MONETARY BULLETIN

2017•2

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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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 17 May 2017

The Monetary Policy Committee (MPC) of the Central Bank of Iceland has decided to lower 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 4.75%.

The outlook is for strong GDP growth this year, as in 2016, with growth for both years exceeding the February forecast. The deviation from the forecast stems mainly from stronger-than-expected growth in tourism, while there is also the prospect of more fiscal easing in 2017 than was previously projected. Demand pressures in the labour market and the general economy have therefore grown despite increased importation of labour and strong productivity growth. This is offset by the appreciation of the króna. The króna has played a key role in the economy's adjustment to positive shocks deriving from improved terms of trade and growth in the tourism sector.

Inflation measured 1.9% in April, broadly similar to the level in the past six months. Underlying inflation appears to have declined in recent months, however. The currency appreciation and low global inflation continue to offset domestic inflationary pressures, and the gap between domestic price developments – housing costs in particular – and external factors has widened even further since the MPC's last meeting. Two opposing forces affect the inflation outlook. Demand pressures in the economy have turned out stronger than previously forecast, but they are offset by the higher exchange rate. The inflation outlook has improved for 2017 and 2018 but has deteriorated further out the forecast horizon.

Clear signs of increased demand pressures in the economy call for a tight monetary stance so as to ensure medium-term price stability. The Central Bank's real rate has risen slightly since the MPC's last meeting. The appreciation of the króna also contains demand.

The Central Bank has scaled down its intervention in the foreign exchange market in view of its strong foreign exchange reserves, as the appreciation of the króna is considered to reflect economic fundamentals. As before, the Bank will intervene in the market in order to mitigate volatility when it considers such intervention warranted.

A stronger anchor for inflation expectations at target and the appreciation of the króna have enabled the MPC to achieve its legally mandated price stability objective with a lower interest rate than would otherwise have been possible. The monetary stance in the coming term will be determined by economic developments and actions taken in other policy spheres.

GDP growth strong, and the output gap widens despite rapid growth in potential output

Global output growth gained momentum towards the end of 2016, and the outlook for this year has improved. Optimism has increased, although the risk to long-term global growth continues to be tilted to the downside. Strong growth in domestic economic activity is based on extremely favourable external conditions. Terms of trade have improved markedly, and exports have grown rapidly. Exports outpaced the forecast in the February *Monetary Bulletin* in 2016 and look set to do so again this year. These large external shocks have pushed the exchange rate of the króna upwards. The forecast published here assumes that the exchange rate will continue to rise through 2018, but at a slower pace than in the past year. The external shocks have also led to a rise in domestic income and wealth, which, together with strong job creation, has boosted domestic demand considerably. In spite of this, household saving has increased and national saving is at a rarely seen high. This is reflected in a large trade surplus despite rapid investment growth in the past few years.

GDP growth measured just over 4% in 2015 and surged to 7.2% in 2016. The outlook is for strong growth again this year, or 6.3%, and GDP growth for both 2016 and 2017 is estimated to be 1 percentage point more than was forecast in February. The deviation from the forecast is due to stronger-than-expected exports and more fiscal easing in 2017 than was previously projected. As in the Bank's previous forecasts, it is assumed that GDP growth will gradually ease towards its long-term trend rate as the forecast horizon progresses. It is forecast at 3½% in 2018 and 2½% in 2019.

Significant importation of labour, increased investment, and strong productivity growth in 2016 have pushed potential output growth to a level far above its long-term trend rate. In spite of this, the output gap has grown swiftly and is expected to measure just over 3% of potential output by the end of 2017, markedly above the February forecast. Offsetting this is the appreciation of the króna, which has played a key role in the adjustment of the economy to the above-described shocks.

Inflation has been at or below the Central Bank's inflation target for over three years. By most measures, inflation expectations are at target, and there are signs that a tight monetary stance has anchored them more firmly. The outlook is for below-target inflation well into 2018. It will rise temporarily to approximately 3% as the end of the forecast horizon approaches and then subside towards the target again. Because the króna has strengthened more than was assumed in February, the inflation outlook for 2017 and 2018 has improved, although increased demand pressures have eroded the outlook further ahead.

I Economic outlook, key assumptions, and main uncertainties

Central Bank baseline forecast[1]

Improved global GDP growth outlook for 2017

In Q4/2016, global output growth exceeded the forecast in the February *Monetary Bulletin*, and the outlook for this year has improved. The International Monetary Fund (IMF) projects global growth for 2017 at 3.5%, slightly above its previous forecast. The IMF forecast also reflects increased optimism about short-term prospects for the global economy, although there are still headwinds further ahead.

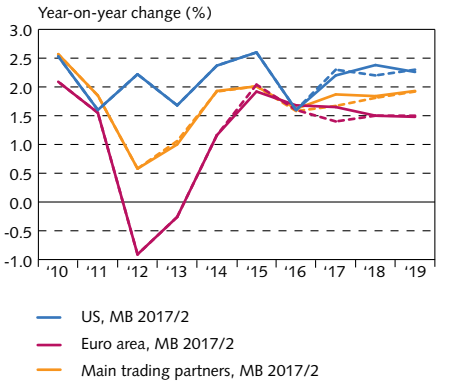
GDP growth among Iceland's main trading partners looks set to rise from last year's 1.6% to 1.9% this year (Chart I-1), some 0.2 percentage points more than was forecast in February, owing mainly to an upward revision of the output growth outlook for the UK and the eurozone to 1.7% from the February projection of 1.3-1.4%. In the US, output growth is expected to measure 2.2%, roughly the same as in the February forecast. As in February, trading partners' GDP growth is assumed to measure about 1.9% per year throughout the forecast horizon. Further discussion of the global economy can be found in Chapter II, and uncertainties in the global outlook are discussed later in this chapter.

Some further króna appreciation through 2018

Preliminary Q4/2016 figures from Statistics Iceland indicate that the ratio of Iceland's export prices to trading partners' export prices rose quarter-on-quarter by 1 percentage point more than was assumed in the Bank's February forecast. The outlook for developments in marine and aluminium product prices has also improved this year, with relative export prices expected to rise by 4½%, nearly 2 percentage points more than was forecast in February (Chart I-2). Nevertheless, a more rapid rise in import prices will cut into this improvement in terms of trade, which is now projected at 1% instead of the 1.9% provided for in the February forecast. The outlook for the next two years is broadly unchanged, however.

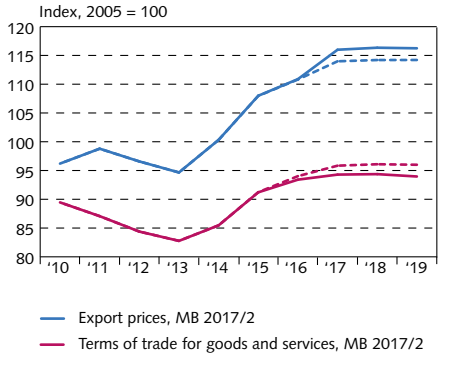
The foreign exchange market has seen some turbulence recently, in connection with the fishermen's strike early in the year and the liberalisation of capital controls in March. The króna was 3½% stronger in Q1/2017 in trade-weighted terms than was assumed in the February forecast and about 18% stronger than it was in Q1/2016. As is discussed in Chapter III, the past year's rise in the exchange rate is due largely to growth in tourism, considerably better terms of trade, and a substantial improvement in Iceland's external position. Therefore, it reflects the adjustment of the króna to a higher equilibrium real exchange rate rather than to carry trade-related inflows. The equilibrium real exchange rate is deemed to have risen somewhat, and the nominal exchange rate is considered close to its equilibrium level. Such an assessment is subject to significant uncertainty, however.

Chart I-1
Global output growth 2010-2019[1]



1. Central Bank baseline forecast 2017-2019. Broken lines show forecast from MB 2017/1.
Sources: Macrobond, OECD, Central Bank of Iceland.

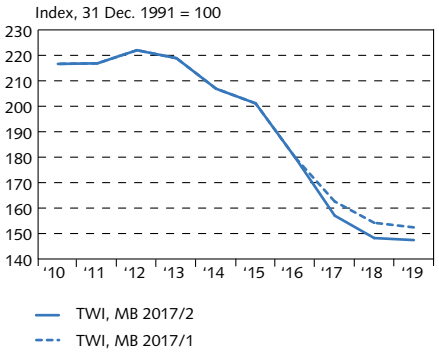
Chart I-2
Export prices and terms of trade 2010-2019[1]



1. Price of Icelandic exports relative to trading partners' export prices (converted to the same currency using the trade-weighted exchange rate index). Central Bank baseline forecast 2017-2019. The broken lines show the forecast from MB 2017/1.
Sources: Macrobond, Statistics Iceland, Central Bank of Iceland.

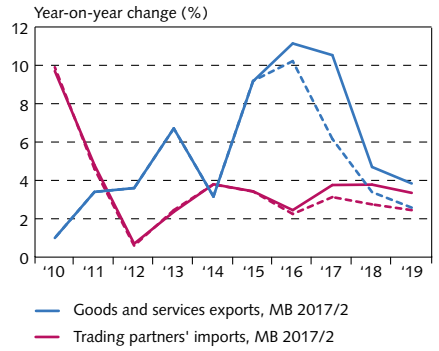
1. The analysis presented in this *Monetary Bulletin* is based on data available in mid-May.

Chart I-3
Exchange rate 2010-2019[1]



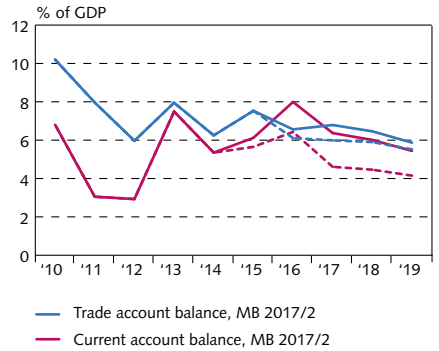
1. Central Bank baseline forecast 2017-2019. Narrow trade basket.
Source: Central Bank of Iceland.

Chart I-4
Exports and global demand 2010-2019[1]



1. Central Bank baseline forecast 2017-2019. Broken lines show forecast from MB 2017/1.
Sources: Macrobond, Statistics Iceland, Central Bank of Iceland.

Chart I-5
Current account balance 2010-2019[1]



1. Central Bank baseline forecast 2017-2019. Broken lines show forecast from MB 2017/1. Current account balance based on estimated underlying balance 2008-2015.
Sources: Statistics Iceland, Central Bank of Iceland.

According to the baseline forecast, the króna will continue to appreciate until end-2018 (Chart I-3). The trade-weighted exchange rate index (TWI) is expected to average about 157 points this year and 148 next year. If the forecast materialises, the exchange rate will be a full 14½% higher, on average, in 2017 than in 2016 and will rise by an additional 6% in the coming two years. By 2019, the króna would be 3½% stronger than was assumed in February, although it should be noted that these forecasts are highly uncertain. The forecast implies a larger rise in the real exchange rate than previously anticipated. If this is borne out, the real exchange rate in terms of relative consumer prices will be 11% higher by the end of the forecast horizon than in Q1/2017. In terms of relative unit labour costs, the increase is somewhat larger. Further discussion of terms of trade and the exchange rate can be found in Chapters II and III.

Strong export growth delivers a record current account surplus …
Exports have grown rapidly in recent years. Exports of goods and services combined rose by over 11% in 2016, and in the past five years export growth has averaged nearly 7% per year, almost three times trading partners' import growth rate over the same period. The main driver of the surge is tourism, which accounts for the bulk of last year's 19% growth in services exports and the five-year average of almost 11%. Furthermore, it is because of strong growth in services exports that total exports are forecast to grow by 10½% this year, well above the February forecast of just over 6% (Chart I-4). The difference is due mainly to the prospect of an even larger increase in tourist arrivals than was previously assumed. Even though marine product exports contracted in Q1/2017 because of the fishermen's strike, they are expected to increase somewhat more this year than was forecast in February, owing to a much stronger capelin fishery than previously anticipated. In addition, aluminium exports are forecast to be stronger than previously thought. As in the Bank's previous forecasts, export growth is expected to ease in the next two years, in line with a rising real exchange rate and relatively weak global export growth. Because services exports are expected to grow more rapidly, however, the forecast for growth in total exports in the next two years has been revised upwards since February.

The trade surplus measured 6.6% of GDP in 2016, slightly outpacing the February forecast. The outlook is for a larger surplus this year as well, or 6.8% instead of the 6% forecast in February (Chart I-5). The deviation is due mainly to the prospect of stronger export growth throughout the forecast horizon. The surplus is expected to measure about 6% of GDP in 2019.

The current account surplus measured 8% of GDP in 2016, the highest ever recorded apart form 2009, when it was also 8%. Last year's surplus was due in particular to a historically high national saving rate of more than 29% of GDP (see Box 1). This year, a smaller surplus on primary income is expected to counteract a growing trade surplus, reducing the current account surplus to 6½% of GDP. The current account surplus is expected to narrow by an additional 1 percentage point over the remainder of the forecast horizon. Further discussion of the external balance can be found in Chapter IV.

… despite rapid growth in domestic demand

Households' disposable income has risen sharply in the recent term, and real disposable income has grown by an average of 7½% per year since 2014. At the same time, household net wealth has grown markedly, supported by rising asset prices and declining debt. Households have used the rise in disposable income for increased consumption spending but have also used a portion to strengthen their balance sheets and step up saving. Private consumption grew by nearly 7% in 2016, while household saving rose to nearly 11% of disposable income. Year-2016 private consumption growth turned out stronger than was forecast in February, owing in part to Statistics Iceland's revision of previous figures and an unexpectedly strong rate of consumption growth in Q4 (Chart I-6). Real disposable income is thought to have risen slightly more in 2016 that was previously projected. The rise is expected to continue this year, and household saving to grow more than was provided for the Bank's last forecast. This explains in part why private consumption is projected to grow more rapidly in coming years than was forecast in February. In spite of this, however, household savings will increase for most of the forecast horizon. Only at the very end of the period, when growth in real disposable income eases, will households begin to tap their savings once again.

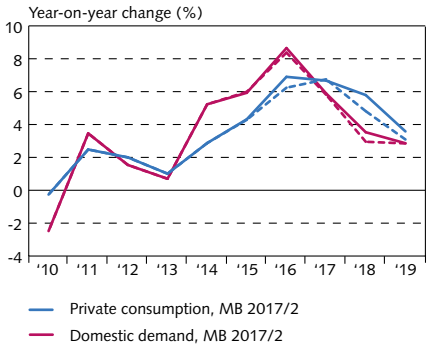
Investment has grown quickly in recent years. In 2016, it grew by almost 23% year-on-year, on the heels of nearly 17% annual growth in the two preceding years. The main driver of the increase is business investment, which has grown by an average of almost one-fourth per year in the past three years. The increase has been particularly notable in sectors related to transport and tourism. Residential investment has also picked up strongly, growing by over a third in 2016. The outlook is for a marked slowdown in investment growth this year, although growth will remain robust, or 8½%. Although this is above the February forecast, the overall outlook for 2017 and the next two years is broadly unchanged. In spite of this, the investment-to-GDP ratio will be slightly below the February forecast throughout the horizon (Chart I-7).

Domestic demand grew by 8.7% in 2017, broadly as was projected in February (Chart I-6). This is the strongest single-year growth rate since 2006. The outlook is for growth to be robust this year as well, nearly 6%, and then taper off to just over 3% in 2018. Further discussion of private and public sector demand can be found in Chapter IV.

GDP growth well above the February forecast in 2016 and set to remain strong in 2017 and 2018

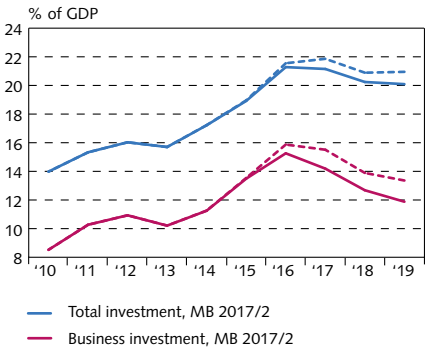
According to preliminary figures from Statistics Iceland, GDP growth picked up strongly as 2016 progressed, measuring 10.4% in H2 and 7.2% for the year as a whole (Chart I-8). This is a full 1 percentage point above the Bank's February forecast. The deviation from the forecast is attributable mainly to stronger-than-expected exports, as domestic demand grew broadly as projected. As before, strong growth in private consumption and investment pull in one direction and the negative contribution from net trade – in spite of over 11% export growth – in the other.

Chart I-6
Private consumption and domestic demand 2010-2019[1]



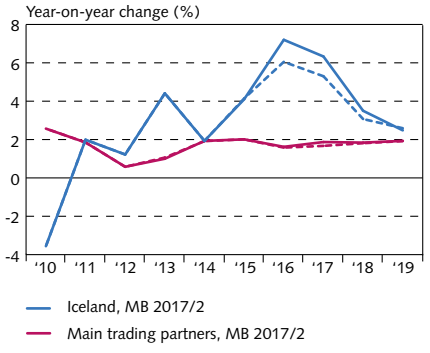
1. Central Bank baseline forecast 2017-2019. Broken lines show forecast from MB 2017/1.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart I-7
Investment 2010-2019[1]



1. Central Bank baseline forecast 2017-2019. Broken lines show forecast from MB 2017/1.
Sources: Statistics Iceland, Central Bank of Iceland.

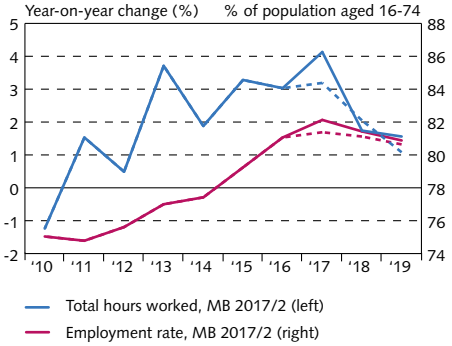
Chart I-8
GDP growth in Iceland and trading partners 2010-2019[1]



1. Central Bank baseline forecast 2017-2019. Broken lines show forecast from MB 2017/1.
Sources: Macrobond, Statistics Iceland, Central Bank of Iceland.

There are signs that GDP growth eased somewhat in Q1/2017. Clearly, the fishermen's strike early in the year caused a steep drop in marine product exports and export inventories. Because the impact is temporary, GDP growth is expected to rally in Q2 and measure 6.3% for 2017 as a whole, 1 percentage point above the February forecast. The expectation of more rapid output growth stems from the assumption that there is greater momentum in the economy, mainly because of the outlook for stronger export growth than previously assumed, but also because the new National Budget provides for more fiscal easing than had been anticipated. Robust export growth also affects the outlook for 2018 GDP growth, which is now projected at 3.5% instead of the 3.1% in the February forecast. As in February, GDP growth is expected to continue to ease over the forecast horizon, to 2.5% by 2019, which is in line with the economy's 2¾% long-term trend growth rate. If the forecast materialises, GDP growth will average 4.7% for the period 2015-2019, almost twice the estimated long-term trend rate. Further discussion of developments in GDP growth can be found in Chapter IV.

Chart I-9
Total hours worked and employment rate 2010-2019[1]



1. Central Bank baseline forecast 2017-2019. Broken lines show forecast from MB 2017/1.
Sources: Statistics Iceland, Central Bank of Iceland.

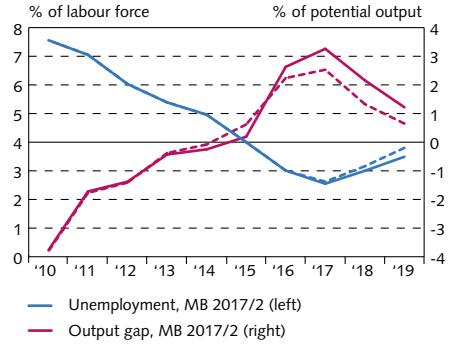
Output gap widens rapidly despite swift growth in potential output

Total hours worked increased by 3% in 2016 and 3.5% in Q1/2017, somewhat outpacing the February forecast. As before, the rise is due mainly to a large increase in the number of employed persons, which the baseline forecast assumes will continue. Total hours are expected to keep rising through this year and to measure 4.1% above the 2016 level (Chart I-9). The working-age population grew by about 2% year-on-year, owing in part to significant importation of foreign labour. The labour participation rate is also on the rise and will be some ¾ of a percentage point higher this year than in 2016, for a total increase of nearly 3 percentage points since 2014. Notwithstanding the rise in the working-age population, the employment rate is expected to increase even further this year, to an average of 82%. If this projection materialises, the employment rate will be the highest ever recorded in annual data in the history of Statistics Iceland's labour force surveys.

Unemployment continued to decline as well, to a seasonally adjusted rate of 2.7% in Q1. It is expected to measure 2.6% for 2017 as a whole, as was forecast in February (Chart I-10). As in previous forecasts, it is projected to rise gradually to the level deemed consistent with low and stable inflation. It is forecast to average 3% in 2018 and 3½% in 2019. This is a somewhat lower unemployment rate than was assumed in February owing to the prospect of stronger output growth and an estimation of a somewhat lower equilibrium unemployment rate. By the same token, total hours are expected to increase more quickly this year than in the February forecast, and the employment rate will be higher for the entire period.

Strong demand growth and job creation have caused a persistent shortage of workers in spite of increased labour importation, and representatives of a steadily growing number of firms indicate that they are operating at or above capacity. As a result, the output gap appears

Chart I-10
Unemployment and output gap 2010-2019[1]



1. Central Bank baseline forecast 2017-2019. Broken lines show forecast from MB 2017/1.
Sources: Statistics Iceland, Central Bank of Iceland.

to be growing. It is estimated to measure 3⅕% of potential output at the end of this year (Chart I-10). It will therefore grow more rapidly than was assumed in February and will be nearly 1 percentage point more during the forecast horizon, at just under 1% of potential output at the end of the period in mid-2020.

According to the baseline forecast, potential output has grown well in excess of its long-term trend rate ever since 2015. The output gap would be even wider if the supply side of the economy were not as flexible as it is. This cyclical surge in potential output reflects a rising participation rate and labour importation-generated growth in the working-age population. The equilibrium unemployment rate has also fallen, as is mentioned above, and investment has grown swiftly. The capital stock has therefore begun to grow after shrinking by nearly 5% during the aftermath of the financial crisis. In addition, productivity growth was unusually robust in 2016 and appears likely to be strong again this year, as is discussed below. As always, the assessment of the output gap is highly uncertain. A discussion of several key uncertainties in the assessment is below, and a discussion of the labour market and factor utilisation can be found in Chapter V.

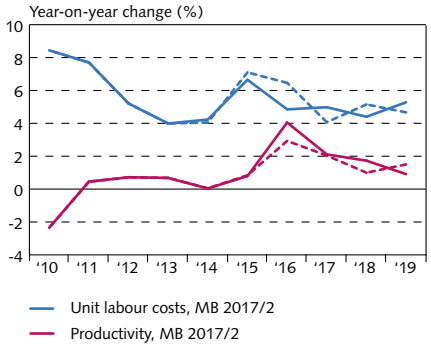
Inflation outlook deteriorates in the latter half of the forecast horizon

Inflation measured 1.8% in Q1/2017, just below the February forecast of 1.9%. It tapered off slightly early in the year but picked up again in April, when it measured 1.9%. It has therefore been at or below the Central Bank's inflation target for over three years, mainly as a result of imported deflation and the appreciation of the króna. As is discussed in Box 2 in *Monetary Bulletin* 2016/4, the decline year-to-date in import prices in krónur has affected measures of inflation that exclude housing costs much more than those that include housing. As a result, there is a substantial difference between inflation as measured by the consumer price index (CPI), on the one hand, and inflation in terms of the CPI excluding housing (CPIXH) and the harmonised index of consumer prices (HICP), on the other. In terms of the CPIXH, the price level has declined by 1.8% since April 2016, and in March 2017, the HICP was down 1.4% year-on-year.[2] By most measures, inflation expectations are well in line with the inflation target and appear to be more firmly anchored to target than they have been in quite some time (see Box 3).

Wages have risen steeply in the recent term, offsetting imported deflation and the appreciation of the króna. Wages and related expenses rose by 9½% in 2016 and have increased by 17½% in the past two years. This year's increase will be large as well, nearly 7%, but the pace will then ease in 2018 and 2019. Offsetting these hefty pay increases is last year's unusually strong productivity growth and the prospect of the same this year. As is discussed in Chapters V and

2. As is discussed in Box 2, the difference between these two measures that exclude housing costs was unusually large for most of 2016 because of differing weights assigned to expenditure factors that weigh heavily in tourists' spending in Iceland.

Chart I-11
Unit labour costs and productivity 2010-2019[1]

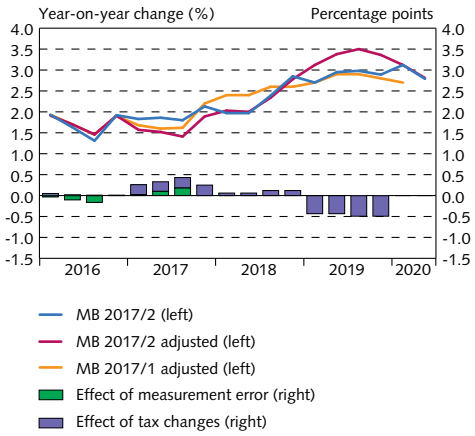


1. Productivity measured as GDP per total hours worked. Central Bank baseline forecast 2015-2019. Broken lines show forecast from MB 2017/1.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart I-12
Inflation[1]
Q1/2012 - Q2/2020

1. Central Bank baseline forecast Q2/2017-Q2/2020.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart I-13
Inflation outlook adjusted for effects of measurement error and tax changes[1]
Q1/2016 - Q2/2020



1. Inflation forecasts from MB 2017/2 and 2017/1, adjusted for the effects of errors in CPI measurements from March-August 2016 and changes in excise taxes at the beginning of 2017. The inflation forecast in MB 2017/2 is also adjusted for the effects of proposed changes in value-added tax as laid down in the fiscal plan.
Sources: Ministry of Finance and Economic Affairs, Statistics Iceland, Central Bank of Iceland.

VI, it is possible that productivity growth has been overestimated – for instance, because of an underestimation of the increase in foreign labour. Based on these figures, productivity growth was a full 1 percentage point more in 2016 than was forecast in February. Unit labour costs therefore rose by 4.9%, not 6.5% (Chart I-11), and a similar rise is forecast for 2017 and the following two years. If the forecast materialises, there will be significant inflationary pressures from the labour market during the forecast horizon.

According to the baseline forecast, inflation will be around 2% well into 2018 and then rise to approximately 3% in mid-2019 before subsiding towards the target (Chart I-12). As is discussed in *Monetary Bulletin* 2016/4, Statistics Iceland made an error in 2016 CPI measurements, which caused an underestimation of inflation during the first three quarters of the year. Because of this, twelve-month inflation will be slightly overestimated for the same period this year. At the turn of the year, excise taxes rose on a number of products, including petrol, alcoholic beverages, and tobacco. The impact of this on the CPI is roughly equal to the aforementioned measurement error. In addition, the Government's new fiscal plan includes some changes in indirect taxes over the forecast horizon (see Chapter IV). Once adjustments are made for these factors, the inflation outlook for 2017 and 2018 is improved (Chart I-13). The situation will change at the beginning of 2019, however, when inflation is projected to be ½ a percentage point more than was forecast in February, owing to the prospect of a wider output gap than was assumed then. 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 developments in the external environment of the Icelandic economy, as well as assessments of the effectiveness of specific markets and on the transmission of monetary policy to the real economy. All of these factors are subject to uncertainty. Below is a discussion of several important uncertainties and of how changes in key assumptions could lead to developments different from those provided for in the baseline forecast.

Monetary policy

Before the publication of this *Monetary Bulletin*, the Central Bank's key interest rate was 5% and had declined by 0.75 percentage points year-on-year. As in previous baseline forecasts, the current 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 quarterly macroeconomic model, which ensures that inflation will be broadly at target over the medium term.

Increased optimism about the global economy, but the risk profile remains tilted to the downside further ahead

As is discussed earlier in this chapter, the global economy appears to have picked up in late 2016, and international markets have turned bullish, as can be seen in rising share prices and long-term interest rates, increased optimism among households and businesses, and reduced risk premia in global financial markets (Chart I-14). Furthermore, markets appear to have responded well to the new US president's stated plans for increased infrastructure investment, tax cuts, and deregulation of financial markets, although the scope and timing of actual measures remains uncertain. The global GDP growth outlook for 2017 and perhaps into 2018 could therefore be underestimated in the baseline forecast.

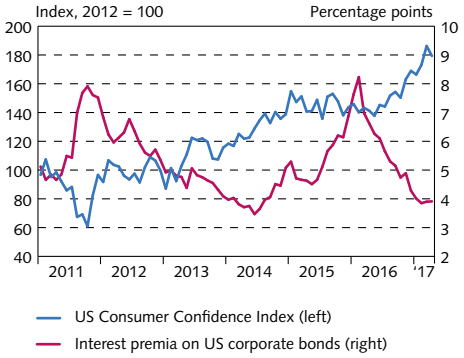
Further ahead, however, the risk profile for global GDP growth is tilted to the downside, largely for the same reasons as in the Bank's previous forecasts. There is the risk that the UK's exit from the European Union will disrupt the integrated network of world trade. This, together with a growing tendency towards protectionism, could catalyse events that cut into cross-border trade, thereby slowing the global economy. The GDP growth outlook is also uncertain in China, one of the most important drivers of global growth. Asset prices have risen steeply in China, and it appears that GDP growth is more credit-driven than before. As a result, the GDP growth outlook appears somewhat fragile, and a sudden correction in asset prices could severely test the resilience of the Chinese financial system. Financial conditions in emerging market economies could also deteriorate quickly with an appreciating US dollar and rising interest rates. As before, many advanced economies are facing a variety of challenges related to weak productivity growth and an aging population.

It can be seen from the above that demand growth in Iceland's main trading partner countries could be underestimated in the short run but overestimated in the longer term. Furthermore, increased geopolitical uncertainty or a sudden surge in oil prices could cause a turnaround in Iceland's exports and terms of trade. The effects of the recent rise in the real exchange rate on the competitive position of Iceland's tradable sector could also be underestimated. As a consequence, the possibility cannot be excluded that the export growth assumptions in the baseline forecast, especially for the long term, are too optimistic.

With lower króna the output gap would be wider and inflation and interest rates higher

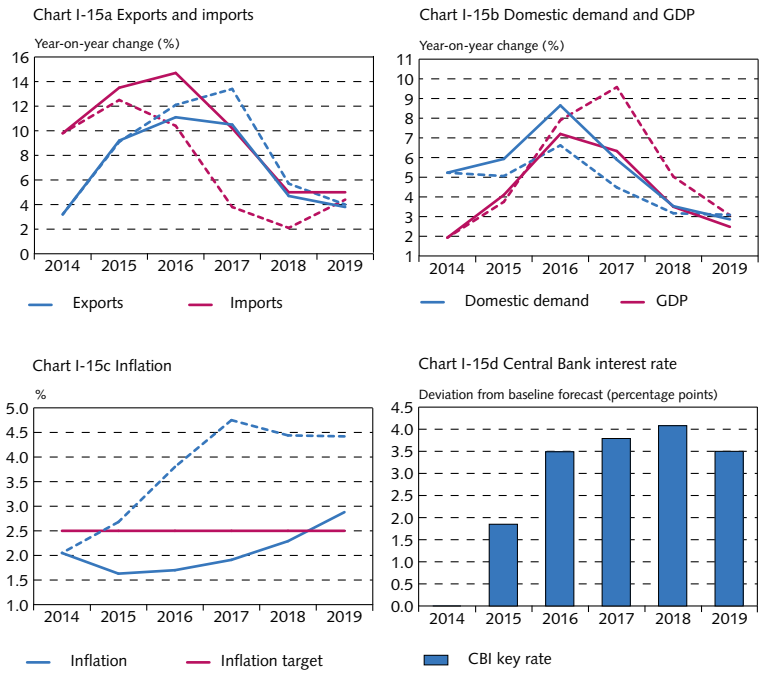
The appreciation of the króna has been a key factor in the economy's adjustment to shocks in the recent term and is likely to remain so. The baseline forecast assumes that the exchange rate will continue to rise through 2018, slowing economic activity and shifting a portion of demand out of the domestic economy. By cutting into GDP growth and lowering imported goods and services prices, the appreciation of the króna counteracts domestic inflationary pressures. This enables the Central Bank to keep inflation at target with lower interest rates than would otherwise be possible.

Chart I-14
Consumer confidence and credit spreads[1]
January 2011 - April 2017



1. US Consumer Confidence Index and interest premia on speculative-grade US corporate bonds.
Sources: Federal Reserve Bank of St. Louis Federal Reserve Economic Data (FRED) database, Macrobond.

Chart I-15
Alternative scenario assuming lower ISK exchange rate[1]



1. Alternative scenario assuming that the trade-weighted exchange rate index remains unchanged at 207 points from 2014 onwards. The baseline forecast in MB 2017/2 is shown with solid lines and the alternative scenario assuming a lower ISK exchange rate with broken lines.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart I-15 illustrates possible economic developments if the króna had not appreciate as it has. The alternative scenario assumes that the TWI remains unchanged at 207 points from 2014 through the end of the forecast horizon. This implies an end-2016 exchange rate about a fifth below the actual one and an end-2019 exchange rate about a fourth below that assumed in the current baseline forecast. Other things being equal, a lower exchange rate would have caused external trade to develop quite differently than it in fact did, as Chart I-15a shows. According to the alternative scenario, year-2016 export growth would have been about 1 percentage point stronger than it actually turned out, and it would have been even stronger this year, other things being equal, or over 13% instead of the forecasted 10½%. Export growth would probably have been stronger in 2018 as well, but from 2019 onwards it would have been broadly as is assumed in the baseline forecast. The difference in import growth is even more pronounced. Without the appreciation, import growth would have been about 1 percentage point weaker in 2015 and more than 4 percentage points less in 2016. Other things being equal, the difference would have been greatest in 2017, when imports increase by nearly 4% in the alternative scenario, as opposed to more than 10% in the baseline forecast. Growth would also be weaker in the next two years.

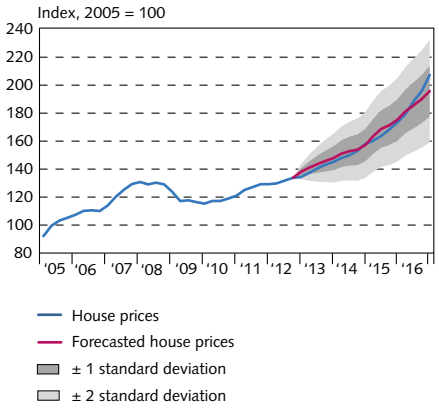
One reason for weaker import growth in the alternative scenario is that the lower exchange rate also tempers domestic demand: a lower exchange rate cuts into real wages, and this plus higher interest rates (see below) slows down consumption and investment spending. As Chart I-15b shows, domestic demand growth would probably

have been 1-2 percentage points weaker in the past two years if the exchange rate had remained unchanged since 2014. The difference is therefore somewhat less than for imports, which shows that a lower exchange rate tends to direct a relatively larger share of households' and businesses' spending towards domestic goods and services. Because of this and strong export growth, GDP growth is much stronger in the alternative scenario than in the baseline forecast, in spite of weaker growth in domestic demand. Other things being equal, with a lower exchange rate, GDP growth would have measured 7.9% in 2016, or 0.7 percentage points above the actual figure, and in the alternative scenario it would be 9½% this year, a full 3 percentage points more than in the baseline forecast. The outlook would also be for stronger GDP growth in 2018 and 2019 if the króna had developed as in the alternative scenario.

Therefore, without the appreciation of the króna, the output gap would be even larger than it actually is. Import prices in krónur would also have fallen more steeply in the past two years and the increase over the forecast horizon commensurably larger. As Chart I-15c indicates, inflation would therefore have developed very differently than it actually has. It would probably have risen to target by 2015 and to nearly 4% in 2016. According to the alternative scenario, inflation would have continued to rise this year, measuring about 4½% throughout the forecast horizon. Other things being equal, significantly higher inflation would have called for a markedly tighter monetary stance so as to bring inflation back to target over the medium term. According to the endogenous interest rate path, the Bank's key rate would have had to be over 9% in 2016, or 3½ percentage points higher than it actually was, and that 3½-point difference would have held throughout the horizon (Chart I-15d).

It is appropriate to take simulation exercises like these with a grain of salt. For instance, the exercise above ignores how an unchanged exchange rate would have come about under these conditions. Presumably, keeping the exchange rate at this low level would have required action by the Central Bank, such as intervening even more heavily in the foreign exchange market than it actually did. Such measures would not have been without side effects, but these are not included in the exercise. Nevertheless, the alternative scenario shows clearly how important a role the appreciation of the króna has played in the adjustment of the economy to increased export growth and improved terms of trade. The appreciation has both slowed economic activity and directed a share of the boost in income from the shocks towards imports. If the króna had not appreciated as it has, the strain on domestic resources would therefore have been even greater. In addition, the rise in the exchange rate has eased demand pressures by facilitating importation of new production inputs – both labour and capital – to address the growth in economic activity. The alternative scenario also shows how important a role the króna has played in transmitting the monetary stance to the real economy. Without the currency appreciation, higher Central Bank interest rates would have been needed to prevent a widening output gap and steep pay rises from unmooring inflation and inflation expectations from the target.

Chart I-16
Actual and forecasted house prices[1]
Q1/2005 - Q1/2017



1. The forecast of house prices is obtained with a dynamic forecast from Q1/2013 through Q1/2017, using the house price equation in the Bank's macroeconomic model.
Sources: Statistics Iceland, Central Bank of Iceland.

Housing inflation to ease from 2018 onwards

Real house prices rose by 11.4% in 2016 and have risen nearly 50% from the early 2010 trough. The increase is similar to that during the period from the beginning of 2004 until year-end 2007, and real house prices are now slightly above their end-2007 peak. As is discussed in Chapter III, the increase is similar in terms of the ratio of house prices to construction costs, but less for house prices relative to wages or disposable per capita income.

The recent increase in house prices has broadly been consistent with developments in the underlying determinants of house prices according to the Bank's macroeconomic model. Chart I-16 compares actual house prices with a dynamic forecast using the house price equation from the Bank's model, from Q1/2013 through Q1/2017. As the chart illustrates, the past four years' rise in house prices is broadly in line with what could have been expected based on the historical relationship between house prices, disposable income, and real interest rates. However, it can be seen that house prices begin to rise faster than forecast near the end of the horizon, although the forecast error is well within the 95% confidence interval. This is also in line with statistical test results, which indicate a growing mismatch between house prices and their usual determinants beginning in H2/2016 or the beginning of 2017.[3]

According to the baseline forecast, the twelve-month rise in house prices will peak this year and then ease from 2018 onwards, as the supply of housing increases and income and demand growth move towards their long-term trend rate. The possibility cannot be ruled out, however, that house prices will deviate even further from developments in wages and income, particularly if the rise in prices is driven by borrowing based on the assumption that house prices will remain high. Under such conditions, imbalances in the economy could develop even more rapidly, exacerbating the risk of a hard landing later on. Neither is it impossible that house prices will rise more slowly than is forecast; for instance, if the strong income growth of the recent past reverses because of external shock such as erosion of terms of trade or a contraction in exports. This could be followed by a drop in household income and wealth and a contraction in demand, including demand for housing. Other things being equal, growth in economic activity would then slow down more markedly than is assumed in the baseline forecast.

Demand growth has been addressed with importation of resources and improved utilisation of them

As is discussed earlier in this chapter, Iceland's GDP growth has been strong in recent years and is expected to remain so this year. Growth has been well in excess of the long-term trend growth rate of the

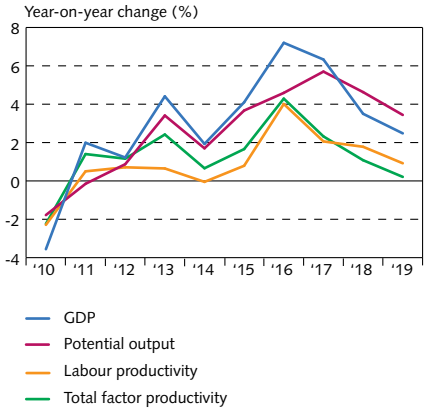
3. Using the GSADF test, a one-sided unit root test that seeks to detect an explosive root in asset prices [P. C. B. Phillips, Y. Wu, and J. Yu (2011), "Explosive behavior in the 1990s NASDAQ: When did exuberance escalate asset values?", *International Economic Review*, 52, 201-226]. This statistical test unequivocally indicates housing bubble formation during the prelude to the financial crisis in 2008. At that time, house prices were also rising far more than was indicated by the house price equation in the Bank's macroeconomic model.

economy and will continue in that vein. The output gap has therefore widened and is estimated at 2½% of potential output in 2016, followed by 3⅓% in 2017. It would be even more, however, if potential output were not also estimated to have grown much faster than its long-term trend rate. Potential output is estimated to have grown by about 3¾% in 2015 and 4½% in 2016. If it had grown at the long-term trend rate, the 2016 output gap could have been more than twice as large as is currently estimated, other things being equal. According to the baseline forecast, potential output will continue to rise quickly this year and in 2017 but will ease gradually towards its trend rate as the forecast horizon progresses.

As is discussed earlier in this chapter, the unusually strong cyclical expansion of potential output stems from several factors. Production factors – labour and capital – have increased markedly, but factor utilisation has also improved. Productivity growth was unusually robust in 2016 and is projected to be strong in 2017 as well.[4] As Chart I-17 indicates, growth in total factor productivity appears to explain the lion's share of 2016 and 2017 productivity growth, while the contribution from growth in the capital stock is relatively small, although it will increase over the course of the forecast horizon.[5] This development shows how flexible the supply side of the economy is: when negative economic shocks strike, supply contracts, but in the recent past it has grown rapidly, with large-scale importation of production inputs and better utilisation of them. As is discussed above, the appreciation of the króna plays an important role here: it lowers relative prices of imported inputs, thereby facilitating the adjustment of the economy to the shocks of the past several years.

There are limits, however, to how flexible the supply side of the economy can become, as can be seen, for example, in persistent wage pressures and firms' growing difficulties in staffing available positions. It is also uncertain how long the past few years' rapid growth in potential output can last. Estimating this is difficult, as it relies to a degree on interpretation of variables that are not directly observable. If growth in potential output is overestimated, this implies that the output gap and underlying inflationary pressures are underestimated in the baseline forecast, and the opposite applies if potential output is underestimated.

Chart I-17
Labour productivity and underlying factors 2010-2019[1]



1. Labour productivity is given as GDP per total hours worked. Total factor productivity is given as the deviation of GDP from the output level obtained with full factor utilisation using the production function in the Bank's macroeconomic model. Central Bank baseline forecast 2017-2019.

Sources: Statistics Iceland, Central Bank of Iceland.

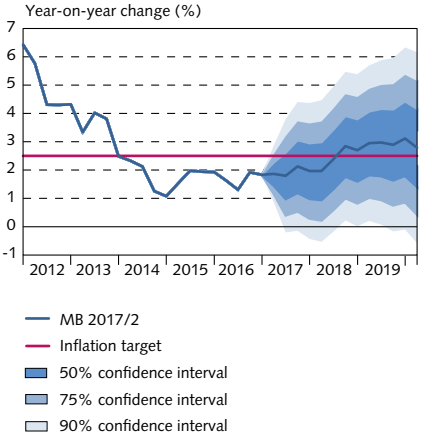
Inflation outlook uncertain, as before

The issues described above show clearly that the inflation outlook for the next three years could easily deviate from the scenario presented in the baseline forecast. The inflation outlook could turn out poorer than in the forecast if domestic demand is underestimated or the

4. As is discussed in Chapter V, last year's productivity growth rate probably reflects to some extent a measurement error due to an underestimation of the foreign labour force. This need not change the estimate of growth in potential output, however: productivity growth would then be weaker and the increase in the working-age population correspondingly stronger. As is discussed in Chapters V and VI, the overestimation of productivity growth could also be related to an overestimation of GDP growth for the year, owing to an underestimation of the GDP price deflator. If this is indeed correct, it is likely that growth in potential output in 2016 was overestimated as well.

5. Total factor productivity growth is the portion of increased output over and above the increase in inputs of capital and labour. For further information, see Chapter V.

Chart I-18
Inflation forecast and confidence intervals
Q1/2012 - Q2/2020



Sources: Statistics Iceland, Central Bank of Iceland.

flexibility of the supply side of the economy is overestimated. Furthermore, a number of wage agreements are up for negotiation soon, and the resulting pay rises could prove larger than is assumed in the baseline forecast. The tension in the labour market could also generate more wage drift than the forecast provides for. Furthermore, the scope for domestic companies to absorb further cost increases could be exhausted – particularly in the tradable sector, where firms' competitive position has been eroded significantly by the rising real exchange rate. The imbalances in the housing market could also be underestimated, which could lead to greater imbalances in the economy and exacerbate the risk of a hard landing later on. Demand pressures could also be underestimated if the fiscal stance eases more than is currently expected. All of this could test the newly established anchor for inflation expectations.

The inflation outlook presented in the baseline forecast could be overly pessimistic, however. The outlook is for sustained large current account surpluses and a continued improvement in Iceland's external position. The equilibrium exchange rate of the króna could therefore rise more than is assumed in the forecast, pulling the nominal exchange rate upwards even further than is currently projected. Weaker GDP growth among Iceland's main trading partners and a more sluggish recovery of global oil and commodity prices could also cut into domestic economic activity and prolong the impact of imported deflation, which has helped keep inflation low in Iceland. The effects of increased global competition on domestic retailers' pricing decisions could also be underestimated. Finally, the cyclical expansion of potential output could be underestimated as well.

Chart I-18 gives the inflation outlook according to the baseline forecast together with the confidence intervals for the forecast; i.e., the range in which there is considered to be a 50%-90% probability that inflation will lie over the next three years (the methodology is described in Appendix 3 in *Monetary Bulletin* 2005/1). The uncertainty about the inflation outlook is broadly unchanged since February. As was the case then, the probability distribution of the inflation forecast is broadly symmetrical. There is a roughly 50% probability that inflation will be in the 1-3% range in one year and in the 1½-4¼% range by the end of the forecast horizon.

II The global economy and terms of trade

Economic growth has picked up worldwide, and the outlook for 2017 has brightened. Forecasts for trading partners' GDP growth have been revised upwards since the Bank's February forecast. There is also the prospect that GDP growth will be increasingly investment-driven; therefore, growth in trading partner imports has been revised upwards. Global inflation has picked up in recent months, with growing economic activity and rising energy and commodity prices. Iceland's terms of trade have improved significantly since mid-2014 and are expected to continue doing so. The real exchange rate has continued to rise and, by Q1/2017, was one-fifth above its historical average, in a reflection of improved terms of trade and export growth, which has led to a sizeable current account surplus and improved Iceland's external position.

Global economy

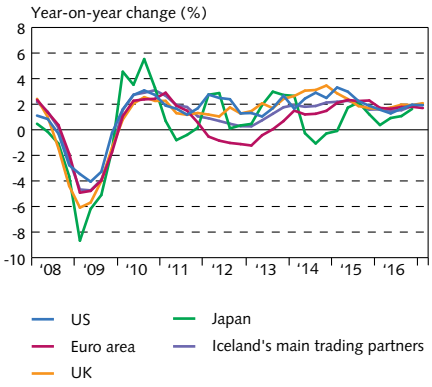
Trading partners' economic recovery weaker in 2016, but Q4 growth exceeded expectations …

As was assumed in the Bank's February forecast, trading partners' GDP growth measured 1.6% in 2016, somewhat less than in the previous two years. GDP growth for the year as a whole turned out weaker than the year before in nearly all trading partner countries. However, it increased in most advanced economies in H2/2016, averaging 1.9% among Iceland's main trading partners in Q4 (Chart II-1). Investment gained ground on both sides of the Atlantic in H2, supported by increased demand, low interest rates, and rising commodity prices, which have stimulated investment in energy-intensive industry. The labour market has recovered strongly in the US, the UK, and Japan, where unemployment is at its lowest since before the financial crisis (Chart II-2). Even though the recovery in the eurozone slowed down in 2016, it now extends to more countries within the currency area, and unemployment is at its lowest since May 2009. GDP growth was positive in all euro area countries and measured 2% or more in nine of them. At the same time, economic activity has slowed in the Nordic countries except in Finland were growth has accelerated after a long recession came to an end in 2015. In Denmark and Norway, GDP growth measured just over 1% in 2016, while Sweden recorded more than 3% growth for the second year in a row.

… and global GDP growth is at its weakest since the financial crisis

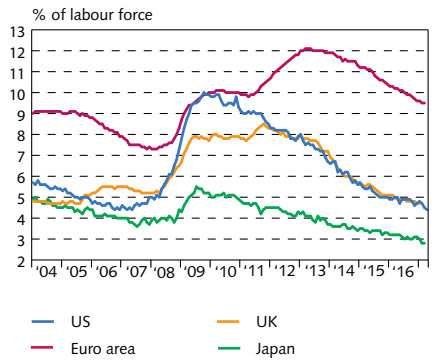
Global GDP growth measured 3.1% in 2015, the slowest rate of growth since 2009, reflecting the weaker economic recovery in both advanced and emerging market economies. GDP growth averaged 1.7% in advanced economies, the weakest growth rate since 2013. In emerging market economies, GDP growth measured 4.1%, some 1½ percentage points below the average for the previous six years. However, these economies, particularly the two largest commodity importers, China and India, continue to be the main drivers of global growth.

Chart II-1
Global GDP growth
Q1/2008 - Q1/2017



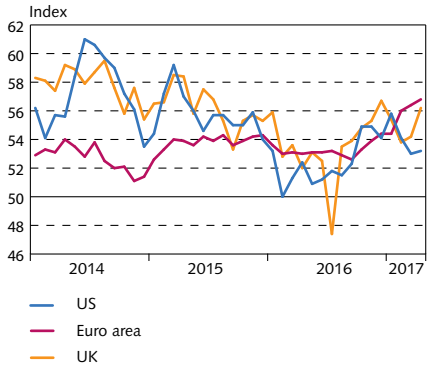
Sources: Macrobond, Central Bank of Iceland.

Chart II-2
Unemployment rate[1]
January 2004 - April 2017



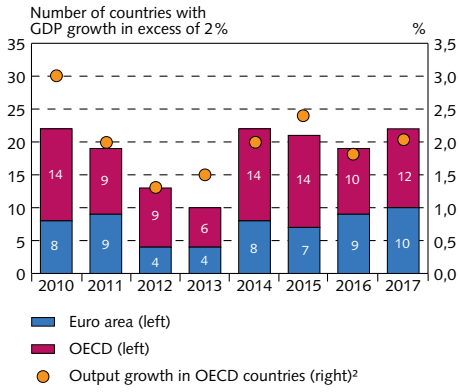
1. Seasonally adjusted figures.
Source: Macrobond.

Chart II-3
Leading indicators of GDP growth[1]
January 2014 - April 2017



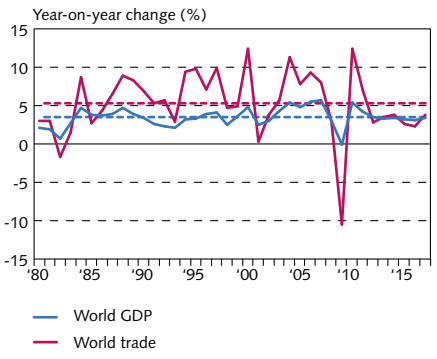
1. Markit composite purchasing managers' index (PMI). The index is published monthly and is seasonally adjusted. An index value above 50 indicates month-on-month growth, and a value below 50 indicates a contraction.
Source: Bloomberg.

Chart II-4
Output growth in OECD countries[1]



1. Including Lithuania, Malta, and Cyprus, which belong to the eurozone but not the OECD. 38 countries in all. 2. The 2017 value is based on IMF's forecast (*World Economic Outlook*, April 2017).
Sources: International Monetary Fund, OECD.

Chart II-5
World GDP and trade 1980-2017[1]



1. Broken lines show average of 1980-2016. The values for 2017 are based on IMF's forecast (*World Economic Outlook*, April 2017).
Sources: International Monetary Fund, Central Bank of Iceland.

A turnaround can also be detected in Russia and Brazil in the wake of the recent rise in oil and commodity prices.

Signs of growing economic activity in advanced economies

Economic indicators for the UK have exceeded market expectations. Even though a sudden uptick in inflation has cut into real wage growth, economic indicators suggest that private consumption growth has slowed less than previously expected. The depreciation of the pound sterling is expected to emerge in a more positive contribution from net trade, with further support from the recent pickup in global GDP growth. Indicators imply that GDP growth will ease slightly in the UK, but less than previously thought. Economic indicators for the euro-zone and the US have also turned out more positive than previously projected. The euro area PMI is at its highest since April 2011, as are indicators of economic sentiment in the region (Chart II-3). In the US, investment picked up at the end of 2016. Signs of growth in leading manufacturing sectors and increased private sector optimism indicate that this trend will continue.

Outlook for rising GDP growth in 2017 ...

According to the International Monetary Fund's (IMF) most recent forecast, global output growth will increase to 3.5% this year. The output growth outlook has improved since the Fund's January fore-cast, particularly for advanced economies, with projections for the UK improving most, while the forecast for emerging market economies is unchanged. According to the forecast, GDP growth will increase year-on-year in both advanced and emerging market economies, and a larger number of advanced economies will record GDP growth in excess of 2% (Chart II-4).

The IMF projects that global output growth will be broadly simi-lar next year, with emerging market economies gaining ground and advanced economies' growth rate holding unchanged between years. There is increased optimism about the short-term economic outlook, but the Fund is of the view that significant uncertainty remains, par-ticularly as regards the medium-term outlook (see also Chapter I), with the risk profile tilted to the downside in the next few years.

... with growth in world trade set to overtake global GDP growth once again

The IMF forecasts that growth in world trade will exceed global GDP growth in 2017. This is a change from the situation in the past two years, when world trade has been outpaced by GDP growth (Chart II-5). In 2016, world trade grew 2.2%, the weakest growth rate since 2009 and well below the long-term average. Last year's sluggish growth is due primarily to weaker growth in imports and exports in advanced economies, which in turn stems from low investment lev-els and a contraction in inventories, particularly in H1. Key indicators imply that growth in investment is on the horizon, with increased eco-nomic activity that should stimulate world trade in the coming term. A shift in policies towards increased protectionism could reverse this trend.

The outlook for GDP growth and demand in trading partner countries has improved since February …

In line with an improving outlook for global output growth and world trade, it is now expected that growth in output and imports will be stronger in 2017 than was projected in February. Trading partners' GDP growth is forecast at 1.9%, which is 0.2 percentage points more than was in February. The main factors in the improvement are the expectation of stronger growth in the UK and the eurozone, as growth in the US is projected to remain broadly as was forecast in February. Trading partners' import growth is expected to be about ½ a percentage point stronger this year than was forecast in February, averaging 3.8%. The upward revision is due in part to base effects from increased import growth in H2/2016 and to signs that trading partners' GDP growth will be more investment-driven than previously anticipated. For these reasons, growth in imports is expected to exceed GDP growth in trading partner countries during the forecast horizon.

… and inflation has risen more than previously projected

Inflation in advanced economies has picked up in recent months, alongside growing economic activity and rising energy and commodity prices (Chart II-6). Developments in inflation in the UK and commodity-exporting countries have also been affected by exchange rate movements. Inflation is above target in the UK and the US but eurozone inflation remains below the European Central Bank's (ECB) target. Underlying inflation is still low in most economies, however. In all of Iceland's trading partners except Norway and Brazil, inflation is expected to rise year-on-year in 2017, averaging 2%, some 0.2 percentage points above the February forecast.

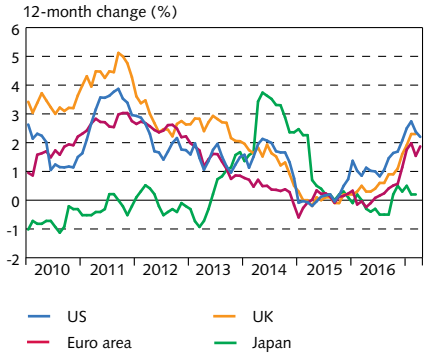
Difference in monetary stance widens in advanced economies

Share prices have risen in advanced economies as economic indicators have exceeded expectations and optimism about the economic outlook has increased. Asset price volatility has also diminished in the recent past (Chart II-7).

The US Federal Reserve Bank raised interest rates by 0.25 percentage points in March, to 0.75-1%, but the monetary stance in other advanced economies remains unchanged. With a wider interest rate spread, the US dollar and other commodity-exporting countries' currencies have appreciated, while the euro and the Japanese yen have weakened. The pound sterling is 10% weaker in trade-weighted terms than it was prior to the Brexit referendum last summer. The spread between long-term interest rates in the US and the UK has also grown wider and is now at its largest since 1980. The spread between US and German long-term rates has widened as well, after investors began shifting to German bonds in response to political uncertainty during the run-up to elections in France, Italy, and Spain (Chart II-8).

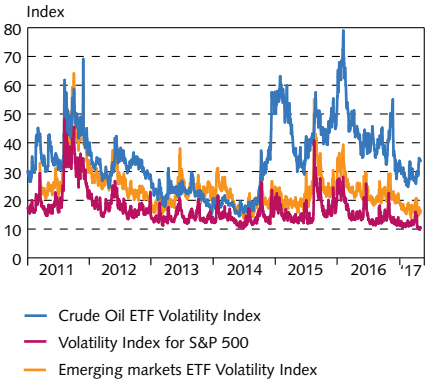
Interest rates in advanced economies are expected to continue diverging. Forward interest rates indicate that investors now expect a more rapid tightening phase in the US than they did in February (Chart II-9). Markets expect that there will be two more rate hikes this year, bringing interest rates to 1.25-1.5% by the year-end. At the

Chart II-6
Inflation in selected industrialised countries
January 2010 - April 2017



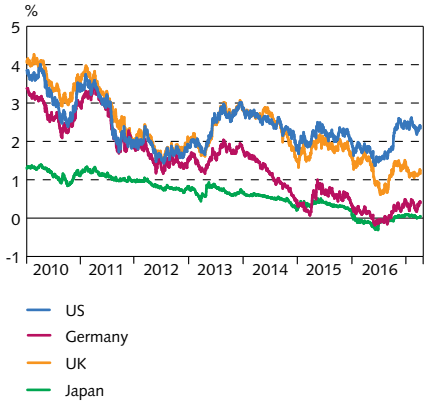
Source: Macrobond.

Chart II-7
Global market volatility[1]
Daily data 3 January 2011 - 12 May 2017



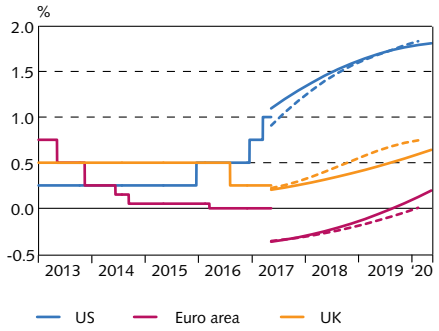
1. The VIX volatility indices indicate the implied volatility of financial products.
Source: Federal Reserve Bank of St. Louis Federal Reserve Economic Data (FRED) database.

Chart II-8
10-year government bond yields in selected industrialised countries
1 January 2010 - 12 May 2017



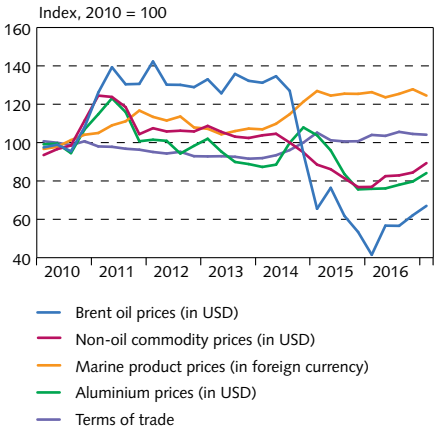
Source: Macrobond.

Chart II-9
Policy rates in selected industrialised economies[1]
January 2013 - June 2020



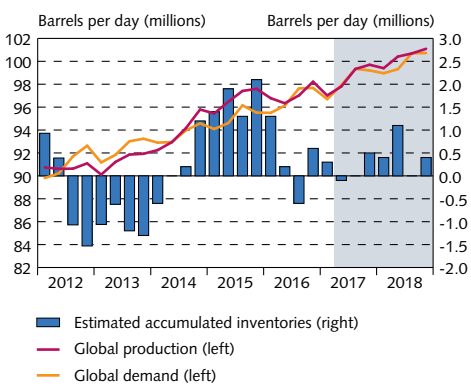
1. Daily data 1 January 2013 through 12 May 2017, and quarterly data Q2/2017 through Q2/2020. US interest rates are the upper bound of the US Federal Reserve bank's interest rate corridor, and rates for the euro area are the European Central Bank's key rate. Forward rates are based on six-month overnight index swaps (OIS) and the Euro Overnight Index Average (EONIA) for the euro area. Solid lines show forward curves from 12 May 2017 onwards and the broken lines from 3 February 2017 onwards.
Sources: Bloomberg, Macrobond.

Chart II-10
World price development and terms of trade[1]
Q1/2010 - Q1/2017



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 Q1/2017 are based on *Monetary Bulletin* baseline forecast 2017/2.
Sources: IMF, Statistics Iceland, Central Bank of Iceland.

Chart II-11
Liquid fuels – supply and demand[1]
Q1/2012-Q4/2018



1. Liquid fuels. Forecast for Q2/2017-Q4/2018. Estimated accumulated inventories are the difference between global supply and global demand.
Source: U.S. Energy Information Administration.

same time, an accommodative monetary stance is expected in Japan, the UK, Sweden, and the eurozone. Higher interest rates in the US could have an adverse impact on the GDP growth outlook for emerging market economies, many of which are vulnerable to rising cost of capital and US dollar exchange rates because of widespread dollar-denominated corporate debt.

Export prices and terms of trade

Foreign currency price of exports set to continue rising

Foreign currency prices of marine exports were unchanged in 2016, after rising by more than 18% in the two preceding years combined (Chart II-10). Key market agents project that prices will rise marginally this year, particularly due to a positive outlook for demersal prices, although price developments for frozen pelagics, fishmeal, and fish oil are highly uncertain. As in February, the forecast assumes a slight additional price increase as the forecast horizon progresses.

Global aluminium prices have risen somewhat over the past five quarters, and the average price in Q1/2017 was 20% higher year-on-year, a much larger increase than was projected in February (Chart II-10). Aluminium inventories in the global market are still relatively strong, although they have shrunk rapidly in the past two years. Futures prices and analysts' assessments indicate that prices will continue to rise, as demand is projected to grow in tandem with increased global output growth. Another expected factor is reduced production in China due to the government's decision to cut back on production in a bid to reduce pollution, as China's aluminium manufacturing is among the most carbon-intensive in the world. Prices are expected to rise to about 2,000 US dollars per tonne by the end of the forecast horizon.

Petrol prices expected to rise less than was forecast in February

The price held stable at 55 US dollars per barrel from the beginning of December to early March when it fell to 50 dollars. It recovered to 55 dollars in late March before falling again to 50 dollars prior to the publication of this *Monetary Bulletin.* Even though the price is nearly double that at the mid-January 2016 trough, it is still about 55% below the level before the plunge began in late 2014 (Chart II-10). At the same time, the mismatch between supply and demand for petrol has diminished (Chart II-11). The year-on-year rise in oil prices is projected at 22%, somewhat less than was forecast in February. Both oil futures and market analysts' forecasts suggest that prices will remain relatively flat for the remainder of the forecast horizon.

Non-oil commodity prices have risen considerably

Non-oil commodities have risen in price since mid-2016, although prices are still much lower than they were before the downturn started in mid-2014 (Chart II-10). In Q1/2017, commodity prices were up 16% year-on-year, more than had been expected in February. The increase has been driven largely by rising metals prices, although food prices are up as well. Commodity prices as a whole are expected to remain relatively stable through the year-end. Non-oil commodities are

projected to rise in price by 8.7% this year, some 6 percentage points more than was forecast in the last *Monetary Bulletin*.

Terms of trade have improved substantially in the last two years, with further improvement expected in 2017

Iceland's terms of trade have improved virtually without interruption since Q2/2014 and have developed much more favourable than those in other advanced economies, particularly other commodity exporters (see Box 1 in *Monetary Bulletin* 2016/2). According to preliminary figures from Statistics Iceland, terms of trade improved by 3.8% year-on-year in Q4/2016 (Chart II-10) and have improved by some 14% since mid-2014. However, in spite of this marked improvement, they were still nearly 11% below the pre-crisis peak. Indicators imply that they have improved even further year-to-date. They are expected to improve by nearly 1% in 2017 as a whole and then remain more or less flat for the following two years.

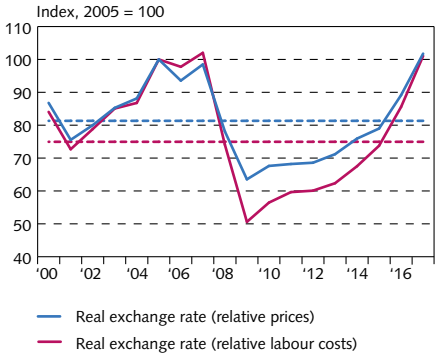
Steep rise in the real exchange rate since 2009 ...

The real exchange rate in terms of relative consumer prices has risen sharply from the autumn 2009 trough and is now only 6.5% below its 2005 peak. The increase has continued so far in 2017, with the real exchange rate about a fifth above its twenty-five year average in Q1 (Chart II-12). The rise is due for the most part to the nominal appreciation of the króna, although higher inflation in Iceland than in trading partner countries has also contributed. Iceland's external position has improved markedly in recent years, with better terms of trade and strong export growth. Unlike the pre-crisis situation, the recent rise in the real exchange rate is considered to reflect to a large degree the adjustment of the economy to a higher equilibrium real exchange rate.[1]

... with an erosion of Iceland's competitive position

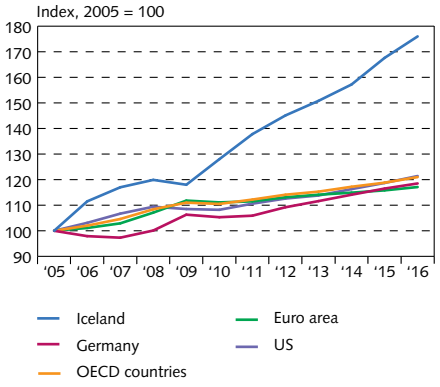
If the forecast in this *Monetary Bulletin* materialises, the real exchange rate in terms of relative consumer prices will be nearly 13% higher this year than in 2015. In terms of relative unit labour costs, it is expected to rise even further, or by just over 16%. Firms' wage costs have risen much more in Iceland than in trading partner countries in recent years, which – all else being equal – erodes the competitive position of companies in the tradable sector (Chart II-13). As is discussed in Chapter I, it is assumed that the króna will appreciate further through 2018 and thus that the real exchange rate will continue to rise.

Chart II-12
Real exchange rate 2000-2017[1]



1. Central Bank of Iceland baseline forecast 2017. Broken lines show 25-year average (1992-2016).
Source: Central Bank of Iceland.

Chart II-13
Unit labour cost in developed countries 2005-2016



Sources: Macrobond, Central Bank of Iceland.

1. For further information on the Central Bank's assessment of the equilibrium real exchange rate, see Box 3 in *Monetary Bulletin* 2016/2 and Appendix 1 in *Monetary Bulletin* 2007/3.

III Monetary policy and domestic financial markets

The Central Bank's key rate is unchanged since the February *Monetary Bulletin* but has fallen since August 2016. Market agents expect it to fall even further this year. Although the key rate is lower, it remains high in international context, reflecting a large dispersion in economic conditions in Iceland and other advanced economies. Bond market yields have fallen and risk premia on foreign Treasury obligations as well. The exchange rate of the króna has begun to rise again, following a dip earlier in the year. Broad money and credit system lending have increased, but its growth is still weaker than growth in overall economic activity. House prices have risen steeply in the recent past, and share prices are up again. Private sector financial conditions therefore continue to improve.

Monetary policy

Nominal Central Bank rates unchanged since end-2016 ...

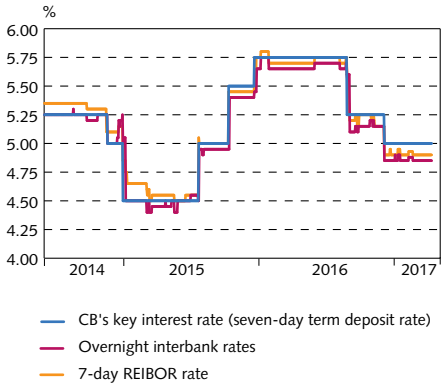
The Central Bank of Iceland Monetary Policy Committee decided at its meetings in February and March to keep the Bank's interest rates unchanged, after having lowered them by a total of 0.75 percentage points in two increments in H2/2016. Prior to the publication of this *Monetary Bulletin*, the Bank's key interest rate – the rate on seven-day term deposits – was 5% (Chart III-1). Interest rates in the interbank market for krónur have developed in line with the key rate, but market turnover has increased year-on-year in 2017 to date.

Accepted rates in auctions of bills issued by the banks have also tracked Central Bank rates and are similar to the Bank's key rate. However, interest rates in Treasury bill auctions have risen by 4.3 percentage points since February, to 5%. Owners of offshore króna assets have been the largest owners of Treasury bills in the recent term, as they have had limited investment options available to them, most of them low-yielding ones. The increase in the most recent auctions is due to reduced demand following the agreement these owners reached with the Central Bank in mid-March, under which the Bank bought offshore króna assets in the amount of about 90 b.kr., including almost the entire stock of outstanding Treasury bills.

... as is the Bank's real rate

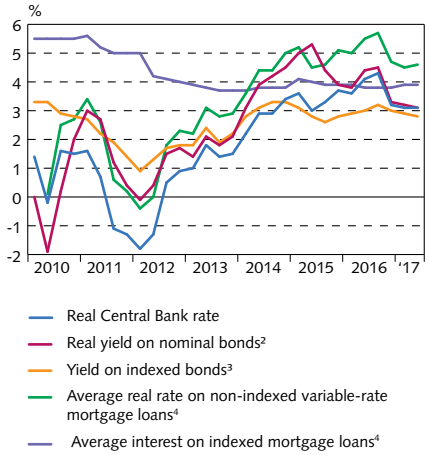
The Bank's real rate measures 2.7% in terms of the average of various measures of inflation and inflation expectations and 3% in terms of past twelve-month inflation (Table III-1). The monetary stance is therefore broadly unchanged since the publication of the February *Monetary Bulletin*. The real rate is as much as 1½ percentage points lower than it was prior to the reduction in the key rate in August, however. This has largely been transmitted to other real rates, although it has affected indexed bond and mortgage lending rates least (Chart III-2). As is discussed in *Monetary Bulletin* 2016/4, monetary policy transmission along the interest rate channel appears to have normalised after the Bank's capital flow management measure was activated in early June 2016.

Chart III-1
Central Bank of Iceland key interest rate and short-term market rates
Daily data 2 June 2014 - 12 May 2017



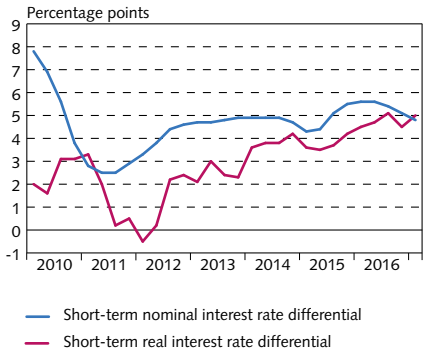
Source: Central Bank of Iceland.

Chart III-2
Real Central Bank interest rate and real market rates
Q1/2010 - Q2/2017[1]



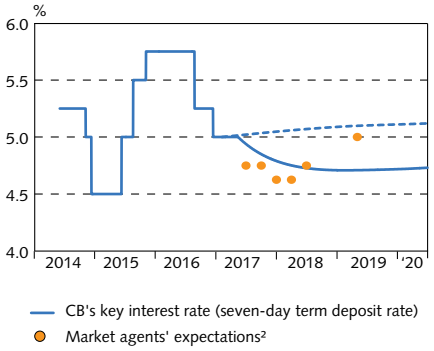
1. Based on data until 12 May 2017. 2. Five-year rate from the estimated nominal yield curve. 3. Five-year rate from the estimated real yield curve. 4. Simple average lowest lending rates from the three largest commercial banks. Fixed-rate period of five years or more on indexed mortgage loans.
Source: Central Bank of Iceland.

Chart III-3
Interest rate differential with main trading partners[1]
Q1/2010 - Q1/2017



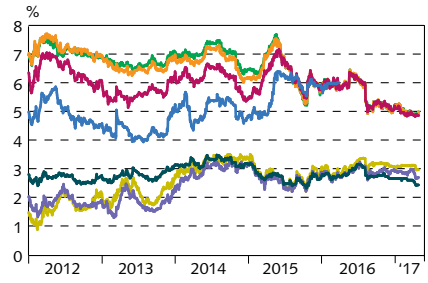
1. The difference between the Central Bank of Iceland's key interest rate and the weighted average key rate in Iceland's main trading partner countries. Real rates are based on current twelve-month inflation.
Sources: Macrobond, Central Bank of Iceland.

Chart III-4
Central Bank of Iceland key interest rate and expected developments[1]
Daily data 1 June 2014 - 30 June 2020



1. CB's key interest rate and Treasury bond yields were used to estimate the yield curve. Broken lines show forward market interest rates since the last MB 2017/1. 2. Estimated from the median response in the Central Bank's survey of market agents' expectations of collaterlised lending rates. The survey was carried out during the period 2-4 May 2017.
Source: Central Bank of Iceland.

Chart III-5
Nominal and indexed bond yields
Daily data 2 January 2012 - 12 May 2017



Source: Central Bank of Iceland.

Interest rates still markedly higher in Iceland than in other industrialised countries

The nominal interest rate spread against Iceland's main trading partners narrowed last year, in line with the reduction in the Bank's key rate. In spite of this, it is still nearly the widest since Iceland's post-crisis economic recovery began (Chart III-3). The real interest rate differential has continued to increase since the beginning of 2012, however, as the difference between economic recovery in Iceland versus other advanced economies has grown more pronounced. Other advanced economies still have a sizeable negative output gap, while in Iceland there is a relatively wide positive gap (see Chapter V). Nominal demand growth and wage increases have also been considerably more in Iceland. Even though inflation expectations appear to have become more firmly anchored than before in Iceland, which contributed to last year's nominal interest rate cuts, the anchor probably remains weaker than in other advanced economies. All of these factors have called for a tighter monetary stance in Iceland than in neighbouring countries.

Markets expect further rate cuts this year

According to the results of the Central Bank's market expectations survey, carried out in the beginning of May, respondents expect the Bank's key rate to be lowered by 0.25 percentage points in Q2/2017 and again in Q4/2017 (Chart III-4). They expect the rate to be raised again to 4.75% in Q2/2018, however. This is a lower rate than they expected in the January survey. Market expectations are consistent with indications from forward interest rates.

Table III-1 The monetary stance (%)

Real interest rates in terms of:[1]	*Current stance (12/5 '17)*	*Change from MB 2017/1 (3/2 '17)*	*Change from MB 2016/2 (6/5 '16)*
Twelve-month inflation	3.0	0.0	-1.1
Business inflation expectations (one-year)	2.4	-0.5	-0.3
Household inflation expectations (one-year)	1.9	0.0	-0.4
Market inflation expectations (one-year)[2]	2.7	0.3	0.2
One-year breakeven inflation rate[3]	3.0	0.2	0.1
Central Bank inflation forecast[4]	2.9	0.5	0.8
Average	2.7	0.1	-0.1

1. Based on the 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 rolling average). 4. The Central Bank forecast of twelve-month inflation four quarters ahead.
Source: Central Bank of Iceland.

Market interest rates and risk premia

Bond market yields have fallen

Yields on nominal and real bonds have fallen by up to 0.3 percentage points since the publication of the February *Monetary Bulletin* (Chart III-5). The decline in bond yields appear to reflect market agents' reduced inflation expectations and their expectations of a lower key rate. This is consistent with the results of the Bank's May survey of market agents' expectations (see above and in Chapter VI), which also indicate that survey participants expect bond yields to be lower in the

coming years than they expected in late January. Yields on the commercial banks' covered bonds have developed similarly since February.

Capital inflows related to new investment in the bond market increased in April but remains limited, as they have been since the Bank activated its capital flow management measure in June 2016 (Chart III-6). On the other hand, inflows for investment in other assets have continued, particularly to include direct investment in Icelandic firms and portfolio investment in listed equities.

Risk premia on Treasury foreign obligations has fallen

In January 2017, rating agency Standard & Poor's (S&P) upgraded Iceland's sovereign rating from BBB+ to A-, and Fitch Ratings changed the outlook on its ratings for the sovereign from stable to positive. After the capital controls were lifted in mid-March and the Central Bank reached an agreement with owners of offshore króna assets concerning the purchase of about half of the outstanding stock, S&P upgraded the sovereign again, this time to A, with a stable outlook. Other international rating agencies also indicated that liberalisation would have a positive impact on Iceland's ratings. Subsequently, risk premia on the Treasury's foreign obligations has fallen to its lowest since the beginning of 2008 (Chart III-7). Interest premia on the commercial banks' international bond issues have continued to decline in tandem with improvements in their credit ratings and with developments abroad.

Exchange rate of the króna

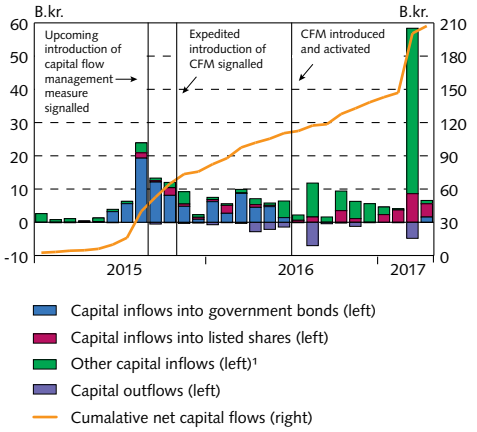
Króna appreciates again

The króna has appreciated by about 7.1% in trade-weighted terms since the February *Monetary Bulletin*, and the index now measures about 154 points, which corresponds to a 22.6% appreciation year-on-year (Chart III-8). For the most part, the increase is attributable to the strong growth in tourism and the marked improvement in Iceland's terms of trade and external position. It therefore reflects to a large extent the adjustment of the exchange rate to a higher equilibrium real exchange rate rather than to carry trade-related inflows.[1]

The exchange rate began to fall in early December, after a virtually uninterrupted rise beginning the previous summer. The fishermen's strike and the seasonal drop in foreign currency inflows from tourism probably contributed to the decline. Increased authorisation for foreign exchange transactions granted at the end of the year may well have been a factor also. The króna began to appreciate again in late January, however, and continued to strengthen after the strike ended in mid-February. It weakened slightly in early March and then fell further after the authorities announced the liberalisation of capital controls on 12 March. The króna began to appreciate again in early April and is now slightly stronger than it was prior to the announcement. Short-term exchange rate volatility increased at the end of 2016 and again after the capital controls were lifted in March, but it has eased somewhat since then.

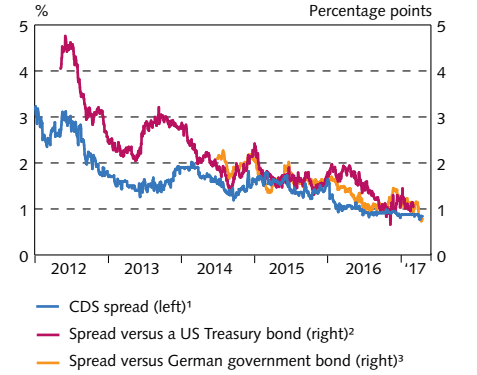
1. For further discussion, see Box 3 in *Monetary Bulletin* 2016/2. Box II-4 in *Financial Stability* 2017/1 also contains a more detailed analysis of foreign currency flows in 2016. According to that analysis, inflows were due for the most part to the trade surplus.

Chart III-6
Capital flows due to registered new investments
January 2015 - April 2017



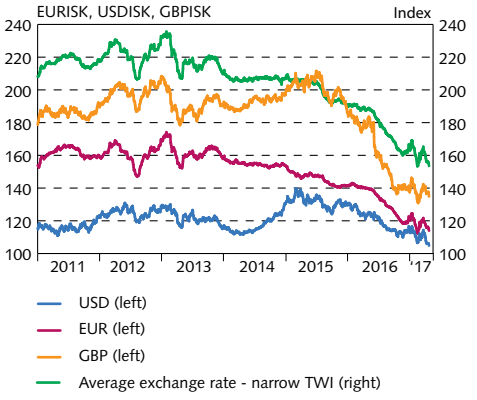
1. Other inflows in March 2017 derive almost entirely from non-residents' acquisition of a holding in a domestic commercial bank.
Source: Central Bank of Iceland.

Chart III-7
Risk premia on Icelandic Treasury obligations
Daily data 2 January 2012 - 12 May 2017



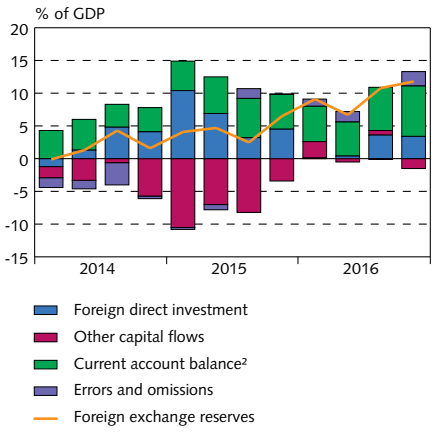
1. Five-year USD obligations. 2. USD bonds maturing in 2022.
3. Eurobonds maturing in 2020.
Source: Bloomberg.

Chart III-8
Exchange rate of foreign currencies against the króna
Daily data 3 January 2011 - 12 May 2017



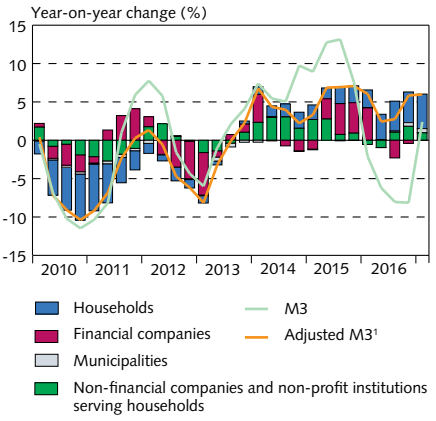
Source: Central Bank of Iceland.

Chart III-9
Changes in reserves and contribution of components[1]
Q1/2014 - Q4/2016



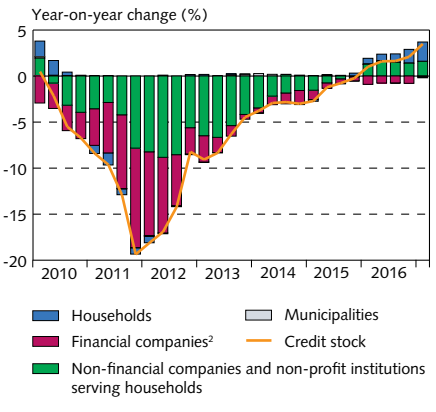
1. Changes in the foreign exchange reserves and net capital flows, by type, based on the balance of payments. Four-quarter moving average. 2. Current account balance without adjusting for the effects of failed financial institutions. Includes net capital contributions.
Source: Central Bank of Iceland.

Chart III-10
Money holdings
Q1/2010 - Q1/2017



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

Chart III-11
Credit system lending to resident borrowers and sectoral contribution[1]
Q1/2010 - Q1/2017



1. Credit stock adjusted for reclassification and 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.
Source: Central Bank of Iceland.

Central Bank scales down FX purchases

The Central Bank's foreign exchange reserves amounted to just over 684 b.kr. in end April. The reserves have decreased in the past few months due to the Bank's purchase of offshore krona assets and the Treasury's repurchase of bonds issued in foreign currency. They are still, however, well above the criteria formulated for reserve adequacy during the prelude to capital account liberalisation. The current account balance has been positive by around 6% of GDP, on average, during the post-crisis period, and the surplus has been used to pay down foreign debt and buy foreign assets, including shoring up the Bank's foreign exchange reserves (Chart III-9). The Bank has scaled down its foreign currency purchases in the recent term, in line with its stated objective that it is no longer deemed necessary to expand the reserves. The Bank will continue to intervene in the foreign exchange market, however, so as to mitigate exchange rate volatility when conditions warrant it. In the first four months of 2017, the Central Bank's net purchases totalled 64 b.kr., and in March the Bank bought krónur in the market for the first time since November 2014.

Money holdings and lending

Deposit institutions' excess reserves have held relatively stable ...

Banknotes and coin in circulation have continued to increase, in line with growing economic activity and increased use of cash as a result of the rise in tourist visits to Iceland. Deposit institutions' excess reserves – i.e., their current account deposits with the Central Bank in excess of reserve requirements – have remained relatively stable.

... and broad money growth is broadly unchanged from previous quarter

Broad money (M3) grew by 6% year-on-year in Q1, after adjusting for deposits of failed financial institutions (Chart III-10). This is broadly the same growth rate as in the previous quarter and still below nominal GDP growth. As has been the case in the recent past, growth in M3 is due mainly to an increase in household deposits.

Relatively modest overall growth in lending to domestic borrowers ...

Growth in credit system lending is still relatively moderate, and well below growth in investment or GDP, unlike the situation during the last upswing. Credit system lending to resident borrowers grew by 3.5% year-on-year in nominal terms in Q1, after adjusting for the Government's debt relief measures (Chart III-11). This is slightly stronger than last year's growth rate, after a continuous contraction beginning in Q2/2010. The increase is somewhat greater, or 4.7%, if the stock of foreign-denominated loans is adjusted for exchange rate movements, and if loans taken from foreign credit institutions by resident borrowers are included, the exchange rate-adjusted credit stock has grown by 5%.

… but lending to households continues to rise

As before, the increase in lending during the year is due for the most part to an increase in loans to households and non-financial companies, particularly companies in transport and transit and construction firms. Twelve-month growth in lending to households began to pick up towards the end of 2016 and has continued in line with rising real estate prices. The stock of credit system loans to households grew by 3.7% year-on-year in Q1, after adjusting for the Government's debt relief measures. As yet, however, the growth rate is modest and loan-to-value ratios on new loans are not high in historical or international context. Indexed loans still account for a large share of mortgage lending, at about 70% of loans granted in recent months. As in the recent past, mortgage lending growth is due primarily to increased lending by deposit institutions and pension funds, the latter of which have increased their market share in the past year. On the other hand, Housing Financing Fund (HFF) lending has continued to contract.

Asset prices and financial conditions

Steep rise in house prices in recent months

House prices in the greater Reykjavík area were up 21% year-on-year in March, and rent rose by over 10%, according to figures from Registers Iceland. Some of the increase is attributable to growth in demand supported by rising wages and job creation. Furthermore, construction of new residential property has been below its historical average as a share of GDP ever since the financial crisis struck in 2008, and this affects the current supply of housing. Flats sell quickly, and the number of properties listed for sale fell by 36% year-on-year in the first three months of 2017. Furthermore, an increase in short-term rentals to tourists has reduced the supply of small flats in the capital area and pushed prices upwards. The number of registered purchase agreements in greater Reykjavík was broadly unchanged year-on-year in Q1, and the average time-to-sale so far this year is about 1.4 months, down from just over 2 months a year ago and 19 months in 2010.

Real house prices rose by 11.4% in 2016 and thus far in 2017 have increased by almost 50% from the post-crisis trough early in 2010. This is comparable to the rise in the last cyclical expansion, and real prices are now slightly above the end-2007 peak (Chart III-12). The rise in house prices has also been rapid relative to construction costs but less pronounced relative to wages and disposable income. The rise in house prices has long been in line with growth in wages and income, but in the recent past a growing mismatch has begun to develop between house prices and the economic fundamentals underlying their development (see Chapter I).

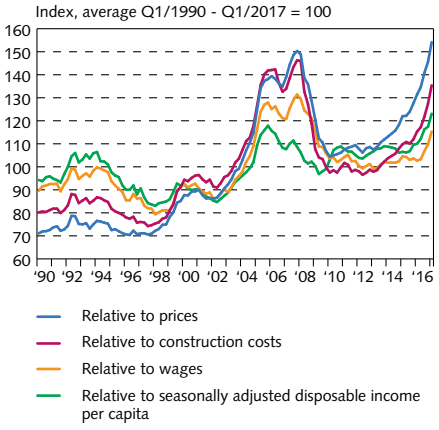
Share prices are up again, and new investment is on the rise

Share prices fell suddenly just before the publication of the February *Monetary Bulletin*, following a profit warning from Icelandair. They recovered quickly, however, and the OMXI8 index is now 17.1% higher than in February (18.5% higher adjusted for dividend payments). Telecom and tech companies' share prices have risen most this year, as

Chart III-12

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

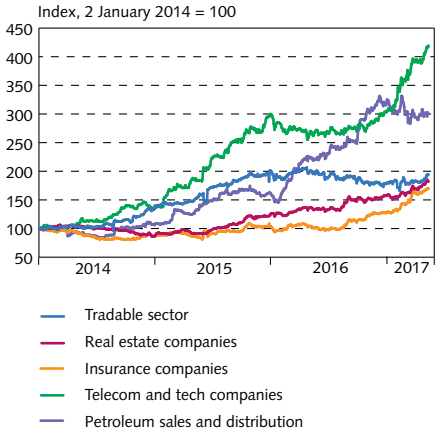
Q1/1990 - Q1/2017



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-13
Share prices by sectors[1]
Daily data 2 January 2014 - 12 May 2017



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

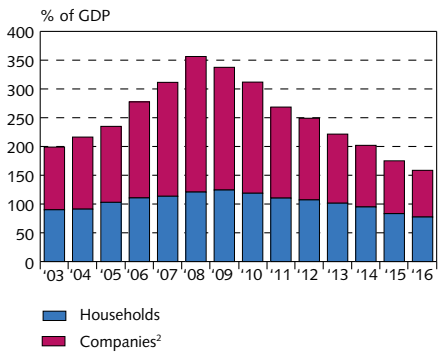
their 2016 operating results exceeded market expectations and their earnings are expected to increase this year (Chart III-13). Real estate and insurance companies' results were broadly as expected, while there were some unexpected results among other companies, with considerable changes in share prices afterwards. Operating conditions have been generally good, owing to the buoyant economy, although there is some uncertainty in the sectors most strongly affected by domestic cost increases and the appreciation of the króna. The newly published earnings reports for Q1/2017 were either in line with or just above market expectations.

Turnover in the Nasdaq Iceland main market totalled approximately 246 b.kr. over the first four months of the year, about 27% more than over the same period in 2016. In February and March, turnover exceeded 70 b.kr., the largest single-month total since 2008. Foreign capital inflows into the domestic equity market have increased markedly in recent months (see Chart III-6 above), totalling 18.6 b.kr. in the first four months of 2017, as opposed to 3.9 b.kr. over the same period last year and 11.1 b.kr. for 2016 as a whole.

Capital controls have largely been lifted

On 14 March 2017, the Bank's new Rules on Foreign Exchange took effect, removing most restrictions on foreign exchange transactions and cross-border movement. Therefore, individuals and businesses are no longer subject to the restrictions that the Foreign Exchange Act places on, among other things, foreign exchange transactions, foreign investment, hedging, and lending activity. Furthermore, resident entities are no longer required to repatriate foreign currency. These are the items that have had the greatest impact on households and businesses since the capital controls were introduced in autumn 2008. In addition, the new Rules authorise pension funds, collective investment funds (UCITS), and other investors to invest abroad. Moreover, cross-border transactions with krónur are now authorised; i.e., foreign financial institutions are permitted to transfer krónur and financial instruments issued in domestic currency to and from Iceland. However, restrictions remain on derivatives trading for purposes other than hedging against risk, foreign exchange transactions undertaken between residents and non-residents without the intermediation of a financial institution, and, in certain instances, foreign-denominated lending by residents to non-residents. This is considered necessary to prevent carry trade on the basis of investments not subject to special reserve requirements. Amendments were also made to the rules on reserve requirements which are so as to ensure their efficacy.

Chart III-14
Household and non-financial corporate debt 2003-2016[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.

Private sector debt ratio continues to fall ...

Corporate debt grew by 2% in nominal terms in Q4/2016 (4½% after adjusting for the effect of exchange rate movements on foreign-denominated debt), to 81% of GDP (Chart III-14). The debt ratio declined by 11 percentage points in 2016, mainly because of increased economic activity. The household debt ratio declined as well, measuring 77% of GDP at the end of 2016, although nominal household debt

rose by 1% in Q4. Private sector debt therefore equalled 159% of GDP at the end of 2016, the lowest ratio since end-2003.

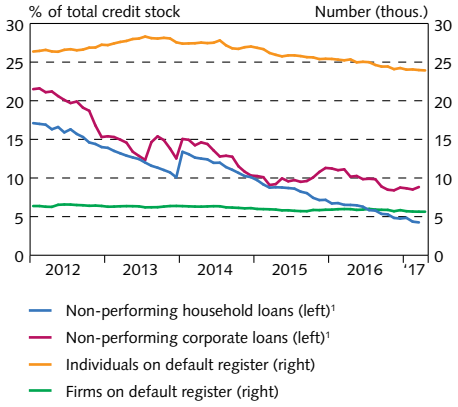
… and non-performing loan ratios are declining

The share of non-performing household debt to the three largest commercial banks and the HFF has fallen still further in the recent past, to 4.3% of total loans at the end of March, down from 6.5% at the same time a year earlier (Chart III-15). Furthermore, the number of individuals on the Creditinfo default register declined by 6% year-on-year in April. The share of non-performing corporate loans granted by credit institutions has declined as well, to 8.8% in March, as opposed to 11.1% in March 2016. The number of firms on the default register fell by 6% year-on-year in April. Furthermore, the number of corporate insolvencies declined year-on-year in Q1, after having been unusually high in 2016 because of delayed registration caused by the strike among capital area Commissioners' employees in 2015. The number of new registrations during the quarter was virtually unchanged between years (Chart III-16).

Non-indexed mortgage lending rates have fallen in line with Central Bank rates

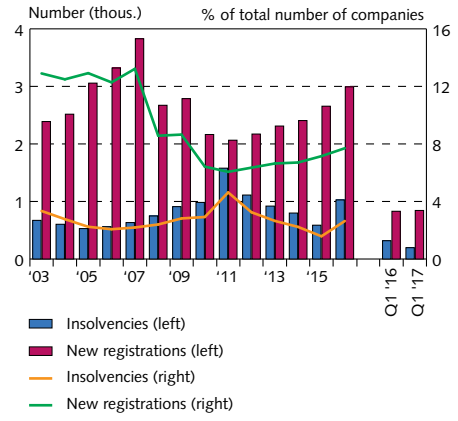
The commercial banks' non-indexed deposit and lending rates are virtually unchanged since the February *Monetary Bulletin*, as are pension funds' lending rates, but have declined since August, in line with Central Bank interest rates. Rates on comparable indexed loans have been broadly unchanged in the recent term, however. Interest rates on pension fund loans remain somewhat lower than rates on comparable loans from the commercial banks. More lenders have changed their lending fees to a fixed amount in compliance with amendments to legislation on mortgage lending to consumers, passed by Parliament last October.[2] As a result, lending fees have declined for a large group of borrowers, which should facilitate borrowing and enhance the likelihood of refinancing.

Chart III-15
Credit system arrears
January 2012 - April 2017



1. Non-performing loans owed to the three largest commercial banks and the Housing Financing Fund are defined as loans at least 90 days in arrears, those that are frozen, or those for which payment is deemed unlikely. The cross-default method is used; i.e., if one loan taken by a customer is in arrears by 90 days or more, all of that party's loans are considered non-performing. The January 2014 increase is due almost entirely to improvements to the HFF's loan portfolio reports and therefore does not reflect an actual increase. Parent companies, book value.
Sources: CreditInfo, Financial Supervisory Authority, Central Bank of Iceland.

Chart III-16
Corporate insolvencies and new company registrations 2003-2017



Source: Statistics Iceland.

2. The legislation provides for the equivalent of a ban on charging loan fees as a fixed percentage of the face value of the loan, as has been the practice in Iceland.

IV Demand and GDP growth

GDP growth measured just over 7% in 2016, well above trading partners' growth rates and Iceland's estimated long-term growth rate. As before, private sector demand is growing rapidly, in line with strong growth in income and employment. This development is based in sizeable positive shocks in the form of improved terms of trade and strong export growth, with further support from fiscal easing. In spite of strong demand growth, the trade surplus is large and national saving historically high. Household saving has continued to increase despite rapid growth in private consumption. The outlook is for GDP growth to be strong again this year, at over 6%, which is markedly above the February forecast, owing to the prospect of more robust export growth and more fiscal easing than was assumed then. As in the Bank's previous forecasts, GDP growth is projected to gradually approach its long-term trend rate as the forecast horizon progresses.

GDP growth and domestic private sector demand

2016 GDP growth outpaces the February forecast

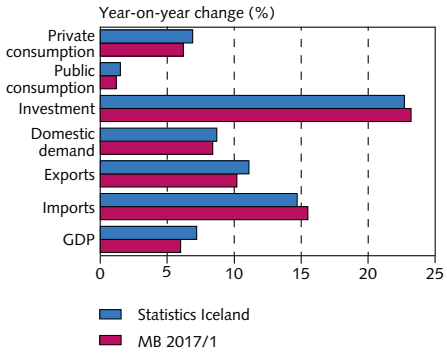
GDP growth accelerated over the course of 2016, measuring 10.4% in H2, according to preliminary figures from Statistics Iceland. It measured 7.2% for the year as a whole and, as in the recent past, was driven mainly by domestic private sector demand plus a sizeable contribution from services exports (Chart IV-1). Added to this are the effects of fiscal easing in 2015-2016. Domestic demand growth measured 8.7% and was offset by a negative contribution from net trade in the amount of 0.8 percentage points, as import growth outweighed export growth. For the year as a whole, GDP growth was a full 1 percentage point above the forecast in the February *Monetary Bulletin*, and in Q4 it measured 11.3%, far more than was projected in February. This is due in part to a surge in residential investment, which was entered to that quarter in Statistics Iceland's figures, and more favourable developments in imports and exports than had been anticipated.

GDP growth for the year was the strongest since 2007 and well above the economy's long-term trend growth rate, which is assumed to be 2¾%. As of last year, GDP had increased by 22½% from the post-crisis trough in 2010, which is remarkable in international context, as Iceland's trading partners recorded growth rates of 1-3% in 2016 (Chart IV-2). Such growth rates in 2016 can only be found in emerging market economies.

Effects of tourism clearly visible in production accounts

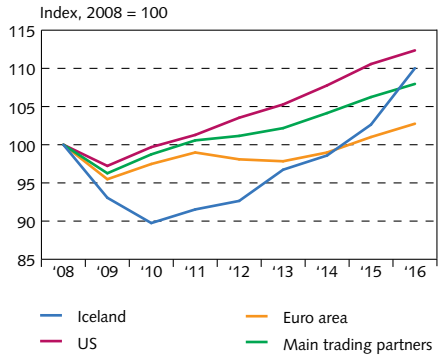
As in the previous year, the impact of the surge in tourism was clearly visible in the production accounts. Gross factor income rose by 7.6% in real terms in 2016, with nearly 3 percentage points of that growth from the tradable sector and the vast majority of that segment from tourism-dominated sectors (Chart IV-3). Construction also weighed heavily – likely owing to tourism-related development – in addition to residential investment. Domestic services sectors were important as well, reflecting both the rise in tourist visits to Iceland and a surge in

Chart IV-1
National accounts 2016



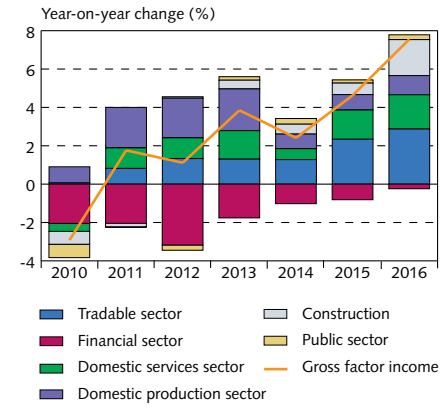
Sources: Statistics Iceland, Central Bank of Iceland.

Chart IV-2
GDP in Iceland and its main trading partners 2008-2016



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

Chart IV-3
Gross factor income and sectoral contributions 2010-2016[1]

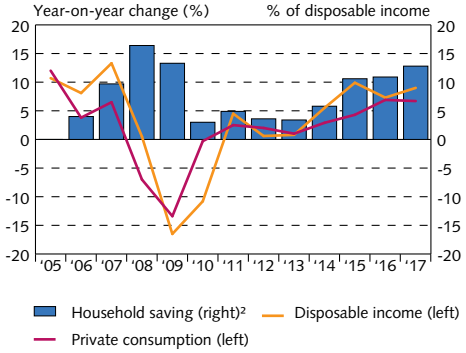


1. Gross factor income measures the income of all parties involved in production. It is equivalent to GDP adjusted for indirect taxes and subsidies. Included in the tradable sector are fisheries, fish product processing, manufacture of metals and pharmaceuticals, tourism, and 75% of electricity, gas, heat, and water utilities. Other sectors are considered non-tradable and are classified as construction, financial sector, services (excl. financial services), and production.

Sources: Statistics Iceland, Central Bank of Iceland.

Chart IV-4

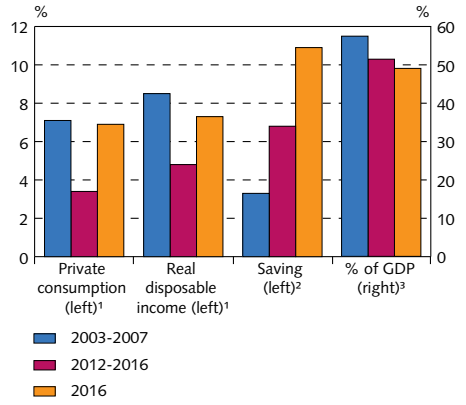
Private consumption, real disposable income, and household saving 2005-2017[1]



1. Central Bank baseline forecast 2017. 2. 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.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart IV-5

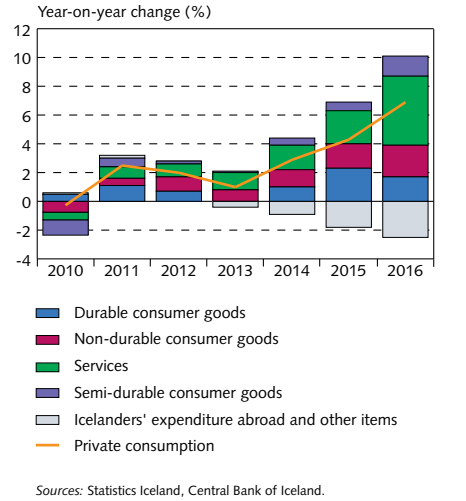
Private consumption during two five-year growth periods



1. Annual real growth in private consumption and real disposable income. 2. Household saving relative to disposable income (see also the footnotes to Chart IV-4). 3. Private consumption at current prices relative to nominal GDP.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart IV-6

Private consumption and its main components 2010-2016



Sources: Statistics Iceland, Central Bank of Iceland.

domestic demand. As in the past few years, the production accounts show growth in all sectors apart from financial services; therefore, year-2016 GDP growth appears to be relatively broad-based.

Household saving increases despite strong private consumption growth

Private consumption grew 6.9% in 2016, the fastest single-year growth rate since 2005. It was also above the February forecast, owing in part to Statistics Iceland's revision of previous figures but mainly to an unusually strong Q4, where private consumption growth was markedly above what leading indicators had implied.

Private consumption has grown by about a fifth since bottoming out in 2010, but its share in GDP has held broadly unchanged in recent years. The private consumption-to-GDP ratio is now below its pre-crisis level, as household saving has increased in the past few years, measuring just under 11% of disposable income in 2016 (Charts IV-4 and IV-5). During the current cyclical expansion of private consumption, the saving ratio has been about twice the 2003-2007 average. The current expansion departs from previous cyclical expansions in Iceland, as households have increased their deposits and credit growth has been modest (see Chapter III) at a time of strong growth in private consumption.

An examination of the components of private consumption by expenditure shows that last year's increase is attributable to most categories (Chart IV-6). The chart also shows that even though Icelanders' spending abroad surged in 2016, it was outweighed by tourists' spending in Iceland.

Continued robust private consumption growth in 2017

Households' financial position has improved substantially since the cyclical trough after the financial crisis. Real wages have risen significantly, and unemployment is down. Real disposable income is estimated to have grown by 7.3% in 2016, more than twice the average increase in the past quarter-century. In addition, rising asset prices and reduced debt have improved households' financial situation. Real disposable income is expected to continue rising and households' net worth to increase further. Consumption growth is therefore expected to remain strong. Indicators of private consumption at the beginning of 2017 suggest that developments are similar to those last year; therefore, consumption is projected to grow by 6.7% this year, after which it will ease but remain robust.

Business investment above its long-term average in 2016 ...

Business investment grew by nearly a fourth in 2016, to just over 15% of GDP. The business investment-to-GDP ratio has risen rapidly in recent years as construction has picked up, measuring about 2 percentage points above its long-term average in 2016. Investment in construction and equipment for construction-related groundwork dominated firms' investment expenditure during the year (Chart IV-7). General business investment accounted for the majority of the increase in business investment, although there was also a moderate

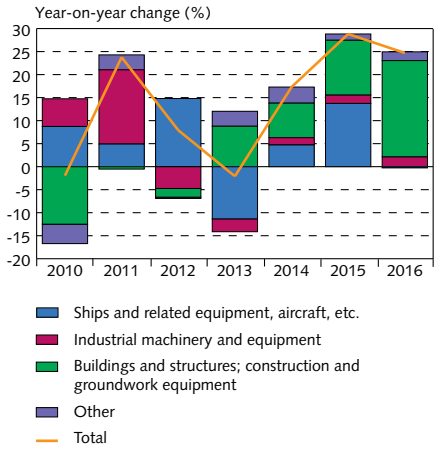
increase in energy-intensive investment, while investment in ships and aircraft was broadly unchanged year-on-year.

… but expected to slow this year

The past few years' surge in investment is expected to ease this year. According to the forecast, business investment will increase by just over 4%, owing to offsetting effects from a contraction in investment in ships and aircraft and growth in general and energy-intensive investment. This projection is based not least on information concerning firms' investment plans (see below). General business investment is expected to continue growing in 2018, while investment in energy-intensive industry and ships and aircraft is projected to contract, resulting in a marginal decline in business investment as a whole.

Chart IV-7

Business investment and contribution by type 2010-2016



Sources: Statistics Iceland, Central Bank of Iceland.

Firms expect to step up investment modestly this year …

A survey of firms' investment plans, conducted earlier this spring, shows that respondents invested more in 2016 than was indicated in a comparable survey taken last autumn, although the year-on-year increase was somewhat less because of a revision of 2015 figures (Table IV-1). According to the survey, investment grew most in the fishing industry and in transport and tourism. This year, firms expect a modest increase in investment, whereas in the autumn survey they anticipated a contraction. The difference is due mainly to plans for increased investment in the transport and tourism sector, although a significant increase is also expected in the financial sector. In the fishing industry and in services and retail/wholesale trade, however, investment is expected to contract during the year.

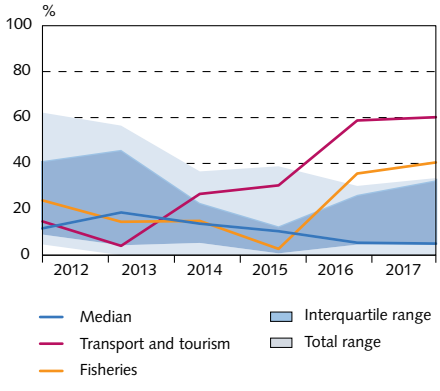
Similar results were obtained from the Gallup survey of the current situation and future plans, conducted in March among executives from Iceland's 400 largest firms. According to the survey, fisheries planning to cut back on investment in 2017 outnumbered those planning increased investment by about a fourth. In transport, transit, and tourism, however, the opposite is true: firms planning to step up investment outnumber those planning cutbacks by one-fourth. Among manufacturing firms, those planning increased investment outnumber those planning reduced investment by about a third. In the retail and wholesale trade sector, an equal number of respondents were planning to increase investment and to reduce it.

… but the share of credit-financed investment rises in transport, tourism, and fishing, alongside reduced earnings

The Central Bank's investment survey includes questions about business investment financing. Notably, about 40% of investment was credit-financed in 2016, and respondents expect a similar percentage this year. This represents a marked increase from the Bank's previous surveys, where the share has ranged between 20% and 30%. The change is most pronounced among companies in transport and tourism, where investment spending has increased most rapidly in recent years, and in the fishing industry. Excluding these sectors, the share of investment that is credit-financed is broadly similar to that in previous surveys (Chart IV-8). Furthermore, the rise in credit financing is

Chart IV-8

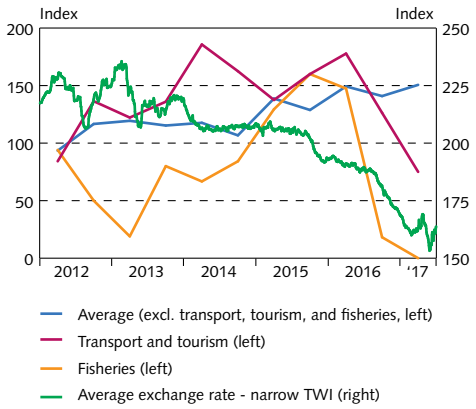
Credit-financed corporate investment 2012-2017[1]



1. Survey of corporate investment plans, excluding ships and aircraft. Median and ranges exclude transport, tourism, and fisheries.
Source: Central Bank of Iceland.

probably due in part to reduced earnings as a result of the appreciation of the króna, as executives in these sectors say that the outlook has deteriorated as the exchange rate has risen (Chart IV-9). According to the Gallup survey from March, for example, the share of transport, transit, and tourism firms that reported reduced earnings in the past six months exceeded the share reporting increased earnings over the same period by 10 percentage points. Some 80% of fishing companies also said their earnings had declined. In other sectors, however, firms reporting increased earnings outnumbered those reporting a downturn.

Chart IV-9
Export sectors' EBITDA indices (last 6 months) and ISK exchange rate[1]
March 2012- March 2017



1. Daily data for trade-weighted exchange rate index; semiannual data for EBITDA indices.
Sources: Gallup, Central Bank of Iceland.

Table IV-1 Survey of corporate investment plans (excluding ships and aircraft)[1, 2]

Largest 102 firms Amounts in ISK billions	*2015*	*2016*	*2017*	*Change between 2015 and 2016 (%) (last survey)*	*Change between 2016 and 2017 (%) (last survey)*
Fisheries (17)	12.2	15.4	8.8	26.0 (12.0)	-42.9 (-32.3)
Industry (17)	4.3	4.6	5.0	8.2 (11.6)	7.4 (10.8)
Wholesale and retail sale (23)	7.4	8.0	7.0	7.8 (22.0)	-12.5 (-9.4)
Transport and tourism (8)	33.9	42.5	50.1	25.4 (55.0)	18 (-6.0)
Finance/Insurance (9)	4.1	3.7	5.2	-9.3 (32.2)	38.7 (31.8)
Media and IT (7)	7.3	7.5	7.7	3.0 (-2.5)	2.5 (4.1)
Services and other (21)	16.4	17.1	16.9	4.3 (-8.5)	-1.2 (-5.3)
Total (102)	85.7	98.9	100.7	15.5 (19.1)	1.8 (-6.3)

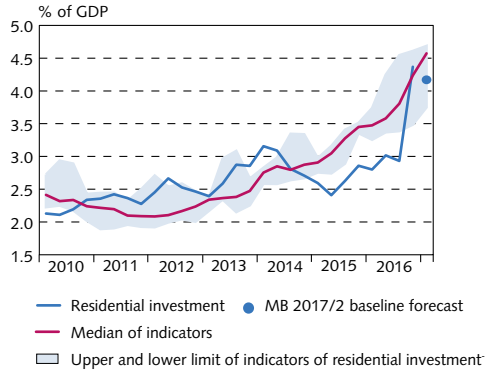
1. In parentheses are results from the last survey, in which respondents from 102 firms were asked about investment plans for 2016-2017 (*Monetary Bulletin* 2016/4). 2. Previously published figures on transport and tourism have changed because spare parts for aircraft are now included for all years, whereas they were previously classified separately. Spare parts for ships are now included as well.
Source: Central Bank of Iceland.

Residential investment finally on the rise

Rising real household incomes, population growth (including strong importation of foreign labour), and the surge in tourism have greatly increased demand for housing. Until recently, however, residential investment has been relatively weak. According to figures from Statistics Iceland, it grew by over 70% year-on-year in Q4, far outpacing the Bank's February forecast. To some extent, this strong uptick reflects the way in which residential investment data are submitted to and processed by Statistics Iceland rather than an actual surge taking place during the quarter.

However, this does not change the fact that residential investment has taken off, growing by about a third in 2016 as a whole, nearly double the rate provided for in the Bank's February forecast. Leading indicators imply that growth continued in Q1/2017 (Chart IV-10). Federation of Icelandic Industries figures from February indicate that, during the forecast horizon, construction will begin on over 8,000 flats and roughly 6,000 will be completed. As in the February forecast, residential investment is projected to continue growing apace, by one-fourth this year, followed by strong growth in 2018 and 2019. The ratio of residential investment to GDP will be just over 5% by the end of the forecast horizon, a full 1 percentage point above the long-term average.

Chart IV-10
Indicators of residential investment[1]
Q1/2010 - Q1/2017



1. The indicators are imports of building supplies, cement sales to buyers other than energy-intensive firms, and value-added tax turnover in the construction industry. In assessing the range, the variables are rescaled so that their average and standard deviation are the same as those for measured residential investment. The chart shows a two-quarter moving average of indicators. Seasonally adjusted data.
Sources: Aalborg Portland Iceland, Centre for Retail Studies, Sements-verksmiðjan ehf., Statistics Iceland, Central Bank of Iceland.

Investment-to-GDP ratio expected to fall marginally during the forecast horizon

Total investment grew by nearly one-fourth in 2016, but the growth rate is expected to slow this year because of reduced business investment. Growth is forecast at around 8½%, with the largest contributions from business investment excluding ships and aircraft and residential investment, as well as a modest increase in public investment (Chart IV-11). If the forecast materialises, the investment-to-GDP ratio will hold steady at about 21% this year before declining to 20% from 2018 onwards.

Prospect of continued strong GDP growth

GDP growth is assumed to have slowed down in Q1/2017, owing mainly to the negative impact of the fishermen's strike on export production, which was probably addressed with a partial depletion of export inventories. The impact of the strike is considered to be temporary, however, and growth is therefore projected to pick up strongly in Q2. GDP growth for 2017 as a whole is forecast at 6.3%, or 1 percentage point above the February forecast, as exports are now expected to grow faster than was projected then and the new National Budget entails more fiscal easing than previously anticipated (see below). As before, strong growth in exports and private consumption will be the main drivers of output growth (Chart IV-12). Output growth will also be somewhat stronger in 2018 than was forecast in February, but as in that forecast, it is expected to ease gradually towards its long-term trend rate as the forecast horizon advances.

Public sector

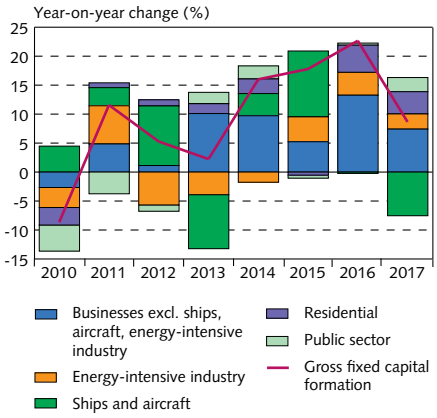
Outlook for growth in public consumption and investment broadly unchanged from February

According to preliminary figures from Statistics Iceland, public consumption grew by 1.5% last year, 0.5 percentage points more than in 2015. The central government's consumption expenditure rose to its post-crisis peak of 2.4% year-on-year, while municipal consumption contracted by nearly 1%. Central government wage costs rose by 9.4% in 2016 and municipal wages by 7%, even though the price of public consumption rose 1 percentage point more for local governments than for the central government. Cost control was therefore considerably more at the local government level than at the state level.

As in the February forecast, large wage increases are expected to impede real public consumption growth, which is now projected to remain broadly unchanged year-on-year. However, public investment is expected to increase between years, and public expenditure will therefore rise by nearly 3½% year-on-year (Chart IV-13). Public consumption growth will be broadly stable throughout the forecast horizon, while public investment will grow by just over 10% per year, which is below the 2004-2007 average of nearly 12%. The public investment-to-GDP ratio is expected to remain unchanged at slightly less than 3% until 2019 and then rise to 3¼% as the construction of the new Landspítali hospital gains momentum. The bulk of the hospital construction project will take place after the end of the current forecast horizon.

Chart IV-11

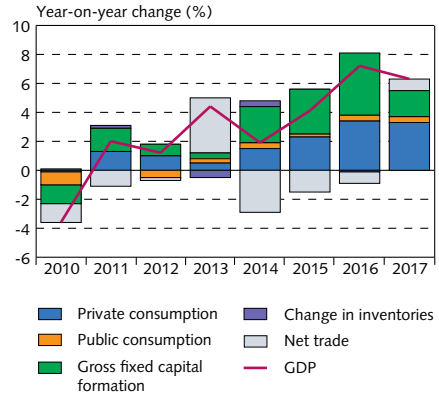
Gross fixed capital formation and contribution of main components 2010-2017[1]



1. Central Bank baseline forecast 2017.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart IV-12

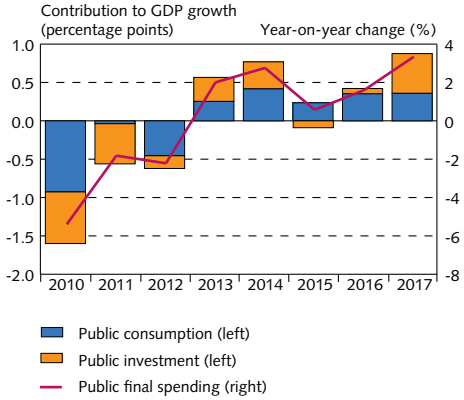
GDP growth and contribution of underlying components 2010-2017[1]



1. Central Bank baseline forecast 2017.
Sources: Statistics Iceland, Central Bank of Iceland.

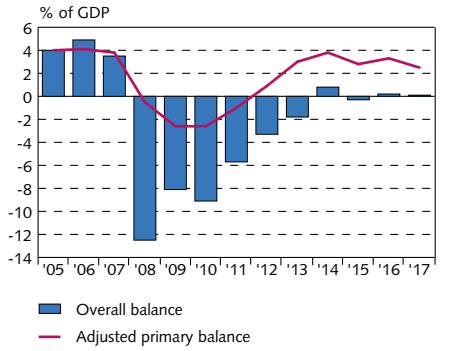
Chart IV-13

Public consumption and investment 2010-2017[1]



1. Central Bank baseline forecast 2017.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart IV-14
Treasury balance 2005-2017[1]



1. The primary balance is adjusted for one-off revenues and expenditures (e.g., stability contributions from the settlement of the failed financial institutions, the accelerated write-downs of indexed motgage loans). In 2016 and 2017 the overall balance is adjusted for one-off items; i.e., the effects of the stability contributions, dividends in excess of the National budget and the accelerated write-downs of indexed motgage loans. Central Bank baseline forecast 2017.
Sources: Ministry of Finance and Economic Affairs, Statistics Iceland, Central Bank of Iceland.

Treasury primary balance to be smaller in 2017

According to preliminary figures from Statistics Iceland, general government operations generated a surplus of 17.2% of GDP in 2016. When the stability contributions and dividends in excess of budgetary allocations have been deducted, the underlying central government surplus is only 0.2% of GDP, which is still 0.6 percentage points more favourable than was assumed in the February *Monetary Bulletin*. The deviation is due for the most part to an overestimation of wage costs, as Statistics Iceland revised nominal wage expense downwards by 1.9% from its previous estimate when it calculated 2016 figures. In comparison, central government operations generated a deficit of 0.3% in 2015.

This year, it is assumed that the underlying surplus will be similar to that in 2016, or 0.1% of GDP. The Treasury primary surplus will contract, however. It is expected to equal 2.5% of GDP this year, as opposed to 3.3% in 2016, after adjusting for one-off effects (Chart IV-14).

New fiscal strategy and plan for 2018-2022

According to the Act on Public Finances, Parliamentary resolutions on a fiscal strategy and a fiscal plan for the next five years were presented before Parliament in January and again in late March. According to the fiscal strategy, the Treasury outcome will be positive by 1.5% of GDP in 2018 and the general government surplus will be 1.6%, therefore assuming a small surplus for local governments. For the remainder of the forecast horizon, the overall general government outcome is projected to deteriorate by 0.1% of GDP each year. The fiscal plan entails a virtually unchanged Treasury outcome from the previous plan, with the difference averaging 0.1% of GDP for the horizon of the plan. The forecast in *Monetary Bulletin* assumes that, during the forecast horizon, the Treasury outcome will be poorer by 0.4% of GDP per year than is provided for in the fiscal plan. The main reason for this lies in the treatment of fixed expenditures, wages, and goods and services purchases, as well as the effect of differing macroeconomic assumptions on the forecasts.[1]

The financial crisis called for tight control of public spending because of Iceland's difficult debt position. Even though the fiscal position has improved, a tight fiscal stance is still necessary because of the widening output gap. It could therefore be that the objective set forth in the fiscal plan – that the primary expenditure-to-GDP ratio will not rise during the period – is not conservative enough, as GDP growth over the period should provide scope for a significant increase in spending.

Significant fiscal easing three years in a row

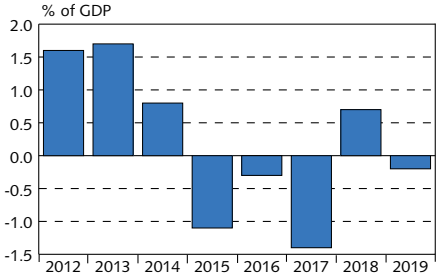
This forecast assumes an improved fiscal outcome compared to the February forecast. For the most part, this is because it is no longer

1. Statistics Iceland and the Ministry of Finance and Economic Affairs publish the outcome using the so-called GFS standard. Their methods for presenting fixed assets, wages, and goods and services purchases differ, however. This report is based on Statistics Iceland's presentation.

assumed that the investment spending provided for in the transport strategy approved by Parliament just before the last elections will be implemented in full, as full funding is not laid down in the fiscal plan.

In other respects, the improved outlook can be attributed to stronger economic activity, as the forecast assumes a larger output gap during the forecast horizon than was projected in February (see Chapter V). Adjusting for the business cycle, the primary balance is expected to deteriorate year-on-year by 1.4% of GDP in 2017 (Chart IV-15). This easing, which is expected to show in both revenues and expenditures, comes in the wake of two years of easing amounting to 1.4% of GDP, making for a total of 2.8% in three years. This is more significant easing than was forecast in February. The proposed increase in value-added tax (VAT) on tourism is expected to result in consolidation of about 0.7% of GDP in 2018, followed by easing in the amount of 0.2% of GDP in 2019, when the planned reduction of the general VAT rate takes effect.[2]

Chart IV-15
Change in central government cyclically adjusted primary balance 2012-2019[1]

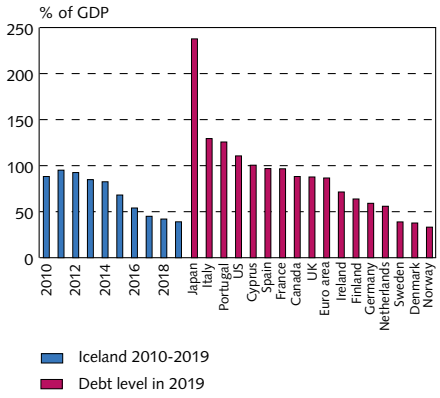


1. Central Bank baseline forecast 2017-2019. Primary balance is adjusted for one-off revenues and expenditures (e.g., dividends and the accelerated write-down of indexed mortgage loans).
Sources: Ministry of Finance and Economic Affairs, Central Bank of Iceland.

General government debt falls below fiscal rule criteria

The debt reduction provided for in the current Government's fiscal strategy is virtually identical to that laid down by the previous Government. It should be possible to achieve rapid deleveraging by using the expected fiscal surplus and the proceeds of planned asset sales. As a result, it is now estimated that Treasury debt will amount to 39% of GDP at the end of 2017. General government debt will total 45% of GDP at the same time, and 39% by the end of the forecast horizon, if current plans materialise (Chart IV-16).

Chart IV-16
General government gross debt



Sources: International Monetary Fund, Ministry of Finance and Economic Affairs, Central Bank of Iceland.

External trade and the current account balance

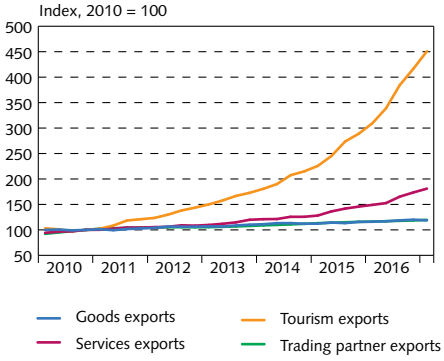
Outlook for strong export growth for the third year in a row

Goods and services exports grew by 11.1% between years in 2016, driven mainly by a 19% year-on-year rise in services exports (Chart IV-17). This surge in services exports was the main reason exports grew by 1 percentage point more than the Bank had forecast in February. Services exports have grown by an average of almost 10% per year since 2011 and now exceed goods exports in value terms for the first time.

Indicators suggest that strong growth in services exports will continue this year, and if the forecast materialises, the growth rate will outpace the February forecast. Figures on foreign tourist arrivals show a 56% year-on-year increase in the first four months of 2017, compared to a 35% increase during the same period in 2016. The pace of the increase is expected to ease, however, to 22% for the year as a whole – about half of the increase in 2016. The recent rise in the real exchange rate is likely a factor here, although the outlook is also for a slower increase in flight offerings from airlines, owing to capacity limitations at Keflavík Airport during peak times.

The outlook for this year's goods exports has also improved from the February forecast. Although marine product exports are expected

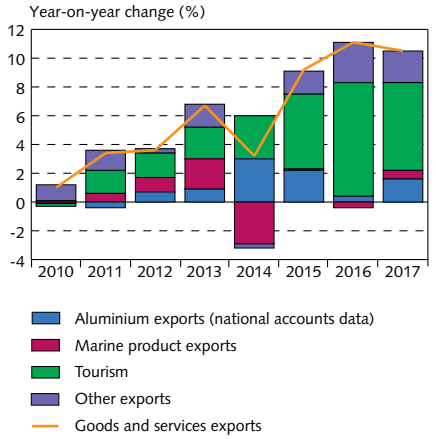
Chart IV-17
Goods and services exports and global demand[1]
Q1/2010 - Q1/2017



1. Four-quarter moving average. Export figures for Q1/2017 are from the baseline forecast in *Monetary Bulletin* 2017/2.
Sources: Statistics Iceland, Central Bank of Iceland.

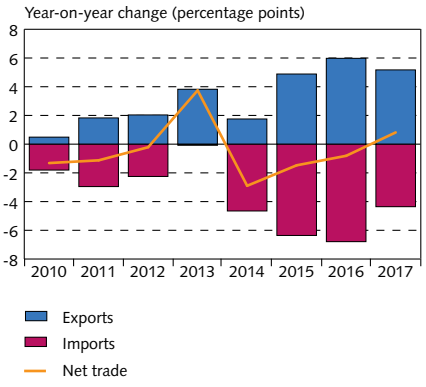
2. This is very close to the results of the Fiscal Council's calculations of the cyclically adjusted primary balance (taking one-off items into account), published in the Council's opinion on the 2018-2022 fiscal plan on 14 April 2017.

Chart IV-18
Exports and contribution of subcomponents 2010-2017[1]



1. Central Bank baseline forecast 2017.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart IV-19
Contribution of net trade to GDP growth 2010-2017[1]



1. Central Bank baseline forecast 2017.
Sources: Statistics Iceland, Central Bank of Iceland.

to have contracted markedly in Q1 because of the fishermen's strike, it is thought likely that this will primarily affect the distribution of export growth within the year and not marine exports for 2017 as a whole. The brighter outlook is due to a stronger capelin season than was forecast in February. Aluminium exports are also expected to be stronger than in 2016, and by a slightly larger margin than was projected in February, although the protracted production stoppage at the United Silicon plant could have some impact on the outcome. Overall, exports are projected to increase by 10.5% year-on-year, or 4.4 percentage points more than was forecast in February. If the forecast materialises, this will be the third year in a row with export growth over 9% (Chart IV-18). The outlook is also for services exports to grow more rapidly in 2018 than was forecast in February, but as was projected then, export growth is expected to slow somewhat in the coming two years, in line with a rising real exchange rate and relatively weak global economic growth.

Robust import growth driven by strong demand and a rising real exchange rate

Imports of goods and services grew by nearly 15% in 2016, the largest increase since 2005. The growth rate was almost 1 percentage point less than was forecast in February but almost twice the growth rate of domestic demand. Strong import growth is due not least to the large share of imports in private consumption last year – both goods and services purchases. Furthermore, export sectors such as tourism and international airline operations have grown swiftly, and their activities call for significant goods and services imports.

As with the forecast for exports, goods and services imports are expected to grow more than previously assumed, or about 10.2%, as opposed to just under 7.4% according to the February forecast. The main reason for the difference is the strength of services exports, which require substantial imports, as is mentioned above. Growth in domestic airlines' activities calls for the operation of additional leased aircraft during the year, and operating fees at foreign airports therefore increase. Furthermore, the real exchange rate has continued to rise, and the Icelandic Tourist Board's figures on Icelanders' departures via Keflavík Airport plus Gallup's survey of individuals' planned overseas travel suggest that services imports will continue to grow strongly this year.

Contribution of net trade to GDP growth positive for the first time since 2013

The contribution of net trade to GDP growth was negative by 0.8 in 2016, whereas the February forecast assumed a negative contribution of 1.7 percentage points (Chart IV-19). The difference is due to the combined effect of stronger export growth and weaker import growth than in the February forecast. In the past three years, the contribution from net trade has been negative in spite of hefty export growth, but it appears that there will be a turnaround this year. If the forecast is borne out, the contribution from net trade will be positive in 2017 – for the first time since 2013.

Trade surplus set to be larger than was forecast in February

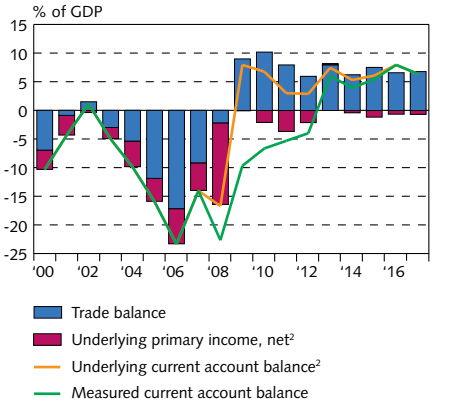
Last year's trade surplus amounted to 6.6% of GDP, more than was assumed in the February forecast. The main reason for the difference is stronger growth in services exports. Because of strong export growth and better terms of trade (see Chapter II), the surplus on combined goods and services trade is expected to measure roughly the same this year. It is then expected to taper off over the remainder of the forecast horizon.

The current account balance was positive by 194 b.kr., or 8% of GDP, in 2016. Only once before has Iceland recorded such a large current account surplus – in 2009, when it was also 8% of GDP (Chart IV-20). This is about 1½ percentage points more than was forecast in February, owing to much more favourable developments in primary income in addition to the increased trade surplus. The rise in primary income is due to improved returns on foreign direct investment, owing in part to the effects of large one-off profits on foreign direct investment (FDI) assets held by the holding companies established on the basis of the failed banks' estates. A larger surplus on primary income is also assumed for this year, reflecting to some extent Iceland's improved external debt position and reduced interest rates on foreign financial obligations. However, the most important factor is stronger FDI returns, which have been positive for the past four years even though the net FDI position (adjusting for the effect of the failed bank estates) has been negative. Therefore, the outlook for 2017 is for a larger current account surplus than was expected in February, or 6.4% of GDP instead of 4½%. The surplus is forecast to decline to 5½% in 2019.

National saving has increased markedly in recent years, measuring 29.3% of GDP in 2016, or 11 percentage points above its twenty-five year average (Chart IV-22). It has exceeded this level only once before: in 1965, when it measured just above 30% of GDP (see Box 1). According to the forecast, national saving will remain somewhat above the historical average throughout the forecast horizon.

Chart IV-20

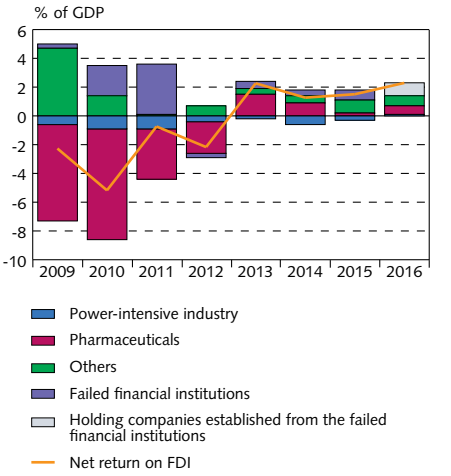
Current account balance 2000-2017[1]



1. Including secondary income. Central Bank baseline forecast 2017.
2. 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).
Sources: Statistics Iceland, Central Bank of Iceland.

Chart IV-21

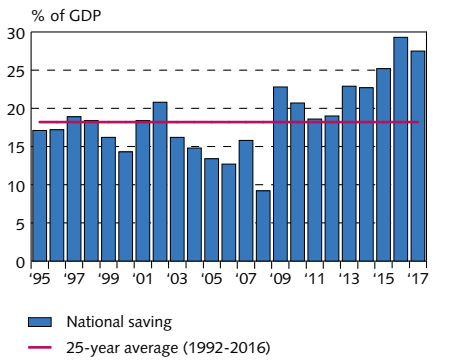
Net return on FDI 2009-2016[1]



1. Sum of net dividends, reinvested earnings, and interest on shareholder loans.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart IV-22

National saving 1995-2017[1]



1. Underlying national saving in 2008-2015, based on the estimated underlying current account balance (adjusted for the effects of failed financial institutions 2008-2015 and pharmaceuticals company Actavis in 2009-2012). Central Bank baseline forecast 2017.
Sources: Statistics Iceland, Central Bank of Iceland.

V Labour market and factor utilisation

According to the Statistics Iceland labour force survey (LFS), growth in total hours worked was somewhat stronger in Q1/2017 than was forecast in the February *Monetary Bulletin*. Unemployment continued to decline and is at its lowest level since early 2008. About one-fourth of firms still plan to recruit staff rather than downsizing, and the share of firms considering themselves short-staffed has remained steady at about 40% in the past year despite considerable importation of labour. According to figures from Statistics Iceland, productivity growth measured just over 4% in 2016, after having been below 1% per year for the preceding six years. This sudden increase in productivity growth could indicate an overestimation stemming from an underestimation of the increase in imported labour. Strong labour importation is expected to continue in the coming term, with potential output rising well above its long-term trend growth rate. In spite of this, the output gap continues to widen and is forecast to be wider than was projected in February.

Labour market

Total hours worked rise rapidly and unemployment continues to decline

Total hours worked grew by 3% in 2016 and by 3.5% year-on-year in Q1/2017, or 0.2 percentage points more than was forecast in February (Chart V-1). Job creation remains strong, but the average work week grew shorter, as it did throughout 2016, with survey responses suggesting that some firms have chosen to cut down on expensive overtime in response to costly wage settlements. In Q1/2017, as in the previous quarter, the seasonally adjusted labour participation rate was 83.8%, which is equal to the pre-crisis peak, while the employment rate is still ½ a percentage point below the previous peak, at 81.6%.

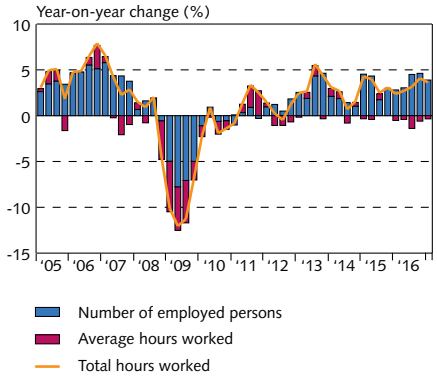
According to the LFS, unemployment fell by 0.4 percentage points between years in Q1/2017, to a seasonally adjusted rate of 2.7%, the lowest rate since the first half of 2008. Unemployment would probably have been still lower had it not been for the fishermen's strike, which put an estimated 1,300 fishing company employees on unemployment benefits for the duration of the strike (Chart V-2).[1]

Executives still expect a sizeable increase in staffing

The outlook is for continued strong labour demand, even though Gallup's spring survey indicates that the share of firms planning to recruit rather than lay off staff has declined by over 5 percentage points, to 24%, after adjusting for seasonality (Chart V-3). The ratio therefore remains high, as it has been in the recent term, although the situation varies from one sector to another. The fishermen's strike appears to have exacerbated pessimism in the fishing industry, as firms plan-

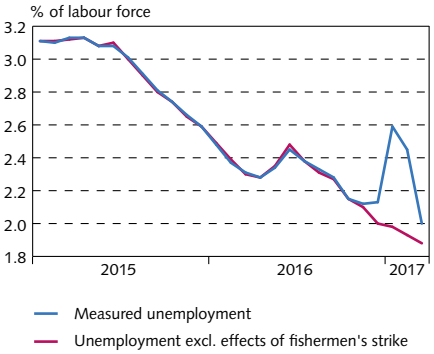
1. According to a report on the economic cost of the fishermen's strike, prepared for the Ministry of Industries and Innovation.

Chart V-1
Employment and hours worked[1]
Q1/2005 - Q1/2017



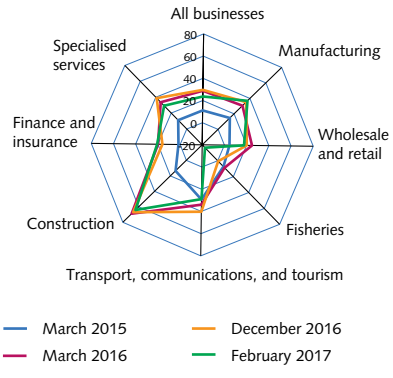
1. Quarterly averages of monthly figures.
Source: Statistics Iceland.

Chart V-2
Registered unemployment[1]
January 2015 - March 2017



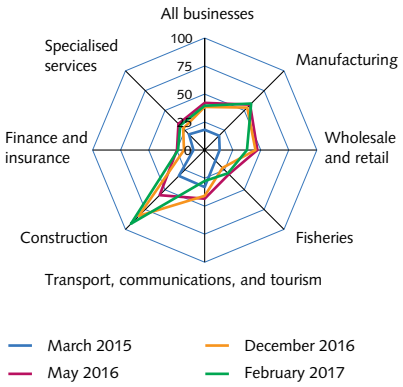
1. Seasonally adjusted figures.
Sources: Directorate of Labour, Central Bank of Iceland.

Chart V-3
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.

Mynd V-4
Firms considering themselves short-staffed[1]
Share of businesses (%)



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

ning to downsize outnumbered those planning to recruit by over 16 percentage points at the time the survey was taken (14 February-3 March). Demand for construction workers is broadly at the high level seen in the past one-and-a-half years, with firms planning to recruit outnumbering those planning redundancies by 64 percentage points. In other sectors, the same ratio lay in the range of 18-37 percentage points.

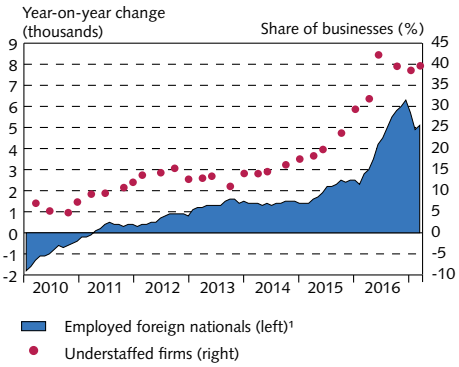
Indicators of factor utilisation

Strong and persistent labour shortage …

According to Gallup's spring survey, the share of companies considering themselves understaffed was broadly similar to that in the winter survey, at about 40%, and broadly unchanged from the summer 2016 survey as well (Chart V-4). Since mid-2015, the shortage is most pronounced in the construction industry, where nearly 93% of firms (adjusted for seasonality) had difficulty filling available positions in February, an increase of nearly 10 percentage points between surveys. This is the largest shortage measured in any sector in the history of Gallup's survey of Iceland's 400 largest firms.

Part of this shortage has been addressed with imported labour. According to estimates from pay-as-you-earn (PAYE) tax data, the number of foreign nationals working in the construction industry has risen by 124% since 2014, from 11% of the construction workforce to last year's total of 20%. In spite of this significant importation of labour, the number of construction companies considering themselves understaffed is still rising. Pronounced and protracted shortage of workers could to some degree reduce the sector's capacity to respond to increased demand. The number of tourism companies considering themselves short-staffed declined between surveys, however, and the number planning redundancies in the next six months increased. The number of foreign workers in tourism-related sectors has risen sharply, which could explain the decline in the number of firms considering themselves understaffed. However, the increase in planned redundancies could also indicate weaker tourist demand, owing to the appreciation of the króna in the past year.

Chart V-5
Foreign labour and worker shortages
January 2010 - February 2017



1. Estimate based on PAYE data.
Sources: Gallup, Statistics Iceland.

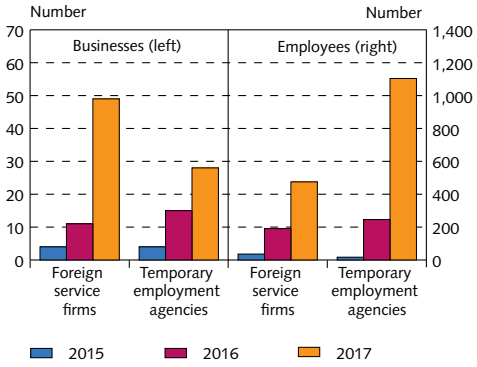
… despite significant importation of labour

In recent years, net foreign migration has been positive in Iceland, and by a growing margin. Similar trends can be seen in figures on the estimated number of foreign nationals in the PAYE register and the Directorate of Labour's (DoL's) registry of temporary employment agencies, foreign service companies, and new work permits. The rise in the number of workers with foreign nationality began early in 2011 and then accelerated in 2016, in line with the growing shortage of labour (Chart V-5). In all, the number of workers in the PAYE register rose 4.7% in 2016, some 60% of the increase due to foreign nationals. This was the first time since 2010 that foreign nationals contributed more than Icelandic nationals to the increase in worker numbers. Most foreign nationals were employed in service sectors that have grown rapidly with the surge in tourism, although many were also employed

in construction and retail and wholesale trade. This growing importation of labour can also be seen in increased activities among temporary employment agencies and foreign service companies in Iceland. These firms and their employees have grown significantly in number since last year (Chart V-6). At the same time, new temporary work permits issued by the DoL for workers outside EFTA and the EEA are on the rise.

Chart V-6

Temporary employment agencies and foreign service firms and their employees at end-Q1



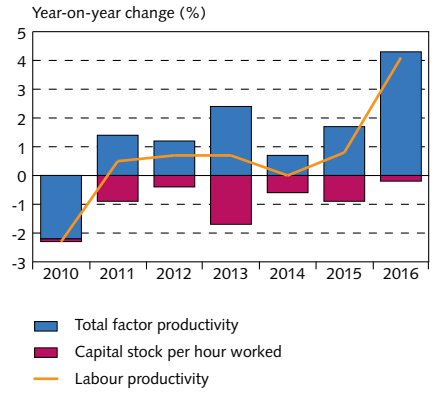
Source: Directorate of Labour.

Signs of underestimation of total hours worked in official statistics

Foreign labour is probably underestimated in official figures, and this underestimation has likely been exacerbated in the recent past. The LFS sample extends only to individuals in the national registry and therefore with a registered legal address in Iceland, but part of the foreign labour force is only temporarily in Iceland and thus not listed in the national registry. Foreign nationals therefore show up with a time lag – or not at all – in the LFS. Another factor indicating that the foreign labour force is underestimated is last year's surge in productivity growth. As Chart V-7 shows, productivity growth measured 4.1%, which is far above the level in previous years and well in excess of the long-term trend growth rate. This spike in productivity growth in 2016 appears to be due to a surge in total factor productivity, while the capital stock per hour worked is still contracting, as it has done continuously since the onset of the financial crisis.[2] Although it is likely that total factor productivity has increased with improved utilisation of production factors – for instance, those relating to the tourism industry – it is unlikely that growth was as strong and rapid as these estimates imply. It is more probable that growth in total hours worked is underestimated because of the steep increase in foreign workers who reside in Iceland temporarily and are therefore not included in official registers (see also Chapter I).[3]

Chart V-7

Labour productivity and its sub-components 2010-2016[1]

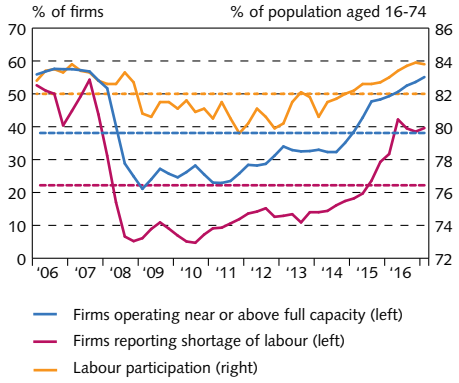


1. Labour productivity is given as GDP per total hours worked. Total factor productivity is given as the deviation of GDP from the output level obtained with full factor utilisation using the production function in the Bank's macroeconomic model.
Sources: Statistics Iceland, Central Bank of Iceland.

With reference to this, the baseline forecast assumes that the working-age population will rise somewhat faster than Statistics Iceland's population forecast implies.[4] The increase provided for in the baseline forecast is also larger than in the Bank's February forecast. In addition, the labour participation rate is also projected to rise. More rapid growth in the labour force increases the output capacity of the economy. Given the significant import of labour, increased labour participation, and reduced long-term unemployment, the equilibrium unemployment rate is estimated to be about ½ a percentage point lower in both 2016 and 2017 than was projected in February.

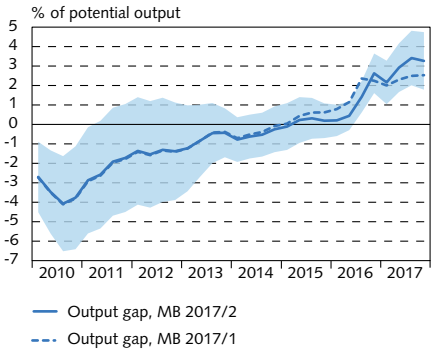
2. Total factor productivity is the portion of increased output over and above the increase in inputs of capital and labour. It is estimated as the deviation in GDP from the output level obtained with the Cobb-Douglas production function in the Bank's macroeconomic model: $A = Y/[N^{\beta} K^{1-\beta}]$, where A is total factor productivity, Y is GDP, N is total hours worked, K is the capital stock, and β (=0.6) is the share of labour in total factor income. The contribution of total factor productivity and the capital stock to labour productivity can then be calculated as: $Y/N = A(K/N)^{1-\beta}$, where Y/N is labour productivity and K/N is the capital stock per hour worked.
3. As is discussed in Chapter VI, the overestimation of productivity growth can also stem from an overestimation of 2016 GDP growth, which could in turn be due to an underestimation of the rise in the GDP price deflator in Statistics Iceland's preliminary figures.
4. For the aforementioned reasons, it is not a given that official figures will show such a large increase in population. Population growth is probably underestimated in historical data as well.

Chart V-8
Capacity utilisation and labour participation[1]
Q1/2006 - Q1/2017



1. Indicators of factor utilisation are from the Gallup Sentiment Survey conducted among Iceland's 400 largest companies, and indicators of labour participation are from Statistics Iceland's Labour Force Survey. All data seasonally adjusted. Broken lines show period averages.
Sources: Gallup, Statistics Iceland, Central Bank of Iceland.

Chart V-9
Output gap[1]
Q1/2010 - Q4/2017



1. Shaded area shows ± 1 five-year standard deviation. Central Bank baseline forecast 2017.
Sources: Statistics Iceland, Central Bank of Iceland.

Wider output gap in spite of increased capacity

A survey conducted among executives shows that firms are experiencing increased difficulty in responding to unexpected increases in demand. After adjusting for seasonality, the share of firms operating at or above full capacity is over 55%, only 2½ percentage points from the autumn 2006 peak (Chart V-8). A persistent shortage of labour and various indicators from the labour market also suggest a high rate of capacity utilisation. The output gap is therefore considered to have widened ever since it opened up in early 2015, in tandem with strong GDP growth (see also Chapter IV). On the other hand, it is assumed that total hours worked will rise more quickly because of an expanded labour force and a higher participation rate and that the equilibrium unemployment rate will fall further than previously projected. Even though it is assumed that potential output is growing more rapidly than was forecast in February, the outlook is also for a wider output gap than was projected then, or about 3.3% of potential output, some 0.7 percentage points more than was provided for in the February forecast (Chart V-9). As is discussed in Chapter I, this projection is subject to considerable uncertainty, as it is based to a degree on the interpretation of variables that are not directly observable.

VI Inflation

Inflation has been at or below the Central Bank's inflation target for over three years. It measured 1.8% in Q1/2017, which is 0.1 percentage points below what was assumed in the February forecast. As before, house prices are the main driver of inflation and, together with large wage increases, the chief manifestation of domestic inflationary pressures. These factors are offset by the steep appreciation of the króna, while trading partners' export prices have begun to rise again as the global economic recovery firms up. Indicators imply strong productivity growth in 2016 and 2017, which also offsets pay increases. Underlying inflation has eased somewhat in recent months and inflation expectations remain close to the target by most measures.

Recent developments in inflation

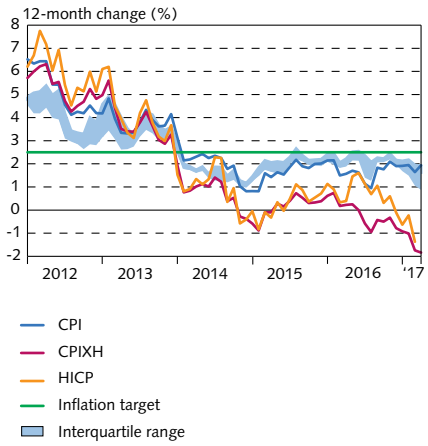
Inflation below target and unchanged since the last *Monetary Bulletin*

Inflation measured 1.8% in Q1, 0.1 percentage point below the forecast in the February *Monetary Bulletin*. It has remained broadly unchanged year-to-date, measuring 1.9% in the first two months of 2017 and falling to 1.6% in March. It rose back to 1.9% in April, after the consumer price index (CPI) rose by 0.5% month-on-month. The main driver of the April increase was rising house prices, as other components were broadly unchanged.

Inflation measures somewhat higher than in April 2016 but similar to the level seen in Q4/2016 (Chart VI-1). As is discussed in *Monetary Bulletin* 2016/4, inflation was underestimated in Statistics Iceland's figures for the period from March through August 2016, owing to an error in index calculation discovered in September. This error also means that twelve-month inflation will be overestimated for the same period in 2017, with the effects most pronounced in July and August, when inflation will be overestimated by 0.2-0.3 percentage points. The increase in excise taxes on items such as petrol, alcoholic beverages, and tobacco that took effect at the turn of the year will have a similar upward effect on measured inflation this year. As is discussed in Chapter I, planned changes to excise taxes at the start of 2018 and the changes in value-added tax planned for the next two years will also affect measured inflation (see also Chapter IV).

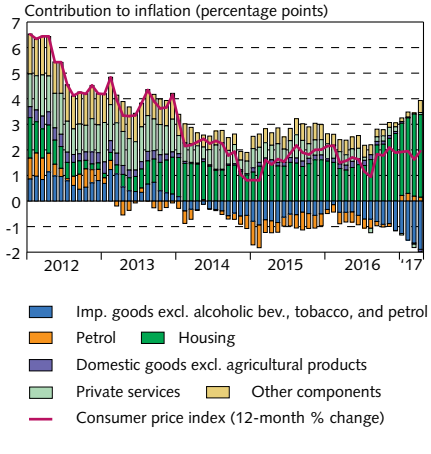
As before, inflation according to measures excluding housing costs was significantly lower than CPI inflation. The CPI excluding housing (CPIXH) fell by 1.8% year-on-year in April, and the difference between the CPI with and without the housing component is now more than six times the average since 2001. Inflation as measured by the Harmonised Index of Consumer Prices (HICP), which also excludes housing prices, was also considerably below CPI inflation. In March, the HICP fell by 1.4% year-on-year. The difference between inflation according to the CPIXH and the HICP was also unusually large for much of 2016, owing to differences in the weights assigned to expenditure items that weigh heavily in tourists' spending in Iceland (see Box 2).

Chart VI-1
Headline and underlying inflation[1]
January 2012 - April 2017



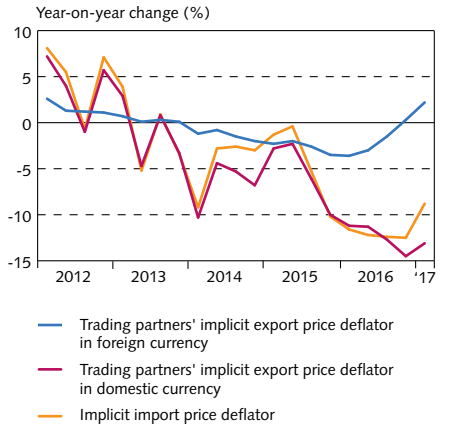
1. The shaded area includes the interquartile range of estimates of underlying inflation; core indices that exclude the effects of indirect taxes, volatile food items, petrol, public services and owner-equivalent rent and statistical measures such as the weighted median, the trimmed mean and a dynamic factor model.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart VI-2
Components of CPI inflation
January 2012 - April 2017



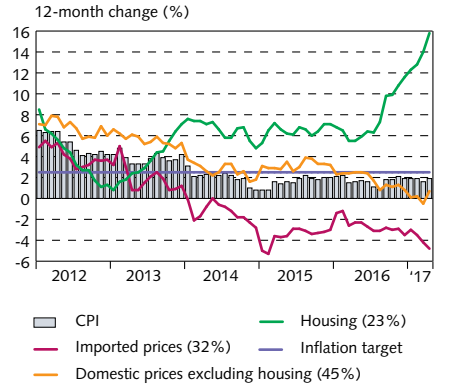
Source: Statistics Iceland.

Chart VI-3
Import prices and international export prices[1]
Q1/2012 - Q1/2017



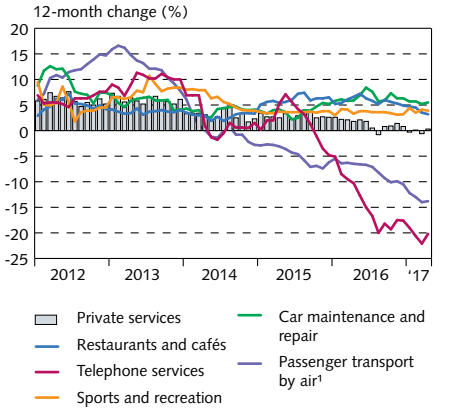
1. Central Bank baseline forecast Q1/2017.
Sources: Statistics Iceland, Macrobond, Central Bank of Iceland.

Chart VI-4
Imported and domestic inflation[1]
January 2012 - April 2017



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. Domestic inflation is estimated using the price of domestic goods and the price of private and public services. The figures in parentheses show the current weight of these items in the CPI.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart VI-5
Private services and selected subcomponents of the CPI
January 2012 - April 2017



1. Twelve-month moving average.
Source: Statistics Iceland.

Underlying inflation and other indications of inflationary pressures

Domestic inflationary pressures most clearly manifested in rising house prices ...

Underlying twelve-month inflation as measured by core index 3 excluding indirect tax effects (which also excludes the effects of volatile food items, petrol, public services, and real mortgage interest expense) measured 2% in April and had increased by 0.3 percentage points since the February *Monetary Bulletin*. Statistical measures suggest, however, that underlying inflation has fallen: most of them indicate that it lay in the 1-2% range in April, as opposed to 1½-2% in February (Chart VI-1).

In the recent term, rising house prices have been the main driver of domestic inflation (Chart VI-2). House prices rose by a fifth year-on-year in April, and their contribution to twelve-month inflation has increased markedly in the past year. As is discussed in Chapter III, house prices have hitherto risen broadly in line with the rise in wages and disposable income; however, in recent months they have risen more than can be explained by these factors (see also Chapter I).

... but are offset by higher króna

One reason that inflation has remained at or below target since the beginning of 2014 is the protracted decline in domestic prices of imported goods, which stems from low global inflation and the appreciation of the króna. Inflation in Iceland's main trading partner countries has picked up, pushing up their export prices. Trading partners' export prices are estimated to have risen by 2.2% year-on-year in Q1/2017, whereas they have fallen by an average of 2% per year over the past three years (Chart VI-3). The steep appreciation of the króna is therefore the main reason for the slightly less than 10% decline in local currency import prices in Q1/2017. If the forecasted appreciation of the króna materialises (see Chapter I), it is likely that import prices in króna terms will most likely continue to counter inflationary pressures stemming from the real estate and labour markets for some time.

At the same time as local currency import prices have been falling, the rise in domestic prices excluding housing has lost pace (Chart VI-4), measuring 0.7% in April, as opposed to 2.5% a year earlier. The main cause of this turnaround is the private services component, which rose by only 0.3% year-on-year in April. In comparison with previous years, the contribution of private services to twelve-month inflation has been very small. This is due mainly to a sizeable decline in two service-related CPI components: telephone services and international airfares (Chart VI-5). These items have fallen on average by about 15% in the past twelve months, reflecting rapid advances in internet technology, on the one hand, and falling oil prices, more cost-effective aircraft, and increased competition in international airfares to and from Iceland, on the other. The price of other labour-intensive products included in service-related components of the CPI, such as maintenance services, has risen markedly. The contribution of private services to twelve-month inflation would therefore be much greater, and more in line with the sizeable wage increases in the recent term,

if telephone services prices and international airfares had not fallen (Chart VI-6).

Domestic inflation is modest ...

According to Gallup's spring survey among Iceland's 400 largest firms, one-third of companies – somewhat below the historical average – consider it necessary to raise their output prices in the next six months (Chart VI-7). A similar share of firms expect their input prices to rise. Presumably, these responses are affected by the recent appreciation of the króna, but firms that rely heavily on imports stand out from the others (for example, executives at about 40% of companies in retail and wholesale trade expect to lower their prices in the next six months). Furthermore, increased competition from foreign online merchants and international retail giants entering the domestic market could also be a factor.

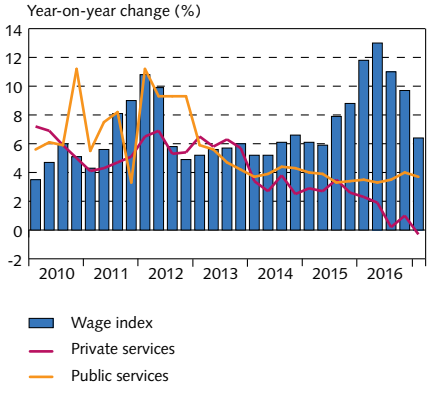
Other indicators also imply that domestic inflation is relatively moderate (Chart VI-8). They are also affected by the appreciation of the króna and low global inflation, however, as imported intermediate goods are important for the production of many domestic goods and services. Producer prices of goods sold domestically have declined markedly year-on-year, for instance, owing largely to favourable exchange rate movements. In addition, the GDP price deflator rose by only 1.3% year-on-year in Q4/2016 and by 2% over the year as a whole, even though wages and related expenses rose by 9½% between years (see below).[1]

... in spite of large pay rises in the recent term

Statistics Iceland has revised its 2015 figures on wages and related expenses upwards and now estimates that wages per hour rose by 6.5% instead of the previous 5.5%. Nevertheless, this is less than the 7.2% increase in the wage index over the same period and a similar rise provided for in the Bank's baseline forecast. It is also below the estimated increase according to pay-as-you-earn (PAYE) data.[2]

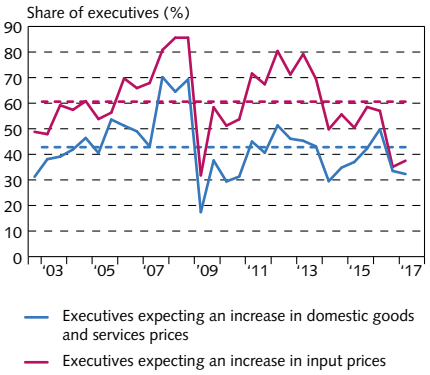
In March, Statistics Iceland published its first estimate of year-2016 increases in wages and related expenses. According to the estimate, wages per hour rose by 9.4% during the year, which is broadly in line with the 9.9% forecast in the February *Monetary Bulletin*. Although the increase is less than the year-on-year rise in the wage index, it is well in line with indications from PAYE data; therefore, the Bank's previous estimate of 2016 pay rises has been revised to 9.4%. According to the baseline forecast, the wage share therefore rose by 0.4 percentage points in 2015 and by an additional 1.6 percentage

Chart VI-6
Wages and services prices
Q1/2010 - Q1/2017



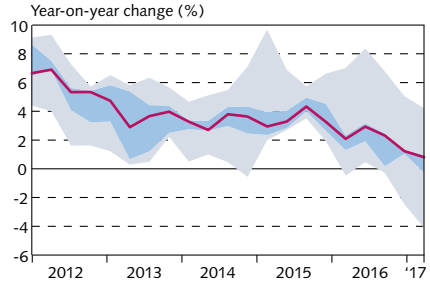
Source: Statistics Iceland.

Chart VI-7
Corporate expectations of input and product prices 6 months ahead 2002-2017[1]



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

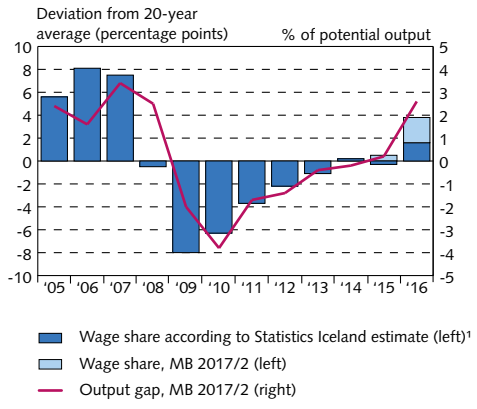
Chart VI-8
Domestic inflationary pressures[1]
Q1/2012 - Q1/2017



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 Q1/2017 for the GDP price deflator and 2015-2017 for unit labour costs.
Sources: Statistics Iceland, Central Bank of Iceland.

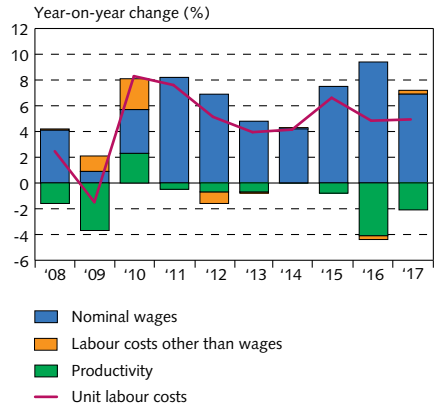
1. This large difference between developments in the GDP price deflator and wage costs could indicate that the price deflator has been underestimated and that year-2016 GDP was overestimated in Statistics Iceland's preliminary figures. This could also explain in part the strong productivity growth shown in Statistics Iceland's figures for 2016 (see below and Chapter V).
2. As is discussed in Box 2 in *Monetary Bulletin* 2016/2, there are several reasons not to rely solely on Statistics Iceland's figures concerning wage developments in 2015 according to the national accounts until final information is available. The preliminary figures show somewhat smaller pay increases than the wage index and PAYE data imply. Furthermore, Statistics Iceland data suggest that the wage share declined in 2015, which seems somewhat unlikely in view of the sizeable pay rises negotiated during the year.

Chart VI-9
Wage share and output gap 2005-2016



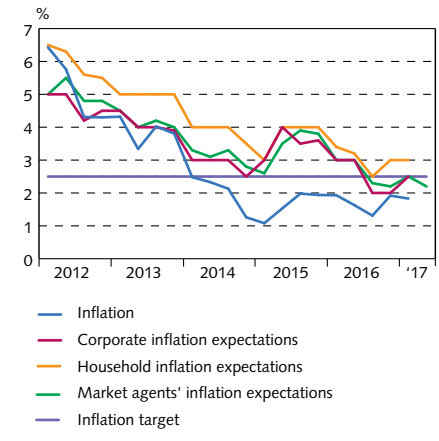
1. Wages and related expenses as a share of gross factor income. The 20-year average is 60.8% (1995-2014, base 1997).
Sources: Statistics Iceland, Central Bank of Iceland.

Chart VI-10
Unit labour costs and contribution of underlying components 2008-2017[1]



1. Labour productivity growth is shown as a negative contribution to an increase in unit labour costs. Central Bank baseline forecast 2015-2017.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart VI-11
Inflation and inflation expectations one year ahead
Q1/2012 - Q2/2017



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

points in 2016, to about 2 percentage points above its historical average (Chart VI-9).

Upcoming wage settlements assumed to be compatible with the SALEK agreement ...

The pay increases provided for in the most recent wage agreements have shown in the Statistics Iceland wage index, in line with last forecast's assumptions, but wage drift has been marginally stronger than projected. The wage index rose by 0.8% quarter-on-quarter in Q1/2017. It rose by 6.4% from the same quarter in 2016, and the twelve-month increase in wages has slowed considerably compared to the past year, as the effects of two private sector wage increases dropped out of the twelve-month index figures in February. The pace will quicken again, however, later in the spring, when the next contractual pay rises take effect.

Because no further pay increases were negotiated in connection with the wage settlement review in February, no changes have been made to projections concerning wage developments this year and through the forecast horizon. As before, it is assumed that agreements made this year will be accommodated within the scope provided for under the SALEK agreement and will not trigger a review of private sector wage settlements in 2018.

... but unit labour costs are expected to rise more than is consistent with the inflation target

Even though the assessment of wage developments in 2017 is unchanged, the year-on-year rise in wages will be about 1 percentage point more than was assumed in February, owing to base effects from the aforementioned review of last year's increases. On the other hand, it is assumed that labour productivity will increase by just above 2% this year, similar to what was forecast in February. This robust productivity growth comes on the heels of more than 4% growth in 2016, which was about 1 percentage point above the February forecast. As is mentioned above and in Chapter V, there is reason to believe that productivity growth has been overestimated but based on these figures, unit labour costs rose by 4.9% in 2016 instead of the 6.5% assumed in February (Chart VI-10). A similar increase is expected this year and on average over the forecast horizon. If this materialises, strong inflationary pressures from the labour market will remain, and the wage share will continue to rise, to about 7 percentage points above its long-term average by 2019.

Inflation expectations

Short-term inflation expectations at target by most measures ...

One- and two-year inflation expectations are more or less unchanged since the last *Monetary Bulletin* and are low in historical context (Chart V-11). Households' one-year expectations measured 3% in the Gallup survey conducted in February and were unchanged from the December survey. Their two-year expectations were likewise unchanged, at 3.5%. Corporate executives expect inflation to measure 2.5% in one year, an increase of ½ a percentage point from the December survey.

Their two-year inflation expectations are unchanged, however, at 3%.

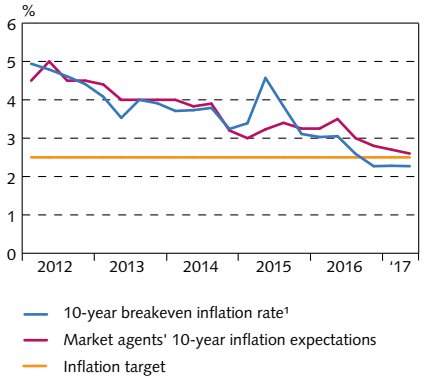
According to the survey carried out by the Central Bank in early May, market agents expect inflation to measure 2.2% in one year, which is a decline of 0.3 percentage points since the February survey. Their two-year inflation expectations measure 2.6%, down from 2.8% in February. The short-term breakeven inflation rate in the bond market, calculated in terms of the spread between interest on indexed and non-indexed bonds, declined markedly after the publication of the CPI in March. That decline later partly reversed with the publication of the CPI in April, when the breakeven rate rose by more than 0.2 percentage points. The average one-year breakeven rate was 1.7% in Q2 to date and had declined by 0.2 since the beginning of the year.[3]

… and long-term inflation expectations appear more firmly anchored

Market agents' long-term inflation expectations have fallen significantly in the recent past and are now at target. According to the Bank's May survey, market agents expect inflation to average 2.6% over the next ten years, a decline of almost 1 percentage point from a comparable survey conducted a year earlier (Chart VI-12). The breakeven inflation rate in the bond market has also fallen in the recent past, with the ten-year breakeven rate down to 2.3% thus far in Q2.

It appears, then, that inflation expectations are more firmly anchored to the target than they have been for some time. As is discussed in Box 3, it also appears that unexpected changes in short-term inflation have less impact on long-term inflation expectations than they used to. The inflation process itself seems to have changed as well, owing to smaller deviations from target, reduced volatility, and diminishing uncertainty about future inflation.

Chart VI-12
Long-term inflation expectations
Q1/2012 - Q2/2017



1. The value for Q2/2017 is the Q2 average to date.
Source: Central Bank of Iceland.

3. Breakeven rates should be interpreted with caution, however, as they also include a liquidity risk premium and an inflation risk premium. See Box 1 in *Monetary Bulletin* 2015/2.

Box 1

The current account balance and national saving

Iceland had a large current account deficit before the 2008 financial crisis, and national saving was at a historical low. The situation reversed during the aftermath of the crisis, and since 2009 there has been a large underlying current account surplus, about 6% of GDP, on average. Not only is this a major turnaround from the immediate prelude to the crisis; it is also unusual in the context of Iceland's longer economic history. The large current account surplus is based on a surge in national saving, which rose to a rarely seen high in 2016. The high level of saving and the current account surplus enhance the economy's ability to withstand unexpected economic shocks. If national saving has increased permanently, this should also contribute to a reduction in long-term real interest rates, other things being equal. This Box discusses developments in national saving in Iceland and its relationship to the current account surplus in recent years.

Current account, financial account and national saving

The current account balance shows the difference between the value of goods and services produced in Iceland and exported to other countries and the value of goods and services imported to Iceland. In addition, it shows residents' income from wages, interest, and dividends paid by foreign entities, as well as residents' expenses from these same items. The current account balance can also be thought of as the difference between domestic investment and saving.[1] A current account deficit reflects more domestic investment than domestic saving can support; therefore, the remaining investment must be financed with inflows of saving from other countries. When there is a surplus, the opposite applies: domestic saving is greater than is needed to support domestic investment, and a portion of the saving is used to invest abroad; for instance, to purchase foreign assets or pay down foreign debt. How this excess saving is disposed of can be seen in the financial account balance, which shows changes in the balance of various asset and debt classes in the country's balance sheet.

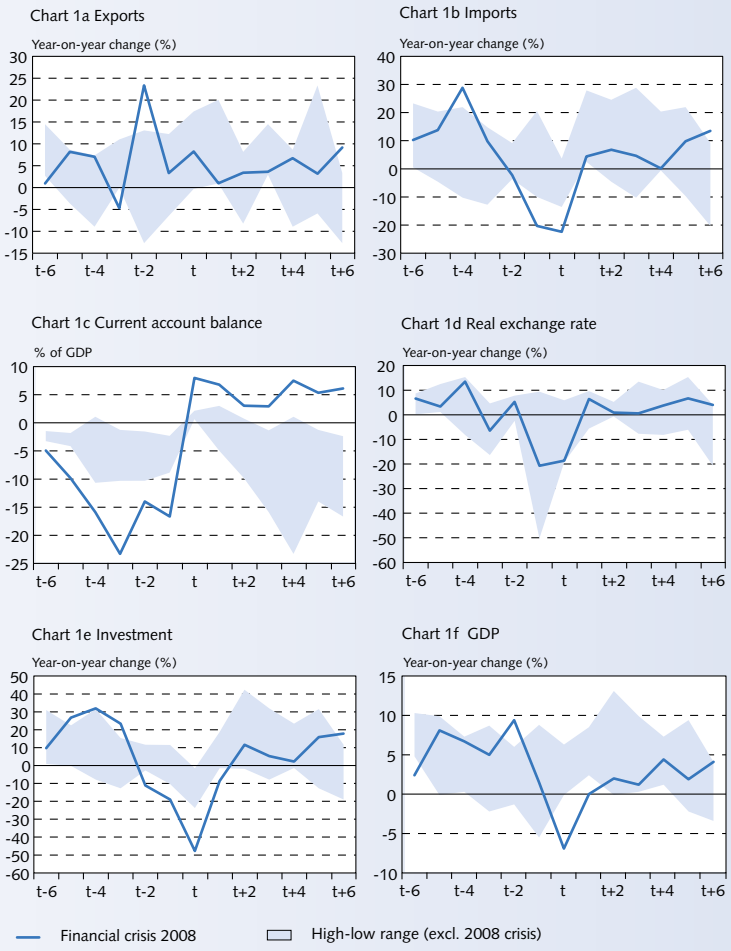
The current account surplus has never been as large over such a long period as it has since 2009

The post-crisis turnaround in the Icelandic economy can be seen in Chart 1, which shows developments in various macroeconomic variables before and after the crisis struck in 2008, in comparison with six periods after 1960 when Iceland has had a current account surplus. When it became impossible to finance a large current account deficit, a steep drop in the real exchange rate resulted, with a corresponding contraction in imports. As the chart indicates, the current account balance went from a deficit of 16.7% of GDP in 2008 to an 8% surplus in 2009 (based on the underlying balance in 2008-2015).[2] This turnaround in the current account balance is much more pronounced than has previously occurred in Iceland. There has been a continuous surplus on the current account since 2009, and the outlook is for a large surplus again in 2017, for the ninth year in a row. The surplus has ranged between 3% and 8% of

1. According to the national account identity (all variables at current prices), $Y = C + G + I + X - M$, where Y is gross domestic product, C is private consumption, G is public consumption, I investment, X is exports, and M is imports. Gross national income is defined as $GNI = Y + PI$, where PI is primary income. Gross domestic saving is defined as the difference between GNI and consumption (private and public) $S = GNI - C - G = I + X - M + PI = I + CA$, where $CA = X - M + PI$ is the current account balance.
2. The underlying current account balance excludes both the effects of the failed financial institutions in 2008-2015 and the effects of pharmaceuticals company Actavis in 2009-2012 on the primary income balance. Adjustments have also been made for the failed financial institutions' financial intermediation services indirectly measured (FISIM).

Chart 1

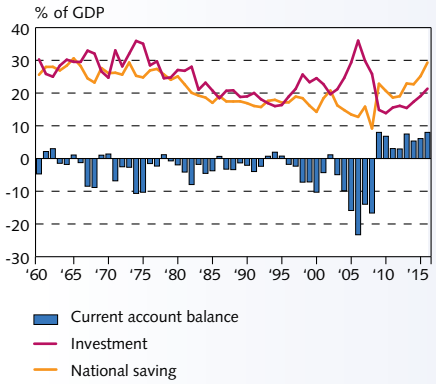
Selected macroeconomic variables in the 2008 financial crisis and comparison with other current account surplus periods[1]



1. Underlying current account balance 2008-2015. Year t is the first year of the current account surplus. There have been seven current account surplus periods since 1960, beginning in: 1961, 1969, 1978, 1986, 1993, 2002 and 2009.
Sources: National Economics Institute, Statistics Iceland, Central Bank of Iceland.

Chart 2

Current account balance, investment, and national saving 1960-2016[1]



1. The underlying current account balance excludes both the effects of the failed financial institutions in 2008-2015 and the effects of pharmaceuticals company Actavis in 2009-2012 on the primary income balance. Adjustments have also been made for financial intermediation services indirectly measured (FISIM).
Sources: Statistics Iceland, Central Bank of Iceland.

GDP over this period, averaging 6% per year. In comparison, over the six comparison periods since 1960, the longest duration of a continuous current account surplus was a period of three years, in 1993-1995, and the previous single-year peak was 3%, in 1962 (Charts 1 and 2).

National saving in 2016 the second-highest ever recorded

During the pre-crisis upswing, increased investment went hand-in-hand with steadily declining national saving. Saving measured just under 21% of GDP in 2002 but had fallen to just above 9% of GDP by 2008 (Chart 2). At the same time, the domestic spending level was high, and investment peaked at 36% of GDP in 2006. Once the crisis struck, domestic households and businesses no longer had ready access to foreign credit to maintain this high level of spending. As a result, they had to reduce their spending. Gross national saving rose to nearly 23% of GDP in 2009 and has been close to that level, on average, since then. With the past few years' rising export revenues, saving has increased still further, measuring 29.3% of GDP in 2016, some 11 percentage points above the historical average. Only once has it exceeded this level – in 1965, when it measured 30.6% of GDP. Such a high level of saving has led to a sizeable current ac-

count surplus even though investment has grown in recent years, reaching its historical average of just over 21% of GDP in 2016.

Saving rate high in international context

Iceland's national saving rate has historically been relatively low compared with that in most other OECD countries (Chart 3). In other OECD countries, saving commonly ranges between 20% and 25% of GDP, although there are certainly lower rates as well, such as in the UK and the US, which have secure access to foreign credit markets as global financial centres. Developments in domestic saving in recent years have therefore brought Iceland closer to its OECD counterparts, and the past few years' increase in saving places Iceland among the advanced economies with the highest saving ratios.

Saving grew more in Iceland than elsewhere in the wake of the crisis

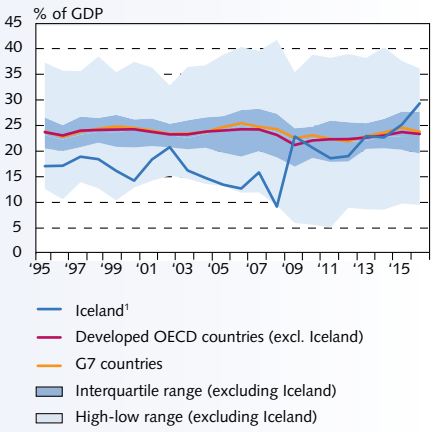
As is discussed above, the financial crisis catalysed a turnaround in domestic saving. As Chart 4 shows, the post-crisis change was much more pronounced in Iceland than it was, on average, in other countries.[3] The saving ratio has a general tendency to fall immediately after a financial crisis and then rise again, reaching its historical average about four years after the onset of the crisis. In Iceland, however, saving increased immediately after the crisis, as is mentioned above. The increase has also grown much larger and more rapid as time has passed. This reflects the 38% contraction in imports over a two-year period after the crisis – a reduction almost twice as large as the average in other countries. Although the turnaround in saving has been stronger in Iceland than the average in other countries, there are examples of similar developments in countries suffering severe financial crises, such as Russia and Indonesia during the 1990s. Ireland is the only country in the comparison group whose saving rate has risen more than Iceland's as time passes following the crisis, and both countries have seen a surge in exports in recent years.

Current account surplus used to pay down foreign debt and build up the foreign exchange reserves

As is stated above, a current account surplus reflects that national saving is in excess of domestic investment. The excess saving shows up as net outward financial flows from the financial account (Chart 5).[4] It can also be seen what type of foreign investments have been made and to what extent the surplus has been used to pay down foreign debt. As the chart shows, the past three years' current account surplus has shown up mainly as net portfolio investment outflows and the build-up of the Central Bank's foreign exchange reserves. To a large extent, these net portfolio investment outflows reflect the retirement of foreign debt, most of it securities debt owed by the failed financial institutions' estates following the composition agreements approved at the end of 2015. The debts were paid with the estates' foreign liquid assets, which shows up

Chart 3

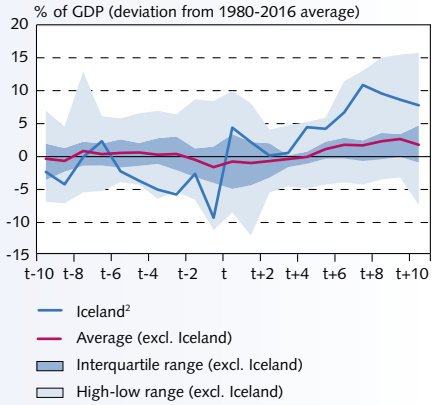
National saving in 33 OECD countries 1995-2016



1. Underlying national saving 2008-2015, based on the estimated underlying current account balance.
Sources: IMF, Statistics Iceland, Central Bank of Iceland.

Chart 4

Post-crisis national saving[1]

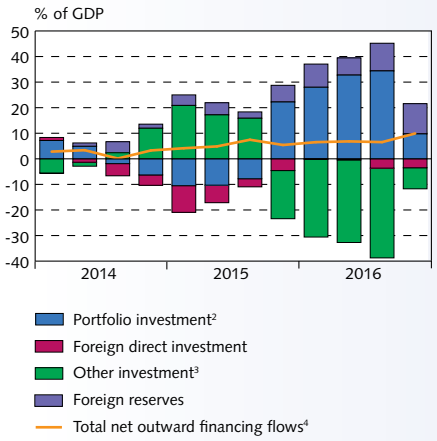


1. National saving as a percentage of GDP in the wake of a severe financial crisis (year t is the first calendar year after the onset of the crisis) in Iceland and 18 other countries. IMF and Central Bank of Iceland forecasts where applicable. 2. Underlying national saving in Iceland in 2008-2015, based on the estimated underlying current account balance.
Sources: IMF, Statistics Iceland, Central Bank of Iceland.

3. The chart illustrates developments in national saving in 19 countries during the aftermath of financial crises since 1970. See Laeven and Valencia (2012), "Systemic banking crises database: An update", International Monetary Fund, *Working Papers* WP/12/163, for a definition of countries that have suffered a systemic banking crisis. The 19 countries are (the first calendar year after the onset of the crisis is in parentheses): Argentina (2002), Brazil (1999), Ecuador (1999), Finland (1992), Iceland (2009), Indonesia (1998), Ireland (2009), Latvia (2009), Malaysia (1998), Mexico (1995), Philippines (1998), Russia (1999), South Korea (1998), Sweden (1992), Thailand (1998), Turkey (2001), United Kingdom (2009), United States (2009), and Uruguay (2003).

4. The text that follows discusses only the unadjusted current account balance, as data on the financial account balance adjusted for the effects of the failed financial institutions are not available.

Chart 5
Net outward financing flows[1]



1. The change in Iceland's foreign liabilities, less the change in Iceland's foreign assets due to net transactions, for each category of investment. Four-quarter moving average. 2. Net portfolio investment and derivatives. 3. Other investment consists mostly of cash and deposits, as well as loans. 4. The total net outward financing flow is equal in magnitude to the current account surplus (not adjusted for failed financial institutions and Actavis), capital account and net errors and omissions.
Sources: Statistics Iceland, Central Bank of Iceland.

as net inflows of other investments in addition to inflows relating to deposit money banks' foreign borrowing. The chart shows as well that outflows relating to foreign deleveraging and expansion of the foreign reserves have been offset by net foreign direct investment (FDI) inflows. Prominent among these are sales of the failed financial institutions' foreign assets, although there have also been inflows relating to the auctions held in connection with the Central Bank's Investment Programme.

These net capital outflows in connection with the current account surplus, together with the settlement of the failed financial institutions' estates and their stability contributions, have caused Iceland's net international investment position (NIIP) to go from being negative in the amount 122% of GDP at the end of 2009 to being positive by 1% at year-end 2016. This is the first time since measurements began that Iceland has had a positive NIIP (see Box 4 in *Monetary Bulletin* 2016/2).

Box 2

The surge in tourism and its divergent effects on various measures of inflation

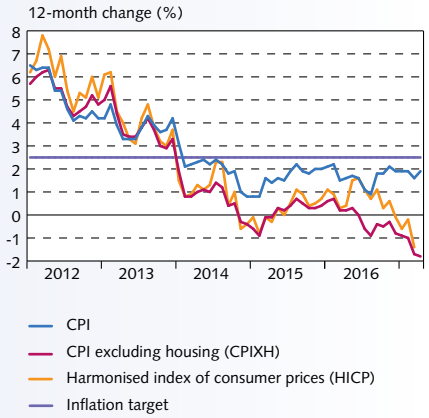
Inflation can be measured in a number of ways. The Central Bank's inflation target is based on the consumer price index (CPI), but there are other inflation measures in use in Iceland, including the CPI excluding housing (CPIXH) and the Harmonised Index of Consumer Prices (HICP). The difference from one index to another lies in which goods and services are included in the consumption basket on which price measurements are based and how they are weighted in the basket.

As Chart 1 indicates, these measures have given divergent inflation figures in the recent past. The greatest difference is that the basket on which the CPI is based includes expenses related to owner-occupied housing, among them imputed rent, which measures the cost of living in one's own home as if it were a rented property. Changes in the market value of housing affect the index through this component. Both the CPIXH and the HICP measure inflation without house prices, however.[1] These two measures usually track one another quite well, but in spring 2016, they began to diverge. The difference was greatest during the summer, at nearly 2 percentage points, and then began to narrow again in the autumn. This Box focuses on the reasons for the divergence in these two measures of inflation in the past year.

Chart 1

Various measures of inflation

January 2012 - April 2017



Sources: Statistics Iceland, Central Bank of Iceland.

Wherein lies the difference?

In order to measure developments in prices, Statistics Iceland gathers information on the price of thousands of products each month. All three price indices are calculated from the same price measurements but using different weights (Statistics Iceland, 2013). The expenditure weights for the CPI (with and without housing) are determined by Statistics Iceland's expenditure study. The weights for the HICP are also based on Statistics Iceland's expenditure study but are adjusted with reference to information from national accounts and value-added tax returns so that they will cover all consumption spending in Iceland, not just that of Icelandic households. The composition of foreign tourists' consumption spending in Iceland therefore affects the expenditure weights of the HICP but not the CPI and the CPIXH. The aim of this method of measuring the price level is to facilitate comparison between countries by measuring inflation in European Economic Area (EEA) member states in a consistent manner, using the method devised by the EU statistical bureau, Eurostat (see, for example, European Central Bank, 2017).

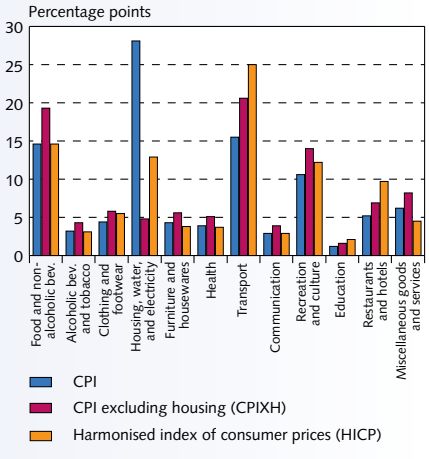
The travel and transport component is the largest single subcomponent in the HICP, with a weight of about one-fourth (Chart 2). Its weight in the CPIXH is less, however, at 20%. The composition of the subcomponent also differs considerably. Air transport carries a weight of 2% in the CPIXH, as opposed to 6% in the HICP. Because airfares are a relatively large spending item for tourists visiting Iceland, they carry more weight in the HICP. For the same reason, there is a significant difference in the weight of the hotel and restaurant subcomponent, which carries a weight of 7% in the CPIXH but a 10% weight in the HICP. Of that amount, the weight of accommodation, including the services of hotels and guesthouses, is almost ten times more in the HICP than in the CPIXH.

The indices also differ in the treatment of various items relating to housing costs. Because the CPIXH is intended to measure developments in prices excluding the impact of housing, only the electricity and heat subcomponent is included in it. The HICP, however, is intended to measure developments in the general price

Chart 2

Comparison of weights in the CPI and HICP

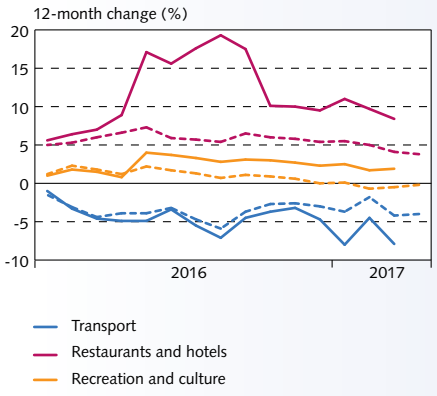
The year 2016



Sources: Statistics Iceland, Central Bank of Iceland.

1. The difference between the CPI on one hand and the CPIXH and HICP on the other hand was discussed in Box 2 in *Monetary Bulletin* 2016/4.

Chart 3
Subcomponents of the CPIXH and the HICP[1]
January 2016 - April 2017



1. Solid lines represent components of the HICP, and broken lines represent components of the CPIXH.
Source: Statistics Iceland.

level and therefore includes items such as paid rent and home maintenance, which are omitted from the CPIXH.[2]

Recent developments

This difference in the handling of expenditures relating to housing can cause inflation to differ according to which index – CPIXH or HICP – is under consideration. But this is not the main reason for the recent divergence in the two measures, as the difference between the housing component of the two indices has been narrowing in the past year.

The main reason for divergent developments in inflation in 2016 lies rather in the steep rise in accommodation prices during the peak tourist season. Since the beginning of 2016, the twelve-month increase in the hotel and restaurant subcomponent has been about 5-7% in the CPIXH, while in the HICP it peaked at nearly 20% last August (Chart 3). The difference stems from the surge in accommodation prices, which carry more weight in the HICP, as is mentioned above. Since May 2016, accommodation has contributed an average of 1 percentage point more to twelve-month inflation as measured by the HICP than to inflation in terms of the CPIXH. In addition, the price of domestic package tours has risen markedly, which explains why the recreation and culture subcomponent rose more in the HICP. Offsetting this, however, the decline in airfares weighs heavier in the HICP than in the CPIXH.

References

Statistics Iceland (2013). Metadata: Harmonised Index of Consumer Prices (HICP). *Statistics Iceland*.

European Central Bank (2017). Measuring inflation – the Harmonised Index of Consumer Prices (HICP). European Central Bank website.

2. Because of a lack of data for the calculation of imputed rent in several EU countries, this item is omitted from the calculation of the HICP so as to facilitate comparison across countries. Work is underway to correct this, with the aim that in the future the HICP will measure the cost of owner-occupied housing through the imputed rent component.

Box 3

Lower and more stable inflation and firmer anchor for inflation expectations

Inflation measured 1.9% in April and has been at or below the Central Bank's inflation target for more than three years running. This is a lower inflation rate than Iceland has seen for quite some time, and there are signs that this increased success in controlling inflation is gradually yielding a firmer anchor for inflation expectations at the target. Deviations of inflation from target have diminished, fluctuations in inflation and inflation expectations have grown smaller, and uncertainty about future inflation has been reduced. Furthermore, short-term inflation surprises have less impact on long-term inflation expectations than before, and the effects of supply shocks on inflation appear less persistent. And finally, there are signs that the relationship between inflation and the macroeconomic variables generally considered to determine it have changed and that recent developments in inflation have been more consistent with the Bank's official 2.5% target.

These findings indicate that monetary policy has been increasingly successful in recent years and, together with favourable external conditions, contributed to lower, more stable inflation and more firmly anchored inflation expectations than Iceland has experienced for quite some time. However, the large pay increases provided for in recent wage settlements indicate that it would be premature to declare victory in the fight against inflation.

Why does a firm anchor for inflation expectations matter?

Inflation expectations are a key determinant of inflation, in part through their impact on firms' pricing decisions and employees' wage demands. For example, workers are likelier to demand large pay increases when they expect high inflation. By the same token, firms are likelier to agree to such demands if they also expect high inflation, which will make it easier for them to pass these pay increases through to prices. Therefore, in order for it to be possible to hold inflation at target for a sustained period, it is necessary that private sector inflation expectations be consistent with the target as well.

In fact, the anchoring of inflation expectations at target reflects monetary policy's main contribution to economic stability. If inflation expectations are stable at target, real interest rates will be less volatile. This stabilises demand, employment, and GDP growth. Smaller fluctuations in inflation expectations and real interest rates also reduce exchange rate volatility, other things being equal.

A firmer anchor for inflation expectations also gives the Central Bank greater scope to look through temporary fluctuations in inflation, thereby supporting the real economy more effectively. This is because, under such conditions, the Bank has less reason to fear that a short-term increase in relative prices – such as oil prices – will affect inflation expectations and thereby have a sustained effect on inflation. The scope for monetary policy to mitigate economic fluctuations will therefore be greater than it would be otherwise. A good example of this is when a deterioration in terms of trade leads to a currency depreciation and a contraction in output. If inflation expectations are firmly anchored, the Central Bank can lower interest rates so as to provide a cushion during the downturn, even though inflation rises temporarily as a result of a lower exchange rate. If expectations lack such an anchor, there will be less scope to lower interest rates because of the risk that a temporary drop in the exchange rate will have a lasting impact on inflation expectations, which will result in higher and more persistent inflation.

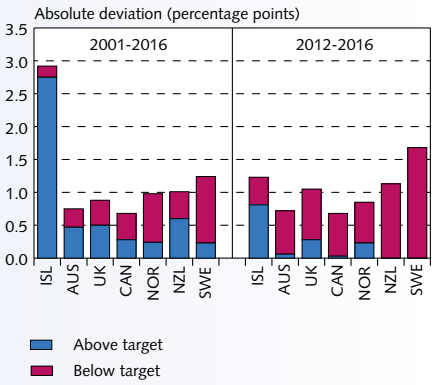
Deviations from target have diminished …

In recent years, inflation has fallen significantly from the level prevailing during the pre-crisis upswing and the immediate aftermath

Chart 1

Average deviation from the inflation target[1]

Q1/2001 - Q4/2016



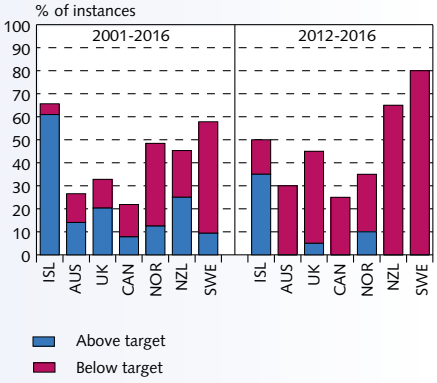
1. Average absolute deviation from inflation target (based on the inflation target measure used by each country) and relative contribution of above- and below-target deviations.

Sources: Central bank websites, OECD, Central Bank of Iceland.

Chart 2

Deviation of more than 1 percentage point from target[1]

Q1/2001 - Q4/2016



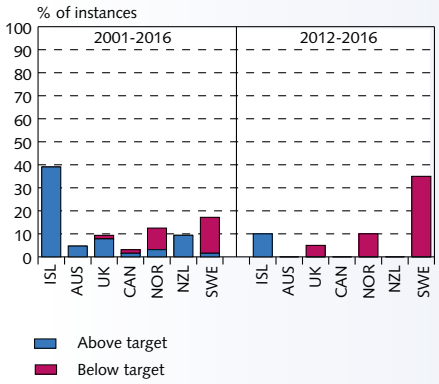
1. Frequency of deviations of more than 1 percentage point from inflation target (based on the inflation target measure used by each country) and relative contribution of above- and below-target deviations.

Sources: Central bank websites, OECD, Central Bank of Iceland.

Chart 3

Deviation of more than 2 percentage points from target[1]

Q1/2001 – Q4/2016

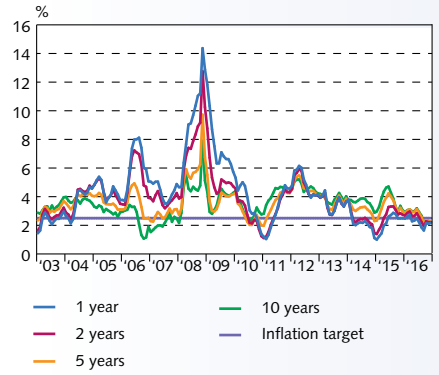


1. Frequency of deviations of more than 2 percentage points from inflation target (based on the inflation target measure used by each country) and relative contribution of above- and below-target deviations.
Sources: Central bank websites, OECD, Central Bank of Iceland.

Chart 4

Breakeven inflation rate in the bond market[1]

January 2003 - December 2016

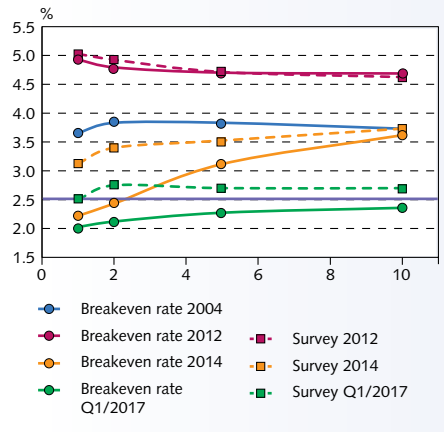


1. One-, two-, five-, and ten-year breakeven inflation rate estimated from the interest rate spread between indexed and non-indexed bonds. Monthly averages.
Source: Central Bank of Iceland.

Chart 5

One- to ten-year inflation expectations[1]

Period averages



1. Inflation expectations 1, 2, 5, and 10 years ahead, estimated from the breakeven inflation rate in the bond market and market survey responses. Period averages.
Source: Central Bank of Iceland.

of the crisis, when the effects of the collapse of the króna could still be felt. For example, inflation averaged 2.9% per year over the past five years (2012-2016), as opposed to 5.1% over the period beginning in 2001, when the monetary policy framework was changed and the 2.5% inflation target formally adopted. For the period until 2008 – i.e., excluding the high-inflation period following the crisis – it was slightly lower, averaging 4.7% per year in 2001-2007.

Therefore, inflation has been markedly above the Bank's target, on average, ever since 2001. The deviation from target averaged about 3 percentage points, as can be seen in Chart 1, and is about three times that in other relatively small, developed inflation-targeting countries (Australia, the UK, Canada, Norway, New Zealand, and Sweden). In addition, the deviations in other countries are divided more or less equally between overshooting and undershooting, while they are dominated by above-target deviations in Iceland. As Chart 2 indicates, inflation has been more than 1 percentage point above target for more than 60% of the period since 2001, and such large target misses are much more common in Iceland than in the other countries. The difference is even greater in terms of deviations of more than 2 percentage points from target: in Iceland, inflation has been more than 2 points away from target in nearly 40% of the period, whereas such large deviations are extremely rare in the other countries (Chart 3).

The economy is subjected regularly to shocks that push inflation away from the target. Deviations from target are therefore normal. Because one of the roles of monetary policy is to stabilise the real economy insofar as is consistent with price stability, it is appropriate to allow a certain flexibility in bringing inflation back to target, as business cycle volatility could be exacerbated by attempts to bring it to target very quickly. On the other hand, large and frequent departures from the target tend to erode the credibility of monetary policy, unmoor inflation expectations, and exacerbate business cycle fluctuations. Charts 1-3 indicate, however, that deviations of inflation from the target in Iceland have diminished significantly in recent years. The average deviation has been reduced by more than half, and large deviations occur much less frequently than before. The frequency of undershooting has increased as well, although overshooting is still more frequent. In the past five years, deviations have been much closer to the pattern seen in other advanced inflation-targeting countries.

… and inflation expectations are better aligned with the target

Inflation expectations have declined alongside falling inflation. As Chart 4 indicates, short- and long-term inflation expectations have fluctuated widely since 2003 and, like inflation, have usually been above target.[1] While this is particularly the case for the post-crisis period, it also applies to the period during the run-up to the crisis, when the breakeven inflation rate averaged between 3% and 4%, depending on the length of the horizon. Breakeven inflation has declined in recent years, however, and is well in line with the inflation target for all horizons. This can be seen more clearly in Chart 5, which illustrates the breakeven inflation rate and market agents' inflation expectations for up to ten years over various periods. As the chart indicates, inflation expectations were usually well above

1. The chart shows the breakeven inflation rate in the bond market; i.e., the spread between interest rates on comparable indexed and non-indexed bonds. As is discussed in Box 1 in *Monetary Bulletin* 2015/2, the breakeven inflation rate also contains a time-varying inflation risk premium and a liquidity premium (a net premium between indexed and non-indexed bonds). Data for breakeven inflation rate are available from 2003 onwards; therefore, this is the only measure of inflation expectations that extends over a long enough period.

the target before the crisis and rose steeply afterwards. As time passed, however, they were brought down towards the target – short-term expectations first and then, more recently, long-term expectations.

Fluctuations in inflation and inflation expectations have diminished …

As inflation and inflation expectations have fallen, fluctuations in both have also diminished (Chart 6). Fluctuations in various measures of inflation are only a fourth as large as they were in 2001-2007, and fluctuations in short- and long-term inflation expectations have receded as well. Chart 7 shows, however, inflation remains more volatile in Iceland than in other advanced inflation-targeting countries, although the difference has narrowed markedly in recent years.

… and uncertainty about the inflation outlook has subsided

With a stronger anchor for inflation expectations and reduced volatility of inflation and inflation expectations, it appears that uncertainty about future inflation has abated as well. As can be seen in Chart 8, households', businesses', and market agents' assessment of the inflation outlook one year ahead grew more divergent during the first years after the adoption of the inflation target, even though inflation and inflation expectations grew less volatile. Uncertainty about the inflation outlook grew even further during the aftermath of the financial crisis and the associated spike in inflation, but dispersion of inflation expectations has diminished again in the past few years and is now broadly at the level seen in the early 2000s.

Long-term expectations more resistant to short-term fluctuations in inflation

If inflation expectations are securely anchored to the target, short-term fluctuations in inflation should not affect them, long-term expectations in particular. If the anchor is weak, however, there is the risk that surprise movements in inflation will affect expectations and give rise to stronger inflationary effects than would otherwise exist.

This can be determined by estimating the following empirical relationship using monthly data for two five-year periods (2003-2007 and 2012-2016):

$$\Delta\pi^e = \alpha + \beta(\pi - \pi^f) + \varepsilon$$

where π is the monthly change in the consumer price index, $\Delta\pi^e$ is the daily change in inflation expectations (the two-, five-, and ten-year breakeven inflation rate) following the publication of the index (from the end of the day before publication to the end of the publication day – the index is published at the beginning of the day), and ε is a residual. π^f is a measure of the forecasted monthly change in the consumer price index and is obtained with a simple forecasting model, where monthly changes are forecast using the monthly change of the previous month, the monthly change six months earlier, and seasonal dummies. $(\pi - \pi^f)$ is therefore a measure of short-term surprises in inflation, and β is an estimation of their impact on inflation expectations. As can be seen in Chart 9, unexpected short-term fluctuations in inflation significantly affected two- and five-year inflation expectations during the former period but not during the latter.

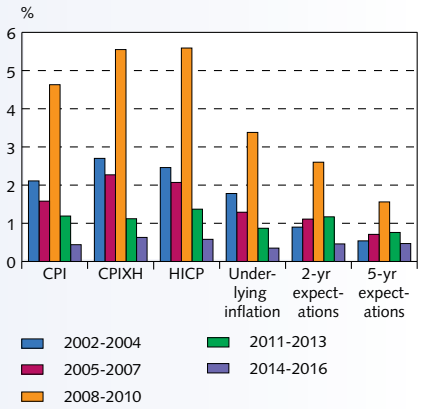
Fluctuations in inflation less persistent than before …

Lower and more stable inflation, a firmer anchor for inflation expectations, and reduced uncertainty about the inflation outlook also appear to have led to changes in the inflation process itself.

Chart 6

Fluctuations in inflation and inflation expectations[1]

Q1/2002 - Q4/2016

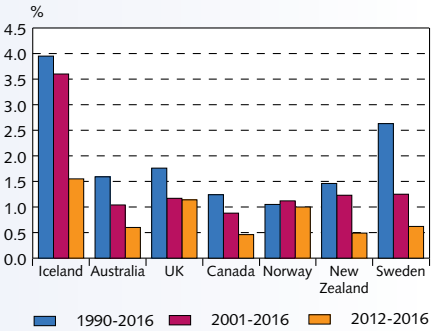


1. Standard deviation in various measures of inflation and inflation expectations for five periods of equal length. Underlying inflation is estimated from the median of five statistical measures (four trimmed means and a weighted median). The breakeven inflation rate in the bond market is used as a measure of two- and five-year inflation expectations (data only available from 2003 onwards).

Sources: Statistics Iceland, Central Bank of Iceland.

Chart 7

Fluctuations in inflation 1990-2016[1]



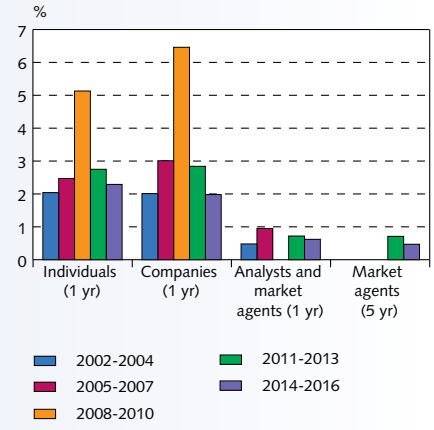
1. Standard deviation in year-on-year inflation based on quarterly averages of the CPI.

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

Chart 8

Dispersion of inflation expectations[1]

Q1/2002 - Q4/2016

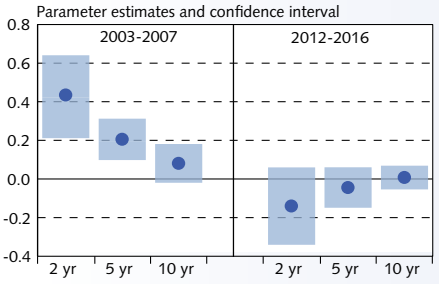


1. Standard deviation in surveys of inflation expectations for five periods of equal length (linear interpolation is used where measurements are missing). No surveys were carried out among analysts and market agents from mid-2008 until the beginning of 2012. From that time onwards, long-term inflation expectations have also been surveyed.

Sources: Gallup, Central Bank of Iceland.

Chart 9

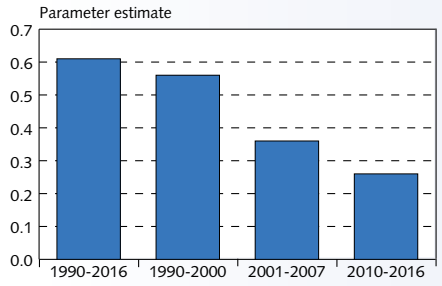
Effects of unexpected changes in inflation on inflation expectations[1]



1. The dots show a parameter estimation from a regression of changes in the two-, five-, and ten-year breakeven inflation rate on unexpected changes in the consumer price index (CPI) on index publication dates for two five-year (sixty-month) periods (2003-2007 and 2012-2016). Unexpected changes in the CPI are estimated as a deviation of monthly changes in the index from the forecasted value, using a forecast equation that contains seasonal dummies and one- and six-month lags in monthly changes in the index. The shaded area shows the two-standard-deviation range of the parameter estimates.
Source: Central Bank of Iceland.

Chart 10

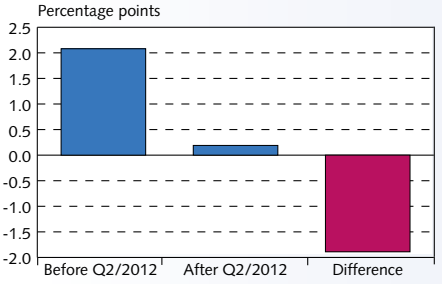
Inflation persistence[1]



1. Estimated using a second-order AR model for the seasonally adjusted quarterly changes in the CPI: $\pi_t = \alpha + \gamma_1 \pi_{t-1} + \gamma_2 \pi_{t-2} + \varepsilon_t$ where π_t is quarterly inflation during period t and ε_t is a residual. $P = \gamma_1 + \gamma_2$ gives an estimate of the level of persistence in inflation.
Source: Central Bank of Iceland.

Chart 11

Inflation bias according to Phillips curve[1]



1. The Phillips curve is of the form: $\pi_t = \alpha + \beta\pi_{t-1} + (1-\beta)\pi_t^e + \gamma g_{t-1} + \phi q_{t-1} + \varepsilon_t$, where π_t is year-on-year inflation in period t, π_t^e are 10-year inflation expectations, g_t is the output gap, q_t is the year-on-year change in importers' real exchange rate, and ε_t is a residual. The inflation bias is given as: $\pi - \pi^e = \alpha/(1-\beta)$.
Source: Central Bank of Iceland.

Indications of this can be obtained by estimating the amount of persistence in the inflation process. If inflation is very persistent, there is the risk that temporary supply shocks such as changes in oil prices will have a lasting impact on inflation, making it harder for monetary policy to control inflation. To measure the persistence of the inflation process, the following time series model is used for different sub-periods between 1990 and 2016:[2]

$$\pi_t = \alpha + \gamma_1 \pi_{t-1} + \cdots + \gamma_n \pi_{t-n} + \varepsilon_t$$

where π_t is quarterly inflation (the seasonally adjusted quarter-on-quarter change in the consumer price index) in period t, and ε_t is a residual. Inflation persistence is then estimated as $\rho = \gamma_1 + \cdots + \gamma_n$. As Chart 10 shows, inflation persistence has been diminishing in the past few years. The effects of supply shocks on inflation therefore appear to taper off more quickly than before, which in turn indicates a reduction in monetary authorities' tolerance of deviations in inflation from target. It also indicates that the Central Bank has had inflation under better control than before and that deviations from target call for less monetary response than was previously needed.

… and the relationship between inflation and its determinants appears to have changed

The last indication of changes in how inflation is determined and of improved management of inflation and inflation expectations can be found by estimating the Phillips curve (see, for instance, Box 5 in *Monetary Bulletin* 2015/2), which is a standard description of the determination of inflation, and to see whether there are signs of a structural break in the relationship between inflation and its determinants. Thus the following Phillips curve is estimated using quarterly data for the period 2003-2016:

$$\pi_t = \alpha + \beta\pi_{t-1} + (1 - \beta)\pi_t^e + \gamma g_{t-1} + \phi q_{t-1} + \varepsilon_t$$

where π_t is twelve-month inflation in period t, π^e is inflation expectations (using the ten-year breakeven inflation rate), g is the output gap, q_t is the twelve-month change in importers' real exchange rate, and ε_t is a residual. The steady-state solution of the Phillips curve – i.e., where inflation is at equilibrium, output equals potential, and the real exchange rate is constant – is then given as

$$\pi = \alpha / (1 - \beta) + \pi^e$$

and the "inflation bias" as $\pi - \pi^e$. If inflation expectations are anchored at the Bank's target, then it should be the case that $\pi - \pi^e = \alpha / (1 - \beta) = 0$.

In order to determine whether and when a possible structural break has taken place in the Phillips curve and whether it means that the inflation bias has grown smaller, the Quandt-Andrews test for structural breaks at an unknown date is used, which gives a clear indication of a structural break beginning in Q2/2012 and suggests that the break stems from a fall in (α), the constant in the Phillips curve. The empirical estimates suggest that the inflation bias was about 2 percentage points before 2012 and has disappeared since then (Chart 11).[3] Similar results can be obtained using a two-regime

2. Statistical tests indicated that a second-order autoregressive process suffices. Further discussion of methods for estimating inflation persistence can be found in Thórarinn G. Pétursson (2008), "How hard can it be? Inflation control around the world", Central Bank of Iceland, *Working Papers*, no. 40.

3. The hypothesis that the inflation bias is zero is strongly rejected by the data before 2012 (p-value = 0.00) but not for the years thereafter (p-value = 0.59). No indications were found of other changes in the Phillips curve; i.e., there is no evidence that the slope of the Phillips curve or the pass-through of exchange rate shocks has changed.

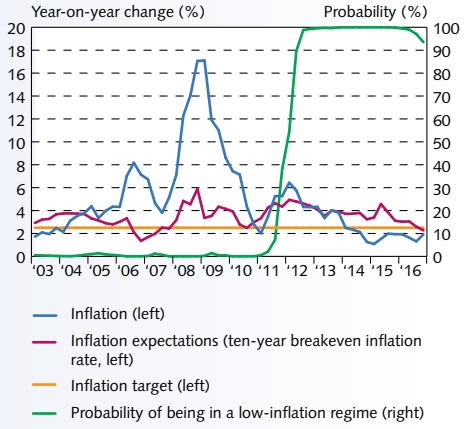
Markov switching model to estimate the Phillips curve. According to the model inflation is either in a high-inflation regime or a low-inflation regime. The results suggest a structural break around the same time, with the probability of being in the low-inflation regime above 50% from the start of 2012 and rising to 90% or more from Q2/2012 onwards (Chart 12).

The inflation bias that seemed for a long time to be built into the determination of inflation in Iceland has therefore grown smaller in recent years and now appears to have disappeared, suggesting that inflation expectations have finally aligned with the Bank's official 2.5% inflation target.

Chart 12

Probability of being in a low-inflation regime[1]

Q1/2003 – Q4/2016



1. Smoothed probability of being in a low-inflation regime based on the Phillips curve, estimated with a two-regime Markov switching model.

Sources: Statistics Iceland, Central Bank of Iceland.

Appendix 1

Forecast tables

Table 1 GDP and its main components[1]

	2015	*2016*	*2017*	*2018*	*2019*
Private consumption	4.3 (4.3)	6.9 (6.2)	6.7 (6.8)	5.8 (4.8)	3.6 (3.1)
Public consumption	1.0 (1.0)	1.5 (1.2)	1.6 (1.5)	1.6 (1.4)	1.6 (1.4)
Gross capital formation	17.8 (18.2)	22.7 (23.2)	8.6 (9.2)	0.8 (0.4)	2.4 (3.9)
Business investment	28.8 (29.4)	24.7 (28.6)	4.3 (6.5)	-4.0 (-4.5)	-2.0 (0.7)
Residential investment	-3.1 (-3.1)	33.7 (17.3)	24.5 (22.9)	18.0 (21.9)	12.8 (12.3)
Public investment	-3.0 (-2.9)	2.5 (4.0)	19.0 (14.2)	3.6 (3.0)	8.5 (8.9)
Domestic demand	5.9 (6.0)	8.7 (8.4)	5.9 (5.8)	3.5 (3.0)	2.9 (2.9)
Exports of goods and services	9.2 (9.2)	11.1 (10.2)	10.5 (6.2)	4.7 (3.4)	3.8 (2.6)
Imports of goods and services	13.5 (13.5)	14.7 (15.5)	10.2 (7.4)	5.0 (3.2)	5.0 (3.2)
Gross domestic product (GDP)	4.1 (4.1)	7.2 (6.0)	6.3 (5.3)	3.5 (3.1)	2.5 (2.6)
GDP at current prices (ISK billions)	2,214 (2,214)	2,422 (2,420)	2,608 (2,617)	2,746 (2,756)	2,890 (2,908)
GDP at current prices (growth rate)	10.4 (10.3)	9.4 (9.3)	7.7 (8.2)	5.3 (5.3)	5.2 (5.5)
Total investment (% of GDP)	18.9 (19.0)	21.2 (21.5)	21.1 (21.8)	20.1 (20.8)	20.0 (20.9)
Business investment (% of GDP)	13.5 (13.5)	15.2 (15.8)	14.1 (15.4)	12.6 (13.8)	11.8 (13.3)
Underlying gross national saving (% of GDP)[2]	25.2 (24.8)	29.3 (28.1)	27.6 (26.4)	26.2 (25.3)	25.4 (25.0)
Contribution of net trade to GDP growth (percentage points)	-1.5 (-1.5)	-0.8 (-1.7)	0.8 (-0.2)	0.2 (0.3)	-0.2 (-0.1)

1. Year-on-year change (%) unless otherwise specified (figures in parentheses are from the forecast in *Monetary Bulletin* 2017/1). 2. The sum of investment, inventory changes, and the underlying current account balance.

Sources: Statistics Iceland, Central Bank of Iceland.

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

	2015	*2016*	*2017*	*2018*	*2019*
Marines production for export	0.6 (0.6)	-2.0 (-2.8)	3.0 (-1.0)	1.0 (2.0)	2.0 (2.0)
Aluminium production for export[2]	5.3 (5.3)	-3.3 (-3.4)	5.7 (4.0)	1.0 (1.5)	1.5 (1.5)
Foreign currency prices of marine products	10.9 (10.9)	0.2 (1.0)	1.5 (1.0)	0.1 (0.0)	1.0 (1.0)
Aluminium prices in USD[3]	-6.4 (-6.4)	-13.7 (-15.0)	12.9 (3.2)	0.3 (2.0)	1.9 (2.5)
Fuel prices in USD[4]	-47.2 (-47.2)	-15.7 (-15.7)	22.0 (30.0)	4.0 (3.0)	0.0 (3.0)
Terms of trade for goods and services	6.7 (6.7)	2.4 (3.1)	1.0 (1.9)	0.1 (0.3)	-0.4 (-0.1)
Inflation in main trading partners[5]	0.6 (0.6)	1.0 (1.0)	2.0 (1.8)	1.9 (1.9)	1.9 (2.0)
GDP growth in main trading partners[5]	2.0 (2.0)	1.6 (1.6)	1.9 (1.7)	1.8 (1.8)	1.9 (1.9)
Main trading partners' imports[5]	3.4 (3.4)	2.4 (2.2)	3.8 (3.1)	3.8 (2.8)	3.4 (2.4)
Short-term interest rates in main trading partners (%)[6]	0.2 (0.2)	0.2 (0.1)	0.2 (0.2)	0.3 (0.3)	0.6 (0.6)

1. Year-on-year changes (%) unless otherwise specified (figures in parentheses are from the forecast in *Monetary Bulletin* 2017/1). 2. According to Statistics Iceland's external trade data. 3. Forecast based on aluminium futures and analysts' forecasts. 4. Forecast based on fuel futures and analysts' forecasts. 5. Forecast based on Consensus Forecasts, Global Insight, IMF and OECD. 6. OECD forecast for three-month money market rates in Iceland's main trading partner countries.

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

Table 3 Current account balance and its subcomponents[1]

	2015	*2016*	*2017*	*2018*	*2019*
Trade balance	7.5 (7.5)	6.6 (6.1)	6.8 (6.0)	6.5 (5.9)	5.9 (5.5)
Headline balance on primary income[2]	-2.1 (-2.4)	1.4 (0.3)	-0.4 (-1.4)	-0.5 (-1.4)	-0.4 (-1.4)
Underlying balance on primary income[3]	-1.2 (-1.6)	1.4 (0.3)	-0.7 (-1.4)	-0.7 (-1.4)	-0.7 (-1.4)
Headline current account balance[2]	5.5 (5.1)	8.0 (6.4)	6.4 (4.6)	6.0 (4.5)	5.4 (4.2)
Underlying current account balance[3]	6.1 (5.6)	8.0 (6.4)	6.4 (4.6)	6.0 (4.5)	5.4 (4.2)

1. % of GDP (figures in parentheses are from the forecast in *Monetary Bulletin* 2017/1). 2. Calculated according to IMF standards. The sum of primary and secondary income. 3. Adjusted for the calculated revenues and expenses of the failed financial institutions for 2015. The services account balance is also adjusted for the failed financial institutions financial intermediation services indirectly measured (FISIM).

Sources: Statistics Iceland, Central Bank of Iceland.

Table 4 Public sector finances[1]

	2015	*2016*	*2017*	*2018*	*2019*
Overall Treasury balance	-0.3 (-0.3)	17.2 (15.0)	0.9 (-0.3)	1.0 (-0.5)	0.8 (-0.5)
Primary Treasury balance	3.2 (3.2)	20.3 (17.9)	3.3 (1.7)	3.4 (1.4)	3.0 (1.1)
Primary Treasury balance excluding one-off items[2]	2.8 (2.8)	3.3 (1.9)	2.5 (0.9)	3.1 (1.4)	2.8 (1.1)
Overall general government balance	-0.8 (-0.8)	17.2 (14.9)	1.2 (-0.3)	1.3 (-0.6)	1.1 (-0.7)
Primary general government balance	2.9 (2.9)	20.4 (17.9)	3.9 (1.8)	3.9 (1.4)	3.6 (1.0)
Total general government debt	68 (68)	54 (60)	45 (56)	42 (48)	39 (44)
Net general government debt[3]	49 (49)	42 (43)	35 (40)	32 (38)	30 (34)

1. % of GDP on an accrual basis (figures in parentheses are from the forecast in *Monetary Bulletin* 2016/4). 2. One-off items are stability contributions and the accelerated write-down of indexed mortgage loans. 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]

	2015	*2016*	*2017*	*2018*	*2019*
Unemployment (% of labour force)	4.0 (4.0)	3.0 (3.0)	2.6 (2.6)	3.0 (3.2)	3.5 (3.8)
Employment rate (% of population aged 16-74)	79.2 (79.2)	81.1 (81.1)	82.1 (81.4)	81.4 (81.1)	80.9 (80.6)
Total hours worked	3.3 (3.3)	3.0 (3.0)	4.1 (3.2)	1.7 (2.0)	1.6 (1.1)
Labour productivity[2]	0.8 (0.8)	4.1 (2.9)	2.1 (2.0)	1.7 (1.0)	0.9 (1.5)
Unit labour costs[3]	6.7 (7.1)	4.9 (6.5)	5.0 (4.1)	4.4 (5.2)	5.3 (4.7)
Wage share (% of gross factor income)	60.7 (61.6)	62.4 (63.6)	64.7 (64.5)	66.4 (66.3)	68.1 (67.5)
Real disposable income	9.9 (10.0)	7.3 (7.0)	9.0 (6.7)	5.2 (4.5)	4.7 (4.3)
Output gap (% potential output)	0.2 (0.6)	2.6 (2.2)	3.3 (2.5)	2.2 (1.3)	1.2 (0.6)

1. Year-on-year change (%) unless otherwise specified (figures in parentheses are from the forecast in *Monetary Bulletin* 2017/1). 2. GDP per total hours worked. 3. Wages costs divided by productivity.

Sources: Statistics Iceland, Central Bank of Iceland.

Table 6 Exchange rate and inflation[1]

	2015	*2016*	*2017*	*2018*	*2019*
Trade-weighted exchange rate index[2]	201.1 (201.1)	179.9 (179.9)	157.0 (162.6)	148.2 (154.2)	147.4 (152.4)
Real exchange rate (relative consumer prices)[3]	79.0 (79.0)	89.1 (89.1)	101.8 (98.6)	108.2 (104.6)	109.9 (106.7)
Real exchange rate (relative unit labour costs)[3]	73.7 (73.9)	85.6 (87.2)	101.1 (98.9)	110.0 (107.8)	114.1 (111.8)
Inflation (consumer price index, CPI)	1.6 (1.6)	1.7 (1.7)	1.9 (2.1)	2.3 (2.5)	2.9 (2.8)
Inflation (CPI excluding effects of indirect taxes)	1.2 (1.2)	1.7 (1.7)	1.7 (1.9)	2.2 (2.5)	3.3 (2.8)

1. Year-on-year (%) unless otherwise specified (figures in parentheses are from the forecast in *Monetary Bulletin* 2017/1). 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	
2016:2	1.6 (1.6)	1.6 (1.6)	4.1 (4.1)
2016:3	1.3 (1.3)	1.3 (1.3)	1.3 (1.3)
2016:4	1.9 (1.9)	1.9 (1.9)	1.9 (1.9)
2017:1	1.8 (1.9)	1.6 (1.7)	0.0 (0.3)
		Forecasted value	
2017:2	1.9 (2.0)	1.6 (1.7)	4.3 (4.3)
2017:3	1.8 (2.1)	1.6 (1.8)	1.1 (1.8)
2017:4	2.1 (2.5)	1.9 (2.2)	3.2 (3.5)
2018:1	2.0 (2.4)	2.0 (2.4)	-0.6 (0.0)
2018:2	2.0 (2.4)	1.9 (2.4)	4.3 (4.4)
2018:3	2.4 (2.6)	2.3 (2.6)	2.7 (2.4)
2018:4	2.8 (2.6)	2.7 (2.6)	5.1 (3.8)
2019:1	2.7 (2.7)	3.1 (2.7)	-1.2 (0.4)
2019:2	3.0 (2.9)	3.4 (2.9)	5.3 (5.1)
2019:3	3.0 (2.9)	3.5 (2.9)	2.8 (2.2)
2019:4	2.9 (2.8)	3.4 (2.8)	4.7 (3.7)
2020:1	3.1 (2.7)	3.1 (2.7)	-0.3 (-0.1)
2020:2	2.8	2.8	4.0

1. Figures in parentheses are from forecast in *Monetary Bulletin* 2017/1.

Sources: Statistics Iceland, Central Bank of Iceland.