MONETARY BULLETIN

2016•4

Contents

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

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

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

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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 16 November 2016

The Monetary Policy Committee (MPC) of the Central Bank of Iceland has decided to keep the Bank's interest rates unchanged. The Bank's key interest rate – the rate on seven-day term deposits – will therefore remain 5.25%.

According to the baseline forecast published in the November issue of *Monetary Bulletin*, GDP growth is expected to be robust in 2016 and 2017 and to exceed the Bank's August forecast. To a greater degree than before, GDP growth is supported by domestic demand, which grew by nearly 10% in H1/2016. Job creation remains strong, unemployment is declining, and there are clearer signs that rapid demand growth is straining domestic resources, although this is offset somewhat by increased importation of foreign labour.

Inflation measured 1.8% in October and has remained below target for nearly three years despite large pay increases and rapid demand growth. Improved terms of trade, low global inflation, and the appreciation of the króna have offset the effects of wage increases on inflation. A tight monetary stance has also played an important role in containing inflation and anchoring inflation expectations. It has done this by slowing demand growth, directing some of the steep rise in income and wealth towards saving, and containing credit growth. In this way, monetary policy has supported the exchange rate of the króna, which has lowered import prices even further and shifted some of the demand towards imports.

According to the Bank's new inflation forecast, the outlook is for inflation to be below target until mid-2017 and then hover in the 2½-3% range for the remainder of the forecast horizon. This is a significant change from the Bank's previous forecast, owing mainly to the fact that the baseline forecast is now based on an endogenous exchange rate path and not on the technical assumption that the exchange rate will be constant throughout the forecast period. The inflation outlook has also improved, however, particularly in the short run. The change in the Bank's inflation forecast does not provide as much scope for monetary policy response as might be expected, as the MPC had already incorporated a strong probability of further appreciation of the currency into its recent policy decisions.

In recent months, the Central Bank has purchased a smaller share of foreign currency inflows than it did earlier in the year. The MPC is of the view that, other things being equal, it is appropriate to continue in this vein.

The MPC's decision to keep interest rates unchanged is taken upon consideration of the Bank's current forecast and the Committee's risk assessment. This includes, in particular, the uncertainty about the fiscal stance, which has eased in the past two years and remains uncertain because it is unclear at present what the next Government's economic policy will be. In addition, there is unrest in the labour market, not least in the wake of the recent ruling providing for pay increases for elected officials. Moreover, there is continued uncertainty about the impact of capital account liberalisation, although the process has been smooth thus far. Added to this is uncertainty about the global economic outlook.

Although inflation expectations appear to be more firmly anchored to target and the monetary stance has tightened to some extent through the appreciation of the króna, strong demand growth and the aforementioned uncertainties call for caution in interest rate setting. The monetary stance in the coming term will depend on economic developments and actions taken in other policy spheres.

Inflation expected to remain at target throughout the forecast horizon

The outlook is for global GDP growth to decline year-on-year in 2016 to its lowest level since 2009. Although the period of declining GDP growth in emerging economies is considered to be at an end, growth in developed countries does not appear to be recovering. The GDP growth outlook for Iceland's main trading partners has deteriorated somewhat, mainly due to poorer prospects for the UK in the wake of the Brexit referendum. As before, the risk to the global outlook is concentrated on the downside.

At the same time, the domestic economy is robust and has gained momentum. Domestic demand grew by nearly 10% year-on-year in H1/2016, including private consumption growth of nearly 8% and investment growth of almost a third. GDP growth measured 4.1%, broadly the same as in 2015. Domestic demand is expected to grow by nearly 9% in 2016 as a whole, the strongest single-year growth rate since 2006. As in the Bank's August forecast, GDP growth would then be 5%, the strongest since 2007. The forecast for 2017 is significantly affected by the assumption in the current baseline forecast that the exchange rate of the króna will rise during the forecast horizon rather than remaining at the level prevailing at the time the forecast was prepared. It is appropriate to depart from this technical assumption of an unchanged exchange rate now that general capital account liberalisation has begun. According to the forecast, the króna will continue to appreciate – by just under 5% over the forecast horizon – and will be almost 14% stronger by the end of the period than was assumed in the August *Monetary Bulletin*. Other things being equal, a rising exchange rate impedes GDP growth and affects its composition. Under such circumstances, GDP growth is driven more by domestic demand, whereas export growth slows down and demand is shifted more towards imports. The current account surplus will therefore narrow. In spite of the negative effects of a rising exchange rate and external shocks such as a poorer outlook for the capelin fishery, GDP growth is expected to be robust next year, or 4.5%, driven mainly by growth in tourism, the impact of recent wage increases, and increased private sector equity. Furthermore, job creation will be strong and unemployment low. Added to this is the stimulative effect of fiscal easing, with offsetting effects from a tight monetary stance. GDP growth is expected to ease gradually towards its trend growth rate of 2¾% as the forecast horizon progresses.

This strong demand growth is increasingly straining the resources of the economy. Labour participation is growing rapidly and has reached the pre-crisis peak. A shortage of labour has emerged, and the current forecast assumes greater importation of labour than forecast in August. Therefore, in spite of stronger GDP growth, the output gap is expected to be narrower during the forecast horizon than was previously assumed.

Inflation measured 1.8% in October, and inflation expectations appear to be broadly consistent with the target by most measures. According to the forecast, inflation will rise to 2.1% in Q4/2016. The outlook is for it to align with the target in H1/2017 and hover in the 2½-3% range for the remainder of the forecast horizon. This is a significant change from the last forecast, and it is due largely to the assumption that the króna will continue to appreciate over the majority of the forecast horizon. The appreciation will therefore weigh against domestic inflationary pressures, both by lowering imported goods and services prices and by shifting some of domestic spending towards imports.

I Economic outlook and key uncertainties

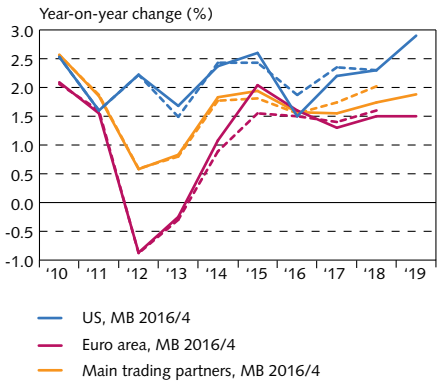
Central Bank baseline forecast[1]

Continued expectations of weak GDP growth among trading partners

According to the most recent forecast from the International Monetary Fund (IMF), the outlook is for global GDP growth to measure 3.1% in 2016, after declining year-on-year for the second year in a row. If this forecast materialises, this will be the weakest global GDP growth since 2009 and the fifth consecutive year with a growth rate below its long-term average. The Fund's forecast assumes that growth will pick up slightly in 2017 and average 3½% over the next three years. Growth will be supported mainly by emerging economies, as growth in advanced economies is expected to remain sluggish.

Among Iceland's main trading partners, GDP growth has been weak for some time. It averaged 1.6% in H1/2016 and, according to the baseline forecast, will be close to that level for the year as a whole (Chart I-1). The GDP growth outlook is more or less unchanged from the forecast in the August *Monetary Bulletin*, as the outlook for weaker growth in the US offsets a pickup in growth in several other advanced economies. The outlook is for growth in trading partner countries to remain broadly unchanged over the next two years and edge upwards to 1.9% by 2019. This is below the August forecast, as growth is expected to be weaker in nearly all developed countries. The main difference is that GDP growth in the UK is expected to be 0.8 percentage points weaker in 2018 than was previously thought, in addition to the previous revision of 2017 growth estimates in the wake of the Brexit referendum. Year-2017 output growth in the UK is now projected to be only 0.9%, some 1.3 percentage points less than was forecast this spring. Further discussion of the global economy can be found in Chapter II, and uncertainties in the global outlook are discussed later in this chapter.

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

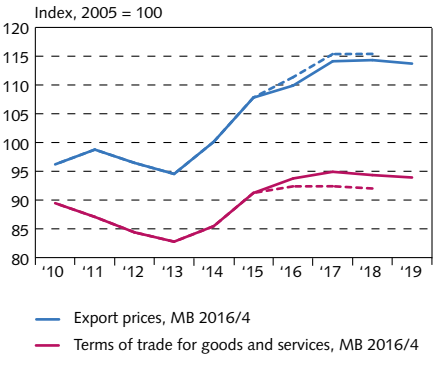


1. Central Bank baseline forecast 2016-2019. Broken lines show forecast from MB 2016/3.
Sources: Macrobond, OECD, Central Bank of Iceland.

Further appreciation of the króna assumed over the forecast horizon

Over the past two years, the price of Iceland's exported goods has risen markedly relative to trading partner exports (Chart I-2). Terms of trade have therefore improved by nearly 10% and look set to improve by a further 3% this year. Even though global oil prices have risen more strongly and marine and aluminium product prices have developed less favourably than was assumed in August, this is a larger improvement in terms of trade than was projected at that time, owing mainly to more favourable developments in other import and export prices. Terms of trade are expected to improve next year but, as was assumed in August, deteriorate slightly in the latter half of the forecast horizon. As is discussed later in this chapter, the forecast of developments in terms of trade could prove overly optimistic, given the out-

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 2016-2019. The broken lines show the forecast from MB 2016/3.
Sources: Macrobond, Statistics Iceland, Central Bank of Iceland.

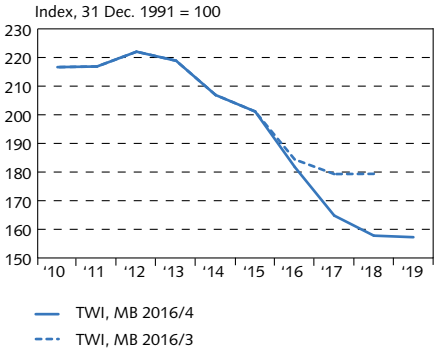
1. The analysis presented in this *Monetary Bulletin* is based on data available in mid-November.

look for global export prices and weak GDP growth in trading partner countries.

The króna has appreciated markedly in the recent past. In trade-weighted terms, it was up by about 13% year-on-year in Q3/2016. As is discussed in Chapter III, inflows of short-term capital into the domestic bond market have more or less ceased since the Central Bank began applying its new capital flow management measure to contain excess inflows in search of higher yields (see also Box 1). The recent rise in the exchange rate can be attributed largely to the sizeable trade surplus, which in turn is due to improved terms of trade and a burgeoning tourism sector, together with increased foreign demand for domestic assets. Therefore, the appreciation may to some extent reflect an adjustment to a higher equilibrium exchange rate, as is discussed in Box 3 of *Monetary Bulletin* 2016/2.

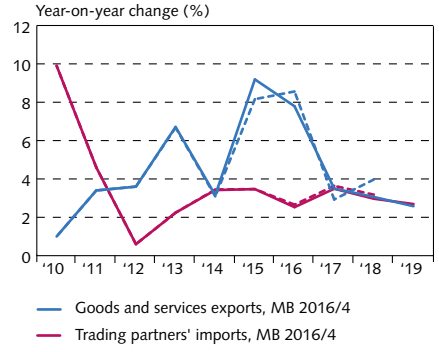
Although it is not impossible that the exchange rate could dip temporarily when the capital controls are lifted, it is expected to continue rising over the forecast horizon (Chart I-3).[2] In 2017, the trade-weighted exchange rate index (TWI) is expected to be just under 165. According to the forecast, the króna will appreciate by another 4½% over the remainder of the forecast horizon, and by the end of the period it will be nearly 14% stronger than was assumed in August. The real exchange rate therefore continues to rise. In terms of relative consumer prices, it rose by 4% in 2015, and it appears likely to rise by another 11½% per year in 2016 and 2017. In terms of relative unit labour costs, the increase is even larger. Further discussion of terms of trade and the exchange rate can be found in Chapters II and III.

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



1. Central Bank baseline forecast 2016-2019. Narrow trade basket.
Source: Central Bank of Iceland.

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



1. Central Bank baseline forecast 2016-2019. Broken lines show forecast from MB 2016/3.
Sources: Macrobond, Statistics Iceland, Central Bank of Iceland.

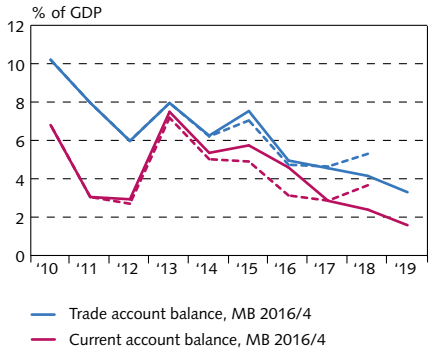
Outlook for weaker export growth as the forecast horizon progresses

Exports of goods and services grew in 2015 by over 9%, about 1 percentage point more than was indicated by Statistics Iceland's first 2015 figures. This rapid growth rate is due to services exports, which grew by over 2 percentage points more than was previously measured, owing mainly to more complete information on exported tourism services. The outlook for export volumes this year is broadly unchanged from the August forecast, and due to base effects from 2015, exports are expected to grow by nearly 1 percentage point less than was projected in August (Chart I-4). Because of the reduced capelin quota, marine product exports are expected to contract by 2% in 2017 instead of growing by 3½%. On the other hand, the outlook is for stronger exports of services and miscellaneous manufactured goods. Export growth is then projected to ease in 2018-2019, in line with the rising real exchange rate and weaker growth in global economic activity.

2. Unlike the Bank's forecasts in recent years, the current baseline forecast assumes that the exchange rate of the króna will develop in line with the Bank's quarterly macroeconomic model (QMM) over the forecast horizon. See Ásgeir Daníelsson, Bjarni G. Einarsson, Magnús F. Gudmundsson, Svava J. Haraldsdóttir, Thórarinn G. Pétursson, Signý Sigmundardóttir, Jósef Sigurdsson, and Rósa Sveinsdóttir (2015), QMM: A quarterly macroeconomic model of the Icelandic economy – Version 3.0, Central Bank of Iceland, *Working Paper* no. 71. Later in this chapter is a comparison between the baseline forecast and an alternative scenario that assumes a constant exchange rate during the forecast horizon.

The surplus on goods and services trade measured 7.5% of GDP in 2015 but, as was forecast in August, is expected to shrink to 5% this year (Chart I-5). According to the current forecast, the surplus will continue to narrow in coming years and will be smaller than was assumed in August. This primarily reflects a changed assessment of the adjustment of the economy to its long-term growth path, which is taking place to some extent through the appreciation of the króna. As is discussed above, previous baseline forecasts were based on the technical assumption that the exchange rate would remain constant over the forecast horizon, but the current forecast assumes that it will rise further. This shifts demand growth out of the domestic economy, which will surface in stronger import growth and reduced foreign demand for Iceland's exports. The current account surplus is expected to narrow in a similar manner, falling from 4½% of GDP this year to 1½% of GDP in 2019. Further discussion of the external balance can be found in Chapter IV.

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

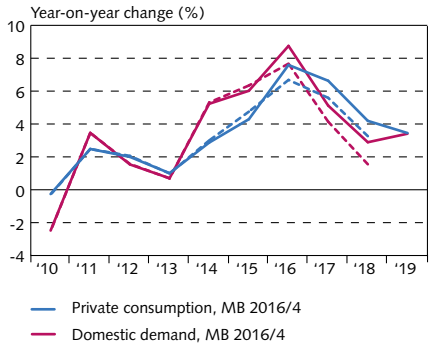


1. Central Bank baseline forecast 2016-2019. Broken lines show forecast from MB 2016/3. Current account balance based on estimated underlying balance 2008-2015.
Sources: Statistics Iceland, Central Bank of Iceland.

Strong growth in domestic demand driven by a surge in consumer and investment spending

Private consumption grew by nearly 8% year-on-year in H1, and the outlook is for 7½% growth in 2016 as a whole, or about 1 percentage point more than was forecast in August (Chart I-6). This is the fastest growth rate since 2005, but unlike the situation then, households' spending has not increased more than their income and balance sheets can sustain. Instead, households have stepped up their saving in the recent past. Real disposable income has grown markedly – and more rapidly in the past two years than was previously thought. By the same token, net household wealth has increased significantly. Job creation has been strong, and households are more optimistic than before. Private consumption growth is still projected to be strong in 2017, or 6½%, but the pace is expected to ease somewhat as the forecast horizon progresses, although it will be a bit stronger than in the August forecast. According to the forecast, households will reduce their saving slightly in 2016 and 2017, but the ratio of private consumption to GDP will still be below its historical average.

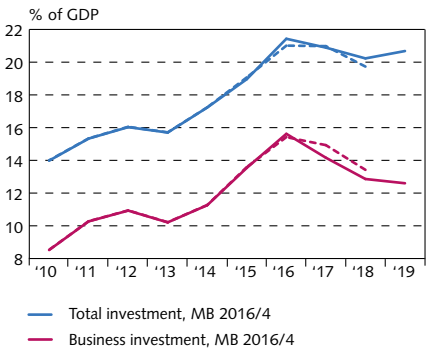
Chart I-6
Private consumption and domestic demand 2010-2019[1]



1. Central Bank baseline forecast 2016-2019. Broken lines show forecast from MB 2016/3.
Sources: Statistics Iceland, Central Bank of Iceland.

Investment has surged this year in virtually all categories. Business investment grew by over 37% in H1/2016 and residential investment by more than a fourth. The increase has been especially large in sectors related to transport and tourism. Total investment therefore grew by nearly a third in H1, somewhat more than was assumed in the Bank's August forecast. For 2016 as a whole, total investment looks set to grow by over 22% instead of the 18% provided for in the August forecast. As in the Bank's previous forecasts, investment growth will ease from 2017 onwards; however, the ratio of investment to GDP will be close to its long-term average throughout the forecast horizon (Chart I-7).

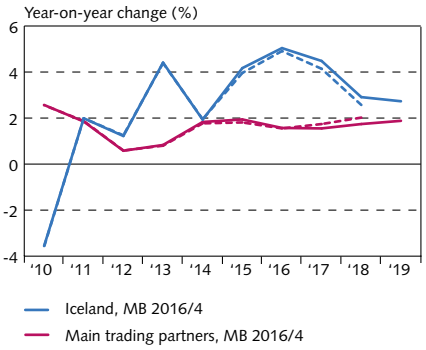
Chart I-7
Investment 2010-2019[1]



1. Central Bank baseline forecast 2016-2019. Broken lines show forecast from MB 2016/3.
Sources: Statistics Iceland, Central Bank of Iceland.

Domestic demand grew by 9.4% year-on-year in the first half of 2016, and for the year as a whole it is projected to grow by 8.7%, about 1 percentage point more than was forecast in August and the strongest single-year growth rate since 2006 (Chart I-6). Strong growth is also expected next year, but from 2018 onwards, demand growth

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



1. Central Bank baseline forecast 2016-2019. Broken lines show forecast from MB 2016/3.
Sources: Macrobond, Statistics Iceland, Central Bank of Iceland.

will be broadly in line with its long-term trend rate. Further discussion of private and public sector demand can be found in Chapter IV.

GDP growth is forecast at 5% this year and expected to outpace the August forecast in 2017 despite a rising exchange rate

According to preliminary figures from Statistics Iceland, output growth measured 4.1% in H1/2016. This is similar to the growth rate for 2015 as a whole but above the Bank's August forecast of 3.6% for H1. The difference is due to stronger domestic demand offset by a more negative contribution from net trade. Economic activity has therefore been robust in the past year. At mid-year, GDP had grown by 22% from its early 2010 trough, according to seasonally adjusted Central Bank figures, and was nearly 6% above the pre-crisis peak.

Year-on-year GDP growth is estimated to have picked up even further in the third quarter, to 6¾%. According to the forecast, it will measure 5% for 2016 as a whole, broadly in line with the August forecast (Chart I-8). As before, strong growth in private consumption and investment pull in one direction and the negative contribution from net trade – in spite of nearly 8% export growth – in the other.

Other things being equal, the appreciation of the króna will erode the GDP growth outlook (see the comparison between the baseline forecast and the alternative scenario with a lower exchange rate path later in this chapter). The composition of GDP growth will also change, as a higher exchange rate and the reduced inflation associated with it will boost real disposable income, thereby supporting private consumption growth. Furthermore, a higher exchange rate directs spending growth towards imported goods and services and weighs on export growth. As a result, GDP growth will be driven more by domestic demand, and the contribution from net trade will be more negative.

In spite of a higher exchange rate and external shocks such as the adverse impact of the Brexit referendum and a poor capelin catch (which are estimated to reduce next year's GDP growth by a combined ¾ of a percentage point), strong domestic demand and the prospect of a continued surge in tourism will cause year-2017 GDP growth to be ½ a percentage point stronger than was forecast in August, or 4½%. As in the Bank's previous forecasts, it is assumed that GDP growth will gradually ease towards its long-term trend rate, measuring about 3% in 2018 and 2¾% in 2019. Further discussion of developments in GDP growth can be found in Chapter IV.

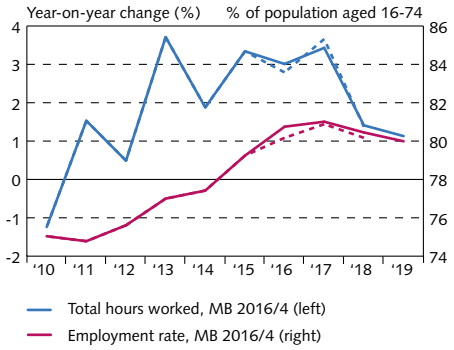
Rapid job creation and labour participation back to pre-crisis peak

Employment rose by 4.5% year-on-year in Q3. At the same time, average hours worked declined by 1.2%, probably reflecting streamlining undertaken in response to last year's costly wage settlements. Total hours worked therefore rose by 3.2% between years, which is in line with the Bank's August forecast. The working-age population has also risen strongly, in part due to importation of foreign labour. Labour participation is therefore broadly back to the early 2007 peak, offsetting the impact of job creation on unemployment. Seasonally adjusted

unemployment measured 3.1% in Q3, about 1 percentage point less than in the same quarter of 2015. Long-term unemployment has also declined markedly and has all but disappeared.

Total hours worked have risen by 2.7% year-on-year in 2016 to date, and the increase for the year as a whole is estimated at 3%, slightly more than was forecast in August (Chart I-9). Total hours are expected to rise by 3½% in 2017 and then taper off slightly in 2018, as GDP growth moves towards its long-term trend rate. The employment rate is expected to rise steeply year-on-year in 2016, for the second year in a row. If this projection materialises, it will be 81% in 2016 and 2017 and then ease to 80% as the forecast horizon progresses. Further discussion of the labour market can be found in Chapter IV.

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



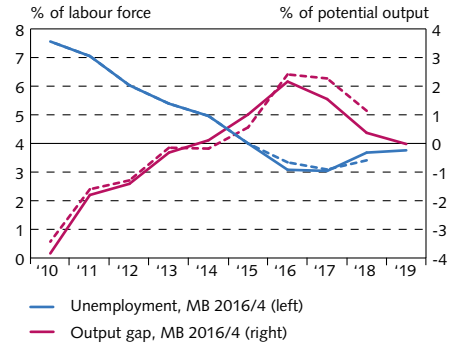
1. Central Bank baseline forecast 2016-2019. Broken lines show forecast from MB 2016/3.
Sources: Statistics Iceland, Central Bank of Iceland.

Declining unemployment and widening output gap, but labour importation eases pressure on domestic resources

According to the forecast, unemployment will average 3.1% this year, slightly more than was forecast in August. It is expected to be broadly unchanged next year and then gradually rise to the level consistent with low and stable inflation (Chart I-10).

As unemployment has declined, it has become more difficult for firms to hire workers, and there is a growing labour shortage in nearly all sectors. There are indications of growing demand pressures in the economy, and as in the Bank's previous forecasts, the output slack is considered to have disappeared in 2015 and the positive output gap is projected at just over 2% of potential output in 2016 (Chart I-10). To a degree, though, labour shortages have been addressed with imported labour, which raises potential output and eases pressures on domestic resources. It is assumed that there will be more importation of labour during the forecast horizon than was projected in August. As a result, the output gap will be smaller from 2017 onwards than was forecast at that time. As always, the assessment of the output gap is highly uncertain. A discussion of the key uncertainties in the assessment is below, and a discussion of factor utilisation can be found in Chapter IV.

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

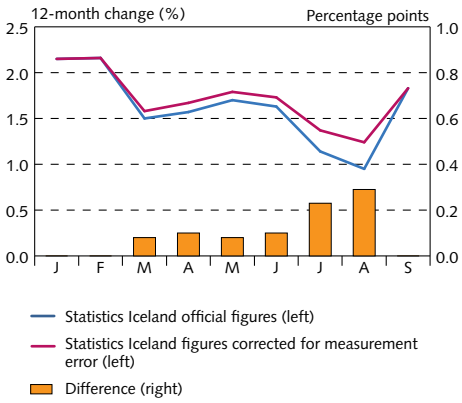


1. Central Bank baseline forecast 2016-2019. Broken lines show forecast from MB 2016/3.
Sources: Statistics Iceland, Central Bank of Iceland.

Further appreciation of the króna lowers the Bank's inflation forecast

Inflation was unchanged month-on-month at 1.8% in October. It had doubled between August and September, but the actual increase was not as drastic as it first appeared because it emerged that Statistics Iceland had made an error in its inflation measurements from March onwards. As a result, twelve-month inflation was actually 0.1-0.3 percentage points higher each month until September, when the mistake was discovered. Headline inflation should therefore have measured 1.2% in August and should have risen by 0.6 percentage points in September (Chart I-11).[3] The Central Bank's overforecast of inflation in H1 was therefore somewhat less than previously thought.

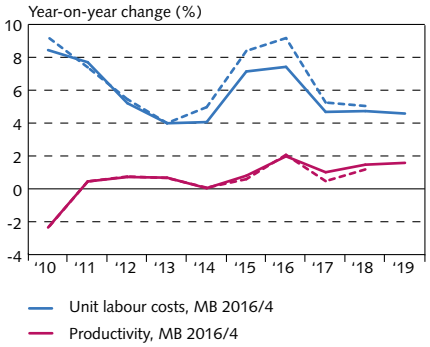
Chart I-11
Inflation - official and corrected data
January 2016 - September 2016



Sources: Statistics Iceland, Central Bank of Iceland.

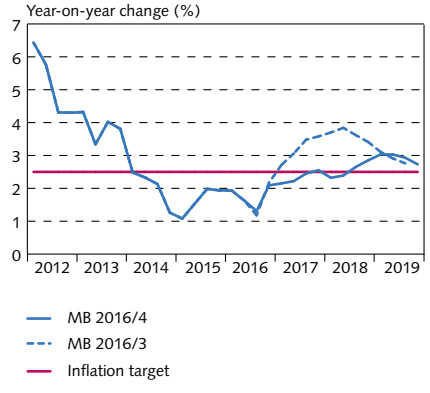
3. In accordance with the joint declaration made on 27 March 2001 by the Government and the Central Bank, the Bank sent the Government a special report on 9 September because inflation had fallen below 1%, the lower deviation threshold for the inflation target (the report is reproduced in this *Monetary Bulletin* as Box 4). If inflation had been measured correctly in August, however, there would have been no need for such a report, as the Bank highlighted in a letter to the Government on 14 October.

Chart I-12
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 2016/3.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart I-13
Inflation[1]
Q1/2012 - Q4/2019



1. Central Bank baseline forecast Q3/2016-Q4/2019.
Sources: Statistics Iceland, Central Bank of Iceland.

Inflation has been below the inflation target for nearly three years. As is discussed in Box 5 of *Monetary Bulletin* 2016/2, this is due in large part to imported deflation and the appreciation of the króna. Inflation has been much lower in terms of the CPI excluding housing, which is affected more strongly by imported deflation and the exchange rate than are indices that include housing costs (see Box 2). The CPI excluding housing fell by 0.5% year-on-year, and inflation thus measured has therefore been consistently below 1% for more than two years.

Households' and businesses' one- and two- year inflation expectations have continued to fall and, like market expectations, appear to be broadly in line with the inflation target. Furthermore, the anchoring of long-term inflation expectations to the target seems to continue to improve.

It is still the case that the main source of domestic inflationary pressures is in the labour market, as the large pay hikes provided for in the last wage agreements stimulate demand through rising household income and could induce firms to pass rising wage costs through to prices. The Statistics Iceland wage index rose by 11% year-on-year in Q3, and firms' wage costs are estimated to rise by 9½% over the year as a whole, somewhat less than was assumed in the Bank's August forecast. As in August, the rise in wages is expected to lose pace in coming years. Although unit labour costs are expected to increase more slowly than was forecast in August, owing to the expectation of more rapid productivity growth, they are still expected to rise well above the level that is consistent with medium-term price stability (Chart I-12).

Inflation averaged 1.3% in Q3, which is consistent with the August forecast. As in August, it is expected to rise in Q4, to 2.1%, due in part to adverse base effects from the prior year. However, as 2017 progresses, the current baseline forecast deviates significantly from the Bank's previous forecast. Instead of continuing to rise, peaking at 3¾% in H1/2018, as was projected in August, inflation will remain in the 2½-3% range throughout the forecast horizon (Chart I-13). The main reason for this change is that the current forecast is not based on the technical assumption that the exchange rate of the króna will remain stable throughout the forecast horizon; instead, it is assumed to rise for most of the period (see the comparison of inflation forecasts based on differing exchange rate paths later in this chapter). As a result, the transmission of monetary policy through the exchange rate channel will be more effective, which will keep domestic inflationary pressures in check for a longer period than was possible in the Bank's previous forecasts. In addition, it is assumed that the output gap will be narrower than was forecast in August and the rise in unit labour costs smaller. As before, the outlook is subject to a number of uncertainties, which are discussed below. Further discussion of global price level developments can be found in Chapter II, and developments in domestic inflation and inflation expectations are discussed in Chapter V.

Key uncertainties

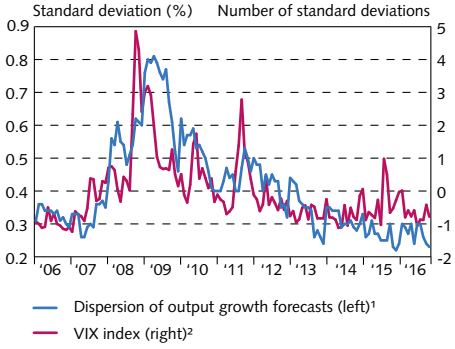
The baseline forecast reflects the assessment of the most likely economic developments during the forecast horizon. It is based on forecasts and assumptions concerning developments in the external environment of the Icelandic economy, as well as assessments of the effectiveness of specific markets and on the transmission of monetary policy to the real economy. All of these factors are subject to uncertainty. The following is a discussion of several key uncertainties in the forecast.

Are global forecasts overly optimistic once again?

The baseline forecast is based on the assumption that global GDP growth will pick up as the forecast horizon progresses and that various factors that have hindered the global economic recovery and contributed to uncertainty about the economic outlook will recede. This is in line with the Bank's previous forecasts and with assessments by leading international institutions. These forecasts have repeatedly proven excessively optimistic, however, and various uncertainties and risks are still in evidence. The Brexit vote in June resulted in some volatility in global financial markets, which resurfaced following the unexpected result in the US presidential election. The turmoil was less pronounced, however, than in the beginning of the year (Chart I-14). The macroeconomic impact of Brexit has yet to emerge, and if Britain's access to the EU internal market is largely curtailed, the impact on the global economy could be underestimated. The same applies to the effects of the unexpected result in the US presidential election. Furthermore, general scepticism about the benefits of open economies and free international trade is on the rise in many advanced economies and if protectionism gains momentum, the global economic recovery could suffer (see IMF, *World Economic Outlook*, Chapter 2, October 2016). China's adjustment to a sustainable GDP growth path has also been a challenge, both domestically and internationally, and although the short-term outlook for China has improved somewhat, a sudden drop in asset prices could severely test the resilience of the Chinese financial system. Although oil prices have risen in the recent past, they are still historically low and, together with low non-oil commodity prices, have strained many emerging economies. Furthermore, financial conditions facing these countries could tighten once again. Moreover, there is still considerable pessimism about whether developed countries will be able to stimulate their economies with conventional policy instruments.

As in the Bank's previous forecasts, the global outlook as projected in the baseline scenario could prove overly optimistic. Demand for Iceland's most important export products could therefore prove weaker than is forecast. Increased geopolitical uncertainty or a sudden spike in oil prices could also cause a reversal in the tourism industry, and the impact of the recent rise in the exchange rate on tourism could be underestimated.[4] In addition, assumptions concerning export prices may be overly optimistic, and terms of trade could therefore turn out weaker than is assumed in the baseline forecast (see below).

Chart I-14
Dispersion of output growth forecasts and implied stock price volatility
January 2006 - November 2016



1. Weighted average of standard deviation in output growth forecasts compiled by Consensus Forecasts for the G7 (weighted with PPP-adjusted GDP). 2. Chicago Board Options Exchange S&P 500 Implied Volatility Index (VIX). Deviation from January 2000-October 2016 average measured in standard deviations.
Sources: Consensus Forecasts, Macrobond.

4. The *Financial Stability* 2016/2 report outlines the possible impact of a severe global economic crisis on the Icelandic economy and financial system through a severe contraction in tourism to Iceland.

Exchange rate forecasts are always uncertain

The baseline forecast assumes that the króna will continue to appreciate over the forecast horizon. This is a departure from the baseline forecasts of the past few years, which have been based on the technical assumption that the exchange rate will remain unchanged at the level prevailing at the time the forecast was prepared. This assumption has been made because the capital controls have in part disconnected the economic forces that typically drive currency movements. Now that full liberalisation is in sight, it is appropriate to revisit this technical assumption and base the baseline forecast on an endogenous exchange rate path.

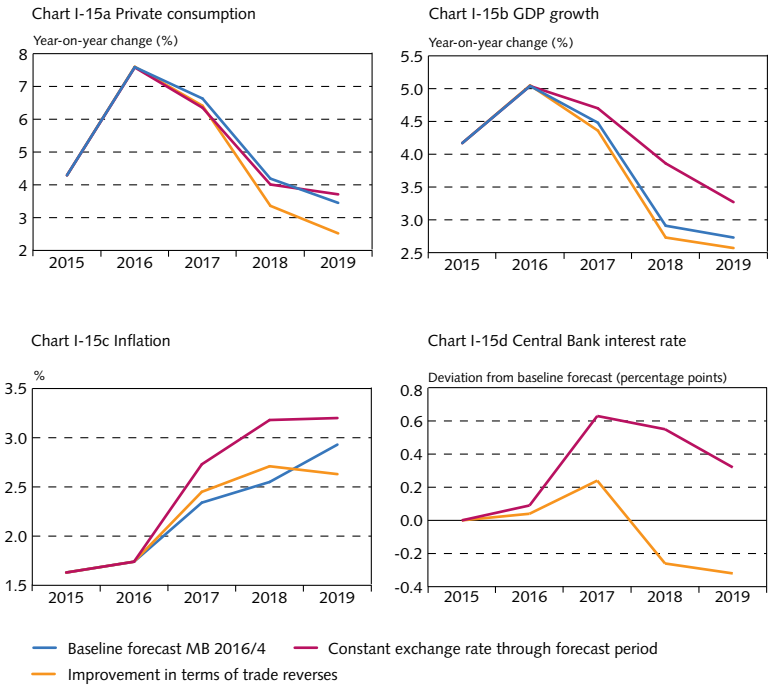
But as always, forecasting exchange rates remains notoriously difficult. The statutory amendments providing for important steps towards liberalisation of capital controls on the private sector have only recently been passed, and if households and businesses choose to accumulate foreign assets rapidly, a sudden surge in outflows is quite possible.[5] As is discussed below, the past years' improvement in terms of trade could also reverse – if key export prices give way, for instance. Furthermore, uncertainty about the global economy could undermine the króna, as such uncertainty is often accompanied by capital flight to safe assets at the expense of small currencies. The recent appreciation of the króna has broadly reflected the strength of the domestic economy and the resulting interest rate spread vis-à-vis neighbouring countries. To the extent that the economy strengthens – for instance, because export growth is even stronger than in the baseline forecast – the exchange rate of the króna could rise even more than the forecast assumes. Moreover, it should be noted that the exchange rate forecast is also affected by the assessment of developments in the equilibrium real exchange rate during the forecast horizon. The equilibrium real exchange rate is judged to have risen somewhat in the recent term (see, for example, Box 3 in *Monetary Bulletin* 2016/2), but it and some of the assumptions surrounding it are uncertain.

One of the main drawbacks of forecasts based on a constant exchange rate is that they shut down an important channel through which the economy adjusts towards its long-term trend growth rate and through which monetary policy affects the real economy. Under the current conditions of GDP growth in excess of its trend growth and increased inflationary pressures during the forecast horizon, the Central Bank's key rate should affect inflation directly – by raising the exchange rate, which lowers import prices – and indirectly – by curbing domestic demand and supporting a shift in expenditure towards imports. Forecasts based on an unchanged exchange rate exclude part of this adjustment, as the resulting inflation forecasts are higher than they would be otherwise and the interest rate path that appears necessary to keep inflation at target over the forecast horizon is higher as well.

Assuming a higher exchange rate path significantly affects the baseline forecast – not only the inflation outlook but also the as-

5. But as is shown in a recent Central Bank analysis, this is not necessarily the most probable outcome (see "Analysis of potential outflows upon capital account liberalisation", Central Bank of Iceland, 19 August 2016).

Chart I-15
Alternative scenarios



Source: Central Bank of Iceland.

sessment of GDP growth and its composition. Chart I-15 compares the current baseline forecast and the alternative scenario based on an unchanged exchange rate over the forecast horizon. As the chart shows, private consumption grows more slowly in the scenario with the lower exchange rate path than in the baseline forecast over most of the forecast horizon. This reflects both reduced real incomes and the fact that a lower exchange rate calls for a higher key interest rate. However, in spite of slightly weaker growth in domestic demand, GDP growth is somewhat stronger in the alternative scenario: about ¼ of a percentage point more in 2017 and nearly 1 percentage point more in 2018. This is because a lower exchange rate stimulates exports and reduces imports. The output gap is therefore wider, which contributes to domestic inflationary pressures, adding to the inflationary effect of a lower exchange rate. This is offset by a tighter monetary stance, with the key Central Bank rate about ½ a percentage point higher than in the baseline forecast from 2017 onwards.

Could the recent improvement in terms of trade reverse?

Terms of trade improved by nearly 10% in 2014-2015 and look set to improve by a further 3% this year. As is discussed in Box 1 of *Monetary Bulletin* 2016/2, this is the largest improvement in terms of trade among OECD countries, and it is particularly striking in comparison with other commodity exporters among advanced economies. All of them except those that are net oil exporters have enjoyed a boost from the past few years' reduction in global oil prices. Iceland stands out among them because marine product prices have risen steeply relative to global food and commodity prices (see Chapter II of *Monetary Bulletin* 2016/2). This can also be seen in Chart I-16, which

Chart I-16
Export prices and global business cycle
1990-2016[1]

1. Price of Icelandic export prices relative to trading partners' export prices (converted to the same currency using the trade-weighted exchange rate index). Shaded area denotes years when global GDP growth is below its 25-year average (1992-2016). The global GDP growth forecast for 2016 is from the International Monetary Fund (*World Economic Outlook,* October 2016). 2. Central Bank of Iceland baseline forecast 2016.
Sources: IMF, Macrobond, Statistics Iceland, Central Bank of Iceland.

shows developments in Iceland's export prices relative to trading partners' export prices. The chart shows clearly how much Iceland's relative export prices have risen in the recent past and how unusual this is: during periods of weak global economic activity, relative export prices usually remain flat or decline, but during the period of tepid global GDP growth since 2012, they have risen by more than 11% and are expected to rise by more than 16% from 2014 through 2016.

After such large increases, it is appropriate to ask how sustainable these gains are and whether there is the risk that the improvement in terms of trade will partially reverse during the forecast horizon, particularly in view of the continued expectation of weak global economic activity. Should this prove to be the case, economic activity in Iceland would be weaker than is assumed in the baseline forecast, as the value of domestic production relative to foreign production would fall. The recent growth in domestic income and wealth could reverse to an extent, cutting into demand and GDP growth. This can be seen more clearly in Chart I-15, which illustrates the possible impact of a combined 9% deterioration in terms of trade over the next three years instead of the ½% improvement provided for in the baseline forecast.[6]

The deterioration in terms of trade causes domestic demand to grow more slowly during the forecast horizon than is assumed in the baseline forecast, as private consumption growth is slightly weaker in 2017 and nearly 1 percentage point weaker from 2018 onwards than in the baseline forecast. To some extent, the reduction in spending is directed at imported goods and services, however, somewhat muting the impact on GDP growth. Nevertheless, GDP growth is about 0.2 percentage points weaker from 2018 onwards. The deterioration in terms of trade also cuts into the trade surplus, although the impact on inflation is relatively limited, owing to the offsetting effects of a weaker króna and reduced domestic demand. As the forecast horizon progresses, monetary policy will offset the contractionary effect of the supply shock, and by 2018 the Bank's key rate will be about ¼ of a percentage point lower than in the baseline forecast.

The fiscal stance could ease more than is assumed in the baseline forecast

The fiscal deficit totalled 6 b.kr. in 2015, or 0.3% of GDP, and according to the baseline forecast, the outlook is for a somewhat larger deficit this year, if the effects of the settlement of the failed banks' estates on Treasury performance are ignored. The primary surplus – i.e., the overall balance net of the financing balance – was considerably larger in 2015, or 3.2% of GDP. It declined by 1 percentage point year-on-year, however, and is projected to narrow still further this year when excluding one-off effects. Cyclically adjusted, this entails a significant easing of the fiscal stance, as is discussed in Chapter IV. The fiscal

6. As is discussed in Box 2 of *Monetary Bulletin* 2015/4, a rise in the exchange rate leads to improved terms of trade, other things being equal. According to the baseline forecast, the króna appreciates by 17% during the period 2014-2016, leading to a 4% improvement in terms of trade according to the empirical results reported in the Box. The alternative scenario therefore assumes that the part of the 13% improvement in terms of trade in excess of the portion attributable to the rise in the exchange rate will reverse over the next three years.

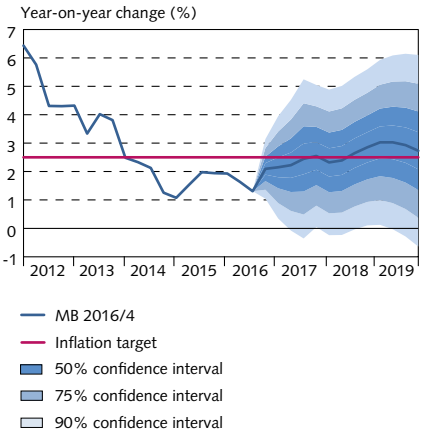
budget proposal for 2017 has not yet been presented; therefore, it is difficult to assess the outlook. The baseline forecast is based on the authorities' previous estimates and the approvals that had been given by the end of the last legislative session. As a result, there is considerable uncertainty about the fiscal situation and the economic policy that will be applied. This is true not least because of the numerous campaign promises centring on increased spending and reduced taxes that were given during the run-up to the recent Parliamentary elections. Consequently, there is the risk of even further fiscal easing in the near future. As experience has shown and as has been discussed in previous issues of *Monetary Bulletin*, this would be extremely unfortunate at a time when it is necessary to coordinate monetary and fiscal policy so as to contain domestic demand under the conditions currently prevailing in the Icelandic economy. The strain on monetary policy would be even greater, thereby exacerbating the negative side effects of an unfavourable policy mix. As can be seen in the alternative scenario in *Monetary Bulletin* 2016/2, a weaker fiscal stance leads to more rapid growth in domestic demand, which in turn calls for a higher policy rate to offset increased inflationary pressures. The current account surplus is then smaller and the exchange rate of the króna higher, further eroding the competitive position of Iceland's export sectors.

The inflation outlook could change if economic developments diverge from the assumptions in the baseline forecast

The uncertainties described above show clearly that the inflation outlook for the next three years could easily deviate from the scenario presented in the baseline forecast. Inflation could turn out higher, for example, if households step up consumption more than is assumed in the baseline forecast. A wage settlement review early in 2017 could bring about larger pay rises than are provided for in the baseline forecast, and tension in the labour market could result in more wage drift than is projected. Firms' capacity and willingness to absorb the associated cost increases could also be overestimated. A limited supply of housing, increasing rentals to tourists, and significant importation of labour could also cause house prices to rise more rapidly than is assumed. This would raise headline inflation directly, through the housing component of the CPI, and indirectly, through stronger demand stemming from homeowners' increased wealth. Demand pressures could also prove to be underestimated if the fiscal stance is eased even further in the wake of the recent elections. Furthermore, inflation expectations, which have only recently been anchored to the target, could become unmoored again if, for instance, the króna should depreciate suddenly.

Inflation could also be overestimated in the forecast. For example, the global economic outlook could turn out too optimistic and projections for the domestic economy likewise, and imported deflation could prove more persistent than is currently assumed – that is, as long as the króna does not give way. The króna could also appreciate further and productivity growth could rise towards its trend rate more quickly than the baseline forecast indicates. The baseline forecast could also underestimate the extent to which firms will absorb wage-

Chart I-17
Inflation forecast and confidence intervals
Q1/2012 - Q4/2019



Sources: Statistics Iceland, Central Bank of Iceland.

related cost increases by streamlining even further – e.g., if competition proves stiffer than is currently assumed.

Chart I-17 illustrates the above-mentioned uncertainties in the inflation forecast by showing 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 August. 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 1½-3½% range one year ahead and in the 1⅓-4% range by the end of the forecast horizon.

II The global economy and terms of trade

The economic recovery in Iceland's trading partners has faltered since mid-2015, and it appears that the episode of weak GDP growth and low inflation will prove somewhat more persistent than was assumed in the Bank's August forecast. The outlook is for global GDP growth in 2016 to be the weakest since the 2009 recession and for the historical weakness in world trade to continue. The unrest in global financial markets has been less than in the beginning of the year despite some volatility in relation to unexpected election results on both sides of the Atlantic, commodity prices have continued to firm up this year, and the economic outlook in emerging countries has improved somewhat. The prospects for Iceland's terms of trade are better than in the August forecast, although the steep rise in the real exchange rate has weakened Iceland's competitive position.

Global economy

Trading partners' economic recovery has stalled …

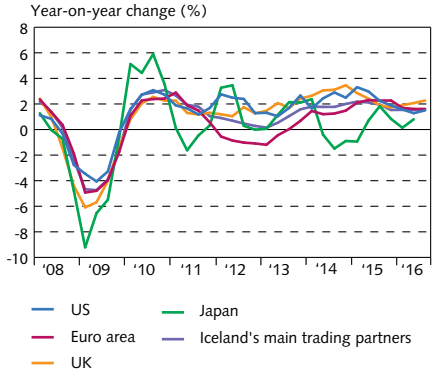
GDP growth among Iceland's trading partners was in line with the Bank's August forecast in H1/2016, measuring 1.6%. This is ½ a percentage point less than over the same period in 2015, when growth had been gaining momentum over a two-year period after the end of the recession in the euro area. Trading partners' economic recovery has stalled since mid-2015; for example, GDP growth has weakened somewhat in both the euro area and the UK, and particularly in the US (Chart II-1). In the US, growth fell by about half year-on-year in the first three quarters, mainly because of weak investment, whereas private consumption growth has been acceptable, spurred on by a robust recovery in the labour market.

… but economic indicators have somewhat improved in the US

Since the publication of the August *Monetary Bulletin*, economic indicators for the US have turned out a bit poorer overall than market agents had expected (Chart II-2), but leading indicators for GDP growth have improved somewhat recently (Chart II-3). The effects of the unexpected result in the US presidential election have not materialised yet, and there is also uncertainty about interest rate hikes by the US Federal Reserve in the coming term. Nevertheless, the foundations for GDP growth are stronger there than in the eurozone and Japan, where legacy issues from financial crises and the lack of confidence in the authorities' ability to support economic recovery persist.

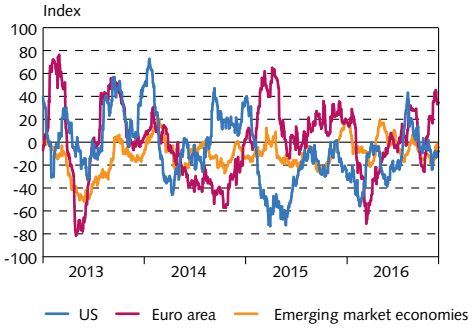
In the UK, economic indicators have improved following a dramatic early response to Brexit. It appears that the depreciation of the pound sterling and accommodative measures by the Bank of England have enhanced confidence and supported demand. On the other hand, indications of a "hard Brexit" are accumulating, even though formal discussions concerning post-Brexit trade and financial frameworks have not yet begun.

Chart II-1
Global GDP growth
Q1/2008 - Q3/2016



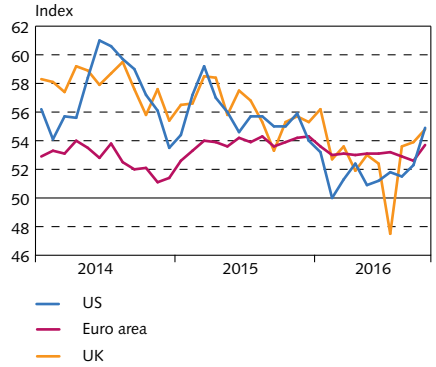
Sources: Macrobond, Central Bank of Iceland.

Chart II-2
Economic surprise index[1]
Daily data 1 January 2013 - 11 November 2016



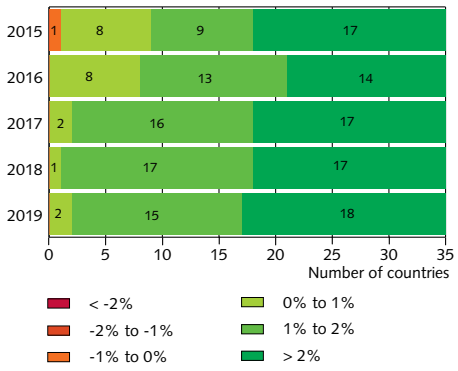
1. When the index is below 0, the indicators are worse than expected; when the index is above 0, the indicators are better than expected. The index does not imply that the indicators are positive or negative.
Source: Macrobond.

Chart II-3
Leading indicators of GDP growth[1]
January 2014 - October 2016



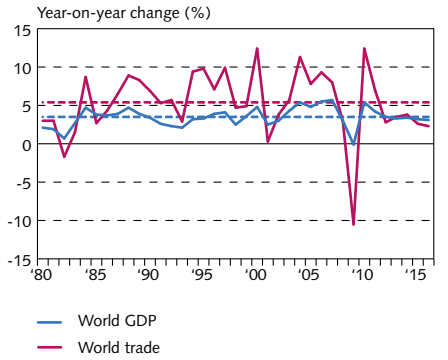
1. Markit composite purchasing managers' index (PMI). The index is published monthly and is seasonally adjusted. An index value above 50 indicates month-on-month growth, and a value below 50 indicates a contraction.
Source: Bloomberg.

Chart II-4
Distribution of GDP growth among 35 industrialised countries



Source: International Monetary Fund.

Chart II-5
World GDP and trade 1980-2016[1]



1. Broken lines show average of 1980-2015. The values for 2016 are based on the IMF's forecast (*World Economic Outlook*, October 2016).
Sources: International Monetary Fund, Central Bank of Iceland.

Global GDP growth at a low ebb in 2016 …

In its new GDP growth forecast for 2016, published in October, the International Monetary Fund (IMF) assumes that global growth will taper off year-on-year, to 3.1%. If the forecast materialises, this year's growth rate will be the weakest since the 2009 recession. The IMF considers the outlook for developed countries to have deteriorated. It projects average year-2016 GDP growth at only 1.6% and expects the number of countries with a growth rate of over 1% to decline in comparison with its spring forecast (Chart II-4). On the other hand, the Fund is of the view that the episode of declining GDP growth among emerging countries has run its course. A key factor is the IMF's increased optimism about the short-term outlook for China and the expectation that China and other Asian countries will remain the main drivers of global GDP growth in coming years. The improved outlook for large commodity exporters that have experienced a contraction in the recent past – Brazil and Russia in particular – is also a factor, as the recovery of global commodity prices and capital flows year-to-date has boosted the economy in these countries. The IMF expects this trend to continue and projects global output growth at 3.4% in 2017, even if growth is tepid in developed countries.

… and the outlook for trading partners' GDP growth during the forecast horizon has deteriorated

Among Iceland's main trading partners, year-2016 GDP growth is expected to be broadly unchanged from the August forecast, at 1.6%, reflecting the offsetting effects of a weaker growth outlook in the US and improved prospects for the euro area and the UK. The outlook for the next two years has deteriorated in comparison with the August forecast, however, not least due to expectations of a harder Brexit than previously anticipated and the associated implications for economic activity in the UK and mainland Europe.

Poorer outlook for world trade and trading partner demand

Growth in world trade has been sluggish in recent years, averaging 3.2% in 2012-2015, which is below average global GDP growth over the same period and less than half of long-term trend growth (Chart II-5). The IMF has lowered its forecast for year-2016 world trade growth by nearly ½ a percentage point since July, to 2.3%. Historically, trade growth rates this low have been seen almost exclusively during global recessions. The IMF attributes the recent weakness of trade to tepid growth in economic activity, investment in particular (see IMF, *World Economic Outlook*, Chapter 2, October 2016). The outlook for trading partner demand has deteriorated as well. This year, import growth among Iceland's trading partners is projected at 2.5%, about a percentage point less than in 2015.

Inflation remains low

Twelve-month inflation measured only 0.6% among Iceland's main trading partners last year, as oil prices fell by nearly half and other commodity prices by almost a fifth, and there was still an output slack in most of the countries concerned. According to the IMF, year-2015

inflation was below long-term expectations in 85 of 120 countries, with deflation in a fifth of them (see IMF, *World Economic Outlook*, Chapter 3, October 2016). In most economies, inflation has picked up slowly as commodity prices have risen and base effects have dropped out of twelve-month measurements (Chart II-6). In September 2016 it measured 1.5% in the US, 0.4% in the euro area, and 0.9% in the UK, whereas there was small deflation in all three economies a year earlier. On the whole, the outlook for trading partner countries during the current forecast horizon is for slightly lower inflation than was projected in August.

Fluctuations in global financial markets

The global financial markets have seen frequent unrest in the recent past, particularly in 2015 and early 2016. Much of it is due to concerns about the Chinese economy, the weak economic recovery in advanced economies, and protracted strain on monetary policy, which has received little support from other policy spheres. Things have stabilised somewhat as 2016 has progressed, however, apart from a flurry of unrest following the Brexit referendum in the UK and again following the US presidential election. In general, concerns about the near-term outlook for the Chinese economy appear to have eased, and market agents expect major central banks to pursue accommodative monetary policy for longer than previously thought (Chart II-7). Risk premia and interest rate spreads have generally been falling (Charts II-8 and II-9), commodity prices have risen slightly in the wake of steep declines (Chart II-10), and capital inflows to emerging countries have picked up again. Financial uncertainty has therefore eased since August, although the situation in the global markets is still unusual, as can be seen in the large outstanding stock of government bonds, from a number of countries, with negative yields. In addition, there is uncertainty with regard to the incoming US president's economic policy actions.

Export prices and terms of trade

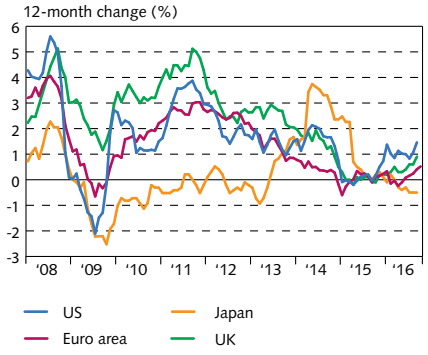
Marine product prices have risen sharply in recent years, and modest increases are expected further ahead …

Marine product prices rose by just under a fifth in foreign currency in 2014-2015. So far in 2016, the pace of the increase has eased, although demersal prices, particularly for fresh and land-frozen products, have continued to climb noticeably. Foreign currency prices of marine products are expected to rise this year by 1%, somewhat less than was assumed in the previous forecast. The outlook is slightly better further ahead, however, as prices are expected to rise overall by about 2% through the end of the forecast horizon (Chart II-10).

… while aluminium prices have suffered year-to-date

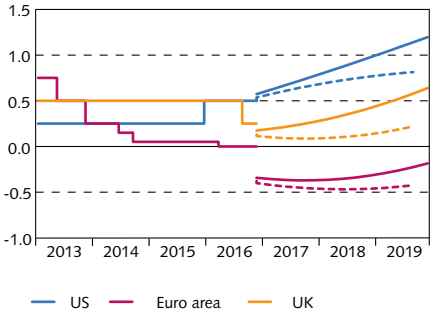
Aluminium prices have plummeted so far this year, both in global markets and in terms of the premium received by companies in Iceland for the production of more valuable aluminium. After adjusting for this premium, 2016 prices in US dollars are projected to fall 14% year-on-year, nearly 2 percentage points more than was assumed in the August

Chart II-6
Inflation in selected industrialised countries
January 2008 - October 2016



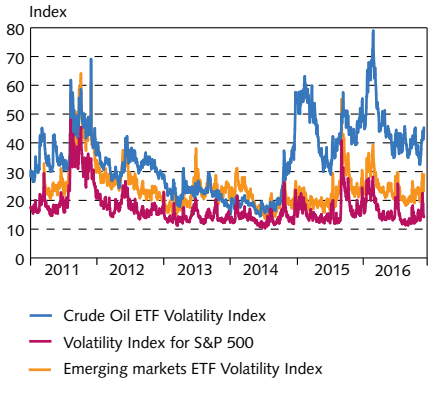
Source: Macrobond.

Chart II-7
Policy rates in selected industrialised economies[1]
January 2013 - November 2019



1. Daily data 1 January 2013 through 11 November 2016, and quarterly data Q4/2016 through Q4/2019. 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 11 November 2016 onwards and the broken lines from 19 August 2016 onwards.
Sources: Bloomberg, Macrobond.

Chart II-8
Global market volatility[1]
Daily data 3 January 2011 - 11 November 2016

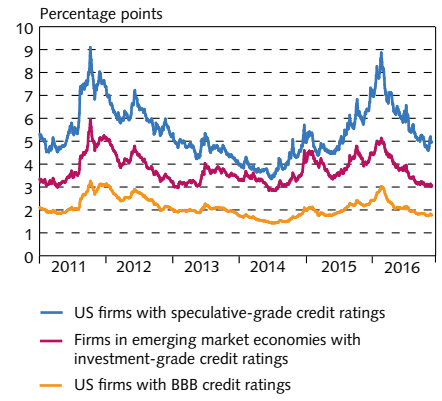


1. The VIX volatility indices indicate the implied volatility of financial products.
Source: Federal Reserve Bank of St. Louis Federal Reserve Economic Data (FRED) database.

Chart II-9

Interest premia on corporate bonds[1]

Daily data 3 January 2011 - 11 November 2016

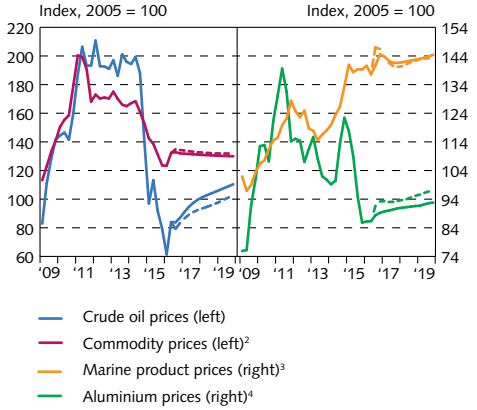


1. Bank of America Merrill Lynch bond indices.
Source: Federal Reserve Bank of St. Louis Federal Reserve Economic Data (FRED) database.

Chart II-10

Prices of marine products, aluminium, oil, and commodities[1]

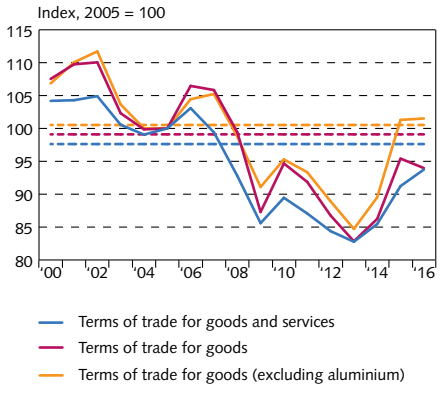
Q1/2009 - Q4/2019



1. Central Bank baseline forecast Q4/2016-Q4/2019. Broken lines show forecast from MB 2016/3. 2. Non-oil commodity prices in USD. 3. Foreign currency prices of marine products are calculated by dividing marine product prices in Icelandic krónur by the trade-weighted exchange rate index. 4. Foreign currency prices of aluminium products are calculated by dividing aluminium prices in Icelandic krónur by the exchange rate of the USD.
Sources: Bloomberg, Statistics Iceland, Central Bank of Iceland.

Chart II-11

Terms of trade of goods and services 2000-2016[1]



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

forecast. Prices are expected to rise by a total of 5% over the next three years (Chart II-10).

Oil prices are expected to be higher than was forecast in August ...

Global oil prices have hovered in the range of 47-50 US dollars per barrel in the past six months, after rising by nearly 50% from the January 2016 trough. They spiked in September, after the OPEC countries decided to impose production limits to offset the supply glut in the market, but have eased again in the past few weeks. The OPEC countries will meet again this month, but the outcome of the meeting and its impact on global oil prices are highly uncertain. The outlook is for higher prices than was assumed in the August forecast – and therefore a smaller decline in 2016 than was projected at the time – and for further price hikes in coming years (Chart II-10).

... but non-oil commodity prices to be lower

Global non-oil commodity prices rose marginally year-on-year in Q3, after a continuous slide lasting over three years. Food prices have risen somewhat year-to-date, owing to El Niño, but the increase turned out smaller than previously expected. On the other hand, declines in the price of metals and miscellaneous agricultural products have eased slightly. Non-oil commodity prices are expected to fall by nearly 3% this year instead of the 2% assumed in *Monetary Bulletin* 2016/3 (Chart II-10).

Terms of trade to improve more in H2 than was forecast in August

Terms of trade for goods and services improved by a combined 10% in 2014 and 2015. According to preliminary figures from Statistics Iceland, they improved in Q2/2016 by 2.3% year-on-year, somewhat less than was forecast in August. They are expected to improve more strongly in H2 than was forecast in August and by nearly 3% in 2016 as a whole (Chart II-11), slightly more than was projected in August, despite higher oil prices and weaker aluminium and marine product prices, reflecting more favourable developments in other import and export prices. As Chart II-11 shows, the improvement in terms of trade for goods excluding aluminium is even stronger, or 20% during the period 2014-2016. As is the case for 2016, the outlook for 2017 is for a more pronounced improvement than was forecast in August. Uncertainty has increased, however, due to the weak global economic recovery (see also Chapter I).

Real exchange rate has risen steeply in the recent term ...

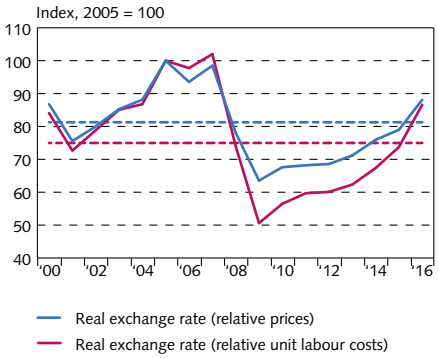
In terms of relative consumer prices, the real exchange rate has soared in the recent past, rising in Q3 to its highest value since year-end 2007. It rose 13.3% year-on-year, as the nominal exchange rate rose 12.9% and domestic inflation was 0.3 percentage points above the trading partner average. The real exchange rate is now about 11% above its twenty-five year average.

… eroding Iceland's competitive position

If the Bank's forecast materialises, the real exchange rate in terms of relative consumer prices will rise by 11½% this year (Chart II-12). In terms of relative unit labour costs, the increase is even greater, at 17½%, owing to large wage hikes. In recent years, the rise in firms' wage costs has been much larger in Iceland than in its main competitor countries, which undermines Iceland's competitive position. As is discussed in Chapter I, the Bank's forecast no longer assumes an unchanged nominal exchange rate throughout the forecast horizon; therefore, the outlook is now for a larger rise in the real exchange rate than was projected in the last *Monetary Bulletin*.

Chart II-12

Real exchange rate 2000-2016[1]



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

III Monetary policy and domestic financial markets

The Central Bank's nominal and real interest rates have fallen since the August *Monetary Bulletin*, and the monetary stance is broadly the same as in the first half of 2016. Market agents expect the Bank's key rate to be lowered by a further 0.25 percentage points before the end of this year. Other market interest rates have fallen in line with the Bank's rate cut, and it appears that there is less reason to question the effectiveness of monetary policy transmission through the interest rate channel than there was before the Bank's new capital flow management measure was introduced in June. The risk premium on Treasury debt has fallen to its lowest point since 2008. The króna has continued to appreciate despite substantial foreign currency purchases by the Central Bank. Growth in money holdings has lost pace in spite of continued strong growth in domestic demand, and credit growth has been limited. Share prices have fallen year-to-date, after a strong performance in 2015, while house prices have risen. Private sector financial conditions have improved overall. Households' and firms' debt ratios have fallen, and their equity ratios are higher than they were before the financial crisis. Moreover, large steps have been taken towards full liberalisation of the capital controls, which will make a significant impact on private sector financial conditions.

Monetary policy

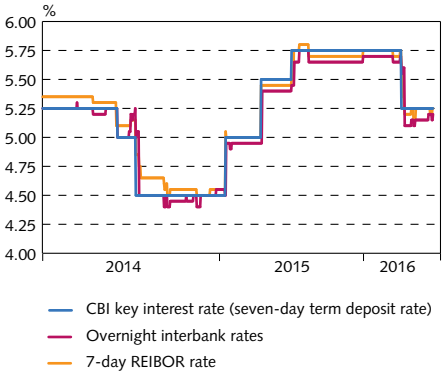
The Central Bank's nominal interest rates have fallen ...

The Central Bank Monetary Policy Committee (MPC) decided to lower the Bank's interest rates by 0.5 percentage points at its August meeting but kept them unchanged at its October meeting. The Bank's key rate was therefore 5.25% just before the publication of this *Monetary Bulletin* (Chart III-1). Short-term interbank market interest rates have declined in line with the key rate. Interbank market turnover rose in the autumn, after having been almost non-existent during the preceding months. Interest rates in auctions of banks' bills have also moved with Central Bank interest rates and have been broadly in line with the key rate. Accepted interest rates in Treasury bill auctions have remained low, however, and are now just over ½%. Treasury bills are owned predominantly by owners of offshore krónur, who have limited investment options available to them.

... as has the Bank's real rate

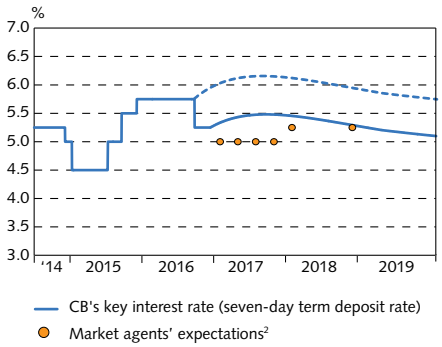
The monetary stance as measured in terms of the Bank's real rate has eased since the August *Monetary Bulletin* and is now similar to that in the first half of the year. In terms of twelve-month inflation, the Bank's real rate has fallen by 1.2 percentage points since August, to 3.4% (Table III-1). The decline is smaller in terms of the average of various measures of inflation and inflation expectations, or 0.1 percentage point, and the real rate by this measure is now 3%. The Bank's interest rate reduction in August has by and large been transmitted to other interest rates, and it appears that the disturbances in monetary policy transmission through the interest rate channel, which began to appear in H2/2015, have subsided (see below).

Chart III-1
Central Bank of Iceland key interest rate and short-term market rates
Daily data 2 June 2014 - 11 November 2016



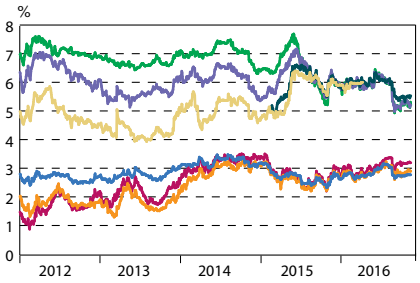
Source: Central Bank of Iceland.

Chart III-2
Central Bank of Iceland key interest rate and expected developments[1]
Daily data 1 June 2014 - 31 December 2019



1. Interbank interest rates and Treasury bonds were used to estimate the yield curve. Broken lines show forward market interest rates since the last MB 2016/3. 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 31 October - 2 November 2016.
Source: Central Bank of Iceland.

Chart III-3
Nominal and indexed bond yields
Daily data 2 January 2012 - 11 November 2016



Source: Central Bank of Iceland.

Market agents expect key rate to be lowered further

According to the Bank's survey of market agents' expectations, carried out in early November, respondents expect the Bank's key rate to be lowered to 5% by the end of this year and be kept unchanged for the majority of 2017 (Chart III-2). This is a lower rate than they expected in a corresponding survey conducted in August. The Bank's rate cut in August took them by surprise, as they had expected it to be introduced in increments through 2017. The forward rate curve suggests a broadly unchanged policy rate throughout the forecast horizon.[1]

Table III-1 The monetary stance (%)

Real interest rates in terms of:[1]	*Current stance (11/11 '16)*	*Change from MB 2016/3 (19/8 '16)*	*Change from MB 2015/4 (30/10 '15)*
Twelve-month inflation	3.4	-1.2	-0.2
Business inflation expectations (one-year)	3.2	0.5	1.3
Household inflation expectations (one-year)	2.7	0.2	1.3
Market inflation expectations (one-year)[2]	3.0	-0.4	1.4
One-year breakeven inflation rate[3]	3.0	-0.2	0.4
Central Bank inflation forecast[4]	2.8	0.2	0.7
Average	3.0	-0.1	0.8

1. Based on the seven-day term deposit rate. 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 in line with the key rate …

Yields on nominal Treasury bonds are now in the 5.2-5.5% range, or up to 0.8 percentage points less than just before the publication of the August *Monetary Bulletin* (Chart III-3). Yields on most Treasury bonds fell in line with the Central Bank's rate cut in August. They fell even further between the publication of the August CPI and early September, when Moody's upgraded Iceland's sovereign credit rating from Baa2 to A3. This dip reversed to an extent after the publication of the September CPI, when it emerged that inflation earlier in the year had been underestimated in Statistics Iceland figures (see Chapter V). The spread between long-term and short-term Treasury bonds has narrowed still further since August and is now about 0.3 percentage points. Over the same period, yields on comparable indexed bonds have fallen by 0.2-0.3 percentage points, to 2.8-3.2%, and the five- and ten-year breakeven inflation rate has declined by ½ a percentage point, to 2.2% (see also Chapter V).

… and the interest rate channel of monetary policy appears to have normalised

Inflows of foreign capital to the domestic bond market have virtually halted since the Bank adopted its new capital flow management measure in early June (see Box 1). Late in 2015, significant foreign capital inflows into the domestic bond market caused interest rates

1. Measurement problems at the short end of the yield curve introduce a measure of uncertainty into the indications provided by the yield curve. For further discussion, see Box III-1 in *Monetary Bulletin* 2013/4.

on nominal Treasury bonds to decline. Demand was concentrated in longer-term bonds, pushing term premia on those bonds downwards. The current reasons for the decline in bond interest rates are probably different, and market agents' reduced inflation expectations and their expectations of a lower key rate appear to be the most important of them. This is in line with the results of the most recent survey of market agents' expectations. Inflation has remained low and has been below target for nearly three years, the Bank's key rate has been cut, and according to the MPC's August statement, it appears that it will be possible to keep inflation at target over the medium term with a lower nominal rate than was previously considered necessary. It is likely that the decline in bond interest rates also reflects Iceland's improved credit ratings and the reduction in the risk premium on Treasury obligations. If changes in market agents' expectations are the main reason for these developments in the bond market, there is less reason than before to doubt the efficacy of monetary policy transmission through the interest rate channel – unlike last year, when bond interest rates fell even though the Central Bank raised interest rates and the MPC's statements indicated that further rate hikes could be in the offing (see Box 1 in *Monetary Bulletin* 2015/4).

Risk premium on Treasury debt has fallen to post-crisis low

The risk premium on the Treasury's foreign obligations has fallen this year, in line with improved sovereign credit ratings and reduced unrest in global financial markets. The spread between the Icelandic Treasury bond issued in US dollars and a comparable bond issued by the US has continued to narrow and is now up to ½ a percentage point less than in August. The spread against German bonds is similar. The interest rate spread measures about 1 percentage point, the smallest spread ever recorded (Chart III-4). Yields on these Treasury obligations have followed the international trend and have fallen steeply in the recent term, particularly the yield on the Treasury's eurobond, which is now about ½%. The CDS spread on five-year Treasury obligations in US dollars is now about 0.9%, and is at its lowest since the beginning of 2008. The spread on Treasury obligations is now similar to that for other countries with comparable credit ratings (Chart III-5).

Interest premia on the domestic commercial banks' international bond issues have also fallen this year, in line with international trends and the reduction in the risk premium on Treasury obligations. The premium on the commercial banks' recent eurobond issues measured about 2 percentage points, ½ a percentage point less than on comparable bond issues earlier this year. Standard & Poor's upgrade of the banks' credit ratings in late October will probably cause risk premia to fall still further. In addition, there are signs that other domestic firms have gained increased access to foreign credit.

Exchange rate of the króna

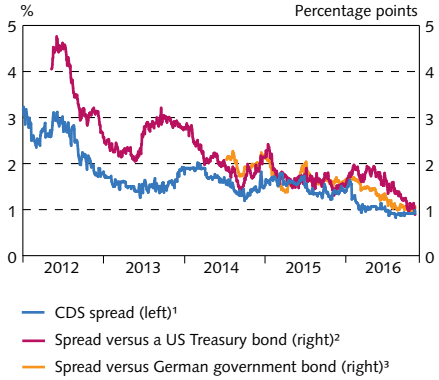
The króna has appreciated in spite of sizable purchases by the Central Bank ...

The króna has appreciated by about 7.6% in trade-weighted terms since the publication of the August *Monetary Bulletin*, and the trade-

Chart III-4

Risk premia on Icelandic Treasury obligations

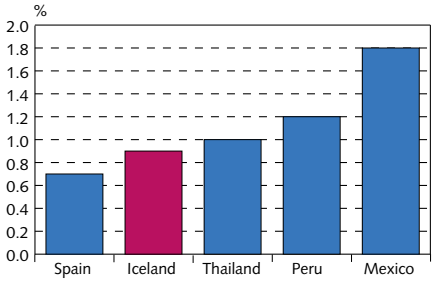
Daily data 2 January 2012 - 11 November 2016



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

Chart III-5

Iceland's sovereign CDS spread versus other countries with comparable credit ratings

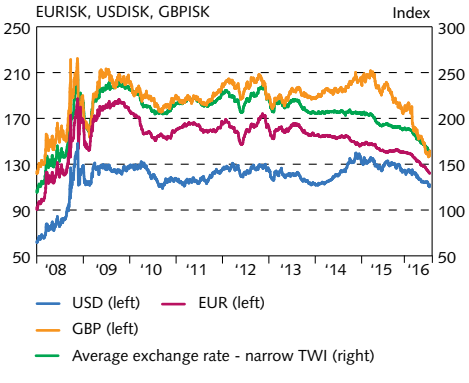


1. CDS spread on five-year Republic of Iceland obligations in USD as of 11 November and CDS spread on other countries with comparable credit ratings from at least two of the three international agencies that assign credit ratings for Iceland.
Source: Bloomberg.

Chart III-6

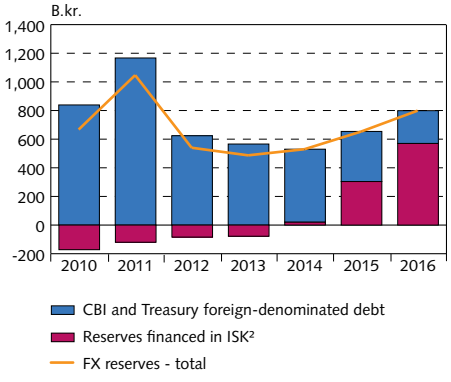
Exchange rate of foreign currencies against the króna

Daily data 3 January 2008 - 11 November 2016



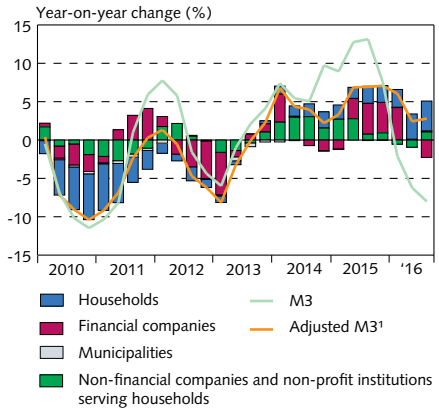
Source: Central Bank of Iceland.

Chart III-7
Central Bank of Iceland foreign exchange reserves 2010-2016[1]



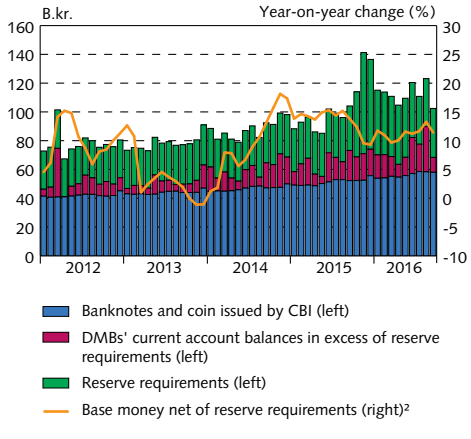
1. Balance as of end-October 2016. 2. Foreign exchange reserves net of Central Bank and Treasury foreign-denominated debt.
Source: Central Bank of Iceland.

Chart III-8
Money holdings
Q1/2010 - Q3/2016



1. Adjusted for deposits of financial institutions in winding-up proceedings.
Source: Central Bank of Iceland.

Chart III-9
Components of Central Bank base money (M0)[1]
January 2012 - September 2016



1. Monthly average. 2. Twelve-month moving average.
Source: Central Bank of Iceland.

weighted index now measures about 164 points (Chart III-6). Over this period, the króna has risen 9.2% against the pound sterling, 4.2% against the US dollar, and 8% against the euro. The Bank's foreign currency purchases have leaned against the appreciation of the króna. The Bank's net purchases year-to-date total about 352 b.kr., more than in all of 2015. In addition, the pension funds have bought 59 b.kr. worth of foreign currency this year, in connection with their special authorisation for foreign investment.

The appreciation of the króna and the Bank's foreign currency purchases in the recent past are probably attributable for the most part to the trade surplus, which stems from improved terms of trade and growth in the tourism industry, in addition to increased non-resident demand for domestic assets (see Box 1). Therefore, to an extent, the appreciation of the króna reflects an adjustment to a higher equilibrium exchange rate (see Box 3 in *Monetary Bulletin* 2016/2).

… and the foreign exchange reserves are broadly in line with the Bank's criteria

For quite some time, the Central Bank has leaned against the rise in the exchange rate through its intervention in the interbank foreign currency market. This is in line with the declared objective of the intervention policy, which is to mitigate exchange rate volatility and build up foreign exchange reserves financed domestically during the run-up to capital account liberalisation. Because of the Bank's foreign currency purchases, its foreign exchange reserves have expanded significantly, although they remain broadly in line with the criteria formulated for reserve adequacy during the prelude to the capital account liberalisation (Chart III-7).

Money holdings and lending

Annual growth in broad money has eased …

Growth in money holdings has lost pace in spite of continued strong growth in domestic demand. M3 adjusted for deposits held by deposit institutions in winding-up proceedings grew by 2.4% year-on-year in Q2 and by 2.8% in Q3, somewhat less than in the four preceding quarters (Chart III-8). This reduced growth is due mainly to a contraction in deposits held by non-deposit-taking financial institutions; however, annual growth in household deposits has gained pace, owing primarily to growth in general savings and term deposits.[2]

… but deposit institutions' excess reserves remain stable

Banknotes and coin in circulation have increased in the recent past, in line with the rise in the number of foreign tourists in Iceland. As a share of GDP, banknotes and coin in circulation have remained relatively stable in recent years, at close to 2½. Deposit institutions' excess reserves with the Central Bank – i.e., their current account deposits in excess of reserve requirements – has held relatively stable, however, averaging 10-20 b.kr. per month (Chart III-9).

2. For further discussion of post-crisis developments in money holdings, see Box III-1 in *Monetary Bulletin* 2014/2.

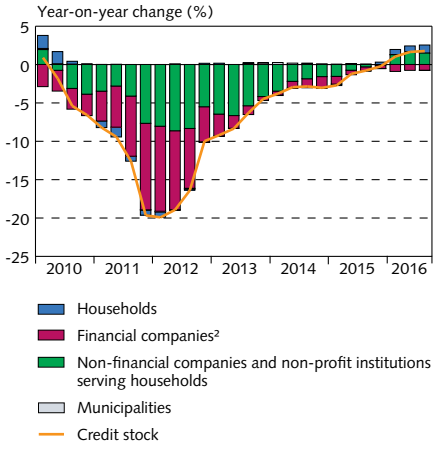
Domestic credit growth remains weak …

Unlike the last economic upswing, credit growth is still relatively weak in spite of a surge in domestic demand. After adjusting for the Government's debt reduction measures, credit system lending to domestic borrowers grew by 1.8% year-on-year in nominal terms in Q3 (Chart III-10), similar to the growth rate in H1, following a continuous decline beginning in Q2/2010. After adjusting for the effects of exchange rate movements on the foreign-denominated credit stock, the increase is somewhat larger, however, or 2.9%. As before, credit growth year-to-date is due largely to an increase in corporate lending – to services companies in particular, but also to construction firms. Lending by the credit system, particularly the pension funds, has increased through purchases of corporate bonds, albeit somewhat less than in recent years.[3] The stock of loans to domestic borrowers plus credit system holdings of corporate bonds is estimated to have increased by nearly 3% year-on-year in Q3/2016. This increase accords with indications from the Central Bank's recent corporate investment survey, which suggests that the share of credit-financed domestic investment has risen somewhat in 2016 (see also Chapter IV).

Chart III-10

Credit system lending to resident borrowers and sectoral contribution[1]

Q1/2010 - Q3/2016



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 financial institutions in winding-up proceedings.

Source: Central Bank of Iceland.

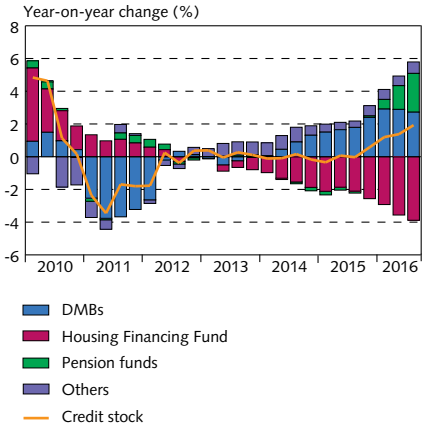
… despite a strong increase in pension funds' household lending

Pension funds' lending to households has increased in the past year, after many funds eased their lending requirements, expanded their product range, and offered better interest rate terms than commercial banks were offering on comparable loans. Before these changes were made, the stock of loans to fund members had contracted, partly in response to the Government's debt relief measures. The stock of pension fund loans has grown by a fourth year-on-year, and the funds' share in the increase in lending to households has been similar to that of the three largest commercial banks (Chart III-11). Nevertheless, the ratio of fund member loans to the pension funds' net assets is still historically low. The increase in loans from pension funds and deposit money banks (DMBs) is offset by the continued contraction in the stock of Housing Financing Fund (HFF) lending to households; therefore, the combined increase in credit system lending to households is still relatively small.

Chart III-11

Credit system lending to households[1]

Q1/2010 - Q3/2016



1. Credit stock adjusted for reclassification and Government debt relief measures.

Source: Central Bank of Iceland.

Asset prices and financial conditions

House prices have risen strongly …

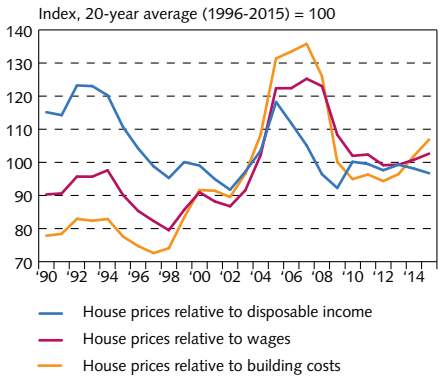
According to figures from Registers Iceland, capital area house prices rose by about 12% year-on-year in September. Significant importation of labour, households' increased disposable income, and limited offerings in the housing market – owing to weak residential investment in recent years and the surge in private rentals to tourists – have contributed to the increase.[4] Although the impact of the spike in short-

3. There is some uncertainty about the reliability of these figures, however, owing to reclassification that has taken place in accordance with new national accounts standards.

4. According to Lúdvík Elíasson (2016), "Icelandic boom and bust: immigration and the housing market", *Housing Studies* (forthcoming), it can be assumed that about a fifth of the 35% rise in house prices since 2013 is attributable to the past three years' rapid population growth, which in turn is due in particular to significant importation of labour.

Chart III-12

House prices, wages, disposable income, and building costs 1990-2015

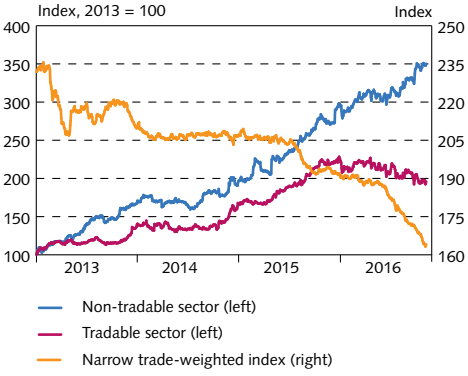


Sources: Statistics Iceland, Central Bank of Iceland.

Chart III-13

Share prices and average exchange rate[1]

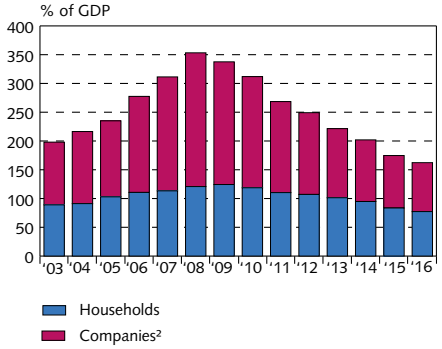
Daily data 2 January 2013 - 11 November 2016



1. Average change in share price of OMXI8 companies in the non-tradable sector versus export companies.
Sources: Nasdaq Iceland, Central Bank of Iceland.

Chart III-14

Household and non-financial corporate debt 2003-2016[1]



1. Debt owed to financial undertakings and market bonds issued. The 2016 figure is the end-June 2016 debt position as a share of year-2016 GDP as estimated by the Central Bank. 2. Excluding financial institutions (which includes holding companies).
Sources: Statistics Iceland, Central Bank of Iceland.

term rentals to foreign tourists varies from one region to another, it is strongest in the central part of greater Reykjavík. Housing market turnover in the capital area was up 7.1% year-on-year in the first nine months of 2016, although the pace of the increase has eased since the beginning of the year. New homebuyers are increasing in number, and in Q2/2016, nearly a fourth of purchasers were first-time buyers, as opposed to 20% in 2015. Even though house prices have risen steeply in the past few years, house prices relative to income and construction costs have been broadly stable at levels close to the respective twenty-year averages (Chart III-12). The outlook is for a continued rise in house prices during the forecast horizon.

… but share prices have fallen

Share prices have continued to fall since the publication of the August *Monetary Bulletin*. The OMXI8 index has fallen by over 2% since August and by nearly 9% year-to-date, after rising steadily throughout 2015. The decline is due largely to a small number of companies that have foreign operations and carry significant weight in the OMXI8 index, and it probably reflects to an extent the impact of the appreciation of the króna on their operating performance (Chart III-13). Most companies' earnings reports have been in line with expectations, and rising wage costs have affected them somewhat. According to a survey carried out recently by the Confederation of Icelandic Employers among its member organisations, about 82% of respondents considered the last wage settlement to have had some effect or a significant effect on their operations, and about 18% of them reduced staffing levels afterwards. Furthermore, a third of them were of the view that the appreciation of the króna had made a somewhat negative or extremely negative impact on their operations. The percentage of respondents holding this opinion was considerably higher among goods exporters and tourism companies. In spite of rising wage costs, share prices of companies operating mainly in the domestic market have risen in the recent term, possibly because of the surge in domestic demand.

Important steps taken towards capital account liberalisation

An act of law amending the Foreign Exchange Act, no. 87/1992, and aimed at lifting capital controls on households and businesses entered into force on 21 October. The amendments in the new legislation, which are part of the authorities' capital account liberalisation strategy, provide for expanded authorisations for foreign exchange transactions and cross-border movement of capital. With the entry into force of the amending legislation, outward foreign direct investment is authorised but is subject to confirmation by the Central Bank. The amending Act also authorises investment in financial instruments issued in foreign currency subject to a maximum of 30 m.kr., which will rise to 100 m.kr. at the turn of the year. The new Act also authorises individuals to purchase one piece of foreign real estate per year and eases or lifts several other special restrictions. These changes represent important steps towards final removal of the capital controls that will have a significant impact on households' and businesses' financial conditions.

Private sector debt-to-GDP ratio continues to decline …

Even though nominal private sector debt rose slightly in H1, it has fallen relative to GDP, which has grown with increased economic activity. The corporate debt-to-GDP ratio declined by 6 percentage points in H1, to 85% of estimated year-2016 GDP (Chart III-14). The household debt-to-GDP ratio fell by 6½ percentage points during the half, to over 77%, partly as a result of the authorities' debt relief measures. As of end-October 2016, the cumulative direct reduction of mortgage principal totalled 73.5 b.kr., and another 27.2 b.kr. had been paid towards loans through the third-pillar pension savings programme.

… and private sector equity ratios exceed their pre-crisis peak

According to new figures from Statistics Iceland, households' assets equalled 392% of GDP at the end of 2015 (including pension assets amounting to 176%). These percentages have held broadly unchanged in recent years. Household equity has increased, however, with declining debt. It totalled 80% of total assets at the end of 2015, or about 12 percentage points more than at year-end 2010, and has risen above its pre-crisis peak (Chart III-15). Figures from Statistics Iceland show as well that 7,300 households had negative equity in real estate at year-end 2015, about the same as at the end of 2007. This is about 4,200 fewer than at the end of 2014 and some 17,700 below the end-2010 peak. Firms' equity position has also been improving. According to figures from Statistics Iceland, firms' equity ratio was 37% at the end of 2014, up from 10% at year-end 2008 and 6½ percentage points above its pre-crisis peak.

Private sector arrears have declined, but corporate insolvencies have increased in line with the rise in new company registrations

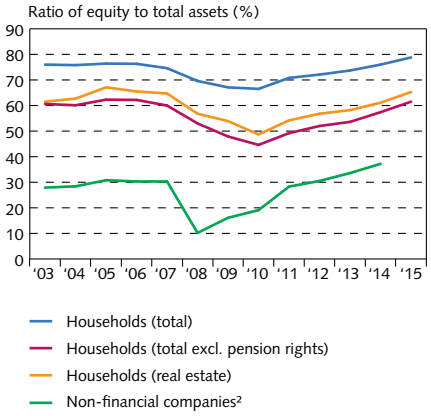
The share of household debt in arrears to the three large commercial banks and the HFF had declined to about 5.4% by the end of September, as opposed to 8% a year earlier (Chart III-16). The number of individuals on the Creditinfo default register has also fallen marginally. The share of corporate loans in arrears to credit institutions rose towards the end of 2015 but then declined again. By September it was 8.9%, 2.4 percentage points lower than at the beginning of the year. The number of firms on the default register has been virtually unchanged year-to-date. There have been more corporate insolvencies thus far in 2016 than in all of 2015, and it is the first time since 2011 that there has been a year-on-year increase in insolvencies. This probably reflects to a significant degree the rapid rise in the number of firms, as new company registrations have also increased rapidly (Chart III-17).

Borrowing costs have been declining

Interest rates on non-indexed deposits and mortgage loans from the commercial banks and the pension funds declined in tandem with the Central Bank's rate cut in August, but indexed mortgage rates from both banks and pension funds have remained virtually unchanged (Chart III-18). In many cases, borrowing fees have declined in recent months, which could facilitate borrowing and increase the likelihood

Chart III-15

Household and corporate equity ratios 2003-2015[1]

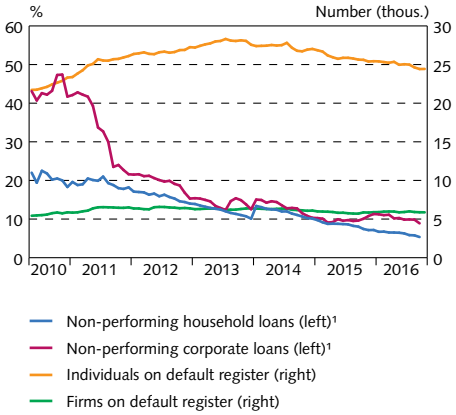


1. According to income tax returns, apart from households' pension rights and securities assets, which are taken from Statistics Iceland's sectoral accounts. 2. Companies excluding pharmaceuticals, financial, and insurance firms.
Source: Statistics Iceland.

Chart III-16

Credit system arrears

May 2010 - October 2016

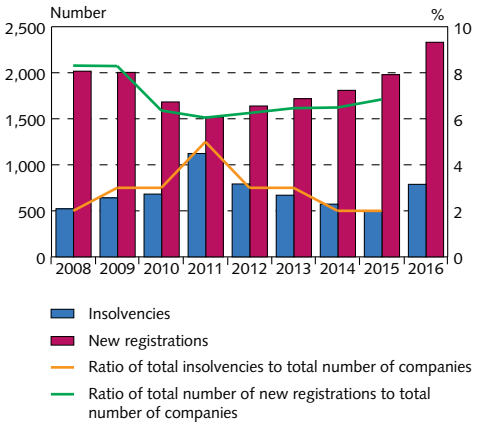


1. Non-performing loans owed to the three largest commercial banks and the Housing Financing Fund are defined as loans at least 90 days in arrears, those that are frozen, or those for which payment is deemed unlikely. The cross-default method is used; i.e., if one loan taken by a customer is in arrears 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.

of refinancing as mortgage lending rates fall. Furthermore, with increased lending by pension funds, the available mortgage loan options have increased in number, as is discussed above.

Chart III-17

Corporate insolvencies and new company registrations 2008-2016[1]

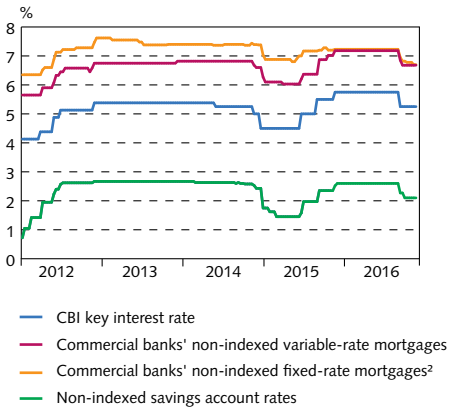


1. Number of corporate insolvencies and new company registrations in the first nine months of each year.
Source: Statistics Iceland.

Chart III-18

Central Bank of Iceland key interest rate and Commercial banks' rates[1]

1 January 2012 - 11 November 2016

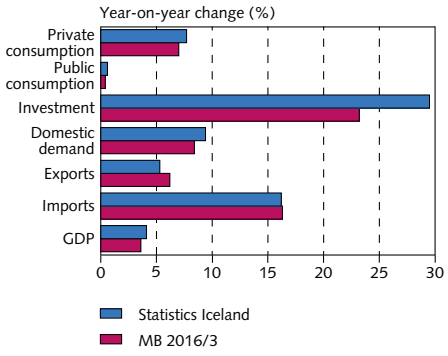


1. Simple average of the lowest mortgage rates from Arion Bank, Íslandsbanki, Landsbankinn. 2. Rates are fixed for 3-5 years.
Sources: Arion Bank, Íslandsbanki, Landsbankinn, Central Bank of Iceland.

IV The domestic real economy

GDP grew 4.1% year-on-year in H1/2016, driven by growth in domestic demand and exports. Terms of trade have improved strongly and boosted domestic incomes and wealth, which, together with fiscal easing, have supported household demand. The outlook is for 5% GDP growth this year and 4½% next year, and domestic demand is expected to grow even more strongly. Imports have also grown rapidly, supported by growth in domestic demand and a rising real exchange rate. As a result, the current account surplus will deteriorate swiftly. The labour market situation reflects increasing economic activity, with labour demand growing rapidly in the recent past and unemployment declining. There is a shortage of labour in most sectors, and an increasing number of firms consider themselves to be operating at full capacity. Importation of labour has eased the pressure on domestic resources, however. The current forecast assumes greater labour importation, and the output gap is therefore not expected to grow as large as was previously believed. On the other hand, weak productivity growth in recent years gives rise to questions about whether Iceland's long-term trend growth rate is overestimated.

Chart IV-1
National accounts H1/2016



Sources: Statistics Iceland, Central Bank of Iceland.

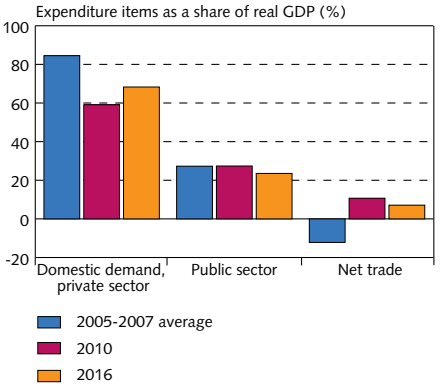
GDP growth and domestic private sector demand

Domestic demand has been stronger than was assumed in August ...

GDP growth measured 4.1% in H1/2016, driven mainly by strong growth in private sector demand. Total consumption and investment grew by a combined 10.2% during H1, somewhat more than was assumed in the August forecast, owing mainly to stronger-than-expected business investment and private consumption. Export growth was robust, but imports grew even more rapidly, owing to buoyant domestic demand and the rising real exchange rate. The contribution from net trade was therefore more negative than had been forecast in August. Despite this, H1/2016 GDP growth turned out 0.5 percentage points stronger than projected (Chart IV-1).

GDP has increased by 22% from its post-crisis trough and is almost 6% above its pre-crisis peak; however, the composition of GDP has changed considerably since the years just before the crisis struck. During the aftermath of the crisis, the share of private sector domestic demand declined alongside a contraction in private consumption and investment. Exports played a leading role during the recovery phase, but as time has passed since the crisis, private consumption and investment have grown more important and their share in GDP has risen (Chart IV-2).

Chart IV-2
Composition of GDP pre- and post-crisis[1]

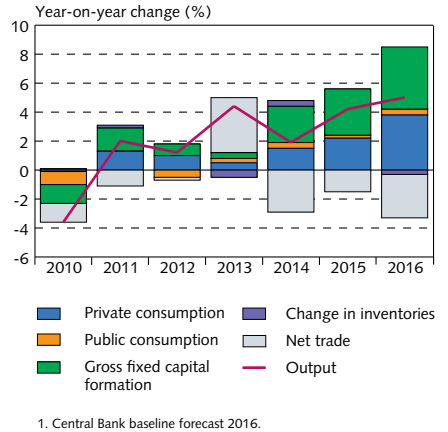


1. Private sector domestic demand consists of private consumption plus business and residential investment. Public sector demand consists of public consumption and investment. Net trade is exports in excess of imports. Central Bank baseline forecast 2016.
Sources: Statistics Iceland, Central Bank of Iceland.

... and GDP growth is expected to reach its post-crisis peak this year

The outlook for the latter half of the year is affected in particular by the assumption that exports will pick up and GDP growth will strengthen, even though the contribution from net trade will remain negative. On the other hand, business investment is expected to grow somewhat

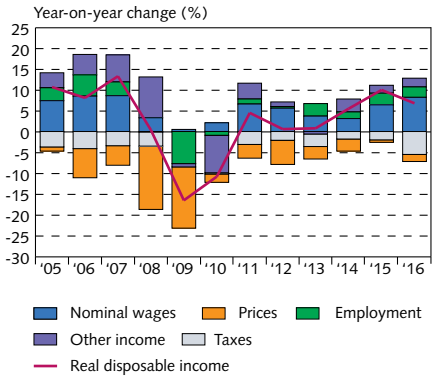
Chart IV-3
GDP growth and contribution of underlying components 2010-2016[1]



1. Central Bank baseline forecast 2016.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart IV-4

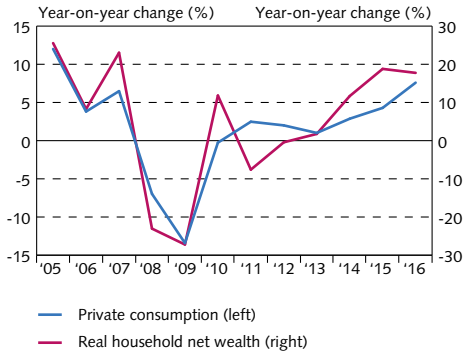
Real disposable income and its main components 2005-2016[1]



1. Central Bank baseline forecast 2015-2016. The contribution of the main underlying components in annual changes in real disposable income is calculated based on each component's weight in disposable income. The combined contribution of underlying components does not add up to the total change due to rounding and incomplete income accounts for households from Statistics Iceland.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart IV-5

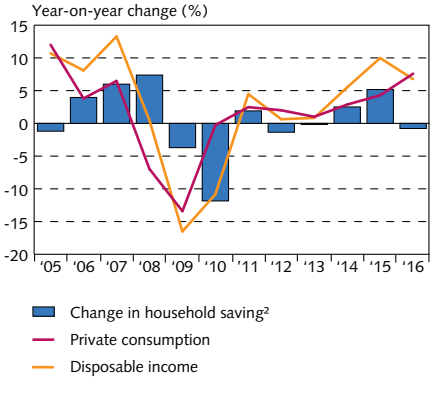
Private consumption and household wealth 2005-2016[1]



1. Central Bank baseline forecast 2016. Net wealth is the sum of households' housing and financial wealth (excluding pension rights), net of household debt (year-end figures).
Sources: Statistics Iceland, Central Bank of Iceland.

Chart IV-6

Private consumption and disposable income 2005-2016[1]



1. Central Bank baseline forecast 2016. 2. Change in the ratio of disposable income to private consumption.
Sources: Statistics Iceland, Central Bank of Iceland.

less, although domestic demand growth will continue to be strong. If these projections materialise, GDP growth will be about 5% this year – the strongest since 2007 – in spite of a sizeable negative contribution from net trade (Chart IV-3). In coming years, private consumption is expected to be the component of domestic demand that will contribute most to GDP growth, and the drain from net trade is expected to ease. GDP growth is forecast at 4½% in 2017 and close to 3% per year in 2018 and 2019, somewhat outpacing the August forecast.

Households' position has strengthened markedly …

Households' position has improved significantly in the recent past, and real disposable income rose by 10% in 2015 alone, mainly because of steep nominal pay hikes and a higher employment level, together with low inflation. This is the largest increase in real household income since 2007. By 2015, real disposable income had risen by 23% from the post-crisis trough in 2010, yet in spite of this surge, it was still some 8½% below the 2008 peak. It is interesting to note how limited an impact other types of income (including financial income) have had on the recent rise in disposable income as compared with 2005-2007 (Chart IV-4). Households' improved situation also shows in their equity position. Between 2014 and 2015, households' net wealth grew by almost 19% in real terms (Chart IV-5). This is due in large part to the boost in housing equity as a result of deleveraging and rising real estate prices (see also Chapter III).

… and household demand has picked up

The developments described above have continued in 2016, and households are upbeat about their situation. Private consumption growth outpaced GDP growth in H2/2015 and has continued to do so this year. It measured 7.7% in H1/2016, and Q2 saw the strongest year-on-year growth rate in a single quarter since Q1/2008. Furthermore, there are indications that this trend continued in Q3, and the forecast assumes that private consumption will grow by 7.6% this year, well in excess of the Bank's previous estimate. If this projection proves correct, private consumption will have grown by nearly 15% during the period 2014-2016, or an average of 5% per year. At the same time, real net household wealth has grown by nearly 19% per year, contributing about one-fifth to the increase in private consumption.

In the past two years, household saving has increased markedly in spite of rapid private consumption growth (Chart IV-6). According to the forecast, households will reduce their saving in 2016 and 2017, but the ratio of private consumption to GDP will still be below its historical average.

Surge in business investment in H1/2016

Business investment has picked up strongly in the past two years, as has its share in GDP. After the financial crisis, business investment as a share of GDP remained broadly stable at 10%, but since 2014 it has grown swiftly. In the first half of 2016, it accounted for 17% of GDP, on the back of a volume increase of more than 37% year-on-year. The bulk of the increase is due to general business investment, as it is

clear that increased household demand and the booming tourism sector have stimulated firms' investment needs.

As has previously been discussed in *Monetary Bulletin*, the composition of business investment has changed in the past two years, with construction playing an increasingly important role. This is in line with indicators from surveys taken among executives, including their assessment of the economic outlook and their staffing needs. Investment in construction is therefore expected to remain strong this year.

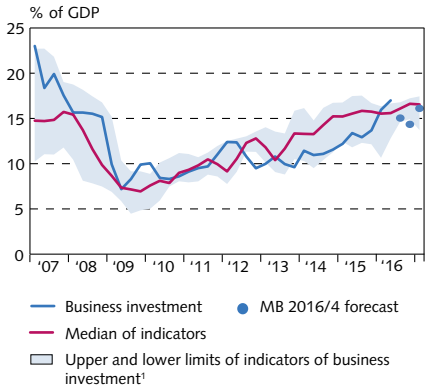
Business investment expected to be stronger in 2016 than previously projected …

Business investment is still expected to grow strongly this year, albeit less than in 2015 (Chart IV-7). The year-on-year reduction in growth is due to investment in ships and aircraft, which is expected to grow more modestly this year, after an increase of 79% in 2015. Pulling in the opposite direction is other business investment, including general business investment, which is expected to account for ¾ of this year's increase in total business investment (Chart IV-8). Energy-intensive investment is projected to grow somewhat less in 2016 than was assumed in previous forecasts, while other types of investment are expected to grow more rapidly. On the whole, business investment is expected to grow by just over 27% this year, some 3 percentage points more than was forecast in August, mainly because H1/2016 investment has outpaced the August forecast. The Bank's investment survey also indicates that, to an increasing degree, firms are financing investment expense with borrowed funds.

… but to slow markedly in 2017

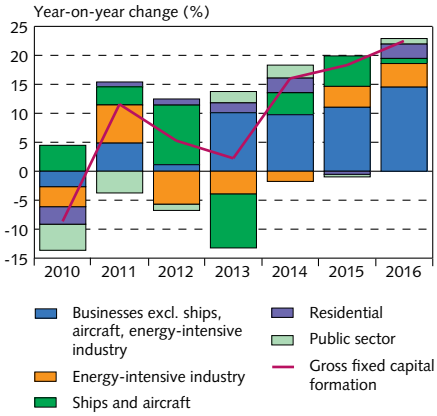
According to the Bank's investment survey, most sectors expect to step up their investment activity in 2016 in comparison with 2015 (Table IV-1). The increase is expected to be most pronounced in the tourism and transport sectors, while the services sector expects a contraction. On the whole, growth is projected at nearly one-fifth, somewhat less than was indicated by a comparable survey carried out this spring. For the first time, the survey asks about year-2017 investment plans. The most pronounced difference in responses is that businesses in the fish-

Chart IV-7
Indicators of business investment
Q1/2007 - Q1/2017



1. The indicators are imports of investment goods at constant prices and responses to four questions from the Gallup survey of Iceland's 400 largest companies. The questions centre on executives' assessment of (a) the economic outlook six months ahead, (b) how they expect domestic demand for their goods or services to develop in the next six months, (c) whether they expect their company's investment to increase year-on-year in the current year, and (d) whether they expect their margins to increase year-on-year. In assessing the range, all variables are rescaled so that their average and standard deviation are the same as those for business investment. Two-quarter moving averages. Indicators are lagged by two quarters.
Sources: Gallup, Statistics Iceland, Central Bank of Iceland.

Chart IV-8
Gross fixed capital formation and contribution of main components 2010-2016¹



1. Central Bank baseline forecast 2016.
Sources: Statistics Iceland, Central Bank of Iceland.

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

Largest 102 (101) firms *Amounts in ISK billions*	*2015*	*2016*	*2017*	*Change between 2015 and 2016 (%) (last survey)*	*Change between 2016 and 2017 (%)*
Fisheries (17)	12.2	13.7	9.3	12.0 (28.1)	-32.3
Industry (17)	4.3	4.8	5.3	11.6 (8.1)	10.8
Wholesale and retail sale (23)	7.4	9.0	8.2	22.0 (7.1)	-9.4
Transport and tourism (8)	18.2	28.2	26.5	55.0 (86.9)	-6.0
Finance/Insurance (9)	4.1	5.4	7.2	32.2 (51.7)	31.8
Media and IT (7)	7.3	7.1	7.4	-2.5 (-0.4)	4.1
Services and other (21)	16.4	15.0	14.2	-8.5 (-5.2)	-5.3
Total 102 (98)	69.9	83.3	78.1	19.1 (30.6)	-6.3

1. In parentheses is a comparison with the last survey, in which respondents from 101 firms were asked about investment plans for 2015-2016 (*Monetary Bulletin* 2016/2).
Source: Central Bank of Iceland.

ing sector expect a contraction in investment apart from investment in ships. Overall, the survey suggests that there will be a contraction in general business investment in 2017; therefore, the forecast assumes a significant reduction in business investment growth as a whole.[1]

Residential investment growth to exceed previous projections throughout the forecast horizon

Residential investment grew 17% year-on-year in H1/2016, as opposed to the August forecast of 13%. Other indicators also imply that residential investment will grow faster in 2016 than was forecast in August; for example, a new survey taken in September by the Federation of Icelandic Industries suggests more housing starts in 2016-2018 than previously expected. Residential investment is therefore expected to grow in 2016 by 18%, some 10 percentage points more than was forecast in August. The growth rate for the next two years is expected to average about a fifth per year. The ratio of residential investment to GDP is projected at 4.7% by the end of the forecast horizon, more than ½ a percentage point above the long-term average.

Investment close to its long-term average during the forecast horizon

In comparison with other components of GDP, investment generated the second-largest contribution to GDP growth in 2011-2015 (exceeded only by exports), even though the investment-to-GDP ratio was well below its long-term average during the immediate aftermath of the financial crisis. In H1/2016, total investment grew by over 23% year-on-year and accounted for 22½% of GDP, some 1½ percentage points above the long-term average. Investment is expected to remain the most important driver of GDP growth this year, with a contribution of over 4 percentage points. Business investment is projected to slow down in the latter half of the forecast horizon, with offsetting effects from increased momentum in residential investment. If this forecast materialises, the investment-to-GDP ratio will be 21% by the end of the forecast horizon.

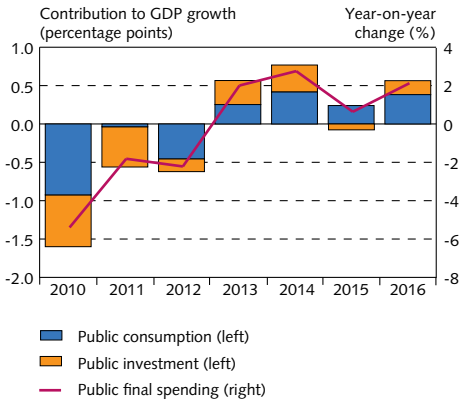
Public sector

Modest growth expected in public consumption

Since 2013, public consumption has grown by an average of 1.2% per year in real terms. Nominal public consumption growth has been much stronger, however, at 7.8% per year. This strong nominal growth rate has affected government sector performance and has required increased consolidation in order to meet performance targets. The targets have been met, in that real public consumption growth has never been this limited during a cyclical upswing. The forecast assumes a growth rate of 1.6% this year and a similar rate in coming years (Chart IV-9).

By the same token, annual growth in public investment has been relatively modest, or about 7½% per year since 2013, after having contracted by more than half in 2008-2012. According to the

Chart IV-9
Public consumption and investment 2010-2016[1]



1. Central Bank baseline forecast 2016.
Sources: Statistics Iceland, Central Bank of Iceland.

1. Because this is the first survey of 2017 investment plans, it should be interpreted with caution, as firms' investment plans may still be in preparatory stages.

last *Monetary Bulletin*, public investment was expected to grow in line with overall growth in economic activity, at about 3% of GDP throughout the forecast horizon. The premises for the forecast have changed, however, with the approval of the new Transport Strategy, which provides for further investment in the amount of 0.4% of GDP per year, in addition to that included in the Government's five-year fiscal plan. As a result, investment growth will be stronger in 2017 than in recent years. In addition to this, the construction of the new Landspítalinn hospital will begin in 2019, as is provided for in the fiscal plan.

Fiscal budget proposal has yet to be presented

The fiscal budget proposal for 2017 has not yet been presented, and the new Government's fiscal policy for the coming years has yet to be publicised.[2] This issue of *Monetary Bulletin* is therefore based on the five-year fiscal policy and fiscal plan presented by the departing Government. That Government recently deviated from its fiscal plan in two major ways: on the one hand, with the Transport Strategy, and on the other, with increased funding for social security. Both of these measures are unfunded and therefore represent fiscal easing.

Treasury performance deteriorates from previous assessment

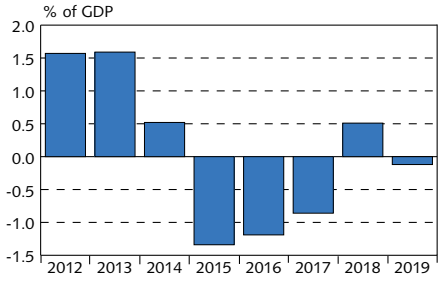
The combined cost effects of changes to the Transport Strategy and the social security system amount to more than 20 b.kr. per year, or nearly 1% of GDP. The outlook has therefore deteriorated in comparison with the Central Bank's previous projections, published in May in *Monetary Bulletin* 2016/2. It is uncertain whether special revenue-generating measures will be undertaken to finance these outlays; therefore, it is assumed that there will be a deficit on Treasury and public sector finances throughout the forecast horizon. There will be a primary surplus, but at the same time as the interest account balance improves, the primary surplus will deteriorate from 1.9% of GDP in 2016 to 1.1% in 2019. This forecast is subject to considerable uncertainty, however, as the 2017 fiscal budget proposal has not yet been presented (see also the discussion of uncertainties in Chapter I).

What is the fiscal stance at any given time?

In general, it is broadly agreed that prudent fiscal policy involves automatic fiscal stabilisers that determine the policy stance at any given time, and that there is no need to apply special policy measures to this end. Because the tax burden rises with increased income, it rises during a cyclical upswing and declines during a cyclical downturn. Therefore, other things being equal, government revenues account for an increased share of GDP during a cyclical upswing. Conversely, government expenditure declines during a cyclical upswing, as spending on various benefits declines and nominal expenditures do not generally fluctuate in line with the business cycle. Therefore, as a share of GDP, government sector net revenue tends to rise during a cyclical upswing and fall during a downturn. In the absence of special fis-

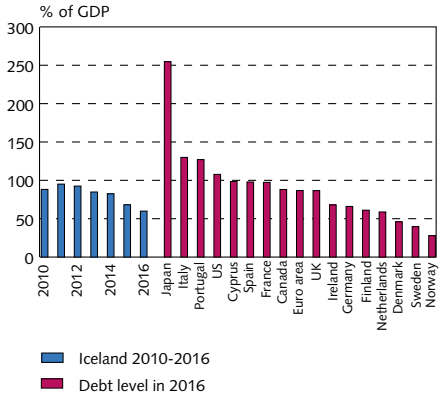
2. For this reason, this *Monetary Bulletin* does not contain a special appraisal of next year's National Budget, as is usual in the November issue of *Monetary Bulletin*.

Chart IV-10
Change in central government cyclically adjusted primary balance 2012-2019[1]



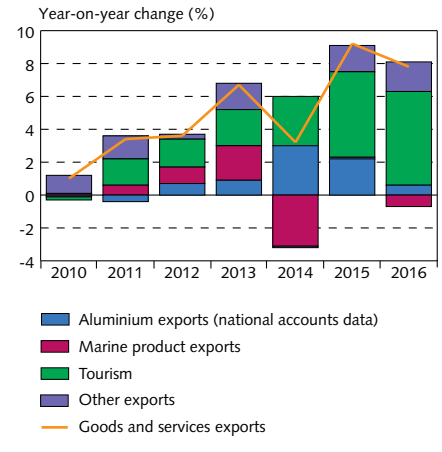
1. Central Bank baseline forecast 2016-2019. Primary balance is adjusted for one-off revenues and expenditures (e.g., stability contributions, and the accelerated write-down of indexed mortgage loans).
Sources: International Monetary Fund, Ministry of Finance and Economic Affairs, Central Bank of Iceland.

Chart IV-11
General government gross debt



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

Chart IV-12
Exports and contribution of subcomponents 2010-2016[1]



1. Central Bank baseline forecast 2016.
Sources: Statistics Iceland, Central Bank of Iceland.

cal measures, the cyclically adjusted primary balance should therefore remain unchanged over the business cycle, as all changes in the fiscal balance can be explained by the cycle itself. This implies that all spending decisions entail fiscal easing unless they are fully financed. The same applies to revenue reductions not accompanied by commensurate spending cuts. This also means that the cyclically adjusted balance could deteriorate even though the headline balance improves, and the fiscal stance could ease in spite of a larger fiscal surplus.

Significant fiscal easing three years in a row

Excluding the stability contributions, Treasury performance is estimated to deteriorate in 2016 and then improve in the following two years. As is discussed later in this chapter, the slack in output is estimated to have disappeared in 2015 and a positive output gap to emerge this year. The cyclically adjusted primary balance will therefore deteriorate by 1.2% of GDP this year, in addition to last year's fiscal easing of 1.3%, making for a total easing of 2.5% of GDP in 2015-2016 (Chart IV-10), which is in line with the Bank's previous estimates. According to the forecast, the fiscal stance is expected to ease by a further 1% of GDP in 2017 and then be broadly neutral over 2018-2019.

Public debt to decline, but less than assumed in the Government's fiscal plan

The fiscal plan presented in spring 2016 provided for rapid reduction of debt. It also provided for the sale of the State's 30% holding in Landsbankinn during the then-current electoral term; however, the sale did not take place. The outlook for government net revenue has also worsened, so that the primary balance is expected to deteriorate. Furthermore, no payments were made towards the Treasury's debt to Part A of the Government employees' pension fund, as was assumed in a bill of legislation that was not passed before the end of the legislative session. Therefore, the baseline forecast assumes a slower rate of government debt reduction than the fiscal plan allows for (Chart IV-11).

External trade and the current account balance

Outlook for robust export growth in 2016 ...

As is discussed above, exports have played a key role in the economic recovery, led by robust tourism-related services exports (Chart IV-12). This trend continued in H1/2016, with exports growing 5.3% year-on-year. Services exports grew more slowly than was forecast in August, however, owing both to Statistics Iceland's revision of 2015 figures and to weaker-than-expected growth in several subcomponents of services exports. Total export growth therefore turned out 1 percentage point less in H1 than was forecast in August, even though goods exports were stronger than previously anticipated.

According to Statistics Iceland's external trade figures, the value of goods exports contracted year-on-year in the first nine months of 2016, owing to the appreciation of the króna. Exports of aluminium and marine products are expected to be weaker this year than was projected in August. On the other hand, other goods exports have been stronger than previously thought, rising by nearly a fourth year-

on-year in H1/2016. On the whole, the forecast for goods exports is broadly unchanged from the last forecast, although the composition of exports has changed significantly.

Services exports grew by 9% in H1/2016 and are expected to maintain that pace in H2. Foreign tourists' departures from Iceland via Keflavík Airport were up by about a third year-on-year in the first nine months of 2016, and Iceland's largest airlines saw increased ticket sales and seat utilisation during the period. There will be some base effects in 2016 because of Statistics Iceland's revision of 2015 numbers, but services export volumes will be broadly in line with the August forecast. Goods and services exports are therefore forecast to grow this year by 8%, or nearly 1 percentage point less than was projected in August.

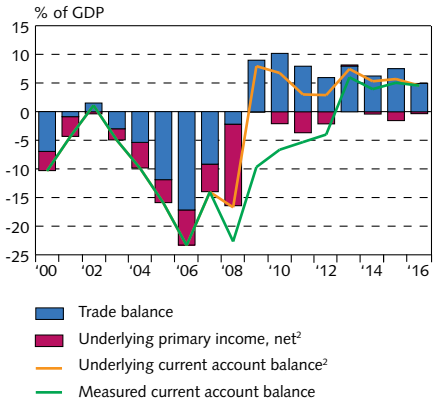
… and stronger import growth alongside a surge in domestic demand

Imports have grown rapidly in the recent term, alongside a surge in domestic demand, and the pace has picked up so far in 2016. In H1, imports grew by over 16% year-on-year, the strongest annual growth rate since H1/2006. This growth rate, which slightly outpaces domestic demand growth over the same period, is reflected in increased imports of consumer durables and investment goods, as well as in increased overseas travel by Icelanders. In addition to generally strong demand effects, it can be assumed that import growth is more robust than it would be otherwise because of the rise in the real exchange rate. Imports of consumer and investment goods have grown significantly year-to-date, and Statistics Iceland's external trade figures suggest that goods imports will continue to grow in the second half. Imports of passenger vehicles have increased in particular. This is due to two factors: the fleet needs renewal after a long period of limited investment, and the surge in tourism generates a substantial need for rental cars. Icelandic Tourist Board figures on Icelanders' departures via Keflavík Airport and Gallup's survey of Icelanders' overseas travel plans also indicate that tourism services imports will grow this year at about the rate assumed in the previous forecast. This is in accordance with households' increased purchasing power. On the whole, goods and services imports are expected to grow by about 15¾% this year, or 1 percentage point more than was projected in August. This is in line with the revision of domestic demand growth by a broadly similar amount.

Contribution from net trade becomes less negative over the forecast horizon

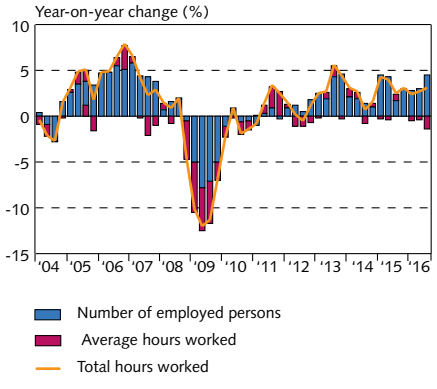
As is discussed above, both imports and exports have grown markedly in 2016. As is generally the case when domestic demand surges, import growth is strong enough that the overall contribution from net trade is negative. According to the forecast, it will be negative by about 3 percentage points of GDP this year, or about the same as in 2014. It is assumed that both import and export growth will lose momentum over the forecast horizon and that the contribution of net trade to output growth will be broadly neutral.

Chart IV-13
Current account balance 2000-2016[1]



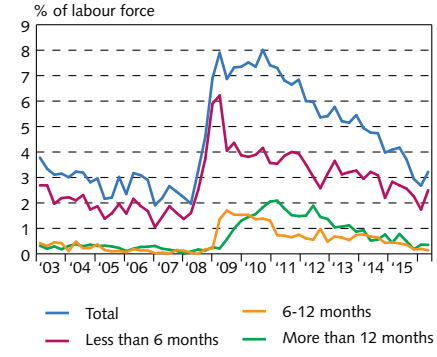
1. Including secondary income. Central Bank baseline forecast 2016.
2. Excluding the calculated income and expenses of DMBs in winding-up proceedings and the effects of pharmaceuticals company Actavis on the balance on income until 2012. Also adjusted for the failed DMBs' financial intermediation services indirectly measured (FISIM). With the settlement of the failed banks' estates in year-end 2015, there is no longer any difference between headline and underlying current account numbers.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart IV-14
Employment and hours worked
Q1/2004 - Q3/2016



Source: Statistics Iceland.

Chart IV-15
Unemployment by duration[1]
Q1/2003 - Q3/2016



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

Trade surplus larger in 2016 than was projected in August, but smaller for the remainder of the forecast horizon

The trade surplus amounted to 7.5% of year-2015 GDP. It has narrowed thus far in 2016 and is projected at about 5% of GDP for the year as a whole, which is broadly in line with the August forecast. The H1/2016 current account surplus amounted to 44 b.kr., or 3.9% of GDP, about the same as at the same time in 2015. The current account surplus for the year as a whole is projected at 4½% of GDP, nearly 1 percentage point less than in 2015 (Chart IV-13). This is a somewhat larger surplus than was provided for in the August forecast, owing to the improved outlook for the primary and secondary income balance. As in August, it is assumed that the current account surplus will narrow to about 3% of GDP in 2017 and then narrow further as the forecast horizon progresses. By the end of the forecast horizon, it is expected to be significantly smaller than has previously been projected, as the exchange rate is projected to be higher than in the previous forecast (see Chapter I). If the forecast materialises, national saving will equal about a fourth of GDP in 2016 but will decline to just over 22% by the end of the forecast horizon.

Labour market

Robust growth in labour demand …

Labour use has grown substantially in the recent term, in line with increased economic activity, and unemployment has declined rapidly. According to the Statistics Iceland labour force survey (LFS), total hours worked rose by 3.2% year-on-year in Q3/2016, as in the August forecast. The rise in total hours can be attributed to a 4.5% increase in the number of employed persons, but the average work week was shortened by 1.2% (Chart IV-14). This recent trend towards a shorter work week is probably due in part to firms' having chosen to cut down on expensive overtime in response to costly wage settlements, opting instead to increase staffing levels. The impact of a strong rise in real wages probably shows as well in increased labour participation and a reduction in the number of people outside the labour market. Labour participation increased by 1.2 percentage point year-on-year in Q3 and is back to its early 2007 peak. The employment rate therefore rose by 2 percentage points and is rapidly approaching its pre-crisis high. Seasonally adjusted unemployment measured 3.1% in Q3, having declined by nearly a percentage point year-on-year (Chart IV-15).[3]

… and executives continue to expect further additions to staffing levels

The outlook is for labour demand to remain robust. According to Gallup's autumn survey, firms interested in recruiting staff in the next six months outnumbered those planning redundancies by nearly a third (Chart IV-16). This is broadly in line with the summer survey and about 15 percentage points more than in the survey carried out a year ago. The percentage is at its highest since 2007, as is the number of firms

3. Unemployment as registered by the Directorate of Labour (DoL) was lower, or 2.4%, in Q3, after adjusting for seasonality, and had declined by 0.6 percentage points between years.

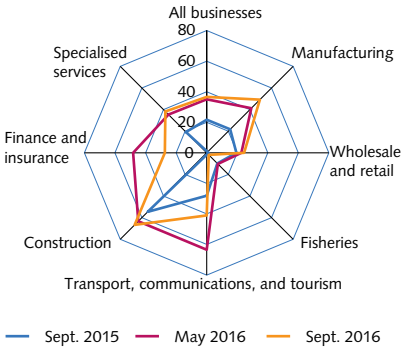
planning to hire workers in coming months. Only 4.5% of firms were interested in downsizing, the smallest share since H1/2007.

In comparison with the summer survey, the number of tourism companies considering recruiting declined relative to the number interested in downsizing, even after accounting for seasonality. This could be because many firms in the sector have already reached the staffing levels required, but it might also be an indication that a stronger króna has begun to affect tourism operators' business, which would be in line with the survey carried out by the Confederation of Icelandic Employers among its members in August. Demand for labour in the construction sector is as strong as in the summer survey, however, as firms interested in recruiting outnumbered those considering redundancies by nearly 70 percentage points, about the same share as in the past year.

Chart IV-16

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.

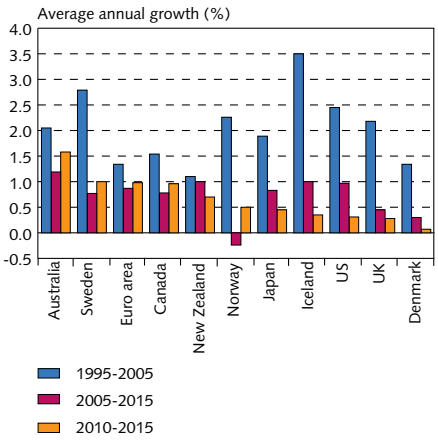
Weak productivity growth in the wake of the financial crisis …

In spite of strong GDP growth and a labour shortage, productivity growth has been weak in Iceland in recent years. This slowdown in productivity is not limited to Iceland, however; similar trends have been seen in most advanced economies since the turn of the century and, more recently, among many emerging countries as well (Chart IV-17). Explaining this slowdown has proven difficult. During the immediate aftermath of the financial crisis, it was common to claim that firms had attempted to retain staff that they had trained even in spite of a decline in demand, but this explanation does not suffice as the economic recovery is underway or even well advanced, as in Iceland. It has also been argued that investment has been limited following the financial crisis, with corporate indebtedness and uncertainty about the economic outlook cited as important underlying causes. It has also been pointed out that, in many economies, low-productivity firms at the margin of exit have been able to limp along on low interest rates or public support aimed at maintaining employment levels. Another factor of possible significance for Iceland is the change in the composition of output, with lower-productivity sectors gaining in importance.

Chart IV-17

Productivity in selected industrialised countries[1]

Average annual growth (%)



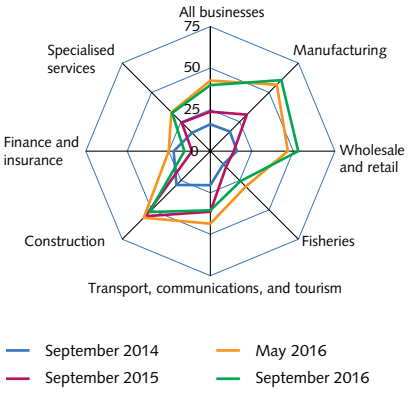
1. Productivity is constant price GDP per hour worked. Growth till 2014 for New Zealand and Japan.
Sources: OECD, Statistics Iceland, Central Bank of Iceland.

… although the slowdown in productivity actually began earlier

As Chart IV-17 shows, productivity had slowed down in most advanced economies before the financial crisis struck. This happened in spite of advances in computer and digital technology. Although the possibility cannot be excluded that the full impact of these advances has yet to emerge or that this technology has made it more difficult than before to measure productivity, this could indicate a deeper, more structural problem. If it is true, as has been maintained, that the low-hanging fruit of digital and computer technology has already been picked, this trend could prove to be a lasting one. It could also be that there is an increasing divergence in productivity growth among firms whose technological position differs, as there is a slowdown in the diffusion of new technology, and companies that are technological leaders capture a rising share of the global market on the basis of their leading position.[4] The recent slowdown in productivity growth could therefore be

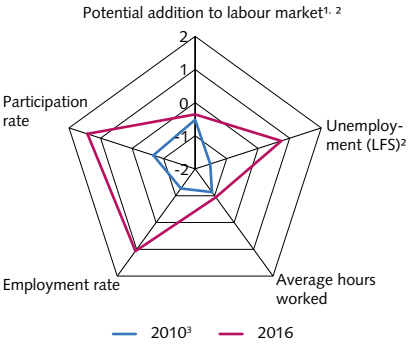
4. These and other related views are discussed in a recent OECD report entitled *The Productivity-Inclusive Nexus*, prepared for a ministerial meeting of member countries in June 2016.

Chart IV-18
Firms considering themselves short-staffed[1]
Share of businesses (%)



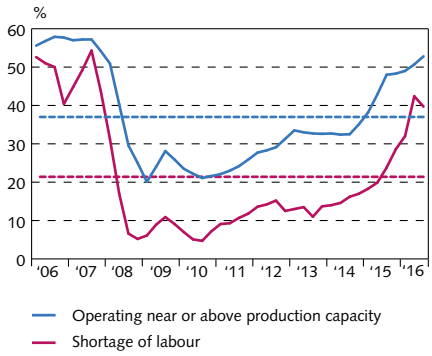
1. Seasonally adjusted figures.
Sources: Gallup, Central Bank of Iceland.

Chart IV-19
Indicators of labour market tension in the first 3 quarters of the year
Deviation from 2003-2016 average (number of standard deviations)



1. The percentage of the population of workinga age that (a) are seeking work but cannot begin work within two weeks; (b) could begin work within two weeks but are not looking for work; or (c) are underemployed.
2. Multiplied by -1 so that a negative deviation from the average indicates tension. 3. The year when labour market recovery began.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart IV-20
Indicators of factor utilisation[1]
Q1/2006 - Q3/2016



1. According to Gallup Sentiment Survey among Iceland's 400 largest firms. Seasonally adjusted data. Data on the operation level relative to production capacity is reported semiannually. Quarterly data is generated via interpolation. Broken lines show period averages.
Sources: Gallup, Central Bank of Iceland.

an indication of weaker long-term productivity growth. If this is also the case in Iceland, it could indicate that the long-term trend growth rate of the economy is less than has generally been assumed.

Indicators of factor utilisation

Labour shortage broadly similar to that in early summer …

The share of firms considering themselves short-staffed in Gallup's autumn survey was similar to that in the summer survey, or about 40%, although it differed from one sector to another (Chart IV-18). In the specialised services, manufacturing, and retail and wholesale trade sectors, the number of firms considering themselves short-staffed rose between surveys, while it fell in other sectors. The share of tourism companies considering themselves understaffed declined between surveys but remained unchanged year-on-year. It should be noted, though, that the ratio is very high, at about 40%, and that in construction, retail and wholesale trade, and manufacturing, it is about 50-60%.

… and tension is growing in the labour market, …

There is growing tension in the labour market, owing to strong labour demand. As has been discussed previously, labour participation is similar to that in early 2007, and the employment rate is approaching its previous peak. Average hours worked and the measure of a potential addition to the labour market are still below their historical averages, however.[5] Consequently, there could still be some scope to address additional demand for labour by lengthening the work week, importing labour, or increasing participation among those willing to work but not necessarily looking for a job (Chart IV-19).

… which has been addressed in part with imported labour …

The percentage of firms considering themselves understaffed has been high enough in the past year that it is probably difficult for them to address the shortage without importing labour, with net immigration of foreign nationals amounting to 2.5% of the population in the past two years. The ratio of foreign nationals to the population of Iceland has also risen strongly since 2013. By the end of 2015, it was 8%, nearly ½ a percentage point above its previous peak from around the time of the financial crisis.

… therefore, the output gap has not grown as rapidly as previously expected

Surveys among corporate executives indicate that firms are having about the same amount of difficulty filling positions and responding to unexpected surges in demand as they had during the spring – after a sharp increase last year (Chart IV-20). This is consistent with the Bank's view that the post-crisis output slack has disappeared and given way to a positive output gap (Chart IV-21). GDP growth has been strong in recent years and is considered to have been in excess of the growth

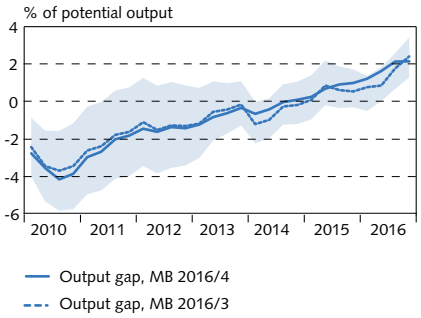
5. Those who are employed part-time but would like to work more (often referred to as underemployed), those who are seeking work but cannot begin within two weeks, and those who could begin work within two weeks but are not looking for a job are considered a potential addition to the labour market.

rate of potential output for some time. The strain on domestic resources has been eased somewhat with imported labour, however. It is now assumed that labour will be imported in greater numbers than before and that the output gap will therefore be smaller than was projected in August, even though output growth is expected to be stronger than was forecast at that time. The output gap is expected to widen until mid-2017 and then gradually narrow thereafter. As Chart IV-22 indicates, the situation is very different from that in other developed countries, where a slack in output has been more persistent.

Chart IV-21

Output gap[1]

Q1/2010 - Q4/2016

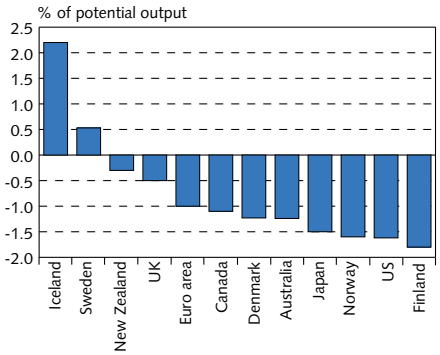


1. Shaded area shows ± 1 five-year standard deviation. Central Bank baseline forecast 2016.

Sources: Statistics Iceland, Central Bank of Iceland.

Chart IV-22

Estimated output gap in 2016, selected industrialised countries[1]



1. US Congressional Budget Office estimate for US; HM Treasury estimate for the UK; European Commission estimate for the euro area and Finland; and estimates of the relevant central banks for Denmark, Iceland, Canada, Norway, New Zealand, and Sweden. For other countries, estimates are based on IMF data (*World Economic Outlook*, October 2016).

Sources: Central banks of Denmark, Canada, Norway, New Zealand, and Sweden; European Commission; HM Treasury; IMF; US Congressional Budget Office, Central Bank of Iceland.

V Inflation

Inflation measured 1.3% in Q3/2016, in line with the forecast in the August *Monetary Bulletin*, and has been below the Bank's inflation target for nearly three years. House prices continue to rise and are still the main driver of inflation. In spite of a strong economic recovery and sizeable pay hikes in the recent term, domestic inflation has remained low, offset by improved terms of trade and the appreciation of the króna. In recent months, however, global deflation has slowed and oil prices have risen, and the outlook is for this trend to continue in the coming term. Long-term inflation expectations have eased downwards and appear more firmly anchored to the Central Bank's inflation target.

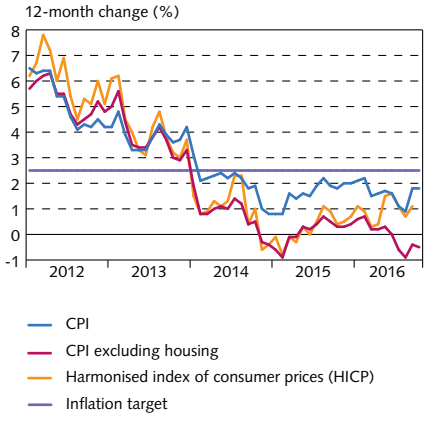
Recent developments in inflation

Inflation is below target but has risen since the last *Monetary Bulletin*

Inflation has been below the inflation target for nearly three years. It measured 1.3% in Q3, in line with the Bank's August forecast, but has risen somewhat since then. The increase is due in part to Statistics Iceland's CPI calculation error over the period from March through August and the subsequent correction. Because of the error, the rise in imputed rent in March was used as a basis for the calculation of the index not in March but in April, giving rise to a one-month lag in this component of the CPI. Statistics Iceland discovered this error in September and corrected it by basing the September CPI calculation on the rise in imputed rent in both August and September. Inflation was therefore underestimated over this period, with the strongest impact in July and August. August inflation should therefore have measured 1.2% instead of Statistics Iceland's published figure of 0.9%, and therefore, headline inflation never fell below the 1% defined as the lower deviation threshold of the inflation target.

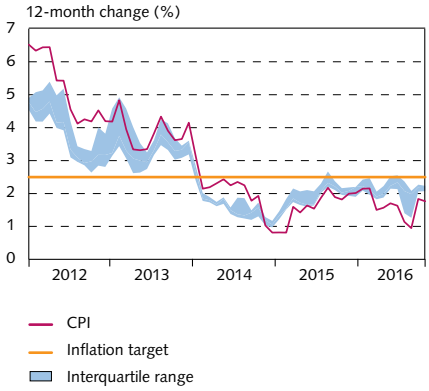
The CPI was unchanged month-on-month in October, and twelve-month inflation was 1.8%, as in October 2015 (Chart V-1). The main drivers in October were rising house prices and reduced imported goods prices. The CPI excluding the housing component declined by 0.5% year-on-year, however. HICP inflation, which also excludes housing, measured 1.1% in September.

Chart V-1
Various measures of inflation
January 2012 - October 2016



Sources: Statistics Iceland, Central Bank of Iceland.

Chart V-2
Headline and underlying inflation[1]
January 2012 - October 2016



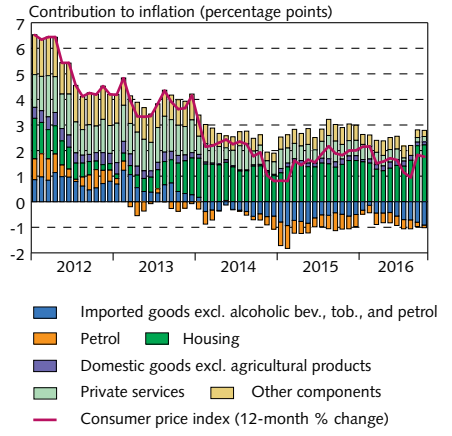
1. The shaded area includes the interquartile range of estimates of underlying inflation; core indices that exclude the effects of volatile food items, petrol, public services and owner-equivalent rent and statistical measures such as the weighted median, the trimmed mean and a dynamic factor model.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

Underlying inflation and other indicators of inflationary pressures

Rising house prices are one of the main manifestations of domestic inflationary pressures ...

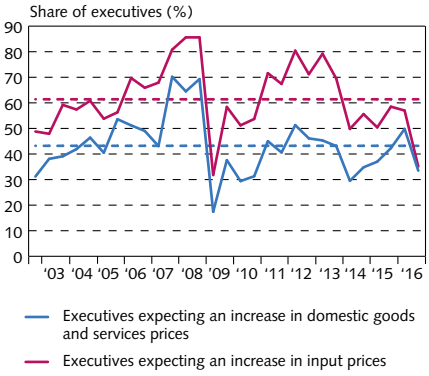
Underlying twelve-month inflation as measured by core index 3 (which excludes the effects of indirect taxes, volatile food items, petrol, public services, and real mortgage interest expense) has been at or below target since early 2014. It measured 2.1% in October and has risen since the publication of the August *Monetary Bulletin*. Statistical measures

Chart V-3
Components of CPI inflation
January 2012 - October 2016



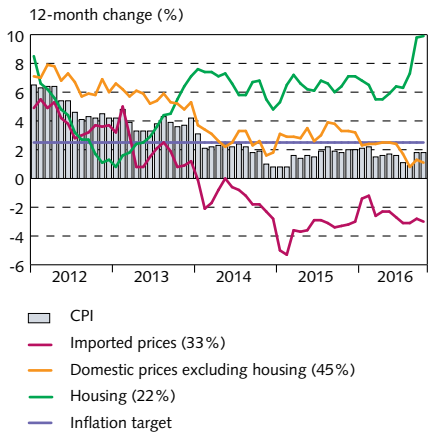
Source: Statistics Iceland.

Chart V-4
Corporate expectations of input and product prices 6 months ahead 2002-2016[1]



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

Chart V-5
Imported and domestic inflation[1]
January 2012 - October 2016



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.

of underlying inflation have developed similarly. Most of them indicate that underlying inflation was around 2% in October (Chart V-2).[1]

In spite of increased purchasing power and a strong economic recovery, there are no decisive signs that general domestic inflationary pressures are growing. However, clearer signs can be seen in house prices, which have been the main driver of inflation in the recent past (Chart V-3). Limited supply is also a major factor here, as residential investment has been relatively weak and private rentals to tourists have soared, particularly in the capital area (see Chapter III). Further signs of mounting tension in the housing market can be seen in Gallup's autumn survey among Iceland's 400 largest firms. According to the survey, about 60% of construction companies expect to raise their domestic product prices in the next six months. On the other hand, sectors that rely more heavily on imports appear less likely to do so. For example, only 13% of firms in retail and wholesale trade expect to raise prices in the next six months, as opposed to nearly half in the previous survey. On the whole, the share of firms expecting to raise prices has fallen from 50% in the last survey to 34% in the current one (Chart V-4). The same is true of executives' expectations concerning input prices, as 35% now expect price hikes in the next six months, down from 57% in March.

... but are offset by an higher exchange rate of the króna

As is discussed in Box 5 of *Monetary Bulletin* 2016/2, the fact that inflation has been below target since early 2014 is mainly explained by the appreciation of the króna and the decline in imported goods prices. Those factors have pulled together with a tight monetary stance to contain inflationary pressures from the labour market. The contribution from imported prices still pulls the CPI somewhat downwards (Chart V-5), even though oil prices have begun rising and reductions in trading partners' export prices in foreign currency have lost pace (Chart V-6). Pulling in the opposite direction is the appreciation of the króna, which has kept the twelve-month reduction in trading partners' export prices in krónur terms at just over 10% for this entire year. Import prices have developed similarly.

The twelve-month rise in domestic prices excluding housing has lost pace since the last *Monetary Bulletin*. In October it measured 1.1%, well below the H1/2016 average of 2.4% per month, owing mainly to private services prices, which rose by only 0.9% in October. Since July, the contribution of private services to twelve-month inflation has been very limited compared to historical averages. However, public services prices have risen more than their private counterpart (Chart V-7). In most cases, wage costs are services companies' largest expense item; therefore, services prices could be expected to have increased more than they actually have, given the large pay increases negotiated recently. However, the appreciation of the króna is most likely a factor, as services sectors use imported inputs even though

1. It should be noted that, owing to Statistics Iceland's error, underlying inflation was also underestimated over the period from March through August. By the same token, Statistics Iceland's official figures will overestimate year-on-year inflation (both in terms of the CPI and in terms of core indices or statistical measures) over the same period in 2017.

they are more labour-intensive than many other sectors.[2] Declining input prices have enabled domestic firms to absorb wage-related cost increases without raising prices, thereby containing inflation. Nevertheless, domestic inflationary pressures appear to have increased since the beginning of the year, although they remain modest by most measures (Chart V-8). As before, signs of increased inflationary pressures come mainly from the labour market, as unit labour costs have risen well in excess of other indicators.

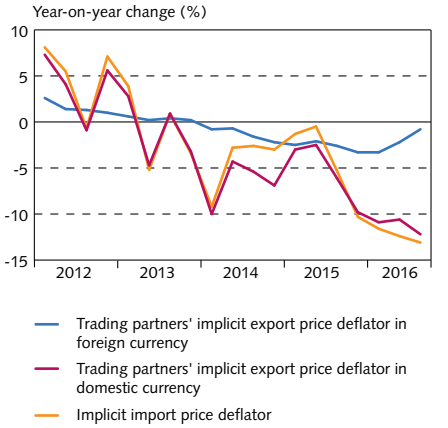
Wages are estimated to have risen more in 2015 than Statistics Iceland's preliminary figures indicate ...

Wages, as measured by the wage index, have risen in line with the previous forecast, and wage drift is broadly in line with the forecast as well. The wage index rose in Q3/2016 by 1.6% quarter-on-quarter and by 11% year-on-year. In historical context, wage drift is still limited given how many firms consider themselves short-staffed. This is probably because employers are importing labour instead of competing for workers by overbidding on wages (see Chapter IV).

As is discussed in Box 2 of *Monetary Bulletin* 2016/2, Statistics Iceland's first estimates of increases in wages and related expenses, published in March, indicated that wages per hour rose by 5.5% in 2015, only half of the 10.4% forecast in the February *Monetary Bulletin*. Statistics Iceland's September estimate of 2015 wage rises was unchanged from the March estimate and is small given the size of the recent contractual pay increases; furthermore, it fits poorly with the contracting parties' own estimates, which are based on those pay increases. It is also less than the 7.2% year-on-year rise in the wage index, and it is unlikely that wages per hour have risen less than the wage index, given how the index underestimated pay increases in 2015 (see Box 4 of *Monetary Bulletin* 2015/4). Statistics Iceland's figures suggest that the wage share fell by almost 1 percentage point in 2015, which is also unlikely in view of the historical relationship between the output gap and the wage share. Given the growing demand pressures in the economy, the wage share should generally be rising, not falling (Chart V-9). Since the wage share began rising again in 2010, it has risen by an average of 1.6 percentage points per year. If it had risen by that amount last year, wages per hour would have risen by 10.2%, and in order for the wage share to remain unchanged, wages would have to rise by 7.3%. In September, Statistics Iceland published disposable income figures for the household sector, which are based largely on individuals' income tax returns. According to those figures, wages per hour rose considerably more in 2015 than according to Statistics Iceland's production accounts, or by 7.4%, which is in line with the rise in the wage index. And finally, a survey carried out by the Confederation of Icelandic Employers among its member organisations indicates that, instead of laying off workers, firms have

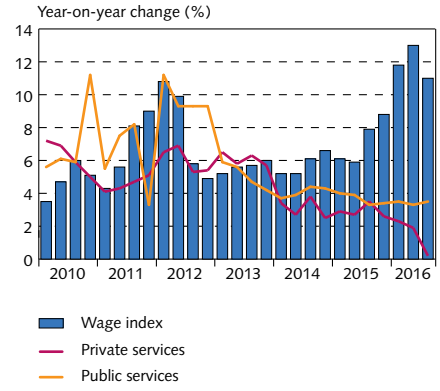
2. According to the OCED's input-output figures from 2011 (http://stats.oecd.org/Index.aspx?DataSetCode=IOTS), the share of foreign inputs in the domestic private services sector is as much as 15%. In most instances, this percentage was much lower for public services (for example, about 5% for education and public administration), which explains to some extent why public services prices have risen more than private services prices.

Chart V-6
Import prices and international export prices[1]
Q1/2012 - Q3/2016



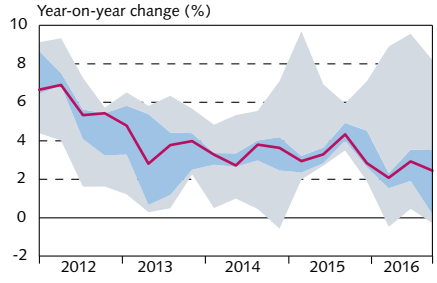
1. Central Bank baseline forecast Q3/2016.
Sources: Statistics Iceland, Macrobond, Central Bank of Iceland.

Chart V-7
Wages and services prices
Q1/2010 - Q3/2016



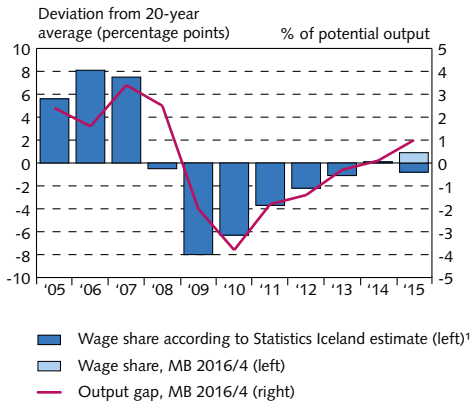
Source: Statistics Iceland.

Chart V-8
Domestic inflationary pressures[1]
Q1/2012 - Q3/2016



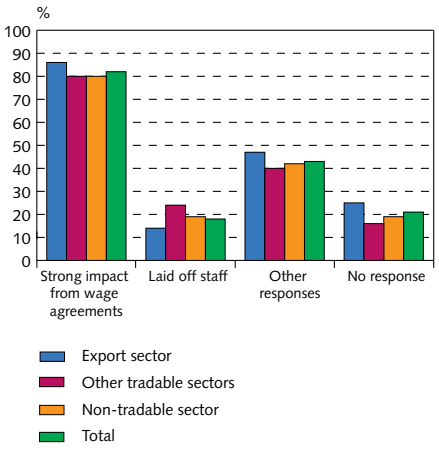
1. The shaded area includes five indicators of domestic inflationary pressures. The indicators are unit labour costs (moving average), the GDP price deflator, prices of private services and domestic goods, and producer prices of goods sold domestically. Central Bank baseline forecast Q3/2016 for the GDP price deflator and 2015-2016 for unit labour costs.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart V-9
Wage share and output gap 2005-2015



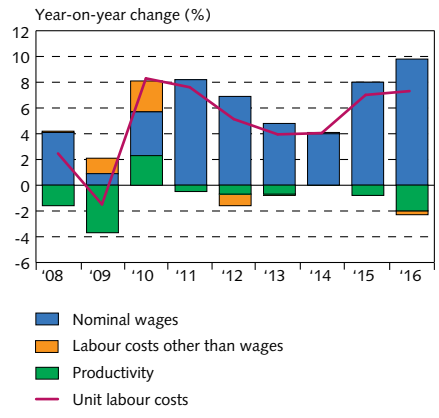
1. Wages and related expenses as a share of gross factor income. The 20-year average is 60.8% (1995-2014, base 1997).
Sources: Statistics Iceland, Central Bank of Iceland.

Chart V-10
Wage agreements: impact on companies and companies' responses



Source: Confederation of Icelandic Employers.

Chart V-11
Unit labour costs and contribution of underlying components 2008-2016[1]



1. Labour productivity growth is shown as a negative contribution to an increase in unit labour costs. Central Bank baseline forecast 2015-2016.
Sources: Statistics Iceland, Central Bank of Iceland.

taken other action to reduce the costs associated with contractual pay increases (Chart V-10). Many firms indicate that they have reduced overtime, which could explain why wages per hour have not risen as the first estimates indicated.

In view of this, it is still assumed that wages rose more in 2015 than Statistics Iceland's preliminary figures according to the production accounts indicate. They are estimated to have risen by 8% last year, less than was assumed in August. The wage share is therefore estimated to have been just about 61½% of gross factor income last year, an increase of ¾ of a percentage point since 2014.

... and are expected to continue rising strongly this year

Estimates of wage developments in 2016 and over the forecast horizon are unchanged from the last forecast; therefore, quarter-on-quarter wage increases are assumed to be broadly in line with that forecast. Because it is estimated that wages rose less in 2015 than was assumed in August, the increase between annual averages will also be smaller this year. It is assumed that wages will rise by nearly 10% between annual averages in 2016, and that the wage share will rise to about 64½%, or 3½ percentage points above the twenty-year average. Offsetting the steep wage increases is nearly 2% productivity growth. Unit labour costs therefore rise by about 7½% this year, or about 1½ percentage points less than was projected in August (Chart V-11). As before, it is not assumed that the wage settlement review next February will lead to further pay hikes than have already been negotiated. This is somewhat uncertain, however, and given the tension that has developed in the labour market, wage drift could also be underestimated.

Inflation expectations

Short-term inflation expectations approach target ...

One- and two-year inflation expectations have fallen markedly in the recent term, alongside the decline in inflation (Chart V-12). According to Gallup's September survey, household inflation expectations fell steeply between surveys and are now at a historical low. Households' one-year expectations now measure 2.5%, a reduction of 0.7 percentage points between surveys, and their two-year expectations fell by 1 percentage point between surveys, to 3%. Corporate inflation expectations have developed in a similar manner, and one-year expectations are now lower than at any time apart from the immediate aftermath of the financial crisis. Executives expect inflation to measure 2% in one year, a reduction of 1 percentage point from the May survey. Executives' two-year inflation expectations have fallen to an all-time low of 3%, a reduction of ½ a percentage point since the March survey.

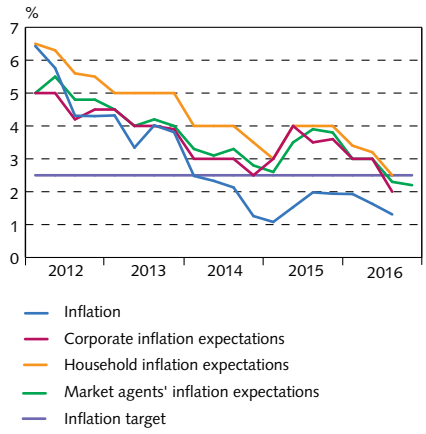
Market agents' inflation expectations have also declined in the recent past. According to the survey carried out by the Central Bank in early November, market agents expect inflation to measure 2.2% in one year, which is broadly unchanged from the August survey. Two-year inflation expectations measured 3% which is unchanged from August. The short-term breakeven inflation rate in the bond market, as calculated in terms of the spread between indexed and non-indexed

bonds, also fell in the wake of the Central Bank's interest rate cut in August but rose again after Statistics Iceland published its September inflation measurement. In October, the one- and two-year breakeven inflation rates averaged 2.4%.[3]

… and long-term inflation expectations appear more firmly anchored to target

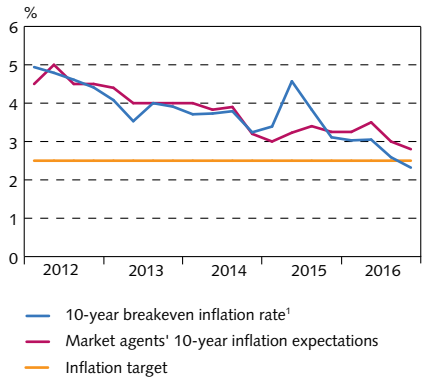
Market agents' long-term inflation expectations have gradually eased downwards towards the inflation target. According to the Bank's November survey, market agents expect inflation to average 2.8% over the next ten years, a decline of 0.2 percentage points from the previous survey (Chart V-13). The breakeven inflation rate in the bond market tells a similar tale, as the ten-year breakeven rate has been about 2.4% thus far in Q4. It is noteworthy that the Bank's interest rate reduction in August and Statistics Iceland's correction of its error in CPI measurements both had less effect on the long-term breakeven rate than on the short-term rate. Both this and recent developments in inflation expectations and the breakeven inflation rate suggest that inflation expectations are more firmly anchored than before.

Chart V-12
Inflation and inflation expectations one year ahead
Q1/2012 - Q4/2016



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

Chart V-13
Long-term inflation expectations
Q1/2012 - Q4/2016



1. The value for Q4/2016 is the Q4 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.

Box 1

Capital flows and the Central Bank's new capital flow management measure

In early June, the Central Bank of Iceland adopted a new policy instrument, a capital flow management measure (CFM), designed to temper and affect the composition of capital flows to Iceland. The CFM is based on the Rules on Special Reserve Requirements for New Foreign Currency Inflows, which were adopted in accordance with a new Temporary Provision of the Foreign Exchange Act, no. 87/1992.[1] It is therefore intended to reduce temporary risk accompanying excessive capital inflows, support other aspects of domestic economic policy, and thereby contribute to macroeconomic and financial stability. Since the CFM was activated, capital flows into the domestic bond market have slowed markedly, and indicators of disturbances in the transmission of monetary policy through the interest rate channel have subsided. Although the CFM is based on the current regulatory framework for foreign exchange, work on the final version of the measure and its long-term legal framework is underway.

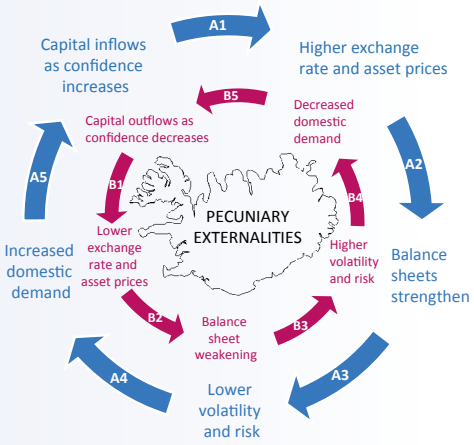
Freedom of capital movements has long fluctuated in line with changes in perceived risk and reward

The scope and volatility of global capital flows have changed over time and are determined in part by the degree of liberalisation prevailing at any given time. This, in turn, stems from changing views on the risks and rewards accompanying capital flows (Reinhart *et al.*, 2008, 2016). Free movement of capital grew apace from the collapse of the Bretton Woods system in the 1970s until the onset of the global financial crisis in 2007. For the most part, frequent sudden stop crises in emerging market economies did not affect this development, as they were usually believed to stem primarily from a weak institutional framework and suboptimal economic policy in the countries concerned, and therefore to be less important for advanced economies (Obstfeld, 1998, Calvo *et al.*, 2006; see also Box IV-1 in *Monetary Bulletin* 2008/3). However, in emerging markets, the use of CFMs tended to increase in the wake of such crises.

In recent years, the pendulum has swung back somewhat and the focus has increasingly turned towards the risks that can accompany capital flows in spite of the well-known benefits associated with them. At the same time, there is increased agreement that under certain circumstances, policy authorities, even in advanced countries, may need temporarily to adopt special policy instruments so as to mitigate such risks (see, for example, IMF, 2011a, 2012).[2] This reflects, among other things, increased understanding of the risks entailed in the fact that during inflow surges, domestic balance sheets appear to strengthen because of the associated rise in exchange rate and asset prices. This tends to stimulate demand even further and feed risk appetite – until the weaknesses finally emerge, confidence collapses, inflows give way to outflows, and the economy contracts, perhaps resulting in a financial crisis (Chart 1).[3]

Chart 1

Self-reinforcing interaction of cross-border capital flows, risk appetite, and balance sheet expansions[1]

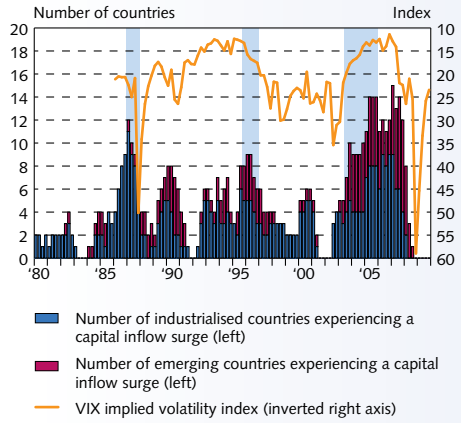


1. Based on Korinek (2011) and Bruno and Shin (2015).

1. Cf. Article 2 of Act no. 42/2016 amending the Foreign Exchange Act, the Act on the Treatment of Króna-Denominated Assets Subject to Special Restrictions, and the Act on a Special Tax on Financial Undertakings, which entered into force on 2 June 2016, and the Rules on Special Reserve Requirements for New Foreign Currency Inflows, no. 490/2016, which took effect on 4 June 2016 and were amended on 16 June and 31 October.
2. Because disruptive capital outflows and the associated economic contraction and even financial crisis often occur following inflow surges, it is generally considered preferable to respond to the inflows in a timely manner, such as by applying CFMs, instead of preventing outflows, although this could prove necessary, as in the case of Iceland (see also Jeanne and Korinek, 2013).
3. Developments of this type are examples of the pecuniary externalities that appear, for instance, in a tendency towards excessive accumulation of foreign debt, where market agents do not consider the systemic impact of their transactions on asset prices and exchange rates, which then causes financial harm to other parties not involved in the

Chart 2

Gross capital inflow surges[1]

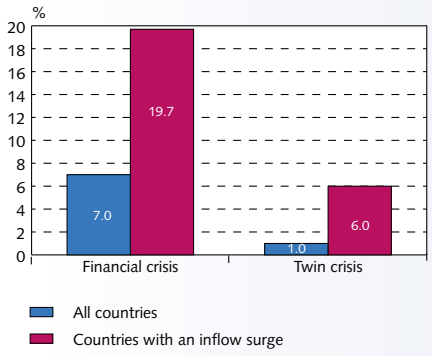


1. The figures shows the number of countries experiencing a gross capital inflow surge based on the definition in Forbes and Warnock (2012a). Shaded area show timing of inflow surges in Iceland. VIX index is a common measure of risk appetite and uncertainty in international financial markets.

Sources: Forbes and Warnock (2012a), Macrobond, Central Bank of Iceland.

Chart 3

Capital inflows and financial crises[1]

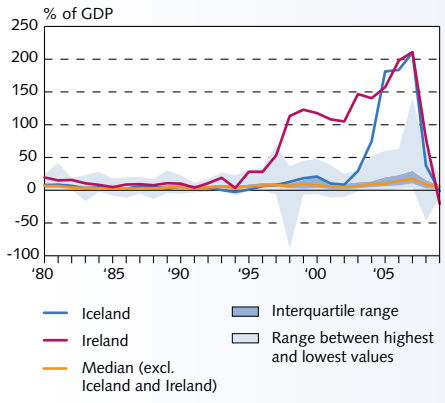


1. The chart shows the percentage of instances when a financial crisis occurred in 53 emerging countries over the period 1980-2014, both all instances and those preceded by a capital inflow surge.

Sources: Ghosh, Ostry, and Quereshi (2016); Central Bank of Iceland.

Chart 4

International comparison of capital inflows 1980-2009[1]



1. Capital inflows from abroad reflect non-residents' net purchases of domestic assets each year and show as increased claims against residents. Flows are estimated in US dollars and shown as a share of GDP in terms of its trend path as determined using an HP filter.

Source: Broner, Didier, and Schmukler (2013).

Inflow-related risks vary, depending on circumstances …

Capital inflows are associated with varying levels of risk. Such risk depends on circumstances and is determined in particular by the size and composition of the inflows and the use of the financing that they represent, as well as the resilience of domestic financial markets and balance sheets to the increased inflows and the volatility that can accompany them (Ostry *et al.*, 2011, IMF, 2011a). Inflow surges tend to come in waves (Chart 2) and are associated primarily with global financial conditions, or push factors, as well as domestic pull factors (Reinhart and Rogoff, 2008; Forbes and Warnock, 2012a; Broner *et al.*, 2013). Capital inflows also convey varying risks and rewards for the country receiving them, depending on the type of capital involved (Hogghart *et al.*, 2016). Foreign direct investment (FDI), for instance, is generally considered a desirable and low-risk form of inflow, as it tends to be based on a long-term business relationship and entails the exchange of technology and expertise.[4] Carry trade and other speculative flows, however, seem to be associated with negligible macroeconomic benefits but elevated risk, not least for economies with relatively illiquid markets and insufficiently resilient domestic balance sheets.

… and can be macroeconomic and/or financial in nature

The risks accompanying capital inflows tend to fall into two main categories, based on their impact on the recipient country's economy and financial system. These risks can be macroeconomic – such as domestic currency overvaluation; unsustainable growth in domestic demand, with the associated current account deficit; excessive and distorting shift of production factors between sectors; or increasingly constrained domestic economic policy. They can also be financial in nature when inflows are large enough to contribute to credit and asset price bubbles or to foster unsustainable developments in the size and composition of the economy's external balance sheet, with systemic risk that jeopardises financial stability (IMF, 2011a; Ostry *et al.*, 2011; and Ahrend *et al*., 2012). Finally, the risks associated with inflows can be simultaneously macroeconomic and financial in nature. Ghosh *et al.* (2016) found that, in about one-fifth of cases over the past few decades, inflow surges to emerging market economies ended with a financial crisis, which could indicate that the likelihood of a financial crisis is nearly three times greater in countries experiencing inflow surges (Chart 3).

Virtually unprecedented capital flows played a pivotal role in Iceland's last financial crisis …

During the run-up to the last financial crisis, Iceland experienced financial flows (Chart 4 shows the inflows) that were virtually unprecedented in scope and fuelled significant macroeconomic and financial imbalances. They also undermined monetary policy by jamming the interest rate channel (Chart 5), shifting policy transmission to the more unpredictable exchange rate channel and encouraging accumulation of foreign-denominated debt. This chain of events resulted in the severest financial crisis in Iceland's history and the introduction of comprehensive capital controls (see Einarsson *et al.*, 2015, 2016a, 2016b, for a discussion of, among other things, the strong

transactions (perhaps including the general public). The existence of such externalities can be used as an argument for economic policy intervention to correct for these types of market imperfections (Korinek, 2011).

4. When an investor in one country owns more than 10% of equity in a company in another country, this is referred to as FDI. However, a recent paper by Blanchard and Acalin (2016) points out measurement difficulties that could cause the inclusion of short-term capital flows with FDI.

spillovers from global financial conditions to the domestic economy and financial system over a period spanning more than a century).

… and inflow-related challenges arose again following the publication of the authorities' capital account liberalisation strategy in 2015

During the slightly more than eight years since the collapse of the Icelandic banking system, the above-mentioned imbalances have been unwound, various economic policy reforms have been introduced, and the domestic economic recovery has gained momentum.[5] At the same time, the most important obstacles to capital account liberalisation – i.e., those related to the settlement of the failed banks' estates and the outstanding stock of offshore krónur – have been either eliminated or isolated, making the large steps already taken towards liberalisation and the steps scheduled at the end of the year possible. Immediately after the presentation of the authorities' revised liberalisation strategy in June 2015, inflows to the domestic bond market increased, causing long-term interest rates and term premia to decline (Chart 6 and Chart 12 below) in spite of Central Bank rate hikes (see Box 1 in *Monetary Bulletin* 2015/4). The interest rate channel appeared to have become clogged again, shifting monetary policy transmission increasingly towards the uncertain and volatile exchange rate channel. Inflows, which had been largely unrestricted since 2009, therefore created challenges again before controls on outflows had been lifted to any significant degree. This came somewhat as a surprise, and work on the Bank's new CFM was therefore expedited.[6]

Development of the CFM was based largely on guidelines from the IMF, …

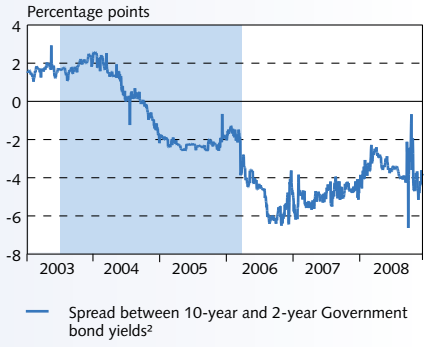
The development of the Bank's CFM was based on guidelines from the IMF, the experience of other countries, and domestic economic conditions. In 2012, the Fund issued its first institutional view on how to respond to rapid changes in capital flows and carry out capital account liberalisation. According to the IMF view, it can be advisable to apply CFMs under certain conditions; for example, when an inflow surge is ongoing, macroeconomic or financial risk is building up, and conventional economic policy response in the form of, for instance, monetary and/or fiscal tightening is constrained. The IMF emphasises that the use of CFMs is not intended as a substitute for traditional policy responses but rather as a complement when conditions require it (Chart 7). Finally, the Fund emphasises that the design and application of CFMs should be characterised by transparency, efficiency, and as limited discrimination as possible; in addition, CFMs should be temporary so that they can be unwound as soon as circumstances permit, due to their potential negative side effects (IMF, 2012).

5. Among new policy instruments are liquidity rules and rules on funding ratios in foreign currency, which are intended to strengthen the resilience of financial institutions vis-à-vis liquidity shocks and to limit their ability to take excessive foreign currency and exchange rate risk. Although they affect capital flows, they can hardly be considered CFMs according to IMF criteria except when the inflows are considered a major source of systemic risk that requires a response. Another policy instrument that has been used increasingly is foreign exchange market intervention, which can lessen the impact of inflows on the exchange rate.
6. The future development of such a policy instrument was announced, among other things, in Central Bank of Iceland (2010, 2012). As was stated in the Governor's speech at the Central Bank's Annual General Meeting in March 2016, it would be desirable to have the statutory framework for such a tool in place before the planned offshore króna auction took place.

Chart 5

Slope of the yield curve during periods of debt inflow surges in Iceland[1]

Daily data 3 January 2003 - 30 December 2008

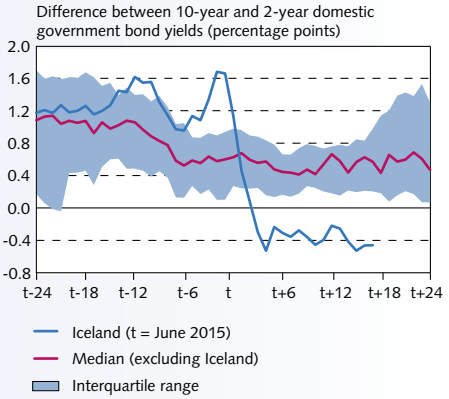


1. The shaded area shows periods featuring a surge in debt inflows from non-residents to Iceland. 2. Based on the estimated nominal yield curve. The estimate is based on interbank market rates and Treasury bond rates.

Sources: Forbes and Warnock (2012b), Macrobond, Central Bank of Iceland.

Chart 6

Slope of the domestic yield curve during periods of debt inflow surges in small, open advanced economies[1]

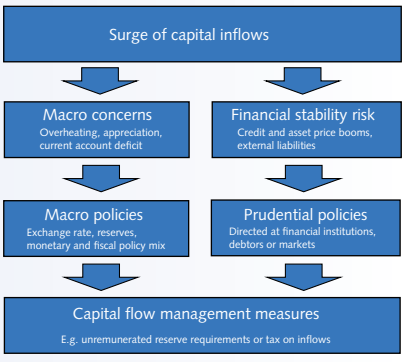


1. Based on Forbes and Warnock's (2012b) assessment of debt-led capital inflow surges. The first month of the surge period is denoted by t. The sample include 22 episodes of debt inflows where countries were in a policy tightening phase as the surge started.

Source: Forbes and Warnock (2012b), Macrobond, Central Bank of Iceland.

Chart 7

Use of CFMs in response to macro or financial instability



Sources: Ostry *et al.* (2011), Central Bank of Iceland.

Chart 8
CFM by country

Tax on inflows	Reserve requirements
· Brazil 1993-1997, 2009-2013 · South Korea 2010- · Thailand 2010-	· Chile 1991-1998 · Colombia 1993-1998, 2007-2008 · Thailand 1995-1996, 2006-2008 · Croatia 2004-2008 · Indonesia 2010- · Turkey 2010-

Source: Central Bank of Iceland.

… other countries' experience with CFMs …

Given the limited experience to date in application of CFMs, there is considerable uncertainty about how effective they are. In recent years, CFMs have been used primarily in South Asia and South America, where they have tended to take the form of special reserve requirements or taxes on capital inflows (Chart 8), but bilateral taxation treaties, among other things, often complicate implementation of the taxation approach. An attempt to summarise the main lessons from other countries' experience would include the following:[7] There is limited evidence that the use of CFMs has reduced inflows and thereby contained the appreciation of the domestic currency. On the other hand, there are clear indications that the use of CFMs changes the composition of inflows, thereby mitigating the associated risk, although strong credit growth and steep rises in asset prices have nonetheless occurred in some instances. There are some signs, albeit not unequivocal ones, that CFMs have given monetary policy broader scope to apply domestic interest rates. Furthermore, it appears that the use of CFMs is determined to a large extent by the authorities' ability to enforce them effectively and prevent circumvention. And finally, it should be borne in mind that due to differences in institutional framework and other conditions, caution should be taken in applying the lessons learned from one country's CFM to other countries.

… and domestic economic conditions

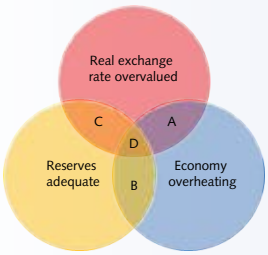
In developing the Central Bank's CFM, it was considered important that the design of the measure and decisions on its activation be based on a thorough analysis of domestic economic conditions. Of particular importance was to assess whether conditions warranted the use of such a tool and what type of tool would be best suited to the Icelandic economy and financial system. Four points were considered key factors in this context.

First of all, macroeconomic risk had already begun to accumulate after the authorities presented their capital account liberalisation strategy in mid-2015, as is mentioned above. This risk was first and foremost reflected in disturbances in monetary policy transmission through the interest rate channel. Inflow-generated systemic risk was still limited, as inflows were not large and there was still scope to tighten other prudential tools. It was clear, however, that circumstances could change rapidly – for instance, in connection with the offshore króna auction in mid-June.

Second, the scope for a conventional economic policy response to growing macroeconomic risk stemming from excessive inflows seemed to be rapidly diminishing over the course of 2016: demand pressures were on the rise, the real exchange rate was rising significantly, and the size of the foreign reserves was heading towards exceeding measures of adequate reserve size if large-scale (sterilised) intervention continued (Chart 9).[8]

Third, there were increasing incentives for carry trade, owing to the ever-widening gap between economic developments in Iceland and elsewhere. Conditions in the global financial markets have actually been unusual for some time, and the stock of foreign government bonds trading with negative yields has grown rapidly. Therefore, it was understandable that foreign investors should be interested in domestic bonds – and it was to be expected that this interest would increase if a tighter domestic monetary stance should be needed. The risk was therefore that speculation of this

Chart 9
Coping with macroeconomic concerns due to capital inflows: Policy considerations



A: Conditions to respond to inflows with sterile intervention in the FX market to strengthen foreign reserves and decrease currency appreciation pressures.
B: Conditions to respond to inflows by allowing the real exchange rate to rise towards equilibrium, thus decreasing the expansionary impact of inflows.
C: Conditions to respond to inflows by lowering interest rates to decrease the interest rate differential to abroad.
D: Conditions where there is limited flexibility for conventional monetary policy responses: overvalued real exchange rate, overheating economy and abundant FX reserves.

Source: International Monetary Fund (2012).

7. See, for instance, IMF (2011a, b, 2012); Ostry *et al.* (2011); Habermeier *et al.* (2011); Baba and Kokenyne (2012); and Bruno *et al.* (2015).
8. Even though there was scope for further fiscal tightening, it did not appear that this would be forthcoming when work on the CFM was at its peak during the spring. On the contrary: it appeared as though further easing lay ahead (see Chapter IV in *Monetary Bulletin* 2016/2).

type would be extensive once again and overburden the domestic institutional framework.[9]

And finally, it was clear that consideration must be given to the fact that large steps towards capital account liberalisation lay ahead. As a result, a CFM could be needed to mitigate risk during the liberalisation process, not least in view of the offshore króna auction that then lay ahead, but also because of the possibility that a surge in speculative carry trade inflows could exacerbate the risk of even stronger outflows following further steps towards general liberalisation.

In view of all this, the Central Bank considered it necessary to have a CFM at hand and activate it immediately so as to temper inflows – particularly those related to carry trade involving bonds and lending – which would also mitigate potential disturbances in monetary policy transmission during the economic adjustment ahead and reduce the risk attached to upcoming steps towards capital account liberalisation. It seemed clear that passing legislation without activating the CFM could have boosted short-term inflows before the tool was activated.

CFM in the form of special reserve requirements for specified inflows ...

The type of CFM used by the Bank is based on a well-known method of tempering capital flows and on the assessment of economic conditions mentioned above.[10] Attempts were also made to ensure that the tool would be flexible, targeted, and efficient, thereby facilitating prompt response to changes in circumstances.

The statutory basis for the CFM can be found in a new temporary provision of the Foreign Exchange Act, no. 87/1992 (cf. Article 2 of Act no. 42/2016), which authorises the Central Bank to adopt rules on special reserve requirements for new foreign currency inflows in connection with specific types of capital, particularly to include bonds, bills, and deposits. The Bank's scope for designing the implementation of the CFM is therefore laid down in the law, while the actual form of the measure is determined by the Bank's rules, which must receive ministerial approval. Five key variables in the CFM determine its structure at any given time: special reserve base, holding period, and special reserve ratio (which specify the *type* of capital for which reserves must be held, the specified *period of time* and the *percentage* of new foreign currency inflows subject to the requirement), interest rate (applied to the special reserve amount), and settlement currency. According to the current rules, which do not fully utilise the scope in the statutory authorisations, the special reserve base is mainly specified as listed bonds and bills plus certain deposits; the holding period is one year, the special reserve ratio is 40%, the special reserve amount earns no interest, and settlement takes place in Icelandic krónur.

... to reduce the incentive for carry trade and promote more effective monetary policy transmission

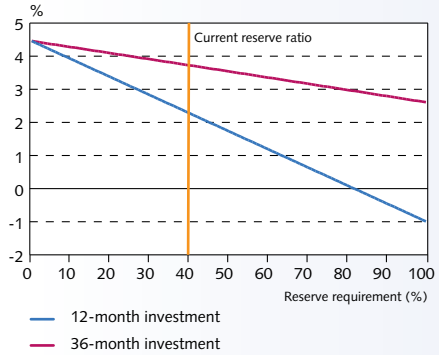
The CFM is designed to reduce the risk associated with carry trade-related inflows. Tying up a portion of inflows for one year in a non-

9. Carry trade-related inflows entail increased short-term obligations for the economy; therefore, it is preferable to respond by building up foreign reserves and tempering such inflows rather than encouraging increased outflows and letting short-term capital of this type fund increases in foreign long-term assets (by pension funds, for instance), as this would entail increased maturity mismatches on the economy's external balance sheet.

10. In general, CFMs can be classified based on whom or what they target (i.e., participants in capital transactions based on residence; specific flows based on currency denomination, type or duration; or financial markets or financial institutions) and the tempering that they entail (i.e., whether they are price- or quantity-based measures).

Chart 10

Interest rate differential per year for various reserve ratios and investment duration[1]

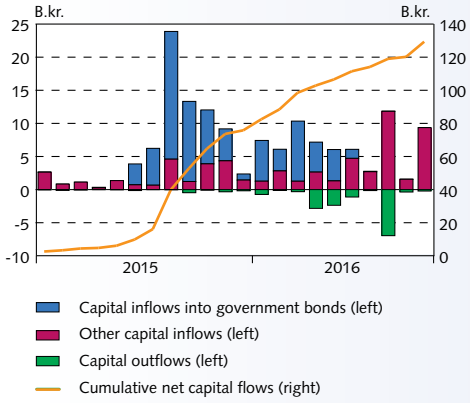


1. Based on the following assumptions: Holding period 1 year, domestic interest rates 5.5%, foreign interest rate 1%, interest rate on special reserve ratio 0%, risk premium 0%, unchanged exchange rate.
Source: Central Bank of Iceland.

Chart 11

Capital flows

January 2015 - October 2016

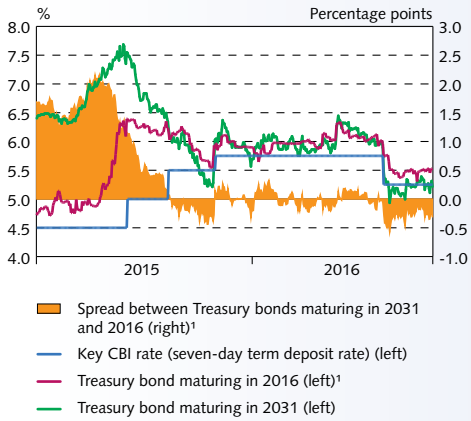


Source: Central Bank of Iceland.

Chart 12

Key Central Bank rate and nominal Treasury bond yields

Daily data 2 January 2015 - 11 November 2016



1. From 14 April 2016, Treasury bond maturing in 2017 instead of 2016.
Source: Central Bank of Iceland.

interest-bearing account cuts into the profit on such carry trade – the shorter the investment horizon, the stronger the effect. For instance, approximately half of the expected interest rate differential on a one-year investment (disregarding potential exchange rate effects) is eliminated due to the reserve requirement (Chart 10). Profits on long-term investments will be affected much less, however, and inflows for portfolio equity investment and direct investment are fully exempted. In this way, the CFM is designed to promote a lower-risk composition of inflows while contributing to more effective transmission of monetary policy through the interest rate channel, thereby making it easier to maintain an interest rate different from that prevailing abroad if it is needed to keep inflation at target. Furthermore, the CFM is a temporary measure that can be dismantled with a simple amendment of the rules.

Inflows have subsided since the CFM was activated …

Since the CFM was activated in early June, inflows into the domestic bond market have virtually halted and total capital inflows subsided. However, inflows not subject to special reserve requirements have increased in comparison with the first half of the year (Chart 11), due mostly to larger FDI inflows, but also to portfolio equity investment.

The composition of the inflows has also changed, but it is too early to assess whether the change is a lasting one and what the ultimate contribution of the CFM will turn out to be. On the other hand, the aim of the measure was clearly to temper inflows, particularly inflows into the bond market, and to mitigate risk during the next steps towards capital account liberalisation. Inflows into the bond market have been negligible since the CFM was activated, the offshore króna auction has already taken place, and large steps have been taken towards general capital account liberalisation. It could therefore be appropriate to consider whether changes should be made to the CFM, in addition to those that must take place before the capital controls are fully lifted.[11] In this context, it is important to determine whether there has been a reduction in the macroeconomic risk that apparently emerged in the form of disturbances in monetary policy transmission via the interest rate channel.

… and there are fewer signs of problems in monetary policy transmission

It is difficult to assess the impact of the CFM on nominal Treasury bond yields, as important drivers of bond yields have changed in recent months, and it is hard to determine how yields would have developed without the CFM (see also Chapter III). Even though the CFM has been activated, the spread between short- and long-term Treasury bonds has remained narrow. Yields on longer Treasury bonds certainly rose just after the CFM was activated, but they reversed quickly and have fallen even further in the recent term (Chart 12).

Among the forces that may be at work here are the reduction in long-term inflation expectations and changed expectations about developments in Central Bank interest rates. In August, the Bank's Monetary Policy Committee (MPC) announced a rate cut and indicated that it appeared that it might be possible to keep inflation at target with a lower key interest rate than was previously thought necessary. The MPC also changed its message and allowed for the possibility that the key rate could rise or fall, whereas it had previ-

11. Some amendments were passed on 31 October, including a provision exempting individuals from the special reserve requirement, subject to a specified maximum amount.

ously considered it more likely that a further rate hike would be needed. To some extent, the reduction in bond market yields could also reflect the continuing improvement in Iceland's sovereign credit ratings and the reduction in risk premia on Treasury obligations. Therefore, unlike last year, it is likely that the decline in long-term bond yields is due primarily to changes in market expectations in response to the MPC's statements and to a change in the economic outlook as a result of more favourable developments than forecasts had indicated. As a consequence, there is less reason to doubt the efficiency of monetary policy transmission through the interest rate channel than there was a year ago, when bond market yields declined in spite of both a Central Bank rate increase and the MPC's signal of possible rate hikes in the future.

Future structure of the CFM

The current version of the CFM is based on the statutory authority provided for in a temporary provision of the Foreign Exchange Act, in connection with the capital controls. The authorities chose to utilise the existing framework for capital inflows, particularly on the basis of new investment that must be explicitly registered. This facilitates implementation of the special reserve requirement. After the capital controls have been fully lifted, however, a new and more permanent version of the CFM and its statutory framework must be laid down, presumably in the Act on the Central Bank of Iceland, no. 36/2001. Preparations for such a framework are already underway.

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Box 2

The housing component of the consumer price index

In the recent past, the consumer price index (CPI) has measured a higher rate of inflation than the CPI excluding housing (CPIXH), as is shown in Chart 1. In October, inflation measured 1.8% according to the CPI but was -0.5% according to the CPIXH, a difference of 2.3 percentage points. The CPI also rose more than the CPIXH during the years before the banking crisis in autumn 2008, as house prices soared during that period while other prices rose less steeply, owing in part to the appreciation of the króna. This reversed during the financial crisis, when the CPI rose less than the CPIXH, as the crisis caused house prices to fall while the depreciation of the króna caused other prices to rise.

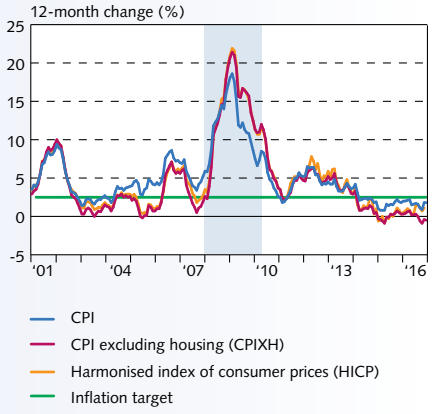
Examining developments over a longer period reveals that house prices have generally risen more, on average, than prices of other goods and services. This is why the CPI has risen more, on average, than the CPIXH. Since the introduction of the inflation target in March 2001, twelve-month inflation has averaged 5% in terms of the CPI but 0.4 percentage points less according to the CPIXH, or 4.6%. The difference between the two has been greater in the last five years, as CPI inflation has averaged 3% while CPIXH inflation has averaged 2.2%. There could be various reasons why these two indices give differing inflation figures over the long term. One possible explanation is that productivity growth has been weaker in the construction industry than in other sectors, and another is that the location of housing has had an increasing effect on its price. The latter of these is particularly noticeable in large, densely populated communities.[1]

The difference between inflation as measured by the CPI and the CPIXH has once again given rise to discussion of which index gives a more accurate measure of inflation in Iceland and whether it is appropriate to use the CPI as the reference for the Central Bank's inflation target. It has been rightly pointed out that many other central banks, including the European Central Bank (ECB) and the Bank of England (BoE), base their inflation targets on a price index that does not include homeowners' housing costs. This Box discusses the issues that are relevant in this context.

Housing expenditure as part of the consumer price index

For those who live in rented housing, the rent is the price of housing services, whereas the cost of living in owner-occupied housing must be estimated somehow. In Iceland, this is done by calculating the so-called "user cost"; i.e., the yearly expense of living in one's own property.[2] The user cost covers maintenance costs, among other things, but the largest component is so-called "imputed rent", which attempts to estimate the cost of living in one's own home as if it were rented property. The basis for the calculation of imputed rent is the market price of housing and interest rates in all purchase agreements.[3]

Chart 1
Various measures of inflation[1]
January 2001 - October 2016



1. The shaded area indicates the financial crisis which represents a period of a near continuous contraction of GDP (based on seasonally adjusted figures from the Central Bank of Iceland) from Q1/2008 to Q1/2010.

Sources: Statistics Iceland, Central Bank of Iceland.

1. It can be argued that the portion of house prices that is determined by the location of the property should not be included in calculations of the price of regular housing services in price indices because it is more related to changes in other costs, such as travel expense and time, than to the cost of housing.
2. Home ownership is more widespread in Iceland than in neighbouring countries. In the expenditure base for the CPI, which Statistics Iceland brought into use in March, the cost of owner-occupied housing accounted for 14.9% of all expenditures, whereas rent accounted for 5.5%. In the expenditure base for 2015, these ratios were 15.6% and 5.4%, respectively.
3. Further discussion of various methods for estimating the housing component of the CPI can be found in Appendix 1 of *Monetary Bulletin* 2004/2. See also the discussion in Box 1 of *Monetary Bulletin* 2003/4, Box 1 of *Monetary Bulletin* 2004/3, and Box 3 of *Monetary Bulletin* 2005/2. A detailed discussion of the CPI, including the housing component, can be found in Gudnason (2004).

Which measure of inflation should be used for monetary policy?
Although it is appropriate that the CPI should reflect housing expenses, there could be other points to consider when selecting the price index on which monetary policy should be based. In general, a price index must be based on robust and continuous data, and it must be published promptly after price measurements have been carried out. Some consider it appropriate to use an index that ignores prices that are volatile and are scarcely affected by monetary policy; e.g., agricultural product prices, which can be strongly affected by weather conditions, or prices of imported goods that are determined by global market conditions; e.g., oil prices (see, for example, Pétursson, 2002). Therefore, most central banks also consider various measures of underlying inflation that exclude these and other similar components when formulating monetary policy.[4]

Today, most economists are of the view that central banks should base monetary policy on the price index that best reflects household expenditures. The main reason for omitting important expenditure items in calculating a price index used for monetary policy purposes would therefore be that it can prove difficult to collect reliable data on price developments for those items. This is true of housing in some countries, but not in Iceland. All information on real estate transactions is collected by Registers Iceland, which publishes data on developments in nationwide house prices. In some countries, it has proven difficult to collect such data in a single database. Because housing is a highly heterogeneous commodity, collecting information in order to calculate a price index that shows developments in these prices is unusually problematic.

The price index on which monetary policy is based varies from one country to another, as does the extent to which the index in question reflects developments in house prices (see, for example, Box 5 in *Monetary Bulletin* 2003/4 and Hammond, 2010). The US Federal Reserve Bank bases monetary policy on the personal consumption expenditure price index (PCE) rather than the CPI because the PCE is considered to be based on better information about the distribution of household expenditure. Both indices include the cost of owner-occupied housing, albeit calculated using different methods. The main difference between the indices, however, is that the PCE accounts more accurately for households' healthcare expenditures. Several other factors are also considered to give the PCE the advantage.

In the other Nordic countries that pursue independent monetary policy – Norway and Sweden – housing costs are included in the price index on which monetary policy is based; however, the methods used to estimate changes in the cost of owner-occupied housing differ. Sweden uses a method similar to that used in Iceland, while in Norway, changes in the cost of owner-occupied housing are based on changes in rent.

The ECB currently uses the harmonised index of consumer prices (HICP), which includes renters' housing expense but omits homeowners' housing expense. This index is also calculated for countries outside the eurozone, Iceland among them. The view of the ECB is that the HICP should be revised so as to include the cost of owner-occupied housing, as the bank states "the only significant area of consumption currently not covered is expenditure on housing by homeowners".[5]

4. Theoretical research further indicates that it is more appropriate to base monetary policy on domestic inflation (e.g., Clarida *et al.*, 2002) or measures of inflation that show the greatest price-stickiness (e.g., Aoki, 2001) or even wage inflation (e.g., Erceg *et al.*, 2000).

5. See https://www.ecb.europa.eu/stats/prices/hicp/html/index.en.html (under Concept).

The BoE uses the HICP and has done so since 2003, but before then it used the retail prices index (RPI). The RPI includes the cost of owner-occupied housing, which accounted for nearly 10% of the index. A report issued by HM Treasury in December 2003 explains several advantages of the HICP over the RPI and points out that "[a]lthough the MPC will target HICP inflation, house prices are – and will continue to be – an important indicator in assessing macroeconomic developments for monetary policy. Furthermore, … Eurostat is currently undertaking a pilot study … to assess the preferred means of incorporating a measure of housing costs into the HICP."

Should current criteria be changed in Iceland?

As is explained in Pétursson (2002), the CPI generally fluctuates less than the CPIXH. Furthermore, as a predictor of future inflation, the CPI appears to be more accurate than the CPIXH and therefore a more robust indicator of domestic inflationary pressures. This can be seen clearly in Chart 1, which shows that CPI inflation is lower than CPIXH inflation during a cyclical downturn and higher during an upswing. As the CPI reflects households' consumption spending more accurately than would an index excluding this important expenditure item, the authorities and the Central Bank decided to use it as a basis when they adopted the inflation target in March 2001.

In the wake of the global financial crisis, the idea that monetary policy should give greater consideration to possible asset price bubbles, such as housing and even stock price bubbles, has gained in popularity. In this context, the term "bubble" refers to a situation where, for instance, house and stock prices rise well in excess of economic fundamentals, merely because further price increases are expected in the future. Those who believe that monetary policy should act to curb such developments in asset prices recommend raising interest rates more than is needed to keep inflation in households' expenditures low. This policy is often referred to as leaning against the wind. Because monetary policy in Iceland is based on a price index that includes a housing component affected by the market price of housing, it can be said that such a countercyclical element is built into monetary policy formation to some extent.[6]

There are several arguments in favour of using the CPI rather than the CPIXH as a basis for monetary policy. As is discussed in Central Bank of Iceland (2010), such an arrangement also has its drawbacks, and there is nothing to prevent the Government from deciding to base the inflation target on a different inflation measure if it so chooses. It would be possible to use the CPIXH, but it could be more appropriate to use the HICP, as it is based on internationally harmonised methods that would facilitate comparison between countries. Just like the CPIXH, the HICP does not include the cost of owner-occupied housing. Other expense calculations are different, however, as they are based on differing methods. HICP inflation has also measured lower, on average, than CPI inflation, although the difference is smaller than that between the CPI and CPIXH (Chart 1).[7] As is mentioned above, the EU aims to revise the HICP to include the cost of owner-occupied housing, and the ECB considers it important that this change should take place.

6. As is discussed in Central Bank of Iceland (2010), opinion is divided on this. Some economists are not convinced that it is appropriate to use central bank interest rates to combat asset price bubbles and consider it more appropriate to use other policy instruments.

7. If this is changed, it could be appropriate to change the inflation target as well if the new inflation reference systematically gives different results than the CPI. For example, in 2003, when the British authorities changed the inflation measure on which the BoE's monetary policy was based, the bank's inflation target was also lowered from 2.5% to 2%, as research had shown that HICP inflation was nearly ½ a percentage point lower, on average, than inflation according to the RPI.

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Box 3

The Central Bank of Iceland forecasting record

Macroeconomic forecasts almost always contain some errors. Some can stem from shortcomings in forecasting models and others from errors in the data on which the models are based. When forecasts are prepared, they must be based on preliminary figures for the recent past, data that in some instances will not be available in their final form until several years later. In addition, there are always unforeseen events that are impossible to forecast. Studying past forecast errors helps to identify the uncertainties in new forecasts and can be useful in further developing macroeconomic models, using them for forecast preparation, and improving the procedures used for analysis and forecast presentation.

Forecasts of the real economy and inflation

Four times a year, the Central Bank prepares forecasts for the real economy and inflation covering a forecast horizon of three years. The forecasts are based on a detailed analysis of the current state of the economy. The assumptions concerning global economic developments are based, among other things, on forecasts from international institutions and the information extracted from key commodity futures. The national accounts are the primary source of data on the domestic economy. In addition, Bank staff prepare an independent assessment of the state of the economy through surveys; discussions with corporate executives, institutional directors, and labour market institutes; and statistical analysis of developments in key variables. The Central Bank's quarterly macroeconomic model (QMM) is the tool used to manage this information. Some of the equations in the model are accounting equations, while others are behavioural equations that are estimated using econometric methods. However, the Bank's forecast – particularly for the recent past and immediate future – is determined largely by staff assessments, various simple statistical models, and a variety of information not included in the QMM.

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

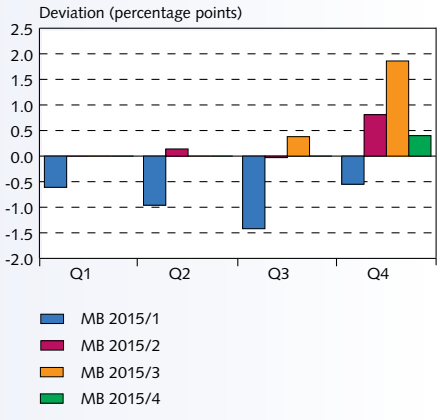
Central Bank inflation forecasts for 2015

Inflation subsided year-on-year in 2015. It averaged 1.6% for the year, down from 2% in 2014. Inflation excluding indirect tax effects was lower, at 1.2%. This excludes the effects of the increase in the lower value-added tax rate, which raised the price of food and beverages, among other things. As has been discussed in previous issues of *Monetary Bulletin*, inflation was driven mainly by rising house prices and domestic goods and services prices in 2015, while the appreciation of the króna and imported deflation pulled in the opposite direction.

Chart 1 illustrates the forecasting record for the inflation forecasts within the year 2015. The forecast in *Monetary Bulletin* at the beginning of the year assumed that inflation would be lower

Chart 1

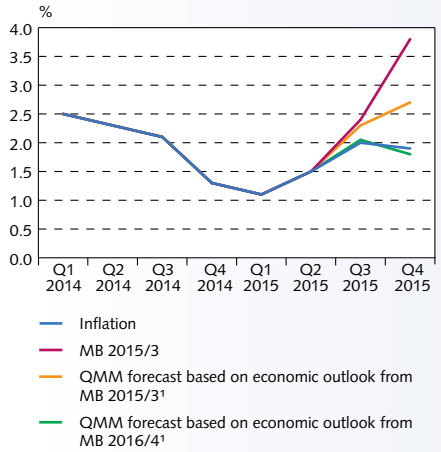
Inflation forecasting errors in *Monetary Bulletin* in 2015



Source: Central Bank of Iceland.

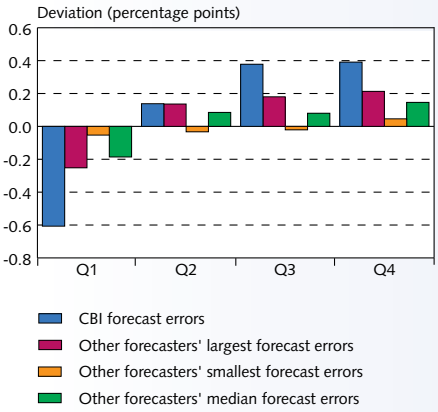
1. See Ásgeir Daníelsson, Bjarni G. Einarsson, Magnús F. Gudmundsson, Svava J. Haraldsdóttir, Thórarinn G. Pétursson, Signý Sigmundardóttir, Jósef Sigurdsson, and Rósa Sveinsdóttir (2015), "QMM: A quarterly macroeconomic model of the Icelandic economy – Version 3.0", Central Bank of Iceland, *Working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

Chart 2
Inflation forecasts for Q3/2015 based on differing assumptions



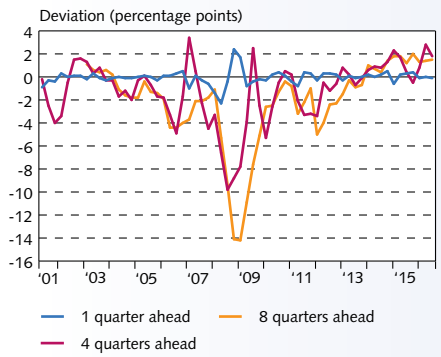
1. Inflation forecast from the inflation equation in QMM.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart 3
Inflation forecasting errors in *Monetary Bulletin* and other forecasters' projections for Q1 in 2015¹



1. Q1 is the quarter in which the report is published or the first quarter forecasted.
Sources: Arion Bank, IFS, Íslandsbanki, Landsbankinn, Statistics Iceland, Central Bank of Iceland.

Chart 4
Inflation forecasting errors in *Monetary Bulletin*¹
Q2/2001 - Q3/2016



1. 1 quarter ahead is the quarter in which the report is published or the first quarter forecasted; 4 quarters ahead is three quarters after the report has been published; 8 quarters ahead is seven quarters after the report has been published.
Source: Central Bank of Iceland.

during the year than proved to be the case. The forecast was prepared following a period of international deflation and a steep drop in oil prices, whose effects on inflation appear to have been overestimated. As Chart 1 indicates, this reversed in the wake of the spring wage agreements, which provided for steep pay increases. This can also be seen in Table 1, which shows that average inflation for the year was underforecast at the beginning of the year. It was then overforecast in the May issue of *Monetary Bulletin* and even more so in the August issue, which presented the first baseline forecast that included an assessment of the impact of the wage settlements. The assessment was affected strongly by the sharp increase in inflation expectations following the wage settlements, and many factors were reminiscent of the situation in early 2011, when inflation was low but rose swiftly after wage agreements were signed that spring. As Chart 2 indicates, the overestimation of inflation following the wage settlements is due partly to changes in assumptions (concerning, for example, the exchange rate of the króna and global developments in inflation), but the forecasting error stems mainly from Bank staff's estimates of wage agreements' impact on short-term inflation, which were based on historical experience and assessments derived from other forecasting models. At the same time, the chart shows clearly that a pure model forecast using the QMM based on the most recent information was almost spot-on in predicting developments in inflation immediately following the wage settlements (see also Box 5 in *Monetary Bulletin* 2016/2).

Table 1 Inflation forecast for 2015

	Monetary Bulletin				*Final*
Year-on-year change (%)	*2015/1*	*2015/2*	*2015/3*	*2015/4*	*result*
Inflation	0.7	1.9	2.2	1.7	1.6
Underlying inflation (excluding indirect tax effects)	0.4	1.4	1.8	1.3	1.2

The Central Bank was not the only forecaster to estimate inflation in the wake of the wage settlements, however. Chart 3 shows the forecasting errors by the Central Bank and other forecasters for the same quarter as the forecast published in *Monetary Bulletin*. All forecasters underestimated inflation in the first quarter but overestimated it as the year progressed. The Central Bank's errors in forecasting inflation during the current quarter of 2015 proved larger than other forecasters' errors, however.

Forecasting errors over a longer period

Chart 4 shows developments in errors in Central Bank inflation forecasts one, four, and eight quarters ahead, from Q2/2001 through Q3/2016. Forecasts two years ahead have been published since March 2001, when the inflation target was adopted. Inflation forecasts for the first quarter of the forecast horizon showed no tendency towards either over- or underforecasting. Forecasting errors can generally be expected to increase as forecasts extend further ahead in time. One- and two-year forecasts tend to underestimate rather than overestimate inflation. The errors were greatest for 2008 and 2009, when inflation was significantly underestimated, owing largely to the steep depreciation of the króna at that time. In 2001-2013, there was a stronger tendency to underestimate inflation. This changed in 2014, when overforecasts became more common, partly due to declining oil prices, global deflation, and the appreciation of the króna.

Table 2 shows the mean deviation (which gives an indication of whether inflation is being systematically over- or underforecast)

and the root mean square error (RSME, which shows the uncertainty in the forecast) since the Bank began publishing inflation forecasts two years ahead. In March 2007, the Bank began publishing forecasts three years ahead. As has been discussed previously, the error was greatest for 2008 and 2009, as Table 2 omits forecasts prepared for those years. By this criterion, inflation has been underforecast three to twelve quarters ahead, and generally to an increasing degree along the horizon. The mean deviation of the forecasts four and eight quarters ahead proved to be statistically significant from zero based on a 5% threshold, which means that the forecasts were skewed to the downside. The forecast errors less than four quarters ahead were not significant from zero, however, nor were those in the three-year forecasts.

Tafble 2 Central Bank of Iceland inflation forecast errors since Q2/2001

%	*One quarter*	*two quarters*	*three quarters*	*Four quarters*	*Eight quarters*	*Twelve quarters*
No. of measurements	55	55	54	52	49	25
Mean deviation (%)	0.0	0.0	-0.2	-0.7	-1.1	-0.6
RMSE (%)	0.4	1.1	1.7	2.0	2.1	1.6

It should also be borne in mind that the Bank did not begin using its quarterly macroeconomic model (QMM) until the beginning of 2006, and it prepared no forecasts of the exchange rate or Central Bank interest rates before 2007.[2] In recent years, the Bank's macroeconomic and inflation forecasts have been based on the technical assumption that the exchange rate of the króna will remain unchanged over the forecast horizon. Experience shows that large errors in inflation forecasts in Iceland are usually related to exchange rate volatility (Chart 5), as the correlation between the absolute errors in inflation and exchange rate forecasts is 0.64. This applies in particular to 2015, where a portion of the inflation forecasting errors can be traced to underestimation of the exchange rate. Unforeseen appreciation of the króna counterbalanced wage increases, with the result that prices rose less than the Bank had forecast. For example, the króna was 6% stronger at the end of 2015 than was forecast in August. As is discussed in Chapter I, the exchange rate assumptions underlying the baseline forecast have been changed and the forecast is now based on an endogenous exchange rate path.

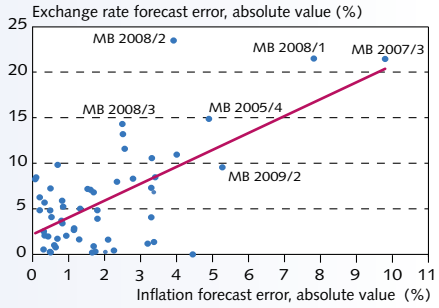
Comparison of selected inflation forecasting methods

The Central Bank also uses simple time series models to forecast inflation, particularly for the next few quarters. It is possible to use them as cross-checks in preparing the forecast by comparing the Bank's forecasts to the results generated by such models (Chart 6).[3] Three ARIMA models, a simple cost-push model, and a VEC model are used for the comparison.[4] A review of 2015 reveals that the

Chart 5

Forecast error for inflation in *Monetary Bulletin* and deviation of average exchange rate from forecast 2001-2015

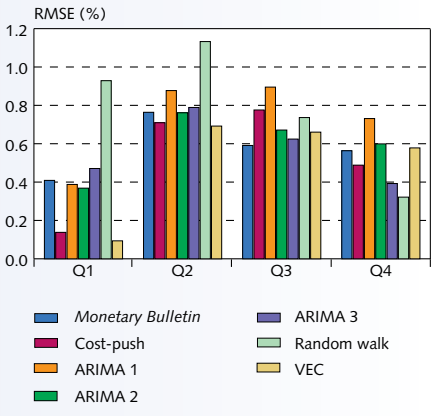
Forecast one year ahead



Source: Central Bank of Iceland.

Chart 6

Forecasting errors for inflation in *Monetary Bulletin* and from simple models in 2015[1]



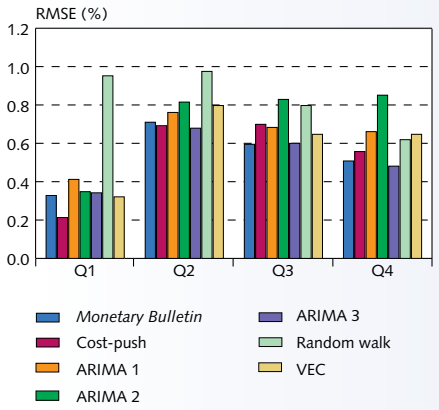
1. Q1 is the quarter in which the report is published or the first quarter forecasted; Q2 is the quarter after the report has been published; Q3 is the following quarter.
Source: Central Bank of Iceland.

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

3. In all models, care is taken to ensure that they have the same information on inflation when the forecast is carried out. In comparing them, it should be borne in mind that the forecasts are not entirely impartial, as the Bank's final forecast each time frequently takes account of the results obtained with simple time series models, particularly for short-term forecasts.

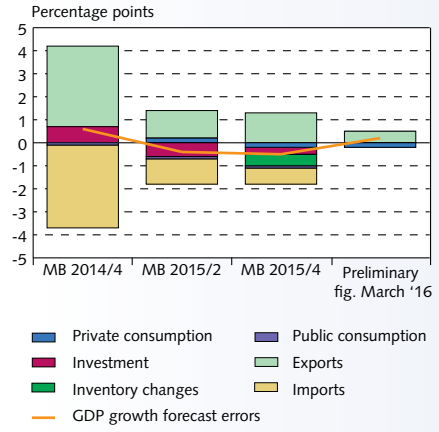
4. According to the simple cost-push model, inflation is determined by historical developments in unit labour costs and the import price level in domestic currency. The ARIMA 1 model draws on forecasts for the principal subcomponents of the consumer price index and weights them together to create a single overall index. The twelve subcomponents of the consumer price index are as follows: agricultural products less vegetables, veg-

Chart 7
Forecasting errors for inflation in *Monetary Bulletin* and from simple models 2011-2015[1]



1. Q1 is the quarter in which the report is published or the first quarter forecasted; Q2 is the quarter after the report has been published; Q3 is the following quarter.
Source: Central Bank of Iceland.

Chart 8
Contribution of expenditure items to forecast errors in GDP growth 2015[1]



1. Based on real figures in September 2016.
Sources: Statistics Iceland, Central Bank of Iceland.

Bank's forecasts were most accurate three quarters ahead, whereas the cost-push model outperformed the Bank's forecasts one, two, and four quarters ahead.

It can also be informative to compare the forecasts with forecasts assuming that inflation in a given quarter will be the same as in the previous quarter throughout the forecast horizon. Such forecasts would generate the smallest errors if changes in inflation were entirely unpredictable; i.e., if inflation were a random walk process. Therefore, a reasonable forecasting model should outperform a random walk forecast. For forecasts one and two quarters ahead, all of the models performed better than the random walk forecast,[5] and for three-quarter forecasts, almost all of the forecasts were more accurate than the random walk. On the other hand, the random walk outperformed all of the other models for forecasts four quarters ahead. As Chart 7 shows, this is an exception, however: from 2011 through 2015, the mean deviation in *Monetary Bulletin* forecasts was always smaller than that in the random walk forecast. Furthermore, the mean deviation in *Monetary Bulletin* forecasts was always smallest three quarters ahead as compared with all of the time series models, whereas the cost-push model outperformed the Bank's forecasts one quarter ahead. It could therefore be appropriate to give greater weight to such models for short-term forecasts.

Central Bank GDP growth forecasts for 2015

In order to obtain a clearer view of the Central Bank's success in inflation forecasting, it is necessary to examine its success in forecasting developments in the real economy. For example, the Bank is likely to underforecast inflation during periods when it underforecasts growth in demand or overforecasts the slack in the economy.

Statistics Iceland publishes preliminary national accounts figures for each quarter about two months after each quarter-end. The first estimates for Q4/2015 and the full year 2015 were published in March 2016, and revised figures were published in September. The *Monetary Bulletin* forecasts and Statistics Iceland's estimates of changes in key macroeconomic variables from the previous year can be seen in Table 3. In February 2015, when *Monetary Bulletin* 2015/1 was published, Statistics Iceland's preliminary national accounts figures were available only for Q3/2014. As a result, the Bank had to base its forecast for 2015 on the forecast for Q4/2014.

Statistics Iceland figures changed between the publication of the preliminary figures in March and the revision in September. Exports were underestimated in the preliminary figures, whereas domestic demand was overestimated. As a result, GDP growth turned out 0.2 percentage points stronger in the revised figures. In September, Statistics Iceland's revision of its calculation of private consumption resulted in a revision of historical figures as well. This explains in part the weaker private consumption growth in the revised numbers.

etables, other domestic food and beverages, other domestic goods, imported food and beverages, new cars and spare parts, petrol, other imported goods, alcohol and tobacco, housing, public services, and other services. ARIMA 2 forecasts the CPI directly, and ARIMA 3 forecasts the overall index excluding indirect taxes and then factors in the estimated tax effects. A discussion of the use of ARIMA models for inflation forecasting can be found, for example, in A. Meyler, G. Kenny, and T. Quinn (1998), "Forecasting Irish inflation using ARIMA models", Central Bank of Ireland, *Technical Paper* no. 3/RT/98. The VEC (vector error correction) model is a multivariate time series model that takes account of developments in import prices, output gap, and wage costs.

5. It should be noted, however, that the random walk forecast receives less information about inflation in the first quarter of the forecast, whereas the other models use available information on inflation during past months in the quarter at the time the forecast is prepared.

Table 3 *Monetary Bulletin* macroeconomic forecasts and Statistics Iceland data for 2015

Forecast horizon from: *% change from prior year*	*2014/4* *MB 2015/1*	*2015/1* *MB 2015/2*	*2015/2* *MB 2015/3*	*2015/3* *MB 2015/4*	*2015/4* *MB 2016/1*	*Pre-liminary figures (March 2016)*	*Revised figures (Sept. 2016)*
Private consumption	3.7	3.9	4.2	4.6	4.9	4.8	4.3
Public consumption	1.4	1.4	1.8	1.4	1.5	1.1	1.0
Investment	13.7	22.6	22.5	20.9	19.6	18.6	18.3
Domestic demand	4.9	6.6	6.8	7.2	7.1	6.3	6.0
Exports	5.3	6.9	6.8	6.8	6.7	8.2	9.2
Imports	6.8	11.1	12.4	12.1	12.8	13.5	13.5
GDP growth	4.2	4.6	4.2	4.6	4.1	4.0	4.2

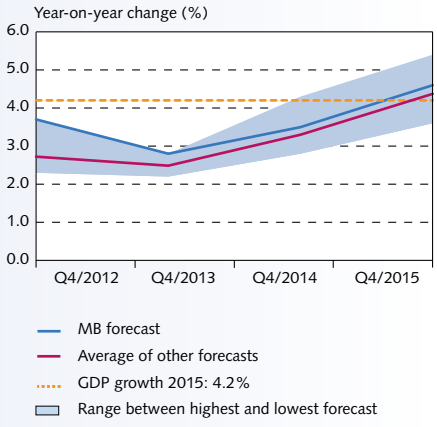
According to Statistics Iceland's most recent figures, year-2015 GDP growth was broadly in line with the Bank's forecasts and the largest forecasting error during the period was 0.5 percentage points (Chart 8). The largest forecasting error in components of domestic demand was in investment, as it is the national accounts item that is generally most volatile and final numbers often appear with a significant time lag. In *Monetary Bulletin* 2015/2, the underestimation of private consumption somewhat offset the overestimation of investment, while in the final forecast of the year all components of domestic demand were overestimated. Both imports and exports turned out higher than was forecast, but the errors were similar in both cases and therefore made little impact on the GDP growth forecast. In the forecast from November 2014, export growth was significantly underforecast, owing mainly to an underestimation of the impact of tourism, as there was a larger error in the forecast of services exports. The error in the forecast of goods imports pulled in the opposite direction, however, and the contribution of net trade to the GDP growth forecast error turned out to be only 0.6 percentage points. This error in external trade forecasts grew smaller as year-end 2015 approached, however.

Central Bank forecasts in comparison with other forecasters' projections

Chart 9 gives a comparison of the Central Bank's GDP growth forecast for 2015 and the average of other forecasters' projections (the International Monetary Fund (IMF), Icelandic Federation of Labour (ASÍ), Iceland's three large commercial banks, Statistics Iceland, and the European Commission). The Bank's forecasts were all prepared during the fourth quarter of the years 2012-2015. The range between the highest and lowest forecast values in other forecasters' projections is given by the shaded area. In general, it widens during periods of uncertainty and further out the forecast horizon. As the chart shows, all forecasters expect GDP growth to strengthen as the forecast horizon progresses, and the Bank's forecasts were well in line with those of other forecasters. The errors in the Bank's forecasts were smaller than the average of other forecasts for the entire period.

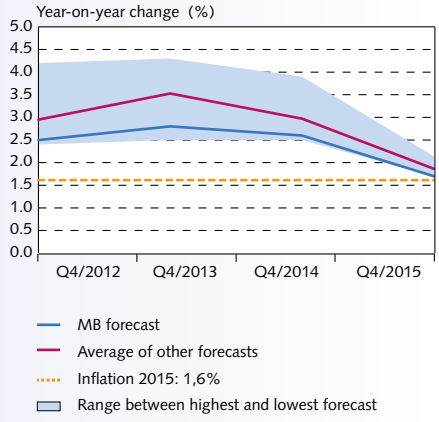
Chart 10 gives a comparison of inflation forecasts. Although the errors in the Bank's forecasts one quarter ahead in 2015 were larger than other forecasters' errors (Chart 3), the Bank's forecasts further ahead tend to be more accurate. This can be seen in the comparison of forecasts for 2015, where the Bank's forecasts are closer to the actual figure for the year than other forecasters' average for the entire period. The range between the highest and lowest forecasts narrows significantly as year-end 2015 approaches, as

Chart 9
GDP growth forecast for 2015



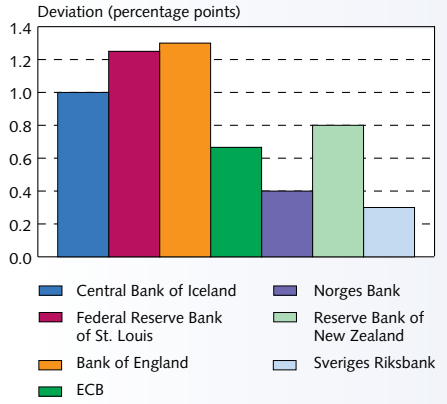
Sources: Arion Bank, European Commission, Icelandic Confederation of Labour, IMF, Íslandsbanki, Landsbankinn, Statistics Iceland, Central Bank of Iceland.

Chart 10
Inflation forecasts for 2015



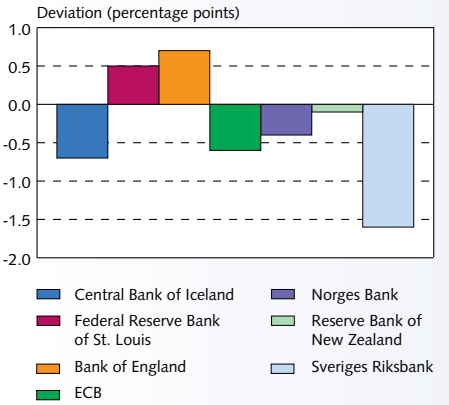
Sources: Arion Bank, European Commission, Icelandic Confederation of Labour, IMF, Íslandsbanki, Landsbankinn, Statistics Iceland, Central Bank of Iceland.

Chart 11
Inflation forecasting errors for 2015 in advanced economies[1]



1. Forecasts made at the end of 2014 except the Fed's, which was made in July 2014.
Sources: Bank of England, ECB, Federal Reserve Bank of St. Louis, Norges Bank, Reserve Bank of New Zealand, Sveriges Riksbank, Central Bank of Iceland.

Chart 12
GDP growth forecasting errors for 2015 in advanced economies[1]



1. Forecasts made at the end of 2014 except the Fed's, which was made in July 2014.
Sources: Bank of England, ECB, Federal Reserve Bank of St. Louis, Norges Bank, Reserve Bank of New Zealand, Sveriges Riksbank, Central Bank of Iceland.

large amounts of data on inflation for the year had emerged by the time that forecast was prepared. At the end of 2015, the Bank forecast inflation at 1.7%, and other forecasters' average was 1.8%. As is stated above, actual inflation averaged 1.6% in 2015.

The Central Bank's 2015 forecasts in international comparison
Finally, it can be instructive to place the Bank's forecast into international context, particularly under the current circumstances of weak global GDP growth and low global inflation, which in part have reflected the plunge in global oil prices at the beginning of the year. As Chart 11 indicates, inflation in developed countries turned out lower in 2015 than had been forecast at the end of 2014, and the overestimation in the Bank's forecast was broadly similar to that in forecasts from the US, the UK, and New Zealand, but slightly larger than in the euro area and in Norway and Sweden. Chart 12 repeats the exercise for GDP growth forecasts. Year-2015 GDP growth was overestimated in the US and the UK but underestimated in the other countries. The underestimation in Iceland was similar to that in the eurozone and Norway.[6]

6. The ECB's underforecast of GDP growth in the eurozone in 2015 is affected somewhat by a major revision of GDP growth in Ireland. Ireland's 2014-2015 GDP growth was revised upwards by more than 20 percentage points due to changes in the treatment of the operations of multinational companies operating there. As a result, 2015 GDP growth for the eurozone as a whole was revised upwards by 0.3 percentage points (see, for example, IMF, *World Economic Outlook*, October 2016, p. 21).

Box 4

Report to the Government on inflation below the lower deviation limit

According to data published by Statistics Iceland on 26 August 2016, twelve-month inflation in terms of the consumer price index (CPI) was 0.9% in August. Measured inflation was therefore below 1%, the lower limit for the inflation target. According to the joint declaration issued by the Government and the Central Bank of Iceland on 27 March 2001, the Bank is to send a report to the Government if inflation deviates by more than 1½ percentage points from the target. These limits do not entail any other formal requirement vis-à-vis the Central Bank except to oblige the Bank to submit a report explaining the reasons for the deviation from the 2½% inflation target, estimating how long the deviation will endure and, as applicable, stating whether the Bank considers it necessary to take action in response to it.

Recent developments in inflation

At the end of 2014, inflation fell below the lower deviation limit of the inflation target for the first time since the target was adopted. The deviation was not long-lived, however, as inflation had moved back within the deviation band only three months later. Since then, and until recently, inflation has measured between 1½% and just over 2%; that is, below the target but within the deviation band. Inflation has now fallen for three months in a row, alongside the appreciation of the króna and low global inflation.

In terms of the CPI excluding the housing component, inflation has been much lower, or -0.9%, and has been below 1% ever since the beginning of 2015. It appears that underlying inflation has also been on the decline. Most measures that the Bank takes account of suggest that it ranged between 1.3% and 2.1% in August, about the same level as at year-end 2014, when measured inflation last fell below the lower limit. Underlying inflation then rose, as did measured inflation.

In the recent term, rising house prices have been the main driver of twelve-month inflation, and the year-on-year rise in the housing component of the CPI measured 7.3% in August. The contribution of domestic goods to twelve-month inflation has also increased. For example, domestic goods prices rose by 2.4% year-on-year in August. These domestic inflationary pressures have been offset by the appreciation of the króna, falling oil prices, and low global inflation. Prices of imported goods fell by 3.1% year-on-year in krónur terms in August, including a 9.7% drop in petrol prices. Other commodity prices have fallen as well. In Q2/2016, prices of non-oil commodities fell by nearly 12% year-on-year in krónur terms.

Furthermore, as is described in *Monetary Bulletin* 2016/3, published on 24 August, inflation expectations have been gradually declining and appear to be more firmly anchored to the target than before. For instance, at the beginning of 2012, market agents appeared to expect inflation to measure 4½% over the next ten years, but by the beginning of 2015 their ten-year expectations had subsided to 3%. Following the wage settlements that spring, inflation expectations rose temporarily but had fallen back to 3% by August 2016. The breakeven inflation rate in the bond market has developed similarly; it was 5% at the beginning of 2012 but had fallen to just over 3% by early 2015. It rose again as the year progressed, peaking at about 4.8% around the time the new wage settlements were concluded. Since then, it has fallen once again and had aligned with the target by early September.

The inflation outlook

The Central Bank published its last inflation forecast in *Monetary Bulletin* 2016/3. According to that forecast, inflation will average

1.2% in Q3/2016 and then rise to 2.2% in the fourth quarter of the year. The August inflation measurement, which was published a few days afterwards, is well in line with the Bank's most recent forecast. According to that forecast, inflation is quite likely to rise above the lower deviation limit soon, perhaps as early as next month.

As is described in *Monetary Bulletin* 2016/3, it appears that the strong improvement in terms of trade in recent years, low global inflation, the appreciation of the króna, and a tight monetary stance have largely contained the cost effects of the large wage increases negotiated in the recent past. However, if the króna does not appreciate further, its effects will gradually taper off as the forecast horizon progresses. According to the baseline forecast in *Monetary Bulletin*, inflation will be just over 3% by mid-2017 and will peak at 3.8% in the first half of 2018. It will then begin to ease again and is expected to fall below 3% during the first half of 2019. It is appropriate to emphasise that uncertainty about near-term exchange rate developments is greater than it has been in recent years because of the planned liberalisation of capital controls.

The Bank will release a new inflation forecast in *Monetary Bulletin* 2016/4, to be published on 16 November. That forecast will contain a detailed assessment of the economic and inflation outlook and the key risks to the forecast.

Monetary policy response

On 24 August, the Central Bank of Iceland Monetary Policy Committee (MPC) announced its decision to lower the Bank's key interest rate by 0.5 percentage points, from 5.75% to 5.25%. As is noted in the MPC statement, the Committee considers the inflation outlook to have improved even though demand pressures have begun to develop in the domestic economy. In view of favourable developments in inflation, an improved inflation outlook, and signs that long-term inflation expectations are more firmly anchored than before, the Committee is of the view that it can keep inflation at target over the medium term with lower interest rates than it had previously thought possible.

That notwithstanding, the Committee considers it necessary, as before, to maintain a relatively tight monetary stance so as to ensure price stability over the longer term. GDP growth is strong, and considerably above its long-term trend level. The output slack is considered to have disappeared in 2015, and a positive output gap has developed and is expected to continue growing until next year. Unemployment is now low in historical and international context, and a labour shortage has begun to emerge. Wage increases have been considerable, and well in excess of productivity growth. Unit labour costs have therefore risen sharply, and more than is consistent with 2½% inflation over the medium term. Nominal demand has also grown rapidly, and nominal GDP grew by more than 10% in 2015 and nearly 7% in H1/2016. Although the decline in inflation expectations gives hope of a firmer anchor, it has yet to emerge how susceptible long-term inflation expectations will be to temporary fluctuations in the exchange rate and inflation.

In this respect, conditions in Iceland are quite different from those in most other advanced economies, even though inflation rates are similar at present. Iceland's main trading partners have seen GDP growth levels well below expectations, and a pronounced slack still remains in most of them. And in many instances, wages have risen only modestly for a long time, which has been a drag on demand growth, among other things. These conditions, together with the current global deflationary pressures, have caused inflation to remain persistently below target in many trading partner coun-

tries. As a result, many central banks are concerned that inflation expectations will fall still further and will be below inflation targets for a protracted period. In Iceland, however, the economic recovery has been much more robust than in trading partner countries, wage costs have risen much more, the slack in output has disappeared and a positive output gap opened up, and inflation expectations have been above target until recently. All of this is reflected in higher interest rates in Iceland than in many neighbouring countries.

Nevertheless, in view of the improving inflation outlook and declining inflation expectations, the MPC considered it timely to lower the Bank's nominal interest rates in August, as the Bank's real rate had risen more than the Committee had assumed in June. Near-term developments in inflation and inflation expectations are highly uncertain, and large steps in the capital account liberalisation process lie ahead. As a result, it is not possible to make statements about the Committee's next steps.

Appendix 1

Forecast tables

Table 1 GDP and its main components[1]

	2015	*2016*	*2017*	*2018*	*2019*
Private consumption	4.3 (4.8)	7.6 (6.7)	6.6 (5.6)	4.2 (3.3)	3.5
Public consumption	1.0 (1.1)	1.6 (1.4)	1.8 (1.5)	1.5 (1.5)	1.6
Gross capital formation	18.3 (18.6)	22.5 (18.2)	5.4 (5.3)	1.3 (-2.6)	5.5
Business investment	29.5 (29.5)	27.2 (23.9)	0.2 (2.7)	-3.2 (-6.2)	2.2
Residential investment	-3.1 (-3.1)	17.8 (8.1)	23.8 (22.9)	19.4 (10.6)	14.2
Public investment	-2.5 (-1.1)	6.5 (4.1)	18.0 (3.9)	3.3 (2.8)	9.3
Domestic demand	6.0 (6.3)	8.7 (7.7)	5.1 (4.1)	2.9 (1.5)	3.4
Exports of goods and services	9.2 (8.2)	7.8 (8.6)	3.5 (2.9)	3.1 (4.0)	2.6
Imports of goods and services	13.5 (13.5)	15.7 (14.6)	4.8 (2.8)	3.0 (1.9)	4.3
Gross domestic product (GDP)	4.2 (4.0)	5.0 (4.9)	4.5 (4.1)	2.9 (2.6)	2.7
GDP at current prices (ISK billions)	2,214 (2,205)	2,403 (2,381)	2,576 (2,583)	2,706 (2,754)	2,858
GDP at current prices (growth rate)	10.3 (10.1)	8.5 (8.0)	7.2 (8.5)	5.0 (6.6)	5.6
Total investment (% of GDP)	19.0 (19.1)	21.4 (21.0)	20.8 (20.9)	20.2 (19.7)	20.6
Business investment (% of GDP)	13.5 (13.6)	15.5 (15.4)	14.1 (14.8)	12.8 (13.3)	12.5
Underlying gross national saving (% of GDP)[2]	24.9 (24.1)	26.0 (24.4)	23.7 (23.7)	22.6 (23.4)	22.2
Contribution of net trade to GDP growth (percentage points)	-1.5 (-2.0)	-3.0 (-2.2)	-0.4 (0.2)	0.1 (1.1)	-0.5

1. Year-on-year change (%) unless otherwise specified (figures in parentheses are from the forecast in *Monetary Bulletin* 2016/3). 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)	-3.0 (-3.0)	-2.0 (3.5)	2.0 (2.0)	2.0
Aluminium production for export[2]	5.3 (5.3)	-2.0 (1.5)	5.0 (1.4)	1.5 (1.3)	1.5
Foreign currency prices of marine products	10.9 (10.9)	1.0 (2.5)	1.0 (-1.0)	0.0 (0.0)	1.0
Aluminium prices in USD[3]	-6.4 (-6.4)	-14.1 (-12.3)	3.1 (4.3)	1.2 (1.3)	1.2
Fuel prices in USD[4]	-47.2 (-47.2)	-17.0 (-19.1)	21.0 (16.6)	8.0 (6.0)	5.0
Terms of trade for goods and services	6.7 (6.8)	2.8 (1.2)	1.2 (0.0)	-0.6 (-0.4)	-0.4
Inflation in main trading partners[5]	0.6 (0.6)	1.0 (1.0)	1.7 (1.8)	1.9 (2.0)	1.9
GDP growth in main trading partners[5]	1.9 (1.8)	1.6 (1.5)	1.6 (1.7)	1.7 (2.0)	1.9
Main trading partners' imports[5]	3.5 (3.5)	2.5 (2.7)	3.5 (3.6)	3.0 (3.2)	2.7
Short-term interest rates in main trading partners (%)[5]	0.2 (0.2)	0.1 (0.2)	0.2 (0.3)	0.5 (0.6)	0.8

1. Year-on-year changes (%) unless otherwise specified (figures in parentheses are from the forecast in *Monetary Bulletin* 2016/3). 2. According to Statistics Iceland's external trade data. 3. Forecast based on aluminium futures and analysts' forecasts. 4. Forecast based on fuel futures 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 (7.0)	5.0 (4.7)	4.6 (4.6)	4.1 (5.3)	3.3
Headline balance on primary income[2]	-2.4 (-2.8)	-0.4 (-1.6)	-1.7 (-1.8)	-1.8 (-1.6)	-1.7
Underlying balance on primary income[3]	-1.6 (-1.9)	-0.4 (-1.6)	-1.7 (-1.8)	-1.8 (-1.6)	-1.7
Headline current account balance[2]	5.1 (4.2)	4.6 (3.1)	2.9 (2.9)	2.4 (3.7)	1.6
Underlying current account balance[3]	5.7 (4.9)	4.6 (3.1)	2.9 (2.9)	2.4 (3.7)	1.6

1. % of GDP (figures in parentheses are from the forecast in *Monetary Bulletin* 2016/3). 2. Calculated according to IMF standards. The sum of primary and secondary income. 3. Adjusted for the calculated revenues and expenses of the DMBs in winding-up proceedings for 2015, but with the recent settlement of the failed banks' estates, there is no longer any difference between measures and underlying current account numbers. The services account balance is also adjusted for the failed DMBs' 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 (0.0)	15.0 (15.5)	-0.3 (0.6)	-0.5 (0.9)	-0.5
Primary Treasury balance	3.2 (3.4)	17.9 (18.3)	1.7 (3.0)	1.4 (3.2)	1.1
Primary Treasury balance excluding one-off items[2]	2.8 (3.0)	1.9 (2.2)	0.9 (2.2)	1.4 (3.2)	1.1
Overall general government balance	-0.8 (-0.5)	14.9 (15.3)	-0.3 (0.4)	-0.6 (0.8)	-0.7
Primary general government balance	2.9 (3.0)	17.9 (18.2)	1.8 (2.9)	1.4 (3.1)	1.0
Total general government debt	68.1 (69)	60 (61)	56 (56)	48 (46)	44
Net general government debt[3]	49.2 (50)	43 (44)	40 (40)	38 (36)	34

1. % of GDP on an accrual basis (figures in parentheses are from the forecast in *Monetary Bulletin* 2016/2). 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)	3.1 (3.3)	3.0 (3.1)	3.7 (3.4)	3.8
Employment rate (% of population aged 16-74)	79.2 (79.2)	80.7 (80.2)	81.0 (80.9)	80.5 (80.2)	80.0
Total hours worked	3.3 (3.3)	3.0 (2.8)	3.4 (3.7)	1.4 (1.4)	1.1
Labour productivity[2]	0.8 (0.6)	2.0 (2.1)	1.0 (0.5)	1.5 (1.2)	1.6
Unit labour costs[3]	7.1 (8.4)	7.4 (9.2)	4.7 (5.2)	4.7 (5.0)	4.6
Wage share (% of gross factor income)	61.6 (62.9)	64.1 (66.7)	65.4 (67.5)	67.1 (68.1)	68.2
Real disposable income	10.0 (8.6)	6.8 (10.4)	5.8 (5.2)	3.8 (2.1)	4.3
Output gap (% of potential output)	1.0 (0.6)	2.2 (2.4)	1.6 (2.3)	0.4 (1.1)	0.0

1. Year-on-year change (%) unless otherwise specified (figures in parentheses are from the forecast in *Monetary Bulletin* 2016/3). 2. GDP per total hours worked. 3. Wage costs divided by productivity.

Sources: Statistics Iceland, Central Bank of Iceland.

Table 6 Exchange rate and inflation[1]

	2015	2016	2017	2018	2019
Trade-weighted exchange rate index[2]	201.1 (201.1)	181.8 (184.4)	164.8 (179.3)	157.8 (179.4)	157.3
Real exchange rate (relative consumer prices)[3]	79.0 (79.0)	88.1 (86.8)	97.7 (90.4)	102.7 (91.8)	104.1
Real exchange rate (relative unit labour costs)[3]	73.7 (74.0)	86.6 (86.9)	98.8 (93.0)	106.0 (95.9)	108.5
Inflation (consumer price index, CPI)	1.6 (1.6)	1.7 (1.7)	2.3 (3.2)	2.6 (3.6)	2.9
Inflation (CPI excluding effects of indirect taxes)	1.2 (1.2)	1.7 (1.7)	2.1 (3.2)	2.6 (3.6)	2.9

1. Year-on-year change (%) unless otherwise specified (figures in parentheses are from the forecast in *Monetary Bulletin* 2016/3). 2. Narrow trade-weighted basket (index, 31 December 1991 = 100). 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	
2015:4	1.9 (1.9)	1.5 (1.5)	-0.6 (-0.6)
2016:1	1.9 (1.9)	1.9 (1.9)	0.4 (0.4)
2016:2	1.6 (1.6)	1.6 (1.6)	4.1 (4.1)
2016:3	1.3 (1.2)	1.3 (1.2)	1.3 (0.8)
		Forecasted value	
2016:4	2.1 (2.2)	2.1 (2.2)	2.6 (3.4)
2017:1	2.1 (2.7)	2.0 (2.7)	0.6 (2.5)
2017:2	2.2 (3.1)	2.1 (3.1)	4.5 (5.6)
2017:3	2.4 (3.5)	2.2 (3.5)	2.2 (2.5)
2017:4	2.5 (3.6)	2.3 (3.6)	3.0 (3.8)
2018:1	2.3 (3.7)	2.3 (3.7)	-0.3 (3.0)
2018:2	2.4 (3.8)	2.4 (3.8)	4.7 (6.1)
2018:3	2.6 (3.6)	2.6 (3.6)	3.2 (1.6)
2018:4	2.9 (3.4)	2.9 (3.4)	3.8 (3.0)
2019:1	3.0 (3.1)	3.0 (3.1)	0.4 (1.8)
2019:2	3.0 (2.9)	3.0 (2.9)	4.7 (5.3)
2019:3	2.9 (2.8)	2.9 (2.8)	2.9 (1.0)
2019:4	2.7	2.7	3.0

1. Figures in parentheses are from forecast in *Monetary Bulletin* 2016/3.

Sources: Statistics Iceland, Central Bank of Iceland.