MONETARY BULLETIN

2018•4

Contents

The objective of the Central Bank of Iceland's monetary policy is to contribute to general economic well-being in Iceland. The Central Bank does so by promoting price stability, which is its main objective. In the joint declaration made by the Government of Iceland and Central Bank of Iceland on 27 March 2001, this is defined as aiming at an average rate of inflation, measured as the 12-month increase in the CPI, of as close to 2½% as possible.

Professional analysis and transparency are prerequisites for credible monetary policy. In publishing *Monetary Bulletin* four times a year, the Central Bank aims to fulfil these principles.

Monetary Bulletin includes a detailed analysis of economic developments and prospects, on which the Monetary Policy Committee's interest rate decisions are based. It also represents a vehicle for the Bank's accountability towards Government authorities and the public.

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Vol. 20 no. 4, 7 November 2018

Printing: Oddi ehf.

This is a translation of a document originally written in Icelandic. In case of discrepancy or difference in interpretation, the Icelandic original prevails. Both versions are available at www.cb.is.

ISSN 1607-6680, print
ISSN 1670-438X, online

Icelandic letters:

ð/Ð (pronounced like th in English this)
þ/Þ (pronounced like th in English think)
In *Monetary Bulletin*, 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 Monetary Policy Committee 7 November 2018

The Monetary Policy Committee (MPC) of the Central Bank of Iceland has decided to raise the Bank's interest rates by 0.25 percentage points. The Bank's key interest rate – the rate on seven-day term deposits – will therefore be 4.5%.

GDP growth in 2017 and H1/2018 was stronger than previously estimated. Even though growth is expected to slow down in H2, it is forecast at 4.4% for 2018 as a whole, according to the November *Monetary Bulletin*. This is nearly 1 percentage point more than the Bank forecast in August. GDP growth is projected to ease in the coming term and the positive output gap is expected to close.

Inflation measured 2.8% in October. The difference between measures of inflation including and excluding housing is close to its smallest in over four years. The year-on-year rise in house prices continues to ease, but this is offset by a sizeable increase in import prices in the recent term. This partly reflects the rise in global oil prices, although the króna has also depreciated since August.

The outlook is for inflation to continue rising and be somewhat above the target next year. In addition, inflation expectations have risen recently and are now above target by all measures. The inflation outlook has therefore deteriorated, but on the other hand, the outlook is for growth in economic activity to ease faster than previously expected.

Higher inflation and inflation expectations in recent months have lowered the Central Bank's real rate more than is desirable in view of current economic developments and prospects. As a result, it is necessary to raise the Bank's key rate now.

The near-term monetary stance will depend on the interaction between a narrower output gap, wage-setting decisions, and developments in inflation and inflation expectations.

The MPC reiterates that it has both the will and the tools necessary to keep inflation at target over the long term. If inflation expectations continue to rise and remain persistently at a level above the target, it will call for a tighter monetary stance. Other decisions, particularly those relating to the labour market and fiscal policy, will then affect the sacrifice cost in terms of lower employment.

Monetary Bulletin 2018/4[1]

The global output growth outlook has deteriorated slightly from the Bank's August forecast, and it is possible that output growth has peaked in many countries. Financial conditions have tightened in a number of emerging market economies and downside risks to the global growth outlook have increased. The recent surge in oil prices and rising alumina prices have eroded Iceland's terms of trade after an uninterrupted four-year improvement. The exchange rate of the króna has fallen in the recent past, owing mainly to poorer terms of trade, weaker export growth, and increased concerns about tourism operators' performance and the economic outlook more generally.

GDP growth measured 6.4% in H1, after increasing significantly since H2/2017. This is stronger growth than was assumed in the August *Monetary Bulletin*, owing primarily to larger increases in inventories and an unexpected contraction in goods imports. There are signs that goods imports have contracted still further in Q3, and it appears that demand has shifted increasingly towards domestic production. The outlook is for GDP growth to ease in H2 and measure 4.4% for the year as a whole, nearly 1 percentage point above the August forecast, with the deviation stemming from stronger economic activity in H1 and a more positive contribution from net trade. GDP growth is expected to slow down in 2019 and converge with its long-term trend rate of 2.7% in the next few years.

Total hours worked increased significantly in Q3, and unemployment fell between quarters. Job creation is expected to ease over the forecast horizon, in line with declining GDP growth. Because of stronger GDP growth in 2017 and H1/2018, the output gap is estimated to be larger than was assumed in August; however, it is now projected to narrow more quickly over time than was previously expected.

Inflation has been close to the target for much of 2018. It measured 2.7% in Q3 and 2.8% in October. Underlying inflation has risen as well, and long-term inflation expectations are now around 3% or more by all measures. Because of the recent depreciation of the króna and the wider output gap early in the forecast horizon, the inflation outlook for the first half of the horizon has deteriorated since the August forecast. Inflation is expected to exceed 3% through 2019 and remain above the target until H2/2020.

1. The analysis presented in this *Monetary Bulletin* is based on data available in early November.

I Economic outlook, key assumptions, and main uncertainties

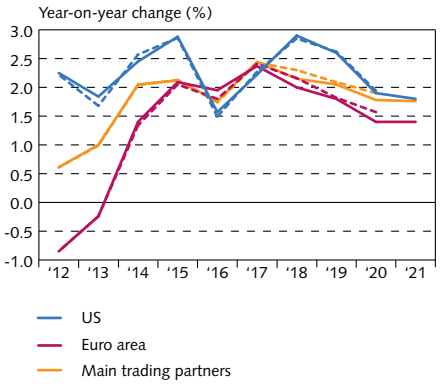
Central Bank baseline forecast

The global GDP growth outlook has deteriorated

Global GDP grew by 3.7% in 2017, the strongest growth rate since 2011. It has softened slightly in 2018 to date, however, and the outlook has deteriorated marginally. The International Monetary Fund (IMF) now expects that global GDP growth will remain at 3.7%, both this year and in 2019, whereas its previous forecast was for 3.9% growth in both years. As before, the outlook is for the persistent slack in leading advanced economies to close by the end of this year.

Among Iceland's main trading partners, GDP growth averaged 2.4% in 2017, the strongest since 2010. It is projected to ease slightly this year, to an average of 2.2%, and fall still further, to 1.8% by 2020 (Chart I-1). This is a poorer outlook than was assumed in the August forecast. The greatest difference is the prospect of weaker growth in the euro area, whereas the outlook for the US is broadly unchanged. In the US, it is still assumed that GDP growth will pick up slightly between years, measuring 2.9% this year, and then slow gradually as the effects of substantial fiscal easing taper off and the repercussions of the escalating trade dispute between the US and China come to the fore. Further discussion of the global economy can be found in Chapter II, and uncertainties in the global outlook are discussed later in this chapter.

Chart I-1
Global output growth 2012-2021[1]



1. Central Bank baseline forecast 2018-2021. Broken lines show forecast from MB 2018/3.
Sources: OECD, Thomson Reuters, Central Bank of Iceland.

Króna weaker than was forecast in August

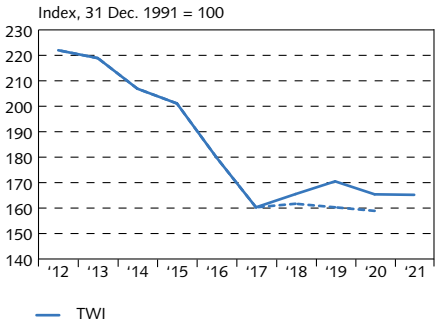
Terms of trade for goods and services have improved by a total of nearly 15% in the past four years. The outlook has worsened, however, after a 4.5% year-on-year deterioration in Q2/2018. The deterioration is due in large part to the jump in oil prices and an increase in the price of alumina, caused by a temporary slowdown in production in Brazil. Import prices in general have also risen. The outlook is for a nearly 2% deterioration in terms of trade in 2018 as a whole, broadly as was forecast in August, with the improved outlook for marine product and aluminium prices counterbalancing the prospect of higher oil prices (Chart I-2). In 2019, however, terms of trade are expected to remain unchanged instead of improving by 2%, as was forecast in August. This is due mainly to higher oil prices, but also to the outlook for lower aluminium prices and a smaller-than-expected decline in alumina prices. If the forecast materialises, terms of trade will be nearly 2% poorer by the end of the forecast than was assumed in August.

The króna has depreciated in recent weeks and is now about 10% weaker against the average of other currencies than it was at the time of the August *Monetary Bulletin*. It is also nearly 8% weaker in Q4 to date than was projected in August. The króna is now at its lowest in more than two years. This abrupt drop is due to several interlinked factors, but the onset of the current slide can probably be traced to some extent to the temporary uncertainty about WOW Air's financing in the first week of September. In addition, the macroeco-

Chart I-2
Terms of trade 2012-2021[1]

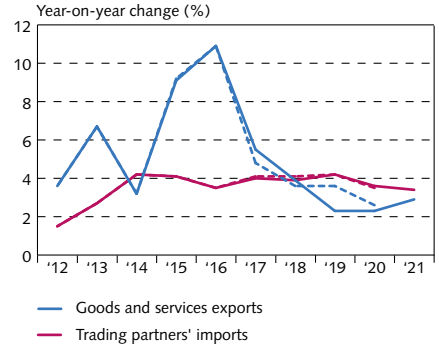
1. Central Bank baseline forecast 2018-2021. Broken line shows forecast from MB 2018/3.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart I-3
Exchange rate 2012-2021[1]



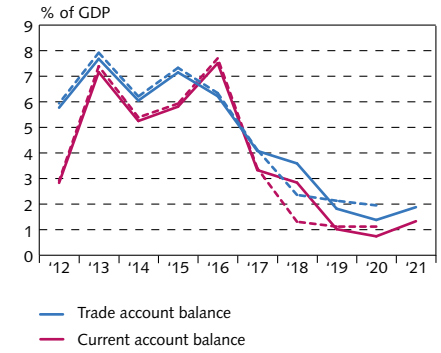
1. Narrow trade basket. Central Bank baseline forecast 2018-2021. Broken line shows forecast from MB 2018/3.
Source: Central Bank of Iceland.

Chart I-4
Exports and global demand 2012-2021[1]



1. Central Bank baseline forecast 2018-2021. Broken lines show forecast from MB 2018/3.
Sources: Statistics Iceland, Thomson Reuters, Central Bank of Iceland.

Chart I-5
Current account balance 2012-2021[1]



1. Current account balance based on estimated underlying balance 2008-2015. Central Bank baseline forecast 2018-2021. Broken lines show forecast from MB 2018/3.
Sources: Statistics Iceland, Central Bank of Iceland.

nomic factors that have generally driven the appreciation of the króna in recent years appear to have given way. Terms of trade have deteriorated, and export growth has slowed. The operating environment in the tourism industry has grown more difficult, and it appears as though GDP growth has lost pace in H2/2018. All of these factors, together with growing concerns about upcoming wage negotiations, appear to have contributed to investor pessimism, which in turn has led to a depreciation of the króna. The baseline forecast assumes that the exchange rate will remain broadly at its year-to-date average for the remainder of the forecast horizon. This entails a trade-weighted exchange rate index (TWI) about 3% lower, on average, in 2018 than in 2017, and a further 3% decline in 2019 (Chart I-3). In 2020-2021, however, the TWI looks set to be just over 165 points, which is broadly in line with the 2018 value and about 4% weaker than was assumed in the August forecast. Further discussion of the uncertain exchange rate outlook can be found later in this chapter, and terms of trade and the exchange rate are discussed in Chapters II and III.

Outlook for weaker export growth than was forecast in August

Goods and services export volumes in H1/2018 were broadly in line with the Bank's assessment in August. Because of Statistics Iceland's revision of 2017 export figures, export growth is slightly weaker than was assumed in August, although the outlook for 2018 as a whole is broadly unchanged. Exports are expected to grow by 3.9% year-on-year, somewhat below the average for the past three years but similar to the 2011-2014 average (Chart I-4). This year's healthy growth rate is due largely to just over 10% growth in marine product exports, which is stronger than was projected in August and can be traced to larger fish catches year-to-date. Due to an unexpected contraction in the transport and transit component of services exports in H1/2018, services exports are now expected to grow somewhat less than was forecast in August. Even though growth in services exports will remain broadly unchanged between this year and next, the outlook is for growth in total exports to weaken further. This is due primarily to a 3.5% contraction in marine product exports, which in turn stems from a significant reduction in pelagic quotas, although it is offset somewhat by increased demersal quotas. This is a change from the August forecast, and the main reason for the difference is that export growth is now forecast at just over 2% in 2019, as opposed to 3½% in August. Growth is expected to remain about the same in 2020 and then rise to nearly 3% in 2021, as goods exports gain ground.

The unexpected contraction in goods imports in H1/2018 is the main reason the year-2018 trade surplus is forecast at 3.6% of GDP, more than 1 percentage point larger than was forecast in August (Chart I-5). However, with the prospect of weaker export growth and poorer terms of trade, the surplus will narrow somewhat in 2019 and be slightly smaller than was forecast in August, or 1.8% of GDP. It will shrink again in 2020 but will rebound to just under 2% of GDP in 2021. The current account surplus is expected to develop in a similar manner, measuring 2.8% of GDP in 2018 and then averaging about

1% of GDP over the next three years. Further discussion of exports and the external balance can be found in Chapter IV.

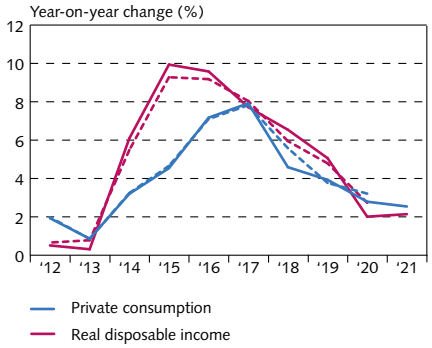
Domestic demand growth has slowed and is expected to ease further during the forecast horizon

Private consumption growth appears to have slowed over the course of the year, after surging in the recent past. Growth is still strong in historical terms, supported by rising real wages, increased employment, and the improvement in households' net worth. Private consumption grew by 5.3% in H1/2018, slightly below the August forecast. On the other hand, the Gallup Consumer Confidence Index indicates that households have grown more pessimistic in response to news about a possible economic turnaround, and leading indicators imply that consumption spending will contract still further in H2. As a result, private consumption growth is projected at 4.6% for 2018 as a whole, some 1 percentage point below the August forecast. The forecast for the next few years is broadly unchanged, however: private consumption growth is expected to measure just under 4% in 2019 and just under 3% per year over the latter half of the forecast horizon (Chart I-6).

Growth in investment spending has slowed as well, although it was stronger in H1/2018 than was assumed in August. In all, investment grew by 7.6% in H1, down from 9.5% in 2017 and just over 19% per year, on average, in 2014-2016. According to the baseline forecast, investment spending will ease further in H2 and investment growth will measure 5% in 2018 as a whole. This is based on a recent survey of investment plans and other indicators of investment. The forecast entails a contraction in investment in energy-intensive industry, as well as in ships and aircraft, and a significantly slower rate of growth in other business investment. Business investment as a whole will therefore contract, whereas residential and public investment will grow strongly. This year's investment-to-GDP ratio will therefore be about 23%, which is well in line with the August forecast (Chart I-7). The ratio appears set to rise still further in 2019 and measure 24% of GDP or more during the forecast horizon, which is above both the August forecast and the historical average. The ratio of business investment to GDP will continue to fall, however, and will align with its historical average by the end of the forecast horizon.

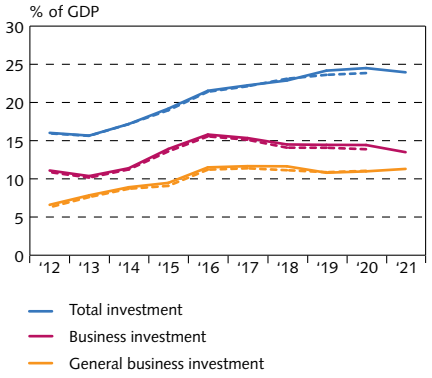
Domestic demand, which reflects all public and private sector consumption and investment spending, increased by 7.9% in 2017 and 6.2% in H1/2018. In part, developments in H1/2018 reflect a strong increase in inventories, but if these are set aside, consumption and investment spending increased by 5.3% year-on-year, which is well in line with the 5.1% projected in August. Domestic demand growth is expected to ease still further in H2 and to measure 4.2% in 2018 as a whole, or 0.5 percentage points below the August forecast (Chart I-8). Investment spending will increase somewhat more next year than this year, which will cause domestic demand growth to gain pace in 2019 before easing again in 2020. Further discussion of developments in private consumption, investment, and domestic demand can be found in Chapter IV.

Chart I-6
Private consumption and disposable income 2012-2021[1]



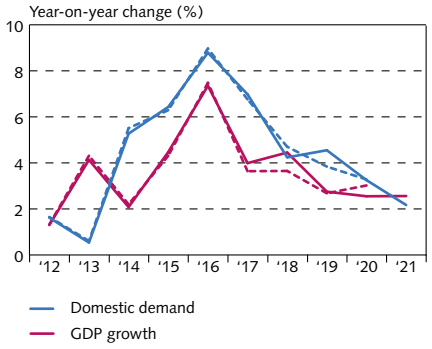
1. Central Bank baseline forecast 2018-2021. Broken lines show forecast from MB 2018/3.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart I-7
Investment 2012-2021[1]



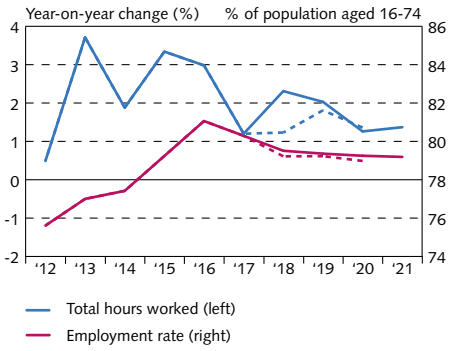
1. General business investment is business investment excluding energy-intensive industry and ships and aircraft. Central Bank baseline forecast 2018-2021. Broken lines show forecast from MB 2018/3.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart I-8
Domestic demand and GDP growth 2012-2021[1]



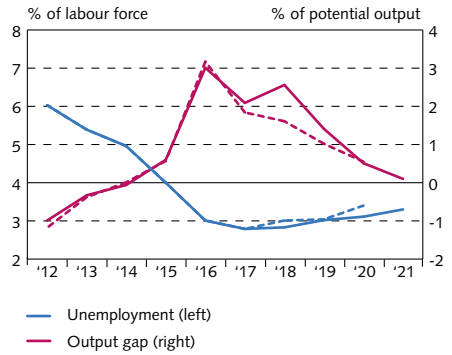
1. Central Bank baseline forecast 2018-2021. Broken lines show forecast from MB 2018/3.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart I-9
Total hours worked and employment rate 2012-2021[1]



1. Central Bank baseline forecast 2018-2021. Broken lines show forecast from MB 2018/3.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart I-10
Unemployment and output gap 2012-2021[1]



1. Central Bank baseline forecast 2018-2021. Broken lines show forecast from MB 2018/3.
Sources: Statistics Iceland, Central Bank of Iceland.

GDP growth in 2017 and 2018 stronger than anticipated

GDP growth measured 4% in 2017, about 0.4 percentage points more than Statistics Iceland's earlier figures had suggested. It was stronger than previously projected in H1/2018 as well. Growth was projected at 5.6% in the Bank's August forecast but measured 6.4%. This is a sharp increase from the H2/2017 average of 2.7%, although domestic demand growth did slow down between years. The deviation in GDP growth from the previous forecast is due primarily to a large increase in inventories in H1 and an unexpected contraction in goods imports. As a result, it appears that demand has shifted increasingly towards domestic production.

The outlook is for GDP growth to ease in H2 and measure 4.4% for the year as a whole, about 0.8 percentage points more than was forecast in August (Chart I-8). This is due to greater strength in the economy in H1 and a more favourable contribution from net trade than was envisioned in August, as Statistics Iceland figures indicate that goods imports contracted still further in Q3. As in the August forecast, GDP growth is expected to approach its long-term trend rate of 2.7% in the next few years. Further discussion of developments in GDP growth can be found in Chapter IV.

Output gap larger than previously forecast but set to narrow faster

The number of employed persons grew by 4.1% year-on-year in Q3, more than was forecast in August. Total hours worked increased by 4.3% between years, well in excess of the annual growth rate in the previous five quarters. Seasonally adjusted unemployment measured 2.6% in Q3, after declining by 0.3 percentage points from Q2, but is about the same as in Q3/2017. The underemployment rate (part-time workers who would like to work more) was 3.5% in Q3 and had fallen by 0.5 percentage points year-on-year. Unemployment is now 0.2 percentage points below the 2003-2007 average, and the under-employment rate is 0.5 percentage points below it.

Total hours worked are estimated to increase by 2.3% this year, about 1 percentage point more than was assumed in August (Chart I-9). In spite of a more than 2% increase in the number of jobs this year, the outlook is for the employment rate to fall by nearly 1 percentage point year-on-year, owing to the prospect of a more than 3% increase in the working-age population. The labour participation rate will fall in a manner similar to the employment rate, and average unemployment will therefore measure 2.8% this year, as it did in 2017 (Chart I-10). Surveys indicate that job growth will continue in the coming term, but at a slower pace than in the recent past. As a result, the baseline forecast assumes that total hours worked will increase by 2% in 2019 and then by just under 1½% per year in 2020 and 2021. However, the employment rate will hold steady at just above 79% of the working-age population, as in the August forecast. Unemployment will rise to 3% in 2019 and 3.3% by 2021, which is close to the level deemed consistent with price stability.

As is discussed above, GDP growth was stronger in 2017 and H1/2018 than previously projected. As a consequence, the output gap

was slightly larger at year-end 2017 than was assumed in August, and the outlook is for it to be about 1 percentage point larger at the end of 2018. As the forecast horizon progresses, however, the gap will narrow faster than was forecast in August, and it will have virtually closed by the end of the horizon (Chart I-10). It should be noted, though, that estimates of the output gap are always subject to uncertainty. Further discussion of the labour market and factor utilisation can be found in Chapter V.

Inflation outlook deteriorates in the first half of the forecast horizon due to a wider output gap and a weaker króna

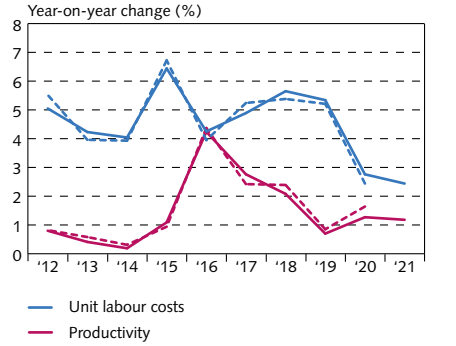
Inflation has been close to the target for much of 2018. It has risen over the course of the year, however, measuring 2.7% in Q3 and 2.8% in October. It is therefore about 1 percentage point higher than it was a year ago. In krónur terms, import prices have risen recently, owing to higher oil prices and the depreciation of the króna, although this is offset in part by the slowdown in house price inflation. The difference between inflation including and excluding housing has narrowed considerably. Underlying inflation in terms of the median of various measures was 3% in October, about 1.8 percentage points higher than in the same month of 2017. This is the highest it has been by that measure since January 2014.

Labour market unrest and the weakening of the króna have caused inflation expectations to rise again. Short-term inflation expectations have risen by as much as 1 percentage point in the past year. Long-term inflation expectations have also inched upwards and are now about 3% or more by all measures. In terms of the survey of market agents, this is the highest they have been since 2016, and in terms of the breakeven inflation rate in the bond market it is the highest since mid-2015.

Wage developments have been broadly in line with the Bank's August forecast. The year-on-year rise in wages has eased in 2018 to date, although it remains sizeable. It is assumed that nominal wages will rise by an average of 7% year-on-year in 2018, whereas the average annual increase in the past three years is estimated at 8%. The year-on-year rise in wages is expected to keep slowing down during the forecast horizon, in line with weaker labour productivity growth, rising unemployment, and a negligible improvement in terms of trade. The rise in unit labour costs will therefore ease from 5½% this year and in 2019 to 2½% in 2021 (Chart I-11).

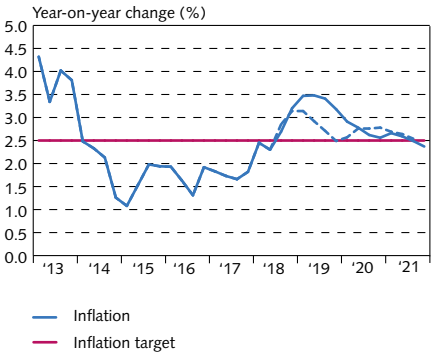
In 2018 to date, inflation has developed broadly in line with the Bank's forecasts. The current forecast assumes that it will average 3.2% in Q4, just above the August forecast of 3.1%. Unlike in August, the outlook is now for inflation to gain further momentum, averaging 3.5% well into 2019 and remaining above 3% by the end of the year instead of being at target, as was forecast in August (Chart I-12). The poorer inflation outlook through H1/2020 is due primarily to the recent depreciation of the króna, although, with the revision of GDP growth figures for 2017 and H1/2018, the output gap will be larger until mid-2020. From then on, the output gap is estimated to be broadly as was forecast in August, and the effects of the recent

Chart I-11
Unit labour costs and productivity 2012-2021[1]



1. Productivity measured as GDP per total hours worked. Central Bank baseline forecast 2018-2021. Broken lines show forecast from MB 2018/3.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart I-12
Inflation[1]
Q1/2013 - Q4/2021



1. Central Bank baseline forecast Q4/2018 - Q4/2021. Broken line shows forecast from MB 2018/3.
Sources: Statistics Iceland, Central Bank of Iceland.

depreciation of the króna are expected to have tapered off. Inflation will then fall back to target as described in the August forecast from H2/2020 onwards. The uncertainties in the inflation forecast are discussed below. Developments in global prices are discussed in Chapter II, and domestic inflation and inflation expectations are discussed in Chapter VI.

Key assumptions and main uncertainties

The baseline forecast reflects the assessment of the most likely economic developments during the forecast horizon. It is based on forecasts and assumptions concerning domestic economic policy and Iceland's external environment. It is also based on an assessment of the effectiveness of individual markets and how monetary policy is transmitted to the real economy. All of these factors are subject to uncertainty. The discussion below explains the assumptions about domestic economic policy. It also lists several important uncertainties and explains how changes in key assumptions could lead to developments that deviate from the baseline forecast.

Fiscal and monetary policies

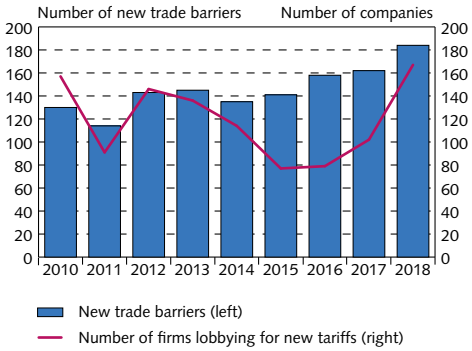
After considerable easing in 2015-2017, the fiscal stance appears set to tighten marginally this year and then ease slightly once again in 2019 and 2020 (see Chapter IV). Over the period from 2018 to 2021, however, the stance is broadly neutral, as was previously assumed.

The Bank's key interest rate has been unchanged at 4.25% since October 2017, at which time it had been lowered by 1.5 percentage points since August 2016 (see Chapter III). The baseline forecast is based on the assumption that, during the forecast horizon, the key rate will develop in line with the monetary policy rule in the Bank's macroeconomic model, which ensures that inflation will be broadly at target over the medium term.

International trade dispute could weigh on domestic economic activity

The global output growth outlook has deteriorated slightly from the Bank's August forecast, and it is possible that output growth has peaked in many countries. Financial conditions have tightened in a number of emerging market economies, and downside risks to the global growth outlook have increased. In addition, concerns have been mounting about the escalating trade dispute between the US and several other countries, and support for free global trade appears to be on the wane. For example, countries have increasingly resorted to technical trade barriers in recent years, at a time of growing pressure from lobby groups to increase import tariffs (Chart I-13). The US authorities have already imposed tariffs on a number of imports and are considering raising them still further. Other countries have reacted, and it is likely that their response will be stronger if the US increases tariffs even more.[2] If this scenario materialises, it will have severe repercussions

Chart I-13
New technical trade barriers and lobbying for new protective tariffs[1]



1. The chart show the average number of new technical trade barriers introduced each month and the number of companies that lobby the US Congress to adopt new protective tariffs. 2018 figures are for the first nine months of the year.
Sources: Center for Responsive Politics, World Trade Organization.

2. The US government has already imposed a 10% tariff on all aluminium imports and a 25% tariff on steel imports. In addition, it has imposed a 25% tariff on 50 billion US dollars of Chinese imports, plus an additional 10% tariff on 200 billion dollars of Chinese imports,

for the global economy, slowing down world trade and global output growth. The escalation of tensions could also have a negative impact on firms' investment plans if the trade dispute exacerbates economic uncertainty. Increased uncertainty is also likely to lead to rising interest rate spreads, which will further tighten the financing terms available to companies around the world. In a recent analysis, the IMF attempts to assess the impact of all of these factors on the global economy.[3] According to the Fund's findings, global GDP growth could turn out 0.3 percentage points less this year and 0.5 percentage points less in 2019 than it would be otherwise. These effects would taper off gradually, but global GDP would be lowered permanently by about ½%. In advanced economies, the impact varies, but it is greatest in the US, where GDP would be reduced permanently by nearly 1%. According to the IMF's assessment, Iceland's main trading partners would experience a permanent 0.5% average reduction in GDP.

It is difficult to predict the effect of this on Iceland, but the likelihood is that reduced global economic activity would cut into Iceland's exports, thereby lowering GDP growth. Potential additional effects could surface in poorer terms of trade, particularly with falling aluminium prices, as increased tariffs on aluminium products have already lowered prices and exacerbated uncertainty in the aluminium market. The estimated impact of the trade dispute on the domestic economy is based on the IMF's assessment of its impact on global GDP growth and trading partner demand. It is also assumed that interest rate spreads on domestic companies' financing costs will rise broadly as in the IMF assessment. Finally, it is assumed the global aluminium prices will fall in line with the historical relationship between aluminium prices and global GDP growth, on the one hand, and trading partner imports, on the other. This implies that aluminium prices will be about 6% lower in 2019 than in the baseline forecast.

With weaker global economic activity, Iceland's exports will grow by ½-¾ of a percentage point less per year in 2019 and 2020. Terms of trade will deteriorate as well and will be about 1% poorer in 2020 than in the baseline forecast. Weaker export growth and poorer terms of trade will lower GDP growth by 0.3 percentage points relative to the baseline forecast in 2019, and by 0.2 percentage points in 2020, whereupon the GDP growth effects begin to taper off. As Chart I-14 shows, by the time the effects peak in 2020, GDP will have fallen by ½% relative to the baseline forecast. This is somewhat less than the average effect among Iceland's trading partners but very similar to the IMF's estimate of the effect on the euro area. Offsetting the contractionary effects due to weaker global economic activity is a decline in the real exchange rate and the Central Bank's policy rate, which is nearly ½ a percentage point lower than in the baseline forecast by 2020. Inflation is 0.1-0.2 percentage points lower than in the baseline, owing to offsetting effects of a lower exchange rate and a smaller output gap.

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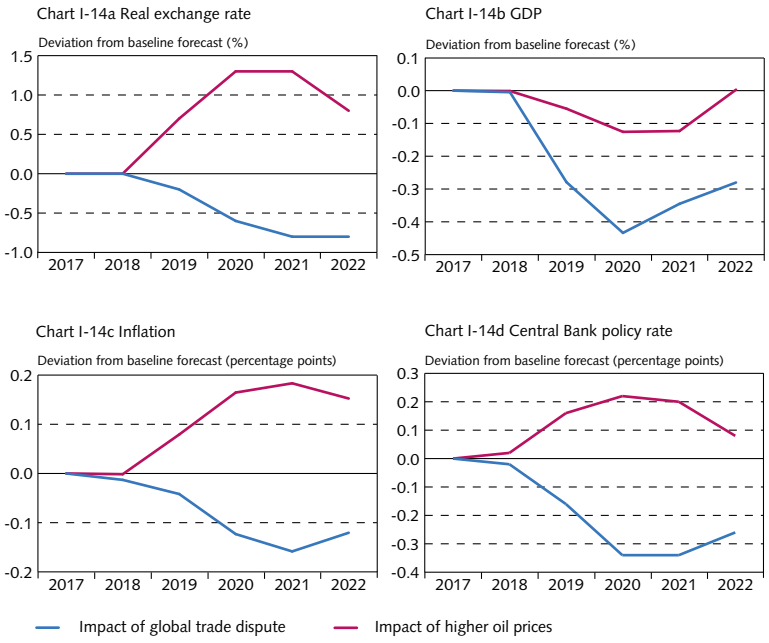
and it intends to increase the latter to 25%. Other countries have more or less responded in kind by imposing tariffs on US exports. The US is also considering imposing a 25% tariff on an additional 267 billion dollars of Chinese imports and a further tariff on imported motor vehicles and spare parts worth about 350 billion dollars.

3. International Monetary Fund (2018), *World Economic Outlook*, Chapter 1, October 2018.

Chart I-14
Alternative scenario



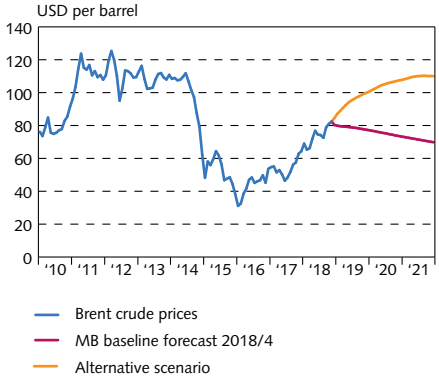
Source: Central Bank of Iceland.

Developments in oil prices highly uncertain after recent surge

Global oil inventories have been reduced rapidly in the recent past, and oil prices have soared as a result. In late September, they rose above 80 US dollars per barrel, more than three times the January 2016 trough. The effects of higher prices can already be felt in Iceland. They emerge directly, through rising petrol prices and their effect on the CPI, and they also affect economic activity, national income, and the general price level indirectly in various ways. These indirect effects include a rise in the price of other imported goods affected by higher oil prices, as well as higher costs of manufacturing domestic goods requiring imported fuel for their production. Higher oil prices have also eroded terms of trade and adversely affected the position of airlines and other transport companies.

According to the baseline forecast, which is based on global oil futures, oil prices will gradually ease back to about 70 US dollars per barrel by end-2021 (Chart I-15). This assessment is highly uncertain, however, and the possibility cannot be excluded that prices will continue rising if, for instance, there are further interruptions in oil production in Venezuela, or if the US trade embargo further impedes Iranian oil exports without a corresponding increase in production elsewhere. In order to assess the impact of a further rise in oil prices, it is assumed that they will rise to 95 US dollars per barrel by mid-2019 and just over 100 dollars by the end of 2019, and then keep rising until, by the end of 2021, they reach 110 dollars, the average from the beginning of 2011 through September 2014, before the recent tumble began. If this materialises, the average 2019 price will be about a fifth higher than in the baseline forecast, and by the end of the forecast horizon the average price will be about 50% higher than in the baseline. In ad-

Chart I-15
Global crude oil prices[1]
January 2010 - December 2021



1. Baseline forecast based on crude oil futures.
Sources: Thomson Reuters, Central Bank of Iceland.

dition, it is assumed that higher oil prices will affect global commodity prices, as well as export prices and the general price level in trading partner countries, in line with the historical relationship among these variables. This entails that by the end of the forecast horizon, commodity prices will be some 9% higher than in the baseline forecast, export prices about 2% higher, and trading partners' consumer prices nearly 1% higher. In all, import prices in foreign currencies will rise in the next three years by 1-1⅓ of a percentage point more per year than in the baseline forecast, and will be a full 3% higher than in the baseline by the end of the forecast horizon.

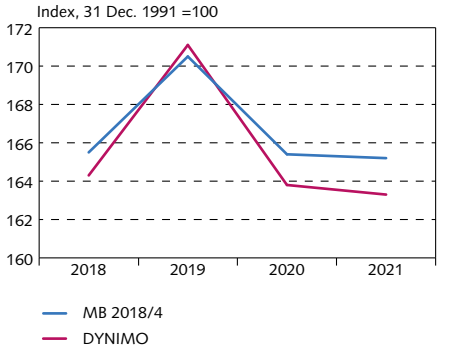
Chart I-14 illustrates the impact of this on the domestic economy. Increased oil and commodity prices erodes Iceland's terms of trade and reduces households' purchasing power. National income therefore declines in comparison with the baseline forecast, and demand grows more slowly. GDP would then be 0.1% less than in the baseline forecast from 2019 onwards. Import prices in krónur terms rise faster than in the baseline and is a full 2% higher by the end of the period. Inflation therefore rises relative to the baseline forecast and is nearly 0.2 percentage points higher in 2021, when the full-year impact peaks. In order to respond to a general rise in prices caused by higher oil prices and ensure that inflation falls back to the target over the medium term, the Central Bank's policy rate rises by 0.2 percentage points above the baseline forecast from 2019 onwards. Higher interest rates push the exchange rate upwards, and the real exchange rate is over 1% higher than in the baseline forecast from 2020 onwards. Higher interest rates and a stronger króna also mitigate the inflationary effects of higher oil prices by further slowing domestic economic activity.[4]

Exchange rate outlook uncertain

According to the baseline forecast, the trade-weighted exchange rate of the króna will be close to the 2018 average for most of the forecast horizon. This technical assumption is affected, on the one hand, by the GDP growth outlook and the interest rate differential with abroad, and on the other, by the estimated equilibrium real exchange rate. The equilibrium real exchange rate is considered to have declined from the previous estimate, owing to poorer terms of trade and a less favourable outlook for exports. Furthermore, the interest rate differential with abroad has narrowed as the slack in trading partner economies has disappeared and the output gap in Iceland has narrowed. All of these are subject to uncertainty, however, and exchange rate developments could easily differ from the baseline forecast. Although the outlook is for GDP growth to remain close to its trend growth rate for most of the forecast horizon, the króna could continue to depreciate, if global economic uncertainty increases still further or if global interest rates rise faster than the markets assume. The exchange rate path in the baseline forecast is very similar, however, to that obtained

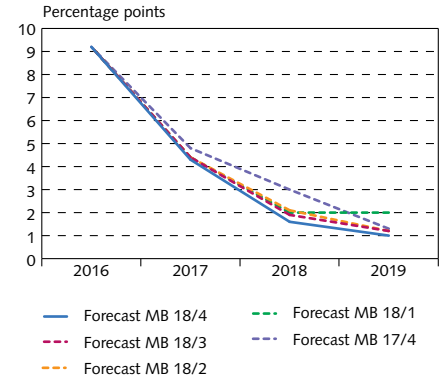
4. The inflationary effect of higher oil prices could be overestimated in that this assessment ignores the negative impact of higher oil prices on global economic activity. It could also be underestimated if inflation expectations become less securely anchored and long-term inflation expectations also begin to rise, which would call for a stronger monetary policy response than is described here (see, for example, the discussion in Chapter I of *Monetary Bulletin* 2018/2).

Chart I-16
Exchange rate forecasts[1]



1. Yearly averages of the trade-weighted exchange rate index according to the baseline forecast in MB 2018/4 and the Bank's DYNIMO model.
Source: Central Bank of Iceland.

Chart I-17
Forecast contribution of tourism to growth in goods and services exports[1]



1. The contribution of tourism (travel and passenger transport by air) to growth in exports of goods and services in MB forecasts.
Sources: Statistics Iceland, Central Bank of Iceland.

with the Bank's dynamic stochastic general equilibrium (DSGE) model, DYNIMO (Chart I-16). On the other hand, the Bank's recent survey of market participants' views on the economic outlook indicates that respondents are more pessimistic about the exchange rate. As in the baseline forecast, market participants expect the króna to be weaker in 2019 than in 2018, but unlike the baseline forecast, they do not expect the depreciation to reverse in 2020.

Growth in tourism could ease faster than in the baseline forecast

Tourism exports grew by 11% in 2017 and by an average of over 25% per year in 2015-2016. The growth rate has eased still further in 2018 to date, and according to the baseline forecast, it will measure just under 4% for the year as a whole, and less than 3% in 2019 and 2020. The contribution of tourism exports to export growth has therefore been declining: in 2017, tourism contributed over 4 percentage points to the 5.5% growth in goods and services exports, and in 2015-2016 it contributed an average of nearly 8 percentage points per year. The outlook is for a considerably smaller contribution to export growth in 2018, or about 1½ percentage points, followed by about 1 percentage point per year in the next two years.

To an extent, it was foreseeable that growth in tourism would ease, although the slowdown has been more pronounced than was assumed in the Bank's previous forecasts. Now, for instance, the outlook is for this year's contribution from tourism to export growth to be about half as much as was assumed in the Bank's November 2017 forecast, and the outlook for 2019 has been revised downwards as well (Chart I-17). The change in outlook probably reflects the impact of a high real exchange rate and the recent surge in oil prices. There have been signs of increasing difficulties in tourism and airline operations as the competitive position of the sector has deteriorated; therefore, the possibility cannot be excluded that growth in 2018 and 2019 will be weaker than is assumed in the baseline forecast.

Inflation could rise faster in the near future than is assumed in the baseline forecast

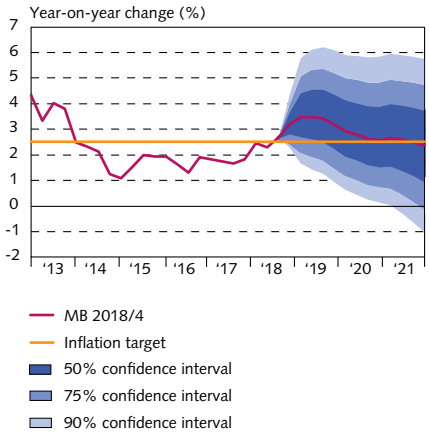
The issues discussed above highlight the uncertainty that generally accompanies the economic outlook. Some of these risks could indicate that the inflation outlook is underestimated in the baseline forecast. The most important of them is uncertainty about the upcoming wage settlements. Although the baseline forecast already assumes relatively sizeable pay increases even though the wage share is above its historical average, it is not impossible that wage settlements will provide for even larger increases or that wage drift will be greater than assumed, not least in view of the fact that unemployment is still low and tension in the labour market remains. Various other factors could pull in the same direction, causing inflation to turn out higher than in the baseline forecast. For example, global oil prices have soared in the recent past, and the possibility of a further increase, opposite to the assumption in the baseline forecast, cannot be ruled out. Although some of the downside risks to the currency from the previous risk assessment have already been realised, the króna could continue

to weaken instead of remaining broadly at the current level for the remainder of the forecast horizon, as the baseline forecast assumes. By the same token, house price inflation could pick up again if growth in mortgage lending continues to gain momentum. Furthermore, the strength of the economy in H1/2018 could indicate that the output gap will be more persistent than is currently assumed, particularly if the fiscal stance eases more than is forecast. Inflation could also rise higher and remain more persistent if long-term inflation expectations do not ease back to the target.

Neither can the possibility be excluded that inflation will turn out lower than is assumed in the baseline forecast. The króna could appreciate again, for example, if external conditions improve. The trade dispute between the US and China could also undermine global economic activity, which could weaken Iceland's exports and result in weaker GDP growth than in the baseline forecast. Moreover, productivity growth could be underestimated, and this could cause the output gap to narrow faster than is assumed in the baseline.

In order to reflect these uncertainties, Chart I-18 illustrates the confidence intervals of the forecast; i.e., the range in which there is considered to be a probability of up to 90% that inflation will lie over the next three years (the methodology is described in Appendix 3 in *Monetary Bulletin* 2005/1). The uncertainty about short-term inflation is considered concentrated on the upside. For the long term, however, the probability distribution is considered to be roughly symmetric. There is a roughly 50% probability that inflation will be in the 2¼-4½% range in one year and in the 1-3¾% range by the end of the forecast horizon.

Chart I-18
Inflation forecast and confidence intervals
Q1/2013 - Q4/2021



Sources: Statistics Iceland, Central Bank of Iceland.

II The global economy and terms of trade

The GDP growth outlook for the global economy and Iceland's main trading partners has deteriorated slightly since August, and growth has become less balanced between countries. Escalating tariffs and international trade disputes have put a damper on growth in world trade, which also affects trading partners' imports. Global inflation has picked up, concurrent with rising oil prices, although core inflation is still low in many economies. Iceland's terms of trade have deteriorated this year, with rising global energy prices, and the real exchange rate has fallen after rising steeply in the past several years.

Global economy

GDP growth has softened slightly in trading partner countries …

GDP growth measured 2.1% among Iceland's main trading partners in H1/2018 (Chart II-1), below the forecast in the August *Monetary Bulletin* and the 2017 growth rate of 2.4%. Growth turned out weaker than was projected in August in most trading partner countries, and differences in growth rates from one country to another have widened again.

GDP growth in the euro area has softened after picking up in 2017, partly because of weaker export growth, but also due to a contraction in private consumption, which in turn is due in part to higher oil prices. Unemployment continues to fall, however, and is now at its lowest since late 2008 (Chart II-2). GDP growth has also softened in Japan, measuring 1.2% in H1/2018, as in the UK, where adverse weather in Q1 temporarily affected economic activity. In spite of this, unemployment in the UK is at its lowest in over forty years, and in Japan it is close to a twenty-year low. Output growth has weakened in Norway and Denmark as well but has held its ground in Sweden. In the US, however, it has gained momentum and is at a three-year high. Domestic demand growth has picked up even further in the wake of tax cuts and increased government spending. The recovery of the labour market has also proven robust, and unemployment is at its lowest in over fifty years.

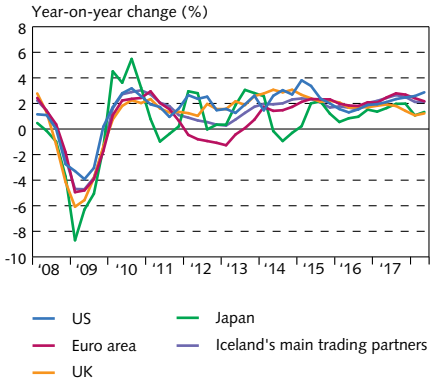
…and global output growth has eased

Global output growth measured 3.7% in 2017, the strongest since 2011, but it lost ground slightly in H1/2018, owing mainly to GDP growth in advanced economies, which declined from 2.8% in H2/2017 to 2.3% in H1/2018. In emerging market economies, however, economic activity has continued on the whole to grow at broadly the same pace as in 2017, and global output growth is sustained largely by these countries.

Indicators imply that GDP growth has begun slowing in many advanced economies …

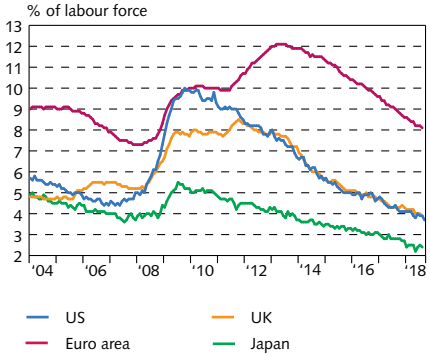
Leading indicators and GDP growth forecasts continue to suggest robust growth in advanced economies, although the outlook has deteriorated since early this year. Forecasts for the euro area suggest

Chart II-1
Global GDP growth
Q1/2008 - Q2/2018



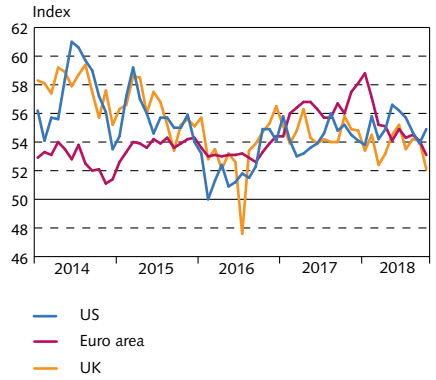
Sources: Thomson Reuters, Central Bank of Iceland.

Chart II-2
Unemployment rate[1]
January 2004 - October 2018



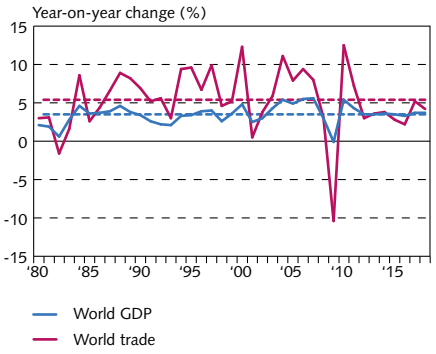
1. Seasonally adjusted figures.
Source: Thomson Reuters.

Chart II-3
Leading indicators of GDP growth[1]
January 2014 - October 2018



1. Markit composite purchasing managers' index (PMI). 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: Thomson Reuters.

Chart II-4
World GDP and trade 1980-2018[1]



1. Broken lines show average of 1980-2017. The values for 2018 are based on IMF's forecast (*World Economic Outlook*, October 2018).
Sources: International Monetary Fund, Central Bank of Iceland.

that GDP growth will be more sluggish this year than had previously been projected, owing primarily to weaker-than-expected growth in H1. Leading indicators have also been below market expectations, and the purchasing managers' index (PMI) for manufacturing and services has fallen even further after tumbling in the spring (Chart II-3). Furthermore, pessimism has increased among consumers and companies in the eurozone, even though the labour market has continued to firm up. Indicators for the UK have been well in line with market expectations in the recent past; however, the outlook for the year as a whole is weaker because GDP growth in H1 was disappointing, as it was in the euro area. Even though the PMI for the US has fallen marginally in the recent term, optimism has increased still further among households and businesses, and the GDP growth outlook for 2018 as a whole is broadly unchanged.

… and the global output growth outlook has deteriorated

The International Monetary Fund's (IMF) most recent forecast estimates global GDP growth at 3.7% in 2018 and 2019, or some 0.2 percentage points below its April and July forecasts, reflecting weaker-than-projected economic activity in advanced economies in H1/2018 and the negative impact of the trade disputes between the US and other leading countries. Reduced global output growth is also attributable to a poorer outlook for emerging and developing economies, many of which are heavily indebted in US dollars and have faced tighter financial conditions, partly as a result of rising US interest rates and the appreciation of the dollar. Among other things, this has caused some capital outflows and a currency depreciation in the countries affected.

International trade disputes hinder growth in world trade

World trade grew by just over 5% in 2017 and appears set to measure slightly more than 4% this year, somewhat less than was previously forecast (Chart II-4). The escalating trade disputes between the US and several other countries, China in particular, and growing support for protectionist policies around the world has put a damper on trade. However, the US, Mexico, and Canada have agreed on a new treaty to replace the North American Free Trade Agreement (NAFTA). Considerable uncertainty remains about the impact of these trade disputes and whether they will escalate still further (for further discussion, see Chapter I).

Outlook for GDP growth and demand in trading partner countries has deteriorated slightly since August …

In line with a weakening global GDP growth and trade outlook, growth in output and imports among Iceland's main trading partners is now projected to be weaker than was assumed in the Bank's August forecast. Trading partners' GDP growth is forecast at 2.2%, which is 0.1 percentage points less than was assumed in August. The main factor here is the prospect of weaker growth in the eurozone, the UK, and the Nordic countries, whereas GDP growth in the US is forecast

at 2.9%. Forecasts for trading partners' imports have been revised similarly, with import growth now projected at 3.9% in 2018, down from 4.1% in August.

... but inflation in trading partner countries has risen more than expected

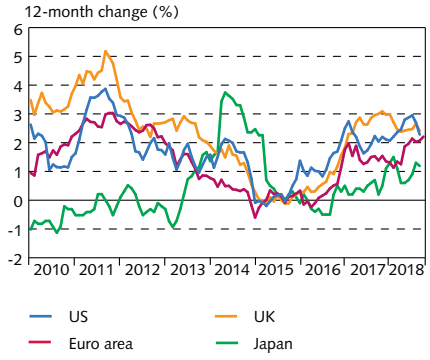
Inflation has been on the rise this year in Iceland's main trading partner countries, reflecting in particular the surge in oil prices in Q2 and Q3. Trading partner inflation averaged 1.8% in H1 but had risen to 2.2% in Q3, exceeding expectations (Chart II-5). Inflation rose more than expected in the euro area, Canada, Sweden, and Norway but was lower than projected in the US, the UK, and Denmark. Core inflation is still widely low, however, and in the eurozone it is still below the European Central Bank's (ECB) inflation target. In the US, however, core inflation is slightly above target. Headline inflation among Iceland's trading partners is forecast to average 2% this year, 0.1 percentage points more than was forecast in August.

Central bank interest rate differential among developed countries widens further

The US Federal Reserve raised its policy rate by 0.25 percentage points in September, to 2-2.25%, in line with market expectations (Chart II-6). Interest rates in the US have been raised by 0.75 percentage points in 2018 to date, as the slack in the US economy has disappeared and inflation has risen. Interest rates are also beginning to rise in a number of other advanced countries. For example, the Bank of Canada raised its policy rate for the third time this year, to 1.75%, and Norges Bank raised its rate by 0.25 percentage points in September, its first rate hike since spring 2011. The Bank of England raised its policy rate to 0.75% in early August, its second rate hike since the onset of the financial crisis. The ECB has held its key interest rate steady at 0%, however, and has signalled that it will remain unchanged at least until autumn 2019.

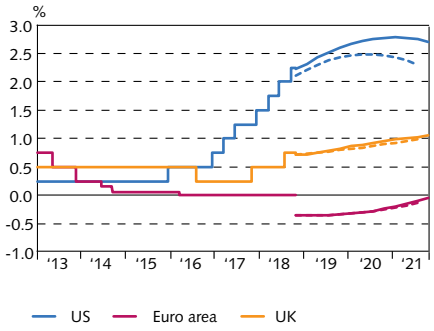
As GDP growth rates in the US and other advanced economies diverge, the interest rate spread has widened, and it appears likely to grow still larger in the coming term. The Federal Reserve has signalled a possible additional rate hike of 0.25 percentage points this year, followed by a hike of 0.75 percentage points in three steps next year, bringing its policy rate to 3-3.25% by end-2019. This is broadly reflected in forward interest rates in the market (Chart II-6). In addition, the Federal Reserve has continued to scale down its bond holdings, which is considered one of the main reasons term premia on long-term bonds have increased. Bond rates have therefore risen west of the Atlantic (Chart II-7), and the US dollar has appreciated by 4½% year-to-date in effective terms. Market agents expect smaller rate hikes in the UK and continued low rates in the euro area. Long-term interest rates in Germany have fallen again even though the ECB scaled down its net monthly bond purchase programme in October and has announced its intention to stop it entirely at the end of December. Bond rates in Japan have also remained low, and the Bank of Japan aims to keep long-term rates around 0%.

Chart II-5
Inflation in selected industrialised countries
January 2010 - September 2018



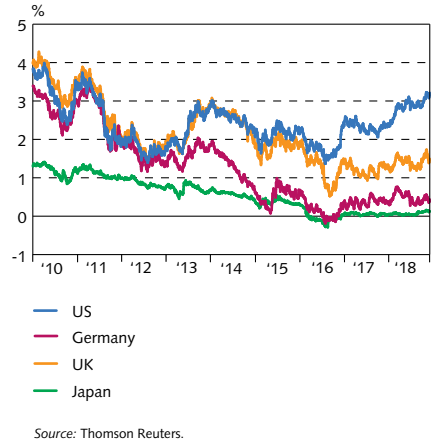
Source: Thomson Reuters.

Chart II-6
Policy rates in selected industrialised economies[1]
January 2013 - December 2021



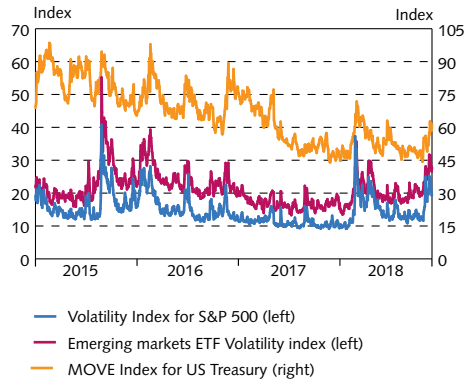
1. Daily data 1 January 2013 through 2 November 2018, and quarterly data Q4/2018 through Q4/2021. US interest rates are the upper bound of the US Federal Reserve bank's interest rate corridor, and rates for the euro area are the European Central Bank's key rate. Forward rates are based on overnight index swaps (OIS) and the Euro Overnight Index Average (EONIA) for the euro area. Solid lines show forward curves from 2 November 2018 onwards and the broken lines from 24 August 2018 onwards.
Source: Thomson Reuters.

Chart II-7
10-year government bond yields in selected industrialised countries
1 January 2010 - 2 November 2018



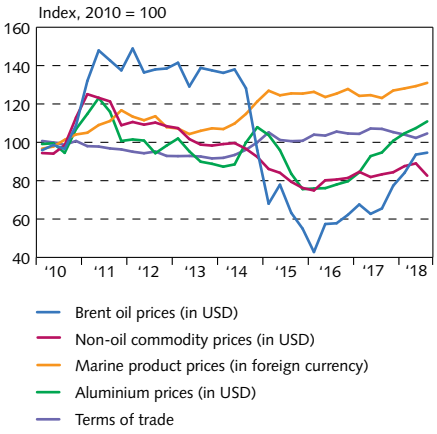
Source: Thomson Reuters.

Chart II-8
Global market volatility[1]
1 January 2015 - 2 November 2018



1. The VIX and MOVE volatility indices indicate the implied volatility of financial products.
Source: Thomson Reuters.

Chart II-9
Commodity prices and terms of trade[1]
Q1/2010 - Q3/2018



1. Foreign currency prices of marine products are calculated by dividing marine product prices in Icelandic krónur by the trade-weighted exchange rate index. USD prices of aluminium products are calculated by dividing aluminium prices in Icelandic krónur by the exchange rate of the USD. Terms of trade in Q3/2018 are based on the Central Bank baseline forecast.
Sources: Statistics Iceland, Thomson Reuters, World Bank, Central Bank of Iceland.

Financial market turbulence and falling asset prices

Volatility in global financial markets has increased in 2018, after having been relatively limited in H2/2017 (Chart II-8). It spiked noticeably in Q1 and then again in October, alongside a marked drop in asset prices, although volatility has receded to a degree. The increased volatility is thought to stem from uncertainty about the trade disputes between the US and other countries, China in particular, and the impact on world trade and global GDP growth, where the outlook has worsened, as is mentioned above. By the same token, the volatility stems from uncertainty about the effect that rising interest rates in the US will affect the country's economic recovery, whether the adjustment to the neutral rate will be too rapid, and whether private sector financial conditions will tighten too quickly, thereby hindering the recovery excessively. Weaker output growth in the US and China could cause spillovers into other economies, owing to the two countries' large share in global demand. In addition, interest rate increases in the US have created uncertainty about global capital flows, as a rapid rise in US rates could lead to further contractions in capital inflows, particularly to emerging economies, with the associated exchange rate volatility.

Export prices and terms of trade

Export prices set to rise more in 2018 than was forecast in August

Foreign currency prices of marine products have rebounded this year, after a slight decline in 2017, and nearly all types of products have risen in price, owing to strong demand in foreign markets. Prices rose by 3½% in H1/2018, and preliminary figures suggest a continued increase in Q3 (Chart II-9). The outlook for marine product prices has therefore improved since August. It is now assumed that prices will rise by 5% in 2018 as a whole, instead of the 3½% provided for in the August forecast, while the outlook for 2019 is broadly unchanged.

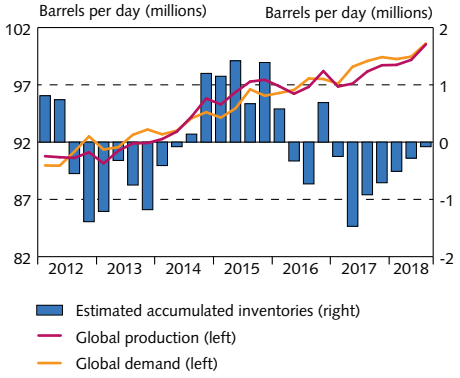
Global aluminium prices have held relatively stable in recent months, in the range of approximately 2,000-2,100 US dollars per tonne (Chart II-9). Icelandic aluminium companies' export prices are higher, however, as buyers pay a premium on the global market price. The premium varies from company to company and from month to month. The year-on-year rise in aluminium prices is projected to average about 16%, somewhat more than was forecast in August. The outlook for 2019 is slightly poorer than in August, however.

Oil prices up sharply year-to-date

Oil prices have been quite volatile in recent months, and near-term developments are uncertain. Prices rose by over a fourth between mid-August and the beginning of October, when they reached just over 86 US dollars per barrel. They had tapered off by the end of October, however, to 75 dollars, about a fourth above the prices seen a year earlier, and three times the January 2016 low (Chart II-9). The recent surge is due mainly to strong demand in the market, including from the petrochemical industry, and declining inventories (Chart II-10). At the same time, there are increased concerns about a contrac-

tion in oil supply. These are due mainly to the US government's trade embargo on Iran and the political situation in Venezuela, which have cut into the supply of oil from these countries. This contraction was finally addressed with an increase in supply from OPEC countries and a few non-OPEC oil producers, which caused prices to fall again in October. It has also emerged that the largest oil-producing countries, particularly the US, have ample inventories, and furthermore, unused production capacity in Saudi Arabia has turned out to be underestimated. Although futures prices indicate that oil prices have peaked, the outlook is for prices to be 38% higher, on average, this year than in 2017, and higher than was forecast in August. The outlook according to futures prices is that oil prices will fall to about 70 dollars per barrel by end-2021, somewhat above the August forecast. The outlook is unusually uncertain, however, owing primarily to the impact of the aforementioned trade embargo on Iran and the US-China trade dispute (for further discussion, see Chapter I).

Chart II-10
Oil demand and supply[1]
Q1/2012-Q3/2018

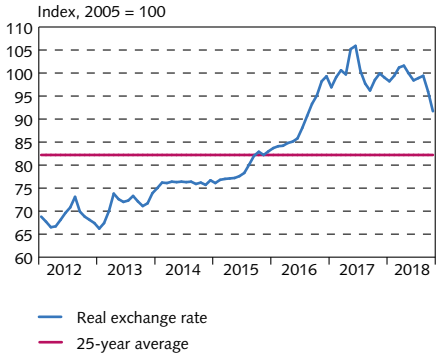


1. Petroleum and other liquid fuels. Estimated accumulated inventories are the difference between estimated global supply and global demand.
Source: U.S. Energy Information Administration.

Non-oil commodity prices have fallen

Non-oil commodity prices rose virtually without interruption from the beginning of 2016, after having fallen in the years beforehand (Chart II-9). They continued to rise in the first five months of 2018 but then lost ground again, falling by 9.5% between May and end-September. Virtually all types of commodities have fallen in price, although the largest declines have been in food and beverage prices. The decline reversed in part in October, and prices are expected to rise by just under 1% in Q4, to a level about 2.5% above 2017 prices, although this is a smaller increase than was forecast in August. The outlook for 2019 is broadly unchanged, however.

Chart II-11
Real exchange rate[1]
January 2012 - October 2018

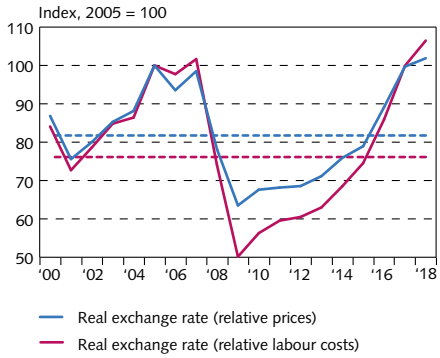


1. Real exchange rate in terms of relative prices.
Source: Central Bank of Iceland.

Terms of trade have deteriorated in 2018, after a marked improvement in recent years

After a nearly continuous improvement from Q4/2013 onwards, terms of trade for goods and services worsened by 4.5% year-on-year in Q2/2018 (Chart II-9), owing mainly to a steep rise in oil and non-oil commodity prices, particularly a spike in alumina prices caused by reduced production at the Norsk Hydro plant in Brazil. Import prices in general have also risen. Terms of trade are expected to deteriorate by 1.9% in 2018 as a whole, broadly as was forecast in August. They are expected to remain unchanged in 2019 instead of improving by 2%, as was forecast in August, owing mainly to higher oil prices, although the prospect lower aluminium prices and a smaller decline in alumina prices play a part as well.

Chart II-12
Real exchange rate 2000-2018[1]



1. Broken lines show 25-year average (1993-2017). Central Bank of Iceland baseline forecast 2018.
Source: Central Bank of Iceland.

Real exchange rate declines after a steep rise in recent years

The real exchange rate in terms of relative consumer prices remained relatively stable from H2/2016 through August 2018, after surging during the preceding years (Chart II-11). In September, however, the króna began to depreciate (see Chapter III), and by October the real exchange rate had fallen by 7.7% since August, to its lowest point since August 2016. Even so, it is still 11.5% above its twenty-five-year average. The past few years' strong increase in the real exchange

rate reflects a rise in the equilibrium real exchange rate; i.e., the real exchange rate consistent with internal and external equilibrium (see, for example, Box 3 in *Monetary Bulletin* 2016/2). Because of weaker terms of trade and slower export growth, the equilibrium real exchange rate is now estimated to be somewhat lower than it was in August.

Domestic wage costs rise more than in other advanced economies

According to the Bank's baseline forecast, the real exchange rate in terms of relative consumer prices is projected to be about 2½% lower, on average, in 2018 than in 2017. This would be the first year-on-year reduction since 2009 (Chart II-12). The real exchange rate in terms of relative unit labour costs is expected to remain broadly unchanged from last year.

III Monetary policy and domestic financial markets

The Central Bank's key interest rate has been unchanged for a little over a year, but the Bank's real rate has fallen and the interest rate differential vis-à-vis Iceland's main trading partners has narrowed. Other market rates have developed broadly in line with the Bank's key rate. According to a recent survey, market agents expect the Central Bank to raise its key interest rate in the near future. The breakeven inflation rate in the bond market has risen in recent months, indicating that market agents expect inflation to rise. There are signs that investors have increased concerns about the domestic economic outlook, and the króna has depreciated in the recent past. Growth in M3 is still relatively rapid, and credit growth is at its strongest since the economic recovery began. In spite of this, the rise in house prices has eased, and share prices have fallen in 2018 to date. Private sector debt is relatively low in historical context, however, and foreign-denominated debt is limited. Some of the commercial banks and pension funds have raised fixed non-indexed interest rates recently, but private sector financial conditions appear broadly unchanged in other respects.

Monetary policy

Central Bank's key rate unchanged this year ...

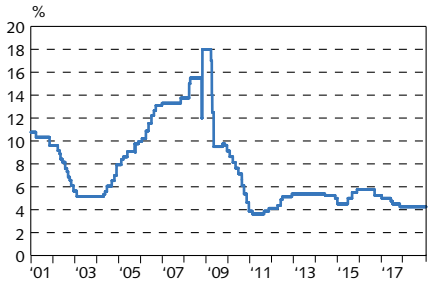
The Central Bank's Monetary Policy Committee has held the Bank's policy rate unchanged since October 2017. The key rate — that is, the rate on seven-day term deposits — was 4.25% just before the publication of this *Monetary Bulletin* and has only once been lower since the start of the inflation-targeting regime in 2001 (Chart III-1). Accepted rates in auctions of bills issued by the Treasury and the banks have developed in line with the Bank's key rate, as have rates in the interbank market for krónur, but there has been little trading in the interbank market thus far in 2018.

... but the Bank's real rate continues to fall

The monetary stance has eased in the recent term, alongside the rise in inflation and inflation expectations (for further information, see Chapter VI). The Bank's real rate in terms of the average of various measures of inflation and one-year inflation expectations is now 0.8% (Table III-1). It has fallen by 0.4 percentage points since the August *Monetary Bulletin* and about 1 percentage point since November 2017. The Bank's real rate in terms of current twelve-month inflation has also fallen. It is now 1.4%, or 0.9 percentage points lower than it was a year ago. Overall, the decline in the Bank's real rate has been transmitted to real market rates (Chart III-2), although it has been transmitted least to fixed indexed mortgage lending rates.[1]

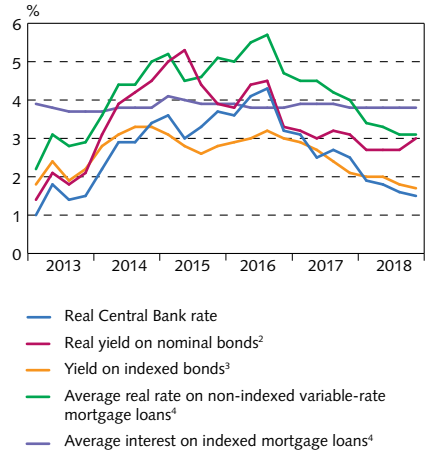
1. The transmission of Central Bank interest rates to other market rates and indexed mortgage lending rates is discussed further in Box 1.

Chart III-1
Central Bank of Iceland key interest rate[1]
3 January 2001 - 2 November 2018



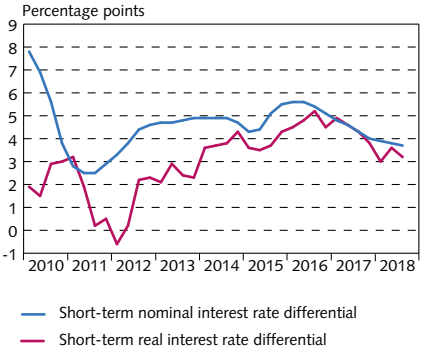
1. The Central Bank's key interest rate is defined as follows: the 7-day collateralised lending rate (until 31 March 2009), the rate on deposit institutions' current accounts with the Central Bank (1 April 2009 - 30 September 2009), the average of the current account rate and the rate on 28-day certificates of deposit (1 October 2009 - 20 May 2014), and the rate on 7-day term deposits (from 21 May 2014 onwards).
Source: Central Bank of Iceland.

Chart III-2
Real Central Bank interest rate and real market rates[1]
Q1/2013 - Q4/2018



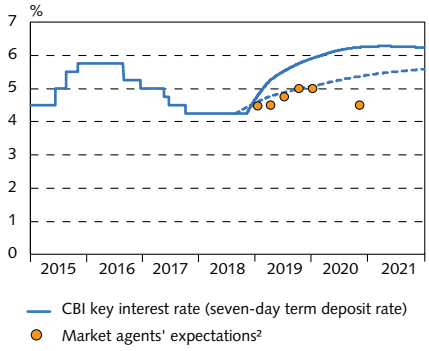
1. Based on data until 2 November 2018. 2. Five-year rate from the estimated nominal yield curve. 3. Five-year rate from the estimated real yield curve. 4. Simple average of lowest lending rates from the three largest commercial banks. Fixed-rate period of five years or more on indexed mortgage loans.
Source: Central Bank of Iceland.

Chart III-3
Interest rate differential with main trading partners[1]
Q1/2010 - Q4/2018



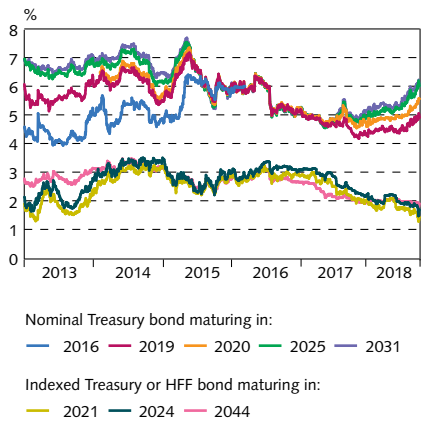
1. The difference between the Central Bank of Iceland's key interest rate and the weighted average key rate in Iceland's main trading partner countries. Real rates are based on current twelve-month inflation. Based on domestic data until 2 November 2018. Central Bank baseline forecast Q4/2018 for international data.
Sources: Thomson Reuters, Central Bank of Iceland.

Chart III-4
Central Bank of Iceland key interest rate and expected developments[1]
1 January 2015 - 31 December 2021



1. The Central Bank's key interest rate and Treasury bond yields were used to estimate the yield curve. Broken lines show forward market interest rates prior to MB 2018/3. 2. Estimated from the median response in the Central Bank's survey of market agents' expectations concerning the collateralised lending rate. The survey was carried out during the period 29-31 October 2018.
Source: Central Bank of Iceland.

Chart III-5
Nominal and indexed bond yields
2 January 2013 - 2 November 2018



Source: Central Bank of Iceland.

Interest rate differential with abroad has narrowed

The nominal interest rate differential vis-à-vis Iceland's main trading partners has continued to narrow as the margin of spare capacity in leading advanced economies has diminished and interest rates have risen (see Chapter II). The nominal interest rate spread has shrunk by 0.3 percentage points in the past year and is at its smallest since mid-2012 (Chart III-3). The real interest rate differential has narrowed accordingly.

Table III-1 The monetary stance (%)

Real interest rate in terms of:[1]	*Current stance (2 Nov. '18)*	*Change from MB 2018/3 (24 Aug. '18)*	*Change from MB 2017/4 (10 Nov. '17)*
Twelve-month inflation	1.4	-0.1	-0.9
Business inflation expectations (one-year)	1.2	0.0	-0.6
Household inflation expectations (one-year)	0.7	-0.1	-0.5
Market inflation expectations (one-year)[2]	0.6	-0.6	-1.1
One-year breakeven inflation rate[3]	0.3	-0.8	-1.7
Central Bank inflation forecast[4]	0.8	-0.5	-0.7
Average	0.8	-0.4	-1.0

1. The nominal rate on financial institutions' seven-day term deposits with the Central Bank. 2. Based on survey of market participants' expectations. 3. The one-year breakeven inflation rate based on the difference between the nominal and indexed yield curves (five-day moving average). 4. The Central Bank forecast of twelve-month inflation four quarters ahead.
Source: Central Bank of Iceland.

Market agents expect rate increases

According to the Central Bank's quarterly survey of market agents' expectations, carried out in late October, respondents expect the Bank's key rate to be raised by 0.25 percentage points in Q4/2018, followed by further increases in 2019. They assume that the key rate will be 5% by the end of 2019 and then begin to decline again (Chart III-4). This is a higher rate than they expected at the time of the August survey. Forward interest rates suggest that the key rate will rise even further, to 6% by end-2019 and 6.25% by the end of 2021.

Market interest rates and risk premia

The breakeven inflation rate in the bond market has risen

Nominal Treasury bond yields began to rise in late 2017, and the yield on the longest bonds is now 6%, the highest since summer 2016. At the same time, yields on indexed Treasury and Housing Financing Fund (HFF) bonds have fallen in line with the decline in the Central Bank's real rate, and indexed rates are now 1.4-1.9%, down from 2.0-2.4% a year ago (Chart III-5). Yields on the commercial banks' covered bonds have developed similarly. The spread between nominal and indexed bond rates has therefore widened in recent months, and this increase in the breakeven rate suggests that inflation expectations have risen.

Bond market turnover has declined in the recent term with reduced Treasury bond issuance and limited issuance of indexed bonds. Pension fund's demand for domestic bonds seems to have declined since the capital controls on resident entities' foreign investments were lifted. Furthermore, capital inflows for new investment in the domestic bond market have been negligible (Chart III-6).

Special reserve requirement lowered

In June 2016, the Central Bank introduced a special capital flow management measure that entailed a 40% special reserve requirement (SRR) on new inflows of foreign currency for investment in high-yielding deposits and listed bonds and bills issued in krónur. The special reserve amount must be held in a non-interest-bearing account with the Central Bank for one year (see, for example, Box 1 in *Monetary Bulletin* 2018/2). Conditions for lowering the SRR have developed with the narrowing of the interest rate differential and a lower exchange rate of the króna. The SRR was therefore lowered to 20% at the beginning of November.

Risk premia on Treasury foreign obligations are at their lowest in a decade

Measures of risk premia on Treasury foreign obligations have remained broadly unchanged this year, even though Moody's Investors Service changed the outlook on Iceland's sovereign credit ratings from stable to positive this summer. The CDS spread on the Treasury is now 0.6 percentage points, its lowest in about a decade (Chart III-7). The unrest in the financial markets during the autumn appears not to have affected the risk premium, but interest rate spreads on domestic commercial banks' international bond issues have risen during the year, as they have for many foreign financial institutions, partly because of increased uncertainty about the global economy.

Exchange rate of the króna

Indications of increased net capital outflows over the course of the year

Net capital outflows have been modest since spring 2017, when most of the capital controls were lifted, in spite of foreign securities purchases by domestic investors, pension funds in particular (Chart III-8). Net capital outflows excluding international reserves totalled nearly 83 b.kr. in Q1/2018, although a portion of this was due to the sale of holdings in a domestic commercial bank. In Q2, outflows totalled less than 11 b.kr., but there are signs of increased net outflows in Q3, which put pressure on the exchange rate of the króna.

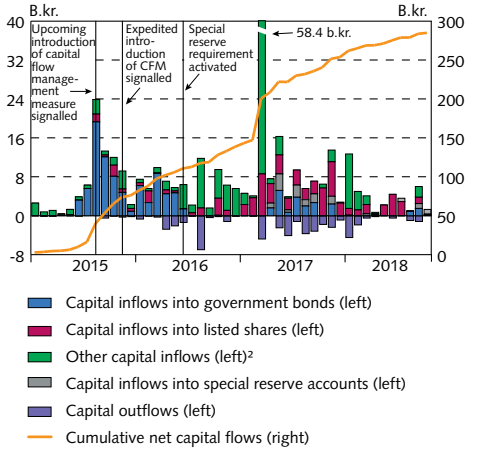
Króna has weakened in the recent term

The króna remained relatively stable in H1/2018, and exchange rate volatility had receded after a brief spike following the liberalisation of the capital controls in 2017. Early in September, however, the exchange rate began to fall, and the trade-weighted exchange rate index measured about 180 points just before this publication went to press; therefore, the currency had depreciated by about 10% since the beginning of September. This is its lowest value since end-July 2016, more than two years ago (Chart III-9). The slide in the exchange rate is due to some extent to temporary uncertainty about domestic airline WOW Air's financing in early September. The macroeconomic factors that have generally driven the appreciation of the króna in recent years appear to have given way as well. Terms of trade have deteriorated

Chart III-6

Capital flows due to registered new investments[1]

January 2015 - October 2018



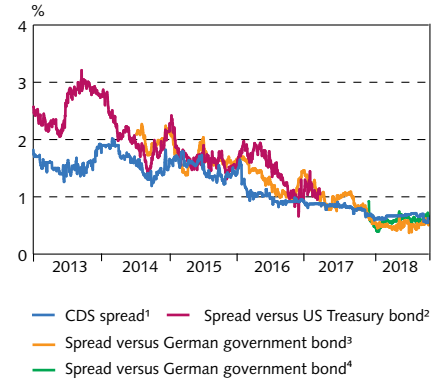
1. Investment commencing after 31 October 2009 and based on new inflows of foreign currency that is converted to domestic currency at a financial institution in Iceland. 2. Other inflows in March 2017 derive almost entirely from non-residents' acquisition of a holding in a domestic commercial bank.

Source: Central Bank of Iceland.

Chart III-7

Risk premia on Icelandic Treasury obligations

2 January 2013 - 2 November 2018



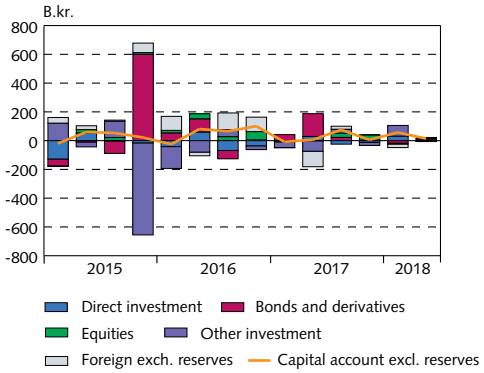
1. Five-year USD obligations. 2. USD bonds maturing in 2022. 3. Eurobonds maturing in 2020. 4. Eurobonds maturing in 2022.

Source: Bloomberg.

Chart III-8

Capital flows[1]

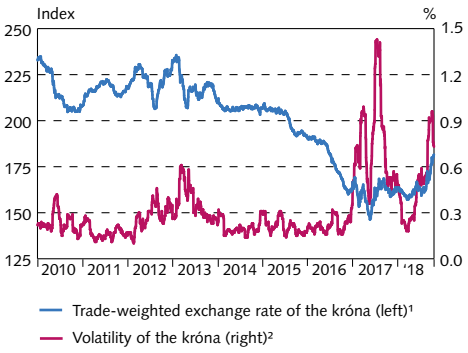
Q1/2015 – Q2/2018



1. Capital account balance (net capital outflows) and net capital flows to foreign direct investment, portfolio investment (bonds, derivatives, and equities), and other investment. Positive (negative) numbers represent an increase (decrease) in resident entities' foreign assets or a decrease (increase) in their foreign debt. Large movements in Q4/2015 reflect the settlement of the failed banks' estates.

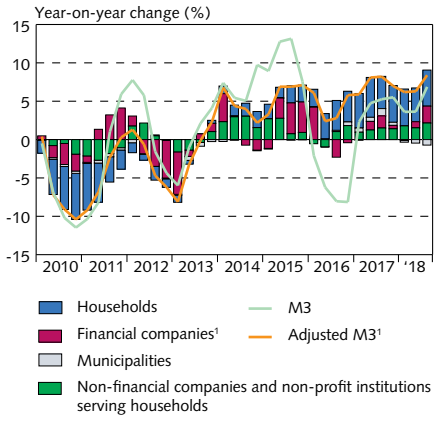
Source: Central Bank of Iceland.

Chart III-9
Exchange rate and volatility of the króna
4 January 2010 - 2 November 2018



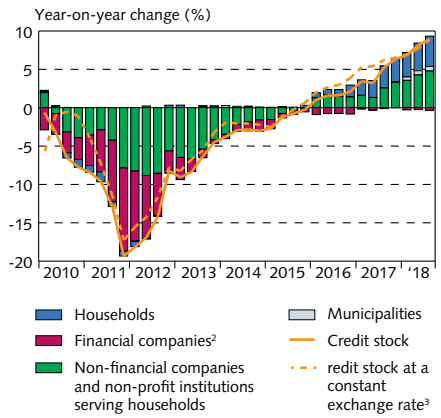
1. Price of foreign currency in krónur 2. 30-day standard deviation of daily changes in the trade-weighted exchange rate index.
Source: Central Bank of Iceland.

Chart III-10
Money holdings
Q1/2010 - Q3/2018



1. Adjusted for deposits of failed financial institutions.
Source: Central Bank of Iceland.

Chart III-11
Credit system lending to resident borrowers and sectoral contribution¹
Q1/2010 - Q3/2018



1. Credit stock adjusted for reclassification and effect of Government debt relief measures. Only loans to pension fund members are included with pension funds. 2. Excluding loans to deposit institutions and failed financial institutions. 3. The foreign-denominated credit stock is calculated using the September 2018 trade-weighted exchange rate index value.
Source: Central Bank of Iceland.

and export growth has slowed. Furthermore, tourism companies' operating environment has grown more difficult, and the outlook is for a slowdown in output growth in H2/2018.

These factors, together with growing concerns about the results of the upcoming wage negotiations, appear to have contributed to investor pessimism, which in turn has led to a depreciation of the króna. Greater uncertainty has also shown in increased exchange rate volatility, as relatively small transactions can have a strong impact on prices in a thin market. The Central Bank did not intervene in the market in 2018, until unrest began to take hold in early September. Since then, the Bank has intervened twice, selling currency for a total of 2.4 b.kr.

Market agents expect the króna to depreciate further

According to the Bank's survey of market agents' expectations, conducted in late October, respondents expect the exchange rate of the króna to fall by almost 2% over the next two years. This is a smaller depreciation than in the last survey, when participants expected a 4½% decline in the next two years, as the exchange rate was nearly 10% lower in October, when the survey was taken, than in August.

Money holdings and lending

Deposit institutions' excess reserves have grown ...

Banknotes and coin have increased at roughly the same pace as in the past few years, in tandem with growth in economic activity and foreign tourist arrivals. Deposit institutions' excess reserves — i.e., the balance on their current accounts with the Central Bank in excess of required reserves — grew faster between years in Q3 than during the quarters beforehand.

... and growth in M3 exceeds nominal GDP growth ...

Annual growth in M3 measured 8½% in Q3/2018, after adjusting for deposits held by the failed financial institutions (Chart III-10). This is a stronger growth rate than in H1 but broadly in line with that seen in Q3/2017. Growth in M3 exceeded estimated nominal GDP growth in Q3, as it did towards the end of 2017.

... owing, as before, to an increase in household deposits

As in the recent past, growth in M3 is attributable to an increase in household deposits. Even though private consumption has grown solidly in the recent term, households' disposable income has grown even faster, and household saving has therefore increased (See Chapter IV). Some of this increased saving found its way to deposit accounts, which have grown by over 10% in the past year.

Growth in lending to domestic borrowers continues to pick up ...

Growth in credit system lending to domestic borrowers was sluggish at the beginning of the economic recovery but began to gain steam in H2/2017 and has continued to increase in 2018 to date. After adjusting for the Government's debt relief measures, the stock of credit system loans to domestic borrowers grew in nominal terms by

an estimated 9% year-on-year in Q3, the swiftest growth rate in a decade (Chart III-11).

… due mainly to growth in corporate lending …

When corporate investment began to pick up at the beginning of the recovery, the increase was equity-financed to a large degree. Right after firms began to seek out more financing, the share of marketable bonds was greater than before, and the large real estate companies played a major role. Now, however, operating companies have obtained direct credit financing from credit institutions to a greater degree than before. Lending to such companies has therefore increased rapidly in recent months, with growth approaching 12½% year-on-year in nominal terms in Q3. As before, credit growth is broad-based and extends to virtually all sectors of the economy, albeit in particular to services companies (especially real estate firms), construction companies, and tourism-related companies (Chart III-12).

… although lending to households also continues to rise

Credit system lending to households has also gained pace in recent quarters. After adjusting for the Government's debt relief measures, the stock of credit system loans to households grew in nominal terms by an estimated 7% year-on-year in Q3 (Chart III-11). Pension fund lending still accounts for the lion's share of the increase, and the funds' share of the credit market has grown simultaneously. The ratio of loans to fund members to the funds' total assets is now above its twenty-year average.

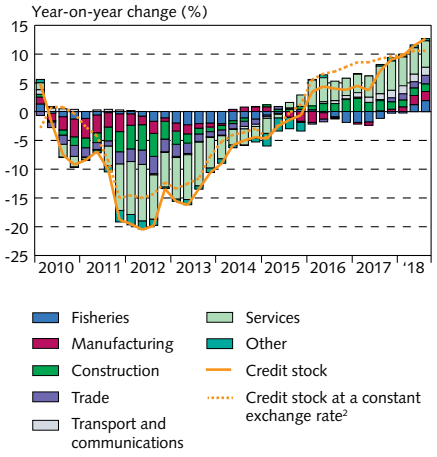
Asset prices and financial conditions

House price inflation continues to ease …

House prices in the greater Reykjavík area were up 3.9% year-on-year in September, and rent rose by 6.1%, according to figures from Registers Iceland. The year-on-year rise in house prices has been smaller than the rise in rent in the past seven months, and it has been tapering off from its peak of nearly 24%, reached in May 2017. House prices in regional Iceland have risen more than those in the capital area in the recent past, as the high price per square metre in greater Reykjavík may well have stimulated demand for housing in nearby communities. In October, house prices in regional Iceland had risen by 14.1% year-on-year, while the rise nationwide measured only 5.8% (Chart III-13).

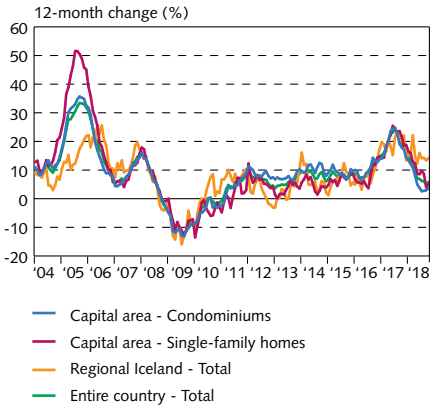
Demand for housing in greater Reykjavík appears to be robust at present, however, with registered purchase agreements increasing in number by nearly 12% year-on-year in the first nine months of 2018 and contracts for the purchase of newly built housing up by some 14%. First-time buyers accounted for over 26% of purchases in Q3, the largest share since before the crisis. The number of new properties in the market has grown markedly since last year, but the number advertised for sale has begun to taper off after peaking in April 2018. The average time-to-sale for capital area homes was 1.6 months in September, 1.4 months shorter than it was a year ago.

Chart III-12
Credit system lending to non-financial companies[1]
Q1/2010 - Q3/2018



1. Estimated loans for September 2018. Excluding loans from failed financial institutions. 2. The foreign-denominated credit stock is calculated using the September 2018 trade-weighted exchange rate index value.
Source: Central Bank of Iceland.

Chart III-13
Market price of residential housing
January 2004 - October 2018

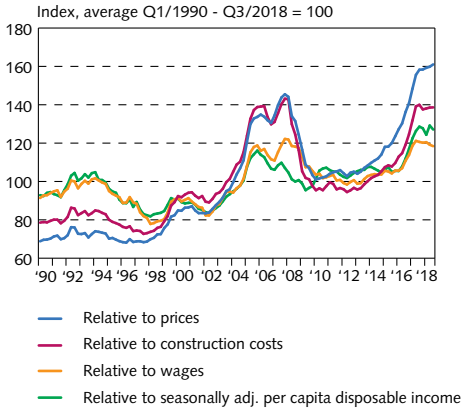


Source: Statistics Iceland.

Chart III-14

House prices relative to prices, construction costs, wages, and income[1]

Q1/1990 - Q3/2018

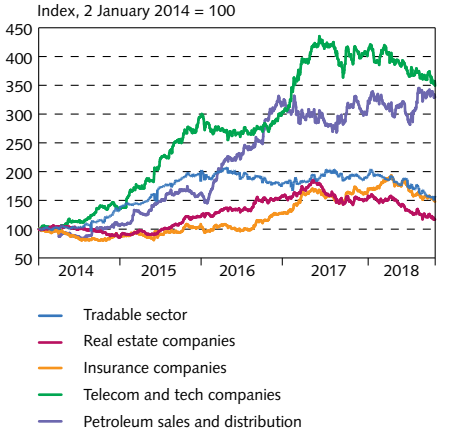


1. The ratio of house prices to the CPI, the building cost index, the wage index, and disposable income per capita (based on the working-age population).
Sources: Statistics Iceland, Central Bank of Iceland.

Chart III-15

Share prices by sector[1]

2 January 2014 - 2 November 2018



1. Average change in share price of listed companies in selected sectors, adjusted for dividend payments and share capital reductions.
Source: Nasdaq Iceland.

... in line with macroeconomic fundamentals

By Q3, real house prices had risen 60% from the early 2010 trough. During the period, there was a significant mismatch between house prices and their macroeconomic determinants, owing primarily to strong growth in short-term rentals to tourists and rapid population growth at a time of limited supply of new housing. (Chart III-14). Unlike the situation in the last housing market boom, the current upswing has not been driven by a surge in lending and indebtedness (see *Monetary Bulletin* 2017/4). Real house prices in terms of the CPI are now higher than ever before and appear to be still on the rise. The rise in house prices relative to wages, income, and building costs appears to have halted, however. Prices are still high relative to construction costs, though, indicating that there is still some incentive to build new properties.

Share prices down in 2018 to date

The Nasdaq Iceland OMXI8 index stands about where it was at the time of the August *Monetary Bulletin*, and about 4% lower than it was a year ago. Share prices fell somewhat at mid-year, following profit warnings from insurance companies, and varying Icelandair share prices have affected the stock market as well. Share prices have fallen since early summer in most sectors, apart from oil companies, whose share prices rose over the same period (Chart III-15). Turnover in the main market totalled 401 b.kr. during the first ten months of the year, about 27% less than over the same period in 2017.

Private sector debt level low in historical context ...

The private sector debt-to-GDP ratio has risen slightly since end-2016, to 160% of estimated GDP by mid-2018. It has therefore risen by 2 percentage points year-on-year (Chart III-16). Corporate debt increased by 9.8% year-on-year in nominal terms, to 86% of GDP, 2 percentage points higher than at the same time a year ago. Corporate debt to domestic financial institutions grew most, whereas there was little change in issued marketable bonds and debt to foreign financial institutions. Household debt increased by 6% over the same period, giving a year-end debt ratio of 75%. Although the private sector debt ratio has risen slightly in the recent term, it remains low in historical context, and foreign-denominated debt levels have fallen sharply since before the crisis (Chart III-17). Households' foreign-denominated debt is virtually non-existent, and in the corporate sector, foreign debt is limited mainly to export companies. Furthermore, public sector and financial sector debt in foreign currencies has declined markedly.

... and non-performing loans are on the decline

The share of household debt in arrears to the three large commercial banks and the HFF measured 2.3% at the end of September, after falling by just under 1 percentage point in the previous twelve months. Furthermore, the number of individuals on the CreditInfo default register declined by 6.4% year-on-year in September. The share of firms in default to credit institutions has also fallen, to 6.5% by September,

a reduction of 2.5 percentage points from the previous year. In September, the number of firms on the default register had fallen by 5% year-on-year. In spite of the decline in default, corporate insolvencies increased in number between years in H1, although the number of insolvencies relative to the total number of companies has remained stable in the recent term. New company registrations declined slightly in number in 2017 and have continued to fall in 2018.

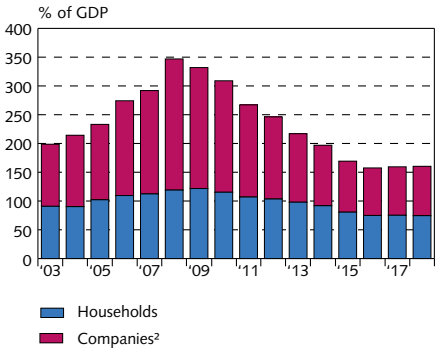
Fixed non-indexed mortgage lending rates have risen

Until this autumn, non-indexed deposit and lending rates offered by banks and pension funds had been virtually unchanged since October 2017, as Central Bank rates had been unchanged since then. In September and October, some commercial banks and pension funds raised rates on fixed non-indexed mortgages, with the average increase equal to ⅓ of a percentage point. Indexed interest rates have been broadly unchanged over this period, however, apart from variable rates charged by some of the pension funds. As before, pension fund loans bear somewhat lower interest rates than comparable loans from the commercial banks.

The arrangements for credit institutions' minimum required reserves with the Central Bank were changed in early June. The change was not intended to affect the monetary stance and does not appear to have done so. Recent increases in mortgage lending rates appear rather to reflect rising inflation expectations. In other respects, households' and businesses' financial conditions are broadly unchanged since the last *Monetary Bulletin*, and access to credit appears more or less unchanged as well.

Chart III-16

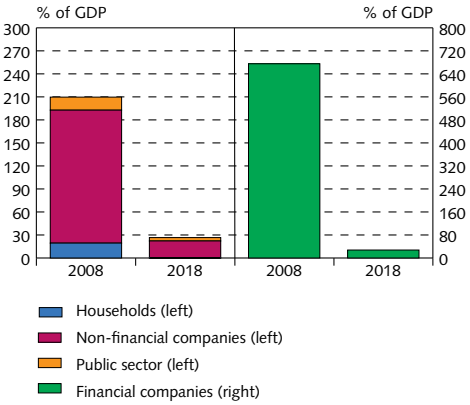
Household and non-financial corporate debt 2003-2018[1]



1. Debt owed to financial undertakings and market bonds issued. 2. Excluding financial institutions (which includes holding companies).
Sources: Statistics Iceland, Central Bank of Iceland.

Chart III-17

Foreign-denominated debt[1]



1. Liabilities denominated in or linked to foreign currencies. Non-financial corporations (excluding holding companies). 2008 figures are from September 2008 for households and businesses and August 2008 for the public sector. 2018 figures are from June 2018 for households and businesses and September 2018 for the public sector (year-end estimates from MB 2018/4 for municipalities).
Sources: Statistics Iceland, Central Bank of Iceland.

IV Demand and GDP growth

Revised figures show that 2017 GDP growth was stronger than previous figures had indicated and growth for H1/2018 was faster than had been forecast in the August *Monetary Bulletin*. Although the pace of GDP growth is expected to slow in H2, the outlook is for stronger growth in 2018 as a whole. The composition of GDP growth is changing as well. Private sector demand is growing slower than before, whereas public sector demand growth has been more resilient. In addition, the outlook is for a positive contribution of net trade to output growth for the first time in five years. In part, this is because demand has shifted increasingly towards domestic production.

GDP growth and domestic private sector demand

GDP growth exceeded expectations in H1/2018

According to revised figures from Statistics Iceland, GDP growth measured 4% in 2017, about 0.4 percentage points more than previous figures had suggested. Growth slowed from 2016 onwards but gained pace again in H1/2018. Figures from Statistics Iceland indicate that GDP growth measured 7.2% in Q2/2018 and 6.4% in H1 as a whole. Growth in domestic demand eased from the 2017 level, but the contribution from net trade was much more favourable, owing to a sizeable contraction in import growth and a smaller contraction in export growth.[1]

The forecast in the August *Monetary Bulletin* assumed that GDP growth would increase in H1, but less than Statistics Iceland figures indicate. On the whole, consumption and investment increased in line with the Bank's forecast, reflecting offsetting effects of weaker private consumption versus stronger business investment, while the contribution of net trade was more favourable than had been anticipated (Chart IV-1). In addition, the contribution from inventory changes was greater than had been forecast in August, although it is expected to even out in H2, resulting in a broadly neutral contribution for the year as a whole.

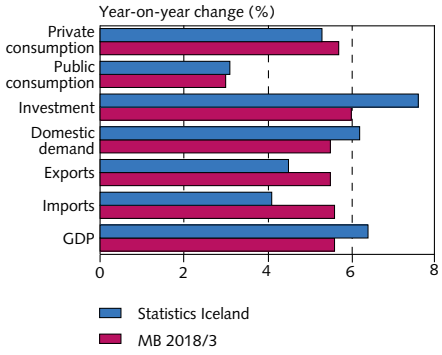
Private consumption growth weaker than expected …

Private consumption grew by 5.3% in H1/2018, somewhat less than in the previous two years but still a full 2 percentage points above its long-term annual average. This is slightly below the August forecast of 5.7% growth for the half.

… and set to continue easing

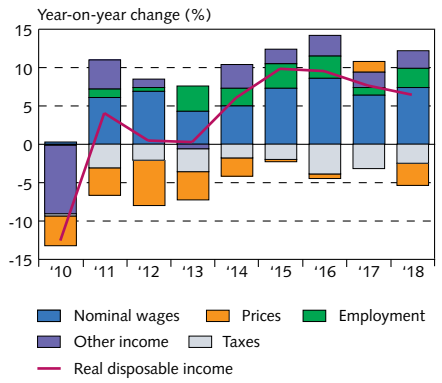
Real disposable income is estimated to have risen by 7.7% in 2017, concurrent with strong job growth and rising wages (Chart IV-2).[2] Dis-

Chart IV-1
National accounts H1/2018



Sources: Statistics Iceland, Central Bank of Iceland.

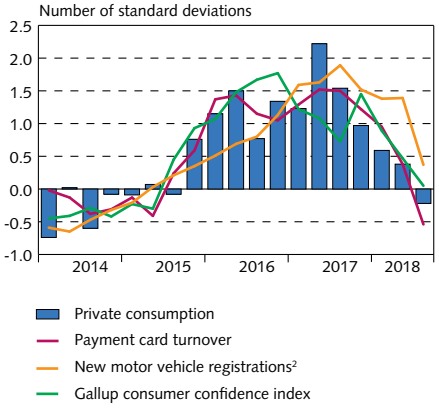
Chart IV-2
Real disposable income and its main components 2010-2018[1]



1. The contribution of the main underlying components to annual changes in real disposable income is calculated based on each component's weight in disposable income. The combined contribution of underlying components does not add up to the total change due to rounding and incomplete income accounts for households from Statistics Iceland. Central Bank baseline forecast 2017-2018.
Sources: Statistics Iceland, Central Bank of Iceland.

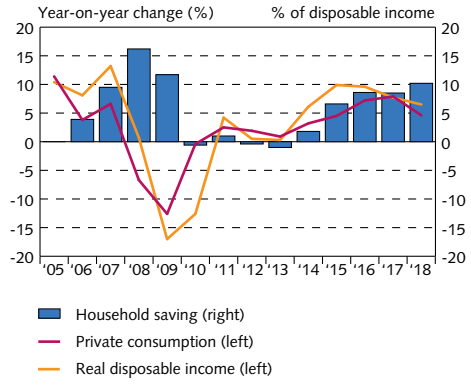
1. This year marks a decade since the financial crisis struck in autumn 2008. In view of this, Box 2 presents an assessment of the post-crisis output loss.
2. Statistics Iceland's figures on households' disposable income for the prior year are usually available by the time the fourth issue of *Monetary Bulletin* is published; however, because of delays in publishing the Government accounts, these figures are not available at present.

Chart IV-3
Private consumption and its indicators[1]
Q1/2014 - Q3/2018



1. The data are scaled so that their average from 2011 is 0 and the standard deviation is 1. Private consumption and payment card turnover are annual changes, while new motor vehicle registrations and the Gallup Consumer Confidence Index are seasonally adjusted time series.
2. New motor vehicle registrations net of car rental agencies' applications for new registrations in each quarter.
Sources: Gallup, Statistics Iceland, Central Bank of Iceland.

Chart IV-4
Private consumption, disposable income, and saving 2005-2018[1]



1. There is some uncertainty about Statistics Iceland's figures on households' actual income levels, as disposable income accounts are not based on consolidated income accounts and balance sheets. The saving ratio is calculated based on the Central Bank's disposable income estimates, as Statistics Iceland figures are rescaled to reflect households' estimated expenses over a long period. Central Bank baseline forecast 2018.
Sources: Statistics Iceland, Central Bank of Iceland.

posable income growth is assumed to ease this year but remain robust, at 6.5%. Households' assessment of their own employment position and the general economic outlook appears to have deteriorated in the recent past, however, and there are signs of a change in sentiment, as can be seen in weaker payment card turnover and a year-on-year reduction in new motor vehicle registrations (Chart IV-3). It is possible that the market is saturated after the past several years' surge in new car registrations and household purchases of consumer durables. Private consumption growth is expected to ease still more in H2, and the growth rate for 2018 as a whole is projected at 4.6%, or 1 percentage point below the August forecast. This implies that household saving is set to increase further (Chart IV-4).

Investment growth outpaces forecasts …

Investment grew by 7.6% year-on-year in H1/2018, outpacing the Bank's August forecast. Growth in business investment was considerably stronger than had been projected, but on the other hand, growth in residential and public investment was weaker. Business investment grew by 5.6% in H1, contrary to the Bank's August forecast of a contraction. The main difference was in general business investment — i.e., investment excluding energy-intensive industry and ships and aircraft — which turned out stronger than projected. Investment in ships and aircraft increased somewhat in H1, and it appears that energy-intensive investment for the year as a whole will be more front-loaded than the Bank had assumed in August.

… but businesses plan less investment this year than they did in the spring

The results of the Bank's survey of corporate investment plans, carried out this autumn, suggest that the investment plans covered by the survey will be smaller in scope than in 2017 (Table IV-1). The greatest differences are in transport and tourism and in retail and wholesale trade. In comparison with the Bank's spring survey, the results suggest that on the whole, firms are planning less investment this year, although this is due in particular to changes in plans by a few large companies in these two sectors. The survey results are interesting,

Table IV-1 Survey of corporate investment plans (excluding ships and aircraft)[1]

Largest 99 (102) firms Amounts in ISK billions	*2017*	*2018*	*2019*	*Change between 2017 and 2018 (%) (last survey)*	*Change between 2018 and 2019 (%)*
Fisheries (15)	14.4	12.8	14.3	-10.8 (-14.3)	11.4
Manufacturing (16)	8.5	6.6	5.5	-23.0 (-19.5)	-17.0
Wholesale and retail trade (21)	8.6	7.5	8.9	-12.9 (13.5)	19.5
Transport and tourism (8)	28.7	18.1	20.4	-36.7 (3.9)	12.3
Finance/Insurance (9)	3.5	5.4	6.0	54.4 (28.2)	9.9
Media and IT (6)	7.6	7.8	7.6	3.1 (-2.0)	-3.3
Services and other (24)	19.0	14.3	16.1	-24.9 (-25.5)	13.2
Total 99 (102)	90.3	72.6	78.8	-19.6 (-4.8)	8.6

1. In parentheses are figures from the last survey, in which respondents from 102 firms were asked about investment plans for 2017-2018 (*Monetary Bulletin* 2018/2). A paired comparison between years is presented, but because the sample could change between surveys, this could affect the results.
Source: Central Bank of Iceland.

given that general business investment was stronger than forecast in H1/2018. It should be borne in mind, though, that the survey does not include hotel construction, where activity has been brisk this year.

Gallup's survey of the position and future prospects of Iceland's 400 largest firms, carried out in September, gives a similar view of businesses' investment plans. As compared with Gallup's February survey, there was an increase in both the number of respondents planning to step up investment and the number planning to scale it down. The increase in the latter group was larger, and for the first time since September 2013, the number of executives who expect to cut back on investment exceeded the number planning an increase. According to the Gallup survey, companies that have scaled down investment plans since the last survey are primarily in the transport, transit, and tourism sector and in miscellaneous specialised services, which is in line with the Bank's survey (Chart IV-5). Companies in construction are more pessimistic than in the last survey as regards developments in domestic demand for their products in the next six months, indicating that the past few years' surge in building and construction investment will begin to ease (Chart IV-6).

Share of credit-financed business investment declines in 2018

The Bank's investment survey reveals that about 30% of this year's investment will be credit-financed, about 8½ percentage points less than in 2017, with tourism and transport companies and contracting firms reducing their share of credit financing the most. In comparison with the Bank's spring survey, the share of planned credit financing has fallen by about 5 percentage points. The survey suggests that the share of credit financing will pick up again in 2019, to 38%, about the same level as in 2016-2017, with much of the increase from fisheries and contracting firms.

Business investment set to decline in 2018

Based on the investment survey and other indicators of business investment and investment plans, it is assumed that business investment will contract by 3% in 2018 as a whole. The forecast assumes that growth in general business investment will slow markedly and that other types of business investment will also contract in H2, in line with leading indicators (Chart IV-7). Energy-intensive investment and investment in ships and aircraft appear likely to be weaker this year than in 2017; however, this will be offset in part by a 2% increase in general business investment. According to the forecast, general business investment will turn out somewhat stronger than the investment survey implies. In this context, it should be borne in mind that the survey does not include small businesses and that the largest changes in the survey stem from a few large companies' changes in plans. Weaker growth in general business investment in H2 is more in line with other indicators, such as the Gallup corporate sentiment survey.

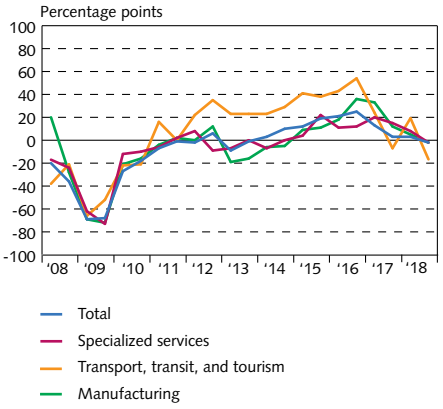
Signs of increased growth in residential investment

Residential investment grew by just over 24% in H1/2018 and has been one of the mainstays of investment growth in the recent term,

Chart IV-5

Investment: balance of opinion, by sector[1]

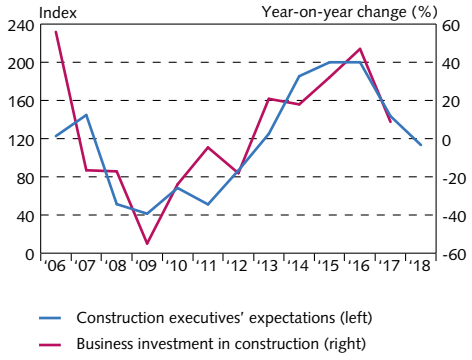
Q1/2008 - Q3/2018



1. Balance of opinion is the share who expect investment to increase between years less the share who expect it to decrease.
Source: Gallup.

Chart IV-6

Expectations within construction sectors and developments in construction 2006-2018[1]

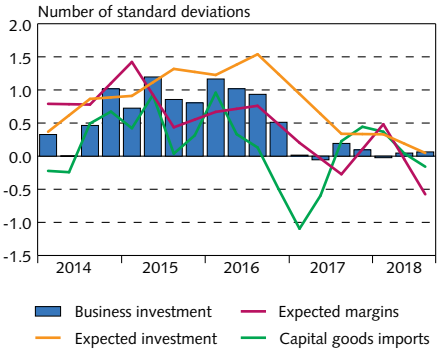


1. Expectations of executives in the construction and utilities sectors on developments in domestic demand for their firms' goods and/or services in the next six months. The index takes a value between 0 and 200, with a value of 100 indicating parity between those expecting an increase and those expecting a decrease.
Sources: Gallup, Statistics Iceland, Central Bank of Iceland.

Chart IV-7

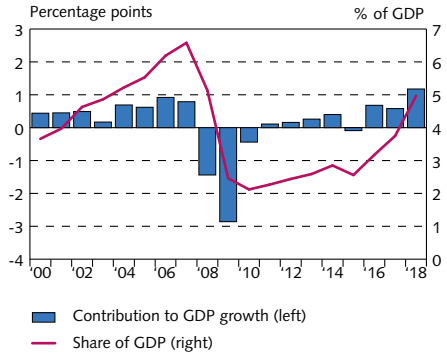
Business investment and its indicators[1]

Q1/2014 – Q3/2018



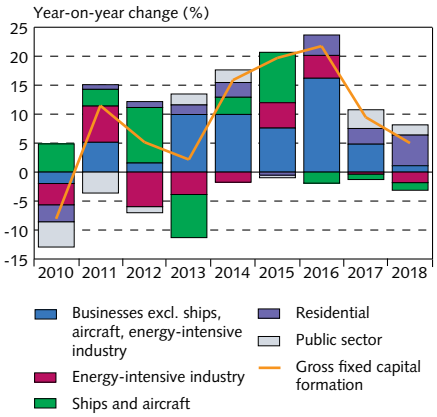
1. The data are scaled so that their average from 2006 is 0 and the standard deviation is 1. Two-quarter moving average for annual change in business investment and imports of investment goods. Figures on expected margins (EBITDA) and investment taken from measurements of expectations six months ahead of executives from Iceland's 400 largest companies. Central Bank baseline forecast Q3/2018 for business investment.
Sources: Gallup, Statistics Iceland, Central Bank of Iceland.

Chart IV-8
Residential investment 2000-2018[1]



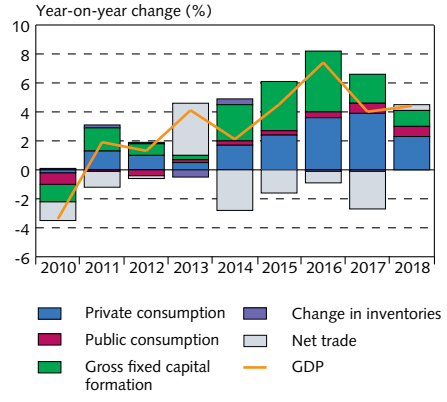
1. Central Bank baseline forecast 2018.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart IV-9
Gross fixed capital formation and contribution of main components 2010-2018[1]



1. Central Bank baseline forecast 2018.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart IV-10
GDP growth and contribution of underlying components 2010-2018[1]



1. Central Bank baseline forecast 2018.
Sources: Statistics Iceland, Central Bank of Iceland.

driven by growing household real earnings and rising house prices. The increase in H1 was smaller than had been projected in August, however. In spite of this, residential investment is forecast to grow by nearly a third in 2018 as a whole, as was assumed in August. This is based in part on a recent count taken by the Federation of Icelandic Industries of flats under construction, which indicates that the number of fully finished properties will increase strongly this year. If the forecast materialises, the contribution of residential investment to year-2018 GDP growth will rise above its pre-crisis peak (Chart IV-8).

Investment growth to ease this year

After a few strong years, investment growth slowed markedly in H1/2018, owing in particular to weaker growth in business investment. For 2018 as a whole, investment spending is expected to increase by a total of 5%, roughly half of last year's growth rate. Growth in general business investment is weakening apace, and in the energy-intensive industry and in ships and aircraft, investment spending is contracting. This is offset by robust growth in residential and public investment (Chart IV-9). If the forecast materialises, the investment-to-GDP ratio will be close to 23% this year, some 1½ percentage points above its long-term average.

GDP growth to pick up in 2018 despite weaker domestic demand

In H1/2018, GDP growth was considerably stronger than previously forecast, as is discussed above. The outlook is for a slowdown in H2, however, and the baseline forecast assumes that growth for 2018 as a whole will measure 4.4%. This is 0.4 percentage points more than in 2017, in spite of reduced growth in domestic demand and exports. Demand appears to have shifted increasingly to domestic production, as can be seen in a contraction in goods imports in H1 and signs of a continued contraction in Q3. The outlook is for the contribution of net trade to output growth to be positive by 0.4 percentage points in 2018, after having been markedly negative in recent years (Chart IV-10). This is also a change from the Bank's August forecast. The outlook is for GDP growth to be 0.8 percentage points above the August forecast, even though domestic demand growth will be 0.5 percentage points weaker. The GDP growth outlook for coming years is broadly unchanged, however; as before, output growth is expected to ease towards its long-term trend rate of 2.7%.

Public sector

Public consumption growth expected to remain robust

Public consumption grew by 3.1% in H1/2018, about the same as in 2017 and in line with the forecast in the August *Monetary Bulletin*. Developments in H2 are projected to be broadly the same as in H1, with growth for the year as a whole measuring 2.9%. The forecast assumes that growth in central and local government consumption will be similar. On the other hand, public investment was considerably less than previously estimated, due in part to the lag between increased budgetary allocations and project implementation. The forecast therefore assumes that public investment will expand faster in H2, as budg-

etary allocations are used for development, and that the increase for 2018 as a whole will measure just over 12%. Public consumption and investment combined are expected to grow by 4% this year, and their contribution to GDP growth is about 1 percentage point, somewhat less than in 2017 (Chart IV-11).

Treasury outcome improves slightly from the previous estimate

The Treasury outcome for this year is set to be well in line with the assumptions in the National Budget, which was passed with a surplus of 33 b.kr. There are several changes in composition of revenues and expenditures, however. For example, regular primary income will be 7 b.kr. less than was provided for in the Budget, whereas dividends paid by the State-owned commercial banks will be increased by just over 6.5 b.kr., to 37.7 b.kr. Expenditures other than interest expense will be greater than was assumed in the Budget, and interest expense will be lower, and the overall impact on the Treasury outcome will be negative by 0.1% of GDP. This year's outcome will therefore be slightly better than last year's. It is assumed that there will be an underlying surplus of 0.8% of GDP, whereas the surplus on the underlying primary balance will be 2.4% of GDP (Chart IV-12).

Fiscal stance to tighten marginally in 2018 but set to ease slightly again in the following two years

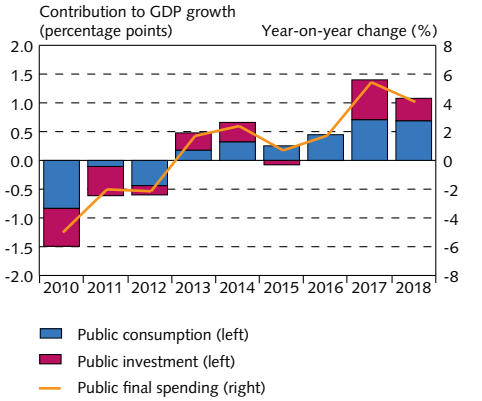
In terms of the cyclically adjusted primary balance, the fiscal stance has eased considerably in the past three years. However, if the Bank's forecast materialises, that will change this year, and the stance will tighten slightly (Chart IV-13) although less than was estimated this when the Bank last assessed the fiscal stance. Based on the fiscal budget proposal for 2019, however, the fiscal stance can be expected to ease again during the year, albeit less than was assumed last spring (for further discussion of the budget proposal, see Box 3). According to current estimates, the stance is also set to ease slightly in 2020, although this will reverse in part in 2021. Over the period as a whole, the outlook for the fiscal stance is broadly unchanged since the spring, however. General government debt will therefore continue to decline broadly as has been assumed in the past.

External trade and the current account balance

Export growth in H1 weaker than assumed in August

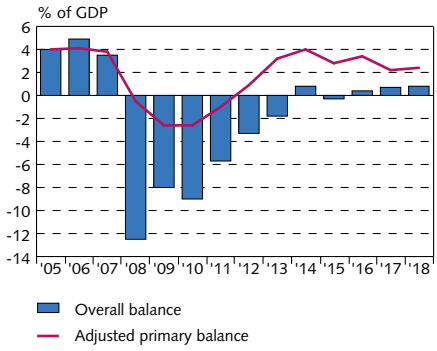
Exports of goods and services grew by 4.5% year-on-year in H1/2018. Goods exports grew by over 6%, owing mainly to marine product exports, which reflects in large part the contraction early in 2017 resulting from the fishermen's strike. Services exports grew by just over 3%, somewhat less than in recent years, due largely to slower growth in tourism. Growth in total exports in H1 was 1 percentage point weaker than was assumed in August, owing in large part to Statistics Iceland's revision of previously published export figures, which show that export volumes were higher in 2017 than previously thought. Goods and services export volumes in H1/2018 were therefore well in line with the Bank's August forecast. The composition of services exports was slightly different than projected, however. The transport and transit

Chart IV-11
Public consumption and investment 2010-2018[1]



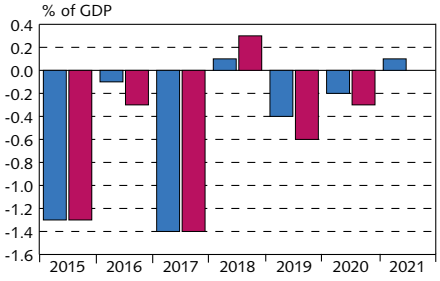
1. Central Bank baseline forecast 2018.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart IV-12
Treasury balance 2005-2018[1]



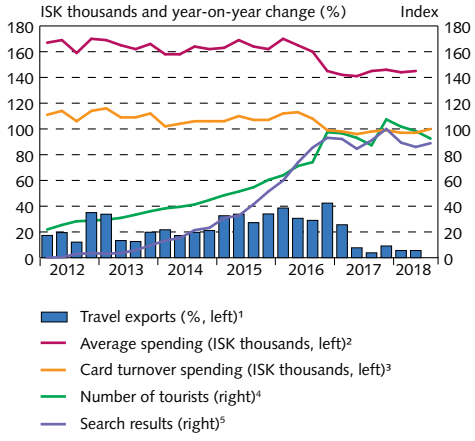
1. The primary balance is adjusted for one-off items. In 2016 to 2018, both the overall and primary balance is adjusted for stability contributions, accelerated write-downs of indexed mortgage loans, special payment to LSR A-division and dividends in excess of the National Budget. Central Bank baseline forecast 2018.
Sources: Ministry of Finance and Economic Affairs, Statistics Iceland, Central Bank of Iceland.

Chart IV-13
Change in central government cyclically adjusted primary balance 2015-2021[1]



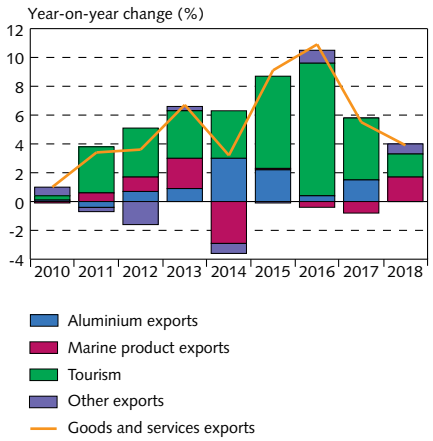
1. Primary balance is adjusted for one-off items (stability contributions, accelerated write-downs of indexed mortgage loans, special payment to LSR A-division and dividends in excess of the National Budget). Central Bank baseline forecast 2018-2021.
Sources: Ministry of Finance and Economic Affairs, Statistics Iceland, Central Bank of Iceland.

Chart IV-14
Indicators of tourism sector activity
Q1/2012 - Q3/2018



1. Year-on-year change of travel exports, at constant prices. 2. Seasonally adjusted average spending per tourist in Iceland, according to services export data. 3. Seasonally adjusted payment card turnover spending per tourist (excluding international airfares and public levies). 4. Seasonally adjusted passenger departures via Keflavík Airport. 5. A principal component model combining the frequency of five different Google search strings relating to travel to Iceland (seasonally adjusted).
Sources: Centre for Retail Studies, Google Trends, Icelandic Tourist Board, Isavia, Statistics Iceland, Central Bank of Iceland.

Chart IV-15
Exports and contribution of subcomponents 2010-2018[1]



1. Aluminium exports as defined in the national accounts. Tourism is the sum of "travel" and "passenger transport by air". Central Bank baseline forecast 2018.
Sources: Statistics Iceland, Central Bank of Iceland.

component contracted unexpectedly year-on-year in H1, for the first time since 2008. On the other hand, both the travel component and other services exports grew more than anticipated.

Outlook for weaker growth in services exports in 2018 …

Growth in services exports has lost pace in the recent term, after a surge in the past few years, particularly in tourism. There are signs that growth will continue this year, but at a more moderate pace than was forecast in August. The reduced growth rate is due in particular to base effects stemming from the aforementioned revision of last year's figures. It is also assumed that growth in tourism will ease as a result of a contraction in the transport component of services exports. In spite of this, the tourism industry looks set to keep growing apace. The number of foreign tourists visiting Iceland was up year-on-year by 3.3% this summer and by 5.5% in the first nine months of 2018. The increase is considerably smaller than in recent years but more than industry analysts had expected. Other indicators also imply that tourism will continue growing this year. For instance, the number of people who used search engines to search for hotels in and flights to Iceland was about the same in Q3 as in the first half of this year (Chart IV-14). In addition, average spending per tourist increased slightly year-on-year in krónur terms in H1, and foreign nationals' payment card withdrawals in Iceland suggest as well that turnover per tourist was up slightly between years in Q2 and Q3. Spending per tourist is still somewhat less than in 2012-2015, however. The number of hotel bed-nights booked by foreign nationals has also increased between years. On the whole, then, the outlook is for growth in services exports to be broadly unchanged between H1 and H2, measuring 3.6% for the full year.

… but stronger growth in goods exports

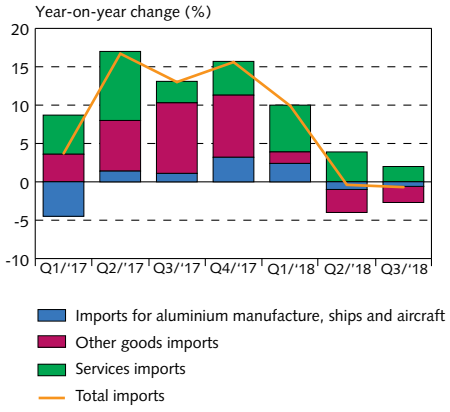
Goods exports are forecast to grow by 4.2% this year, a full 1 percentage point more than in the August forecast, even though the increase in H1 was smaller than was projected then. The greatest difference was the prospect of more than 10% growth in marine product exports, which would be the strongest seen in decades and nearly 3 percentage points stronger than was forecast in August. The upward revision since August is due mainly to increased fish catches in Q3, but also to an increased demersal fish quota in the current fishing year, which began on 1 September. The outlook is therefore for goods and services exports to grow by 3.9% in 2018 as a whole, which is broadly in line with the August forecast (Chart IV-15).

Import growth has eased after several strong years

The outlook is for import growth to ease faster in 2018 than previously projected, after several years of robust growth. The slowdown is due in particular to weaker growth in domestic demand, but by the same token, demand appears to be shifting increasingly towards domestic production. Imports of goods and services grew by 4.1% year-on-year in H1, some 1½ percentage points less than was assumed in the August forecast. The main factor here was a 1% contraction in goods imports, which in turn was due to a year-on-year contraction in im-

ports of passenger cars, other consumer durables, and commodities and operational inputs. Growth in imports of most goods has eased, apart from fuels and lubricants, which have increased between years. Preliminary external trade figures from Statistics Iceland also suggest that goods imports contracted still further year-on-year in Q3 (Chart IV-16). Counteracting the contraction in goods imports, services imports were somewhat stronger in H1 than was anticipated in August, and appear set to grow swiftly in 2018 as a whole. For instance, travel agency figures indicate a continued year-on-year increase in Icelandic nationals' departures via Keflavík Airport. For this reason, the Bank's forecast of 2018 goods and services imports has been revised significantly since August. Growth is now forecast at only 3.3%, as opposed to 6% in August. If the forecast materialises, the contribution of net trade to output growth will be positive by 0.4 percentage points instead of being negative by just under 1 percentage point, as was assumed in August. This would be the first positive contribution from net trade in five years.

Chart IV-16
Imports and contribution of subcomponents[1]
Q1/2017 - Q3/2018



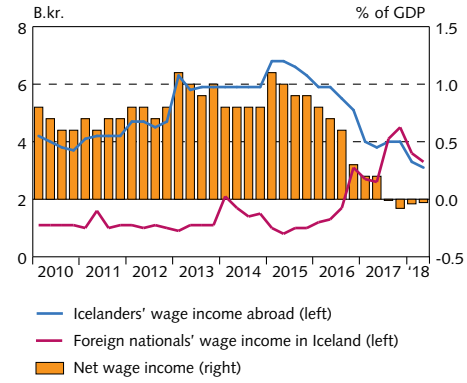
1. Aluminium imports according to national accounts definition. Central Bank baseline forecast Q3/2018.
Sources: Statistics Iceland, Central Bank of Iceland.

Surplus on goods and services trade set to grow in 2018

The surplus on combined goods and services trade measured 1% of GDP in H1/2018, slightly less than was forecast in August and less than in H1/2017, when it measured 1.9% of GDP. The trade surplus for 2018 as a whole is now estimated at 3.6% of GDP, 1.2 percentage points more than was forecast in August. A smaller goods account deficit, owing to reduced imports, is the main reason for the changed outlook, although it is offset in part by a smaller surplus on services trade.

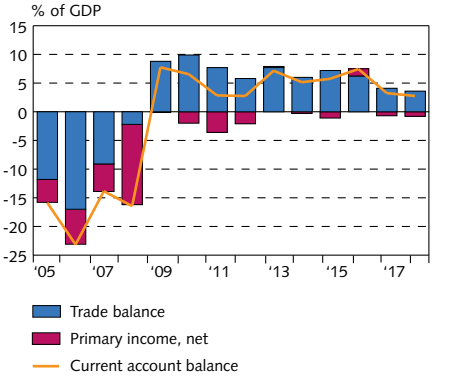
2018 will be the tenth consecutive year with a sizeable current account surplus. The surplus has been shrinking, however, in the recent term. In H1/2018, it measured 0.4% of GDP, down from 1.6% for the same period in 2017 and 3.8% in H1/2016. In addition to the shrinking surplus on goods and services trade, the balance on primary and secondary income reversed last year from a surplus to a deficit. Income from foreign direct investment (FDI) has contracted more than FDI expense. Furthermore, Icelanders' foreign wage income has contracted in recent years, at the same time that foreign nationals' wage income in Iceland has increased due to the appreciation of the króna and the rise in the number of foreign workers (Chart IV-17). The primary and secondary income balance is also expected to be negative this year, but to a lesser degree than was forecast in August. The current account surplus is still expected to shrink, although more favourable goods trade will offset it. The surplus is projected at 2.8% of GDP this year, as opposed to the 1.3% forecast in August (Chart IV-18). If the forecast materialises, gross national saving will measure 25½% of GDP in 2018, as in 2017.

Chart IV-17
Net wage income
Q1/2010 – Q2/2018



Sources: Statistics Iceland, Central Bank of Iceland.

Chart IV-18
Current account balance 2005-2018[1]



1. Including secondary income. Current account excluding the effect of failed financial institutions 2008-2015 and the pharmaceuticals company Actavis 2009-2012 on primary income. Also adjusted for the failed financial institutions' financial intermediation services indirectly measured (FISIM). Central Bank baseline forecast 2018.
Sources: Statistics Iceland, Central Bank of Iceland.

V Labour market and factor utilisation

The outlook is for job creation to continue, although it has probably peaked. Total hours worked increased more in Q3 than was assumed in the Bank's August forecast. The labour participation rate rose slightly year-on-year, as did the employment rate; therefore, unemployment remained unchanged between years. According to Gallup's survey of Iceland's 400 largest firms, job growth is expected to continue this year, but at a slower pace than in 2017. Immigration of foreign labour is still growing strongly, and the number of firms considering themselves understaffed has fallen concurrently. The number of firms operating above capacity has also declined, although the percentage falling into this category is still historically high. On the whole, the output gap appears to be narrowing; however, with the revision of GDP growth figures for 2017 and H1/2018, it appears to be wider than was assumed in August. The outlook, however, is for the output gap to close faster than was forecast then.

Labour market

Strong increase in total hours worked in Q3 ...

According to the Statistics Iceland labour force survey (LFS), total hours worked increased by 4.3% year-on-year in Q3, well in excess of both the Bank's August forecast and the year-on-year growth rate in the past five quarters (Chart V-1). The number of employed persons rose by 4.1%, and the average work week lengthened slightly. As has previously been discussed in *Monetary Bulletin*, the LFS probably underestimated job creation for a period of time, owing to the large increase in the number of foreign workers not captured by the survey. Now, however, it appears that LFS measurements of the increase in worker numbers align more closely with measurements from the pay-as-you-earn (PAYE) register, with the latter indicating that labour demand growth has peaked (Chart V-2).

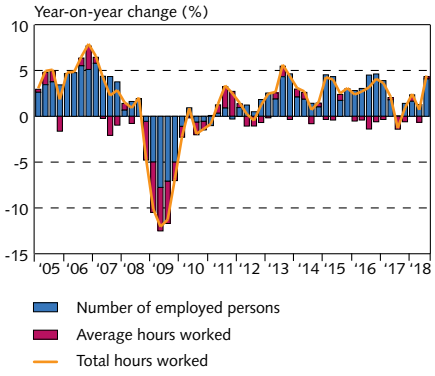
... but unemployment is broadly unchanged year-on-year

According to the LFS, the labour participation rate rose by 0.4 percentage points year-on-year in Q3, to a seasonally adjusted 81.7%. The employment rate rose commensurably, and the unemployment rate was unchanged year-on-year as a result. The seasonally adjusted unemployment rate was 2.6% in Q3, some 0.3 percentage points lower than in the previous quarter. The underemployment rate (i.e., part-time workers who would like to work more) has continued to decline between years, however, to 3.5% in Q3, 0.5 percentage points below its 2003-2007 average. Long-term unemployment is very low and has hovered around 0.2-0.4% since Q4/2015 (Chart V-3).

Job growth projected to continue in the next six months

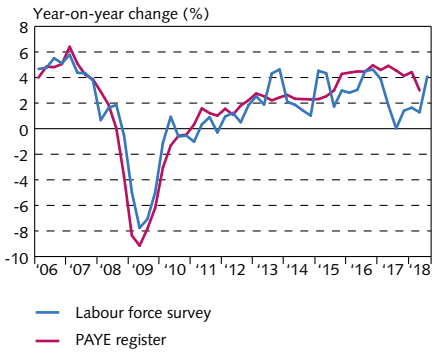
According to Gallup's autumn survey of Iceland's 400 largest companies, the share planning to add on staff exceeded the share planning redundancies by 4 percentage points. This balance of opinion has been broadly unchanged in the past two surveys and slightly below

Chart V-1
Employment and hours worked[1]
Q1/2005 - Q3/2018



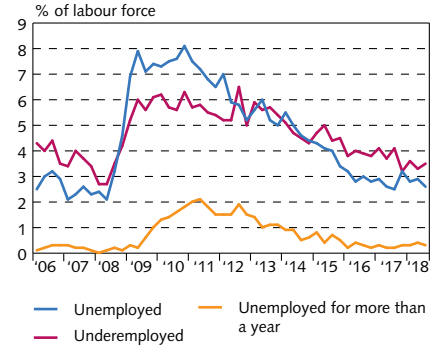
1. Quarterly averages of monthly figures.
Source: Statistics Iceland.

Chart V-2
Number of employed persons[1]
Q1/2006 - Q3/2018



1. Quarterly averages of monthly data for number of employed persons according to labour force survey. The number of employed according to pay-as-you-earn (PAYE) register is based on data on individuals aged 16-74 who received employment income included in the Director of Internal Revenue's PAYE register, including individuals on childbirth leave and self-employed persons.
Source: Statistics Iceland.

Chart V-3
Unemployed and underemployed[1]
Q1/2006 - Q3/2018

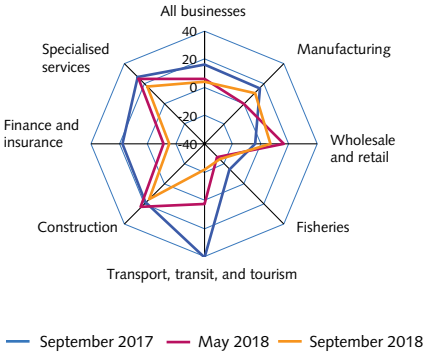


1. Underemployed workers are part-time workers who want to work more. Seasonally adjusted figures.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart V-4

Firms planning recruitment net of firms planning redundancies within 6 months[1]

Share of businesses (%)

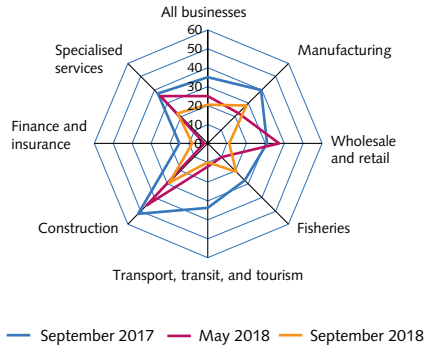


1. Seasonally adjusted figures.
Sources: Gallup, Central Bank of Iceland.

Chart V-5

Firms considering themselves short-staffed[1]

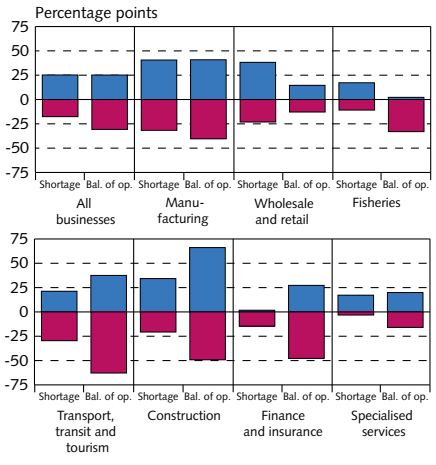
Share of businesses (%)



1. Seasonally adjusted figures.
Sources: Gallup, Central Bank of Iceland.

Chart V-6

Fluctuations in labour demand and worker shortages[1]



1. The chart shows the change in the balance of opinion (bal. of op.) between firms planning to recruit and those planning redundancies and the share of firms experiencing worker shortages in 2014-2016 and 2016-2018. Average of summer and autumn surveys for the year. Seasonally adjusted figures.
Sources: Gallup, Central Bank of Iceland.

its historical average. The outlook among companies in construction and miscellaneous specialised services is for continued recruitment. In these sectors, the balance of opinion ranged between 15 and 17 percentage points in favour of those planning to take on workers, which is noticeably smaller than in the previous survey. The survey results also indicate plans for continued recruitment among companies in industry and manufacturing, as well as those in wholesale and retail trade. As before, fishing companies planning to downsize outnumbered those planning to recruit. It is also possible that the number of jobs in transport, transit, and tourism will decline, in a significant change from the autumn 2017 survey, which indicated plans for sizeable staffing increases (Chart V-4).

Indicators of factor utilisation

Worker shortages have diminished

About a fifth of firms are having difficulty filling jobs, according to the seasonally adjusted results of Gallup's autumn survey. This share, which is in line with the historical average, has fallen by 5 percentage points since the summer survey and about 15 percentage points in the past year (Chart V-5). The shortage of workers was most pronounced in the construction industry and the industrial and manufacturing sector, where it was nearly 30%, although this is not high in historical terms. There is little shortage, however, of workers in transport, transit, and tourism, or in financial services and retail and wholesale trade. In these sectors, the share of executives reporting difficulties filling available positions was in the 8-11% range, slightly below the historical average. The survey results could indicate a forthcoming reduction in jobs in financial services and in tourism-related sectors in the next six months.

Recruitment plans and understaffing have generally developed in line with the business cycle

According to the Gallup survey, the labour market upswing appears to have peaked in mid-2016, and recruitment plans have slowed accordingly since then. This can be seen clearly in Chart V-6, which shows how a steadily increasing number of firms planned to add on staff beginning in mid-2014, when worker shortages also became more common. This turned around in H2/2016, virtually across all sectors, albeit slightly more in transport, transit, and tourism. The chart also shows how symmetric the turnaround is within sectors; i.e., the number of firms planning to hire and the number considering themselves understaffed have declined at about the same pace as they increased until mid-2016.[1] Recruitment plans and difficulty filling available jobs have therefore broadly developed in line with the business cycle.

Labour importation still strong despite slowdown

Figures on net migration in Q3 show that importation of foreign workers is still strong, although it has receded from last year's peak level.

1. The most pronounced exceptions are the fishing industry, which has been crowded out by the tourism boom, and financial services, which has downsized in recent years.

Net migration was positive by 1% of the population during the quarter, and the number of foreign nationals living in Iceland has increased by 2.7% of population year-to-date (Chart V-7). The number of workers hired by temporary employment agencies and foreign services firms has held relatively steady in 2018 to date, at about 0.8-0.9% of the labour force, although the number of work permits issued in the first nine months of the year was up 12% from the same period in 2017.

Productivity growth stronger in 2017 but weaker in 2018

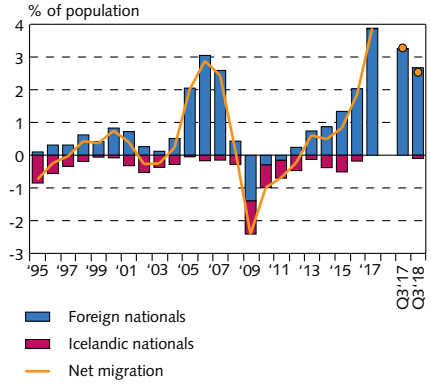
Following Statistics Iceland's upward revision of 2017 GDP growth figures, it appears that labour productivity, measured as GDP per hour worked according to the LFS, increased by 2.8% in 2017, slightly more than was assumed in the Bank's August forecast. On the other hand, the outlook is for weaker productivity growth this year, or 2.1% instead of 2.4%, owing to the prospect of a 1 percentage point larger increase in total hours worked than was projected in August.

Output gap remains but expected to narrow in coming years

Slightly less than half of firms reported difficulty responding to unexpected demand, an increase of 5 percentage points from the summer survey. This percentage therefore remains high, but it has been relatively volatile since it peaked in Q1/2017. Even clearer signs of a turnaround can be seen in the share of firms reporting worker shortages (Chart V-8). In comparison with the previous survey, the number of executives experiencing difficulties responding to unexpected demand increased in the financial services and miscellaneous specialised services sectors but decreased in the construction and fishing industries.

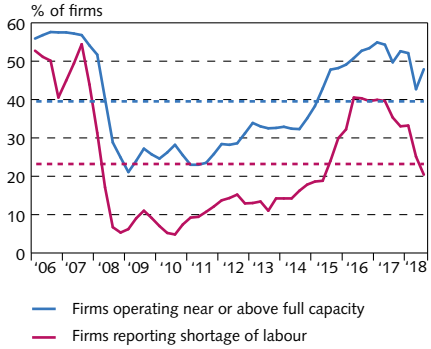
The resource utilisation (RU) indicator, which combines a number of indicators of factor utilisation, has fallen somewhat from its mid-2016 peak and now suggests that resource utilisation is now close to normal (Chart V-9). The RU indicator has fallen relatively quickly since the spring, but strong output growth in 2017 and 2018 suggests that the output gap is still significant. The gap is also somewhat larger than was estimated in August, owing to Statistics Iceland's revision of 2017 GDP growth figures and the prospect of stronger growth this year. It appears to be narrowing faster than was forecast then, however, and is expected to close towards the end of the forecast horizon.

Chart V-7
Net migration 1995-2018[1]



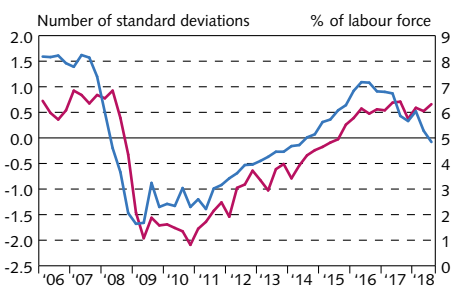
1. Net migration of persons aged 20-59 relative to total population of the same age. Beginning-of-year figures for population. Annual figures for 1995-2017 and cumulative figures for Q3/2017 and Q3/2018.
Source: Statistics Iceland.

Chart V-8
Capacity utilisation[1]
Q1/2006 - Q3/2018



1. Indicators of factor utilisation are from the Gallup Sentiment Survey conducted among Iceland's 400 largest companies. Seasonally adjusted figures. Broken lines show period averages.
Sources: Gallup, Central Bank of Iceland.

Chart V-9
Resource utilisation and unemployment[1]
Q1/2006 - Q3/2018



1. The RU index is the first principal component of selected indicators of factor utilisation; it is scaled so that its mean value is 0 and the standard deviation is 1. A more detailed description can be found in Box 3 in MB 2018/2. Unemployment is seasonally adjusted.
Sources: Statistics Iceland, Central Bank of Iceland.

VI Inflation

Inflation measured 2.7% in Q3/2018, slightly less than was forecast in August. The composition of inflation has changed markedly since last year, as the rise in house prices has eased and the contribution from other factors has increased accordingly. Imported inflation has risen, as the króna has weakened since August and global oil prices have continued to rise. Domestic goods prices have also risen recently, although the contribution of private services to inflation remains small. Even though wage increases have slowed in 2018 to date, they remain sizeable, and the outlook for the forecast horizon is coloured by uncertainty about upcoming wage settlements. Inflation expectations have risen year to date, and long-term inflation expectations are markedly above the target.

Recent developments in inflation

Q3 inflation slightly below the previous forecast

Inflation has been close to the target for most of this year. It measured 2.7% in Q3, some 0.1 percentage points below the forecast in the August *Monetary Bulletin*. Although the rise in house prices has slowed in the recent term, the housing component was the one that most strongly affected the CPI during the quarter. More than half of the effect of house price increases could be traced to price increases in regional Iceland. Moreover, a portion of the rise in the housing component was due to paid rent, which has risen by just over 6% in the past twelve months. Pulling in the opposite direction was the seasonal decline in airfares.

Inflation has picked up over the course of the year, measuring 2.8% in October (Chart VI-1). An increase in the price of new motor vehicles was the main factor in the 0.6% month-on-month rise in the CPI in October, together with a rise in housing and food prices. Pulling in the opposite direction was a decrease in road tolls. Inflation excluding housing measured 1.7% in October, and the difference between inflation with and without housing is close to its smallest since summer 2014, although it is still above its long-term average of ½ a percentage point. The HICP, which also excludes owner-occupied housing costs, rose 1.2% year-on-year in September.

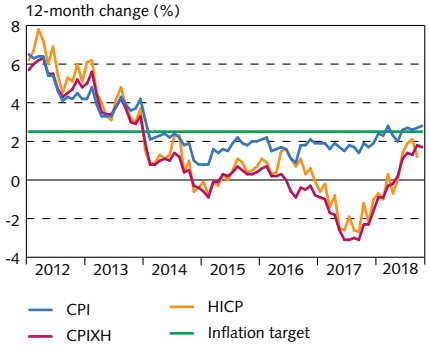
Inflation has therefore risen since October 2017. In terms of the CPI, inflation has risen by 0.9 percentage points, but the increase is even greater in terms of indices that exclude owner-occupied housing costs. According to such indices, there was considerable deflation a year ago.

Underlying inflation and other indicators of inflationary pressures

Underlying inflation has risen in the past year

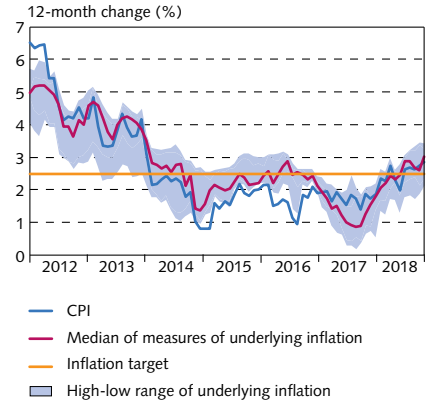
Underlying inflation measured 3% in October, according to the median of various measures, and had risen by 1.8 percentage points since October 2017 (Chart VI-2). By this measure, it is at its highest since

Chart VI-1
Various measures of inflation
January 2012 - October 2018



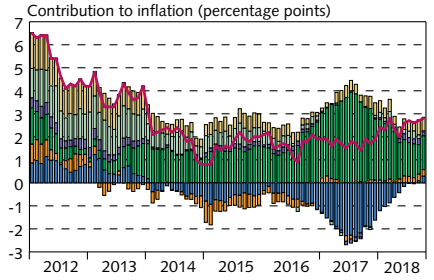
Sources: Statistics Iceland, Central Bank of Iceland.

Chart VI-2
Headline and underlying inflation[1]
January 2012 - October 2018



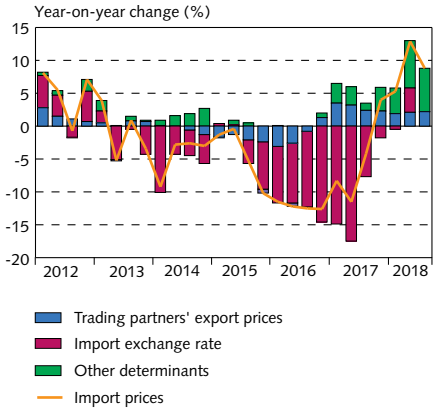
1. Underlying inflation measured using a core index (which excludes the effects of indirect taxes, volatile food items, petrol, public services, and real mortgage interest expense) and statistical measures (weighted median, trimmed mean, a dynamic factor model, and a common component of the CPI).
Sources: Statistics Iceland, Central Bank of Iceland.

Chart VI-3
Components of CPI inflation
January 2012 - October 2018



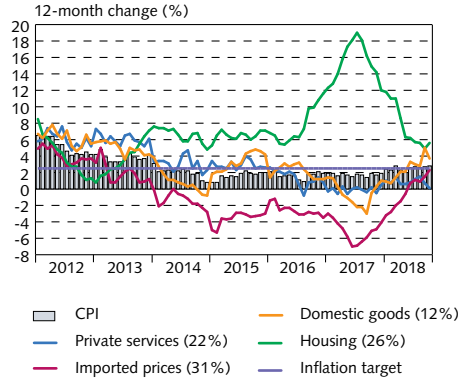
Source: Statistics Iceland.

Chart VI-4
Import prices and their determinants[1]
Q1/2012 - Q3/2018



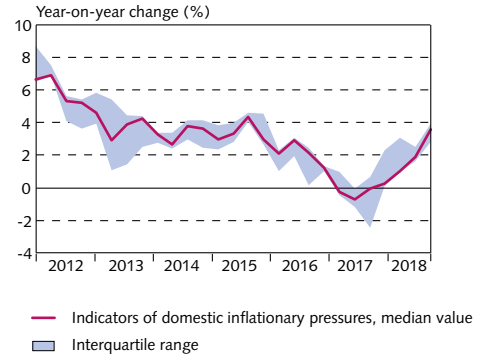
1. Central Bank baseline forecast Q3/2018.
Sources: Statistics Iceland, Thomson Reuters, Central Bank of Iceland.

Chart VI-5
Imported and domestic inflation[1]
January 2012 - October 2018



1. Imported inflation is estimated using imported food and beverages and the price of new motor vehicles and spare parts, petrol, and other imported goods. The figures in parentheses show the current weight of these items in the CPI.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart VI-6
Domestic inflationary pressures[1]
Q1/2012 - Q3/2018



1. The shaded area includes five indicators of domestic inflationary pressures. The indicators are unit labour costs (moving average), the GDP price deflator, prices of private services and domestic goods, and producer prices of goods sold domestically. Central Bank baseline forecast Q3/2018 for the GDP price deflator and for unit labour costs.
Sources: Statistics Iceland, Central Bank of Iceland.

January 2014. Underlying inflation has therefore risen in the recent term, as has headline inflation, while house price inflation has simultaneously lost momentum. As a result, the composition of inflation has changed somewhat, with the contribution from the housing component declining sharply since the beginning of 2018, whereas other components have begun to contribute accordingly more (Chart VI-3). In October, owner-occupied housing costs had risen by 5.5% year-on-year, and about half of twelve-month inflation was due to the housing component (see Chapter III).

Import prices have surged in the recent past ...

Imported inflationary pressures have increased markedly in the recent past, as the króna has depreciated by some 10% since the last *Monetary Bulletin*. In addition, global oil prices have continued to rise, as has trading partner inflation (see Chapter II). As a result, all factors are pulling in the same direction as regards the current outlook for imported goods and services prices, which are estimated to have risen by 8.8% year-on-year in Q3 (Chart VI-4). This is a significant change since Q3/2017, when import prices fell by over 4% year-on-year in krónur terms. In part, this reflects the impact of rising trading partner export prices, which is augmented by the fact that the effects of past appreciation of the króna have gradually disappeared. Furthermore, it appears that mark-ups on import prices have increased, as can be seen in that prices have risen more than can be explained by global price hikes and the exchange rate of the króna.

The price of imported goods in the CPI has risen by 2.3% in the past twelve months, and the contribution to headline inflation is about 0.7 percentage points (Chart VI-5). Most subcomponents of imported goods have risen somewhat in price in recent months, although clothing and footwear prices, for instance, were lower in October than they were a year earlier. Petrol prices in Iceland have risen by 16% between years, directly adding roughly 0.3 percentage points to headline inflation in October. On top of this comes the indirect effect of higher oil prices on other goods and services, such as airfares.

... and more executives expect to have to raise product prices

There is the risk that increased imported input costs, which stem from rising oil prices and the depreciation of the króna, will prompt domestic firms to raise prices. Costs have also risen in the recent past because of large pay hikes. The price of domestic goods in the CPI has risen by some 3.7% in the past twelve months, whereas it had risen by about 1.7%, on average, in H1/2018. This is in line with the recent increase in producer prices of goods sold domestically, which measured 2.8% year-on-year in Q3. The contribution of private services to headline inflation is still limited, in spite of growing domestic inflationary pressures (Chart VI-6). The decline in international airfares has played a major role, and in October, the year-on-year reduction was similar to that a year ago. Telephone services prices have also fallen markedly at the same time (Chart VI-7).

Gallup's autumn survey of Iceland's 400 largest companies also suggests that inflationary pressures are on the rise. About 56% of ex-

ecutives expected to need to raise their prices in the next six months, the largest share in ten years (Chart VI-8). About 70% of executives expected input prices to rise in the next six months, an increase from the previous survey. It was revealed in the survey that 76% of executives considered wage expense the main determinant of price increases for their own products, and 38% considered input prices to rank second. Furthermore, 35% of executives were of the opinion that competition and mark-ups had the greatest downward impact on prices (Chart VI-9).

Wage share well above the long-term average

In September, Statistics Iceland published production accounts figures on developments in wages and related expenses, including a minor revision of previous figures. Wages per hour worked are estimated to have risen by 8.3% in 2017, somewhat more than is indicated by either the general wage index, which rose by 6.8%, or the total wage index, which rose 6.5%.[1] In the August forecast, it was assumed that wages per hour worked rose by 7.5% in 2017, and because other measures of wage developments show smaller increases, this estimate has not been changed.

Although wages and related expenses changed slightly upon revision in September, the wage share declined in comparison with the national accounts as published in March. This is due largely to a revision of gross factor income. The wage share is now estimated at 63.1% in 2017, about 3½ percentage points higher than in 2016 and 3 percentage points above its long-term average.

The year-on-year rise in wages has slowed, but the outlook is highly uncertain

The year-on-year rise in wages has eased in 2018 to date, although it remains large. The general wage index rose by 6.1% year-on-year in Q3, and the total wage index was up 4.9% year-on-year in Q2 (Chart VI-10). In part, the more rapid decline in annual wage inflation as measured by the total wage index reflects base effects from bonuses paid by financial services companies last year. Those effects will be felt in the first three quarters of 2018. In addition, these are preliminary figures, and experience of the impact of revisions of the new index is still limited.

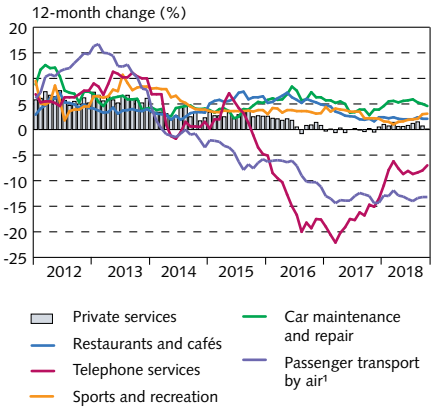
The baseline forecast assumes that total wage costs per hour worked will rise by an average of 7.8% this year. The outlook is for productivity growth of just over 2%; therefore, unit labour costs are projected to rise by 5.6%, about the same as in the August forecast but more than in the past two years (Chart VI-11). Near-term wage developments are very uncertain at present, in view of the status of upcoming wage negotiations. Demands for large pay hikes have been presented, but as is mentioned above, the wage share is above its historical average, and terms of trade have deteriorated. Furthermore, the outlook is for unemployment to inch upwards and for productivity growth to ease after three years of strong growth. Wage-earners' bar-

1. The new total wage index is discussed in greater detail in Box 4.

Chart VI-7

Private services and selected subcomponents of the CPI

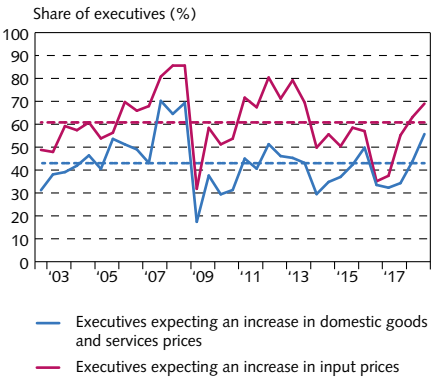
January 2012 - October 2018



1. Twelve-month moving average.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart VI-8

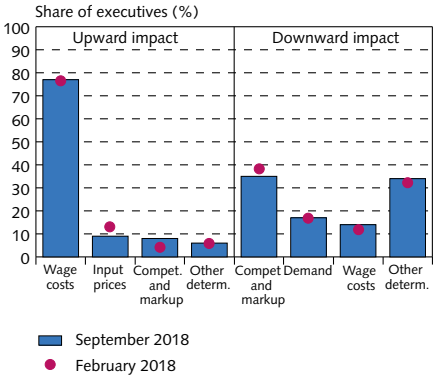
Corporate expectations of input and product prices 6 months ahead 2002-2018[1]



1. Broken lines show averages from 2002.
Source: Gallup.

Chart VI-9

Firms' price setting decisions[1]



1. Executives' answers about which factors would have the strongest impact on price setting decisions over the coming six months.
Source: Gallup.

gaining position may therefore have weakened at a time when companies' scope to absorb pay increases has diminished.

Inflation expectations

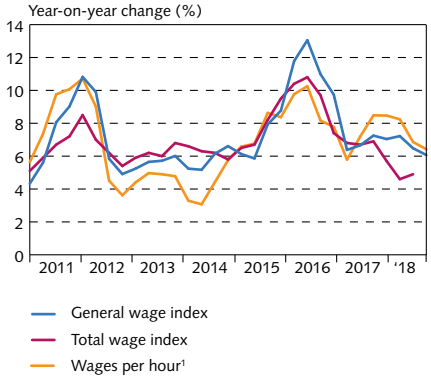
Households' and businesses' short-term inflation expectations are unchanged between surveys but have risen in the past year

According to Gallup's autumn surveys, carried out in September, households and businesses expect inflation to measure 3-3.5% in one year's time and 3.5-4% in two years. This is unchanged from the previous survey but 0.5-0.8 percentage points higher than in surveys taken a year ago. Market agents' short-term inflation expectations have risen in the recent past (Chart VI-12). The one- and two-year breakeven inflation rate in the bond market has been 3.2-3.5% in Q4 to date, just under ½ a percentage point higher than in Q3 and nearly 1½ percentage points higher than a year ago. Market agents' inflation expectations according to the Central Bank's late October survey tell a similar tale, with respondents expecting inflation to measure 3.6% one year ahead and 3.2% two years ahead.

Long-term inflation expectations have risen markedly above the target

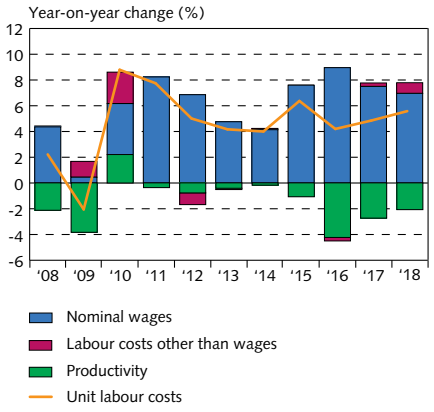
Households' and businesses' long-term inflation expectations have remained unchanged between surveys, after having been measured for the first time in H1/2018. Households expected inflation to average 3.5% over the next five years, and corporate executives expected it to measure 3%. Market agents' long-term inflation expectations have eased upwards in the recent past, however (Chart VI-12). According to the Bank's survey, respondents expected inflation to average about 3% in the next five and ten years, which is around ½ a percentage point higher than in the survey a year ago. The breakeven inflation rate in the bond market has also increased in recent months. The five-year breakeven rate has been 4% in Q4 to date, as opposed to 3.5% in Q3/2018 and 2.6% in Q4/2017.[2] The ten-year breakeven rate has developed similarly, although measuring higher, at 4.2%. Thus there are signs that inflation expectations have grown less securely anchored to the target in recent months.

Chart VI-10
Different measures of wages
Q1/2011 - Q3/2018



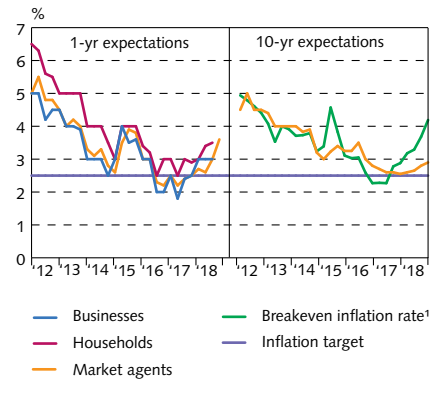
1. Wages per hour worked are based on annual figures for the wage portion of the "wages and related expenses" category from the production accounts, as a share of total hours worked according to the Statistics Iceland labour force survey. Estimate from Q4/2016.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart VI-11
Unit labour costs and contribution of underlying components 2008-2018[1]



1. Labour productivity growth is shown as a negative contribution to an increase in unit labour costs. Central Bank baseline forecast 2017-2018.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart VI-12
Inflation expectations
Q1/2012 - Q4/2018



1. The Q4/2018 figure is the average for the quarter to date.
Sources: Statistics Iceland, Central Bank of Iceland.

2. The breakeven inflation rate is calculated based on the interest rate differential between indexed and non-indexed bonds. It should be interpreted with caution, however, as it also includes a risk premium related to bond liquidity, as well as a risk premium reflecting uncertainty about inflation. To some extent, the recent rise in the breakeven rate probably reflects a rise in the bond market risk premium.

Box 1

The transmission of the Central Bank policy rate to other interest rates

The Central Bank's principal task is to promote price stability, and to achieve this, it applies the policy instruments at its disposal, chief among them the interest rates on its transactions with other financial institutions. By changing these interest rates, the Bank can affect market rates and, in turn, the interest rates generally available to households and businesses. The Bank's interest rates also affect money demand, asset prices, the exchange rate of the króna, and overall demand in the domestic economy. All of these factors then affect inflation. These various channels of monetary policy are generally referred to as the monetary policy transmission mechanism.[1]

How does monetary policy affect other interest rates?

The first stage of the transmission mechanism describes how the Central Bank's policy rate affects other short-term market rates and, through them, long-term market rates. Because short- and long-term market interest rates have an important effect on financial institutions' marginal cost of funding, the effects of changes in the policy rate are ultimately transmitted to the interest rates offered to households and businesses. Pétursson (2001b) examines this stage of the transmission mechanism. As is discussed there, changes in the policy rate should cause a comparable change in short-term market rates. For longer-term financial obligations, however, the situation becomes more complex. According to the expectations hypothesis, long-term rates should by and large be determined by current short-term bond rates and expected short rates over the lifetime of the bond. As a result, the Central Bank can affect long-term interest rates both by changing its current policy rate and by creating the expectation that it will change it in the future. For instance, the Bank can enhance the impact of a rate hike by signalling that additional rate increases can be expected in the near future. By the same token, the impact of a rate hike is diluted if it is expected that the policy rate will be lowered again soon. The ultimate impact of a change in the Central Bank's policy rate on long-term interest rates is determined in no small part by its impact on market agents' expectations concerning future developments in the policy rate. The same applies to the impact on indexed financial obligations. To the extent that a change in the policy rate affects short-term real rates, the impact of monetary policy on real non-indexed long-term bond rates should be transmitted broadly as is described above. Substitutability between indexed and non-indexed bonds then ensures that indexed bond rates change in a manner similar to real rates on non-indexed financial obligations.

The data

The findings from the above-mentioned study show that the Central Bank's policy rate affects short- and long-term market rates as expected. Monetary policy also affects the banks' indexed lending rates, but with a lag of a few months, and policy appears to be transmitted largely through indexed bond rates. This study focused on the pegged exchange rate period during the 1990s, and the financial system has changed markedly in structure since it was carried out. Furthermore, fundamental changes have been made to the monetary policy framework in the interim. As a result, it is appropriate to update the assessment of this stage of the transmission mechanism and examine whether it has changed.

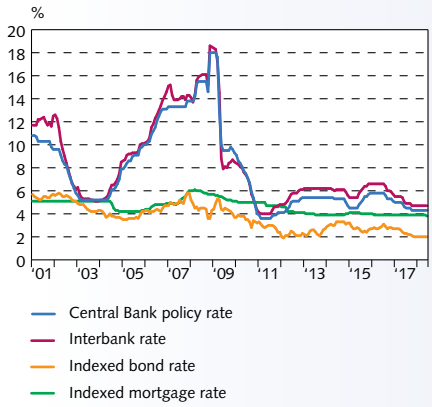
As in Pétursson (2001b), a structural vector autoregressive model (VAR) is used. Structural VARs are commonly used to ana-

1. A general discussion of the transmission mechanism can be found in Pétursson (2001a), and a more detailed analysis of the magnitude of the impact and the time lags in transmission can be found in the Bank's macroeconomic models' handbooks (Daníelsson *et al.*, 2015, and Seneca, 2010).

Chart 1

Central Bank policy rate, market rates and mortgage rates[1]

January 2001 - June 2018



1. The interbank rate used is the three month REIBOR rate. The indexed bond rate is the 10-year rate obtained from estimating the zero-coupon yield curve for indexed bonds. The mortgage rate is the weighted average of mortgage rates offered by the HFF, the commercial banks, and the pension funds.

Source: Central Bank of Iceland.

lyse causal relationships when all of the variables are determined simultaneously. The VAR used here contains two types of short-term interest rates: the Central Bank's policy rate and the three-month interbank rate.[2] The long-term interest rate is the ten-year indexed bond rate, which is obtained by estimating the zero-coupon yield curve for indexed bonds.[3] For mortgage lending rates, the interest rate used is the lowest listed fixed rate on mortgage loans from the Housing Financing Fund (HFF) (with a prepayment penalty from December 2005 onwards and without it before that time), the commercial banks (a simple average of the three commercial banks' rates), and pension funds (a simple average of rates charged by four pension funds before February 2010 and seven pension funds thereafter). The commercial banks first offered long-term indexed mortgage loans in September 2004, although they had offered short-term supplemental loans before then. In addition, no information on indexed mortgage loans issued by pension funds prior to 2004 is available. Therefore, the mortgage lending rate used here is the HFF's lending rate until September 2004 and a weighted average (based on market share) of the rates charged by the HFF, the three commercial banks, and the pension funds from September 2004 onwards.[4] Chart 1 shows developments in these interest rates from 2001 onwards. As can be seen, the interbank rate tracks the Central Bank's policy rate closely, whereas longer interest rates change less and are lower, as they are real rates while the short-term interest rates are nominal.

Assessment of the impact of monetary policy on other interest rates

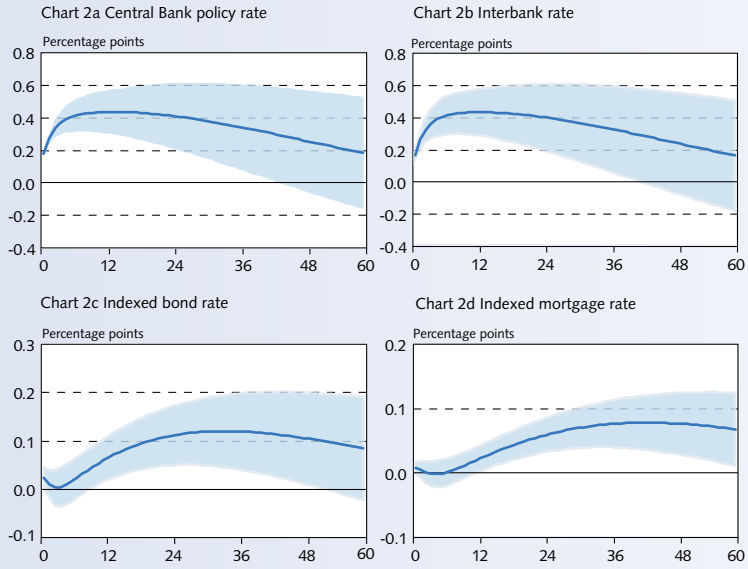
Chart 2 shows the impulse responses for an unforeseen one-standard-deviation shock to the Central Bank policy rate on the four interest rate series. The VAR is estimated using monthly data (monthly averages) over the period from January 2001 through June 2018. The VAR includes two lags, in accordance with the results of the Schwarz information criterion, and it contains dummy variables for April and October through December 2008, on the one hand, and April through June 2009, on the other. The dummies for 2008 are due to wide swings in short-term interest rates during the financial crisis, and the dummies for 2009 are due to major changes in financial institutions' liquidity, which caused wide swings in interbank interest rates and loosened the monetary stance more than had been intended (see, for example, *Monetary Bulletin* 2009/4).

According to the estimated impulse responses, the policy rate rises immediately by 0.18 percentage points, but the impact on the policy rate peaks about a year later, when it has risen by nearly 0.5 percentage points. As the chart shows, the rise in the policy rate is

2. The definition of the Central Bank's key rate can change from one period of time to another, depending on conditions in the financial markets. From January 2001 through March 2009, the Bank's key rate was defined as the rate on seven-day collateralised Central Bank loans, and from April through September 2009 it was defined as the rate on financial institutions' current accounts with the Bank. From October 2009 through May 2014, the key rate was defined as the average of the current account rate and the rate on 28-day certificates of deposit, and since May 2014 it has been defined as the rate on seven-day term deposits with the Bank.
3. The zero-coupon yield curve is estimated using the Nelson-Siegel method, using rates on indexed Government bonds, indexed HFF bonds, and indexed Housing Bonds falling under market making agreements. The short end of the yield curve is estimated using short-term real rates based on measured twelve-month inflation.
4. Pétursson (2001b) uses the average rate on indexed banking system loans; i.e., a weighted average of base rates on indexed loans issued by the banks and savings banks. Virtually the same results are obtained when this rate is used instead of the indexed mortgage rate, as is done here; however, if the general bank rate is used, the impact of monetary policy on lending rates is somewhat stronger than is reported here.

Chart 2

The impact of an unforeseen one-standard-deviation shock to the Central Bank's policy rate[1]



1. The chart shows impulse response functions for an unforeseen one-standard-deviation shock to the Central Bank policy rate on short- and long-term interest rates over a five-year (60-month) period. The structural VAR estimated uses monthly data for the period 2001-2018. The structural shocks are identified using a Cholesky ordering based on Pétursson (2001b). The shaded area shows the 95% confidence interval.

Source: Central Bank of Iceland.

transmitted virtually intact in a rise in three-month interbank rates. Although the contemporaneous effect on the indexed bond rate is relatively small, it is statistically significant based on the 95% confidence interval. It gradually increases and peaks at 0.12 percentage points just over two years after the original shock. The impact on indexed mortgage lending rates becomes statistically significant one year after the original shock, and the peak impact is similar to the impact on the bond rate. The contemporaneous impact of the shock is of a magnitude similar to that described in Pétursson (2001b), but it is more persistent and somewhat stronger at its peak.

Finally, Chart 3 shows how much of the variability in individual interest rate series can be explained by underlying shocks to the four interest rates over the same five-year period as is shown in Chart 2. It shows, for example, that fluctuations in interbank rates can be traced largely to unforeseen shocks to the policy rate; i.e., interbank rates are determined largely by developments in the Central Bank's policy rate. As time passes from the original shock to the policy rate, its share in the variability of bond and mortgage lending rates also increases. For instance, monetary policy shocks explain nearly half of the variability of mortgage lending rates after three years, and about two-thirds after five years.[5]

Summary

Changes to the Central Bank's policy rate appear to be transmitted normally along the yield curve. By the same token, changes in the policy rate have a statistically significant impact on indexed mortgage lending rates, and the transmission of monetary policy to lending rates seems to have strengthened since the 1990s. The impact of changes in the policy rate lasts longer and appears to be transmitted directly to mortgage rates instead of being transmitted through

5. If the statistical estimate is repeated using a short-term real rate (the short-term interest rate net of inflation), it can be seen that the above-described estimate mainly reflects the impact of a shock to short-term real rates on indexed rates.

Chart 3

Variance decomposition of interest rate fluctuations[1]

1.The chart shows the share of different interest rate shocks in the variability of interest rates over a five-year (60-month) period. The structural VAR estimated uses monthly data for the period 2001-2018. The structural shocks are identified using a Cholesky ordering based on Pétursson (2001b).

Source: Central Bank of Iceland.

bond rates, as previous studies had indicated. This can also be seen in the fact that the Bank's policy rate now explains a larger share of the variability in mortgage rates than before.[6]

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6. These findings are somewhat at odds with those published in the appendix to a recent report to the Government on proposed changes to the monetary policy framework (Jónsson *et al.*, 2018), in which the authors conclude that the impact of monetary policy on indexed lending rates is statistically insignificant. Their study uses a structural VAR similar to that estimated by Pétursson (2001b) and used in this Box, but without bond interest rates. Furthermore, the model is estimated using only data from 2011, which makes the findings less reliable.

Box 2

The Icelandic economy a decade after the financial crisis

The financial crisis that struck Iceland in autumn 2008 had a profound impact on the country's economy. Economic activity contracted severely, a large number of jobs were lost, and unemployment rose to its highest in a long time. In spring 2010, the economy finally started to gain traction, and the recovery began. It was weak and uneven at first, but gradually it began to pick up steam, not least due to a significant improvement in terms of trade and a massive boom in tourism.

Now, ten years after the crisis struck, it is appropriate to attempt to assess how much output was lost in its wake. A comparison with the estimated trend growth rate suggests that the accumulated loss amounted to about one-third of GDP, or about 2.5 m.kr. per person.

The post-crisis contraction has reversed — and then some

According to figures from Statistics Iceland, GDP contracted by 6.8% in 2009 and another 3.4% in 2010, or a total of 10%.[1] On a per capita basis, the contraction was similar in size, as Chart 1 indicates. The contraction was deep, and the recovery was protracted: it was not until six years later, in 2015, that GDP returned to its pre-crisis level. The strong growth of the past three years has resulted in an output level this year of more than a fifth above the pre-crisis peak.

However, this strong output growth reflects a surge in population growth; therefore, the growth rate of GDP per capita has been lower, particularly in the past two years. GDP per capita did not return to its previous high until 2016. In 2018 it is expected to be more than 7% above its 2007 peak.

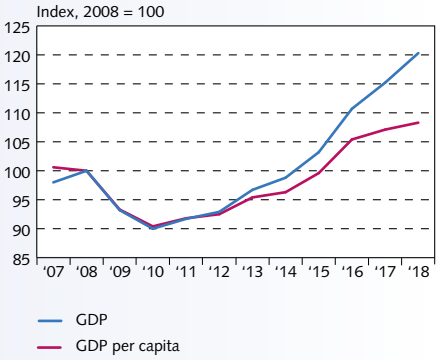
The contraction was larger in Iceland than in other advanced economies, but the recovery was stronger as well

The contraction in Iceland was considerably larger than that in major advanced countries, and above the OECD average (see Chart 2). In the US, the contraction measured almost 3%, and in Iceland's main trading partners it was about 3½%, which was also the OECD average. In the eurozone it was somewhat larger, or 4½%, as it was affected greatly by the situation in Ireland and Greece and on the Iberian peninsula. The reasons why Iceland's contraction was steeper than that in other advanced economies are numerous, and to a large extent they reflect the severe financial and macroeconomic imbalances that had built up during the prelude to the crisis. These imbalances were manifested, for instance, in a large current account deficit and rapidly growing debt, including in foreign currencies. As a result, Iceland's crisis was twofold, unlike the situation in other countries. In addition to a systemic banking crisis, Iceland suffered a severe currency crisis, and research shows that when a twin crisis of this sort develops, the economic contraction is generally much deeper and more protracted.[2]

Chart 2, on the other hand, shows how rapid Iceland's recovery has been in international comparison. This is particularly true of the past five years: GDP growth averaged 4.4% in Iceland, as opposed to 2% among its trading partners and only 1½% in the eurozone.

Chart 1

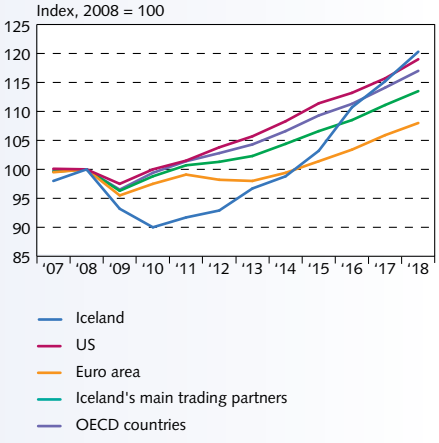
Iceland's post-crisis economic contraction and recovery[1]



1. Central Bank of Iceland forecast 2018.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart 2

Post-crisis economic contraction and recovery in international comparison[1]



1. Central Bank 2018 baseline forecast for all countries except the OECD, which is based on the OECD forecast.
Sources: OECD, Statistics Iceland, Thomson Reuters, Central Bank of Iceland.

1. The contraction is larger in terms of quarterly figures, which indicate that GDP contracted by 13% from Q4/2007 until Q1/2010, whereupon it began to grow again.
2. See, for example, Bordo et al. (2001) and Hutchinson and Noy (2005). A more detailed discussion of the financial crisis in Iceland and the underlying reasons for it, including an international comparison, can be found, for example, in Ólafsson and Pétursson (2011), Einarsson *et al.* (2015), and Benediktsdóttir et al. (2017). In addition, Box IV-2 in *Monetary Bulletin* 2010/4 contains a comparison of Iceland's contraction and the experience of other severe financial crises, including the Nordic banking crisis and the Asian crisis.

Post-crisis output loss substantial and protracted

Post-crisis developments in GDP and the fact that GDP has returned to its pre-crisis peak do not tell the whole story about the severity of the crisis, however. To gain a clearer view of Iceland's post-crisis output loss, it is necessary to estimate how GDP would have developed had the crisis never occurred. Such a counterfactual assessment is always subject to major uncertainty; however, a conventional way to estimate the loss is to compare actual developments with the estimated trend path and then project the lost output as the accumulated deviation of output from the trend path during the post-crisis period.

Two issues arise, however, that could have a significant impact on the ultimate assessment of the output loss. First of all, it is necessary to select which trend path to use in the counterfactual scenario: the steeper the trend path, the greater the output loss. It is desirable that the trend path reflect as realistically as possible the growth path the economy would have taken, on average, had the crisis not occurred. A frequently used method is to use average GDP growth during the pre-crisis period, although it is best to avoid allowing that assessment to be affected too strongly by developments during the immediate prelude to the crisis if this period is characterised by growing underlying imbalances. This is particularly applicable to Iceland, where severe imbalances had developed during the run-up to the crisis and GDP growth had long been well above its realistic long-term potential. This can be seen, for instance, the International Monetary Fund's (IMF, 2018) recent analysis of the post-crisis output loss, which uses average GDP growth over the period 2000-2008 to estimate the trend growth rate. In Iceland, average output growth during this period was 3.6%, which can hardly be considered a sustainable long-term growth rate. A similar problem arises in Laeven and Valencia's (2013) international comparison of post-crisis output loss with respect to the calculations for Iceland.

The other issue involves selecting at which time to start the trend path. The choice implicitly assumes that the GDP growth rate before that time is permanent and therefore does not reflect the accumulation of pre-crisis imbalances. The estimated output loss usually grows larger as the point of origin moves closer to the onset of the crisis, and the risk of overestimating the loss is correspondingly greater because pre-crisis imbalances are more pronounced.

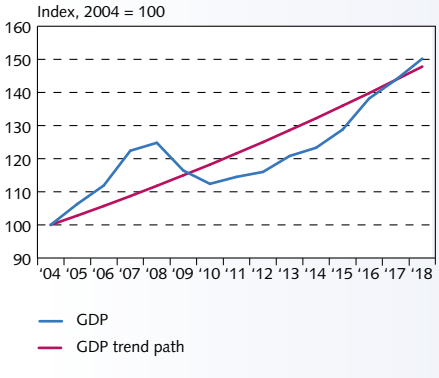
Laeven and Valencia (2013) choose to start the trend path at four years before the onset of the crisis — in 2004, in the case of Iceland — which is what is done here. This accords well with the fact that economic and financial imbalances began to accumulate rapidly in the wake of structural changes in the Icelandic financial system in late 2004 and the credit growth surge that followed. In addition, the Central Bank's assessment indicates that output in Iceland was very close to potential in 2004 and resources were therefore close to fully utilised.

In order to avoid allowing the estimated trend growth rate to be affected too strongly by the surge in output during the run-up to the crisis, average GDP growth over a fairly long period excluding the pre-crisis years with the largest imbalances is used. The period selected is a twenty-year period ending with the point of origin of the trend path: i.e., 1984-2003. Over this period, GDP growth averaged 2.8%, which is very close to the Bank's estimated long-term GDP growth potential of 2.7%.

Chart 3 gives a comparison of developments in GDP and its trend path. As the chart shows, the aforementioned assumptions imply that some of the GDP growth during the pre-crisis years is viewed as unsustainable. GDP fell below its trend path in 2009 and

Chart 3

GDP in comparison with trend path[1]



1. Central Bank of Iceland baseline forecast 2018.
Sources: Statistics Iceland, Central Bank of Iceland.

remained below it until 2017. The accumulated output loss (the area below the trend path) over this ten-year period from 2009 through 2018 is about 35%, which is close to the 32% loss that Laeven and Valencia estimated as the average among advanced economies following financial crises since 1970, but larger than the 25% average loss following the last crisis.[3] The macroeconomic impact of the crisis was therefore profound: it is estimated that the accumulated loss of output amounted to over a third of GDP, which corresponds to a permanent loss of income amounting to 2.5 m.kr. per inhabitant.

This is similar to the 42% loss estimated by Laeven and Valencia (2013), but well below the estimate of 86% obtained by Benediktsdóttir *et al.* (2017).[4] These different results reflect differing assumptions concerning underlying trend growth and the start of the trend path. Laeven and Valencia's (2013) higher estimate reflects their use of a higher trend growth rate than is used here; on the other hand, they estimate the loss only for the first three years after the onset of the crisis. The higher estimate obtained by Benediktsdóttir *et al.* (2017) stems from their having set the beginning of the trend path at 2007, which implies that the trend path starts at a considerably higher level than is used here. On the other hand, they assume a slower trend growth rate. The assumptions behind these two studies probably reflect the fact that their analysis focuses on international comparison, where it is important that each country be treated identically. The estimate published here, however, focuses only on Iceland, which makes it easier to choose assumptions that best fit with domestic economic developments. The differences in findings show clearly how dependent estimates of post-crisis output losses are on the two main assumptions discussed above. However, all of them show how severe and persistent the impact of the crisis was.

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3. The estimated output loss in Iceland falls to 23%, however, if the deviation for 2008 is also included, as Laeven and Valencia (2013) do. In 2008, GDP was a full 11% above its trend path (the difference in Laeven and Valencia is considerably smaller, however). Because the crisis struck late in 2008, it is considered more appropriate to base the calculation of the output loss on the period from 2009 onwards.

4. Borio *et al.* (2001) estimated the output loss with the accumulated difference between GDP growth and the trend growth rate (measured in terms of average output growth for the five years before the crisis) from the time the crisis struck until GDP growth returned to its trend rate. Using this method gives an output loss of 44%.

Box 3

Fiscal budget proposal for 2019

The fiscal budget proposal for 2019 was presented in September. Macroeconomic assumptions have changed marginally since the fiscal plan was submitted this spring, and a few revenue and expenditure items have been revised. Table 1 shows the Statistics Iceland forecast used as a basis for the budget proposal, together with revisions from the previous Statistics Iceland forecast, which was used as a basis for the fiscal plan. For comparison purposes, the forecast in *Monetary Bulletin* 2018/3 is also shown, as it was published at around the same time as the forecast on which the budget proposal was based.

Table 1 Macroeconomic assumptions in the 2019 fiscal budget proposal

	2019 (%)	*Change since February (percentage points)*	*MB 2018/3 (%)*
Private consumption	3.9	0.2	3.8
Public consumption	2.1	0.5	1.9
Gross capital formation	4.9	-0.2	6.1
Exports	2.7	-0.7	3.6
Imports	5.1	-0.2	6.2
Gross domestic product	2.7	-0.1	2.7
Consumer price index (CPI)	2.9	0.0	2.8
Exchange rate index	0.3	0.1	-0.9
Wage index	6.0	0.1	5.7

Sources: Fiscal budget proposal 2019, Central Bank of Iceland.

Various assumptions in the 2019 fiscal budget proposal

Wage assumptions: The 2018 National Budget assumed that wages would rise this year by 3.1%. Most wage increases took effect on 1 June 2018. The actual rise in wages will turn out larger, however, owing to the effects of several wage settlements that had not been concluded at the time the budget was prepared. These, plus updated annualised wage increases during the year, raise the wage assumptions for the 2019 budget proposal by 4.1 b.kr. State employees' wage agreements expire on 1 April 2019, and projected wage developments for that year are based on estimated results of those negotiations. The fiscal budget proposal assumes that a 3.4% increase as a result of the wage settlements will take effect on 1 April 2019. The weighted average wage increase for 2019 is estimated at 3.1%.

Price assumptions: The 2018 National Budget assumed that inflation would measure 2.9% during the year. Statistics Iceland has revised its forecast and now projects inflation at 2.7%. There is no precedent for lowering budgetary authorisations because of an overestimation of inflation in the Budget itself; instead, the overage is deducted from the next year's price level update. Statistics Iceland forecasts 2019 inflation at 2.9%, and the price level update for other operating expenditures therefore amounts to 2.7%, after adjusting for the deduction. Operating expenditures generally total about 20-30% of institutions' operating turnover.

Exchange rate assumptions: In the 2019 fiscal budget proposal, foreign-denominated expenditures are calculated based on the average exchange rate in July 2018, which is 1.4% above the exchange rate on which the 2018 National Budget was based. This causes a 500 m.kr. increase in institutions' budgetary authorisations.

Unemployment and social security benefits: The budget proposal assumes that benefits will increase by 3.4% on 1 January 2019. The total cost of these increases is 5.6 b.kr. Furthermore, a special 4 b.kr. increase in disability benefits is planned.

In all, changes to budgetary authorisations in the 2019 budget proposal – i.e., changes in wages, prices, and exchange rates, together with increased unemployment and social security benefits – amount to just over 25 b.kr. (see Table 2).

Table 2 Changes in wages, benefits, prices, and exchange rate in 2019

Accrual basis

Wage assumptions	*B.kr.*
Wage increases in 2018 in excess of budgetary assumptions	4.1
Projected wage increases in 2019	9.9
Special resolutions included in 2015 and 2016 wage settlements	0.1
Total wage increases	14.1
Unemployment and social security benefits	5.6
General price level assumptions	5.1
Exchange rate assumptions	0.5
Total change in wages, benefits, price level, and exchange rate	25.3

Source: Fiscal budget proposal 2019.

Furthermore, it is assumed that changes in the tax system, both statutory (already passed into law) and non-statutory (not yet passed into law), will reduce revenues by just over 2 b.kr. (Table 3).

Table 3 Impact of tax changes on Treasury revenues in 2019

Accrual basis

Statutory changes	*B.kr.*
Cancellation of discount on rental car excise tax	1.3
Third-pillar savings measure expires at mid-year	1.1
Total	2.4
Non-statutory changes	
Payroll tax reduction, 0.25 percentage points	-4.0
Additional increase in personal deduction and smaller increase in upper tax bracket limit	-1.7
Support for publishing of books in Icelandic	-0.8
Increase in carbon tax, 10%	0.6
Increase in additional income	0.5
Anti-tax fraud measures	1.0
Total	-4.5
Total changes, statutory and non-statutory	-2.1

Source: Fiscal budget proposal 2019.

Deviations in budget proposal from the fiscal plan are minor

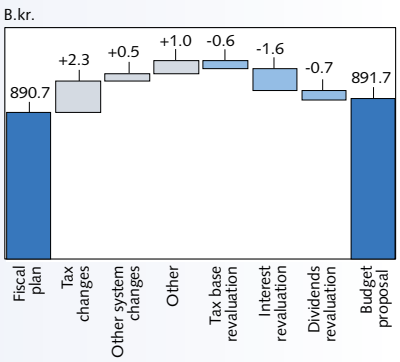
Based on the assumptions above, the difference between the fiscal budget proposal and the fiscal plan totals only 1 b.kr. on the revenues side and 500 m.kr. on the expenditures side. Both amounts represent increases relative to the fiscal plan. The fiscal budget proposal is therefore very similar to the fiscal plan as regards revenues, expenditures, and outcome.

Changes on the revenues side

Chart 1 summarises the main changes in revenues from fiscal plan to budget proposal, by type. In the fiscal plan, plans for several changes to the tax system were announced for 2019. These plans changed somewhat by the time the budget proposal for the year was finalised. The planned reduction in income tax is now smaller, and child benefits are to increase. Additional revenues resulting

Chart 1

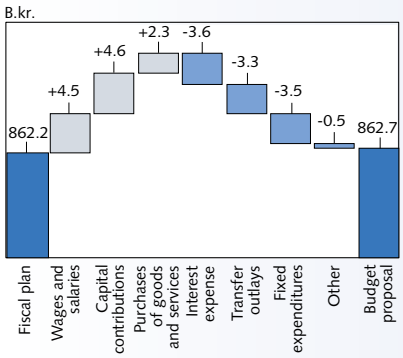
Change in expected revenue from fiscal plan to budget proposal 2019



Source: 2019 fiscal budget proposal.

Chart 2

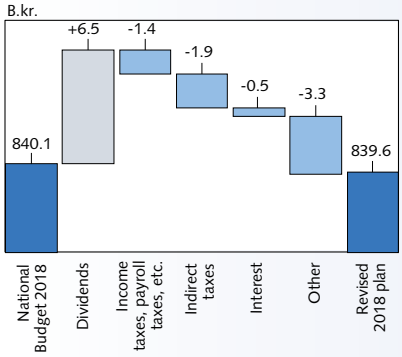
Change in expenditure from fiscal plan to 2019 budget proposal



Source: 2019 fiscal budget proposal.

Chart 3

Revision of revenue estimate from 2018 National Budget



Source: 2019 fiscal budget proposal.

from anti-tax fraud measures are assumed as well. These changes combined have a positive impact on Treasury revenues in the amount of 2.3 b.kr., plus a 500 m.kr. price level update of miscellaneous additional revenues. As is mentioned above, there was little cause to re-estimate tax bases due to economic assumptions, but this led to a revenue reduction of 0.6 b.kr. in comparison with the fiscal plan. Changes in special revenues are due mainly to a 1.6 b.kr. revocation of five funds' interest income on their balances with the Treasury and a 700 m.kr. reduction in planned dividends.

Changes on the expenditures side

The main changes in expenditures from fiscal plan to budget proposal for 2019 are shown in Chart 2. The two most important increases are wages and capital contributions. According to a revised estimate, Treasury interest expense will be reduced by 3.6 b.kr. relative to the fiscal plan. This is due to various offsetting upward and downward changes within the year. Investment will decline by 3.5 b.kr., and transfers will decline by 3.3 b.kr.

Revision of revenue estimate for 2018

In the National Budget for 2018, revenues were estimated at 840 b.kr. The outcome is expected to be in line with this (Chart 3). Even though tax revenues will fall by a total of 3.4 b.kr., and other reductions will total 3.8 b.kr., increased dividend payments from the State-owned commercial banks will offset the reduction in full.

Primary balance for 2019 in line with the fiscal plan but declines by 0.5% of GDP between years

The 2019 fiscal budget proposal assumes that the primary balance will be positive by 77.2 b.kr., as opposed to a surplus of 91.2 b.kr. in the 2018 National Budget. The primary surplus will decline year-on-year from 3.3% to 2.7% of GDP (Table 4). It is assumed that various measures on both revenues and expenditures sides will both raise and lower primary expenditures, as has been discussed previously. Primary income is projected at 880.5 b.kr., an increase of 53.2 b.kr. from the 2018 National Budget. The fiscal budget proposal assumes that primary expenditures will total 803.3 b.kr., up from 736.1 b.kr. in the 2018 National Budget, an increase of 67.2 b.kr. Excluding changes in wages, exchange rate, and price level, the real increase in primary expenditure is 42.9 b.kr. According to the budget proposal, the interest balance will improve by 10 b.kr. between years. The change is due largely to an 11.7 b.kr. reduction in interest expense. Of that total, charged Treasury interest expendi-

Table 4 Summarised outcome according to 2018 and 2019 fiscal budget proposals

	B.kr.			*% of GDP*		
National accounts basis	*Budget proposal 2018*	*Budget proposal 2019*	*Change In b.kr.*	*Budget proposal 2018*	*Budget proposal 2019*	*Change in percentage points*
Primary income	827.2	880.5	53.2	28.9	30.7	1.8
Primary expenditures	736.1	803.3	67.2	25.7	28.0	2.3
Primary balance	91.2	77.2	-14.0	3.2	2.7	-0.5
Interest income	12.9	11.2	-1.7	0.5	0.4	-0.1
Interest expense	71.2	59.4	-11.7	2.5	2.1	-0.4
Interest balance	-58.3	-48.2	10.0	-2.0	-1.7	0.4
Total revenues	840.1	891.7	51.6	29.4	31.1	1.7
Total expenditures	807.3	862.7	55.4	28.2	30.1	1.8
Overall balance	32.8	29.0	-3.8	1.1	1.0	-0.1

Source: Fiscal budget proposal 2019.

ture will decline by 10.4 b.kr., and calculated interest expense on unfunded pension obligations will decline by 1.3 b.kr. from the estimate in the 2018 National Budget. Including changes in the interest balance, the total Treasury outcome is projected to be positive by 29 b.kr., or 1% of GDP, which is in line with the fiscal plan approved by Parliament in March.

In estimating the fiscal stance, it is necessary to consider the degree to which the primary balance is affected by irregular revenue and expenditure changes and the degree to which the outcome simply reflects changes in overall economic activity. Chapter IV contains a more detailed analysis of the outcome after adjusting for these automatic stabilisers (see also Table 4 in Appendix 1).

Box 4

The total wage index

In July, Statistics Iceland published an index for total wages for the first time. The index provides new information on firms' and institutions' wage costs and provides a useful supplement to the wage statistics currently available. It is calculated based on total taxable wages and salaries for paid hours. The estimate has been enhanced with information from administrative documents and Statistics Iceland research.[1] In addition, subindices are published for public sector and private sector employees, as well as for specific economic sectors. The figures currently extend back to Q1/2008. Among the advantages of the index is its quarterly frequency, which gives an indication of developments in wage costs much earlier than annual figures currently available from the production accounts. The new index is therefore a useful additional tool for the Central Bank to use in estimating wage developments and preparing its macroeconomic forecasts.

Composition of labour force, hours worked, and wages affect developments in total wages

The total wage index reflects more than just changes in wages per hour worked, as changes in wage distribution and the composition of hours worked also make an impact. An increase in the share of high-earning people or of overtime would push the index higher, whereas an increase in the share of low-earning people and an increased share of regular day-work hours would tend to lower it. The index also takes account of irregular payments, such as bonuses and annual one-off payments. Students and substitute workers enter the labour market during the summer and generally receive lower pay than permanent employees. The share of lower-paid workers increases as a result, which tends to lower the index in Q3 of each year. In Q4, the effect of summer workers is reversed, and December supplements are paid as well; therefore, the index usually rises most in Q4 of the year. These changes cause strong seasonal fluctuations in the index. The impact of changes in composition of the labour force can also surface over a longer period of time; for instance, due to changes in the share of sectors with varying wage levels or the share of foreign workers.

Comparison with other measures of wage developments

When comparing the total wage index to the general wage index, it must be borne in mind that the two indices do not measure wage developments in the same way. The wage index is an index of regular wages per hour paid; therefore, care is taken to ensure that changes in the composition of groups and hours worked, in addition to irregular payments, do not affect the measurement of the index. A third measure of wage developments is wage costs according to the production accounts. This is the measure that the Central Bank takes most account of in estimating wage developments, although the wage index is also used for reference. This measure is based on information from firms' annual accounts, and to measure wages per hour worked, wage costs are divided by hours worked according to Statistics Iceland's labour force survey. Because the production accounts are currently prepared only on an annual basis, quarterly figures have been constructed using information on quarterly developments in the wage index. The disadvantage of using wage infor-

1. In the main, the total wage index is based on a multi-modal statistical evaluation by Statistics Iceland, where relative variables from the Icelandic Survey on Wages, Earnings, and Labour Costs are applied to administrative data that span the entire population. The administrative data include pay-as-you-earn (PAYE) data, personal income tax returns, and individuals' wage slips, as well as the educational database, fishermen's registered days at sea, and corporate income tax returns.

mation from the production accounts, however, is that this information is published with a time lag and is often revised significantly between publications (see, for instance, the discussion in Box 4 of *Monetary Bulletin* 2015/4). In the Bank's analyses, it has therefore proven necessary to estimate historical changes in wages as much as two years back in time, usually using the wage index. Therefore, over time, the new total wage index should give the Bank more detailed information for use in estimating wage developments.

Developments in wages by various measures

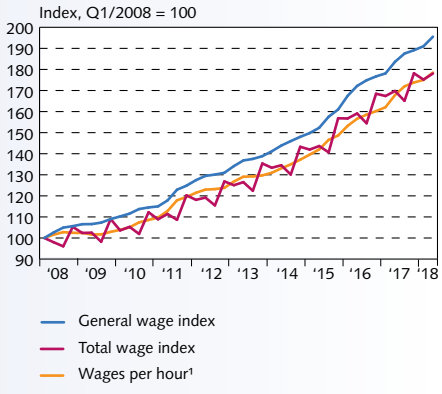
Chart 1 shows that the total wage index and wage costs according to the production accounts move closely together over the period and, over a ten-year period from Q1/2008 through Q1/2018, rose by the same amount, or 75%.[2] However, the wage index rose considerably more over the same period, or by 91%. From end-2015 onwards, the number of foreign workers rose steeply, and it can be seen that the difference between developments in the general wage index and the other measures also grew larger from that time on. Furthermore, the share of tourism-related sectors, where wages are generally below average, has increased, while the share of the financial sector, where wages are generally relatively high (and were particularly high a decade ago), has decreased. This change in composition does not affect the wage index but can affect the other two measures.

If a company responds to wage increases by streamlining — for example, by hiring younger workers or foreign workers at lower wages instead of higher-paid local employees — the rise in the total wage index and in wages per hour worked be smaller, whereas there is no impact on the general wage index. The same happens when overtime hours are reduced. In this context, it is also interesting to examine developments in the wake of wage settlements in recent years, as there is a particularly striking difference between the wage index and the total wage index when wage increases peaked following the 2011 wage settlement, on the one hand, and following the settlements reached in 2015 and 2016, on the other. In the former instance, the twelve-month rise in the wage index peaked at 11%, and in the latter case, it peaked at 13%. The total wage index peaks at the same time as the wage index in both cases, but the growth rate of the total wage index was a full 2 percentage points less (Chart 2). Comparing the total wage index and the general wage index therefore gives an indication that employers have to a degree responded to contractual pay increases by reducing overtime and hiring cheaper labour. On the other hand, wages per hour worked do not always show a comparable trend. Based on wages per hour worked, the pay rises following the 2011 settlements showed fully in wage costs, as in the wage index. In addition, wages rose more slowly than both the total wage index and the wage index in the latter part of the contract period and at the beginning of the next settlements, in late 2013. Wages per hour worked and the total wage index are better aligned, however, following the 2015 and 2016 wage settlements, but they diverge again in early 2017.

Divergent developments in these measures of wage developments reflect differing methodologies in estimating wages per hour worked, but they can also reflect both uncertainties in measurements and measurement errors in wages and hours worked. In view of this, it can be expected that some uncertainty in estimating recent developments in wage costs will remain.

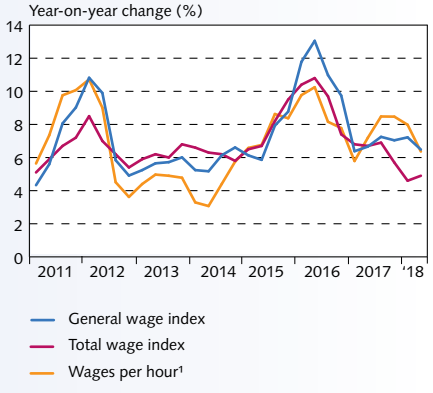
2. Developments in wage costs according to the production accounts from Q1/2017 through Q2/2018 are based on Central Bank estimates.

Chart 1
Different measures of wages
Q1/2008 - Q2/2018



1. Wages per hour worked are based on annual figures for the wage portion of the "wages and related expenses" category from the production accounts, as a share of total hours worked according to the Statistics Iceland labour force survey. Estimate from Q4/2016 onwards.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart 2
Different measures of wages
Q1/2011 - Q2/2018



1. Wages per hour worked are based on annual figures for the wage portion of the "wages and related expenses" category from the production accounts, as a share of total hours worked according to the Statistics Iceland labour force survey. Estimate from Q4/2016 onwards.
Sources: Statistics Iceland, Central Bank of Iceland.

Box 5

The Central Bank of Iceland forecasting record

Economic developments often diverge from forecasts. The forecasts in *Monetary Bulletin* are based on models that present a simplified view of the economy. The equations in the model describe the economic relationships that are most important; however, it is inevitable that they will omit many other less significant. When forecasts are prepared, they must be based on preliminary figures for the recent past, data that in some instances will not be available in their final form until several years later. Furthermore, forecasts are based to a degree on forecasters' assessments, which can also give rise to errors. Moreover, unforeseen developments that are impossible to forecast can always occur. Studying past forecast errors helps to identify the uncertainties in future forecasts and possible structural changes in the economy. In addition, it can be useful in further developing macroeconomic models, using them for forecast preparation, and improving the procedures used for analysis and forecast presentation.

Forecasts of the real economy and inflation

The Central Bank's macroeconomic and inflation forecasts are prepared four times a year over a horizon of three years and are published in its *Monetary Bulletin*. Each forecast is based on a detailed analysis of the current state of the economy. The assumptions concerning global economic developments are based, among other things, on forecasts from international institutions and the information implied by key commodity futures. The national accounts are the primary source of data on the domestic economy. In addition, Bank staff prepare an independent assessment of the state of the economy through surveys; discussions with corporate executives, directors of institutes, and labour market partners; and statistical analysis of data on key variables. The Central Bank's quarterly macroeconomic model (QMM) is the tool used to manage this information. Some of the equations in the model are accounting equations, while others are behavioural equations that are estimated using econometric methods. However, the Bank's forecast – particularly for the recent past and immediate future – is determined not least by staff assessments, various simple statistical models, and a variety of information not included in QMM. The Bank's dynamic stochastic general equilibrium (DSGE) model, DYNIMO, also plays an important role in forecast preparation, not least as a cross-check on the baseline forecast (see Box 3 in *Monetary Bulletin* 2017/4).

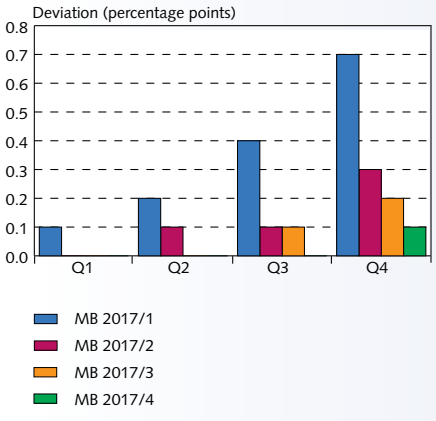
Monetary policy performance during the forecast horizon is a key factor in the preparation of each forecast. In QMM, monetary policy is set with a forward-looking monetary policy rule wherein Central Bank interest rates are determined by the expected deviation of inflation from the inflation target and the current output gap. This rule ensures that the Bank's interest rates bring inflation back to target by the end of the forecast horizon. The monetary policy rule in the model was selected so as to minimise the sacrifice cost in ensuring that inflation is at target.[1]

Central Bank inflation forecasts for 2017

Inflation rose slightly year-on-year in 2017, averaging 1.8% for the year, up from 1.7% in 2016. It was the fourth year in a row with below-target inflation. Inflation excluding indirect tax effects was slightly lower, at 1.5%. Rising house prices were the main

Chart 1

Inflation forecasting errors in *Monetary Bulletin* in 2017



Source: Central Bank of Iceland.

1. See Ásgeir Daníelsson, Bjarni G. Einarsson, Magnús F. Gudmundsson, Svava J. Haraldsdóttir, Thórarinn G. Pétursson, Signý Sigmundardóttir, Jósef Sigurdsson, and Rósa Sveinsdóttir (2015), "QMM: A quarterly macroeconomic model of the Icelandic economy - version 3.0, Central Bank of Iceland, Working Paper no. 71, http://www.sedlabanki.is/library/Skraarsafn---EN/Working-Papers/WP_71_net_nytt.pdf.

driver of inflation during the year, albeit offset to a large degree by lower imported goods prices. Chart 1 and Table 1 illustrate the forecasting record for inflation forecasts within the year. The Bank's baseline forecast assumed that inflation would be higher in 2017 than proved to be the case, particularly the first forecast of the year. To some extent, this is attributable to stronger-than-expected pass-through from the appreciation of the króna to imported goods prices early in the year. The February forecast also assumed that oil prices would rise more than they ultimately did. As Chart 2 indicates, the Bank's forecasting errors at the beginning of 2017 were well within the 50% confidence interval of the forecast.

Table 1 Inflation forecast for 2017

	Monetary Bulletin				*Final*
Year-on-year change (%)	*2017/1*	*2017/2*	*2017/3*	*2017/4*	*result*
Inflation	2.1	1.9	1.8	1.8	1.8
Inflation excl. indirect tax effects	1.9	1.7	1.6	1.5	1.5

Errors in inflation forecasts over longer periods

Chart 3 shows developments in errors in Central Bank inflation forecasts one, four, and eight quarters ahead, from Q2/2001 through Q3/2018. Forecasts two years ahead have been published since March 2001, when the inflation target was adopted. Inflation forecasts one quarter ahead showed no tendency towards either over- or underestimating inflation. Forecasting errors can generally be expected to increase as forecasts extend further ahead in time, and one- and two-year forecasts tend to underestimate rather than overestimate the level of inflation. The errors were greatest for 2008 and 2009, when inflation was significantly underestimated, owing largely to the steep depreciation of the króna during the financial crisis. The chart also shows that forecasts during the period 2001-2013 had a tendency to underestimate inflation, whereas overestimation became more common in 2014 and thereafter.

Table 2 shows the mean deviation (which gives an indication of whether inflation is being systematically over- or underestimated) and the root mean square error (RMSE, which shows the uncertainty in the forecast) since the Bank began publishing inflation forecasts. Because the errors were greatest for 2008 and 2009, the table also reports the mean deviation and the RMSE of the forecasts, excluding those years.[2]

Table 2 Forecast errors in Central Bank of Iceland inflation forecasts[1]

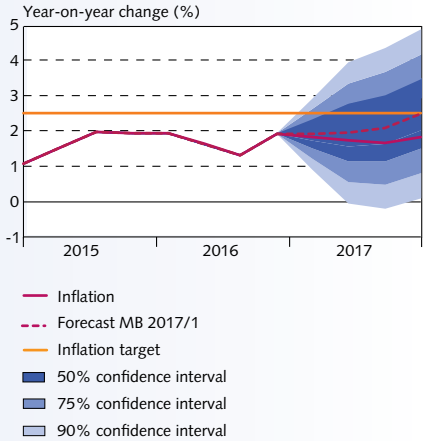
%	*One quarter*	*Two quarters*	*Three quarters*	*Four quarters*	*Eight quarters*	*Twelve quarters*
No. of measurements	67 (63)	66 (63)	65 (62)	64 (62)	60 (57)	34 (33)
Mean forecast error (%)	0.0 (0.0)	0.0 (0.0)	-0.4 (-0.1)	-0.8 (-0.5)	-1.3 (-0.7)	-0.4 (-0.2)
RMSE (%)	0.6 (0.3)	1.4 (1.0)	2.1 (1.6)	2.4 (2.0)	3.4 (2.2)	1.8 (1.6)

1. Forecast errors from Q2/2001 through Q3/2018. Figures in parentheses represent the same period, excluding 2008 and 2009.

Inflation was underestimated three to twelve quarters ahead during the period. The underestimation in forecasts up to three quarters ahead is minor and not statistically significant, but for the forecasts four and eight quarters ahead, it is statistically significant. For forecasts two years ahead, the underestimation totals 1.3

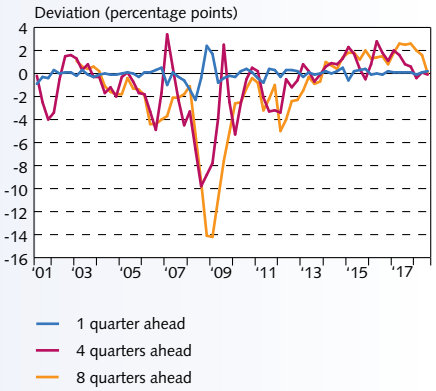
2. There are fewer measurements for inflation forecasts three years ahead because the Central Bank did not begin to publish forecasts with a three-year horizon until 2007.

Chart 2
Inflation forecast and confidence intervals *Monetary Bulletin* 2017/1
Q1/2015 - Q4/2017



Sources: Statistics Iceland, Central Bank of Iceland.

Chart 3
Inflation forecasting errors in *Monetary Bulletin*[1]
Q2/2001 - Q3/2018

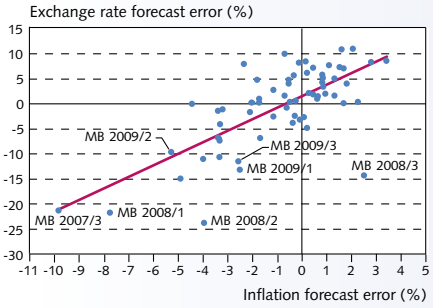


1. First quarter is the quarter in which the report is published or the first quarter forecasted; Four quarters ahead is three quarters after the report has been published; Eight quarters ahead is seven quarters after the report has been published.
Source: Central Bank of Iceland.

Chart 4

Inflation forecasting errors in *Monetary Bulletin* and deviation of average exchange rate from forecast 2001-2017

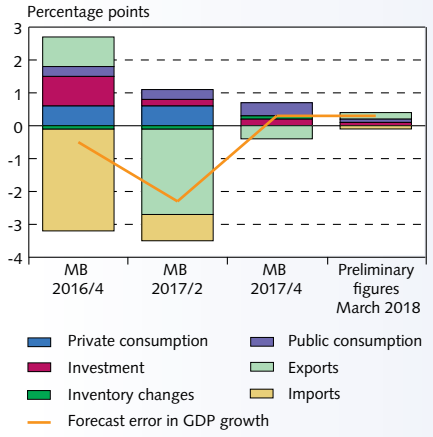
Forecast one year ahead



Source: Central Bank of Iceland.

Chart 5

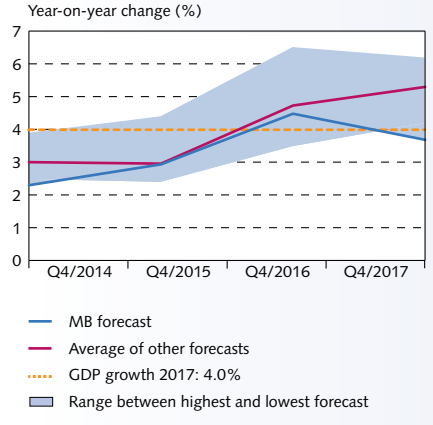
Contribution of expenditure items to forecast errors in GDP growth 2017[1]



1. Based on real figures in September 2018.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart 6

GDP growth forecast for 2017



Sources: Arion Bank, European Commission, Icelandic Confederation of Labour, IMF, Íslandsbanki, Landsbankinn, Statistics Iceland, Central Bank of Iceland.

percentage points. There was no significant bias in the three-year forecasts, however.

It should be borne in mind that the Bank did not begin using its quarterly macroeconomic model (QMM) until the beginning of 2006, and it prepared no forecasts of the exchange rate or Central Bank interest rates before 2007.[3] From the introduction of the capital controls through the forecast in *Monetary Bulletin* 2016/4, the Bank's macroeconomic and inflation forecasts were also based on the technical assumption that the exchange rate of the króna would remain unchanged throughout the forecast horizon. Experience shows that large errors in inflation forecasts in Iceland are usually related to exchange rate volatility (Chart 4), as the correlation between the numerical errors in inflation and exchange rate forecasts is 0.72. Chart 4 also shows that inflation was generally underestimated in those instances when the króna turned out weaker than the forecast had assumed. This is particularly the case for forecasts prepared during the wake of the financial crisis. However, in the instances when the króna proved stronger than the forecast had assumed, inflation was usually overestimated.

Central Bank GDP growth forecasts for 2017

In order to obtain a clearer view of the Central Bank's success in inflation forecasting, it is necessary to examine its success in forecasting developments in the real economy. It is likely that inflation will generally be underestimated during periods when demand pressures or growth in demand is also underestimated.

Statistics Iceland publishes preliminary national accounts figures for each quarter about two months after each quarter-end. The first estimates for Q4/2017 and the full year 2017 were published in March 2018, and revised figures were published in September. The *Monetary Bulletin* forecasts and Statistics Iceland's estimates of changes in key macroeconomic variables from the previous year can be seen in Table 3. In February 2017, when *Monetary Bulletin* 2017/1 was published, Statistics Iceland's preliminary national accounts figures were available only for Q3/2016. As a result, the Bank had to base its forecast for 2017 on the forecast for Q4/2016. In addition, the forecast was based on historical figures that would subsequently change.

Table 3 *Monetary Bulletin* macroeconomic forecasts and Statistics Iceland data for 2017

% change form prior year	*MB 17/1 (forecast from Q4/'16)*	*MB 17/2 (forecast from Q1/'17)*	*MB 17/3 (forecast from Q2/'17)*	*MB 17/4 (forecast from Q3/'17)*	*MB 18/1 (forecast from Q4/'17)*	*Pre-liminary figures (March 2018)*	*Revised figures (Sept. 2018)*
Private consumption	6.8	6.7	7.1	7.9	7.5	7.8	7.9
Public consumption	1.5	1.6	1.6	1.5	2.7	2.6	3.1
Investment	9.2	8.6	9.2	8.8	9.0	9.3	9.5
Domestic demand	5.8	5.9	6.5	6.3	7.0	6.8	7.0
Exports	6.2	10.5	8.7	6.1	3.2	4.8	5.5
Imports	7.4	10.2	11.9	12.2	11.0	11.9	12.5
GDP growth	5.3	6.3	5.2	3.7	3.4	3.6	4.0

Statistics Iceland's figures for 2017 changed between the publication of the preliminary numbers in March 2018 and the revision in September. Growth in domestic demand was underestimated in the preliminary figures, owing mainly to a 0.5-point underestima-

3. See Ólafsson, T. T. (2007), "Publication of its own policy rate path boosts the effectiveness of central bank monetary policy", *Monetary Bulletin* 2007/1, pp. 71-86.

tion of public consumption growth. Both import growth and export were underestimated by roughly the same amount, and therefore these underestimations had little impact on the GDP growth figure for the year. GDP growth according to Statistics Iceland's September figures was therefore 4.0%, or 0.4 percentage points more than in the March figures.

GDP growth for the year turned out weaker than had been projected earlier on. The forecast error amounted to 1.3 percentage points in the forecast in *Monetary Bulletin* 2017/1 and 1 percentage point more in *Monetary Bulletin* 2017/2, but beginning with the August issue, the deviation has been relatively small. As can be seen in Table 3 and Chart 5, the overestimation of GDP growth in *Monetary Bulletin* 2017/2 is due predominantly to an overestimation of the outlook for export growth, although it was offset to a degree by an underestimation of domestic demand growth. The underestimation of domestic demand was due to an underestimation of growth in consumption spending by households and the public sector. However, the deviation in the forecasts of investment growth were relatively small, which is unusual, as investment is the national accounts item that tends to be most volatile and changes the most upon revision.

Central Bank forecasts in comparison with other forecasters' projections

Chart 6 gives a comparison of the Central Bank's output growth forecasts for 2017 and the average of projections from others that publish regular forecasts concerning the Icelandic economy. All of the forecasts were prepared in the fourth quarter of the years 2014-2017, and the mean is calculated from each year's last forecast as prepared by seven forecasters: the International Monetary Fund (IMF), the Icelandic Federation of Labour (ASÍ), the three large commercial banks, Statistics Iceland, and the European Commission.[4] The range between the highest and lowest forecast values is indicated by the shaded area. In general, it widens during periods of marked uncertainty. Other things being equal, economic forecasts should become more consistent with one another as the period covered by the forecast approaches and more detailed information becomes available.

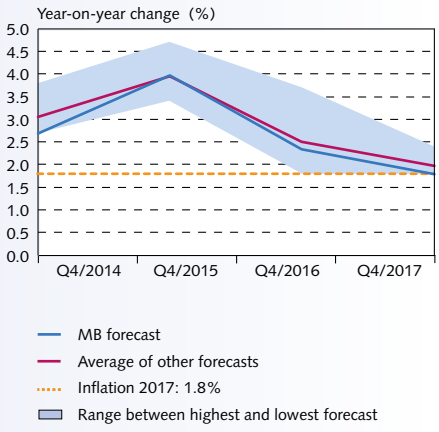
Overall, the forecasts in *Monetary Bulletin* accord well with the average from other forecasters, although the Bank's GDP growth forecasts were closer to the ultimate outcome for 2017 than the other forecasters' average. Chart 7 gives a comparison of the inflation forecasts for 2017, prepared by the Bank and the other forecasters. The Bank's inflation forecasts have generally been more accurate than those from other forecasters in recent years, and this applies to 2017 as well.

The Central Bank's 2017 forecasts in international comparison

It can be useful to examine the Bank's forecasts in international context. In recent years, the general tendency has been to overestimate inflation among advanced economies; however, this trend turned around in some economies, such as New Zealand and Sweden, in 2017 (Chart 8). In Iceland, however, inflation was overestimated, in part due to stronger-than-expected pass-through from the appreciation of the króna to imported goods prices, as is discussed above. The deviation was similar to that, for instance, in Norway.

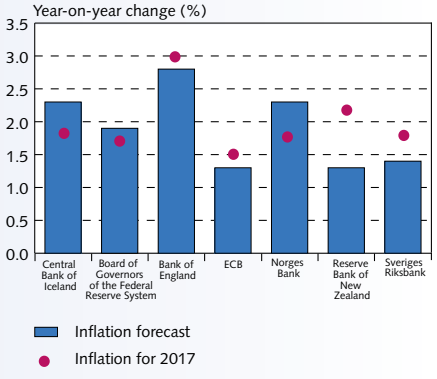
4. Not all of these forecasters prepare forecasts over a horizon of three years; therefore, the 2014 value in Chart 7 is based only on the forecasts from the IMF, Arion Bank, Statistics Iceland, and Landsbankinn. This explains in part why the high-low range is smaller in 2014 than in 2015.

Chart 7
Inflation forecasts for 2017



Sources: Arion Bank, European Commission, Icelandic Confederation of Labour, IMF, Íslandsbanki, Landsbankinn, Statistics Iceland, Central Bank of Iceland.

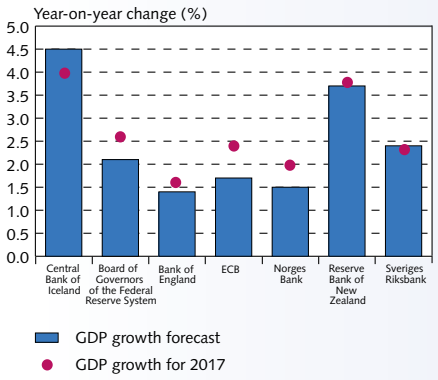
Chart 8
Inflation forecasts for 2017 in advanced economies[1]



1. Forecasts made in end of 2016 except the Fed's was made in June 2016. Bank of England's projection is Q4 four-quarter CPI inflation.
Sources: Bank of England, Board of Governors of the Federal Reserve System, ECB, Norges Bank, Reserve Bank of New Zealand, Sveriges Riksbank, Thomson Reuters, Central Bank of Iceland.

Chart 9

GDP growth forecasts for 2017 in advanced economies[1]



1. Forecasts made in end of 2016 except the Fed's, which was made in June 2016.

Sources: Bank of England, Board of Governors of the Federal Reserve System, ECB, Norges Bank, Reserve Bank of New Zealand, Sveriges Riksbank, Thomson Reuters, Central Bank of Iceland.

Chart 9 gives the same type of comparison of GDP growth forecasts. In most countries, GDP growth for 2017 turned out underestimated, whereas for Iceland it was overestimated, as is discussed above. The size of the deviation does not stand out in international context.

Appendix 1

Forecast tables

Table 1 GDP and its main components[1]

	2017	*2018*	*2019*	*2020*	*2021*
Private consumption	7.9 (7.8)	4.6 (5.6)	3.9 (3.8)	2.8 (3.2)	2.5
Public consumption	3.1 (2.6)	2.9 (2.5)	2.0 (1.9)	2.1 (2.1)	2.5
Gross capital formation	9.5 (9.3)	5.0 (5.2)	8.5 (6.1)	5.3 (4.6)	1.0
Business investment	4.8 (4.3)	-3.0 (-7.2)	2.7 (4.0)	4.6 (2.6)	-2.9
Residential investment	18.4 (21.6)	31.4 (31.5)	15.8 (10.7)	10.2 (11.1)	9.2
Public investment	26.9 (23.4)	12.4 (31.9)	22.4 (7.5)	1.3 (3.1)	2.8
Domestic demand	7.0 (6.8)	4.2 (4.7)	4.6 (3.8)	3.2 (3.3)	2.2
Exports of goods and services	5.5 (4.8)	3.9 (3.6)	2.3 (3.6)	2.3 (2.6)	2.9
Imports of goods and services	12.5 (11.9)	3.3 (6.0)	6.2 (6.2)	3.8 (3.1)	2.0
Gross domestic product (GDP)	4.0 (3.6)	4.4 (3.6)	2.7 (2.7)	2.5 (3.0)	2.6
GDP at current prices (ISK billions)	2.615 (2.555)	2.818 (2.731)	2.993 (2.917)	3.150 (3.084)	3.318
GDP at current prices (growth rate)	4.5 (4.1)	7.8 (6.9)	6.2 (6.8)	5.2 (5.7)	5.3
Total investment (% of GDP)	22.3 (22.1)	22.9 (23.1)	24.2 (23.6)	24.5 (23.8)	23.9
Business investment (% of GDP)	15.3 (15.1)	14.4 (14.0)	14.4 (14.0)	14.4 (13.8)	13.5
Gross national saving (% of GDP)[2]	25.6 (25.6)	25.7 (24.4)	25.2 (24.7)	25.2 (24.9)	25.3
Contribution of net trade to GDP growth (percentage points)	-2.6 (-2.7)	0.4 (-0.9)	-1.6 (-1.1)	-0.6 (-0.2)	0.4

1. Year-on-year change (%) unless otherwise specified (figures in parentheses are from the forecast in *Monetary Bulletin* 2018/3). 2. The sum of investment, inventory changes, and the current account balance.

Sources: Statistics Iceland, Central Bank of Iceland.

Table 2 Global economy, external conditions, and exports[1]

	2017	*2018*	*2019*	*2020*	*2021*
Marine production for export	-3.9 (-3.9)	10.2 (7.5)	-3.5 (3.0)	1.0 (2.0)	2.0
Aluminium production for export[2]	4.5 (4.9)	0.0 (1.0)	0.0 (1.0)	1.0 (1.0)	1.0
Foreign currency prices of marine products	-0.8 (-0.8)	5.0 (3.5)	3.0 (3.0)	2.0 (2.0)	2.0
Aluminium prices in USD[3]	20.3 (20.3)	15.9 (10.0)	-0.6 (2.0)	1.7 (1.0)	2.3
Fuel prices in USD[4]	24.1 (23.3)	37.6 (32.0)	5.3 (1.0)	-4.4 (-3.0)	-5.0
Terms of trade for goods and services	1.7 (1.7)	-1.9 (-1.8)	-0.1 (2.0)	0.6 (0.2)	0.3
Inflation in main trading partners[5]	1.7 (1.7)	2.0 (1.9)	1.9 (1.8)	1.9 (1.8)	1.9
GDP growth in main trading partners[5]	2.4 (2.4)	2.2 (2.3)	2.1 (2.1)	1.8 (1.9)	1.8
Main trading partners' imports[5]	4.0 (4.1)	3.9 (4.1)	4.2 (4.2)	3.6 (3.5)	3.4
Policy rates in main trading partners (%)[6]	0.2 (0.2)	0.5 (0.5)	0.6 (0.9)	0.7 (1.0)	0.9

1. Year-on-year changes (%) unless otherwise specified (figures in parentheses are from the forecast in *Monetary Bulletin* 2018/3). 2. According to Statistics Iceland's external trade data. 3. Forecast based on aluminium futures and analysts' forecasts. 4. Forecast based on fuel futures. 5. Forecast based on Consensus Forecasts, Global Insight, IMF and OECD. 6. Forecast based on main trading partners' forward policy rates.

Sources: Bloomberg, Consensus Forecasts, Global Insight, IMF, New York Mercantile Exchange, OECD, Statistics Iceland, Thomson Reuters, Central Bank of Iceland.

Table 3 Current account balance and its subcomponents[1]

	2017	*2018*	*2019*	*2020*	*2021*
Trade balance	4.1 (4.1)	3.6 (2.4)	1.8 (2.1)	1.4 (1.9)	1.9
Balance on primary income[2]	-0.7 (-0.7)	-0.8 (-1.0)	-0.8 (-1.0)	-0.6 (-0.8)	-0.5
Current account balance	3.3 (3.4)	2.8 (1.3)	1.0 (1.1)	0.7 (1.1)	1.3

1. % of GDP (figures in parentheses are from the forecast in *Monetary Bulletin* 2018/3). 2. The sum of primary and secondary income.

Sources: Statistics Iceland, Central Bank of Iceland.

Table 4 Public sector finances[1]

	2017	2018	2019	2020	2021
Overall Treasury balance	1.2 (1.2)	0.9 (0.8)	0.9 (0.6)	0.8 (0.5)	0.6
Primary Treasury balance	4.0 (4.0)	3.3 (3.2)	2.5 (2.3)	2.3 (2.1)	2.1
Primary Treasury balance excluding one-off items[2]	2.2 (2.2)	2.4 (1.5)	1.5 (0.9)	0.8 (0.3)	0.7
Overall general government balance	0.0 (1.5)	1.1 (1.0)	1.1 (0.8)	1.0 (0.6)	0.9
Primary general government balance	3.0 (4.5)	4.0 (3.9)	3.2 (2.9)	2.9 (2.7)	2.7
Total general government debt	42 (42)	40 (40)	37 (37)	36 (37)	32
Net general government debt[3]	35 (35)	32 (32)	29 (29)	28 (29)	24

1. % of GDP on an accrual basis (figures in parentheses are from the forecast in *Monetary Bulletin* 2018/2). 2. One-off items are stability contributions, accelerated write-down of indexed mortgage loans, special payment to LSR-A division and dividends in excess of the National Budget 3. Net debt is defined here as total liabilities excluding pension obligations and accounts payable and net of cash and bank deposits.

Sources: Ministry of Finance and Economic Affairs, Statistics Iceland, Central Bank of Iceland.

Table 5 Labour market and factor utilisation[1]

	2017	2018	2019	2020	2021
Unemployment (% of labour force)	2.8 (2.8)	2.8 (3.0)	3.0 (3.0)	3.1 (3.4)	3.3
Employment rate (% of population aged 16-74)	80.3 (80.3)	79.5 (79.2)	79.4 (79.2)	79.2 (79.0)	79.2
Total hours worked	1.2 (1.2)	2.3 (1.2)	2.0 (1.8)	1.3 (1.4)	1.4
Labour productivity[2]	2.8 (2.4)	2.1 (2.4)	0.7 (0.9)	1.3 (1.6)	1.2
Unit labour costs[3]	4.9 (5.2)	5.6 (5.4)	5.3 (5.2)	2.8 (2.4)	2.4
Wage share (% of gross factor income)	63.1 (64.8)	64.7 (66.2)	65.9 (67.0)	66.0 (66.8)	65.8
Real disposable income	7.7 (8.0)	6.5 (6.0)	5.1 (4.8)	2.0 (2.7)	2.1
Output gap (% of potential output)	2.1 (1.8)	2.6 (1.6)	1.4 (1.0)	0.5 (0.6)	0.1

1. Year-on-year change (%) unless otherwise specified (figures in parentheses are from the forecast in *Monetary Bulletin* 2018/3). 2. GDP per total hours worked. 3. Wage costs divided by productivity.

Sources: Statistics Iceland, Central Bank of Iceland.

Table 6 Exchange rate and inflation[1]

	2017	2018	2019	2020	2021
Trade-weighted exchange rate index[2]	160.3 (160.3)	165.5 (161.7)	170.5 (160.3)	165.4 (158.9)	165.2
Real exchange rate (relative consumer prices)[3]	99.8 (99.7)	97.5 (99.5)	95.9 (101.4)	99.6 (103.2)	100.4
Real exchange rate (relative unit labour costs)[3]	99.6 (99.9)	100.2 (102.4)	100.5 (106.7)	104.0 (107.8)	104.1
Inflation (consumer price index, CPI)	1.8 (1.8)	2.7 (2.7)	3.4 (2.8)	2.7 (2.7)	2.5
Inflation (CPI excluding effects of indirect taxes)	1.5 (1.5)	2.6 (2.6)	3.3 (2.8)	2.6 (2.7)	2.5

1. Year-on-year (%) unless otherwise specified (figures in parentheses are from the forecast in *Monetary Bulletin* 2018/3). 2. Narrow trade-weighted basket (index, 31 December 1991 = 100). The index has been recalculated so that on 2 January 2009 it was assigned a value equivalent to that of the now-discontinued Exchange Rate Index. 3. Average 2005 = 100.

Sources: Statistics Iceland, Central Bank of Iceland.

Table 7 Quarterly inflation forecast (%)[1]

Quarter	*Inflation (year-on-year change)*	*Inflation excluding effects of indirect taxes (year-on-year change)*	*Inflation (annualised quarter-on-quarter change)*
		Measured value	
2017:4	1.8 (1.8)	1.6 (1.6)	2.5 (2.5)
2018:1	2.5 (2.5)	2.4 (2.4)	2.5 (2.5)
2018:2	2.3 (2.3)	2.2 (2.2)	3.1 (3.1)
2018:3	2.7 (2.8)	2.6 (2.8)	2.6 (3.2)
		Forecasted value	
2018:4	3.2 (3.1)	3.1 (3.1)	4.6 (3.7)
2019:1	3.5 (3.1)	3.4 (3.1)	3.6 (2.5)
2019:2	3.5 (2.9)	3.4 (2.9)	3.2 (2.2)
2019:3	3.4 (2.7)	3.3 (2.7)	2.3 (2.4)
2019:4	3.2 (2.5)	3.1 (2.5)	3.7 (2.8)
2020:1	2.9 (2.6)	2.8 (2.5)	2.5 (2.9)
2020:2	2.8 (2.8)	2.7 (2.7)	2.6 (3.0)
2020:3	2.6 (2.8)	2.5 (2.7)	1.6 (2.4)
2020:4	2.6 (2.8)	2.5 (2.7)	3.5 (2.9)
2021:1	2.7 (2.7)	2.6 (2.6)	2.9 (2.5)
2021:2	2.6 (2.6)	2.5 (2.6)	2.4 (2.8)
2021:3	2.5 (2.5)	2.4 (2.5)	1.3 (2.0)
2021:4	2.4	2.3	2.9

1. Figures in parentheses are from the forecast in *Monetary Bulletin* 2018/3.

Sources: Statistics Iceland, Central Bank of Iceland.