FINANCIAL STABILITY

2020•2

Contents

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

Statement of the Financial Stability Committee 23 September 2020

The battle to control the pandemic is proving more protracted than previously hoped, exacerbating uncertainty and adversely affecting financial institutions' loan portfolios. It is important that financial institutions work diligently on debt restructuring and that they use the scope provided by Government and Central Bank measures to support households and businesses.

The three large commercial banks are in a strong capital and liquidity position. Central Bank measures have significantly eased their access to liquidity, and funding spreads in international markets have narrowed. As a result, the banks have access to liquidity in both krónur and foreign currencies. They are therefore well positioned to address the repercussions of the pandemic.

The current low-interest environment creates new challenges for pension funds and financial institutions. The pension funds are dominant participants in the domestic financial market; therefore, the framework for their activities and the associated risks warrant further review.

The Financial Stability Committee is required to determine the value of the countercyclical capital buffer on financial institutions on a quarterly basis. In accordance with its statement of 18 March 2020, the Committee has decided to keep the buffer unchanged for the next six months.

The easing of the monetary policy stance has contributed to financial stability under the current circumstances.

The Committee reiterates that it is prepared to use every tool at its disposal to safeguard financial stability in Iceland.

I Financial Stability: Developments and prospects

The outlook for financial stability has deteriorated since the publication of the Bank's last report at the beginning of July. Most indicators now suggest that the battle with the COVID-19 pandemic will be more protracted than was hoped in the spring. This will have an adverse impact on households and businesses, thereby affecting financial system loan quality as well. The actions taken by the Government and the Central Bank have aimed, among other things, to provide households and businesses with easier access to lower-cost financing, thereby cushioning against the blow and enabling them to weather the pandemic. Measures such as moratoria on payment, part-time unemployment benefits, and interest rate cuts are still mitigating the impact of the pandemic on households. This can be seen in a buoyant real estate market, rising house prices, and more robust private consumption than was previously expected. Unemployment is likely to rise still further in coming months, however. The tourism industry is facing a collapse in revenues, and there are significant spillovers to related sectors such as commercial property leasing. Firms' access to financing has tightened because of diminished debt service capacity and heightened uncertainty. Increased leverage alone will not solve the problems of the weakest companies. There is considerable risk that a number of companies will seek moratoria or become insolvent in the next few months. The exchange rate of the króna has fallen, owing to substantial uncertainty in tourism, the country's largest export sector. The Central Bank's international reserves are very large, however, and well in excess of all reserve adequacy criteria. Responses to the pandemic entail an easing of the policy stance, which could undermine financial stability in the long run. Households and businesses need to be prepared for a tightening of the policy stance once the economy starts to recover.

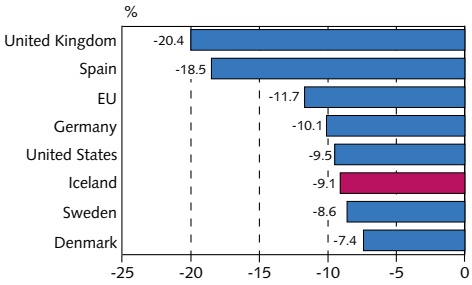
Risks relating to the external position and currency flows

Strong contraction and bleaker global outlook …

GDP growth among Iceland's key trading partners is estimated to have contracted in Q2/2020 by nearly 13% year-on-year, the largest single-quarter contraction since quarterly measurements were introduced just after World War II. The economic outlook for the quarters to come has deteriorated as well, alongside a continued rise in the global COVID infection rate following the relaxation of the public health measures introduced in the spring. Leading economic indicators suggest, however, that advanced economies have seen an uptick in activity with the easing of public health measures. Purchasing managers' indices (PMI) in manufacturing and services sectors have risen from their historical lows earlier in the year, although there was a discernible slide in the euro area in August.[1]

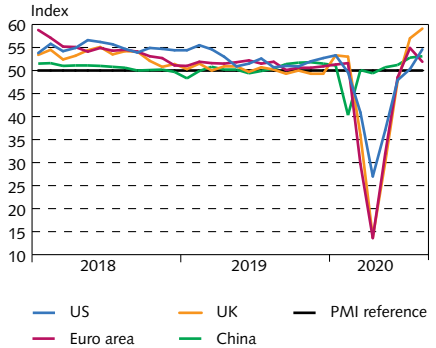
In Iceland, GDP shrank 9.3% year-on-year in Q2, the largest contraction in a single quarter since quarterly measurements were introduced. The Central Bank's most recent macroeconomic forecast, published in *Monetary Bulletin* 2020/3, assumes that GDP will contract by 7% for the year as a whole, somewhat less than in the Bank's previous forecast. The main reason the contraction was smaller than had been forecast was that domestic demand grew more strongly than had been expected after public health measures in Iceland were eased in the spring. Because of the Government's labour market measures – particularly the part-time employment benefits programme – and unexpectedly strong demand in recent months, unemployment has

Chart I-1
International comparison:
GDP Q2/2020



1. Real quarter-on-quarter change in GDP in Q2/2020 compared to Q1/2020. Seasonally adjusted.
Sources: Eurostat, Statistics Iceland.

Chart I-2
Composite purchasing managers' index[1]
January 2018 - August 2020



1. Markit composite output purchasing managers' index. The index is published monthly and is seasonally adjusted. An index value above 50 indicates month-on-month growth, and a value below 50 indicates a contraction.
Source: Refinitiv Datastream.

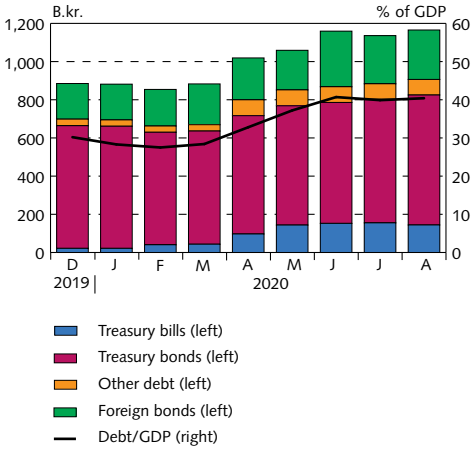
1. PMIs for manufacturing and services, published monthly, provide a leading indicator of the economic outlook. The indices are calculated based on responses from a survey panel and executives from over 400 firms. In the survey, respondents are asked to answer questions on production volume, price developments, staffing plans, and expectations for the future, among other topics. For further information, see the IHS Markit website: https://ihsmarkit.com/products/pmi.html

not yet risen substantially. The outlook is for a spike this autumn, however, although the extension of the Government measures will help to keep it in check.

In an attempt to mitigate the economic impact of the pandemic, governmental authorities in Iceland and many other countries have significantly boosted public spending and taken on massive debt. The Icelandic Government's total debt increased by 280 b.kr. in the first eight months of the year, driven by exchange rate movements and increased bond issuance. In the draft of its revised fiscal strategy, the Government proposes changing the debt target for 2020-2022 so that total debt will not exceed 64% of GDP at the end of 2022.[2] Central banks have resorted to interest rate cuts and other stimulative measures such as secondary market bond purchases, thereby using their balance sheets to keep the economy moving. The objectives of these measures include ensuring the transmission of interest rates, increasing liquidity in circulation, and strengthening financial market efficacy.

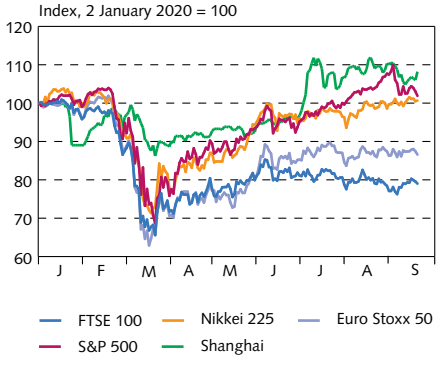
In August, the real exchange rate in terms of relative consumer prices was down 12% year-to-date, mostly because of an 18% nominal depreciation of the króna over the same period. Terms of trade improved in Q2, but outlook for 2020 as a whole is for a slower improvement than the Bank had previously projected, owing to a smaller rise in exported goods prices and an increase in the price of oil and other inputs.

Chart I-3
Treasury debt



Source: Government Debt Management.

Chart I-4
Share price indices
2 January 2020 - 18 September 2020



Source: Refinitiv Datastream.

… and substantial uncertainty in foreign financial markets

International financial markets have rebounded in response to government stimulus, relaxation of public health measures, increased economic activity, and optimism about the development of a COVID-19 vaccine. Investors have turned increasingly to riskier assets such as equities and junk bonds in search of higher returns, after having sought the shelter of safer investments early in the year. Stock prices have diverged in recent weeks. Share price indices in the US, Japan, and China are above pre-pandemic levels, while European shares have risen less strongly. Share price volatility has receded as well, and the VIX implied volatility index, which measures market expectations of volatility in the S&P 500 share price index, has fallen by over half from its March 2020 peak. The VIX remains relatively high in historical context, however.

A high level of non-pandemic-related uncertainty still remains. The trade dispute between the US and China, has stiffened, and the UK and the European Union (EU) have yet to reach a permanent post-Brexit trade agreement. Added to this is the uncertainty surrounding the US presidential election in November.

Current account still in surplus despite collapse of services exports

The COVID-19 pandemic and the associated public health measures have cut into cross-border trade, which the International Monetary Fund (IMF) projects will shrink by some 12% this year.[3] Iceland has

2. See https://www.althingi.is/altext/150/s/2031.html

not been spared the effects of this trend, with a deficit on goods and services trade measuring 0.8% of GDP in Q2/2020, the weakest balance since the 2008 financial crisis. The balance on services contracted sharply year-on-year in Q2 and was positive by only 0.5% of GDP, down from 7% in 2019. This was due primarily to a 90% year-on-year drop in tourism export revenues, as the effects of opening the border in June will mainly show in Q3. The goods account deficit also contracted, however, offsetting the drop in tourism revenues. Nevertheless, the current account balance for the quarter was positive by 1% of GDP. The surplus stems in part from a surplus on primary income, which in turn is due mainly to negative foreign reinvestment in Iceland – in other words, losses sustained by domestic subsidiaries of foreign companies.

In its most recent macroeconomic forecast, the Central Bank projects that the current account surplus for 2020 as a whole will measure 2% of GDP, as compared with 6% in 2019, and then rise to approximately 4% in 2021 and 2022.[4]

Non-residents scale down asset positions in Iceland

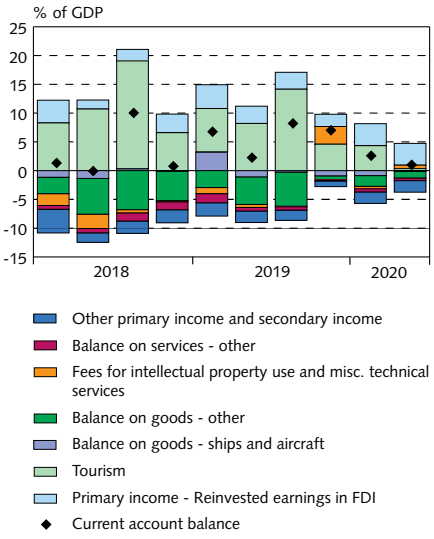
Net new investment using foreign capital was negative by 12 b.kr. during the period from June through August. The outflows stem primarily from Treasury bond sales by non-resident investors in the amount of 15 b.kr., offset in part by nearly 4 b.kr. in inflows. The stock of offshore krónur shrank marginally during the spring but has remained broadly unchanged since, at 50 b.kr. At the end of July, non-residents held 94 b.kr. in Treasury bonds. Virtually all foreign-owned Treasury bonds are held by fund management companies, with four companies holding over 90% of the foreign-owned stock.

Resident entities' capital outflows have been limited in the recent past, as the pension funds temporarily stopped buying foreign currency for foreign investment after the pandemic began to spread. The pension funds' foreign investment (including reinvestment and alternative investments) totalled 35 b.kr. over the period from April through July. Part of their total investment was probably financed with foreign currency balances, which contracted by 33 b.kr. at constant exchange rates over that period.

Over the past three years, the pension funds' foreign currency purchases have averaged 100 b.kr. per year. In H1/2020, they totalled about 30 b.kr., including 7 b.kr. in Q2. As these figures show, they scaled down their foreign currency purchases by nearly ¾ between Q1 and Q2. Preliminary figures for July and August show an increase between Q2 and Q3, however. A sizeable increase in the pension funds' domestic króna-denominated deposits – in the amount of 39 b.kr. between April and end-August – suggests that the funds have generally refrained from investing due to pandemic-related uncertainty.[5] In addition, demand for mortgage loans from the pension

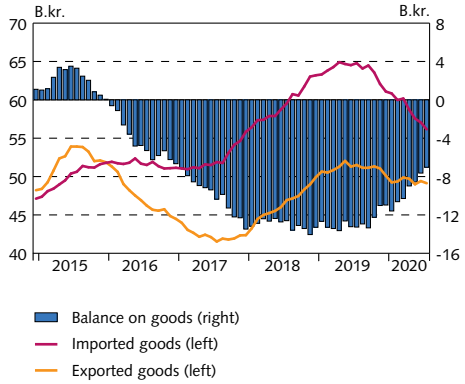
3. See IMF (June 2020), *World Economic Outlook update*.
4. See *Monetary Bulletin* 2020/3.
5. In comparison, the pension funds' disposable income, which consists primarily of pension contributions net of pension benefit payments and operating expenses, has totalled approximately 90 b.kr. per year in recent years.

Chart I-5
Current account balance[1]



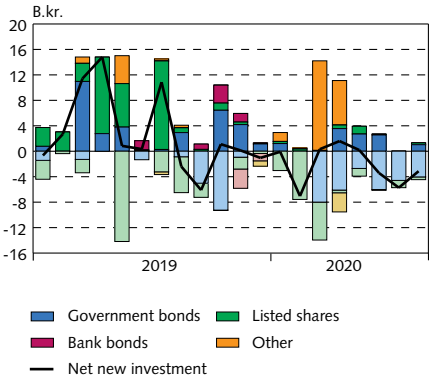
1. Current account components relative to quarterly GDP.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart I-6
Balance on goods excluding ships and aircraft
12M moving average



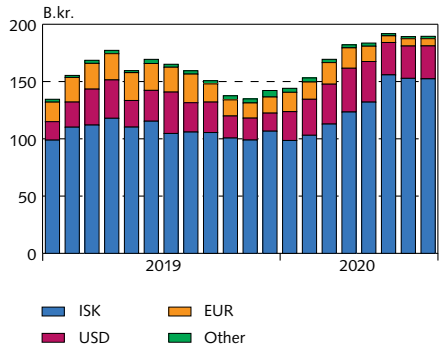
Sources: Statistics Iceland, Central Bank of Iceland.

Chart I-7
Registered new investment[1]



1. Data on new investments represent inflows of foreign currency converted to Icelandic krónur for investment in Iceland. Total investment, new investment, and reinvestment. Inflows in dark colours; outflows in light colours. August numbers are preliminary.
Source: Central Bank of Iceland.

Chart I-8
Pension funds' deposits with domestic DMBs



Source: Central Bank of Iceland.

funds has diminished. As a result, their pent-up investment need has increased somewhat in recent months. Based on the pension funds' investment plans, it is not unlikely that they will step up their foreign investments in the coming term, as they have decided not to extend their pledge to refrain from buying foreign currency for new investment abroad.

NIIP improves, and international reserves are well above adequacy metrics

At the end of Q2, Iceland's net international investment position (NIIP) was positive by nearly 29% of GDP, after improving by 5 percentage points between quarters, mainly because of a 19% rise in foreign securities prices. External debt increased marginally, owing mainly to eurobond issuance by the Treasury in June, to about 90% of GDP at the end of the quarter. Foreign-denominated liabilities accounted for some ¾ of that total.

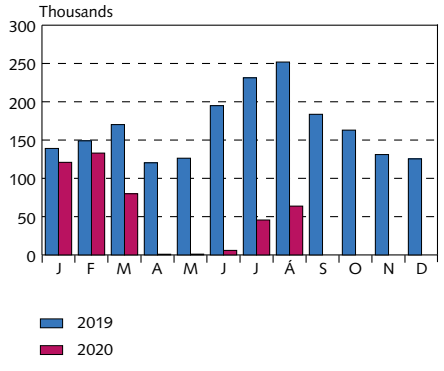
The Central Bank's international reserves totalled 973 b.kr. at the end of August, and the ratio of the reserves to the International Monetary Fund's (IMF) reserve adequacy metric (RAM) was 175% at the end of Q2. The reserves are therefore large, and well above key adequacy criteria. The Central Bank began a programme of regular currency sales in the interbank foreign exchange market in mid-September. The Bank is prepared to sell up to 240 million euros, or roughly 4% of the reserves, under this programme through end-2020.

Conditions in foreign credit markets improve

Financial conditions and the terms available to resident borrowers in foreign markets deteriorated sharply in late winter, owing to the uncertainty brought on by the pandemic. Since June, however, terms have improved steadily, with interest premia on the commercial banks' foreign issues falling by nearly 150 basis points, as is discussed further in the section entitled *Liquidity and funding*.

In Q2, domestic companies obtained foreign financing for the equivalent of 26 b.kr. and retired some 5 b.kr. in foreign debt. Even though terms have been improving, resident entities appear for the most part to be refraining from foreign financing thus far in Q3, reflecting the general trend towards caution during times of major uncertainty.

Chart I-9
Tourist departures via Keflavík Airport



Sources: Icelandic Tourist Board, Isavia.

Tourism beset by major uncertainty following a resurgence of the pandemic

The tourism industry environment is vastly changed. Over the first eight months of the year, 450,000 tourists visited Iceland, down from 1.4 million over the same period in 2019. After a virtual standstill from mid-March onwards, tourist arrivals began to pick up slightly in July, to 45,000, about a fifth of the total for July 2019. Air travel and tourist arrivals have contracted again, however, after restrictions were tightened at the border in the wake of a new wave of infections in Iceland and many other European countries. Several neighbouring countries, including Norway and the Baltics, have required visitors from Iceland to quarantine themselves as a result of rising infection rates in August.

In some instances, other countries have warned against travelling to Iceland. In addition, the borders of the Schengen Area are still subject to tight restrictions, including a prohibition on tourist arrivals from the US and China. Tourism as an export sector will not recover again while these broad border restrictions in Iceland and elsewhere remain in effect.

This summer, 13 airlines had scheduled flights to Iceland, down from 23 a year earlier. The contraction in flights to the country was comparable to the decline in tourist numbers – over 90% at the trough in Q2. Icelandair has announced that its flight schedules do not provide for a significant increase in flights to and from Iceland until Q2/2021. In August, the airline was forced to scrap plans to increase flights in September, after the spike in COVID-19 infections and the tightening of measures at the border. Furthermore, Icelanders have been encouraged not to travel to other countries.

Heavy weather ahead in the hotel business …

The decline in tourist numbers has been accompanied by a strong contraction in foreign-issued payment card turnover. Aggregate card turnover for the first eight months of the year was down 64% year-on-year. Turnover was negligible from end-March through mid-June but then picked up again when tourists were offered the option of being tested upon arrival at the border instead of mandatory quarantine. Even so, turnover in July was only 33% of the total a year earlier. Foreign card turnover plunged again in early August, when restrictions at the border were tightened again. An increased number of Icelanders who reside abroad have remained in the country this summer, and this has probably supported foreign card turnover in recent months.

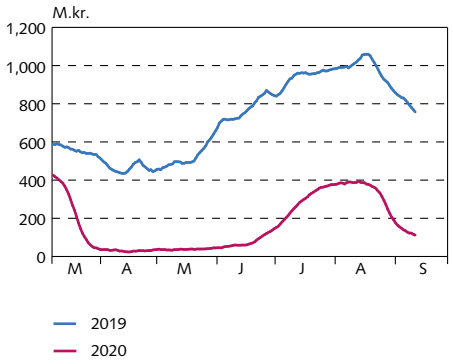
Hotel bed-nights contracted by 63% year-on-year from June through August. This summer, hotels relied on domestic travellers, whose numbers nearly trebled year-on-year. Incentive programmes launched by the Government and reduced travel abroad supported this trend. Furthermore, the price of hotel lodging has fallen in the wake of the pandemic. In June through August, Icelanders accounted for nearly 61% of hotel bed-nights, as opposed to 8% in 2019. The increase in domestic travel benefited hotels in regional Iceland the most, while most hotels in the capital area have been closed since the pandemic reached Iceland in March. Most indicators suggest that a large share of those hotels still open will close in the autumn when Icelanders cut back on travel, as there are few foreign tourists in the country. A number of companies in hotel operations, many of which have had virtually no revenues since April, are currently working with credit institutions, landlords, and other creditors on restructuring plans in an attempt to prevent insolvency.

… and job losses in the tourism sector

Growth in domestic systemically important banks' (D-SIB) lending to tourism companies has slowed markedly as a result of difficulties in the sector. Annual credit growth measured 1.5% at the end of Q2, down from over 8% a year earlier. Impairments of loans to the sec-

Chart I-10

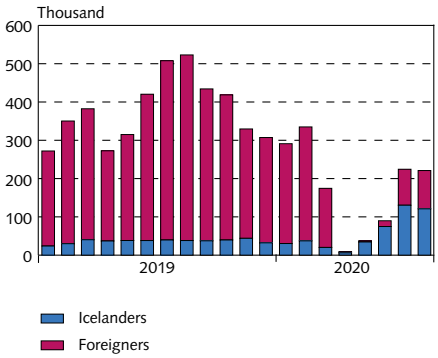
Daily turnover of foreign debet and credit cards in Iceland[1]



1. Seven-day moving average. Total payment card turnover (debet- and credit card) in Iceland.
Source: Central Bank of Iceland.

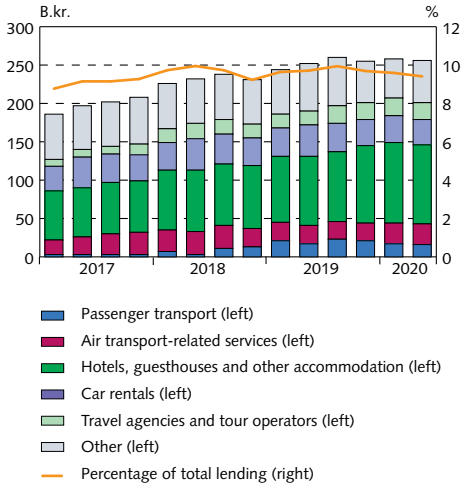
Chart I-11

Number of hotel bed-nights[1]



1. 2020 numbers are preliminary figures.
Source: Statistics Iceland.

Chart I-12
D-SIB lending to the tourism industry



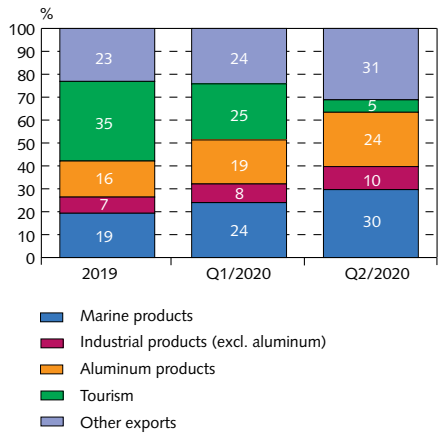
Source: Central Bank of Iceland.

tor increased by nearly 13 b.kr. in H1/2020, and the ratio of impairments to the total claim value of loans is currently almost 8%. Since the pandemic started, tourism companies have availed themselves of payment assistance measures offered by financial institutions and the Government. As of mid-September, nearly 23% of D-SIB loans to tourism companies were in moratorium. Since the special pandemic-related moratorium measure was introduced, 63% of loans to the sector have been protected in this manner. Over the same period, tourism companies had received support loans and bridging loans amounting to 3.8 b.kr.

Because of restrictions on international travel, activities in the sector will be at a minimum in coming months, and there is little need for workers. Companies in the tourism industry have availed themselves of the Government's part-time unemployment benefits scheme, and a number of employees have worked during their termination notice period in recent months. Unemployment in the sector will inevitably be high in the months to come, as an estimated 25,000 people were employed in the tourism business at the beginning of the year. The number of employees in the industry has fallen steeply in 2020 to date, and further layoffs are expected.

Tourism is in the midst of a period of major uncertainty following the boom of the past several years. It is impossible to predict when cross-border travel will normalise again, but the short-term outlook is not a rosy one. A number of firms in the sector are expected to shutter their operations this autumn and winter, when Icelanders reduce their domestic travel. Under financial institutions' agreement to extend moratoria to companies, which took effect at the end of March, loan payments may be deferred for up to six months.[6] Therefore, moratoria are beginning to expire for the companies that applied earliest, and it is unclear how many firms will be able to extend them. Default could rise thereafter, as companies in the sector have seen their revenues collapse. It is expected that many tourism operators will apply for moratorium or be subjected to insolvency proceedings in the near future.

Chart I-13
Goods and services exports and contribution from underlying components



Source: Statistics Iceland.

The pandemic has adversely affected marine product exports …

Marine product export volumes were down 13% year-on-year in H1/2020. Furthermore, product prices declined in foreign currency terms in Q2 and are now about where they were a year ago. Marine product-generated export revenues contracted by roughly 6% between years. The outlook for the sector has improved since the spring, as product distribution in foreign markets has gone more smoothly than expected and demand has been stronger. Market conditions remain challenging, however, and the economic contraction in key export markets, including the UK, could affect demand for Icelandic fish in the long run.

Loans to fishing companies accounted for 12% of the D-SIBs' total loans to customers at the end of August 2020. This ratio has risen somewhat in recent months, concurrent with the depreciation

6. The agreement is in effect until end-September, but it is prohibited to defer payments beyond year-end 2020. See https://sff.is/samkomulag-um-timabundna-greidslufresti-a-lanum-fyrirtaekja-vegna-heimsfaraldurs-covid-19/

of the króna, as most fishing industry debt is denominated in foreign currencies. About 7.2% of D-SIB loans to the fishing sector were in moratorium in mid-September. The share of non-performing loans to fishing companies has risen slightly in 2020, to 3.7% in the end of August.[7]

… and demand for aluminium and ferrosilicon has declined

Aluminium exports declined in value by 10.5% year-on-year in Q2/2020, owing to falling prices and reduced production. At the same time, aluminium prices in US dollars fell by 16% and export volumes fell 7.5%. Furthermore, the outlook for ferrosilicon production has worsened because of weak demand. A sizeable contraction in production is expected, with Elkem temporarily shutting down one of its three furnaces at Grundartangi this summer and executives at PCC BakkiSilicon near Húsavík deciding to halt production temporarily at the end of July.

Risk stemming from domestic asset markets

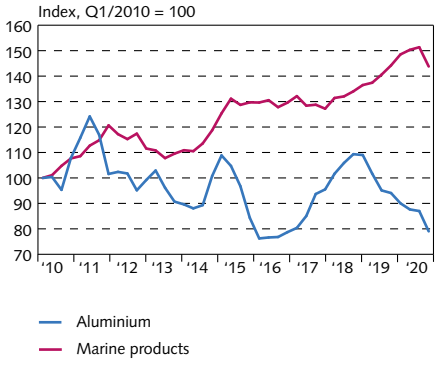
Share prices differ across sectors …

Nasdaq Iceland's OMXI10 index has risen since the last Financial Stability report was issued in early July and is now broadly at the level seen in late February, before the COVID-19-induced plunge. Developments in share prices have differed from one company to another and from one sector to another. The rise in the OMXI10 can be explained largely by the price of shares in Marel, which is Iceland's largest listed company by far, accounting for some 60% of the index's total market cap. On the other hand, companies in sectors that are sensitive to the bleaker outlook for tourism – Icelandair and real estate firms – have pulled in the opposite direction. Stock market turnover was down more than 50% year-on-year in July and August, to a total of 51.4 b.kr. Direct pledging in the Icelandic stock market was 13% at the end of July, after falling marginally in recent months. The pension funds hold about 40% 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 22%.[8] In mid-September, Icelandair increased its share capital by about 23 b.kr. in a successful public stock offering. The real estate companies Reginn and Reitir are also planning stock offerings in September. No new companies have been listed on the market this year, but in late August, Heimavellir requested that its shares be delisted, as the company has recently been acquired by Nordic investment firm Fredensborg AS.

… and the breakeven inflation rate in the bond market has risen

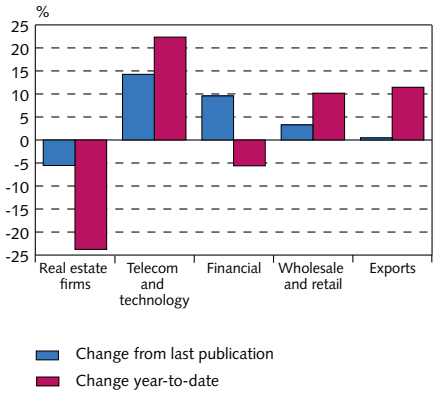
Nominal Treasury bond yields began rising in August. At the time of the last Financial Stability report they were near historical lows, after having tumbled year-to-date in tandem with reductions in the Central

Chart I-14
Developments in export prices[1]
Q1/2010 - Q2/2020



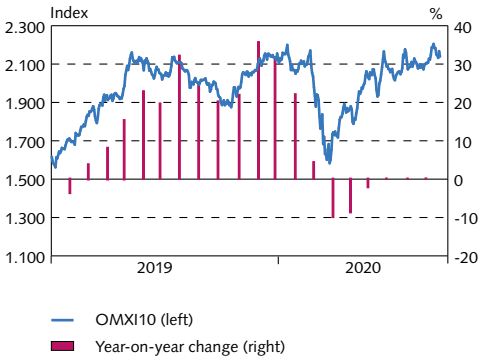
1. Aluminium prices in US dollars and marine product prices in foreign currencies.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart I-15
Developments in listed share prices, by sector[1]



1. Value-weighted change in listed share prices relative to 18 September, by type of activities. Adjusted for dividend payments and share capital changes.
Source: Kodiak Excel.

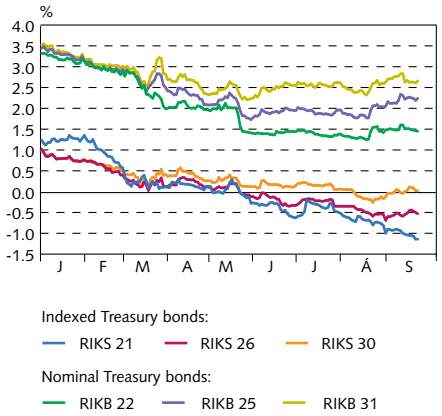
Chart I-16
OMXI10 share price index



Source: Nasdaq Iceland.

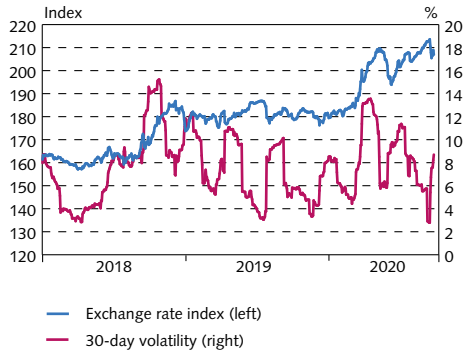
7. Lending to companies engaged in fishing and fish processing.
8. Direct pledging is the average percentage of pledged shares for all listed companies on both the Main List and the First North market, based on the relative weight of each company. Only direct pledges are considered; therefore, no account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

Chart I-17
Treasury bond yields
2 January 2020 - 18 September 2020



Source: Nasdaq Iceland.

Chart I-18
Exchange rate of the króna[1]



1. Exchange rate index based on average imports and exports, narrow trade basket (1%).
Source: Central Bank of Iceland.

Bank's key interest rates. Yields at the long end of the yield curve rose more than at the short end, and the slope of the yield curve has therefore grown steeper. To an extent, this trend reflects greater pessimism among investors. The Central Bank's decision to stop offering one-month term deposits also boosted demand among financial institutions for Treasury bills and short Treasury bonds. The yield on one- and five-year Treasury bonds is now negative, but the breakeven inflation rate in the bond market has risen in recent months. Bond market turnover has risen between years. In July and August it was up 19% year-on-year, to a total of 188 b.kr.

Central Bank commences regular foreign currency sales programme

The króna depreciated somewhat during the summer and continued to slide until, on 9 September, the Central Bank announced a programme of regular foreign currency sales. The exchange rate is now about 2.5% lower than at the beginning of July and roughly 15% lower than at the turn of the year. There was considerable downward pressure on the exchange rate in late August and early September. At that time, foreign currency inflows into the market were limited and pessimism was gaining ground, owing to the reinstatement of tighter public health measures, prompting non-residents to move capital out of the country. The Central Bank sold currency for approximately 30 b.kr, in August and until 18 September, both in regular foreign currency sales and in interventions in the market.

The Bank's aim with its regular currency sales programme is to deepen the market and improve price formation. At the outset, the Bank plans to sell 1 million euros per day to each market maker, for a daily total of 3 million euros. The Central Bank will continue to intervene in the market to mitigate exchange rate volatility when it deems such intervention warranted. Foreign exchange market turnover has increased somewhat year-on-year. During the first eight months of the year, turnover came to some 220 b.kr., about 65% more than over the same period in 2019. The Central Bank's share in market turnover has increased as well, from 10% in the first eight months 2019 to 24% over the same period in 2020. In mid-September, measured 30-business-day volatility in the exchange rate of the króna was 3%, much lower than in April (14%). The Bank's intervention in the market has therefore smoothed out exchange rate fluctuations. The pension funds have limited their purchases of foreign currency in recent months, but their intentions for the months to come are highly uncertain.

Residential housing supply shrinks

Capital area housing market turnover contracted markedly after the pandemic reached Iceland, measuring 35% lower in real terms in Q2 than in the same quarter of 2019. Then, in July and August, market activity firmed up again, with a 57% year-on-year increase in turnover. Market supply has declined somewhat since spring, indicating strong demand. The number of flats for sale in the capital area fell from 2,000 to 1,700 between May and July, even though turnover estimated from registered purchase contracts was quite low in early sum-

mer. According to information from the officer of the Commissioner of Greater Reykjavík, the number of documents submitted for registration has jumped between years, with most of the submittals due to refinancing and amendment of contract terms. This surge in filings has caused delays in registration of purchase agreements and, as a result, in the official data based upon them. As a result, a portion of the increased turnover in July and August stems from purchases made in spring and early summer, and measured turnover is likely to remain high in the months to come.

Although a new tally of flats under construction has not been published since the July issue of Financial Stability, most indicators suggest that construction market activity has eased. For example, cement sales have continued to decline, and job numbers in the construction industry have fallen in spite of brisk home maintenance and repair activity, which is driven in part by the temporary 100% reimbursement of value-added tax on repair and improvement of owner-occupied property.

Real house prices in the greater Reykjavík area have continued to climb steadily, with the year-on-year rise measuring 1.9% in August. Although this modest increase was driven initially by rising real condominium prices, the real price of single-family homes has jumped by 3.7% in the past three months, after falling markedly in the months beforehand. In the past year, condominium prices have risen by 1.9% and single-family home prices by 1.6%, both in real terms. Prices are rising much more in regional Iceland than in the capital area. In July, the real year-on-year rise in regional Iceland house prices measured 8.6%, much in line with previous months and the Q2 average of 8.5%.

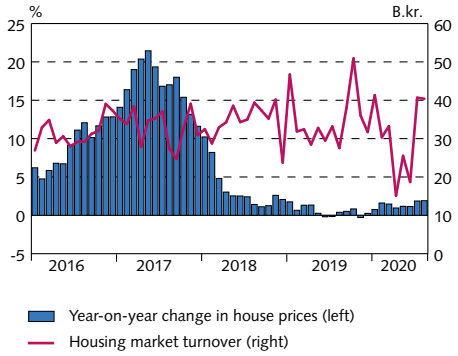
The ratio of house prices to rent prices has risen in the past few months. The supply of rental housing grew in the spring, concurrent with the contraction in short-term rentals to tourists. As a result, rent prices have fallen and the ratio of purchase prices to rent prices has risen accordingly. The rise in the rent price index has lost pace, and in August, the twelve-month change in rent prices declined in real terms for the fourth month in a row. The ratio of house prices to wages has fallen more or less steadily since spring 2018, a trend that has continued since the pandemic struck.

Central Bank interest rate cuts have improved borrowing terms

Developments in the real estate market this spring and summer indicate that reductions in the Central Bank's key interest rate and subsequent declines in mortgage lending rates have supported the market. The weighted interest rate on new non-indexed consumer mortgages from the D-SIBs have fallen from nearly 5.3% at the beginning of the year to 3.8% by June. Over the same period, the D-SIBs' weighted indexed mortgage rate has fallen from 3.3% to 2.6%. These rate cuts reduce debt service on new mortgage loans by a substantial margin, thereby making it easier for households to invest in property and to lower their debt service by refinancing existing loans. This has boosted demand in the real estate market and eased the downward pressure on prices caused by the surge in supply this spring, the spike

Chart I-19

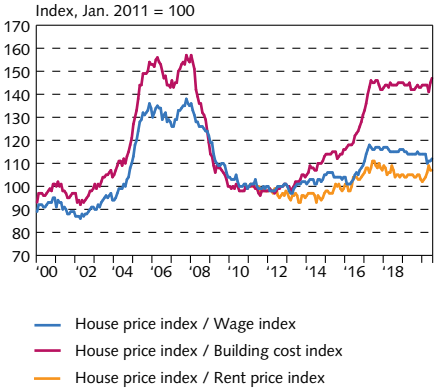
Real house prices and housing market turnover in greater Reykjavík[1]



1. Housing market turnover, at constant December 2019 prices.
Sources: Register Iceland, Statistics Iceland, Central Bank of Iceland.

Chart I-20

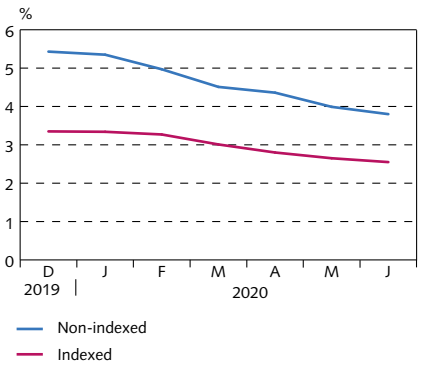
House prices in greater Reykjavík and their determinants



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

Chart I-21

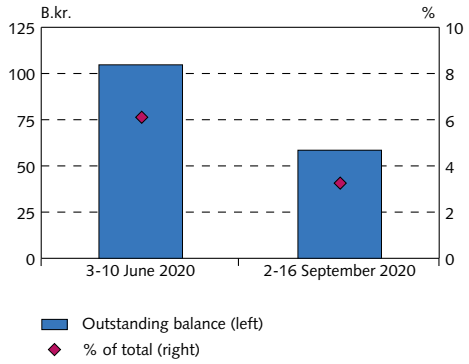
O-SIIs: Weighted interest rates of new mortgage loans to consumers



Source: Central Bank of Iceland.

Chart I-22

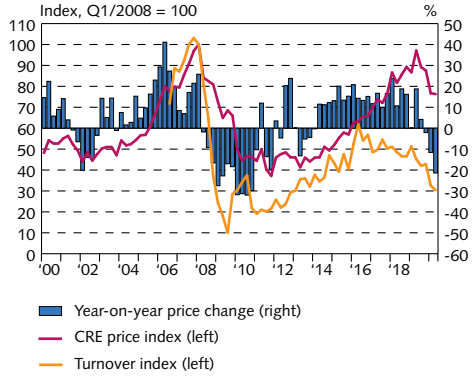
Outstanding balance of consumer mortgages that have been in moratorium[1]



1. The data includes D-SIBs, the largest pension funds, and the HFF. Pension funds' corporate loans are classified as other.
Source: Central Bank of Iceland.

Chart I-23

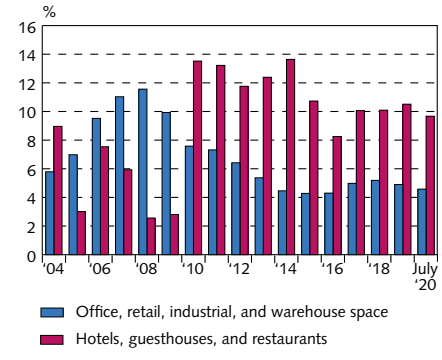
Capital area commercial real estate: real prices and turnover[1]



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.

Chart I-24

Commercial property under construction as a percentage of constructed property[1]



1. Nationwide. Property under construction is in constuction stages 1-6. Year-end figures except for 2020 (end-July figures).
Source: Registers Iceland.

in unemployment, and growing economic uncertainty. In addition, households with mortgage debt have been able to apply for debt moratoria. Around mid-September, some 3.3% of consumer mortgages were in moratorium, down from 6.1% at the beginning of June. About 5,500 applications for moratoria on consumer mortgages have been approved since the option was made available to consumers this spring. By the middle of September, almost 2000 applications were still in effect. The outstanding balance of mortgage loans that have been granted a moratorium since the spring totals nearly 150 b.kr. Loans totalling nearly 58 b.kr. were still in moratorium in the first half of September. Moratoria on consumer mortgages have been rather broad in scope, although fast decreasing in recent weeks, and have reduced the pandemic-related uncertainty in the property market, at least for the short term.

Commercial property price index remained flat in Q2

In the past twelve months, the commercial real estate (CRE) price index has fallen by over 21% in real terms, after having peaked in Q2/2019.[9] The index tumbled in Q1 and then stood still between Q1 and Q2, and is now close to its estimated long-term trend. Commercial property turnover in the capital area contracted by nearly 50% year-on-year in real terms in Q2, in line with the rapidly deteriorating economic outlook brought on by the spread of the pandemic.

Large number of hotels under construction in greater Reykjavík

Large hotel and guesthouse construction is currently underway throughout the country. For example, lodging space under construction in greater Reykjavík in July totalled 42,000 square metres, about 16% of the space already in existence. Conditions in the hotel market have changed radically for the worse, and the premises for some of these projects are probably shattered, at least in the short run. The capital area is beset by a glut of lodging space at present. According to figures on loans to the tourism industry, real annual growth in lending to firms connected to hotel operations measured 12% in Q2.

Excluding hotels and guesthouses, growth in the commercial property stock has been relatively modest in recent years. A large amount of office space is under construction in central Reykjavík, however, and this could cause a localised glut in supply in the coming term. As yet, the pandemic has had only a limited impact on demand for office space, but the shift towards teleworking could push demand downwards in the future.

Customers' financial hardship adversely affects real estate firms' cash flows

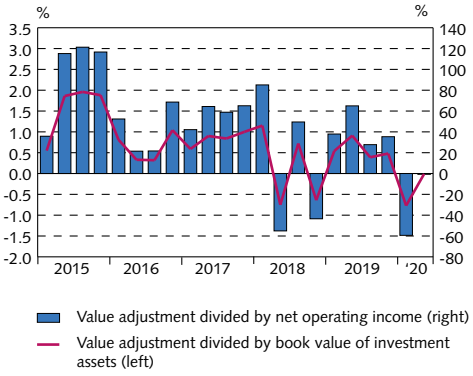
Iceland's largest commercial real estate companies – Eik, Reginn, and Reitir – have not been spared the effects of COVID-19. In the past

9. The CRE price index measures the average price in registered transactions with office, retail, and industrial space. Hotels and guesthouses are not included. Larger price reductions can be expected in this latter subset of commercial property than in the subset included in the index, but registered transactions involving hotels and guesthouses are relatively rare.

few months, the companies have been working with the tenants that have suffered most as a result of the pandemic. Chief among them are hotel operators, although restaurants, dance halls, and other businesses have lost substantial revenues as a result of the authorities' public health measures. This, in turn, has affected the real estate firms' cash flows, whether due to reductions, cancellations, or deferrals of rent payments. It can be assumed that a large share of this impact has yet to show in the companies' books. The real estate firms have tried to protect their liquidity position, including by deferring loan payments, issuing new bonds, and issuing new share capital. In addition, they have postponed some of the development projects they had planned to undertake this year. Returns on investment assets measured 5.1% in Q2 and have not yet fallen significantly. The risk premium on commercial property has risen, however, in the wake of continued declines in Treasury bond yields.

There have been changes in the value of assets in the real estate firms' books since the pandemic struck. In H1/2020, the companies wrote down the value of their investment assets by nearly 3 b.kr., or 0.8% of their total value at the turn of the year. Most of the reduction in value has been related to hotels. If a recovery is long in coming, the negative impact could spread to other types of commercial property, and further drops in value could occur, with the associated effect on equity ratios. As yet, however, the real estate firms are strong financially, and the pandemic has not had a significant effect on their equity position. Their combined equity ratio was 30.2% in Q2 and their leverage ratio 65.4%. As a result, they should be able to withstand fairly stiff headwinds and could also contribute to greater equilibrium in the market by providing temporary support to their tenants.

Chart I-25
Value adjustment of investment assets[1]



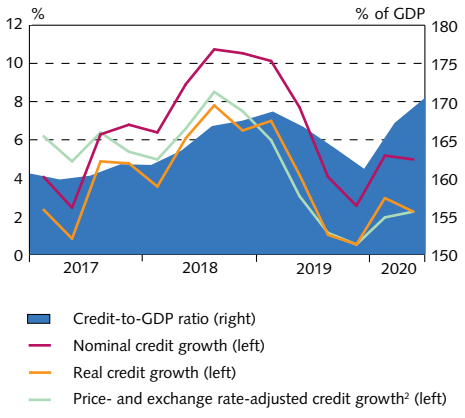
1. Combined ratios for commercial property firms Eik, Reginn, and Reitir. Value adjustment according to profit and loss account, divided by, on the one hand, the book value of investment assets, and on the other hand, net operating income, i.e. rental income net of operating expenses of investment assets.
Sources: Annual and interim financial statements from Eik, Reginn, and Reitir, Central Bank of Iceland.

Risk in the private sector

Private sector debt on the rise

Private sector debt rose by 2.2% in real terms year-on-year in Q2.[10] Corporate debt grew by 1.6% over the period and household debt by 2.9%. Growth in corporate debt eased over the course of 2019, but after a marginal contraction, debt has grown thus far in 2020. The private sector debt-to-GDP ratio rose nearly four percentage points between years, to just over 170% at the end of Q2/2020, its highest since 2015. The contraction in GDP pushes the debt ratio upwards, and the depreciation of the króna has increased exchange rate-linked debt in krónur terms.

Chart I-26
Private sector credit growth[1]



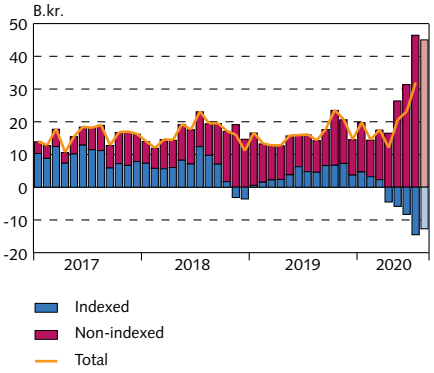
1. Lines show annual growth rates. 2. CPI-indexed credit at constant prices and foreign-denominated credit at constant exchange rates.
Sources: Statistics Iceland, Central Bank of Iceland.

Households seek out non-indexed variable-rate loans

The household debt-to-GDP ratio was just under 79% at the end of Q2/2020. It had risen by just over two percentage points between years, after remaining virtually unchanged since 2016. Growth in household debt is driven by an increase in mortgage loans, while other debt has contracted in real terms, as it has in the past few years. Notwithstanding the uncertainty afoot, household demand

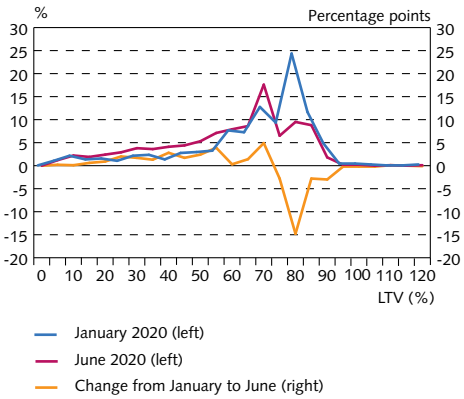
10. Debt owed by households and non-financial companies to domestic and foreign financial institutions, and issued marketable bonds.

Chart I-27
Net new lending to households[1]



1. Net new household loans from deposit institutions, pension funds and the Housing and Construction Authority, at fixed prices. Figures on the pension funds' net new loans in August not yet available.
Sources: Central Bank of Iceland.

Chart I-28
LTV distribution of D-SIBs' new mortgage loans to consumers



Source: Central Bank of Iceland.

for mortgage loans is still robust, owing to falling financing costs and stable real wages despites the economic contraction. In July, net new lending to households totalled nearly 32 b.kr., about 80% above the twelve-month average.[11] There are strong indications that developments in August were along the same lines, with net new loans issued by deposit institutions and the Housing and Construction Authority totalling 32 b.kr.[12] Furthermore, early retirement of loans has increased markedly, indicating that households are refinancing in response to interest rate reductions. The banks have increased their share in new mortgage lending, at the pension funds' expense. In June and July, retirement of pension fund loans exceeded the amount of new loans for the first time. At present, an overwhelming majority of new mortgages are non-indexed, variable rate loans, which have a more favourable debt service burden at current interest rates. In general, the commercial banks are now offering more favourable interest rates and more flexible terms on these loans than the pension funds are. Increased demand for non-indexed, variable-rate loans is a sign that households expect interest rates to remain low in the near term. The weight of indexation in household debt has declined in the recent past. At the end of Q2/2020, 67% of household debt was indexed, down from 72% a year earlier. The increase in non-indexed, variable-rate loans makes households more sensitive to interest rate hikes, as rising interest rates will increase the debt service on these loans more than on other available loan types. Improved distribution of household debt across differing interest rate benchmarks, indexed and non-indexed loans, and fixed- and floating-rate loans reduces the overall risk attached to households' indebtedness.

Loan quality improves for the banks' new mortgage loans

The distribution of the loan-to-value (LTV) ratio for new mortgages from the D-SIBs has changed markedly in recent months. The average LTV ratio on new loans was 59% in June, down from 67% in January. The share of new D-SIB borrowers with LTV ratios of 70% or less has risen steeply, from 49% in January to the current 73%. It is particularly noteworthy that the share of borrowers with an LTV ratio of approximately 80% has fallen from 24% in January to just under 10% in June.[13] The same is true of the loan-to-income (LTI) ratio, which is the ratio of borrowers' mortgage loans to their annual disposable income. In Q2/2020, 87% of new loans had an LTI ratio of five or less, up from 84% in Q1 and 81% in Q4/2019. Indicators imply that the number of loans with low LTI ratios continued to rise in July. The debt service ratio on new loans has fallen as well, as interest rates have fallen concurrent with a rise in the wage index.[14] The most common LTI distribution value is about 17.5%, which is

11. Net new loans are defined as new loans less loan retirement and loan prepayments in excess of contractual requirements.
12. Figures on the pension funds' net new lending in August will not be available until the beginning of October.
13. LTV ratio ranging from 77.5-82.5%.
14. The debt service ratio is defined as the ratio of monthly mortgage debt service to the borrower's monthly disposable income.

considered cautious, and a very small share of new loans have a high debt service ratio. Therefore, more new consumer mortgages from the D-SIBs have lower LTV ratios, lower LTI ratios, and lower debt service than before. This should have a positive impact on the D-SIBs' loan quality. This trend indicates strongly that a larger share of new borrowers are refinancing existing loans than was previously the case. In all likelihood, well-positioned borrowers are shifting increasingly from the pension funds to the D-SIBs in order to take advantage of better lending terms.

Growth in corporate lending has slowed

Growth in corporate lending is now driven by an increase in debt to foreign lenders, while debt to domestic financial institutions has contracted, primarily debt to deposit institutions. Well over a third of businesses' total debt is denominated in foreign currencies, and the depreciation of the króna has therefore increased that debt in krónur terms. Almost without exception, companies with foreign-denominated loans have revenues in foreign currency and are therefore hedged against exchange rate risk. Annual price- and exchange rate-adjusted growth in total debt measured 0.6% at the end of Q2.[15]

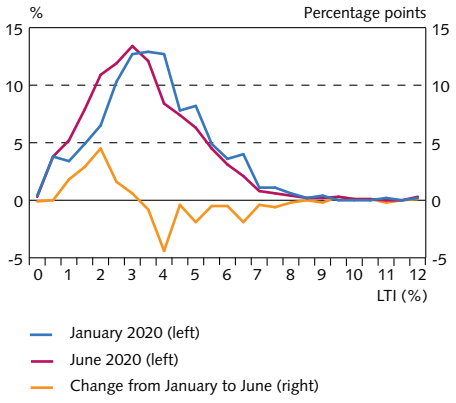
Net new D-SIB loans to companies totalled nearly 12 b.kr. in August, owing mainly to retirement of marketable bonds. In July, net new D-SIB lending was negative by 5.1 b.kr. Growth in lending to virtually all sectors has either slowed or contracted. The contraction in companies' domestic debt indicates that firms' access to credit may be tighter than before, primarily because of increased risk, as is reflected in rising credit spreads on the banks' corporate loans. The economic contraction and increased uncertainty because of the pandemic have also cut deeply into demand for credit, as firms' risk appetite has diminished and profitable investment opportunities are in short supply. Debt owed by companies that avail themselves of concessions from the Government and the financial institutions will increase in coming months. Many firms have suffered severe revenue losses and will enter the post-pandemic recovery period more heavily leveraged. Companies' exposure to risk due to interest rate movements and/or revenue losses increases as they become more heavily leveraged. That said, low interest rates support indebted companies and boost debt sustainability, all else being equal. The deterioration in credit institutions' loan quality is reflected in changed risk assessment and rising impairment in Q2. As yet, only a small share of the D-SIBs' corporate loans have been moved to Stage 3 according to the IFRS9 financial reporting standard; however, this is expected to change in the coming term, as the claim value of Stage 2 loans has doubled, and their impairment has increased fivefold.[16] The risk of even further impairment and increased insolvency is growing.

15. Foreign-denominated debt at constant exchange rates and indexed debt at constant prices.

16. 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.

Chart I-29

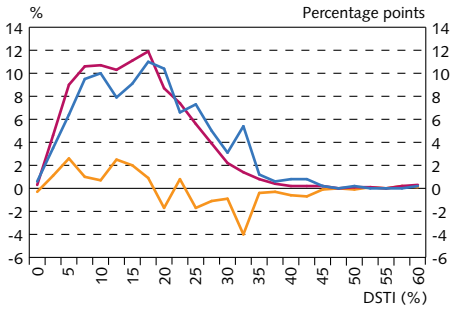
LTI distribution of D-SIBs' new mortgage loans to consumers



Source: Central Bank of Iceland.

Chart I-30

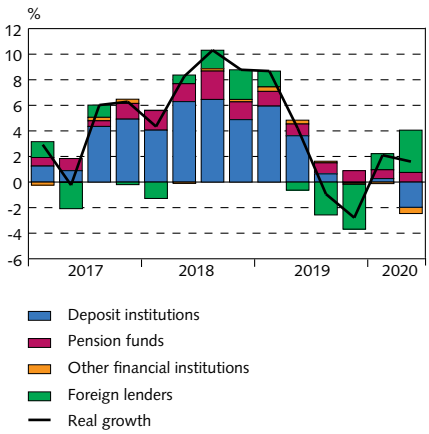
DSTI distribution of D-SIBs' new mortgage loans to consumers



Source: Central Bank of Iceland.

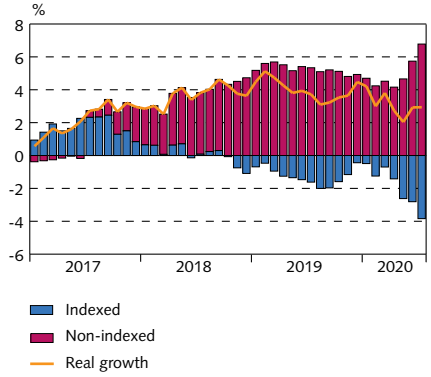
Chart I-31

Corporate debt, by lender[1]



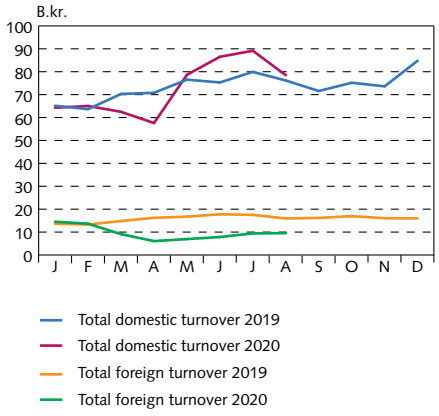
1. Real year-on-year change. Debt to financial institutions and issued marketable bonds.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart I-32
Real growth in household debt, by loan type[1]



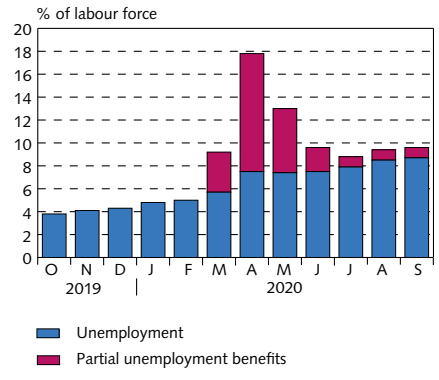
1. Annualised change in real terms. Debt owed to domestic financial institutions.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart I-33
Payment card turnover, domestic cards



Source: Central Bank of Iceland.

Chart I-34
Registered unemployment[1]



1. Directorate of Labour forecast for September.
Source: Directorate of Labour.

Risk associated with households' and businesses' position

Increase in non-performing household loans …

Domestic payment card turnover jumped after the public health measures were relaxed early this summer. In spite of social distancing requirements and the ban on gatherings during the spring, grocery store turnover and purchases of consumer durables remained broadly unchanged. On the other hand, turnover from miscellaneous services purchases fell steeply. The past few months' increased card turnover in Iceland is due in part to the virtual collapse in household spending abroad. In addition, it is possible that reduced debt service, as a result of lower interest rates, and third-pillar pension savings withdrawals boosted consumption temporarily. It is likely that high unemployment, limited growth in disposable income, and increased uncertainty will curb household consumption in the months to come.

Household arrears in the financial system have increased in recent months, even though the number on the default register is broadly unchanged. The ratio of non-performing D-SIB loans to households was 2.7% at the end of July, up from 2.1% at the turn of the year.[17] As of mid-September, 3.4% of the D-SIBs' household loans were in moratorium as a result of the pandemic. The same number for the largest pensions funds measured 3.8% at the beginning of September. These loans are not considered non-performing; therefore, the actual increase in default could be even greater.

… and a difficult labour market situation

The authorities have responded to the pandemic and its repercussions with specialised measures designed to mitigate the blow to the labour market and maintain purchasing power. Even so, the situation in the labour market is difficult. Unemployment has risen, albeit not as rapidly as was assumed in the spring, and, according to the Central Bank's most recent macroeconomic forecast, will measure close to 10% by the end of the year. A falling labour participation rate and an increase in part-time jobs have kept measured unemployment from rising as fast as was projected in the spring.

In the spring, the Government's part-time unemployment benefits scheme was very popular, and when the situation bottomed out in April, over 32,000 workers, or 17% of the labour force, were receiving part-time benefits. The tightening of the measure, the relaxation of the ban on gatherings in May, and Government assistance with wage payments during workers' termination notice period reduced the use of the part-time option. By July, just under 4,000 workers, or 2% of the labour force, were receiving part-time benefits. In August, the Government extended the part-time option for two months, through end-October. Furthermore, the validity period of income-linked unemployment benefits was lengthened from three months to six. Companies that have suffered severe revenue losses can receive Government assistance with wage payments during workers' termina-

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

tion notice period, but detailed information on the number of workers who have benefited from this measure is not available. There is the risk of increased financial hardship and rising arrears among households once the Government's temporary labour market measures expire.

Households' balance sheets are stronger now than they have been for years. In recent years, households have paid down debt, their disposable income has risen, and their net wealth has grown. Interest rate cuts have also lowered their debt service significantly. As a result, households should be well prepared to face the economic implications of the pandemic if unemployment does not become entrenched.

The pandemic has a broad impact on companies, but support measures soften the blow

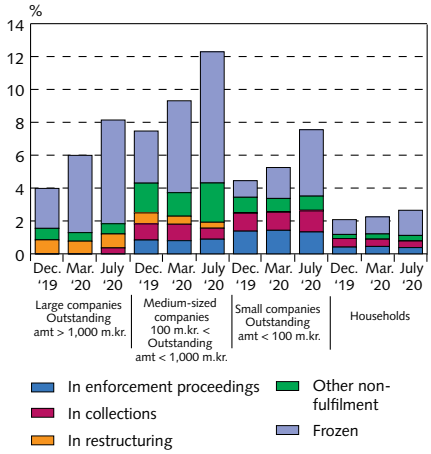
Domestic firms' balance sheets were generally strong and indebtedness at historically low levels when the pandemic struck. The pandemic has had profound implications, however, albeit mostly for tourism and other services sectors that were forced virtually to halt operations in the spring. There were signs of improvement in mid-summer, when public health measures were eased, measures taken to stimulate domestic demand, and people encouraged to travel within Iceland. However infection rates have picked up again, and there is considerable uncertainty about how severe the effects, how long they will persist, and how successful the measures to blunt those effects will be.

The financial system and the authorities were well prepared to respond to the shock, mitigate the financial impact of the pandemic on companies, and provide companies with the temporary scope they needed to withstand revenue losses. In July, about 1,400 companies were participants in the Government's part-time unemployment benefits programme, down from 6,500 at the peak in April. The part-time option has now been extended through October. In mid-September, some 600 support loans amounting to just over 4.7 b.kr. had been granted, and two bridging loans had been issued. At that time, 998 firms that had been forced to close because of public health measures received closure subsidies totalling about 1 b.kr. In mid-September, about 1,000 companies were protected by a special pandemic-related loan payment deferral measure, which expires at the end of the month. In addition, 8.6% of the D-SIBs' corporate loans were in moratorium due to the pandemic, down from almost 17% at the beginning of June. The majority of these loans are to companies in services and in retail and wholesale trade. The share of non-performing corporate loans issued by the D-SIBs has increased, from 4.8% at the end of 2019 to 8.9% by the end of July. The rise in the ratio is due primarily to an increase in default among services companies and real estate firms. Non-performing loan ratios are expected to rise further as pandemic-related moratoria expire over the months to come.[18]

The number of corporate insolvencies has risen year-on-year thus far in 2020, but the increase is not limited to the months following the onset of the pandemic, as insolvencies show in the data with a significant time lag. In the first seven months of 2020, a total of 601 companies were subjected to insolvency proceedings, as compared

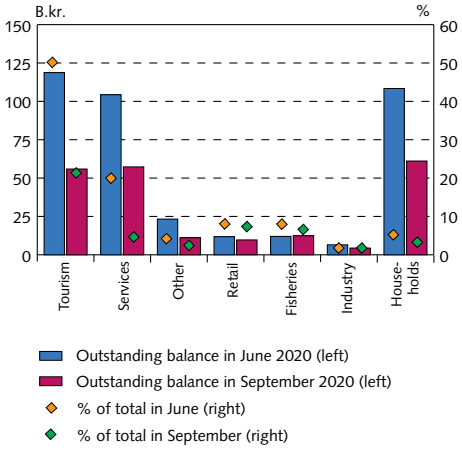
18. Loans placed in moratorium due to the pandemic are not classified as non-performing.

Chart I-35
D-SIBs status of non-performing loans, by claim amount[1]



1. Parent companies, book value.
Source: Central Bank of Iceland.

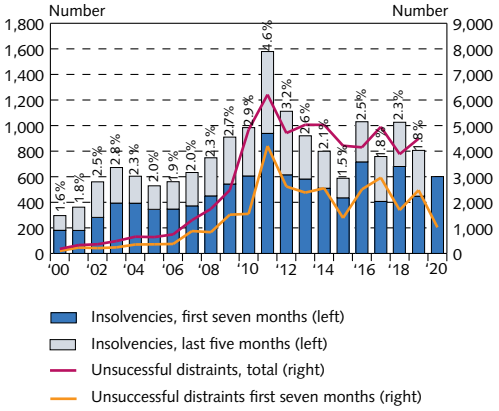
Chart I-36
Outstanding balance of loans in moratorium[1]



1. Data from 3-10 June and 2-16 September 2020. The data includes D-SIBs, the largest pension funds, and the HFF. Pension funds' corporate loans are classified as other.
Source: Central Bank of Iceland.

Chart I-37

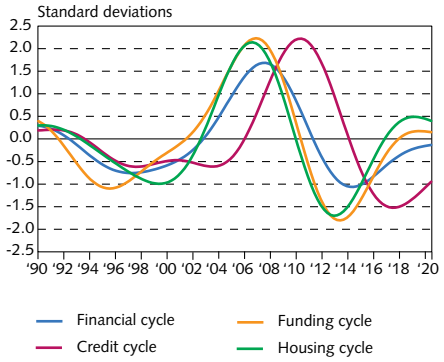
Companies insolvencies and unsuccessful distraint actions[1]



1. The percentages show insolvencies as a share of the total number of firms.
Sources: Registers Iceland, Statistics Iceland, Central Bank of Iceland.

Chart I-38

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.

with 448 over the same period in 2019. The rise is most pronounced in the tourism and construction sectors. Even though insolvencies have increased, the number of firms on the default register has declined between years. In virtually all sectors, the share of companies on the default register has fallen over the past year. In general, firms are not entered to the default register until they have been in arrears for some time. Furthermore, the number of unsuccessful distraint measures against companies declined by more than half year-on-year in the first seven months of 2020.

The financial cycle

Outlook unchanged

Measurements of the financial cycle tend to be sticky between quarters, owing to the nature of the data and the methodology used. As a result, the outlook is broadly unchanged since the last *Financial Stability* report, published at the beginning of July. There are a number of indicators in the markets and in the economy that suggest how the financial cycle will develop, however.

Interest rate cuts have encouraged households to borrow, and as is discussed in the section entitled *Risk stemming from private sector debt*, net new mortgage lending has surged. The number of households with debt in moratorium has also added to debt levels, as interest payments during the moratorium period are added to the loan principal. On the other hand, growth in corporate debt has eased, partly due to the high uncertainty level in the economy. It is expected that pandemic-related measures such as moratoria, supplemental loans, and support loans will increase the stock of corporate debt in coming months. The debt-to-GDP ratio has risen sharply because of the contraction in GDP in H1/2020. Taken together, these points suggest that the debt cycle will continue to rise in the coming term.

The housing cycle has fallen since 2019, but interest rate cuts and limited investment opportunities appear to have stimulated the real estate market, at least temporarily. The cycle could therefore turn upwards again, as is indicated by increased turnover in the residential housing market this summer and a sharp rise in prices in July. Commercial property prices have continued to slide, however.

Thus far, the financial cycle has been characterised more by the banks' buying back their own bonds and increasing the weight of deposits in their funding. The banks' foreign-denominated liquidity is ample, so they have no need to seek funding in foreign credit markets this year. As a result, the funding cycle will probably not turn upwards in the near future.

The subcomponents of the financial cycle are therefore in different phases, but overall, the cycle can be expected to rise gradually over the coming year. If the effects of the pandemic prove long-lasting, the upward financial cycle will be adversely affected.

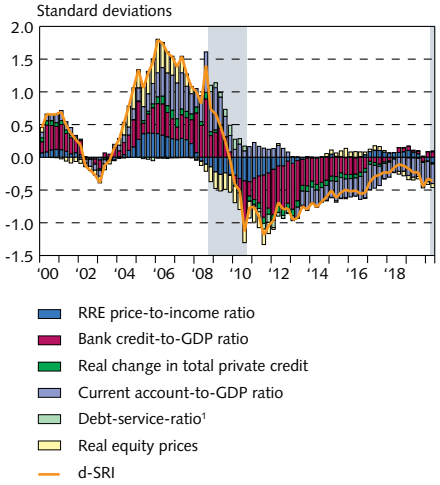
Cyclical systemic risk

Cyclical systemic risk is closely linked to the financial cycle, as it often grows when the financial cycle is in an upward phase. Measures of cyclical systemic risk can therefore give more detailed information

about the financial cycle position. The domestic systemic risk indicator (d-SRI) is composite risk indicator based on six variables associated with the accumulation of cyclical systemic risk. The weight of each variable in the d-SRI is scaled so as to maximise the probability that it will give a warning signal well in advance of financial shocks.[19]

The d-SRI fell to a trough in 2011 but has risen steadily since then, as can be seen in Chart I-39. The current account balance and the ratio of bank credit to the non-financial private sector are the most important variables in the indicator, with a combined weight of 56%. These variables have strongly signalled low cyclical systemic risk in recent years. However, the impact of the COVID-19 pandemic has been to lower GDP, boost debt, and erode the current account surplus. These sub-indicators can be expected to turn around and begin to signal elevated cyclical systemic risk. The other variables have also become more likely to signal elevated risk. However, because the variables are presented in terms of either two-year or three-year changes, the situation must persist for a longer period of time in order to have a quantifiable impact on cyclical systemic risk according to this metric.

Chart I-39
Cyclical systemic risk indicator (d-SRI)



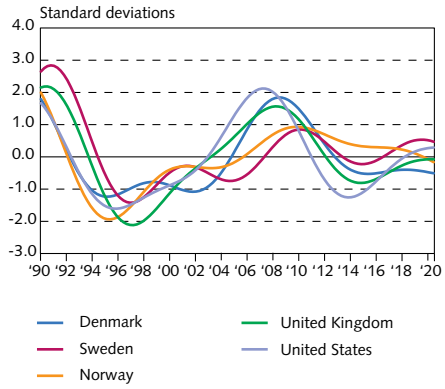
1. Estimates are used for Q1 and Q2 of 2020.
Sources: Registers Iceland, Statistics Iceland, Central Bank of Iceland.

Comparison with neighbouring countries

Research has shown that greater globalisation and cross-border financial system integration have caused countries' financial cycles to synchronise with those of neighbouring countries to an increasing degree.[20] Therefore, in order to estimate likely developments in Iceland's financial cycle, it could be useful to place it into the context of neighbouring countries' financial cycles.

Chart I-40 shows the financial cycles of Norway, Denmark, Sweden, the US, and the UK, estimated as a simple average of cyclicality in real house prices, debt, and the credit-to-GDP ratio.[21] As can be seen, none of the countries shown are at the top of a protracted upward phase, as was the case prior to the global financial crisis of 2008. In Norway, the financial cycle has been in a downward phase since 2010, but the impact of the global financial crisis there was mild, and debt levels and asset prices have been relatively stable for a long time. In Denmark and Sweden, the financial cycle peaked in 2017 and 2018, after a relatively short upward phase. The US and the UK are still in an upward phase, albeit a mild one in comparison with previous cycles. These data show that, like Iceland, neighbouring countries are entering the current crisis from a position of relative strength compared with previous crises. This reduces the likelihood that the financial cycle in those countries will take a nosedive that would adversely impact the cycle in Iceland.

Chart I-40
Financial cycles of neighboring countries



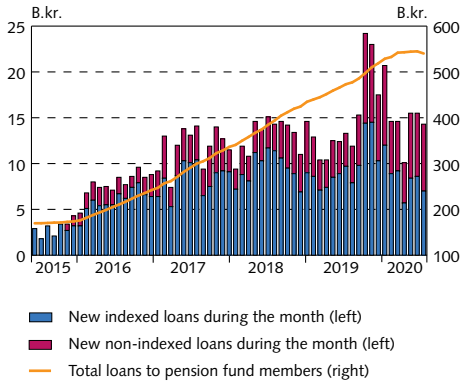
Sources: Bank for International Settlements, Central Bank of Icelands.

19. Lang, J. H., et al. (2019). "Anticipating the bust: a new cyclical systemic risk indicator to assess the likelihood and severity of financial crises". *ECB Occasional Paper Series* No. 219.
20. See, for example, Claessens, S., et al. (2019). "Financial Cycles: What? How? When?" *IMF Working Paper no. 76, and Einarsson, B. G., 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.
21. The methodology is taken from Drehmann, M., et al. (2012). "Characterising the financial cycle: Don't lose sight of the medium term!" *BIS Working Papers* no. 380.

II The financial system

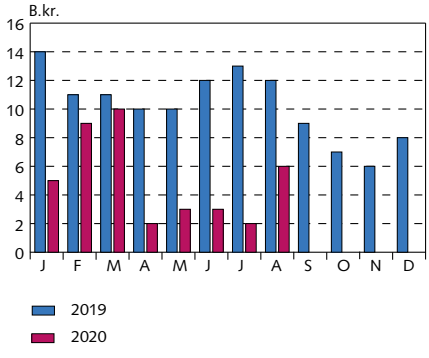
Uncertainty in the economy, in firms' operating environment, and in households' circumstances is reflected in financial institutions' loan portfolios. Ever since the spring, a share of borrowers have availed themselves of concessions such as moratoria or freezing of loans. In all likelihood, further write-downs and loan portfolio restructuring will be needed in coming months, once the outlook for firms' operations grows clearer. Under these conditions, financial institutions need to have the capacity both to restructure existing loans and to finance promising new projects. The D-SIBs have sizeable capital and liquidity buffers at present; therefore, they can withstand both write-offs and new lending. In the future, however, it could prove challenging for the banks to adapt their funding to the surge in demand for non-indexed loans, as long-term investors in the domestic bond market have tended until now to prefer the banks' indexed market issues. The banks' foreign liquidity position remains strong, and interest premia in foreign markets have fallen rapidly in recent weeks. The banks have not issued any bonds abroad since the onset of the pandemic, however. The banks' interest environment has changed, with lower rates narrowing their scope to profit on interest rate spreads, exacerbating cost-cutting pressures.

Chart II-1
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.

Chart II-2
Net FX purchases of Pension Funds



Source: Central Bank of Iceland.

The systemically important banks and the pension funds comprise more than two-thirds of Iceland's financial system and provide most of the capital to households and businesses. At the end of H1/2020, the pension funds' assets equalled 166% of GDP. In recent years, the composition of the pension funds' assets has shifted towards loans to fund members and foreign assets. From mid-March through mid-September, the pension funds refrained temporarily from purchasing foreign currency, in accordance with a declaration made by the National Association of Pension Funds. In spite of this, the funds' foreign assets have increased during the year, mostly because of rising market prices abroad and the depreciation of the króna. The pension funds have continued to grant loans to fund members, but their total loans have contracted in tandem with increased demand for non-indexed mortgages.

The domestic systemically important banks' (D-SIB) position remains strong. Their liquidity is ample and their capital position well above regulatory minimum. The banks have frozen loans and granted moratoria, but in the months to come they will have to face the repercussions of the pandemic and will probably have to restructure their loan portfolios to a degree. Restructuring the current loan portfolio and granting new loans for profitable projects will be necessary so that the financial system can support and stimulate the economy once again.

Profitability

D-SIBs' profitability varied in Q2

In Q2, the D-SIBs' profit totalled 6.5 b.kr., in a vast improvement over the Q1 loss of 7.2 b.kr. The turnaround is due mainly to net income from financial activities, which was positive by 5.3 b.kr., driven by steep rises in asset prices during the quarter, whereas it had been negative by 6.2 b.kr. in Q1. Q2 profits differed from one bank to another, however, with Arion Bank recording a profit of 4.9 b.kr., Íslandsbanki 1.2 b.kr., and Landsbankinn 0.3 b.kr. The D-SIBs' return on equity was positive by 4.3% in Q2 but had been negative by 4.6%

in Q1. In the first half of the year, their return on equity was -0.2%, as compared with 6.2% in H1/2019.

Interest rate spread narrows

The Central Bank's key interest rate has fallen rapidly, in tandem with the deteriorating economic outlook. In May, the key rate was lowered to 1% and had been cut by a total of 3.5 percentage points in twelve months' time. The reduction in the key rate has been transmitted effectively to variable non-indexed market rates, but rates on short-term nominal Treasury bonds and the banks' non-indexed covered bonds have fallen even more. Reductions in the banks' deposit and lending rates have not fully kept pace with the decline in the Bank's key rate, however. The decline in the banks' variable non-indexed mortgage rates is just over 75% of the decline in the key rate, and for other variable-rate loans, the same ratio is about 70%. The reduction in variable non-indexed corporate lending rates comes to about 60% of the decline in the Bank's key rate, and for new corporate loans the ratio was 30% in June and just over 50% in July.[1] Households have therefore enjoyed the benefits of the policy rate cuts more than companies have. It is appropriate to point out, however, that the poorer economic outlook and elevated uncertainty have increased many companies' credit risk which has ultimately led to higher risk premia. In some instances, credit risk on older loans has been underestimated, and risk premia in those cases may have increased upon refinancing. Non-indexed sight deposit rates offered to households and businesses have generally been comparable, however, and have fallen by about 60% of the decline in the Bank's key rate. By now, a very large share of non-indexed sight deposits bear 0% interest, and it could be problematic for the banks to move deposit rates into negative territory.

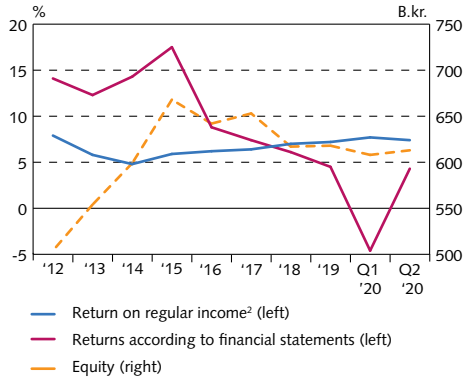
Lower interest rates and reduced scope to lower interest rates on the banks' liabilities have narrowed their interest rate spreads. In Q2/2020, the spread on the D-SIBs' total assets was 2.6%, which is 0.1 percentage point less than in Q1 and 0.2 percentage points less than in Q2/2019. The banks assume that net interest income and interest rate spreads will continue to fall in H2/2020, as the impact of the steep drop in interest rates in Q2 only came fully to the fore at the end of the quarter. Further declines in the Central Bank's key rate would probably erode net interest income – and therefore the measured interest rate spread – even further.

Costs decline and underlying operations improve

The D-SIBs' combined operating expenses for H1/2020 totalled 36.9 b.kr., a decline of 6.8% year-on-year in real terms. Real expenses were down 5.2% year-on-year in Q2, with the decline more or less evenly distributed between wages and other operating expenses. The number of full-time position equivalents was 2,635 at the end of June, about 7% less than in mid-2019. Tax payments fell by 6.7 b.kr. between years, to an H1/2020 total of 4.9 b.kr. More than half

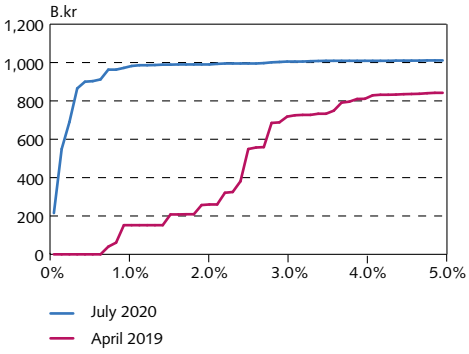
1. Support loans bearing a 100% Government guarantee are excluded from the calculation of lending rates.

Chart II-3
D-SIBs' returns[1]



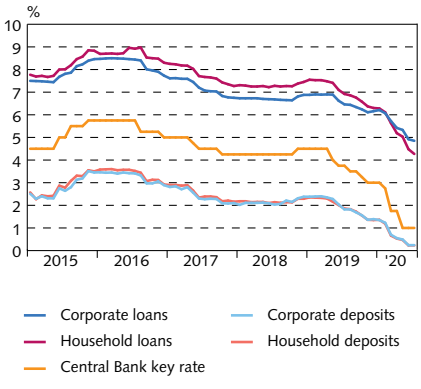
1.Returns are calculated on average equity. Domestic systemically important banks, consolidated figures. 2. The return on regular income is based on net interest income and fee/commission income net of regular expenses. The tax rate is 20% and is based on average equity. Valitor is excluded in 2017-2020 and Borgun in 2020.
Sources: Commercial banks' financial statements.

Chart II-4
Interest rates on variable-rate króna-denominated[1]



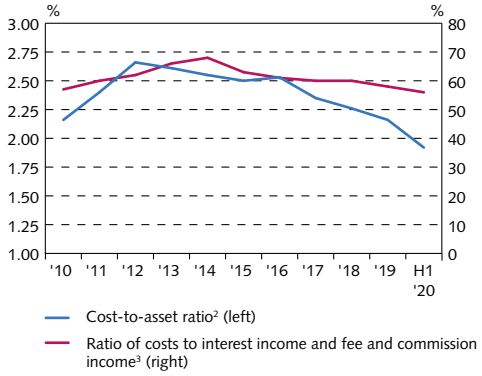
1. Total stock of private sector deposits. Amount accumulated from 0% interest rates.
Source: Central Bank of Iceland.

Chart II-5
Interest rates on variable-rate non-indexed deposits and loans[1]
January 2015 - July 2020



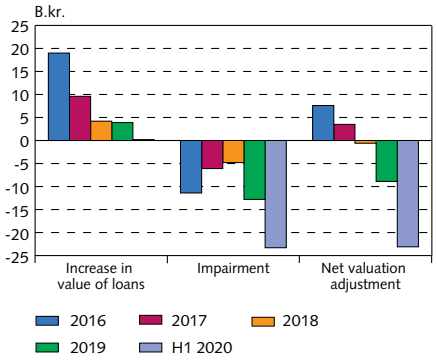
1. Total stock and weighted average interest rates.
Source: Central Bank of Iceland.

Chart II-6
D-SIB: Cost-ratios[1]



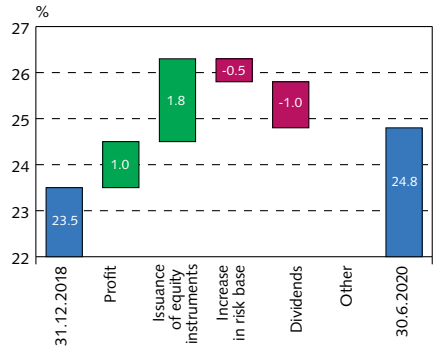
1. Domestic systemically important banks, consolidated figures. Valitor excluded in 2017 - 2020 and Borgun in 2020. 2. Operating expenses, adjusted for major irregular items, as a share of assets, excluding loan revaluation changes and discontinued operations. 3. Operating expenses, adjusted for major irregular items, as a share of net interest income and net fee and commission income.
Sources: Commercial banks' financial statements.

Chart II-7
D-SIB: Income and expenses due to revaluation of loans[1]



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

Chart II-8
Change in D-SIBs' capital ratios in 2019 and H1 2020[1]



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

of the decline in the tax payment is attributable to a reduction in the bank tax.[2]

In recent years, regular income has accounted for about 90% of the banks' total income, including net interest income of about 70%. In the first half of the year, this ratio was close to 100%. The D-SIBs' core operations are characterised by regular income and have been improving in recent years. With lower costs, this trend will continue, even though regular income declines due to a drop in interest income. The return on regular operations was about 7.4% in H1/2020, as compared with 7.3% in H1/2019 and just over 6% in H1/2018. The banks' ratio of costs to regular income has also been falling. In H1/2020, it was 57%, down 1.5 percentage points since H1/2019 and down 6.5 percentage points relative to H1/2018.[3] Their cost-cutting and streamlining measures have therefore been successful.

Differences in impairment

Moratoria and loan freezing are the most common measures the banks have offered to help customers in financial distress because of the COVID-19 pandemic. In mid-September, 3.4% of loans to households and 8.6% of corporate loans were frozen or in moratorium. In July, the banks began offering support loans, which bear a partial or full Government guarantee. There has been some demand for support loans, and as of mid-September about 600 loans totalling just over 4.7 b.kr. had been granted. By that time, however, only two bridging loans had been granted.

According to guidance from the European Banking Authority, loans need not be classified as non-performing or forborne if they are protected by general pandemic-relief measures. If it seems clear, however, that the borrower's debt service capacity and creditworthiness have been severely compromised because of the current situation and is unlikely to be restored soon, the borrower's position must be re-evaluated and impairment provisions made if necessary. In this context, a large share of loans to tourism companies have been moved from Stage 1 under the IFRS9 financial reporting standard to Stage 2. The claim value of D-SIB loans in Stage 2 more than doubled in H1/2020, to a total of 432 b.kr. (or 14.6% of total loans). Impairment of Stage 2 loans increased by 400% over the same period, to a total of 15.1 b.kr. at the end of Q2.[4] The share of loans in Stage 3 was 3.3% at the end of Q2, an increase of 0.4 percentage points during the quarter.[5] The limited increase in Stage 3 loans suggests that the

2. The special tax on financial institutions (bank tax) was 0.376% of total liabilities in excess of 50 b.kr. as of end-2019. The tax rate was supposed to be lowered to 0.145% in four equal increments between 2020 and 2023. One of the Government's pandemic response measures was to reduce levies on the banks by lowering the tax rate to 0.145% immediately. See https://www.althingi.is/altext/150/s/1206.html.

3. Returns on regular income are based on net interest income and net fee and commission income, less regular expenses, which are defined as salaries and related expenses plus other operating expenses, apart from one-off cost items. The tax rate of 20% is based on the average balance of capital.

4. The D-SIBs' impairment account totalled 55 b.kr. at the end of Q2/2020, after increasing by 21 b.kr., or 62%, since the turn of the year.

5. 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.

banks' pandemic response measures are still general in nature, for the most part, and are not as yet focused on individual borrowers.

Impairment totalled 23.1 b.kr. in H1/2020, an increase of 16.9 b.kr. relative to H1/2019. It is distributed evenly across Q1 and Q2, and as a share of loan portfolio size, it was broadly the same from one bank to another in Q1, at about 0.4% of the loan portfolio. In Q2, however, it varied greatly from one bank to another. At Landsbankinn, it measured 0.7% of the loan portfolio, whereas at Íslandsbanki it was 0.3% and at Arion Bank it was 0.1%. There are no simple explanations for this divergence in Q2. Most likely, this situation reflects the unusually high level of uncertainty about the economy – and therefore, about the strength of the banks' borrowers.

Capital position

The D-SIBs' capital and their capital ratio have changed little in 2020. At the end of Q2, their capital totalled 613 b.kr., an increase of 5.5 b.kr. between quarters but a decline of 4.5 b.kr. since the turn of the year. The banks' combined capital ratio at the end of Q2 was 24.8%, 0.3 percentage points higher than in the previous quarter but 1.3 percentage points higher than at the end of 2018.[6] The rise in capital ratios since end-2018 is due mainly to the banks' issuance of Tier 1 and Tier 2 equity instruments. In February, Arion Bank issued a bond in the amount of 100 million US dollars, thereby becoming the first domestic bank to issue debt classifiable as additional Tier 1 capital since the financial crisis.

Risk-weighted assets totalled 2,692 b.kr. as of end-Q2, broadly the same as at the end of Q1 but about 67 b.kr. more than at the year-end. Risk-weighted assets accounted for 67.5% of total assets at the end of the quarter, a decline of 5.5 percentage points since end-2018. The D-SIBs' leverage ratio remained unchanged in Q2, ranging between 13.4% and 14.9% at the quarter-end.

In order to boost the banks' resilience and enhance their ability to grant new loans during a time of potentially increased losses and impairment, the Central Bank lifted the countercyclical capital buffer in March. This measure released 52 b.kr. of the D-SIBs' capital, and their capital ratios now exceed the Bank's capital requirement by 5 to 9 percentage points. The D-SIBs' excess capital relative to capital requirements amounted to 180 b.kr. at the end of Q2. Their scope to change their funding structure by issuing equity instruments has narrowed in the recent term, but because their capital base is well above the required level and the banks have shelved plans for dividend and share repurchase plan for the present, they do not need to strengthen their capital base because of the pandemic.

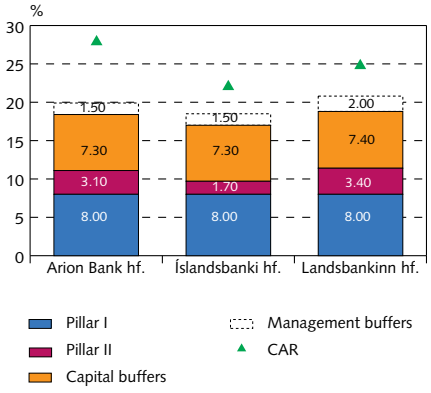
Liquidity and funding

Banks' liquidity still strong despite high level of uncertainty

The large commercial banks' liquidity position has been strong this year, and their liquidity ratios are somewhat above the minimum

Chart II-9

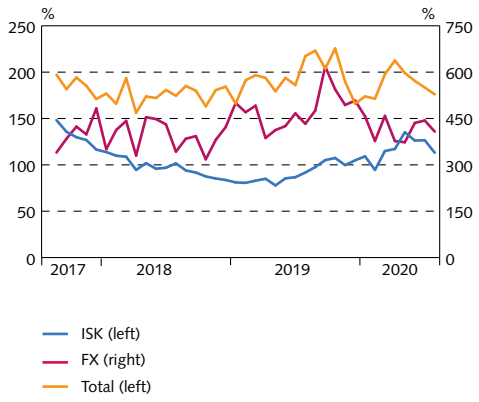
D-SIB: Capital requirements and capital adequacy ratios at the end of Q2/2020[1]



1. Domestic systemically important banks, consolidated figures.
Sources: Commercial banks' financial statements and other published materials.

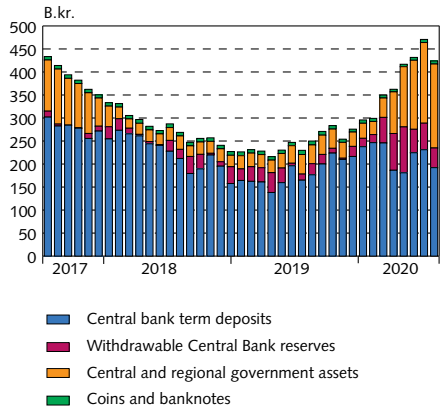
6. At the end of Q2/2020, Arion Bank's capital ratio was 28.1%, Íslandsbanki's was 22.2%, and Landsbankinn's was 24.9%.

Chart II-10
D-SIB: Liquidity coverage ratio[1]



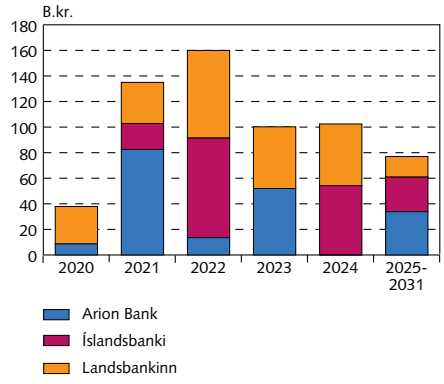
1. Domestic systemically important banks, consolidated figures.
Source: Central Bank of Iceland.

Chart II-11
D-SIB: ISK HQLA



Source: Central Bank of Iceland.

Chart II-12
D-SIB: Foreign bonds by maturity[1]



1. At 31.8.2020 exchange rate.
Source: Nasdaq Iceland.

required under Central Bank rules. Their liquidity ratios rose after the Bank implemented in connection with changes to reserve requirements and reduced lending activity. Furthermore, the banks have refrained from paying dividends, which has supported their liquidity ratios. At the end of August, the D-SIBs' combined liquidity ratio in all currencies was 176%, well above the regulatory minimum of 100%. In mid-summer, their liquidity ratios in Icelandic krónur started to decline, as the banks have been issuing record amounts in new residential mortgages in recent months. At the end of August, the liquidity ratio in foreign currencies was 414%, whereas the ratio in Icelandic krónur was 115%.

The banks' liquid assets consist largely of deposits with the Central Bank, Treasury bills and short Treasury bonds issued in krónur, and foreign government bonds. The share of Treasury bills and Treasury bonds issued in krónur has risen steeply since the Central Bank stopped offering one-month term deposits so as to support monetary policy transmission. The banks have responded by investing liquid krónur in Government-guaranteed paper, although one-week term deposits have also increased significantly.

Increased defaults, drawdowns of credit lines, and increased overdrafts by firms and individuals all have the effect of lowering the liquidity ratio and could do so to an increasing degree in the coming term. In order to ensure the funding of support loans bearing a 100% Government guarantee, the Bank has developed a special temporary collateralised framework at the seven-day term deposit rate. The Bank has also opened up the possibility of additional collateralised lending facilities by temporarily expanding the list of instruments eligible as collateral. Under current conditions, the banks need to have access to enough liquidity to ensure that they can intermediate credit to households and businesses and help resolve borrowers' payment difficulties. To this end, the Central Bank has significantly increased their access to liquid assets, thereby giving them greater scope for action.

Limited domestic market funding this year

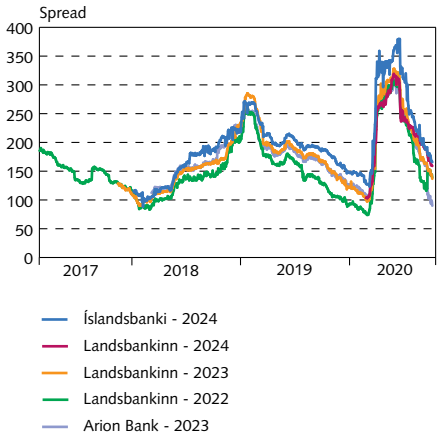
The vast majority of the banks' funding is in the form of deposits and marketable bonds. Deposits have increased by 10% in 2020 to date, and by the end of August they accounted for about half of the banks' funding. Just over half of all deposits are owned by individuals and small and medium enterprises (SME), and another fifth are owned by large companies. In recent months, there have been limited changes in the banks' deposits, while pension funds' deposits have increased by 30%. Furthermore, the commitment period on financial institutions' term deposits has been growing shorter, which has an adverse effect on liquidity ratios. Declining deposit rates in line with Central Bank rate cuts increase depositors' incentive to invest their savings elsewhere. Such a shift would have a negative impact on the banks' liquidity.

The banks' domestic marketable bond issues have been limited in recent months, as it has been difficult for them to increase other types of domestic market funding apart from covered bonds. Increased demand for non-indexed mortgage loans from the banks

has increased their need for funding through nominal bond issues. In the first seven months of the year, the stock of outstanding covered bonds grew by 39 b.kr. Over the same period, new loans issued by the banks increased by 134 b.kr.[7] The banks' plans for 2020 include covered bond issues in the amount of 60-80 b.kr. It would be favourable if they continued to increase the weight of domestic market funding so as to reduce concentration risk on the funding side, including issuing additional nominal bonds.

The Act on Recovery and Resolution of Credit Institutions and Investment Firms, no. 70/2020, entered into force on 1 September 2020, thereby incorporating the substance of EU Directive 2014/59/EU, called the Bank Recovery and Resolution Directive (BRRD), into Icelandic law. The Act authorises the resolution authority, which is a unit within the Central Bank, to demand that credit undertakings satisfy minimum requirements for own funds and eligible liabilities (MREL); i.e., to demand that their capital and other funding be sufficient to recapitalise them in the event of resolution proceedings, through write-downs of subordinated debt.

Chart II-13
D-SIB: Spread on listed foreign bonds, EUR[1]



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

Interest premia on foreign issues on the decline again

After falling slightly in H2/2019, the banks' funding risk has remained relatively stable by most measures in the recent term. Their net stable funding ratio (NSFR) in foreign currencies was 133% at the end of August.

Foreign bonds issued by the D-SIBs that are scheduled to mature later this year amount to 38 b.kr., or 6% of their foreign market funding and 1% of total funding as of end-August. Contractual payments scheduled for 2021 are higher, or 135 b.kr. The banks' ample foreign liquidity gives them the flexibility to retire all of this year's maturities without refinancing. However, the banks need to consider refinancing their 2021 maturities this autumn, as required funding ratios in foreign currencies move closer to their minimum as the maturity date approaches. Risk premia on the banks' foreign issues rose rapidly this past winter as risk appetite dried up in response to the spread of the pandemic in February and March. They have fallen again this summer and are now back to where they were in early March, somewhat above the pre-pandemic level.

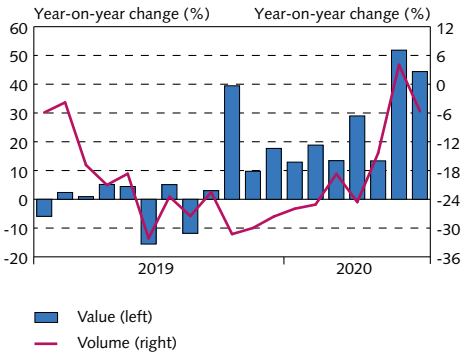
7. Net new loans are defined as new loans less loan retirement and loan prepayments in excess of contractual requirements.

III Financial market infrastructure

Financial market infrastructure operations have been generally stable in the recent term. The number of operational incidents in Iceland's interbank systems has fallen from its peak in 2018, which occurred following the launch of new payment and deposit systems by some of the commercial banks. Further core infrastructure renewal lies ahead for both the Central Bank and the commercial banks. As experience has shown, launching new financial market infrastructure entails strain and the possibility of contagion if risks materialise. All over the world, governmental authorities and international institutions are focusing increasingly on network and information security in various parts of important social infrastructure, including in the field of financial services. During times of growing cyberthreats, it is vital that payment intermediation systems be equipped with powerful protections against cyberattacks. If the payment systems of one bank are disrupted, the effects can easily spread to other payment systems, thereby interrupting intermediation of capital throughout the financial system as a whole. The Central Bank conducts regular stress tests to measure interbank system resilience in terms of participants' intraday liquidity position, which gives an indication of their ability to cover their payment obligations. Such tests were conducted this spring, based on the position of the systems at the height of the COVID-19 pandemic, and all system participants withstood the strain placed upon them. Today, electronic retail payment intermediation in Iceland is based mainly on international payment card infrastructure, and clearing now takes place for the most part through international card systems. Use of physical currency for cash transactions has long constituted only a small share of domestic payment intermediation, and it is likely that use of cash has diminished even further since the pandemic struck. It is important to consider alternatives to the most commonly used payment instruments in order to ensure financial stability. Operating financial market infrastructure is expensive, and it is clear that increased cooperation in the operation of complex and costly core infrastructure offers significant opportunities.

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 can therefore be said that financial market infrastructure functions as the plumbing system or road network for the financial system. It is extremely important for the stability of the financial system that its infrastructure be secure, efficient, and economical to operate.

Chart III-1
Payment outflows from domestic interbank payment intermediation



Sources: Greiðsluveitan ehf., Central Bank of Iceland.

Payment flows and risk

Payment outflows through domestic payment intermediation

The vast majority of domestic payment intermediation takes place in the banks' and savings banks' internal payment systems. In the first seven months of 2020, an average of 389 b.kr. per day were transferred within these systems. Settlement between banks and savings banks takes place in the Central Bank of Iceland's interbank system (central bank money), where transfers averaged 93 b.kr. per day over the same period. The interbank system consists of the real-time gross settlement system (RTGS system), which handles payments in amounts exceeding 10 m.kr., and the retail netting system, which handles payments below that amount. Payment flows in interbank systems can be observed virtually in real time. Payment flows can give certain indications of retail sales activity and large purchases. A total of 35 million transactions were made during the period, an average of 167,000 per day. Over this same period, interbank system turnover increased by 26% year-on-year, while the number of transactions declined by 16%.

Strong RTGS system turnover in 2020 to date …

This year, RTGS system turnover has increased markedly relative to 2019, when it contracted year-on-year. There was a particularly large increase in June and July of this year. During these two months combined, turnover increased by 1.6 trillion krónur, or 61% year-on-year, reflecting increased economic activity in society. Final settlement of securities transactions takes place in the RTGS system. The total amount settled in the securities settlement system was nearly 1.6 trillion krónur in the first seven months of the year, or an average of 10.4 b.kr. each business day. The year-on-year increase, which measured 47%, was due largely to bond trading.

… but retail payments declined markedly

During the first seven months of the year, there were roughly 35 million transactions in the retail netting system, or an average of about 166,000 transactions per day. This equals a 16% contraction relative to the same period in 2019. The turnover represented by these transactions came to just over 2.4 trillion krónur, or an average of 11 b.kr. per day. The year-on-year contraction in turnover measured 2%.

Liquidity risk in interbank systems is generally limited

From the standpoint of operational security in the interbank systems, it is very important that banks and savings banks send as many payments as possible for settlement early in the day, so as to reduce the severity of the incident if a disruption should occur. In the first seven months of 2020, a majority of transactions were settled before 13:00 hrs. in the RTGS system, on average, which is desirable. What is noteworthy, however, is that large value is often sent in just before the system closes. During March and April, when many financial and tech services employees in charge of payment system operations were working at home because of the pandemic, there were no discernible delays in intraday settlement.

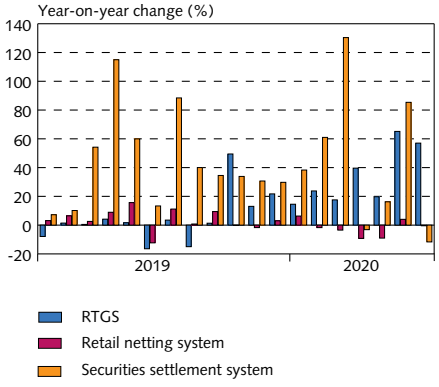
The banks' and savings banks' intraday liquidity has been good in recent years, and there has been little risk of their being unable to fulfill their payment obligations. There has been limited demand for collateralised overnight loans from the Central Bank, which can be used to ensure that settlement account balances are always positive at the end of the day.[1] In the first seven months of the year, the Bank granted 11 overnight loans, as compared with eight over the same period in 2019.

Resilience of payment intermediation participants

Liquidity risk is always present in payment systems. 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. Strain peaks at regular intervals, including when taxes,

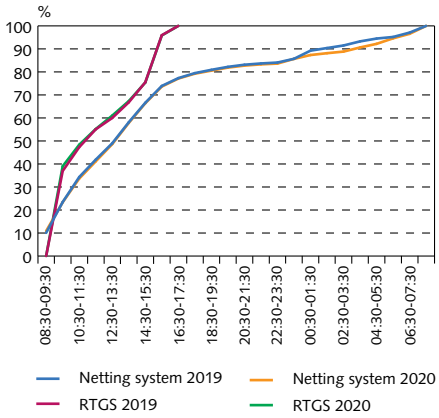
1. Overnight loans are loan facilities granted by the Central Bank to counterparties eligible for such facilities, against collateral in the form of securities or term deposits. They are granted until the next business day and are intended to ensure that settlement account balances are positive at the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

Chart III-2
Payment outflows from RTGS and netting systems



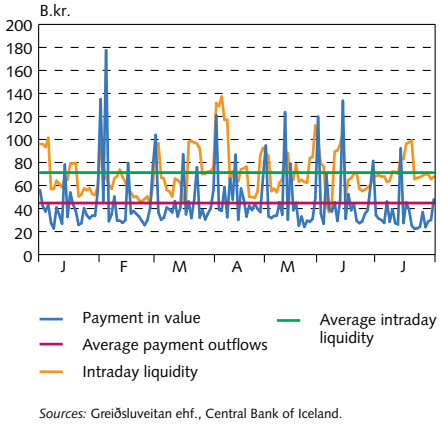
Sources: Greiðsluveitan ehf., Central Bank of Iceland.

Chart III-3
Average settlement time for interbank system payments, cumulative amounts[1]



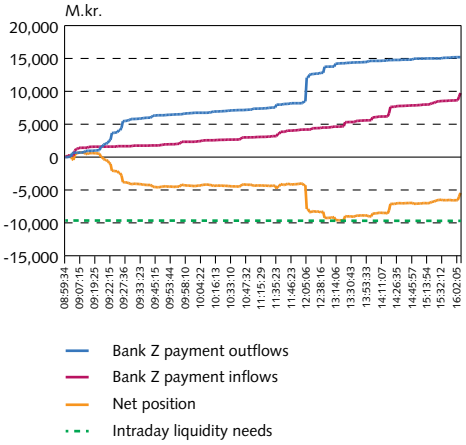
1. January-June 2019 and 2020.
Sources: Greiðsluveitan ehf., Central Bank of Iceland.

Chart III-4
Payment outflows and available intraday liquidity (end-of-day)



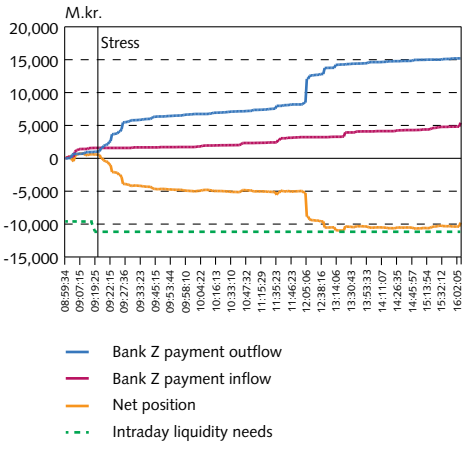
Sources: Greiðsluveitan ehf., Central Bank of Iceland.

Chart III-5
Scenario 1: Z's payment flows, without stress[1]



1. Daily data (business days), March-April 2020
Sources: Greiðsluveitan ehf., Central Bank of Iceland.

Chart III-6
Scenario 2: Z's payment flows, before and after stress[1]



1. Daily data (business days), March-April 2020.
Sources: Greiðsluveitan ehf., Central Bank of Iceland.

interest, and bond principal are paid. The days just before and after holidays also see heavy payment intermediation activity. Furthermore, increased liquidity risk can develop if payment system operations are interrupted and unforeseen payments are settled in the RTGS system at the same time; for example, when high-value assets are purchased or corporate bonds are retired. It is therefore important to manage intraday payment flows effectively so as to minimise risks if incidents should occur in interbank payment intermediation. This requires, among other things, that participants analyse important payments on a regular basis.

Stress testing – incidents in the banks' payment systems

The Central Bank conducts regular stress testing of payment intermediation among RTGS system participants, with the aim of measuring payment system resilience in terms of participants' intraday liquidity and their ability to fulfill their payment obligations.

In the last stress test, carried out in spring 2020, the scenario provided for an interruption in the payment systems of one randomly selected participant on specified days during the period between 2 March and 30 April 2020. During that period, risk was potentially elevated due to the pandemic, and the total value of payments submitted to the RTGS system was about 11% higher than in the same period of 2019. Real data were used for settlement of all payments (volume and value) between participants, and various scenarios involving interruption of payment intermediation were presented. The results of the stress tests showed that participants were able to provide sufficient liquidity, including overdraft authorisations granted by the Central Bank against collateral, to withstand the shock.

Chart III-5 shows the resilience of Bank Z, an RTGS system participant, according to its payment flows and liquidity position without disruptions, on 2 April 2020, when strain on the system was greatest. The blue line shows the aggregate turnover that Bank Z sent, on average, to other banks and savings banks, and the red line shows Bank Z's average aggregate receipts. The yellow line represents the difference in turnover (settlement position). When the blue line lies above the red line, Bank Z is sending larger amounts than it is receiving and must therefore finance those transfers by either tapping its RTGS account or using its overdraft. Z's liquidity need is equal to the largest negative settlement position that develops over the course of the day without delays in payment, as is shown by the broken green line. The peak liquidity need was 9.6 b.kr.

Chart III-6 shows Z's payment flows during a staged interruption in the payment systems of another payment system participant, Bank Q, due to operational problems. The incident was assumed to occur at 09:20:01 hrs., with the result that all payments from Q were halted. In order to test the system's tolerance limits, it was also assumed that banks and savings banks continued to send payments to Q. This caused liquidity to accumulate at Q instead of being redistributed to other payment system participants. It was assumed that Q was unable to restore control of its payment intermediation before the closure of the RTGS system that day. Because Z could no longer rely on intraday

payments from Q to finance part of its payment obligations to other participants, Z needed to use over 4.3 b.kr. more liquidity to cover the incident taking place at Q. Z's intraday liquidity was well in excess of this amount; therefore, Z was able to withstand the strain.

For the interbank system as a whole, the stoppage of payment flows from Q during the stress test made it impossible to settle an average of 24% of transactions (in value terms) over the day at the time the interruption took place. That portion accumulated at Q instead of flowing between payment system participants and re-utilised. Stress tests based on the same scenarios were carried out among other interbank system participants, without any difficulties.

Risk and risk management connected to financial market infrastructure operations

Financial market infrastructure may not be a source of shock

There are various types of risk related to financial market infrastructure operations, and they can surface in a number of ways. To some extent, the question of when risk management measures are sufficient – how far one should go in safeguarding against specific risks – is a subjective one. One important criterion, however, is that while financial market infrastructure must be able to withstand strain during a financial crisis, it must never be the source of a shock.

"An FMI should have a sound risk-management framework for comprehensively managing legal, credit, liquidity, operational, and other risks."

(PFMI, Core Principle 3)

More often than not, the operational security of financial market infrastructure depends to some extent on external entities. Technical operations are often outsourced to specialised service providers, and important data connections – i.e., telecom services – are usually involved. Owners of systemically important infrastructure and supervised entities that depend on services from third parties are nevertheless fully responsible for the operational security and efficacy of their infrastructure, including possible outsourcing arrangements.

The Principles for Financial Market Infrastructures (PFMI) were issued in 2012 by the International Organization of Securities Commissions (IOSCO) and the Committee on Payment and Market Infrastructure (CPMI), which operates within the Bank for International Settlements (BIS). The PFMI are recognised internationally as criteria for best practice in the operation and oversight of systemically important financial market infrastructure.[2] They are used as a basis for the operation and oversight of the Central Bank of Iceland's interbank systems.

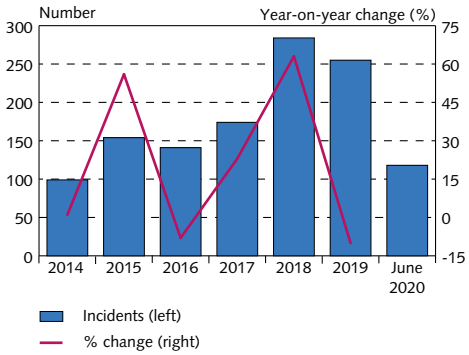
Analysis of incidents

One metric that can shed light on operational risk in payment intermediation is the number and type of incidents (operational deviations) that occur.[3] The Central Bank of Iceland gathers information on incidents occurring in interbank systems and analyses them against the criteria laid down in the PFMI. The causes and potential repercussions

2. The PFMI (available on the BIS website: www.bis.org) were discussed in detail in the Bank's 2013 *Financial Market Infrastructure* report.

3. 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.

Chart III-7
Incidents in RTGS and netting systems



Sources: Greiðsluveitan ehf., Central Bank of Iceland.

of incidents are assessed, as are the severity of the incidents and the responses or measures taken as a result. An assessment is also made of whether the incident or operational deviation warrants other special measures.

In 2019, a total of 255 incidents occurred in interbank systems, some 10% fewer than in the prior year. In 2018, there was a spike in incidents, owing mainly to the launch of new deposit and payment systems.[4] Of the 255 incidents occurring in 2019, six received a severity score of "high", 241 were classified as "medium", and eight were deemed to be of "low" severity. In H1/2020, there were 118 recorded incidents in interbank system operations, a reduction of 11% year-on-year. Only one of these incidents was classified as of high severity. The reduction in the number of incidents in the recent past is due primarily to action taken by the Icelandic Banks' Data Centre (RB) to improve system integration and to the fact that neither RB nor any of its customers renewed or significantly changed their systems in 2019 or H1/2020. It is clear that, despite careful preparation, coordination, and testing in connection with renewal of financial market infrastructure, an increase in the number of incidents is probably unavoidable when large-scale renewals take place. Even so, lessons have presumably been learned from the incidents that have occurred in the past few years, and the experience gained should reduce the operational risk attached to the planned installation and launch of new infrastructure elements in the coming term.

Renewal of key core infrastructure elements

A much-needed renewal of the most important core infrastructure elements used in the Icelandic financial system in recent decades is currently underway. Landsbankinn led the way in November 2017 with the renewal of its deposit and internal payment intermediation infrastructure, installing a standardised system. Íslandsbanki installed and launched the same system in September 2018. The new system was launched following thorough preparation, testing, and contingency exercises. In the main, the process went smoothly, although a variety of unforeseen incidents arose, affecting e.g. the functioning of interbank systems. In the coming term, other financial institutions and the Central Bank of Iceland will install and launch the deposit system used by Landsbankinn and Íslandsbanki.

The Central Bank has been preparing for the launch of a new interbank system in the recent past. The new system is a standardised solution already in use by Nordic central banks, with the exception that the retail portion will be a newly designed system comparable to the current retail netting system. The launch of the new interbank system has been delayed somewhat, for two main reasons: there have been delays in the software developer's delivery of the final version of the system, and the necessary changes to the tech environment have proven more complex and extensive than anticipated. This applies to the tech environment at both RB and the banks themselves, in connection with both existing and new infrastructure.

4. For further information, see Chapter I of the 2019 *Financial Market Infrastructure* report.

Securities depositories are required to ensure the operating compatibility of securities settlement systems and interbank systems, so that delivery of securities versus payment is carried out securely and without interruption. Securities depositories are responsible for matching the payment instructions and the securities to be delivered. The Central Bank's role in the process is to ensure that securities depositories, as agents of settlement institutions (RTGS system participants), have access to central bank money, which ensures settlement finality and minimises risk. At the end of May 2020, the Nasdaq CSD Iceland securities depository merged with Nasdaq CSD Latvia, and thereafter, the operations of Nasdaq CSD Iceland were transferred to a branch established in Iceland by Nasdaq CSD Latvia in accordance with European legislation. Testing was carried out this summer, following the installation of the new securities registration and settlement system, and the system was launched in August. The new system is a standardised software solution already in use by Baltic securities depositories.

The above-mentioned infrastructure renewal projects will result in major changes in the technological structure of the financial system's core infrastructure. Standardised solutions will supplant legacy systems, technological boundaries between different infrastructure elements will be clearer, and responsibility will be more explicit. It is expected that the technological environment will be more open, more flexible, and more secure, and that the renewal will lead to increased operational efficiency.

Payment services and service providers

Service providers play an important role in payment services. Payment intermediation has generally shifted towards vastly increased integration of systems used to mediate payments, as well as increased outsourcing of all or part of payment intermediation to service providers, including with the advent of new payment solutions. This is often based on efficiency considerations.

Operational risk in financial services has been a frequent topic of discussion in the recent term. Both the law and Governmental directives contain provisions on operational risk in supervised financial activities, as well as the management of that risk. The Financial Supervisory Authority of the Central Bank of Iceland has issued the Guidelines on Risk in the Operation of Supervised Entities' Information Systems, no. 1/2019. The aim of the Guidelines is to present and harmonise criteria for the Authority's assessment of supervised entities' compliance with the above, with emphasis on information system operations and the use of information technology in that context.[5] The Guidelines apply to payment service providers, which must, without exception, fulfil the criteria therein.

The Guidelines also include provisions on outsourcing, including use of cloud solutions, and they specify which requirements must

5. Also in effect are the Financial Supervisory Authority's Guidelines on Outsourcing by Supervised Entities, no. 6/2014, which supplement other guidelines covering outsourcing of specific aspects of supervised entities' operations; for instance, those pertaining to information system operations.

be included in written contracts with external contractors in order to minimise operational risk. It is emphasised that the board and management of the financial institution remain responsible, no matter whether information system operations are outsourced entirely or only in part. Responsibility for information system operations and management of risks associated with outsourcing always rests with the board of the supervised entity and cannot be outsourced. In view of this responsibility, it is obvious that payment service providers must select providers of outsourced tech services with the utmost care, so as to ensure effective and secure payment intermediation to the maximum extent possible.

For decades, a critical service provider, the Icelandic Banks' Data Centre (RB), has played a key role in Icelandic payment intermediation. Actually, it can be said that all roads lead to RB when it comes to domestic payment intermediation, as the company provides service to much of the domestic financial market and, among other things, hosts the Central Bank's interbank systems under an outsourcing contract. This arrangement is certainly highly streamlined, but by the same token, it could entail increased operational risk, particularly in the form of concentration risk and contagion risk.[6] It is also clear that a complete disruption in RB's operations would have a major impact on domestic payment intermediation. More stringent requirements must be made to such operators, and it is vital that RB take all appropriate actions to ensure operational continuity. The company's customers operate under such requirements, as they are required under the aforementioned Guidelines to have in place a business continuity plan or a comparable plan outlining responses to various crisis scenarios.

As is mentioned above, developments in payment intermediation have tended towards increased outsourcing to service providers. By the same token, it can be said that service providers play a more important role than before in promoting effective and secure payment intermediation. As a result, there has been increased discussion recently, both in Iceland and abroad, about whether there is reason to formulate a specific policy on monitoring supervised entities' service providers and whether the statutory framework for such monitoring should be strengthened. It should be borne in mind that even providers of the most critical services to the financial services sector fall outside the scope of financial supervision.[7]

Recognition of payment and settlement systems by law

The purpose of designating payment and securities settlement systems as recognised systems is to ensure the efficacy and security of settlement in payment and securities settlement systems insofar as is possible. System recognition is based on the Act on the Security

6. In simple terms, it can be said that concentration risk entails that if one system fails, other systems may follow suit, owing to interconnection or centralisation and spillovers. Furthermore, if serious incidents occur in one system, they could spread to other connected systems, with serious repercussions.

7. Written contracts with external contractors must contain provisions granting the Financial Supervisory Authority access to data and information held by the external contractor and pertaining to the supervised entity. They must also contain provisions authorising the supervised entity to monitor the activities covered by the contract in question; cf. the aforementioned Financial Supervisory Authority Guidelines.

of Transfer Orders in Payment Systems and Securities Settlement Systems, no. 90/1999.[8]

Recognising payment and settlement systems entails that settlement of transactions in the recognised system is not interrupted even if a party to the transaction in question is engaged in insolvency proceedings. This is done by providing greater legal protection for transfer orders in connection with the settlement of transactions, 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. This increased legal protection actually means that if a transfer 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, and the rescission rules in the Act on Bankruptcy cannot be applied upon settlement. The increased legal protection also applies to collateral that an insolvent participant may have provided to secure the settlement and final execution of a transfer order. The objective is to prevent one participant's possible default from spilling over into the financial system.

Entities that operate payment and settlement systems in Iceland may apply to the Central Bank of Iceland for such recognition. If the Central Bank considers the system to fulfil the requirements laid down in the Act on the Security of Transfer Orders in Payment Systems and Securities Settlement Systems, no. 90/1999, it recommends to the Minister that the system be recognised. When the system has been recognised, its operators are obliged to provide the Central Bank of Iceland with specified information on system participants.

The systems that have been recognised in accordance with Act no. 90/1999 are the Central Bank's RTGS system, the retail netting system operated by the Bank through its company Greiðsluveitan ehf., and the Icelandic branch of the Nasdaq CSD SE securities settlement system. The Central Bank is of the opinion that the recognition of these systems strengthens the operational framework for financial market infrastructure, ensuring security and efficacy in the settlement of transfer orders and bolstering confidence in the Icelandic financial system. The Bank considers the recognition of the systems to be of benefit to financial institutions, investors, issuers of financial instruments (including the Government of Iceland), participants in the securities market, and other market agents.

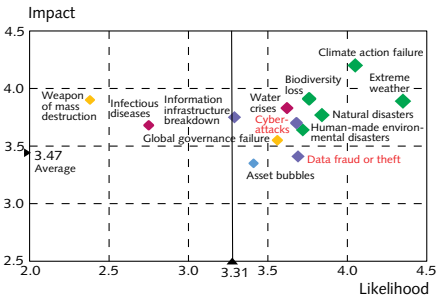
Cyberthreats

Electronic payment intermediation, which for a long time has been carried out almost solely by banks and savings banks, is increasingly provided by financial technology (fintech) companies.[9] This trend is set to continue, which could have a positive impact on competition

8. 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.

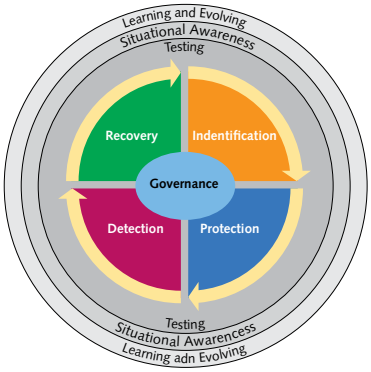
9. There is no single definition of the term financial technology, or fintech, but it can be described as technology designed to revolutionise financial services for the future.

Chart III-8
Cyberattack: A key threat



Source: The Global Risks Reports 2020. World Economic Forum.

Chart III-9
Cyber resilience guidance components



Source: CPMI-IOSCO Guidance on cyber resilience for financial market infrastructures, June 2016.

and could lower the cost of electronic payment intermediation. On the other hand, it could have the effect of changing the financial system risk structure and shifting risk to where business takes place, thereby exacerbating the risk of cyberattacks. The importance of cyber resilience is therefore clear, but the constantly changing and increasingly complex methods used for cyberattacks make it ever more difficult to safeguard against them. It should come as no surprise that all over the world, governmental authorities and international institutions focus increasingly on network and information security in various parts of important social infrastructure, including in the field of financial services, and that cybersecurity is widely viewed as an important part of national security. Threats caused by cyberattacks have been rapidly increasing worldwide, and the World Economic Forum (WEF)'s 2020 *Global Risks Report* ranks cyberattacks among the top ten most serious threats facing the global population. Central banks the world over are highly aware of the threat stemming from cyberattacks. Since 2017, the Nordic central banks, including the Central Bank of Iceland, have held annual cybersecurity conferences. In addition, central banks have attempted to raise awareness of the severity of cyberattacks.

Central banks generally own and operate real-time gross settlement systems, or so-called interbank systems. Even though the Central Bank of Iceland's RTGS and netting systems are not directly connected to the internet and are therefore not exposed to cyberattacks in that sense, they can still be vulnerable to attacks. This is due to the high level of centralisation or concentration in electronic payment intermediation in Iceland, which greatly exacerbates the risk of contagion. For example, RB hosts the Central Bank's interbank systems, to which most elements of domestic payment intermediation are connected. A cyberattack on RB, on one of the interbank system participants, or even on participants' customers – perhaps through online banking activity – could therefore cause spillovers into the interbank systems and potentially jeopardise financial stability.

Especially now, during a time of growing cyberthreats, it is vital that payment intermediation systems be equipped with the most powerful available protections against cyberattacks. Such protections pertain not least to effective management of operational risk, which includes cybersecurity issues. Well-designed business continuity plans and contingency plans must be in place, tested regularly, and updated. It is also important to have backup systems that could be used, particularly in the case of critical financial market infrastructure. Powerful tech equipment and well trained employees are important as well, and stress tests and contingency exercises that include cyberattacks should be carried out on a regular basis. According to a 2016 report issued by the BIS (CPMI/IOSCO), Guidance on Cyber Resilience for Financial Market Infrastructures, on key aspects of risk management relating to cyber- and information security, it is of key importance that entities have a clearly articulated cyber resilience and cyber governance framework that is endorsed by the board (or equivalent) of the entity concerned.

Cooperation on complex and costly financial market infrastructure

The financial system is based on financial market infrastructure that enables it to intermediate capital and payments between parties. The infrastructure elements are either privately or jointly owned, and the operational framework may vary. Given the small size of the Icelandic financial system and the cost involved, it is desirable to seek out ways to increase streamlining, efficiency, and security in financial market infrastructure operations to the extent possible.

Cooperation on infrastructure operations could lead to streamlining while also creating a strong foundation for competition in the field of financial services. Overall interests are often best served when cooperation takes place through joint utilisation of costly infrastructure, which also provides an opportunity to achieve economies of scale. In such cases, cooperation focuses only on core services, which are sold to all at the same price, or as close to it as possible. Then each participant in the cooperative endeavour finds value-added solutions based on the core infrastructure, and this is where competition takes place. An example of this is joint utilisation in the electricity sector, where energy producers utilise electrical lines jointly and sell electricity on to their customers. The costliest investment is therefore utilised jointly by a number of entities that simultaneously compete for customers. This is of benefit to consumers.

In recent years, financial institutions have shown growing interest in cooperating on and outsourcing support services, driven by significant changes in retail payment intermediation, a need for increased streamlining in banking operations, and consumer demands. Rapid advances in markets and technology, together with amendments to the regulatory framework, are revolutionising the previous arrangements. New tech solutions require substantial investment, irrespective of the number of users, and it is therefore important for banking systems in small economies to join forces on such solutions and share the cost of putting them into place. Increased cooperation could also bring with it various advantages, particularly in a small market like Iceland's.

Banks in Iceland have cooperated through RB since 1973. RB operates systems that play a fundamental role in financial institutions' operations. Such cooperation contributes to increased operational efficiency, yet the banks still compete for customers, thereby maintaining competition in the market. Iceland's experience with joint utilisation of financial market infrastructure through RB, on the basis of a settlement made with the Competition Authority in 2012, and the priorities outlined in the *White Paper on a Future Vision for the Financial System* give cause to assume that there are further opportunities for streamlining through cooperation on the use of joint infrastructure, provided that it does not curtail competition.

The opportunities that lie in increased cooperation could take many forms. Examples include:

- Cutting costs and therefore lowering prices to consumers without compromising the level of service or curtailing competition;

- Harmonising development, mitigating risks, and integrating the implementation of new projects and systems to the extent possible;
- Mitigating systemic risk and bolstering financial stability, financial system resilience, and preparation for risks, including cyberattacks;
- Ensuring unrestricted access to core infrastructure, so that market agents can utilise joint infrastructure at a lower start cost, thereby contributing to more diverse product and service offerings;
- Enhancing the adaptability of the Icelandic financial market, both domestically and across borders, while simultaneously safeguarding national security.

It is important to take advantage of available opportunities to cooperate on the operation of complex and costly infrastructure and to consider whether it would be desirable to make changes to the financial market infrastructure currently in place in Iceland. This implies, among other things, that it is necessary to determine which infrastructure should be considered systemically important and which infrastructure elements are such that they can stand outside the competitive environment and form the foundations for cooperation, with the aim of promoting security, efficacy, and efficiency and thereby safeguarding financial stability. It is also necessary to determine which framework could be suited to cooperation on financial market infrastructure, and whether the activities of entities that service jointly utilised payment infrastructure should be subject to supervision by law.

It is well to bear in mind that, even though entities in the Icelandic financial market join forces in certain areas, the market itself remains very small in international context. As a result, it could be beneficial to look beyond national boundaries for opportunities to cooperate.

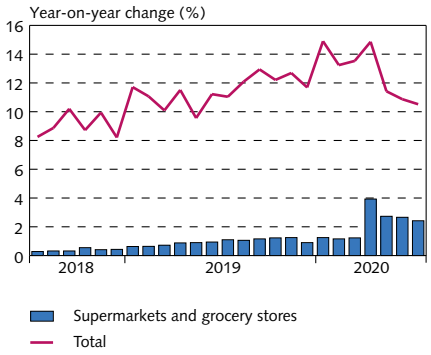
Retail payment intermediation

Implementation of the payment services directive

The Ministry of Finance and Economic Affairs is currently preparing for the incorporation of EU Directive 2015/2366 on payment services (PSD2) into Icelandic law. The plan is to introduce a bill of legislation before Parliament in January 2021, with entry into force set for 1 July 2021. The current Act no. 120/2011 on the same topic would expire at that time. The Directive brings with it various technical standards and guidelines, and after the passage of new payment services legislation, the Central Bank will set rules laying down more detailed provisions on its implementation. In this context, it should be noted that it is assumed that EU Regulation no. 2018/389 on strong customer authentication and common and secure open standards of communication will also take effect on 1 July 2021 and will be implemented in full by 10 January 2022. This means that account information payment service providers (deposit institutions), which are defined under PSD2 as a new type of payment services, shall make available a testing facility upon the entry into force of the new legislation, while a six-month testing period is given to access the online interface vis-à-vis third parties, which must be complete by 10 January 2022. If these dates hold, it should be clear that there will be some pressure

on deposit institutions to fulfil these requirements, as the time frame given is not very long in the context of the technological system modifications that would typically be needed.[10]

Chart III-10
Domestic online shopping



Source: Icelandic Centre for Retail Studies.

Developments in retail payment intermediation

Retail payment intermediation has undergone significant changes in the recent term. Rapid advances in information technology and innovation have made a permanent impact on retail payment intermediation in an environment characterised by rapidly increasing consumer demands for faster, easier, and more convenient payment instruments, with no apparent end in sight. During times of rapid advances and changes in the regulatory environment, it is vital to ensure security, efficacy, and preparedness, so that financial stability will not be jeopardised.

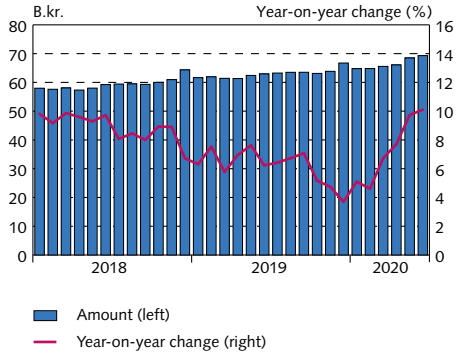
Without doubt, the COVID-19 pandemic will affect developments in retail payment intermediation. Use of contactless payments is probably at an all-time high, as the authorities and payment service providers have encouraged the public to use contactless payments ever since the pandemic struck, owing to the contagion risk stemming from handling cash, the close physical proximity required for cash payments, and the need to minimise entry of PIN numbers by touching POS machine surfaces. It is uncertain whether this trend will reverse to any significant extent; therefore, it is likely that use of cash in retail payment intermediation will diminish even further in the future and that contactless payments have come to stay. E-commerce has been on the rise in recent years, and the pandemic has accelerated the trend. This increase in online shopping can be expected to continue after the pandemic passes, with the associated impact on retail payment intermediation.

Clearly, payment service providers must be prepared for changes demands in the market, and those that do not keep up run the risk of falling by the wayside. Today, contactless payments are based mostly on card infrastructure, but in other countries, there is rapid development in the field of retail payment solutions based directly on the banking system's core infrastructure (deposit accounts), which are independent of payment card systems.[11] As is mentioned above, the implementation of the updated EU Payment Services Directive, PSD2, is underway. With the implementation of PSD2 and the advent of new fintech companies, it is likely that an increasing number of payment solutions based on core banking system infrastructure will become available. It is also likely that this trend will be accompanied by a further decline in the use of cash, and even in the use of payment cards. Development of new tech solutions takes place rapidly, and there have never been as many ways to pay for goods and services as there are today. Because of this rapid development, it is difficult to predict exactly how retail payment intermediation will evolve in the years to come.

10. Further information can be found on the Government's consultation portal: www.samradsgatt.island.is.

11. Further information can be found in previous Financial Market Infrastructure reports (Chapter VII in the 2017 issue, Chapter III in the 2018 issue, and Chapter IV in the 2019 issue).

Chart III-11
Cash in circulation[1]



1. Montly data (end of the month).
Source: Central bank of Iceland.

Cash

Use of cash (banknotes and coin) has long accounted for only a small share of domestic payment intermediation, but at the same time the amount of cash in circulation has increased somewhat in nominal terms. Cash has certain properties that other payment instruments do not, and paying in cash is simple and final. One benefit of cash is that it can be used as a backstop if electronic retail payment intermediation malfunctions.

At the end of 2019, cash issued by the Central Bank of Iceland amounted to 74.7 b.kr., including 70.5 b.kr. in banknotes and 4.2 b.kr. in coin. Discussions of cash in circulation usually refer to cash outside deposit institutions and central banks. The difference between this figure and issued cash is called the banks' overnight cash balance. The overnight cash balance consists of the banknotes and coin on the assets side of the banks' balance sheets at the close of business. A part of this cash is held in commercial and savings banks' branches, and the remainder is held in automatic teller machines (ATM). At the end of 2019, deposit institutions' overnight cash balance was 8 b.kr. Cash in circulation outside deposit institutions and the Central Bank totalled 66.7 b.kr. at the end of 2019, an increase of 2.4 b.kr., or 3.7%, between years. This is a smaller increase than in the years beforehand. Over the period 2015-2018, the increase ranged between 6.7% and 12.7%.

As is mentioned above, cash accounts for only a small proportion of domestic payment intermediation. For example, on an average day in 2019, RTGS system turnover was 66 b.kr., slightly more than average cash in circulation outside the Central Bank and deposit institutions during that same year. Another way to compare digital payments and cash payments is to examine the composition of M1, which is defined as sight deposits (commercial bank money) and banknotes and coin in circulation. At the end of 2019, cash accounted for 13.8% of M1. It is possible to compare cash in circulation between one period and another, and between one country and another, by looking at it as a share of GDP. For a long time, Iceland's cash-to-GDP ratio was 1%. It rose in the wake of the financial crisis, however, and since 2010 it has been close to 2.25%.

Between February and June 2020, the amount of cash in circulation at the end of each month has increased much more than it did over the same period in 2019. This is out of line with expected developments during a pandemic, when people are concerned that handling cash could spread the disease. It is possible, though, that uncertainty about the aftereffects of the pandemic has given rise to fears like those prevailing during the autumn 2008 financial crisis, when some of the banks' customers wanted to have ready access to cash in safety deposit boxes.

An alternative for electronic retail payment intermediation

Today, electronic retail payment intermediation in Iceland is based mainly on international payment card infrastructure, and clearing now takes place for the most part through international card schemes. Denmark and Norway have independent domestic debit card systems

with a sizeable market share, while in Sweden international payment cards predominate, as they do in Iceland. Each of these countries, however, has implemented new electronic retail payment solutions (account-to-account solution) based directly on the core banking system infrastructure (payment accounts) in the country concerned. These solutions are independent of international card schemes. The Danish, Norwegian, and Swedish financial markets have agreed on a single payment solution for each country. No such solution is in use in Iceland. In the recent past, use of smartphone-based solutions linked to payment cards has increased, including ApplePay and the commercial banks' card apps for Android phones. With payment by card via smartphone, clearing is entirely dependent on the systems of international card companies.

This has the drawback of limiting the Icelandic authorities' ability to intervene in order to ensure the efficacy of domestic electronic retail payment intermediation – and therefore safeguard financial stability – in case of technical, trade, or geopolitical difficulties. It is important to have in place a domestic electronic retail payment solution that is independent of international payment card infrastructure. Such a solution could serve as an alternative for the domestic retail payment intermediation system.

The Central Bank is exploring the possibility of issuing *rafkrónur* as part of financial system preparedness, in order to promote financial stability.[12] The rafkróna would be an Icelandic króna issued by the Central Bank of Iceland in digital form and stored in a specific way, such as a card or app, or in an account with the Central Bank. Rafkrónur could serve a number of purposes, including as an alternate payment intermediation route built on a different base than is currently used in Iceland. There are a number of issues that require further examination before a decision is made on the possible issuance of rafkrónur. In the long run, however, payment intermediation can be expected to keep evolving towards increased use of electronic retail payment intermediation, with the associated demands for changes in the focus of payment intermediation.

12. For further information, see the Central Bank's *Special Publication* no. 12 from 2018, which focuses on the possible issuance of rafkrónur in the future. Other central banks are also considering the advantages and disadvantages of electronic cash. For example, the Swedish central bank, Riksbanken, is currently working on an experimental electronic currency project based on distributed ledger technology (DLT). Further information can be found on Riksbanken's website: riksbank.se.

Appendix I

Tables

Table 1 Financial system assets[1]

Assets, b.kr	*31.12. 2016*	*31.12. 2017*	*31.12. 2018*	*31.12. 2019*	*30.6. 2020*	*Change from 31.12. 2019, %*
Central Bank of Iceland	901	765	755	840	1,030	23
Deposit-taking corporations excluding the Central Bank	3,222	3,405	3,681	3,775	4,076	8
Commercial banks	3,199	3,381	3,656	3,748	4,049	8
Savings banks and other deposit-taking corporations	23	24	26	26	27	4
Money market funds	177	158	147	144	144	0
Non-MMF investment funds[2]	668	686	668	766	798	4
Other financial intermediaries[3, 4]	1,773	1,426	1,338	1,233	1,332	8
Housing Financing Fund	787	761	731	718	712	-1
Financial auxiliaries	18	20	25	25	50	97
Insurance corporations	206	220	232	259	282	9
Pension funds	3,540	3,943	4,245	4,977	5,292	6
Total assets	10,505	10,623	11,091	12,019	13,002	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. 2016*	*31.12. 2017*	*31.12. 2018*	*31.12. 2019*	*30.6. 2020*	*Change from 31.12. 2019, %*
Cash and deposits with Central Bank	385,056	378,700	293,870	329,923	316,147	-4
Deposits in domestic deposit-taking corporations	4,176	6,075	658	633	320	-49
Deposits in foreign deposit-taking corporations	56,299	77,887	107,039	63,887	78,827	23
Domestic credit	2,187,741	2,407,764	2,708,062	2,784,748	2,868,523	3
Foreign credit	132,419	133,857	153,272	137,546	181,797	32
Domestic marketable bonds and bills	206,056	116,001	95,842	104,980	271,809	159
Foreign marketable bonds and bills	53,590	85,778	137,139	145,433	150,107	3
Domestic equities and unit shares	130,720	114,561	101,026	121,132	100,633	-17
Foreign equities and unit shares	2,197	14,276	3,077	2,622	2,180	-17
Other domestic assets	56,906	57,445	68,435	67,047	85,220	27
Other foreign assets	6,703	12,478	13,068	16,693	20,664	24
Total	3,221,861	3,404,821	3,681,488	3,774,645	4,076,228	8

Source: Central Bank of Iceland.

Table 3 Other financial corporations' assets[1]

Assets, b.kr.	*31.12. 2016*	*31.12. 2017*	*31.12. 2018*	*31.12. 2019*	*30.6. 2020*	*Change from 31.12. 2019, %*
Cash and deposits with Central Bank	116,026	93,566	99,432	61,466	5	-100
Deposits in domestic deposit-taking corporations	76,342	55,036	53,234	91,090	100,559	10
Deposits in foreign deposit-taking corporations	60,762	37,924	36,088	28,597	21,993	-23
Domestic credit	876,738	801,463	755,422	744,432	740,859	0
Foreign credit	136,426	64,940	57,731	17,413	18,802	8
Domestic marketable bonds and bills	217,461	178,233	211,887	222,551	356,723	60
Foreign marketable bonds and bills	3,501	998	266	0	0	0
Domestic equities and unit shares	165,317	109,192	94,051	33,328	7,328	-78
Foreign equities and unit shares	68,507	46,380	3,680	6,763	7,597	12
Other domestic assets	39,833	31,776	19,612	23,529	74,440	216
Other foreign assets	12,323	6,268	6,544	3,445	3,476	1
Total	1,773,237	1,425,775	1,337,946	1,232,614	1,331,781	8

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. 2016*	*31.12. 2017*	*31.12. 2018*	*31.12. 2019*	*30.6. 2019*	*Change from 31.12. 2019, %*
Deposits in domestic deposit-taking corporations	116,608	149,353	142,872	152,558	201,967	32
Deposits in foreign deposit-taking corporations	18,450	20,451	13,776	24,174	19,908	-18
Domestic credit	237,973	332,007	428,474	522,485	547,908	5
Foreign credit	199	268	309	378	409	8
Domestic marketable bonds and bills	1,720,558	1,808,826	1,909,858	1,970,535	2,024,385	3
Foreign marketable bonds and bills	926	524	3,980	8,516	8,001	-6
Domestic equities and unit shares	671,691	657,083	647,835	805,449	801,162	-1
Foreign equities and unit shares	748,503	925,416	1,071,412	1,465,972	1,660,829	13
Domestic insurance and pension assets	17,155	19,227	21,003	22,697	21,272	-6
Foreign insurance and pension assets	44	63	69	48	48	0
Other domestic assets	7,860	30,219	5,083	4,005	4,885	22
Other foreign assets	1	1	0	0	964	0
Total	3,539,967	3,943,438	4,244,671	4,976,817	5,291,737	6

Source: Central Bank of Iceland.

Table 5 Insurance company assets

Assets, b.kr.	*31.12. 2016*	*31.12. 2017*	*31.12. 2018*	*31.12. 2019*	*30.6. 2020*	*Change from 31.12. 2019, %*
Cash and deposits with Central Bank	7,354	7,011	1,563	40	2	-96
Deposits in domestic deposit-taking corporations	4,586	4,861	6,589	10,571	5,626	-47
Deposits in foreign deposit-taking corporations	208	149	75	48	55	15
Domestic credit	1,487	3,449	3,523	2,490	2,077	-17
Foreign credit	0	0	0	0	0	0
Domestic marketable bonds and bills	89,989	94,177	98,628	109,161	128,382	18
Foreign marketable bonds and bills	3,740	4,467	16,801	20,378	21,300	5
Domestic equities and unit shares	60,664	65,696	61,159	65,790	61,340	-7
Foreign equities and unit shares	5,945	8,182	8,821	10,200	13,194	29
Domestic insurance and pension assets	17,869	20,662	22,228	24,772	33,916	37
Foreign insurance and pension assets	7,451	5,815	6,310	6,997	6,641	-5
Other domestic assets	5,798	4,350	5,197	8,005	8,938	12
Other foreign assets	1,312	1,546	1,542	750	320	-57
Total	206,404	220,365	232,436	259,202	281,792	9

Source: Central Bank of Iceland.

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

Income and expenses, b.kr	*30.6. 2016*	*30.6. 2017*	*30.6. 2018*	*30.6. 2019*	*30.6. 2020*	*Change from 30.6. 2019, %*
Arion Bank hf.						
Operating income	27,639	27,482	23,315	23,928	23,039	-4
Net interest income	14,626	14,824	14,141	15,242	15,110	-1
Net fee and commission income	6,747	4,608	4,917	4,696	5,764	23
Other operating income	6,266	8,050	4,257	3,990	2,165	-46
Operating expenses	15,155	13,188	13,686	13,480	12,602	-7
Change in loan values	-945	-1,308	301	2,069	3,778	83
Income tax	3,667	4,870	3,875	3,331	2,983	-10
Net after-tax gain from discontinued operations	0	-266	-442	-1,934	-934	-52
Profit	9,762	10,466	5,011	3,114	2,742	-12
Íslandsbanki hf.						
Operating income	30,161	22,718	22,780	23,400	20,040	-14
Net interest income	15,895	15,211	15,342	16,341	16,808	3
Net fee and commission income	6,659	6,813	5,810	5,405	4,798	-11
Other operating income	7,607	694	1,628	1,654	-1,566	-195
Operating expenses	13,424	13,441	14,301	12,943	12,038	-7
Change in loan values	-369	-440	-1,934	1,809	5,929	228
Income tax	5,213	4,075	4,077	3,736	1,646	-56
Net after-tax gain from discontinued operations	1,124	2,399	794	-203	-558	175
Profit	13,017	8,041	7,130	4,709	-131	-103
Landsbankinn hf.						
Operating income	26,307	27,987	27,291	30,272	22,710	-25
Net interest income	17,611	18,176	19,476	20,459	18,939	-7
Net fee and commission income	3,894	4,432	3,876	4,136	3,598	-13
Other operating income	4,802	5,379	3,939	5,677	173	-97
Operating expenses	13,781	13,668	13,904	14,306	13,157	-8
Change in loan values	-2,275	-1,301	-1,727	2,372	13,435	466
Income tax	3,503	2,967	3,501	2,481	-595	-124
Net after-tax gain from discontinued operations	0	0	0	0	0	-
Profit	11,298	12,653	11,613	11,113	-3,287	-130
D-SIBs						
Operating income	84,107	78,187	73,386	77,600	65,789	-15
Net interest income	48,132	48,211	48,959	52,042	50,857	-2
Net fee and commission income	17,300	15,853	14,603	14,237	14,160	-1
Other operating income	18,675	14,123	9,824	11,321	772	-93
Operating expenses	42,360	40,297	41,891	40,729	37,797	-7
Change in loan values	-3,589	-3,049	-3,360	6,250	23,142	270
Income tax	12,383	11,912	11,453	9,548	4,034	-58
Net after-tax gain from discontinued operations	1,124	2,133	352	-2,137	-1,492	-
Profit	34,077	31,160	23,754	18,936	-676	-104

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

%	31.12.2016	31.12.2017	31.12.2018	31.12.2019	30.6.2020
Return on equity	8.9	7.4	6.1	4.5	-0.2
Return on assets	1.8	1.4	1.1	0.7	0.0
Expenses as a share of net interest and commission income	62.0	59.0	60.0	59.1	56.8
Expenses as a share of total assets	2.6	2.3	2.3	2.2	1.9
Net interest and commission income as a share of total income	85.0	89.4	92.4	88.5	98.8
Net interest income as a share of total assets	3.0	2.8	2.9	2.7	2.6
Capital ratio	27.7	25.1	23.2	24.2	24.8
Foreign exchange as a share of the capital base	-0.5	0.5	0.3	2.1	-0.6
Liquidity coverage ratio (LCR), total	163.0	165.9	166	163.0	191.0
Liquidity coverage ratio (LCR), FX	403.8	412.8	509.6	508	436
Net stable funding ratio (NSFR), total	123.0	122.2	117.9	117	119
Net stable funding ratio (NSFR), FX	161.8	161.5	159.8	142	134

Source: Central Bank of Iceland.

Table 8 Commercial banks' foreign bond issues, last 12 months (21 September 2019 - 20 September 2020)

Issuer	Date	Currency	Ammount B.kr.	Maturity Years	Premium on interbank rate,[1] %
Arion Bank	December 2019	SEK	2.9	10.0	3.7
	February 2020	USD	12.8	10.0	6.25% fixed
Total			15.7		
Landsbankinn	february 2020	EUR	41.4	4.3	0.5% fixed
Total			41.4		

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

Source: Nasdaq Iceland.

Table 9 Capital buffers[1]

Capital buffer	FSC recommendation	FME decision/ announcement	Value %	Applicable from
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
Capital buffer on systemically important institutions	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, Central Bank of Iceland.

Table 10 Indicators pertaining to the international investment position

	Unit	*Frequency*	*2017*	*2018*	*2019*	*M8 or Q2 2020*
Net IIP	% of GDP	Q	2.0	9.9	22.4	28.5
External debt[1]	% of GDP	Q	89.5	83.4	78.1	90.1
Net external debt[2]	% of GDP	Q	32.6	22.7	20.9	23.7
Short-term debt based on remaining maturity[3]	% of GDP	Q	14.4	17.6	13.8	14.3
Treasury FX debt as a share of total debt	%	M	12.8	14.9	21.1	22.2
Commercial banks' foreign-denominated bonds	% of GDP	Q	19.7	21.3	19.7	28.6
Current account balance[4]	% of GDP	Q	3.8	3.2	6.2	4.9
International reserves	% of GDP	M	26.3	26.4	27.7	32.7
International reserves financed in krónur	% of GDP	M	21.1	21.2	20.6	22.9
International reserves/IMF RAM	%	Q	149.4	142.0	156.9	175.1
Terms of trade[5]	Value	Q	87.9	83.2	86.0	85.2
Nominal exchange rate[6]	Value	M	162.9	174.1	179.7	201.9
Real exchange rate[7]	Value	M	99.2	90.4	91.4	80.3
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. The quarterly value is based on the last four quarters. 5. Index. Q1/2000 = 100. 6. Trade-weighted exchange rate index – narrow trade basket (1%).7. Index. March 2005 = 100. In terms of relative consumer prices.

Sources: Statistics Iceland, Central Bank of Iceland.

Appendix II
Glossary

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.
Bill	A debt instrument with a short maturity, generally less than one year.
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.
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.
Calculated return on equity	The profit for a given period as a percentage of average equity over the same period.
Capital ratio	The ratio of the capital base to risk-weighted assets (risk base).
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.
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.
Current account balance	The sum of the goods, services, and income account balances.
Deposit institutions	Commercial banks and savings banks licenced to accept deposits.
Disposable income	Income net of taxes.
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 systemically 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.
Encumbrance ratio	The proportion of a bank's assets that are hypothecated for funding.
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 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.
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.
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.
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.
Interest burden	Interest payments as a percentage of disposable income.
Interest premium	A premium on a base interest rate such as the interbank rate.
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.
Liquidity coverage ratio (LCR)	The ratio of high-quality liquid assets to potential net outflows over a 30-day period under stressed conditions; cf. the Rules on Liquidity Coverage Requirements for Credit Institutions no. 266/2017.
Liquidity rules	The Central Bank's liquidity rules are based on the liquidity coverage ratio (LCR) 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 ratio (NSFR)	The ratio of available stable funding to required stable funding; cf. the Rules on Funding 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.
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.
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 adequacy metric (RAM) 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).
Trade-weighted exchange rate index (TWI)	The index measuring the average exchange rate in terms of average imports and exports, based on the narrow trade basket.
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.