Daily turnover, Januar - June 2021



Source: Central Bank of Iceland.

12 See, for instance, Financial Stability 2020/2.

In retail payment intermediation, strain is usually greatest around the end of the month, when wages and public benefits are deposited to individuals' bank accounts. At that time, individuals also make loan payments and pay fees; furthermore, as Chart IV-3 shows, they usually do more shopping around the turn of the month. All transfers between deposit institutions in amounts under 10 m.kr. are routed through the retail component of the interbank system.

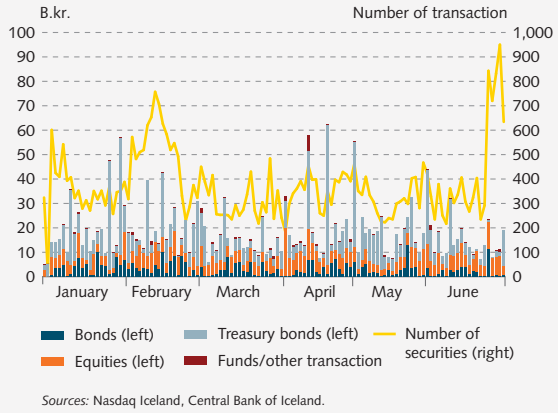
Increased turnover in the securities settlement system

The Central Bank monitors payment flows relating to securities, as the Icelandic branch of the Nasdaq CDS SE securities settlement system is designated a systemically important financial market infrastructure element. The total value of payment instructions amounted to just under 2.2 b.kr. in H1/2021, or an average of 18.2 b.kr. per business day. The year-on-year increase, which measured 48%, was due largely to a surge in equity securities trading. The turnover figure derived from 45,500 transactions, as compared with 43,000 over the same period in 2020. The average amount per transaction sent for settlement during the period was therefore about 400,000 kr.

Chart IV-4

Nasdaq Securities settlement system

Daily turnover, January - June 2021



Sources: Nasdaq Iceland, Central Bank of Iceland.

Interbank system operated largely without disruption

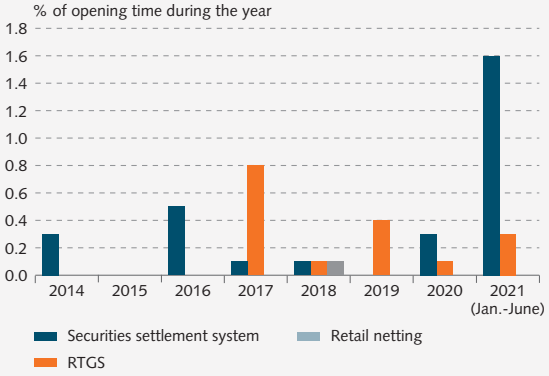
One metric that can shed light on operational risk in payment intermediation is the number and type of incidents (operational deviations) that occur.[13] The Central Bank of Iceland gathers information on incidents occurring in interbank systems and analyses them. The causes and

13 The terms incident and operational deviation are used in particular to refer to unexpected disruptions in operations or service, reduced quality, or deficiencies that have not yet made an impact but could do so in the future.

repercussions of incidents are assessed, as are the severity of the incidents and the responses or measures taken as a result of them. An assessment is also made of whether the incident or operational deviation warrants other special measures. In 2020, a total of 275 incidents occurred in interbank systems. Three incidents were classified as severe in 2020, down from six in 2019. In H1/2021, there were 166 recorded incidents in interbank system operations, three of them classified as severe. Most of the incidents did not disrupt service to participants by delaying transactions within the same day or by not forwarding a transaction during the day. Chart IV-5 shows the amount of time service was disrupted each year, from the beginning of 2014 through Q2/2021. In 2021, securities settlement was disrupted for a total of 18 hours, which is 1.6% of the system's total opening time during the first six months of the year. The disruption was due to a single incident that prevented settlement from being completed that day. It was caused by a backlog of securities in the Nasdaq system, owing to strain during initial public offerings (IPO).[14] In the real-time gross settlement component of the system, total disruption time came to 6 hours, or 0.3% of the system's total opening time.

Chart IV-5

Interruption in interbank system operation[1]



1. Zero percent indicates that the systems operated without interruption during the year. If the operation of a given system was interrupted within the year, the duration of the interruption was calculated as a percentage of the total number of minutes that system was open during that year. The RTGS component of the interbank system is open from 09:00-16:30 hrs. on weekdays. The securities settlement system is open from 09:15-15:20 hrs. on weekdays (with settlement taken place five times throughout the day), and the retail netting component of the interbank system is open 24 hours a day.

Source: Central Bank of Iceland.

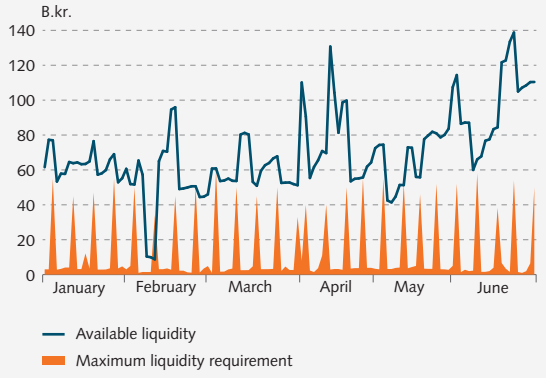
Deposit institutions' liquidity sufficient to cover intraday settlement

Liquidity risk is always present in payment systems. Risk can develop if a participant does not have enough liquid assets to cover a payment obligation at the moment it falls due. One participant's liquidity problems can create problems for other participants, which base their own liquidity management in part on expected payment flows. Naturally, risk is elevated on days when interbank payment flows are large. At present, participants' intraday liquidity position is very good, and there is little risk of their being unable to withstand shocks in payment intermediation.[15] Interbank system participants seldom take overnight loans from the Central Bank in order to satisfy the requirement that their settlement

Chart IV-6

Intraday liquidity requirement in the RTGS component of the interbank system

Daily turnover, January - June 2021

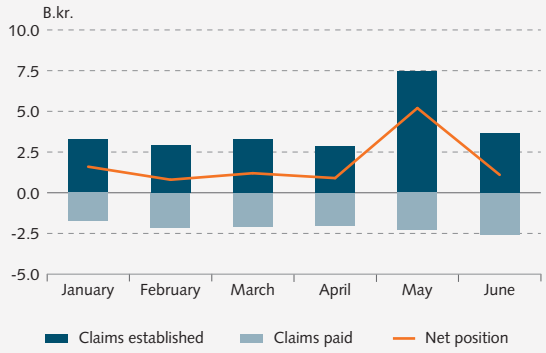


Source: Central Bank of Iceland.

Chart IV-7

Payables pool

Average daily turnover, January - June 2021



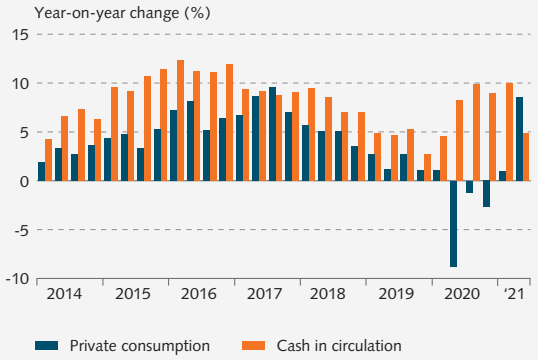
Sources: Icelandic Banks' Data Centre (RB), Central Bank of Iceland.

14 Eight transactions had to be carried out the following day. There were no further repercussions of the disruption.

15 The Central Bank regularly assesses banks' and savings banks' ability (i.e., liquidity position) to fulfil their payment obligations in the interbank system and their resilience against payment system disruptions (further discussion can be found, for instance, in Financial Stability 2020/2).

Chart IV-8

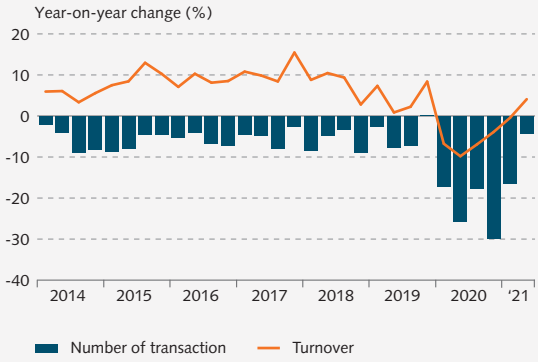
Growth in cash in circulation and private consumption



Sources: Statistics Iceland, Central Bank of Iceland.

Chart IV-9

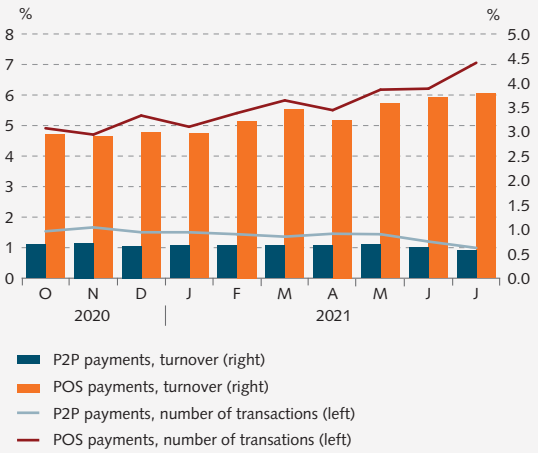
ATM withdrawals



Sources: Icelandic Banks' Data Centre (RB), Central Bank of Iceland.

Chart IV-10

Mobile payment apps[1]



1. Peer-to-peer (P2P) mobile payments as a share of total payments app use. Mobile app-based point-of-sale (POS) transactions as a share of total payment card use.

Sources: Icelandic Banks' Data Centre (RB), Central Bank of Iceland.

accounts always have a positive end-of-day balance.[16] In H1/2021, three overnight loans were granted, as compared with 11 over the same period in 2020.

The payables pool – an important financial market infrastructure element

The RB claim system, sometimes called the payables pool, is a system owned by the Icelandic Banks' Data Centre hf. (RB). It handles the preparation and calculation of claims for collection, delivery of claims to payers, and payments of claims. The system provides the payer with an overview of unpaid invoices across the banking system. It is an important infrastructure element for effective payment intermediation in Iceland and ensures a certain basic functionality in collection of claims.

The claims in the RB claim system cover a broad range. Every month, new claims are sent from creditors to payers. The payment deadline may vary from one claim to another, and some pay on the initial due date, whereas others pay on the final payment date. Furthermore, a certain number of claims are not paid by the final due date. As a result, it is not abnormal that established claims exceed paid claims, as settlement may not take place during the month or period when a claim is established. In H1/2021, claims established in the RB claim system totalled 3 b.kr. per day, on average, while claims paid in full averaged 2 b.kr. per day, leaving a net position of approximately 1.8 b.kr. There were 140,000 transactions per day, on average. The average amount per established claim was therefore roughly 167,000 kr, and the average per paid claim was 107,000 kr.

Risks in electronic retail payment intermediation

Most retail payment transactions in Iceland are carried out electronically, using credit cards, debit cards, and card-based mobile payment apps. According to a survey of households' payment behaviour, conducted by Gallup for the Central Bank, households seldom use cash to pay for goods or services. After the onset of the COVID-19 pandemic, cash was used even less. Withdrawals of cash from automatic teller machines (ATM) declined as well. Furthermore, there has been a surge in online shopping, which requires a payment card instead of cash. On the other hand, the decline in demand for cash during the pandemic did not keep pace with increased use of electronic payment solutions and reduced consumption in

16 Overnight loans are loan facilities granted by the Central Bank to counterparties eligible for such facilities, against collateral in the form of securities or term deposits. They are granted until the next business day and are intended to ensure that settlement account balances are positive at the end of the day.

Iceland. There may be many reasons for this, but further discussion of the use of cash can be found in *Financial Stability* 2021/1.

For some time, the Central Bank has discussed risks in retail payment intermediation in its publications, particularly to include the fact that a steadily increasing number of retail payments are routed through foreign card infrastructure elements. Today, all transactions using domestic credit cards and 95% of those using domestic debit cards are routed through international infrastructure.[17] Three years ago, 9% of debit card transactions were routed through foreign infrastructure. Furthermore, international systems are used for all payments using mobile apps (whether linked to a debit card or a credit card), which have become highly popular in the recent term.[18]

The Central Bank has emphasised the importance of having in place a domestic electronic retail payment solution that is independent of international payment card infrastructure. Such a solution could serve as an alternate route for the domestic retail payment intermediation system. The Bank is currently preparing an assessment of the most favourable way to implement such a solution.

Cooperation forum for operational resilience of financial market infrastructure

The Central Bank has established a special cooperation forum on operational resilience of financial market infrastructure, referred to in daily speech as SURF, the acronym for its Icelandic name. Preparation for this has been under consideration for quite a while, as comparable fora can be found elsewhere in the Nordic region.[19]

SURF aims to create a common vision for measures to enhance the resilience of the cyber- and IT systems of important financial infrastructure elements and coordinate measures in case of operational disruptions that could affect financial system security and efficacy; i.e., organise emergency cooperation and joint emergency plans. Particular emphasis is to be placed on shoring up cybersecurity defences and financial system resilience against cyberattacks. In this context, consideration shall be given to the Government's cybersecurity framework, with reference to possible overlapping, interactions, and views on harmonisation. The forum's work shall also be guided by the Act on Network and Information Security, no. 78/2019, with which systemically important financial institutions and operators of regulated securities markets and multilateral trading facilities must comply.

At SURF's inaugural meeting, held in August 2021, a set of protocols were approved, and it was decided to establish a work group for projects that are consistent with the purpose of the forum as described above. Participation in SURF is voluntary. Participants other than the Central Bank include representatives from Arion Bank, the Electronic Communications Office of Iceland (ECOI), the Ministry of Finance and Economic Affairs, Íslandsbanki, the Nasdaq Iceland exchange, Landsbankinn, the Nasdaq CSD securities depository, the Computer Emergency Response Team (CERT-IS), and the Icelandic Financial Services Association. It is hoped that SURF's work will be successful in further bolstering the security of financial market infrastructure and the financial system as a whole in a broad context.

Fintech

In recent years, rapid technological developments have made marked impact on financial services, with no end in sight. Because of this, the term *financial technology*, often shortened to *fintech*, has gained currency. Although the term has no universal or generally accepted definition, fintech is said to be any type of innovation in financial services that could give rise to new business models, software, processes, or products in payment services, potentially affecting financial markets, financial institutions, and the way in which financial service is provided.[20]

It can be said that minting of coins and issuance of banknotes are examples of fintech products, as are the payment cards and automatic teller machines (ATM) introduced in the 20th century. In the 1990s, internet caused a fintech revolution, first with online banking and, more recently, with mobile apps that can be used to intermediate payments.

The Central Bank keeps abreast of developments in fintech

Within the Central Bank is a special fintech group whose objective is to create a cross-disciplinary framework for the Bank's fintech-related activities. It is intended as a forum for keeping track of developments in fintech and related activities in Iceland and abroad. The Bank

17 Based on debit card transactions as of end-July 2021.

18 Further discussion of developments in electronic retail payment intermediation and international payment card infrastructure can be found in *Financial Stability* 2020/2.

19 The Bank introduced the idea of establishing SURF in the 2018 issue of Financial Market Infrastructure and discussed it again in the 2019 issue of the same report.

20 Note the usage of the term by the European Commission, the G20 countries, and the Bank for International Settlements (BIS).

Table IV-1 Payment intermediation

	2018	2019	2020	Q2 2021	2018	2019	2020	Q2 2021
Electronic payment intermediation								
Interbank payments[1]	Daily average, turnover (b.kr.)				Daily average, number of transactions (thousands)			
RTGS payments	65.8	69.4	100.3	118.5	456.3	474.5	487.9	549.2
Retail netting payments	11.4	11.8	11.7	12.6	240,613.4	187,310.1	163,659.8	142,632.1
Nasdaq securities settlement system	5.7	7.9	13.7	18.2	138.4	166.0	270.6	376.0
Payment card use:	Daily average. turnover (m,kr,)				Daily average. number of transactions (thousands)			
Total use of domestic debit cards:	1,420.6	1,445.2	1,341.1	784.5	243.1	254.5	238.8	152.4
In Iceland	1,273.7	1,275.9	1,220.1	700.5	220.0	228.2	217.8	138.1
Point-of-sale transactions	1,000.2	1,018.1	1,094.4	700.5	213.0	221.6	214.4	137.8
Abroad	146.9	169.3	121.0	84.0	23.1	26.4	21.0	14.3
Point-of-sale transactions	109.2	133.7	102.5	74.4	21.3	24.8	20.3	14.0
Total use of domestic credit cards:	1,407.7	1,505.7	1,390.3	862.3	198.4	211.7	198.3	122.4
In Iceland	1,076.7	1,151.7	1,196.3	745.2	161.1	173.0	170.3	105.6
Point-of-sale transactions	1,027.3	1,099.9	1,152.3	721.3	159.0	171.0	168.8	104.8
Abroad	331.0	354.1	194.0	117.2	37.3	38.7	28.0	16.8
Point-of-sale transactions	309.7	334.0	187.1	114.1	36.4	37.9	27.7	16.7
Foreign payment cards	705.0	639.7	176.0	136.2	76.1	68.5	20.3	13.3
Point-of-sale transactions	670.7	610.4	166.8	130.7	74.7	67.4	20.0	13.1
					Number of payment cards			
Active debit cards issued in Iceland	—	—	—	—	257,493	234,086	218,464	184,562
Active credit cards issued in Iceland	—	—	—	—	251,966	245,529	240,800	207,133
Cash	Year-end amount (b,kr,)				Number (millions) at year-end			June 2021
Cash in circulation	72.8	74.7	81.5	80.4	260.6	265.0	271.7	272.3
Banknotes								
10,000 kr.	38.9	42.6	49.9	49.7	3.9	4.3	5.0	5.0
5,000 kr.	21.6	19.6	18.8	18.1	4.3	3.9	3.8	3.6
2,000 kr.	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
1,000 kr.	6.3	6.3	6.4	6.4	6.3	6.3	6.4	6.4
500 kr.	1.7	1.7	1.7	1.7	3.4	3.5	3.3	3.3
Coin								
100 kr.	2.5	2.7	2.8	2.8	25.2	26.6	27.9	28.0
50 kr.	0.7	0.7	0.7	0.7	13.6	14.1	14.6	14.7
10 kr	0.6	0.6	0.6	0.6	58.4	60.1	62.1	62.2
5 kr.	0.1	0.1	0.1	0.1	25.7	26.1	26.6	26.6
1 kr.	0.1	0.1	0.1	0.1	119.6	120.0	121.9	122.5

1. The Central Bank of Iceland's new interbank system was launched on 26 October 2020, replacing the previous real-time gross settlement (RTGS) system and retail netting system. Data processing changed with the switch to the new system. As a result, data are not fully comparable over time.

Source: Central Bank of Iceland

also operates a separate fintech service desk whose tasks include evaluating applications for fintech-related licenses.[21] With the passage of the new Payment Services Act, no. 114/2021, which will enter into force on 1 November 2021, it can be expected that the Central Bank will receive an increased number of queries from entities that offer or plan to offer fintech services. In can also be expected that issues relating to fintech will increasingly be referred to the Bank for examination, as the new Act broadens the concept of payment services to include payment initiation[22] and account information services.[23]

Innovation hubs and the BIS fintech network

Central banks follow developments in fintech closely. In general, they try to learn about the opportunities fintech

21 See: https://www.fme.is/thjonustuvefur/fintech-thjonustubord/.

22 Payment initiation involves activating payment instructions at the request of a user of payment services, as regards a payment account held with another payment services provider; cf. Article 3, Item 20 of Act no. 114/2021.

23 Account information service is a direct-line service that provides consolidated information on one or more payment accounts that a user of payment services holds with another payment service provider or with more than one payment service provider; cf. Article 3, Item 33 of Act no. 114/2021.

offers and the threats that it may pose. In particular, these include its impact on financial stability and central banks' monetary policy.[24]

The Bank for International Settlements (BIS) has played an important role in this context. In 2019, the BIS established fintech-focused special innovation hubs in cooperation with several central banks. The first of them were opened that same year in Hong Kong, Singapore, and Switzerland. The aim of the hubs is to foster international cooperation on fintech and build up knowledge in the field, especially insofar as fintech intersects with the role of central banks. On this occasion, the BIS has said that technology-driven innovation in the provision of financial services is now moving at a breakneck pace and will have an enormous impact on global financial systems. Each year, the BIS sets a one-year work programme focusing on key themes, which are as follows for 2021-2022:[25]

- Examination of regulation technology, called regtech, which enables the financial sector to demonstrate compliance with regulatory requirements, and supervisory technology, or suptech, which facilitates interactions with oversight or supervisory bodies.
- Next-generation financial market infrastructure.
- Central bank digital currency (CBDC).
- Open finance.
- Cybersecurity
- Green finance.

In June 2021, the BIS in collaboration with the Bank of England ,opened the fourth innovation hub in London.[26] That same month, an innovation hub was opened in Stockholm, in cooperation with the central banks in Iceland, Denmark, Norway, and Sweden.[27] Preparation for the launch of the Stockholm hub had been underway for some time, with active participation from the Central Bank of Iceland. The hub's initial projects will be determined in accordance with the aforementioned BIS work programme. This is an exciting opportunity for Iceland, as the hub is expected to be a focal point for collaboration among experts on innovation and research concerning the significance of fintech for central banks, as well as an opportunity to strengthen international cooperation so as to enhance the efficacy of the global financial system. The BIS is planning to open additional hubs, including one in collaboration with the Bank of Canada in Toronto. Further plans include a joint hub for the eurozone in Frankfurt and Paris and cooperation with the US Federal Reserve Bank in New York.[28]

And finally, in January 2021, the BIS launched a special innovation network focusing on fintech issues of importance to central banks.[29] The roles of the BIS Innovation Network are to support the BIS Innovation Hubs, facilitate the exchange of information about technology projects, and discuss innovative solutions. The Central Bank of Iceland is represented in the BIS Innovation Network.

EU policy formation and regulation in the area of fintech

In 2018, the European Commission introduced an action plan in the area of fintech.[30] On that occasion, the Commission emphasised that fintech can create many opportunities and even be transformative, not only for financial services but for world trade in a broad sense.[31] By the same token, consideration must be given to potential risks and the need for regulation.

In September 2020, following broad consultation with stakeholders, the Commission introduced a digital finance package containing a digital finance strategy and relevant legislative proposals.[32] The package is intended to apply to the entire financial sector in the EEA internal market, and it is hoped that it will stimulate both competition and further innovation in the fintech field. The package also includes proposals for the EU's future policies on retail payment intermediation[33] and digital financial services.[34] With the package, an attempt is being made to mitigate the risks potentially accompanying developments in fintech or digital finance, with the aim of having in place, by 2024, a European regulatory framework for digital financial services that is well equipped to meet modern needs.

24 This includes, for example, the possible issuance by central banks of digital currencies.

25 For further information, see: https://www.bis.org/about/bisih/topics.htm.

26 See: https://www.bis.org/about/bisih/locations/uk.htm.

27 See: https://www.bis.org/about/bisih/locations/se.htm.

28 For information on the BIS Innovation Hubs, see: https://www.bis.org/about/bisih/about.htm?m=1%7C441%7C713.

29 Information on the BIS Innovation Network can be found here: https://www.bis.org/about/bisih/network.htm.

30 The FinTech Action Plan, COM(2018)109 8.3.2018, can be found here: https://ec.europa.eu/transparency/regdoc/rep/1/2018/EN/COM-2018-109-F1-EN-MAIN-PART-1.PDF. The action plan and the project timeline accompanying it are discussed briefly in the 2018 issue of the Central Bank's Financial Market Infrastructure publication (page 32).

31 This refers mainly to distributed ledger technology and the blockchain technology on which it is based, and in this context, so-called smart contracts are mentioned both in world trade and in the insurance technology (insurtech or insuretech) sector.

32 The digital finance package can be found here: https://ec.europa.eu/info/publications/200924-digital-finance-proposals_en.

33 COM (2020) 592.

34 COM(2020)591.

Cryptocurrencies

In recent years, cryptocurrencies have been in the crosshairs of central banks and international institutions. There are a number of reasons for this, including the impact on monetary and financial stability policy conduct, and even sovereignty issues relating to countries' control over their own currencies,[35] but in general, central banks have the exclusive right to issue banknotes and coin. To put this in context, it is worth noting that upwards of 2,000 types of cryptocurrency are estimated to be in current use worldwide.

Current legislation does not contain any single recognised definition of the term *cryptocurrency*, as cryptocurrencies have not yet been defined in any harmonised way. The Act on Measures Against Money Laundering and Terrorist Financing, no. 140/2018, uses the term *virtual currency* (IS: *sýndarfé*). According to that Act, virtual currency is any type of digital money that is neither electronic money in the sense of the Act on Issuance and Treatment of Electronic Money nor a fiat currency. In the same Act, a *provider of digital wallet services* is defined as an individual or legal entity that offers custodial services relating to the storage of virtual currency owners' payment information, irrespective of whether it uses software, systems, or other types of media to manage, store, or transfer virtual currency.[36] The Central Bank of Iceland has described virtual currency as 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.[37]

Virtual fintech first appeared on the scene in 2008, with the release of a white paper on a payment instrument that was fully electronic and unregulated.[38] The payment instrument in question, Bitcoin, is still the most widely used virtual currency. All transactions with Bitcoin are stored on blockchain. The blockchain does not include any information identifying the owner – i.e., name or identification number – but instead is based on encrypted keys to digital wallets owned by those who conduct the transactions. Transactions take place between digital wallets, and information on who owns which wallet is generally not accessible. Transparency is therefore severely lacking.

Warnings concerning transactions with virtual currency

As early as 2014, the Icelandic authorities, including the Central Bank, issued warnings to the public concerning the risk attached to buying, storing, or trading virtual currency. Among other things, it was emphasised that Icelandic law does not protect consumers against losses involving virtual currency, such as those incurred because the party that exchanges or stores virtual currency does not honour their obligations, because a payment is routed incorrectly or is lost, or because a payment ends up in the wrong hands. The Bank noted that the holder of virtual currency does not have a claim on the issuer, as do holders of banknotes and coin, electronic money, deposits, and other balances in bank accounts in the sense of the Payment Services Act. In this warning, the Bank also mentioned that there is no guarantee that virtual currency will retain its value and accessibility one time to another.[39] In March 2021, the Central Bank reminded consumers of the risks associated with transactions using virtual currency, noting that, among other things, transactions of this type are speculative in nature and can be extremely risky. The Central Bank's notice makes reference to the joint warning issued by the European financial market supervisory bodies (EBA, EIOPA, and ESMA), then recently published, and stresses the possibility that consumers could lose their money. The European Economic Area (EEA) has no regulatory framework in place for virtual currency; therefore, those who own it do not benefit from the deposit insurance or consumer protection schemes that apply to financial services subject to regulation and supervision.[40]

The above-mentioned package introduced by the European Commission, if approved, could be important in this context, as it includes proposals for a regulation on markets in crypto-assets (MiCA) and a regulation on a pilot regime for market infrastructure based on distributed ledger technology (DLT).

It is also appropriate to mention that certain types of virtual currency have been referred to as *stablecoins*. Stablecoin is a type of virtual currency whose value is pegged to the price of other assets or fiat currencies so

35 Supply and demand for currency depend in particular on the economic situation in the country(-ies) of issuance.

36 According to Article 35, Paragraph 1 of the Act, these entities are subject to registration with the Central Bank Financial Supervisory Authority and are, according to Article 2, Paragraph 1, Items (j) and (k), obliged entities in the sense of the Act. This includes the obligation to notify the police of transactions suspected to involve money laundering or terrorist financing.

37 Cf. the Prime Minister's April 2018 response in Parliament (in Icelandic) to a query from a Member (Parliamentary Document no. 455, Case no. 341, 148th legislative session, 2017-2018).

38 Bitcoin: A Peer-to-Peer Electronic Cash System. https://bitcoin.org/bitcoin.pdf.

39 For further information, see: https://www.sedlabanki.is/utgefid-efni/frettir-og-tilkynningar/frettasafn/frett/2014/03/19/Advorun-til-almennings-um-syndarfe-e.-virtual-currencies/.

40 For further information, see: https://www.sedlabanki.is/utgefid-efni/fettir-og-tilkynningar/frettasafn/frett/2021/03/19/Neytendur-minntir-a-ahaettu-tengda-vidskiptum-med-syndarfe/.

as to prevent the price volatility that otherwise characterises virtual currencies or cryptocurrencies. Examples of stablecoins are Ether, which is pegged to the US dollar, and Diem (previously known as Libra), a blockchain-based currency (similar to Bitcoin) also pegged to the dollar, that Facebook plans to issue. Given Facebook's global presence, the issue of Diem could have profound implications.

Digital cash

Icelandic banks and savings banks have electronic claims against the Central Bank in the form of deposits held in their accounts linked to the Bank's interbank system. Electronic central bank money, however, is not available to other parties. In the recent term, central banks all over the world have expressed growing interest in issuing central bank digital currency (CBDC) for general use, owing mainly to reduced use of cash and increased demand for secure, inexpensive real-time payments and transfers, both domestically and across cross national borders.[41] As a result, a large number of central banks have systematically studied the advantages and disadvantages of issuing digital cash, thereby expanding the group of users who have access to digital central bank money. The BIS work programme for 2021-2022 assumes that the aforementioned BIS Innovation Hubs will focus on central bank issuance of digital cash. Work on projects related to this is already underway.

The Central Bank of Iceland has explored the possibility of issuing digital currency called the *rafkróna* (pl. *rafkrónur*).[42] The rafkróna would be an Icelandic króna issued by the Central Bank in digital form. Rafkrónur could serve a variety of purposes, including as an alternate method of payment intermediation. Clearly, there are a number of issues that require further examination before a decision is made on the issuance of rafkrónur. The Bank is currently studying the impact of such issuance on monetary policy and financial stability in general.

41 Central bank digital currency (CBDC) is an electronic claim against a central bank that is free of counterparty risk and can fulfil the role of a conventional currency, just as banknotes and coin do today.

42 For further information, see Central Bank Special Publication no. 12, issued in 2018, which focuses on the possible issuance of rafkrónur in the future.

Appendix

Tables

Table 1 Financial system assets[1]

Assets, b.kr.	*31.12.2017*	*31.12.2018*	*31.12.2019*	*31.12.2020*	*30.6.2021*	*Change from 31.12.2020, %*
Central Bank of Iceland	765	755	840	844	896	0.6
Deposit-taking corporations excluding the Central Bank	3,405	3,681	3,775	4,212	4,563	3.7
– Commercial banks	3,381	3,656	3,748	4,183	4,534	3.7
– Savings banks and other deposit-taking corporations	24	26	26	28	29	-1.3
Money market funds	158	147	144	145	149	4.1
Non-MMF investment funds[2]	686	668	766	846	971	7.3
Other financial intermediaries[3, 4]	456	397	290	258	220	1.0
Treasury	969	941	936	1,064	1,058	-1.0
– Housing Financing Fund	761	731	718	703	681	-2.5
Financial auxiliaries	20	25	25	54	56	21.4
Insurance corporations	220	232	259	290	304	2.3
Pension funds	3,944	4,245	4,975	5,732	6,161	4.8
Total assets	10,623	11,091	12,010	13,445	14,378	3.8

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, b.kr.	*31.12.2017*	*31.12.2018*	*31.12.2019*	*31.12.2020*	*30.6.2021*	*Change from 31.12.2020, %*
Cash and deposits with Central Bank	378,700	293,870	329,923	213,003	297,747	40
Deposits in domestic deposit-taking corporations	6,075	658	633	1,736	874	-50
Deposits in foreign deposit-taking corporations	77,887	107,039	63,887	85,059	76,622	-10
Domestic credit	2,407,764	2,708,062	2,784,748	3,070,639	3,277,133	7
Foreign credit	133,857	153,272	137,546	168,636	164,132	-3
Domestic marketable bonds and bills	116,001	95,842	104,980	306,068	331,796	8
Foreign marketable bonds and bills	85,778	137,139	145,433	146,996	99,309	-32
Domestic equities and unit shares	114,561	101,026	121,132	123,347	181,135	47
Foreign equities and unit shares	14,276	3,077	2,622	2,262	3,489	54
Other domestic assets	57,445	68,435	67,047	74,048	119,326	61
Other foreign assets	12,478	13,068	16,693	19,845	11,643	-41
Total	3,404,821	3,681,488	3,774,645	4,211,637	4,563,205	8

Source: Central Bank of Iceland.

Table 3 Other credit institutions' assets[1]

Assets, b.kr.	*31.12.2017*	*31.12.2018*	*31.12.2019*	*31.12.2020*	*30.6.2021*	*Change from 31.12.2020, %*
Cash and deposits with Central Bank	34,285	29,493	21,067	0	0	0
Deposits in domestic deposit-taking corporations	32,261	20,511	8,639	17,081	10,813	-37
Deposits in foreign deposit-taking corporations	37,924	36,088	28,597	24,927	19,670	-21
Domestic credit	106,382	137,595	154,903	178,637	156,397	-12
Foreign credit	64,940	57,731	17,413	17,847	14,975	-16
Domestic marketable bonds and bills	107	258	1,430	5,431	5,077	-7
Foreign marketable bonds and bills	998	266	0	0	0	0
Domestic equities and unit shares	108,096	92,915	29,765	926	3,319	258
Foreign equities and unit shares	46,305	3,602	6,681	1,402	28	-98
Other domestic assets	17,975	12,068	18,126	8,799	4,217	-52
Other foreign assets	6,268	6,544	3,445	2,650	5,387	103
Total	455,541	397,071	290,065	257,700	219,884	-15

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, b.kr.	*31.12.2017*	*31.12.2018*	*31.12.2019*	*31.12.2020*	*30.6.2021*	*Change from 31.12.2020, %*
Deposits in domestic deposit-taking corporations	150,812	142,872	151,522	164,838	158,755	0
Deposits in foreign deposit-taking corporations	20,451	13,776	24,174	34,230	24,561	-28
Domestic credit	332,554	428,474	522,485	511,516	489,500	-4
Foreign credit	268	309	378	495	505	2
Domestic marketable bonds and bills	1,808,280	1,909,858	1,970,450	2,105,645	2,194,619	4
Foreign marketable bonds and bills	524	3,980	8,516	8,568	6,033	-30
Domestic equities and unit shares	656,680	647,835	805,115	991,701	1,183,809	0
Foreign equities and unit shares	925,454	1,071,412	1,465,596	1,887,626	2,068,680	10
Domestic insurance and pension assets	19,227	21,003	22,118	21,197	30,149	42
Foreign insurance and pension assets	63	69	48	50	19	-62
Other domestic assets	30,025	5,083	4,149	5,595	4,226	-24
Other foreign assets	1	0	0	46	142	207
Total	3,944,339	4,244,671	4,974,551	5,731,509	6,160,998	7

Source: Central Bank of Iceland.

Table 5 Insurance company assets

Assets, b.kr.	*31.12.2017*	*31.12.2018*	*31.12.2019*	*31.12.2020*	*30.6.2021*	*Change from 31.12.2020, %*
Cash and deposits with Central Bank	7,011	1,563	40	3	2	0
Deposits in domestic deposit-taking corporations	4,861	6,589	10,571	6,944	7,524	8
Deposits in foreign deposit-taking corporations	149	75	48	28	0	-100
Domestic credit	3,449	3,523	2,490	1,819	1,691	-7
Foreign credit	0	0	0	0	0	0
Domestic marketable bonds and bills	94,177	98,628	109,161	133,121	140,218	5
Foreign marketable bonds and bills	4,467	16,801	20,378	20,351	18,594	0
Domestic equities and unit shares	65,696	61,159	65,790	74,850	68,601	-8
Foreign equities and unit shares	8,182	8,821	10,200	12,168	13,120	8
Domestic insurance and pension assets	20,662	22,228	24,772	25,786	35,028	36
Foreign insurance and pension assets	5,815	6,310	6,997	6,311	7,513	19
Other domestic assets	4,350	5,197	8,005	8,691	11,796	36
Other foreign assets	1,546	1,542	750	319	222	-30
Total	220,365	232,436	259,202	290,392	304,311	5

Source: Central Bank of Iceland.

Table 6 D-SIB: Income and expenses[1]

Income and expenses, b.kr..	*30.06.2017*	*30.06.2018*	*30.06.2019*	*30.06.2020*	*30.06. 2021*	*Change from 30.06.2020,%*
Arion Bank hf,						
Operating income	27,482	23,315	23,928	23,039	28,101	22
Net interest income	14,824	14,141	15,242	15,110	15,358	2
Net fee and commission income	4,608	4,917	4,696	5,764	6,839	19
Other operating income	8,050	4,257	3,990	2,165	5,904	173
Operating expenses	13,188	13,686	13,480	12,602	12,420	-1
Change in loan values	1,308	-301	-2,069	-3,778	1,892	150
Income tax	4,870	3,875	3,331	2,983	3,959	33
Net after-tax gain from discontinued operations	-266	-442	-1,934	-934	241	-126
Profit	10,466	5,011	3,114	2,742	13,855	405
Íslandsbanki hf,						
Operating income	22,718	22,780	23,400	20,040	23,657	18
Net interest income	15,211	15,342	16,341	16,808	16,607	-1
Net fee and commission income	6,813	5,810	5,405	4,798	5,769	20
Other operating income	694	1,628	1,654	-1,566	1,281	-182
Operating expenses	13,441	14,301	12,943	12,038	13,272	10
Change in loan values	440	1,934	-1,809	-5,929	682	112
Income tax	4,075	4,077	3,736	1,646	2,078	26
Net after-tax gain from discontinued operations	2,399	794	-203	-558	57	-110
Profit	8,041	7,130	4,709	-131	9,046	-7,005
Landsbankinn hf,						
Operating income	27,987	27,291	30,272	22,710	27,485	21
Net interest income	18,176	19,476	20,459	18,939	18,958	0
Net fee and commission income	4,432	3,876	4,136	3,598	4,368	21
Other operating income	5,379	3,939	5,677	173	4,159	2,304
Operating expenses	13,668	13,904	14,306	13,157	12,990	-1
Change in loan values	1,301	1,727	-2,372	-13,435	2,782	121
Income tax	2,967	3,501	2,481	-595	3,172	-633
Net after-tax gain from discontinued operations	0	0	0	0	0	-
Profit	12,653	11,613	11,113	-3,287	14,105	-529
D-SIB						
Operating income	78,187	73,386	77,600	65,789	79,243	20
Net interest income	48,211	48,959	52,042	50,857	50,923	0
Net fee and commission income	15,853	14,603	14,237	14,160	16,976	20
Other operating income	14,123	9,824	11,321	772	11,344	1,369
Operating expenses	40,297	41,891	40,729	37,797	38,682	2
Change in loan values	-3,049	-3,360	6,250	23,142	-5,356	-123
Income tax	11,912	11,453	9,548	4,034	9,209	128
Net after-tax gain from discontinued operations	2,133	352	-2,137	-1,492	298	-120
Profit	31,160	23,754	18,936	-676	37,006	-5,574

1. Figures are based on methodology used by SNL Financial. Figures on operating income and expense could differ from those published in the banks' annual accounts.

Source: SNL Financial.

Table 7 D-SIB: Key ratios

%	31.12.2017	31.12.2018	31.12.2019	31.12.2020	30.6.2021
Return on equity	7.4	6.1	4.5	4.8	11.7
Return on assets	1.4	1.1	0.7	0.7	1.8
Expenses as a share of net interest and commission income	59.0	60.0	57.8	54.1	54.7
Expenses as a share of total assets	2.3	2.3	2.1	1.8	1.8
Net interest and commission income as a share of total income	89.4	92.4	88.2	91.8	85.6
Net interest income as a share of total assets	2.8	2.9	2.7	2.6	2.4
Capital ratio	25.1	23.2	24.2	24.9	24.9
Foreign exchange as a share of the capital base	0.5	0.3	2.1	0.3	0.2
Liquidity coverage ratio (LCR). total	165.9	166	165.9	179.7	192.0
Liquidity coverage ratio (LCR). FX	412.8	509.6	508	481.3	335
Net stable funding ratio (NSFR). total	122.2	117.9	117	118.7	118
Net stable funding ratio (NSFR). FX	161.5	159.8	141.2	147	147

Source: Central Bank of Iceland.

Table 8 Commercial banks' foreign bond issues, last 12 months (20 September 2020 - 20 September 2021)

Issuer	Date	Currency	Amount (b.kr.)	Maturity (years)	Premium on interbank rate[1] %
Arion Bank	nov.20	EUR	48.5	3.5	1.15
	jul.21	EUR	44.0	4.0	0.8
Total			92.5		
Íslandsbanki	nov.20	EUR	48.5	3.0	0.5% fixed
	Mar.21	NOK	2.2	3.0	
	Mar.21	NOK	11.1	4.0	
	Mar.21	SEK	3.7	3.0	
	Mar.21	SEK	6.6	4.0	
	jul.21	NOK	6.7	3.0	
	jul.21	SEK	2.9	3.0	
			81.7		
Landsbankinn	oct.20	SEK	7.9	3.0	1.55
	oct.20	NOK	7.5	3.0	1.55
	Feb.21	SEK	13.9	1.5	0.75
	Feb.21	EUR	45.9	4.3	0.38 fixed
Total			75.2		

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

Source: Nasdaq Iceland.

Table 9 Capital buffers

Capital buffer	FSC recommendation	FME decision/ announcement[1]	Value %	Effective date
Systemic risk buffer, D-SIB	22.1.2016	1.3.2016	3	1.4.2016
Systemic risk buffer, other DMBs	30.6.2020	15.5.2018	3	1.1.2020
Other systemically important institutions buffer	22.1.2016	1.3.2016	2	1.4.2016
Countercyclical capital buffer	18.3.2020	18.3.2020	0	18.3.2020
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)..

Sources: Financial Supervisory Authority, Ministry of Finance and Economic Affairs.

Table 10 Indicators pertaining to the international investment position

	Unit	*Frequency*	*2018*	*2019*	*2020*	*M8 or Q2 2021*
Net IIP	% of GDP	Q	9.2	19.6	34.6	36.6
External debt[1]	% of GDP	Q	82.0	77.1	83.5	81.6
Net external debt[2]	% of GDP	Q	22.5	21.2	22.7	26.6
Short-term debt based on remaining maturity[3]	% of GDP	Q	17.3	13.9	11.3	14.5
Treasury FX debt as a share of total debt	%	M	14.9	21.1	20.1	25.7
Commercial banks' foreign-denominated bonds	% of GDP	Q	20.9	19.1	22.1	20.9
Current account balance[4]	% of GDP	Q	3.5	5.8	0.9	-3.5
International reserves	% of GDP	M	25.9	27.0	27.8	30.4
International reserves financed in krónur	% of GDP	M	20.8	20.1	18.4	16.3
International reserves/IMF RAM	%	Q	141.1	150.6	147.7	146.1
Terms of trade[5]	Value	Q	91.2	94.3	90.6	92.8
Nominal exchange rate[6]	Value	M	173.8	179.7	200.5	191.1
Real exchange rate[7]	Value	M	90.3	91.3	84.8	87.2
Treasury's highest credit rating	Rating	-	A2/A	A2/A	A2/A	A2/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 Based on available current account data for relevant year relative to GDP for the same period.
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. Article 3 of Act no. 114/2021.

Acquirer
A provider of payment services that offers acquiring; cf. Act no. 114/2021.

Acquiring
One type of payment service described in the Payment Services Act, no. 114/2021; cf. Article 3, Item 22(e) of Act no. 114/2021.

Balance on goods
The difference between the value of exported and imported goods.

Balance on income
The difference between revenues and expenses due to primary income and secondary income.

Balance on services
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.

Blockchain technology
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. Blockchain technology has been used, among other things, to develop cryptocurrencies such as Bitcoin. The blockchain does not include information on owners, such as their names or identification numbers, and despite its traceability properties, there are certain restrictions on access.

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.

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; cf. Articles 84-85 of Act no. 161/2002.

Capital buffer
Additional capital required by the Central Bank upon approval from the Financial Stability Committee. Capital buffers currently in effect are: capital conservation buffer, countercyclical capital buffer, capital buffer for systemically important institutions, and systemic risk buffer.

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 as described in Act 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 before deducting discounts or loan loss provisions.

Commercial bank
A financial institution that has been granted an operating licence pursuant to Article 4, Paragraph 1, (1) of the Act on Financial Undertakings, no. 161/2002.

Commercial bank money
A claim against a commercial bank/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 (credit undertaking)
A company whose business is to receive deposits or other repayable funds from the public and to grant credit on its own account.

Cross-default nonperforming loans
Based on the cross-default method, all of a given customer's loans are considered to be in default if one loan is 90 days past due, frozen, or deemed unlikely to be repaid.

Cryptocurrencies
Electronic or digital currencies have not been defined in a harmonised manner, but the term virtual currency(-ies) has been used in Icelandic law.

CSDR
Regulation (EU) no. 909/2014 of the European Parliament and of the Council of 23 July 2014 on improving securities settlement in the European Union and on central securities depositories.

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

Deposit institutions
Commercial banks and savings banks licenced 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. Article 3 of Act no. 140/2018.

Disposable income
Income net of taxes.

Distributed ledger technology (DLT)
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 Financial Stability Council. Currently, D-SIBs in Iceland are Arion Bank hf., Íslandsbanki hf., and Landsbankinn hf. In addition, the Housing Financing Fund (HFF) is considered a systemi-cally important supervised entity.

Economic outlook index
Corporate expectations concerning economic developments and prospects, based on the Gallup survey carried out among executives from Iceland's 400 largest firms.

Electronic króna/krónur
Digital cash that could potentially be issued by the Central Bank of Iceland, would be in digital form, and would be stored in a specific medium (such as cards or apps) or in an account with the Central Bank.

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. Act no. 17/2013.

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

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. EU Regulations no. 1093/2010, 1094/2010 and 1095/2010, incorporated into Icelandic law with Act no. 24/2017; cf. Articles 2 and 3 of the Act.

Equity
Assets net of liabilities.

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 default
Based on the facility method, a given customer's loan is considered to be in default if it is past due 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 institutions (including the Housing Financing Fund, HFF); pension funds; insurance companies; mutual, investment, and institutional 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 sets rules on credit institutions' foreign exchange balance. 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 15% of the capital base.

Foreign exchange imbalance
Difference between assets and liabilities in foreign currencies.

Foreign exchange reserves
Foreign assets managed by monetary authorities and considered accessible for direct or indirect funding of an external balance of payments deficit.

FSB
Financial Stability Board.

Funding rules
The Central Bank of Iceland sets rules on foreign currency funding ratio. The rules are based on the net stable funding ratio (NSFR) developed by the BCBS. The rules are designed to limit the extent to which banks can rely on unstable, short-term foreign funding to finance long-term loans granted in foreign currency. The ratio is subject to a minimum of 100%.

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 in their operations, albeit with reservations concerning their rights as shareholders.

Indexation imbalance
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 institutions) in interbank systems that are generally operated by central banks. PFMI

Interest burden
Interest payments as a percentage of disposable income.

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

Internal payment system/In-house payment intermediation
Payments between customers of a single payment service provider (financial institution).

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.

Key Central Bank of Iceland 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 interest 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.

Legal tender
Banknotes and coin issued by the Central Bank and accepted for all payments at full nominal value; cf. Acts no. 92/2019 and 22/1968.

Liquidity coverage
The ratio of high-quality liquid assets to potential net outflows over a 30-day period under ratio (LCR) stressed conditions; cf. the Rules on Liquidity Coverage Requirements for Credit Institutions no. 266/2017.

Liquidity rules ratio (LCR)
The Central Bank's liquidity rules are based on the liquidity coverage require ments developed by the Basel Committee on Banking Supervision (BCBS) and are largely harmonised with European Union liquidity rules. Credit institutions must always have suffi cient high-quality assets to cover potential liquidity needs over the coming 30 days under stressed conditions. The LCR may not fall below 100% for all currencies combined or for all foreign currencies combined.

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).

Net stable funding (NSFR)
The ratio of available stable funding to required stable funding; cf. the Rules on Funding ratio Ratios in Foreign Currencies, no. 1032/2014.

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. Article 3 of Act no. 114/2021.

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 wage index to the consumer price index (CPI).

Risk-weighted assets
Assets adjusted using risk weights; cf. Article 84(e) of Act no. 161/2002.

Risk-weighted assets (risk base)
The sum of the weighted risks of financial institutions (e.g., credit risk, market risk, operational risk, etc.), cf. Article 84(e) of Act no. 161/2002.

Shadow bank
Definition based on the methodology of the Financial Stability Board (FSB). Shadow banking is defined as credit intermediation involving entities and activities outside the regular banking system. Shadow banks include money market funds, bond funds, equity funds, investment funds, specialized investment companies, securities companies, brokers, specialized funds and other credit institutions. Government operated credit institutions, pension funds, insurance companies and financial auxiliaries are excluded. A detailed discussion on the methodology can be found in the Committee on Shadow Banking's March 2015 report to the Ministry of Finance and Economic Affairs.

Stablecoin
A type of virtual currency 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 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.

The IMF's reserve adequacy metric (RAM)
The reserve was developed by the International Monetary Fund (IMF) as a criterion for desirable size of foreign exchange 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 elements: i. Export revenues: Reflect the risk of contraction in foreign currency accumulation ii. Money holdings: Reflect potential capital flight in connection with liquid assets iii. Foreign short-term liabilities: Reflect the economy's refinancing risk iv. Other foreign debt: Reflects outflows of portfolio assets The RAM is the sum of 30% of current foreign short-term liabilities, 15% of other foreign debt (20% at constant exchange rates), 5% of money holdings (10% at constant exchange rates), and 5% of export revenues (10% at constant exchange rates).

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

PSD and PSD2

The EU Payment Services Directives.

Trade-weighted exchange

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

Virtual currency

Any type of digital money that is neither electronic money in the sense of the Act on Issuance and Treatment of Electronic Money nor a fiat currency; cf. Article 3 of Act no. 140/2018. Virtual currency 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 currency 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 aversion.

Yield

The annualised return that an investor requires on funds invested.

Yield curve

A curve that plots the interest rates, at a set point in time, of bonds with equal credit quality but differing maturity dates.

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