

## Substantially worse inflation outlook if policy rate is kept unchanged

*The turbulence in the foreign exchange market in February and March following Fitch Ratings' announcement of a negative outlook for Iceland's sovereign ratings, and other subsequent negative reports, underlines how sensitive the economic situation is to relatively minor events. Forecasts for economic developments based on the assumption of an unchanged policy interest rate and exchange rate should therefore still be treated with great reservations. The inflation outlook two years ahead has deteriorated, both because demand growth over the past two years has been revised upwards and the króna is much weaker than was assumed in the Central Bank's last forecast in December 2005. Labour market pressures have also continued to build up and wage costs have risen at a rate well beyond what is compatible with the inflation target. On a positive note, the residential housing market appears to be heading back towards balance soon and house price inflation is waning. However, these effects will be outweighed in the medium term by the depreciation of the króna, as demand growth is still robust. Recent events underline that a rapid adjustment cannot be ruled out. Inflation expectations have grown after the foreign exchange market unrest in February and March, which pushes the real policy rate down and channels demand into indexed bonds, lowering their yields. Thus the monetary stance has eased at a time when most indications are that it needs to be tightened substantially and relatively rapidly.*

### I Overview of macroeconomic and inflation forecast

#### **Assumptions for policy rate and exchange rate have changed substantially**

Exceptionally large macroeconomic imbalances over the past year make the development of several variables, which are of critical importance to inflation prospects, highly uncertain. In *Monetary Bulletin*, the Central Bank has responded to this uncertainty by playing down the emphasis on specific forecast paths, e.g. by describing a number of scenarios based on different assumptions and emphasising the risk profile of the projected inflation path more than the path itself. The baseline scenario makes the technical assumption of an unchanged policy interest rate (currently 10.75%) over the forecast horizon. This is not because the Central Bank considers this interest rate path to be likely; on the contrary, the Bank has frequently changed its policy rate at the same time as it publishes its inflation forecast. Such a forecast merely provides a useful reference for monetary policy decision-making. The baseline forecast also assumes an unchanged exchange rate over the forecast horizon, consistent with the random walk behaviour of exchange rates. However, this assumption can be problematic when the real exchange rate is exceptionally high or low. The current baseline forecast assumes an unchanged effective exchange rate index value of 116 over the next two years. The effective exchange rate of the króna in the current forecast is therefore roughly 12% lower than in the December baseline forecast. An alternative scenario

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1. This article uses data available on March 28, 2006, but the forecast is based on data until March 15.

Table I-1 Central Bank macroeconomic forecast based on unchanged policy interest rate and exchange rate (baseline forecast)

	Policy rate and exchange rate assumptions <sup>1</sup>							
	Current forecast				Change from previous forecast (percentage points) <sup>2</sup>			
	2004	2005	2006	2007	2004	2005	2006	2007
Central Bank policy interest rate (%)	6.13	9.37	10.73	10.75	-	0.01	0.48	0.50
Foreign exchange index (Dec. 31, 1991 = 100) <sup>3</sup>	121.0	108.6	114.3	116.0	-	0.4	12.1	13.7
	Current macroeconomic forecast							
	Volume change on previous year (%)				Change from previous forecast (percentage points) <sup>2</sup>			
	Current forecast							
	2004	2005	2006	2007	2004	2005	2006	2007
GDP and its main components								
Private consumption	7.2	11.9	5.4	0.5	0.3	0.8	-2.4	-3.6
Public consumption	2.9	3.2	2.8	4.0	0.1	0.2	-0.1	1.4
Gross fixed capital formation	29.1	34.5	4.2	-17.1	8.1	4.4	7.1	2.7
Business sector investment	34.5	56.9	-1.1	-32.3	11.2	1.1	3.1	-0.1
Residential construction	13.8	10.3	24.8	15.7	8.1	-1.5	15.3	15.1
Public works and buildings	34.6	-13.5	-7.5	22.7	7.7	-2.3	6.5	-5.7
National expenditure	10.4	14.9	4.7	-3.3	2.0	1.6	0.6	-1.2
Exports of goods and services	8.4	3.5	3.4	13.1	0.1	-0.1	-2.4	-2.3
Imports of goods and services	14.4	28.4	4.5	0.9	0.2	3.9	4.0	2.3
Gross domestic product	8.2	5.5	4.2	0.4	2.0	0.8	-2.4	-3.7
Other key aggregates								
Gross domestic product at current prices (b.kr.)	917	996	1,099	1,168	32	7	-11	-29
Current account balance (% of GDP)	-9.3	-16.5	-14.1	-9.9	-0.9	-0.9	-2.2	-3.2
Unit labour cost (change between annual averages in %)	5.1	6.2	6.4	3.9	-	0.6	0.6	-0.4
Unemployment (% of labour force)	3.1	2.1	1.5	1.9	-	0.1	-0.4	-0.5

1. Annual averages, assuming unchanged interest rates and exchange rate from the day of forecast. 2. Change since *Monetary Bulletin* 2005/4. 3. Percentage change in index from previous forecast.

is also presented assuming a variable policy rate and exchange rate, based on forecasts by financial market analysts. The forecast horizons are until Q1/2008.

### Macroeconomic imbalances considerably larger than previously estimated

Recent and revised national accounts figures indicate significantly more robust economic growth over the past two years than previously estimated. Hence, the estimated output gap, indicators of tightness of the labour market and the estimated current account deficit have all been revised upwards from the December forecast, notwithstanding a downward revision of forecast domestic demand and GDP growth.

### Outlook for a sharp slowdown in domestic demand growth ...

Domestic demand growth is forecast to slow down sharply later this year and the outlook is for a contraction in 2007. GDP growth will also decline, but at a slower rate, due to rapidly declining import growth and a surge in aluminium exports next year.

Forecast GDP growth this year has been revised downwards since December, in spite of broadly unchanged growth of national expenditure. This is the result of a negative contribution from foreign trade. GDP growth in 2007 will be negligible, and considerably less than was forecast in December, which is also explained by a negative

contribution from net trade and reduced growth of domestic demand, especially of private consumption.

### ... while the economy moves back into balance

Slower domestic demand growth is an inevitable result of the economy's adjustment after several years of overheating. Nonetheless, the speed of adjustment in the baseline forecast is insufficient, with a risk that underlying imbalances will become entrenched due to persistent high inflation expectations. Thus the baseline forecast implies that a considerably tighter monetary stance would be called for, if the inflation target is to be attained within the two-year horizon.

### Marked downturn in the inflation outlook

The substantial depreciation of the króna and greater underlying macroeconomic imbalances have produced a significantly worse inflation outlook since the last forecast in December, notwithstanding that the policy interest rate has been raised by half a percentage point since then. According to the baseline forecast, inflation will accelerate rapidly in the near term to reach almost 5½% at the end of this year and peak in mid-2007 at more than 6%. The outlook is that inflation will remain high across the horizon with little likelihood of hitting the target in the next few years unless the monetary stance is tightened significantly.

Table I-2 Inflation outlook

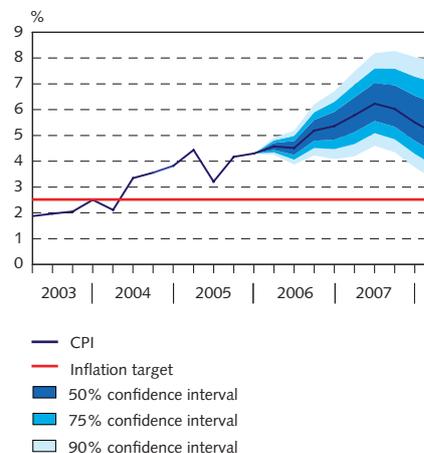
Year-on-year changes in the CPI

Quarter	Forecast based on unchanged policy rate and exchange rate	Forecast based on variable policy rate and exchange rate
2005:1	4.4	4.4
2005:2	3.2	3.2
2005:3	4.2	4.2
2005:4	4.3	4.3
Annual average	4.0	4.0
2006:1	4.6	4.6
2006:2	4.5	4.5
2006:3	5.2	5.2
2006:4	5.4	5.3
Annual average	4.9	4.9
2007:1	5.8	5.8
2007:2	6.2	6.4
2007:3	6.0	6.4
2007:4	5.5	6.0
Annual average	5.9	6.2
2008:1	5.1	5.7

This assessment is corroborated by an alternative scenario based on financial market analysts' expectations about policy rate developments over the next two years and an exchange rate path calculated using uncovered interest rate parity.<sup>2</sup> The alternative scenario depicts

Chart I-1  
Current Central Bank inflation forecast  
– baseline scenario

Forecasting period: Q1/2006 - Q1/2008



Source: Central Bank of Iceland.

2. The expected policy rate path is discussed in more detail in Section III and Box VIII-2. The spread between this path and foreign forward interest rates can be used to produce an expected exchange-rate path based on uncovered interest rate parity. The exchange rate path is explained in more detail in Section VIII.

even bleaker inflation prospects than the baseline forecast, despite the higher policy rate path, due to the weaker exchange rate. Inflation according to the alternative scenario will be around 6% two years hence.

Both the baseline forecast and the alternative scenario are based on policy rate paths that must be deemed unrealistic, given how much the inflation outlook has deteriorated. It is highly unlikely that the Central Bank will attain the inflation target based on the two underlying interest rate paths.

As pointed out earlier, it is important to bear in mind the high degree of uncertainty that always surrounds the inflation outlook, especially in times of such large imbalances as are now apparent in the economy. For this reason, attention is drawn to the uncertainties in the baseline forecast and possible divergence from the baseline path. Broadly speaking, the uncertainties are the same as in the December forecast. The upside risk two years hence has been moderated slightly since December, however, because the risk of a depreciation that loomed then has already materialised to some extent. However, the risk profile two years ahead is still heavily tilted to the upside, on the assumption of an unchanged policy rate. It must be considered near-impossible to attain the inflation target over the forecast horizon without further monetary policy measures. Thus it seems quite clear that in order to rein in inflation, monetary policy needs to be tightened considerably.

## II External conditions and exports

Iceland's external conditions are broadly favourable, at least in the short run. Global economic growth is estimated at 3.2% in 2005 with a similar rate forecast for this year. If forecasts hold, the generally favourable global economic conditions can be expected to continue.<sup>1</sup> Inflation has slowed slightly in Europe and the US since the autumn. To a large extent, price movements can be attributed to fuel prices. Core inflation, defined as the rise in the HICP excluding energy and food prices, has been low. Even after a recent tightening of the monetary stance in the US and Europe, which has driven up short-term interest rates, real interest rates are still relatively low and credit supply is ample.

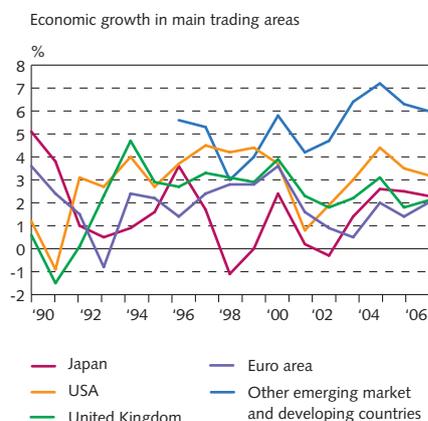
Foreign prices of Iceland's main exports have risen briskly and look likely to remain buoyant or even increase further. However, the forecast for export growth this year and in 2007 has been revised downwards.

### How long can the US continue to lead world economic growth?

As in recent years, global economic growth has largely been driven by the US, China and other emerging Asian economies. Because of its size and the pace of its growth, the influence of the Chinese economy has increased rapidly. The US has sustained robust demand, while Asian countries provide the US and other Western economies with a steady supply of cheap goods and, increasingly, also services. Together with the main oil-exporting countries, Asia also funds the ever-widening US current account deficit by steady investment in US securities. Among other factors, this has contributed to holding down US interest rates in spite of increasing economic growth, and has swollen the foreign reserves of China, Japan and other countries. In turn, low interest rates have kept private consumption buoyant in the US and several other countries and driven up asset prices, in particular house prices, in much of the world.

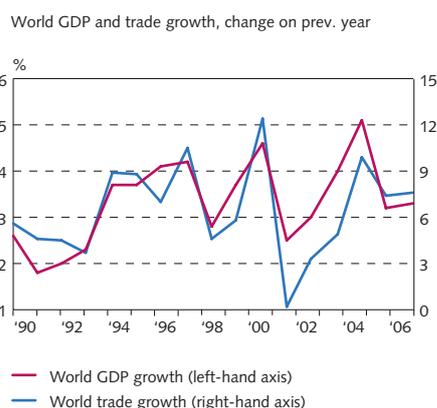
The sustainability of the present global economic arrangements has been called into question. Some analysts believe they can be sustained for many years without significant problems, while others expect them to break down within a year or two, given that the growing US current account and fiscal deficits and the relentless stockpiling of foreign reserves in Asia and the oil-producing countries represent an unsustainable development that will inevitably come to a halt. Global imbalances cast some uncertainty over an otherwise positive economic outlook. The current expansion phase has to a great extent been sustained by robust private consumption and low savings in the US, which is largely explained by the wealth effect caused by rising property prices.

Chart II-1  
International economic developments  
1990 - 2006<sup>1</sup>



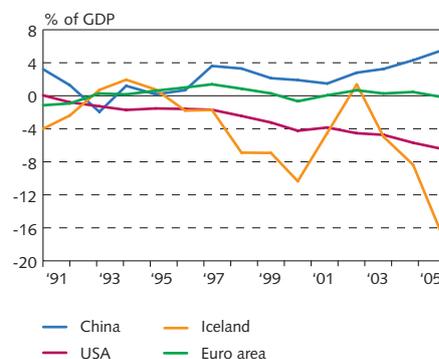
1. Data for 2005 and 2006 are based on estimates and forecasts.  
Sources: IMF, Consensus Forecasts.

Chart II-2  
International economic developments  
1990 - 2006<sup>1</sup>



1. Data for 2005 and 2006 are based on estimates and forecasts.  
Sources: IMF, Consensus Forecasts.

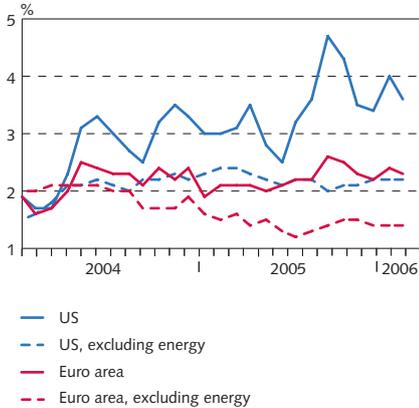
Chart II-3  
Current account balance as % of GDP  
1991 - 2005<sup>1</sup>



1. Data for 2005 are based on forecasts.  
Sources: Global Insight, OECD, Reuters EcoWin, Central Bank of Iceland.

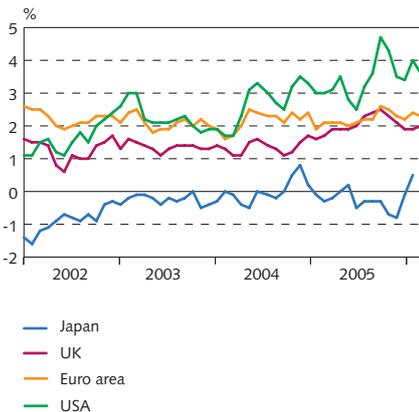
1. See e.g. *Moody's Global Outlook and Consensus Forecasts*.

Chart II-4  
Inflation in the US and Euro area  
January 2004 - February 2006  
Inflation with and without energy prices



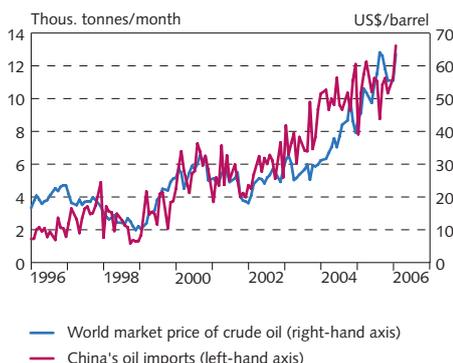
Source: Reuters EcoWin.

Chart II-5  
Inflation in the USA, UK, Japan and Euro area  
January 2002 - February 2006<sup>1</sup>



1. February figures not available for Japan.  
Source: Reuters EcoWin.

Chart II-6  
China's oil imports and the world market price of oil  
January 1996 - January 2006



Source: Reuters EcoWin.

### Disintegration of the fixed exchange rate regimes could push up interest rates and squeeze growth

The wider that the US current account deficit stretches, the more its sustainability is questioned. In Q4/2005 it was equivalent to 7% of GDP, an unparalleled scale for the world's largest economy.<sup>2</sup> China and Japan, with some major oil-exporting countries, have registered corresponding current account surpluses, while foreign trade in the euro area has been close to balance in recent years (see Chart II-3).

China appears to be inching away from a fixed exchange regime. If it completely abandons its stable exchange rate policy, this could potentially have a substantial impact on the global economy, by pushing up interest rates and contributing to depreciation of the US dollar. This would curb the growth of US private consumption and probably economic growth in general, but boost US export growth. The US dollar is still relatively strong in spite of the current account deficit, shored up by a fairly large interest-rate differential with abroad. *Consensus Forecasts* expect some rise in the ECB's minimum bid rate but little change in the federal funds rate this year. A narrower interest-rate differential increases the probability that the dollar will weaken.

GDP growth in the US fell unexpectedly in Q4/2005 and measured only 1.6% on an annualised basis. This was well below expectations but probably represents a temporary contraction reflecting for example budgetary relocation of defence expenditures and hurricane damage.

### More upbeat outlook for euro region growth

Indications have emerged recently that inspire hopes of a fairly firm economic recovery in Europe. The latest ECB forecast expects average GDP growth of 1.7-2.5% in the euro area this year, slightly more than in its previous forecasts. However, the recovery is still largely driven by export growth. Private consumption remains subdued, although upbeat consumer confidence surveys signal that a change may be in the offing. Unemployment in the euro area has slightly decreased, which should spur private consumption, but its effect may be dampened by higher energy prices and planned tax increases. Wage demands may also create inflationary pressures, after several years of modest wage rises and real wage growth in the euro area. Investment has grown steadily and is expected to increase this year, making a stable recovery more likely.

China is expected to maintain its vigorous growth this year and invest heavily in the export sector. Growing demand from China is considered one of the main explanations for rising commodity and metals prices (see Chart II-6) and will probably contribute to keeping them buoyant. Increased production this year is expected to reduce price fluctuations, however.

2. Despite persistent current account and fiscal deficits, which have left the US net external position equivalent to half of its GDP, the balance on income has not deteriorated significantly. The interest paid by the US on its foreign debts, and profits on foreign inward investment in the US, therefore appear to be much lower than the interest and profit reaped by the US on its own external investments. This may change, however, if there is a rise in interest rates on US bonds which form the backbone of foreign reserves in many Asian and oil-exporting countries.

The Bank of Japan has recently tightened its monetary stance following signs of a marked recovery at the end of last year. *Consensus Forecasts* expect a substantial jump in industrial production and private consumption this year which will deliver GDP growth of 2.9%, considerably more than previously forecast. A modest rise in the CPI is also expected after a prolonged episode of deflation.

### Decrease in fish catch but higher prices for marine products

Fish catch volume in 2005 was similar to the year before, but its value fell due to smaller harvests of cod and redfish. The shrimp catch was down by more than half.

Over the first two months of this year, catches of both demersal and pelagic fish have been exceptionally poor. It is quite likely that the last capelin for the season was caught at the beginning of March. This would leave the current capelin season as one of the leanest for many years. The demersal catch is expected to be broadly unchanged from last year, but a continuing decline is foreseen in shrimp. On these assumptions, marine export volume is expected to decrease by 2% this year. However, the value of the capelin and herring will be enhanced as the result of a large part of the herring catch being processed for food (rather than oil and meal) – and probably as much as 40% of the capelin catch in the current season. Added value from processing of these products will outweigh the drop in catch volume.

Marine prices rose briskly in 2005. Demersal products went up by more than 8% and marine products as a whole by 8.4%. The sharpest gains were in frozen-at-sea fish and fresh fish. Fish meal and oil prices also rallied. Prices rose faster as the year progressed. Sellers forecast that prices of all main fish species will continue to rise this year. The Central Bank's forecast assumes that in 2006, prices of marine products will be as much as 10% higher in foreign currency terms year-on-year.

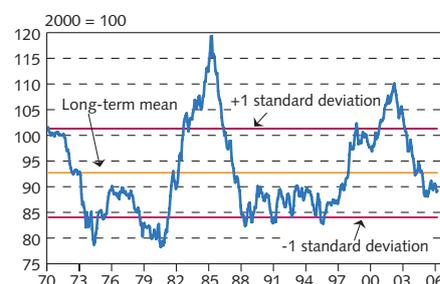
### Aluminium prices likely to remain high

Demand for aluminium has soared in recent years and the trend has continued in the first months of this year. Global inventories last

Chart II-7

Effective exchange rate of the US dollar  
 January 1970 - February 2006

Monthly data, based on relative consumer prices

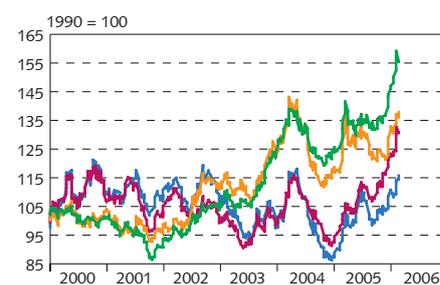


Sources: JP Morgan, Reuters EcoWin.

Chart II-8

World market commodity prices

Weekly data January 2000 - February 2006



— Commodity Price Index Food, €  
 — Commodity Price Index excluding oil, €  
 — Commodity Price Index Food, USD  
 — Commodity Price Index excluding oil, USD

Source: Reuters EcoWin.

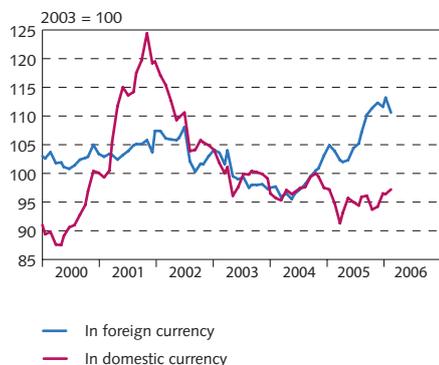
Table II-1 Main assumptions for developments in external conditions

	Current forecast (%) <sup>1</sup>			Change from previous forecast (percentage points) <sup>2</sup>		
	2005	2006	2007	2005	2006	2007
Exports of goods and services	3.5	3.4	13.1	-0.1	-2.4	-2.3
Marine production for export	-6.0	-2.0	2.0	-4.0	-5.0	0.0
Aluminium production for export	2.4	31.3	61.6	2.4	15.7	-23.3
Export prices of marine products	7.3	9.5	4.0	-1.7	3.5	1.0
Aluminium prices in USD <sup>3</sup>	7.7	27.0	-2.0	-4.2	19.7	0.0
Foreign fuel prices <sup>4</sup>	41.3	16.0	5.6	3.9	14.3	6.1
Global inflation <sup>5</sup>	2.3	2.0	2.0	-0.2	-0.3	0.0
Terms of trade for goods and services	1.0	7.2	1.3	0.7	3.3	0.6
Foreign short-term interest rates <sup>6</sup>	2.7	3.1	3.5	0.1	0.0	0.0

1. Percentage change year-on-year, except for interest rates. 2. Change since *Monetary Bulletin* 2005/4. 3. Based on forward aluminium prices. 4. Based on forward fuel prices. 5. *Consensus Forecasts*. 6. Based on weighted average forward interest rates of Iceland's main trading partner countries.

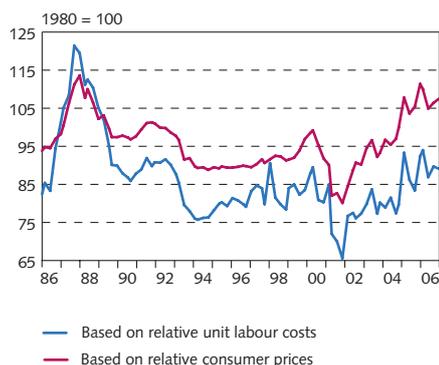
Sources: Bloomberg, Consensus Forecasts, IMF, New York Mercantile Exchange, Statistics Iceland, Central Bank of Iceland.

Chart II-9  
Marine product prices  
January 2000 - February 2006



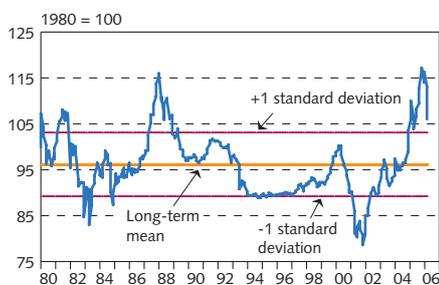
Sources: Statistics Iceland, Central Bank of Iceland.

Chart II-10  
Real effective exchange rate of the króna  
Q1/1986 - Q1/2006<sup>1</sup>



1. The forecast assumes a constant exchange rate from March 2006.  
Source: Central Bank of Iceland.

Chart II-11  
Real effective exchange rate of the króna  
January 1980 - March 2006  
Monthly data, based on relative consumer prices



Source: Central Bank of Iceland.

year were nearly half those in 2002-2003. Aluminium prices climbed swiftly in 2005, but with some fluctuations reflecting changes in supply and demand. Fundamentals suggest that prices will remain high. Exports from China are expected to decrease as surging domestic demand claims an ever-larger share of production capacity. Demand in China could soon even outstrip domestic production. Reorganisation of production in the US and Europe and the general increase in global demand for aluminium, e.g. in the US, should force prices up. Global demand increased by an estimated 6% last year, largely boosted by 20% demand growth in China. Futures on London Metal Exchange indicate that prices will peak in Q2 at 2,500 \$/t, which is almost 40% up year-on-year. *GFMS Metals Consulting* forecasts average aluminium prices above 2,000 \$/t both this year and in 2007.

### Tourism buoyant despite the strong króna

The tourist industry has been squeezed fairly hard by the strong króna. Tourist traffic from abroad increased by 2½% in 2005 and overnight stays by 8%. However, receipts from tourists increased by only 1% in króna terms year-on-year. The tourist industry has therefore absorbed part of the cost entailed by the appreciation of the króna. In the first two months of 2006 the number of visitors was up 12% year-on-year. Thus there are no signs that the strong króna poses a threat of a contraction.

### The real exchange rate of the króna has depreciated since November

The real exchange rate of the króna is still high in historical terms, but has depreciated substantially both in nominal and real terms since November 2005. Based on the average nominal exchange rate for the first half of March, the real exchange rate, defined in terms of relative consumer prices, was 10% lower than in November. Hence, over the forecast horizon the real exchange rate will be considerably lower than assumed in December, provided that the króna remains unchanged or slides further.<sup>3</sup>

### Lower-than-expected marine exports are likely this year

In *Monetary Bulletin* 2005/4 in December, marine export production was expected to increase by 3% this year. This forecast has been revised to a 2% contraction, largely due to the unexpectedly poor capelin catch. On the other hand, some of the forecast increase in aluminium production for 2007 will shift to this year. A slight decrease is foreseen in exports of other manufactured goods than aluminium and alloys. The forecast for exports of services is broadly unchanged. The combined effect is 3.4% growth in exports of goods and services this year, down by 2.4 percentage points from the forecast in December.

3. The real effective exchange rate based on relative unit labour costs is estimated considerably lower now than was shown in *Monetary Bulletin* 2005/4 in December, due to a revision of foreign wage costs stretching back several years.

### III Financial conditions

Iceland's financial markets have been volatile in recent weeks following reports on Icelandic financial companies and macroeconomic imbalances by international rating agencies and analysts, and latest data released on the size of last year's current account deficit. Fitch Ratings changed the outlook for the Republic of Iceland from stable to negative, but affirmed the banks' ratings. In March, Standard & Poor's affirmed the sovereign ratings and outlook. Since December, the Central Bank has twice raised its policy interest rate: on December 2, coinciding with the publication of *Monetary Bulletin* 2005/4, and on January 26 on the first formal interest rate announcement date of the year. The króna has depreciated sharply so far this year and inflation expectations have risen accordingly. This is reflected in falling interest rates on indexed bonds and an edging upwards of nominal bond rates since February. Despite the lower indexed rates, financial conditions of households have tightened somewhat because of a rise in the lowest mortgage interest rates.

#### Higher short-term rates in the US and Europe

In the US, the Federal Reserve has been raising its federal funds rate in measured steps since mid-2004 and it now stands at 4.5%. Interest rates on long US Treasury bonds have not changed much despite sizeable hikes in short-term rates. This has gradually narrowed the spread between short and long rates to virtually zero at present. The last time this happened was at the beginning of 2001 and it is often interpreted as heralding a contraction in the US. However, the Federal Reserve has dismissed these concerns, pointing to low inflation expectations as the explanation.

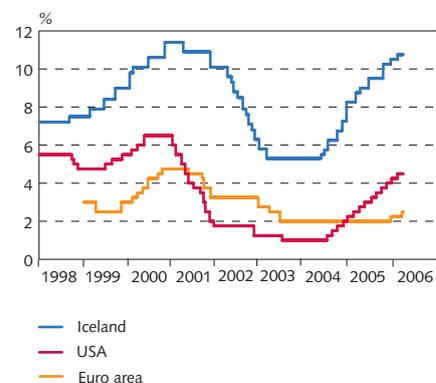
The European Central Bank has also raised its minimum bid rate, most recently to 2.5% in March, in response to indications of increasing inflation. In line with expectations in the UK, the Bank of England has not changed its policy rate since mid-2005; it is currently at 4.5%.

#### The weaker króna could make conditions for foreign borrowing more favourable, but increase debt service on existing loans

The foreign exchange market has been jumpy since February. As a result, the króna has depreciated and the exchange rate become more volatile. In the first three weeks of March, the value of the króna was roughly 12.5% lower than at its peak in November. Conditions for borrowing in foreign currency may therefore be more favourable, assuming that borrowers appraise the króna as lying closer to its long-term equilibrium rate than it has in the past few months. However, expectations about the overall required exchange rate readjustment have probably also changed, for example because last year's current account deficit exceeded forecasts and exchange rate volatility has intensified. The latest survey of financial market analysts' outlooks could point in this direction. The depreciation is immediately transmitted to a heavier debt service burden for borrowers who have already taken foreign loans that they have to repay in domestic currency.

Chart III-1  
Central Bank policy rate

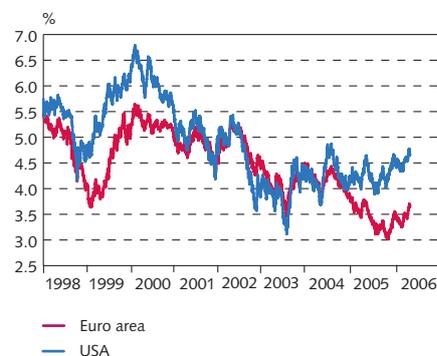
Daily data January 1, 1998 - March 17, 2006



Sources: Reuters EcoWin, Central Bank of Iceland.

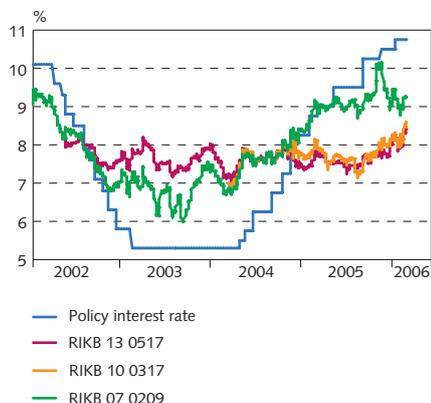
Chart III-2  
Yield on 10-year government bonds

Daily data January 1, 1998 - March 17, 2006



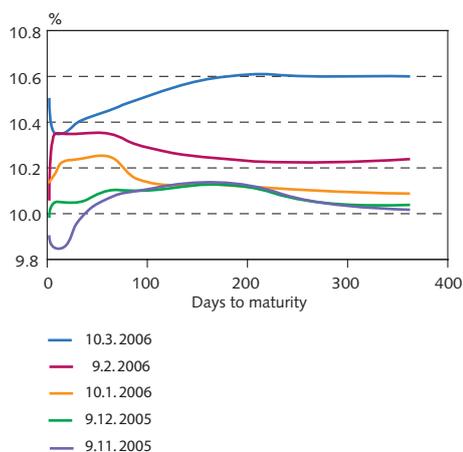
Source: Reuters EcoWin.

Chart III-3  
Long-term nominal Treasury bond yields and the Central Bank repo rate  
Daily data January 3, 2002 - March 17, 2006



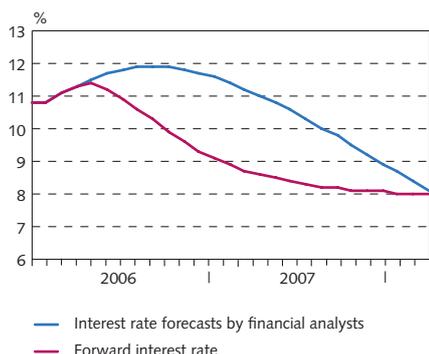
Source: Central Bank of Iceland.

Chart III-4  
Yield curve in the króna interbank market



Source: Central Bank of Iceland.

Chart III-5  
Central Bank policy rate based on forward rates and analysts' projections  
January 2006 - March 2008



Source: Central Bank of Iceland.

### Monetary policy transmission across the yield curve has not been entirely smooth

Monetary policy transmission across the yield curve has not always been smooth. Interest rates on nominal Treasury notes with maturities of roughly four and seven years have gone up. However, króna-denominated Eurobond issues have suppressed rates on bonds with a maturity of one year, which are now also targeted by a buyback. For a while, Eurobond issuance also affected four-year nominal rates, but less so after the króna began to slide; furthermore, Eurobond issuance has slowed sharply in March. Nominal instruments have been under upward pressure after Fitch changed Iceland's sovereign outlook from stable to negative and the króna slid afterwards. While the possibility of a ratings downgrade for these bonds may be one explanation, a weightier consideration is probably that investors have raised the inflation premium on nominal instruments in light of the depreciation of the króna.

The yield curve of money market interest rates has shifted upwards since the policy rate hikes, and the shape of the curve has altered noticeably over the past month. The shift is particularly pronounced at the longer end. While this may be caused by expectations of higher inflation and a further policy rate hike, it could also reflect the decrease in króna Eurobond issuance abroad. Oddly, one- to three-month rates have been some way below the Central Bank's policy rate, in spite of an unambiguous message that further policy rate rises could be expected.<sup>1</sup>

### Enigmatic forward interest rates

As discussed in the last *Monetary Bulletin* in December, the zero-coupon curve on nominal instruments has been difficult to interpret. A factor at work is the heavy demand for domestic short-term securities caused by offshore issuance of króna Eurobonds, which has pushed down the shortest end of the zero-coupon curve. In addition, the Treasury has cut back sharply on its short-term note issuance, further aggravating the imbalance between supply and demand in the domestic money markets and distorting pricing of these instruments. Thus it is imprudent to interpret the forward rates that can be read from the zero-coupon curve as explicitly representing market expectations for the Central Bank's policy rate path over the years to come.

### Analysts expect further policy rate hikes for a while

The Central Bank's regular surveys among financial market analysts provide a possible illustration of just how far the zero-coupon curve diverges from real expectations. Analysts are asked about their views on the development of the policy rate two years ahead (see Box VIII-2). In December, they forecast that the policy rate would have

1. In mid-December, the National Debt Management Agency announced a new arrangement for Treasury bill issuance. Bills will be issued in smaller amounts with shorter maturities. In the first auction held on February 27, the average yield on accepted bids was 9.506%. The low required yield relative to the policy rate may be explained by short supply of bills. Since the bill was listed on Iceland Stock Exchange (on March 2) the yield has been considerably higher, at above 11%.

risen to 11.5% by today, which is 0.75 percentage points more than the actual increase. They clearly expected a tighter monetary stance than has been maintained recently.

However, they now expect on average that the policy rate will continue to rise into the second half of this year to almost 12%, which is similar to their responses in the previous survey in December, although they now expect the peak to be reached later and the high rate to be maintained for longer than they expected before.<sup>2</sup> Afterwards, the policy rate will gradually come down, in the analysts' view, but will not return to its current level until next spring. Two years ahead, the analysts expect a policy rate of 8%, which is considerably higher than could be inferred from their responses in December.

### Indexed bond yields have gone back down

*Monetary Bulletin* 2005/4 in December described how monetary policy was finally being transmitted to interest rates on long-term indexed bonds. After a sizeable additional rise in the second half of January this has been largely reversed. Explanations can be found in both Icelandic and international factors. Indexed US long-term bond rates went down marginally after a spike. However, the most plausible explanation is that higher inflation expectations following the depreciation of the króna in February spurred demand for indexed bonds. Changes in market expectations about the monetary stance may also have been at work. Supply of the Housing Financing Fund's HFF bonds will be less than expected this year as well, according to its recently published issuance programme. Uncertainty about the future role of the fund itself may also have impacted indexed lending rates, since it is not clear how much supply of indexed HFF bonds will be available in the near future.

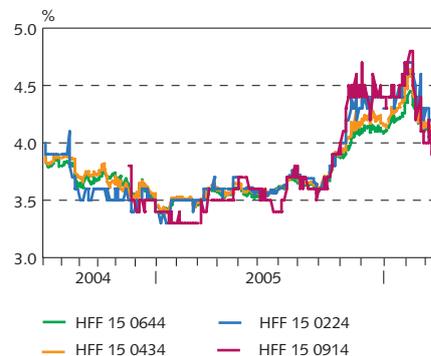
Lower indexed bond yields will entail a considerable easing of financial conditions if they result in lower indexed lending rates. However, the relationship between lending rates and required yields is fairly inelastic: despite lower yields on indexed bonds, the rise in mortgage lending rates towards the end of last year has not entirely unwound and some banks have recently raised them again.

### The policy interest rate has gone down in real terms

Market expectations of inflation, measured as the yield spread between indexed and non-indexed Treasury instruments with a maturity of roughly seven years, have increased from just under 3.5% in December. Expectations are now heading for broadly the same level as at their peak in March 2005 – above 4% – as the depreciation of the króna is expected to drive up inflation. The last two policy rate increases were initially transmitted in full in real terms, but mounting inflation expectations since February have unwound them. This development eases the monetary stance. Thus the real policy rate has not reached the heights it attained in 1999-2001 – which in retro-

Chart III-6  
HFF bond yields

Daily date July 8, 2004 - March 17, 2006

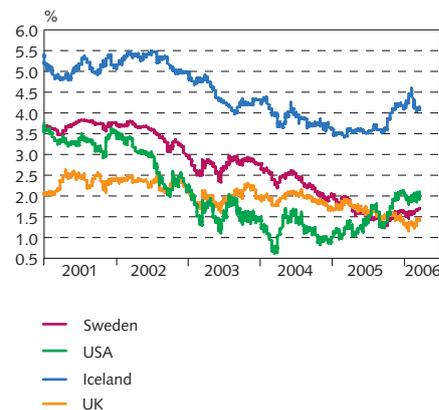


Source: Central Bank of Iceland.

Chart III-7

Yield on indexed bonds in selected countries

Daily data January 14, 2000 - March 17, 2006

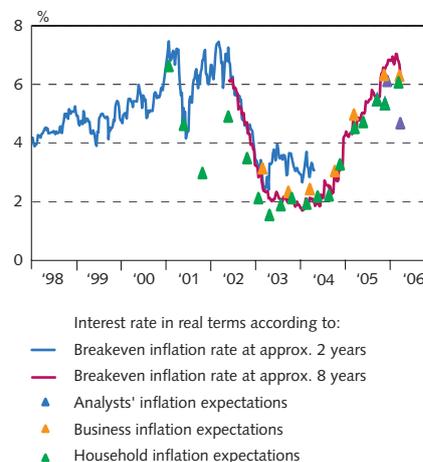


Source: Central Bank of Iceland.

Chart III-8

Central Bank policy interest rate in real terms

Daily data January 5, 1998 - March 17, 2006



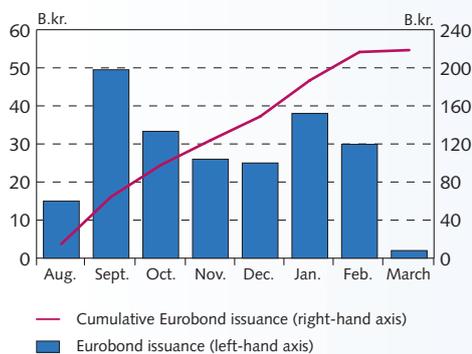
Source: Central Bank of Iceland.

2. This average is made up of widely diverging estimates, however. One analyst expects the policy rate to peak at 12.5% and another that it could go as high as 14.5% early next year.

Box III-1

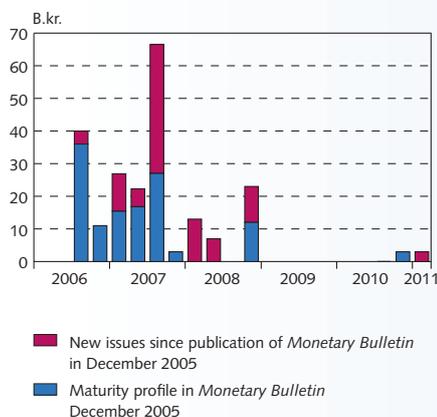
## Króna-denominated Eurobond issues

Chart 1  
Króna Eurobond issuance  
August 2005 - March 2006<sup>1</sup>  
Monthly and cumulative volume



1. Data until March 15, 2006 inclusive.  
Source: Central Bank of Iceland.

Chart 2  
Maturity profile of króna-denominated Eurobond issues  
Q3/2006 - Q1/2011



1. Data until March 15, 2006 inclusive.  
Source: Central Bank of Iceland.

Non-residents have issued króna-denominated bonds to a nominal value of 95 b.kr since the last edition of *Monetary Bulletin* was published in the beginning of December 2005. This brought the total outstanding stock of króna-denominated Eurobond issues by non-residents up to 220 b.kr. on March 16. The first issues mature in Q3/2006.<sup>1</sup>

### Slower issuance since December

Last year's issuance of króna Eurobonds amounted to 150 b.kr., equivalent to 15% of GDP. Issuance has slowed down in recent months. Over the fourteen weeks from the launch of issues at the end of August to the publication of *Monetary Bulletin* in the beginning of December, bonds were issued for the equivalent of 8.8 b.kr. per week. Over the following fourteen weeks, average weekly issues ran at 6.8 b.kr. Bonds to the value of only 2 b.kr. have been issued in March at the time of writing. Issuers are probably holding back until the FX market settles down from the turmoil caused by the Fitch ratings update and reports on the Icelandic economy by overseas securities companies.

### Securities valued at 50 b.kr. will mature this year

Chart 2 shows the maturity profile of offshore króna bonds. The red part of the columns shows the distribution of maturity dates for bonds issued since the publication of *Monetary Bulletin* in December. The bulk of the bonds mature in the second half of this year and in 2007. Bonds to the equivalent value of roughly 50 b.kr. mature in the second half of this year and roughly 120 b.kr. over the whole of next year. The maturity profile peaks in Q3/2007 when bonds mature for the equivalent of almost 70 b.kr.

It is difficult to state with any certainty what will happen when the first bonds approach maturity. Since they are all coupon bonds, buyers are paid the entire principal in krónur on maturity, plus the final interest payment. Buyers of the bonds can choose between converting the krónur into foreign currency in the Icelandic FX market or reinvesting it in new króna-denominated bonds. Which option is chosen will affect the exchange rate of the króna. The former option will clearly increase the supply of krónur. However, expectations about the response by the bonds' owners are likely to be reflected in the FX market before they mature.

It should be pointed out that extensive research by economists at the Reserve Bank of New Zealand has not established any significant exchange-rate effect from offshore bonds, neither on issuance nor maturity.

### Impact on the capital markets and exchange rate of the króna

The impact that issuance of króna Eurobonds has had on the Icelandic capital markets appears to be in line with the analysis presented in the last *Monetary Bulletin* in December. Turnover has increased in the interbank markets for krónur and foreign exchange, and bond issues have also put downward pressure on nominal interest rates, hindering the Central Bank's policy rate rises from being transmitted in full across the nominal yield curve. Limited supply of non-indexed Treasury notes has also driven interest rates down at the same time.

It is difficult to ascertain the exchange-rate effect of bond issuance. In *Monetary Bulletin* in December it was underlined that while the króna had strengthened in tandem with a tighter mon-

1. For a detailed discussion of króna-denominated Eurobond issues, see the article by Thorvardur Tjörvi Ólafsson in *Monetary Bulletin* 2005/4, 55-83.

etary stance in the autumn, it was impossible to isolate the contribution that bond issuance had made. The long-term impact of bond issuance would depend on market expectations of domestic and international interest-rate and inflation developments and investor appraisals of the risk posed by the strength of the króna. Developments in recent weeks and months have confirmed this.

The króna has depreciated in recent weeks in the wake of reports on the Icelandic economy by international rating agencies and analysts and new data on the size of last year's current account deficit. Investors appear to have adjusted their risk profiles, at least temporarily. At the same time, interest rates have been on the increase on both sides of the Atlantic and indications have emerged of a pending change in the Bank of Japan's monetary policy. Foreign portfolio investment by Icelandic investors has also offset the exchange-rate impact of bond issues. Outflows on securities purchases amounted to 210.9 b.kr. in 2005 compared with 98.7 b.kr. a year before, while króna-denominated bond issuance amounted to 150 b.kr. in 2005.

### Expectations about the drivers of bond issuance

*Monetary Bulletin* in December maintained that issuance of króna Eurobonds will continue for as long as expectations persist that the forces driving them will remain in place, i.e. an ongoing wide interest-rate differential with abroad, strong króna and robust domestic demand for credit. Market expectations towards these drivers have probably changed since December, especially with regards to the exchange rate of the króna and the interest-rate differential with abroad.

As mentioned above, there were tremors in the FX market and the króna weakened in February and most of March. The exchange rate used in the present inflation forecast is 12% lower than in *Monetary Bulletin* in December. International capital markets have also changed tack somewhat with a tighter monetary stance. Interest rates, for example, have been rising in important funding countries in "carry trading", whereby investors borrow in currencies where interest rates are low to invest in currencies where they are high. Accordingly, foreign investors' appetite for króna Eurobonds is likely to have waned, because of a shift in expectations that the interest-rate differential will outweigh possible movements in the exchange rate of the króna. However, this is difficult to state for certain.

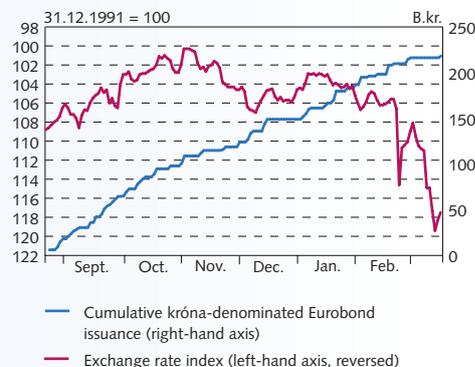
spect was not considered a sufficiently tight stance, as pointed out in *Monetary Bulletin* 2005/3 in September. The current imbalances are even greater than then. However, the interest-rate differential with abroad in the money markets is almost unchanged since December.

### Financial conditions have probably worsened for households but not changed by much for businesses

The recent turmoil in the financial markets has probably squeezed households. Mortgage interest rates have gone up in spite of the recent fall in indexed bond yields. Nominal interest rates have increased, but if household inflation expectations also go up in the near future this will not represent a lasting tightening. The depreciation of the króna will be transmitted through heavier debt service on foreign loans, but this is not a major part of household debt service. The foreign currency-denominated share of household debt in January was estimated at 3-4%. The growth rate of household lend-

Chart 3  
Exchange rate index and króna-denominated Eurobond issuance

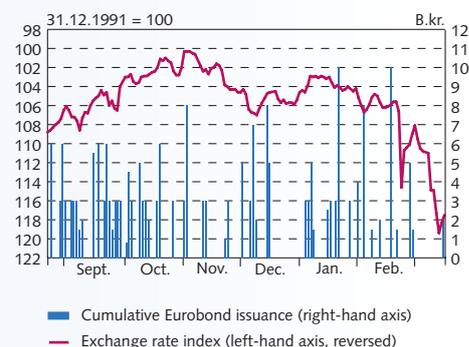
Daily data August 24, 2005 - March 15, 2006



Source: Central Bank of Iceland.

Chart 4  
Exchange rate index and announcements of króna Eurobond issuance

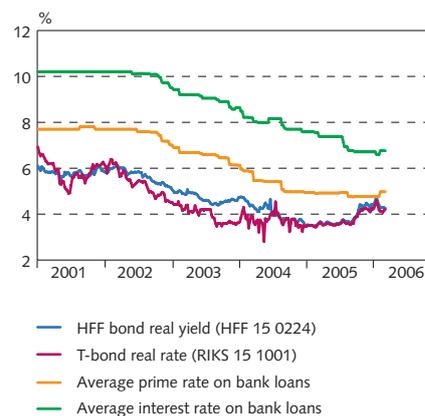
Daily data August 24, 2005 - March 15, 2006



Source: Central Bank of Iceland.

Chart III-9  
Average indexed bank lending rates and real yield on HFF bonds and T-bonds

Weekly data January 5, 2001 - March 24, 2006



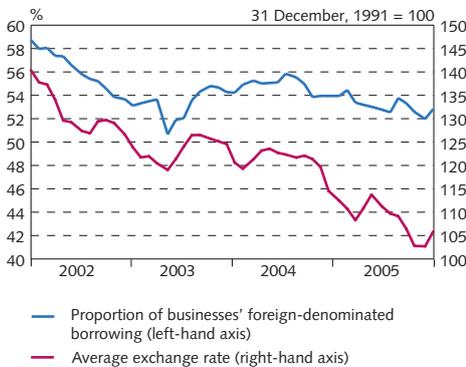
Source: Central Bank of Iceland.

Chart III-10  
Corporate foreign currency-denominated borrowing, and as a share of total lending 2002 - 2005<sup>1</sup>



1. Corporate borrowing in foreign currency as a proportion of total lending by DMBs and other credit institutions and direct foreign borrowing, at end of month.  
Source: Central Bank of Iceland.

Chart III-11  
Corporate foreign currency-denominated borrowing as a share of total corporate lending, and the average exchange rate 2002 - 2005<sup>1</sup>



1. Corporate borrowing in foreign currency as a proportion of total lending by DMBs and other credit institutions and direct foreign borrowing, at end of month.  
Source: Central Bank of Iceland.

ing by the credit system slowed down towards the end of last year. Deposit money bank (DMB) lending growth has also slowed down since August 2005 when its annual growth rate had reached a peak of 131%, compared with 68% in February. However, lending growth is still some way above the level before the banks entered the mortgage lending market with full force in August 2004.

Corporate inflation expectations have soared since the last business confidence survey. Expected short-term real interest rates may perhaps have fallen, easing their financial conditions. However, indexed credit has become more expensive. Corporate lending increased by more than 30% year-on-year in Q4/2005. DMB lending to businesses is still intense and has increased strongly in recent months, but after estimated exchange rate and price indexation adjustments are taken into account the rate of growth has been fairly constant.

The impact of the depreciation affects different sectors to varying extents. It contributes to higher profits in the traded goods sector and increases the debt service burden of companies with foreign currency-denominated debt, but also makes foreign borrowing more attractive, on the assumption that less depreciation can be expected now that some adjustment has already taken place. Last year's strong króna does not appear to have deterred corporate borrowing abroad, despite the increasing probability that the exchange rate would move towards balance, the further it headed away from its long-term equilibrium value. Nonetheless, the proportion of foreign currency-denominated borrowing in the economy has been reduced on the same scale as the outstanding loan stock has been reduced by the strengthening of the króna. The depreciation will increase this proportion once more and add to the corporate debt service burden. It squeezes businesses that have no currency hedges. Businesses have increasingly used swaps to hedge against currency risk. Hedging costs have been lower recently than often before, partly thanks to króna Eurobond issuance. Information on the scope and terms of swaps is difficult to obtain, however. Lower hedging costs could conceivably explain the increase in foreign borrowing in spite of the stronger króna, if the hedging costs have been less than the interest spread. All this makes it difficult to assess the overall impact that the recent financial market unease has had on the financial conditions of businesses, but the effect is probably less than would appear at first sight.

## IV Domestic demand and output

According to the latest data from Statistics Iceland, domestic demand sprang yet another surprise by increasing even faster over the past two years than had been estimated in *Monetary Bulletin* 2005/4 in December. Macroeconomic imbalances have intensified as domestic demand grows faster than potential output. The outlook is that the positive output gap will remain wide across the forecast horizon, assuming an unchanged policy rate and exchange from the forecast day.

### Domestic demand growth contracts in the baseline forecast and even faster in the alternative scenario

Domestic demand growth is now expected to slow sharply this year and national expenditure to drop by more in 2007 than was forecast in December. This year's outlook for national expenditure is broadly unchanged from the December forecast, despite policy rate hikes totalling 0.5 percentage points and a roughly 12% depreciation of the króna. The GDP growth forecast has been revised downwards but will remain positive over the forecast horizon due to a surge in exports next year from additional aluminium capacity. It should be firmly underlined that the following baseline forecast assumes an unchanged policy rate and exchange rate across the forecast horizon.

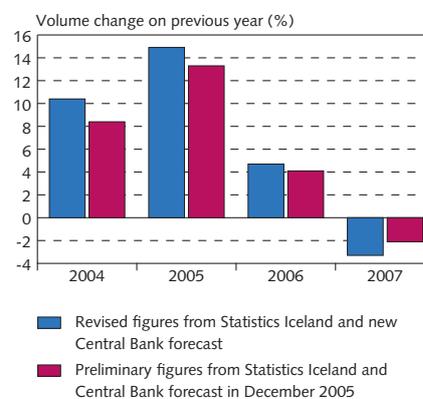
The alternative scenario based on a variable exchange rate and interest path projects a faster drop in domestic demand growth. Nonetheless, GDP growth in the alternative scenario is close to the baseline forecast because of a more positive contribution from foreign trade caused by the depreciation of the króna.

### GDP growth revised upwards for last year, and especially for 2004

The national accounts for 2005 show GDP growth of 5.5%, somewhat above the Central Bank's December forecast. GDP growth in 2004 was notably stronger than previously estimated, up two percentage points at 8.2%. This is the highest GDP growth figure in Iceland since 1987, when the changeover to the PAYE system effectively created a tax-free year. Revised investment figures offer the main explanation for the difference. Turkey is the only OECD member to record higher GDP growth in 2004.

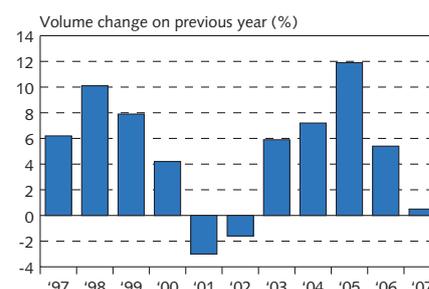
Over the past three years, Iceland's economy has been characterised by spiralling domestic demand and mounting macroeconomic imbalances. Investments in the aluminium and hydropower sectors, credit market restructuring and rising real wages and net wealth are the main drivers of a domestic demand growth which is almost unparalleled in Iceland's economic history. Several economic records were set in 2005. Private consumption grew faster than in any year since 1987 and gross fixed capital formation at a record rate since 1971. Import growth was the fastest since 1953 and the current account deficit broke all records. Iceland's current economic conditions are therefore extremely unusual.

Chart IV-1  
National expenditure growth 2004-2007



Sources: Statistics Iceland, Central Bank of Iceland.

Chart IV-2  
Private consumption growth 1997-2007<sup>1</sup>



1. Central Bank forecast 2006-2007.  
Sources: Statistics Iceland, Central Bank of Iceland.

Table IV-1 Indicators of private consumption in 2005 and in the first two months of 2006

% year-on-year change unless otherwise stated	Quarterly figures				Most recent period		
					Change based on		
	Q1/2005	Q2/2005	Q3/2005	Q4/2005	Month	same period in prev. year	year-to-date figures
Grocery turnover (in real terms)	7.2	10.5	9.2	9.5	February	9.0	9.5
Payment card turnover (in real terms) <sup>1</sup>	11.2	14.4	10.7	4.8	February	9.3	7.5
of which domestic	9.8	12.8	8.3	1.5	February	7.3	5.4
of which abroad	35.6	35.7	42.9	49.1	February	36.4	42.5
Car registrations (increase in number)	61.4	64.4	57.8	43.3	December	32.9	57.2
General imports (volume change) <sup>2</sup>	15.1	17.5	19.5	24.0	December	.	24.0
Imports of consumer goods (volume change) <sup>2</sup>	22.1	26.9	26.0	27.1	December	.	27.1
Private motor vehicles <sup>2</sup>	56.7	66.0	61.3	54.9	December	.	54.9
Consumer durables, e.g. household appliances <sup>2</sup>	36.3	38.5	38.7	35.7	December	.	35.7
Consumer semi-durables, e.g. clothing <sup>2</sup>	16.9	17.4	17.5	20.6	December	.	20.6
Food and beverages <sup>2</sup>	6.8	9.0	8.5	12.4	December	.	12.4
Imports of investment goods excluding ships and aircraft (volume change) <sup>2</sup>	36.9	26.6	28.4	42.7	December	.	42.7
Gallup confidence index	-1.7	9.4	6.2	4.1	February	13.5	8.8
Current situation	21.2	34.6	31.5	28.8	February	20.7	3.3
Expectations six months ahead	-13.7	-5.9	-10.5	-8.1	February	8.3	14.4

1. Payment card turnover for both households and businesses; the bulk of payment card turnover comes from households. 2. Quarterly figures are year-to-date figures.

Sources: Federation of Trade and Services, Housing Financing Fund, IMG Gallup, Motor Dealers' and Services Federation, Statistics Iceland, Central Bank of Iceland.

## Private consumption

Private consumption soared by 11.9% in 2005, according to Statistics Iceland's national accounts. This figure is 0.8 percentage points higher than in the Central Bank's forecast in December. Statistics Iceland's revision of private consumption data for the first half of last year explains much of the difference. The timing of a one-off payment agreed when wage settlements were reviewed in mid-November may also have driven higher-than-forecast growth in Q4. When the forecast was prepared in November, it assumed that the one-off payment would be made in January rather than December, as the final outcome of wage settlements was still not known then.

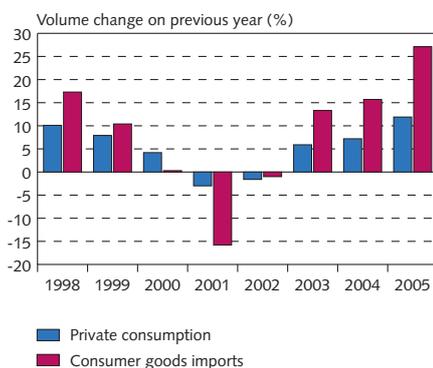
### Private consumption growth forecast revised downwards from December

In December, the Central Bank forecast private consumption growth of close to 8% this year and 4% next year. The outlook is now for less growth this year and a much lower rate in 2007. Private consumption is now expected to grow by roughly 5½% this year and only ½% next year. The downward revision since December is mainly explained by real disposable income being eroded by higher inflation and weaker wealth effects, as well as subdued demand for imported consumer goods as a result of the depreciation of the króna. Also, the upward revision of private consumption growth in 2005 serves to lower this year's figure.

### Households more optimistic than ever, but their expectations could be short-lived

Household expectations reached a record level in Gallup's consumer

Chart IV-3  
Private consumption and consumer  
goods imports 1998 - 2005



Source: Statistics Iceland.

confidence survey in February. They turned buoyant after much-publicised discussion about further investments in the aluminium and power sectors in several parts of Iceland. Both the households' assessment of the current economic and labour situation and their expectations six months ahead were unusually upbeat. However, the unrest in financial markets that followed reports by international ratings agencies and analysts may have changed expectations and could be reflected in subsequent confidence surveys.

### Financial conditions of households still not strongly affected by monetary tightening

Financial conditions of households have tightened since December as a result of higher short-term interest rates, the weakening of the króna, a rise in the lowest interest rates on new mortgage loans, and higher inflation. However, the impact is less than might be expected. Most household debt is CPI-indexed. The only major change in debt service on it has been an increase in the inflation indexation factor. Also, the rise in the lowest mortgage rates affects only homebuyers who take new loans on these terms. Households that have borrowed or taken over older loans on easier interest terms will not feel the recent increases. Higher rates for new mortgages will bite mainly in the real estate market, where soaring prices have been a major driver of private consumption.

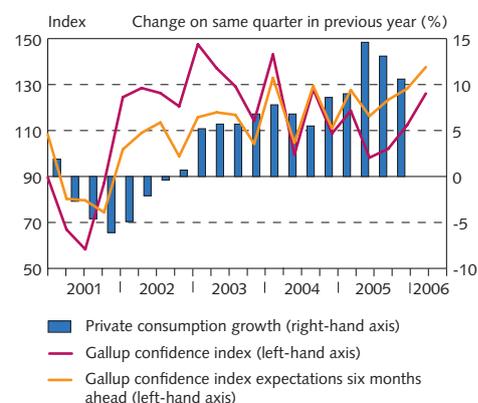
### Asset price developments and household expectations about them may prove crucial for private consumption growth

Soaring private consumption has been driven by higher levels of disposable income and household debt. Disposable income has been boosted by wage rises, increased employment and tax cuts. Likewise, household wealth has grown in leaps and bounds, in pace with the surge in real estate and equity prices. Easier household access to credit secured against increasing wealth has provided an extra input, and private consumption growth is clearly driven more and more by borrowing and debt accumulation. Households' and businesses' upbeat expectations about economic developments have intensified this appetite for debt.

Annual double-digit growth of private consumption is rare and can only be short-lived. Most indications are that asset prices are an important factor behind this surge. Real estate prices in the Greater Reykjavík Area went up by roughly 45% over the past one and a half years. Equity prices rocketed by almost 95% over the same period. Asset price developments and households' expectations about them will prove crucial for the rate at which private consumption grows in the near future.

House price inflation in the Greater Reykjavík Area has been slowing recently, although the real estate market is still robust. If this trend continues, private consumption growth will normalise, in line with the current baseline forecast. House price inflation is still forecast above general inflation this year, but nominal house prices will then fall in 2007, which will greatly subdue private consumption growth.

Chart IV-4  
Private consumption and consumer confidence  
Q1/2001 - Q1/2006<sup>1</sup>



1. Confidence index at end of each quarter. Value for Q1/2006 is for January-February.

Sources: IMG Gallup, Statistics Iceland.

## Box IV-1

## The economic impact of the US military withdrawal from Iceland

On March 15, Washington announced its decision to withdraw the bulk of its military capability from the Keflavík base this autumn. After the jets and helicopters have left, only a skeleton presence will be maintained in Iceland. Much still remains unclear as to how defence and security capability will be built up after the US withdrawal and how the accompanying expenses will be shared out in the short and long term.

The US-manned Iceland Defense Force (IDF) has been a significant provider of both employment and currency earnings in Iceland. Its importance has been waning, but is still substantial. In 2005, Iceland earned more than 8 b.kr. from work for the IDF – equivalent to 0.8% of GDP. Of this figure, 3.2 b.kr. was compensation to (all civilian) employees and 1.3 b.kr. payment to contractors, while others accounted for 3.6 b.kr. Icelandic employees of the IDF number around 850.

Revenues from the IDF are entered on the export side in the national accounts. In 2005, these revenues amounted to 131 m. US dollars and had increased by 9% in dollar terms since 2001. This increase reflects the depreciation of the US dollar over the period: measured in Icelandic krónur, revenues were 30% lower in 2005 than in 2001. Revenues from the IDF amounted to 2.3% of Iceland's export revenues in 2005, but more than 7% in the early 1990s.

The US military currently pays part of the basic operating costs of Keflavík international airport. If the IDF ceases to pay this cost, it will have to be borne by the Icelandic state, airport users or both. Military helicopters have been used on air-to-ground rescue operations in and around Iceland. Iceland's own Coast Guard helicopter fleet is expected to need to be expanded when the US helicopters are deployed elsewhere. What needs to be done for Iceland's defences is a much vaguer issue. Presumably this will depend on the outcome of negotiations with the US authorities. Activities under the auspices of the Icelandic authorities are also likely to be built up over a longer period. Thus it is uncertain that the cost of such activities will increase massively over the coming years. On the other hand, defence capabilities are very expensive and commonly account for the equivalent of 1-2% of a country's GDP.

At a rough estimate, the impact of a complete withdrawal by the US military on October 2006 would be as follows, per year (with 1/4 of the annual figure incurred this year): i) Export revenues will decrease by 8 b.kr. (130 m. US dollars); ii) Domestic expenses on the operation of Keflavík airport will increase by 1.5-2 b.kr.; iii) Treasury expenditures will increase due to the purchase and operation of helicopters; and iv) Treasury expenditures will increase due to the development of local defence capability.

The contraction in export revenues is known. It could be offset by a grant from the US authorities, conceivably phasing to zero over a transition period of some years.

Both the volume and timing of Treasury expenditures are more uncertain, partly because of possible US participation during a transition period. It appears unlikely that large-scale defence capability will be built up in the immediate future.

The Central Bank's macroeconomic forecast assumes that export revenues will shrink by 8 b.kr. as of next year on account of the military withdrawal. The Treasury is expected to shoulder an additional 3 b.kr. in operating costs for Keflavík airport and helicopter rescue operations. These costs are bracketed as an increase in public consumption. A further 1 b.kr. in public sector investment is also assumed, for example on helicopter purchases. Naturally these figures are highly uncertain but a clearer picture of the impact of the military withdrawal can be expected to emerge in the coming weeks and months.

## Public consumption

Public consumption in 2005 increased broadly in line with Central Bank forecasts. Growth measured 3.2% according to the national accounts, while the Central Bank had forecast 3% in December.

In December, the Central Bank forecast 2.9% growth in public consumption this year and 2½% in 2007. The forecast for this year is almost unchanged at 2.8% now. The Ministry of Finance estimates that public consumption will increase by 2.2% this year. However, growth generally turns out higher than initial estimates and has measured 3% or more per year since 1998, with one exception.

On the other hand, the December forecast for next year's public consumption growth has now been revised upwards to 4%. The main factor at work is increased central government expenditures due to the US military withdrawal from Iceland (see Box IV-1).

## Gross fixed capital formation

The Icelandic economy has been characterised by robust investment growth for the past three years. Gross fixed capital formation as a proportion of GDP was roughly 17% in the recession of 2002 but almost 30% in 2005, the highest for almost 30 years. Aluminium smelters and power stations account for the bulk of the extra investment. Since 2002, their share of GDP has increased from roughly 2% to 11%. Investment in the aluminium and power sectors will peak this year at 11½%, according to the Central Bank's forecast, before shrinking to 3½% in 2007 when construction nears completion.

### Significantly underestimated investment growth for the past two years ...

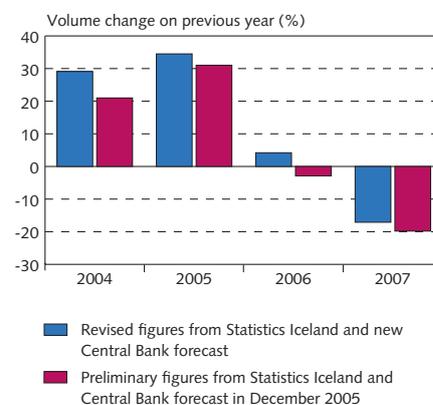
According to revised national accounts for 2004 and preliminary figures for 2005, gross fixed capital formation increased by even more than originally estimated. In 2004 it grew by 29.1% instead of the 21% quoted in provisional figures published in September. Fuller information on business investment is available now than in September, especially from annual accounts.

In December, the Central Bank forecast that gross fixed capital formation would grow by 31% in 2005. Preliminary figures in Statistics Iceland's latest national accounts put the figure even higher, at 34½%. The difference lies in more business investment than the Bank expected. However, residential investment turned out to be overforecast then and the contraction in the public sector underestimated. Aluminium and power sector investments account for almost half of business investment and therefore weigh heavily in total investment figures.

### ... and positive investment growth is now forecast for this year, instead of a slight contraction

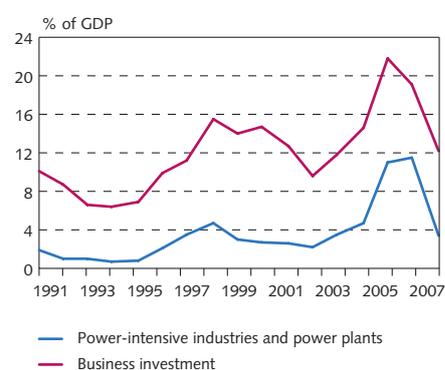
The outlook is for just over 4% investment growth this year and a contraction of 17% in 2007. In December, the forecast was for contractions of 3% and 20% respectively. Business investment is expected to shrink less and residential investment to grow by more than previously forecast.

Chart IV-5  
Gross fixed capital formation growth  
2004-2007



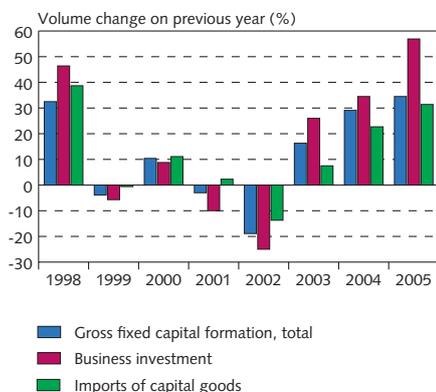
Sources: Statistics Iceland, Central Bank of Iceland.

Chart IV-6  
Gross fixed capital formation: businesses,  
power-intensive industries and power plants  
1991-2007<sup>1</sup>



1. Central Bank forecast for 2006-2007.  
Sources: Statistics Iceland, Central Bank of Iceland.

Chart IV-7  
Gross fixed capital formation and imports  
of capital goods 1998-2005



Source: Statistics Iceland.

### Last year's hefty business investment growth was dominated by aluminium and power projects

According to provisional figures from Statistics Iceland, business investment increased by just under 57% last year, slightly more than the Central Bank forecast in December. This surge comes on the back of more than 34% investment growth in 2004, as shown by an upward revision of 10 percentage points from the preliminary figures released in September. The boom in investment in 2004-2005 is of course primarily rooted in aluminium smelters and power stations. The deviation in 2005 is mainly because of 6 b.kr. more investment in the aluminium and power sectors than assumed in December.<sup>1</sup>

### Business investment almost unchanged this year but will shrink by almost one-third in 2007

In December the Central Bank forecast a contraction of more than 4% in business investment this year and of almost one-third next year. This year's forecast contraction has been revised to roughly 1%, while the outlook for next year is unchanged.

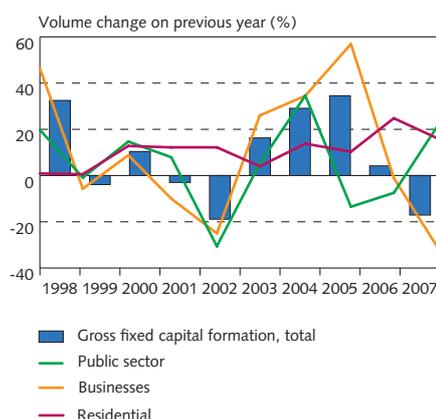
Investment in the aluminium and power sectors will peak this year. It is estimated at roughly 97 b.kr., up 6 b.kr. on last year's figure and 4 b.kr. more than expected in the Central Bank's December forecast.<sup>2</sup> Activity will be much less in 2007, at an estimated 34 b.kr., which explains the contraction in overall business investment then. The share of total investment accounted for by the aluminium and power sectors will shrink from almost one-third this year to 12% next year, according to the forecast.

Large-scale investments have also been made in aircraft recently and look set to continue. Aircraft investments amounted to 10 b.kr. in 2005 and are expected to climb this year to 17 b.kr. Strong growth will also be recorded in investments in the hotel and catering sector, from 3 b.kr. last year to at least 5 b.kr. this year. In 2007, hotel development will take off in connection with the planned concert hall and conference centre in Reykjavik city centre, construction of which is estimated to cost at least 7 b.kr.

### Are business expectations recovering?

A Gallup survey of business sentiment, conducted in February, reveals that corporations, like consumers, have turned rather more optimistic about the economic position and outlook since October. However, the findings must be taken with reservations, since the survey was made in the wake of intense media coverage of further aluminium and power sector projects, and before some of the tremors in the financial markets. Responses reinforce the forecast for virtually unchanged business investment this year.

Chart IV-8  
Gross fixed capital formation growth and its  
main segments 1998-2007<sup>1</sup>



1. Central Bank forecast 2006-2007.

Sources: Statistics Iceland and Central Bank of Iceland.

1. Offsetting this, aircraft purchases to the tune of 2 b.kr. have been rescheduled from last year to the current year.
2. Possible further aluminium industry development in north Iceland, the expansion of the smelter in Straumsvik and siting of another smelter in southwest Iceland are discussed in Box IV-2. The macroeconomic forecast presented in this *Monetary Bulletin* does not incorporate these projects, because they are hardly beyond the drawing board stage yet.

### Public sector investment

In December, the Central Bank forecast that public sector investment would contract by over 11% in 2005 and even more this year, then surge back in 2007. According to the national accounts, last year's contraction exceeded the Bank's forecast, at 13.5%. However, in absolute terms this represents a discrepancy of only 600 m.kr. between the national accounts figure and the Central Bank's forecast.

The current forecast is that public sector investment volume this year will remain unchanged from the December forecast, but the contraction in percentage points will be smaller, because last year's contraction was underestimated. Public sector investment is forecast to grow by almost 23% in 2007. Treasury investment will surge by 82%, according to the Ministry of Finance's medium-term programme, and the current forecast adds a further 1 b.kr. to meet the US military withdrawal from Iceland. Local government investment is expected to drop by 20% in 2007 – experience shows that such a contraction is common after an election year.

### Statistics Iceland adopts new methods for estimating residential investment

Statistics Iceland has adopted new methods for estimating residential investment. This has resulted in a substantial revision of figures for the period 2001-2004. Residential investment growth in 2004 appears to have been considerably faster than estimated in September, measuring 13.8% instead of 5.7%. Growth in 2003 was revised downwards, however.

Recent editions of *Monetary Bulletin* have underlined that various indicators for residential investment pointed towards faster growth in 2004 and 2005. Soaring house price inflation indicated strong incentives for residential construction. The number of construction permits and imports of building materials also indicated that residential investment growth was more rapid than in Statistics Iceland's estimates. According to preliminary figures released in March 2005, residential investment increased by a mere 3% in 2004. In September the figure was revised marginally upwards and provisional figures published this March are very close to the Central Bank's forecast for 13% growth published in *Monetary Bulletin* 2004/4, ahead of Statistics Iceland's preliminary figures for that year.

Statistics Iceland published its preliminary figures for residential investment in 2005 on March 14. According to them, residential investment grew by 10.3% last year, which is 1½ percentage points below the Central Bank's December forecast. Figures for issued construction permits and imports of building materials could indicate a considerably faster pace of growth.

### Robust residential investment growth this year and next year

In December, the Central Bank forecast that residential investment would increase by 9½% this year but only 0.6% in 2007. Revised data for recent years appear to call for a massive upward revision to the December forecast. An increase of roughly 25% is now expected this year and almost 16% next year.

## Box IV-2

Plans for more  
aluminium smelters

Ideas for further development of Iceland's aluminium industry have recently been given a boost. The plans currently being examined by the Icelandic authorities, aluminium producers and power companies involve expanding the Alcan Corp. smelter in Straumsvík by 280 thousand tonnes per year (tpy) to 460 thousand tpy; a new smelter for Alcoa near Húsavík (northeast Iceland) and a new smelter for Century Aluminium's subsidiary Norðurál in Helgúvík (southwest Iceland), both with an installed capacity of 250 thousand tpy. All these plans are still at the discussion or exploratory stage. Accordingly, all assumptions underlying them are fraught with uncertainties concerning, for example, feasibility, timetabling, profitability, power rates, environmental impact assessment, negotiations with the authorities and power supplies.

A great deal of work obviously lies ahead on studies of their feasibility and economic and environmental impact, and on energy research, negotiations on the power rate and with central and local government, before it becomes clear whether the projects will actually go ahead or not. These three projects differ in such respects as timetabling, construction time, power supply, prospective electricity producer and government involvement.

**Details of possible projects**

Representatives of Reykjanesbær municipality, Invest in Iceland Agency and Norðurál have signed a joint action plan to evaluate further the possible construction of a new aluminium smelter in the vicinity of Helgúvík. With a probable capacity of 250 thousand tpy, the smelter would be built in two phases over 2008-2015. The regional power producer Suðurnes Heating (Hitaveita Suðurnesja) would supply power generated from geothermal steam.

Ideas for expanding the Straumsvík smelter have been aired for many years. The mooted expansion would have a capacity of 280 thousand tpy and be aimed for completion by 2010. This implies that work on the expansion would have to be launched at the beginning of 2008 at the latest. The possibility has been discussed that Reykjavík Energy (Orkuveita Reykjavíkur) would supply 40% of the power requirements using geothermal generation, and the national power company Landsvirkjun the remainder from hydro-power stations in the River Þjórsá basin.

At the beginning of March, Alcoa Corp. and the Minister of Industry signed an agreement to begin detailed feasibility studies for the development of a 250 thousand tpy aluminium smelter near Húsavík. There has been talk of Landsvirkjun providing power by developing geothermal stations in the region. If the project is given the go-ahead, construction will not commence until 2010.

**Cost, size and development time**

Since preparations are still at the earliest stage, it is very uncertain when construction might begin and end. The timetables presented

Tafla 1 New aluminium industry projects under consideration

	<i>Production capacity tpy</i>	<i>Investment cost – power</i>	<i>Investment cost – plant</i>	<i>Investment cost – power and plant</i>	<i>Time</i>
Extension, Alcan smelter at Straumsvík	280 thous.	80 b.kr.	80 b.kr.	160 b.kr.	2007-2010
Alcoa NE Iceland	250 thous.	60 b.kr.	75 b.kr.	130 b.kr.	2010-2015
Century SW Iceland	250 thous.	60 b.kr.	75 b.kr.	135 b.kr.	2008-2015
Increased capacity tpy	780 thous.				
Total cost		200 b.kr.	230 b.kr.	430 b.kr.	

Source: Central Bank of Iceland.

here are almost entirely based on requests put forward by the aluminium producers. It is not sure that all these requests can be met. For example, extensive research must be conducted in high-temperature geothermal fields before prospecting and drilling for steam can begin. An environmental impact assessment is also needed. The first power prospecting will have to begin next year if the Helguvík smelter and Straumsvík expansion are to go on stream in 2010. The construction period for the three projects would therefore probably be spread over a relatively long period – nine years – from 2007 to 2015. At a rough estimate, the total cost of the smelters and power facilities for them could amount to as much as 430 b.kr., divided between 200 b.kr. on power supply and 230 b.kr. on the smelters. These projects are therefore greater in scope than those currently in progress in east Iceland which will cost an estimated 300 b.kr. spread over the period 2001-2007. Because the new projects would probably be distributed over a longer period, the major peaks in activity witnessed this year and last year could conceivably be avoided. However, too much uncertainty still surrounds all these projects for them to be incorporated into assessments of the economic outlook.

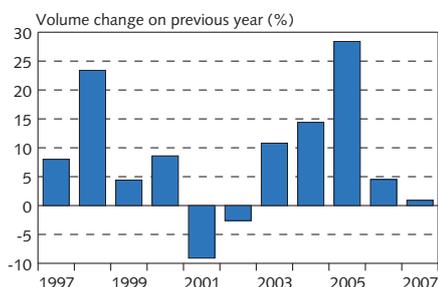
The residential investment forecast is based on the Central Bank's new Quarterly Macroeconomic Model (QMM). The main reason for such a hefty increase in residential investment in 2006-7 is that housing prices have risen far in excess of construction cost. However, as discussed above, last year's residential investment estimate may err on the side of caution. Preliminary figures have often diverged sharply from the final figures published several years later. Underestimated residential investment growth last year may imply that growth figures for this year have been overestimated. The number of construction permits issued in 2005, however, indicates that rapid growth of residential investment will continue this year.

#### **Impact of tighter monetary policy on investment**

Surging gross fixed capital formation and private consumption are the main explanation why domestic demand has far outpaced potential output in the past few years.

According to the baseline forecast, business investment will stay at a historical high this year, then shrink rapidly in 2007 when development work for the aluminium and power sectors is scaled down. Robust growth is forecast in residential investment both this year and next year. This prompts questions about the scope for tightening monetary policy in order to contain investment and promote better macroeconomic balance, when much of this investment is virtually predetermined and immune to the monetary stance. Investment in the aluminium and power sectors accounts for just under half of estimated business investment this year, and one-third of total investment. Around half of estimated business investment remains exposed to the impact of monetary policy measures, and two-thirds of total investment. The conclusion is that considerable scope remains for monetary policy to influence investment.

Chart IV-9  
Import growth 1997-2007<sup>1</sup>



1. Central Bank forecast for 2006-2007.  
Sources: Statistics Iceland, Central Bank of Iceland.

## Imports

As stated above, imports increased by 28.4% last year, their fastest rate of growth for more than half a century. This is an almost 4 percentage points higher rate of growth than was forecast in December. Most of the discrepancy stems from underestimated investment and private consumption growth.

### Import growth forecast for this year revised upwards from December, despite the weaker króna

Imports are forecast to increase by 4½% this year and just under 1% next year. In December, imports were expected to contract by 1.4% in 2007. The import forecast assumes a 12% lower exchange rate value than in December. Depreciation on such a scale could be expected to cause imports to contract this year, given the December forecast for only ½% growth and the downward revision to the private consumption growth forecast. The explanation is that investment is now forecast to grow, instead of contracting as expected in the December forecast. However, import growth will decline as the year progresses and turn negative in Q4/2006.

## GDP growth and the output gap

### Significant downturn in GDP growth prospects from the December forecast

In December, the Central Bank forecast that GDP in the current upswing would peak this year at 6½% and measure 4% in 2007. Three factors have changed the outlook for GDP growth since then. First, according to revised national accounts for 2004 and preliminary figures for 2005, GDP grew considerably faster in the past two years than previously estimated, at 8.2% in 2004 and 5.5% last year.

Second, an even more negative contribution from foreign trade is expected than in December, due to higher forecast imports and lower forecast exports.

Third, national expenditure is now expected to contract by more in 2007 than was forecast in December. Slower growth of private consumption will outweigh a smaller decrease in investment.

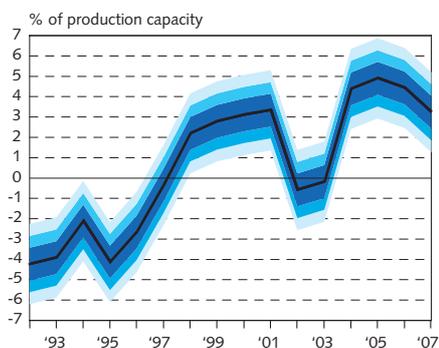
The bottom line is a GDP growth forecast of 4.2% this year and only 0.4% in 2007. Economic growth prospects are therefore much bleaker than in December.

### Macroeconomic pressures revised upwards, and will remain strong across the forecast horizon

Estimates of the output gap have altered with the introduction of the Central Bank's new macroeconomic model. Likewise, the estimates are presented in a changed format to emphasise the high degree of uncertainty surrounding them, as discussed in Box IV-3.

The large upward revision in GDP growth in 2004 and 2005 implies a wider output gap than was estimated in December. For this year, a sharp drop in GDP growth leaves the output gap estimate unchanged, but considerably wider in 2007. On the assumption of an unchanged policy rate and exchange rate as made in the baseline forecast, the output gap is unlikely to close until Q1/2010.

Chart IV-10  
The output gap 1992-2007<sup>1</sup>



1. Confidence intervals for the output gap showing 50%, 75% and 90% probability that the output gap will lie within them, based on the average standard deviation of various measurement methodologies since 1981.  
Source: Central Bank of Iceland.

The output gap provides monetary authorities with important indications about underlying inflationary pressures. However, estimation of the output gap is fraught with uncertainty. Methods are under continuous review within the Central Bank of Iceland to reflect advances and new knowledge in this field. The following is an account of several changes in both the methodology and presentation of the Bank's estimation of the output gap.

### Box IV-3

## Estimating the output gap

### Uncertainty surrounding output gap estimation

The output gap is defined as the difference between actual GDP and potential output as a percent of potential output. Potential output is defined as the level of GDP that is consistent with full utilisation of all factors of production under conditions of stable inflation.

Estimations of the output gap are subject to two uncertainties. The first is data uncertainty. This arises because preliminary figures in the national accounts are often revised extensively before final data are available, as witnessed by Iceland's revised GDP growth estimates in recent years. Second, because potential output is not directly observable, estimates of it are uncertain. Various methods for estimating potential output have been developed but there is no consensus on which is the most suitable.

Economists at Norges Bank have estimated a data uncertainty range for the output gap of ½-1½ percentage points. Even greater uncertainty is found in estimates of potential output. The total uncertainty surrounding the output gap estimate is assumed to lie in the range 1½-3½ percentage points.<sup>1</sup> This is a high degree of uncertainty, given that the estimated output gap often lies within this uncertainty range.

### Methods used so far

The Central Bank of Iceland has for several years estimated the output gap using the production function method.<sup>2</sup> This involves calculating the potential output of the economy by a Cobb-Douglas production function with fixed economies of scale. It has been based on the mean of four variants of the production function using different trend paths for labour input. Annual data have been used with a varying degree of use of a Hodrick-Prescott (HP) filter. Special account has been taken of investments in the aluminium and power sectors. Blind use of an HP filter could lead to an underestimated output gap by creating a trend path for the factors of production in which the additional production capacity of new aluminium smelters and power stations in the coming years is spread backwards in time.

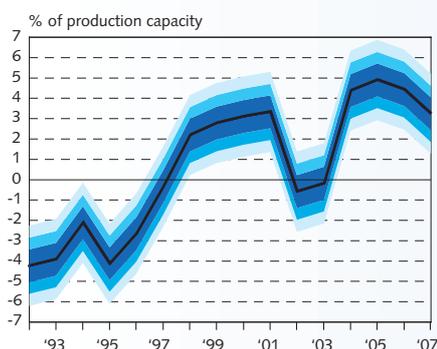
### Three changes in methodology

The Central Bank's new quarterly macroeconomic model, described in Appendix 1, and the underlying database enable the evaluation methods to be enhanced. Three main changes are most important.

First, quarterly data are now used instead of annual data. Hitherto, the output gap has been calculated from annual data; quarterly data have only been available since 1997. Alongside the new forecasting model, Central Bank economists have created a database at a quarterly frequency for main aggregates several decades back in time. The evaluation of the output gap published in this edition of *Monetary Bulletin* is based on quarterly data for the first time.

1. See the discussion and references in Norges Bank's *Inflation Report* 3/2005, Box, 36.  
2. The most recent account of the Central Bank's method for estimating the output gap was published in *Monetary Bulletin* 2005/1, Appendix 2, 55-58.

Chart 1  
The output gap 1992-2007<sup>1</sup>



1. Confidence intervals for the output gap showing 50%, 75% and 90% probability that the output gap will lie within them, based on the average standard deviation of various measurement methodologies since 1981.

Source: Central Bank of Iceland.

Second, the estimated output gap using the new macroeconomic model is given a weight in the total calculation. In the new model, the output gap is calculated from a Cobb-Douglas production function, which is estimated for the period 1981-2004, without using an HP filter. The output gap figure is then the conventional difference between GDP and potential output.

Third, several changes are made in the treatment of investments in the aluminium and power sectors. The earlier macroeconomic model estimated the GDP, investment stock, labour use and manpower that would have been created had the investment programme not been made. This has proven increasingly difficult in practice as the investment programmes have worn on. Instead of attempting to produce an alternative scenario excluding investments in the aluminium and power sectors, the output gap measured with the new model is given a larger weight in the total estimate, since it does not use HP filtering. It also takes some account of the impact of imported labour on the potential output of the economy – access to foreign labour has clearly eased pressures in the domestic market which otherwise would have surfaced in the form of even higher inflation.

#### New presentation of the output gap estimate

The presentation of the output gap estimate is no less important than the methodology itself. It is important to underline the uncertainties surrounding output gap estimation and the undesirability of focusing too closely on point estimations of varying reliability. Accordingly, the output gap estimate is now presented with an uncertainty range with probabilities of 50%, 75% and 90% that the output gap will lie inside them, based on the average standard deviation yielded by different estimates since 1981. The bands on the chart are darker, the narrower the uncertainty range. It should be underlined that this presentation is confined to the uncertainty surrounding estimations of potential output and its effect on the Bank's output gap estimations. No attempt is made to allow for the impact of data uncertainty on output gap estimations.

Chart 1 shows that the output gap is strongly positive at present and the probability that it will turn negative over the forecast horizon is estimated at zero. Thus there is no indication that demand and potential output are close to balance.

#### Other indicators of the output gap

Monetary authorities in many countries have stepped up their use of surveys in estimates of the output gap. Experience in recent years shows that surveys provide the monetary authorities with useful information about the output gap and a gauge for comparison with the findings of conventional economic research. Surveys can therefore perform an important role in confirming the results of other research as well as serving as a major indicator of trends and movements in the economy.

The Gallup survey of business sentiment in February asked for the first time about companies' capacity for responding to unexpected increases in demand or sales. Interpretation of responses is initially limited by the lack of comparative data. Nonetheless, it is clear that sectors differ widely in their ability to respond to unexpected increases in demand or sales.

## V Public sector finances

### Record public sector result

The public sector surplus in 2005 was 30 b.kr., equivalent to 3% of GDP. This is the largest public sector surplus for as far back as comparable data go – and does not include proceeds from the privatisation of Iceland Telecom. At the beginning of 2005, the public sector surplus for the year was forecast at 14 b.kr., divided between 3 b.kr. for local government and 11 b.kr. for central government. Preliminary figures from Statistics Iceland, on the other hand, show a 6 b.kr. deficit for local government and a 37 b.kr. surplus for central government. Thus the entire improvement on the initial budget is more than accounted for by the Treasury. It should be noted that the description of public sector finances in this section mimics the national accounts presentation used by Statistics Iceland and excludes transactions connected with the privatisation of Iceland Telecom.

Table V-1 Public sector 2003-2007 (% of GDP)<sup>1</sup>

	2003	2004	2005	2006	2007
Public sector revenues	44.5	45.6	47.3	46.5	42.5
Public sector expenditures	46.5	45.3	44.3	43.2	43.9
Public sector balance	-2.0	0.3	3.0	3.3	-1.4
Treasury balance	-1.7	1.2	3.8	4.0	-1.1
Local government balance	-0.5	-1.1	-0.6	-0.6	-0.2

1. National accounts presentation.

Sources: Statistics Iceland, Central Bank of Iceland baseline forecast for 2006-7.

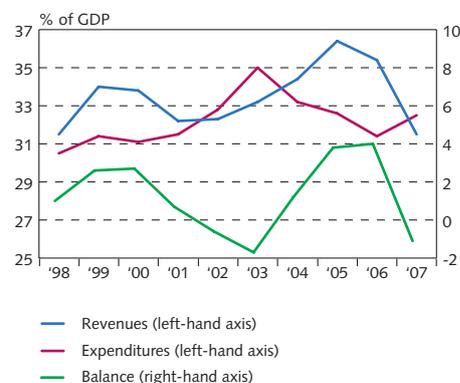
Last year's strong Treasury result was entirely due to enormous tax revenues in most areas. They totalled 37 b.kr., which is 13% more in nominal terms than projected by the Ministry of Finance in January 2005. Originally the ministry forecast no change in nominal revenues from personal income tax, following a 1% cut in the rate. The actual result is an increase in excess of 10%. Corporate income tax generated record revenues from strong business performance in 2004. Stamp duty yielded 9 b.kr., double the ministry's preliminary forecast in nominal terms, as a result of brisker housing market activity. More than half of the Treasury's increased tax revenues – 19 b.kr. – is explained by extra VAT and other taxes on goods and services. One of the largest increases was in revenues from motor vehicle imports, up by 65% in nominal terms year-on-year and 88% at constant exchange rates.

Central government expenditures turned out 4% higher than the Ministry of Finance forecast in January. Transfers increased most, while public consumption was 1% more than forecast. Nominal expenditures grew by 7% year-on-year, which is considerably more than estimated in *Monetary Bulletin* in December 2005, but broadly the same as given in the previous *Monetary Bulletin* in September.

### Local government still in deficit

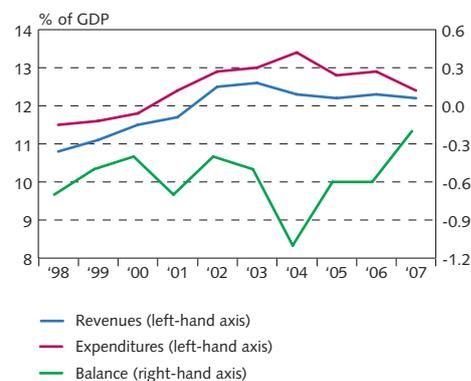
Processing of local government financial data takes longer than for Treasury data, which often causes large discrepancies between pre-

Chart V-1  
Central government sector finances  
1998 -2007



Sources: Statistics Iceland, Central Bank of Iceland projections.

Chart V-2  
Local government finances 1998 - 2007



Sources: Statistics Iceland, Central Bank of Iceland projections.

liminary and final figures. At the beginning of 2005, local government revenues were forecast to grow by 9% year-on-year and expenditures by 6%, to produce a surplus of 3 b.kr. Preliminary national accounts figures show increases of almost 8% in revenues and over 4% in expenditures last year, but a deficit of 6 b.kr. On first impression this deterioration would seem inconsistent with revenue and expenditure developments, which were close to forecast. The explanation is that the revised local government result for 2004 turned out much worse than was estimated at the beginning of 2005.

### Outlook for strong public sector result this year

This year's public sector result is likely to be broadly the same or slightly better compared with last year, when it corresponded to 3% of GDP. The Central Bank's baseline forecast projects a further small improvement in the Treasury's record surplus from last year, with the local government result more or less unchanged. Public sector revenues will rise just over 2% in real terms (above consumer prices), but decline slightly as a proportion of GDP, from just under 47½% to 46½%. Expenditures will be more than 1% up in real terms, but slip from just under 44½% of GDP to just over 43%. The surplus will edge up to almost 3.3% of GDP. In *Monetary Bulletin* in December, revenues were forecast to rise by 5% in real terms and expenditures by 2% in 2005-2006, leaving a public sector surplus of nearly 5% of GDP in 2005. The shortfall lies in a downward revision of both central and local government surpluses, as described below.

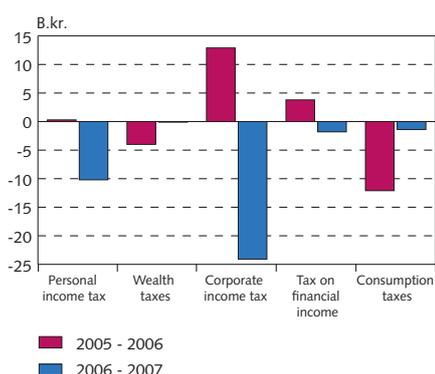
### Hefty revenues from business taxes and capital income tax offset the effect of slower private consumption growth

In the last *Monetary Bulletin* in December, Treasury revenues in 2006 were forecast to rise by 3.7% in real terms year-on-year and expenditures by 1.1%, to yield a surplus of 55 b.kr. Revenues are now expected to rise by only 1% in real terms to produce a surplus of 43 b.kr., up from 3.8% to 4% of GDP. Statistics Iceland's estimates also now show a rather weaker Treasury result for 2005 than was estimated in December.

The Treasury's indirect tax revenues now seem likely to increase by less than was projected in December, due to a slowdown in private consumption and housing market turnover. Offsetting this, business taxes will probably yield the Treasury roughly 15 b.kr. more revenue than in 2005, on the basis of announced profit figures for the year, and capital income tax appears to be heading at least 2-3 b.kr. beyond the budget forecast.

Treasury expenditures are expected to stay broadly unchanged in real terms, even if the U.S. military withdrawal adds an estimated 1½ b.kr. to Treasury expenditure. Public consumption and transfers will grow by 2½-3%, but fixed investment will be down. Public consumption is expected to increase by half a percentage point over the ministry's last forecasts. This may be a cautious estimate, given that public consumption has overshot budget forecasts for six of the past eight years, by an average of 1.2 of GDP%.

Chart V-3  
Changes in Treasury revenue 2005 - 2007  
Year-on-year changes, b.kr. in real terms



Source: Central Bank of Iceland projections.

### Similar local government result to last year

No clear picture of local government finances will emerge until later this spring. The Central Bank's estimates are based on data from Statistics Iceland for 2005 and Ministry of Finance projections for 2005-7. Both municipal revenues and expenditures are now expected to rise by almost 4% in real terms, yielding broadly the same deficit as last year at 6 b.kr. The deficit could narrow if real estate taxes are underestimated here – many local authorities lowered their residential rates to offset soaring housing prices and real estate valuations for 2005. However, few of them lowered taxes on commercial properties, which weigh much heavier in total real estate taxes.

### Sharp downturn in public sector finances in 2007

The final phase of tax cuts – costing the Treasury an expected 13 b.kr. – and an increase of almost 10 b.kr. in investment are likely to leave their mark on next year's fiscal picture. Measured as a proportion of GDP, corporate income tax is expected to keep rough pace with the levels in 2002-2004, while the ratio of consumption taxes will continue to go down and reach 15½%, compared with just under 18% in 2005. However, the decrease represented by these forecasts is not as rapid as after the last upswing. Accordingly, Treasury revenues will drop by 9½% in real terms, from the equivalent of 35½% of GDP to 31½%. On the basis of long-term plans, expenditures can be expected to grow by 5½% in real terms due to increased transfers and public sector investments. The increase in transfers is spread over various categories, while the extra investment reflects not only plans which were postponed at the peak of investment in the aluminium and power sectors, but also others announced in 2003 to counteract the contraction that was expected to follow, as well as dedicated projects for which proceeds from the privatisation of Iceland Telecom have been earmarked. A further 4 b.kr. is added to Treasury expenditures in 2007 because of the US military withdrawal from Iceland.

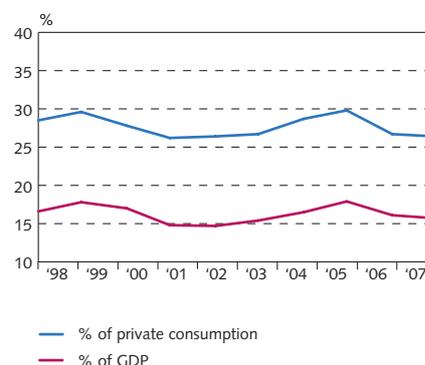
On these assumptions, the Treasury position will deteriorate sharply from a 43 b.kr. surplus this year to a 12 b.kr. deficit in 2007, corresponding to roughly 1% of GDP. The reversal is equivalent to 5 percentage points of GDP.

Local governments will witness much less change. Municipal income taxes, which are by far their largest tax base, are not as cyclically sensitive as the Treasury's income taxes and consumption taxes. In real terms, local government revenues are expected to increase slightly. Real expenditures are expected to decline by 2½% due to a drop in investment, which is typical after municipal elections. Accordingly, the local government deficit should shrink by 4 b.kr., from 0.6% to 0.2% of GDP.

### Public sector debt

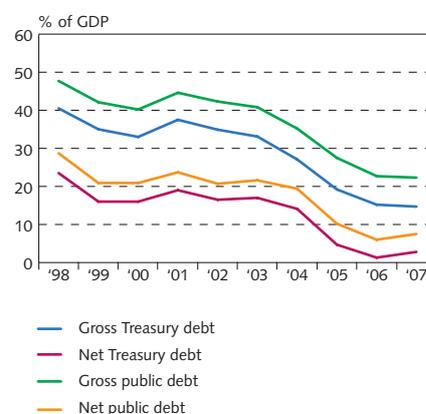
If developments unfold as outlined above, Treasury debt net of bank deposits and other claims should fall to near zero at the end of 2006, while net local government debt will remain in the range 4-5% of GDP. Treasury monetary claims other than bank deposits should also move down during the year. They have dropped from 17% of GDP

Chart V-4  
Treasury indirect tax revenue 1998 - 2007



Sources: Treasury accounts, Central Bank of Iceland projections.

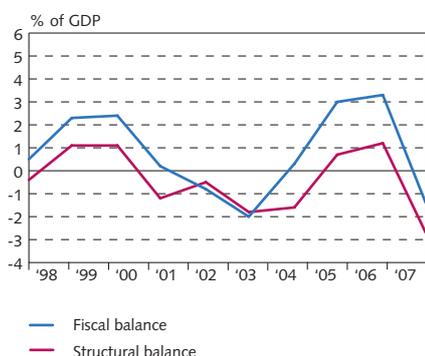
Chart V-5  
Public debt and Treasury debt<sup>1</sup> 1998 - 2007



1. Treasury bank deposits lower net debt.

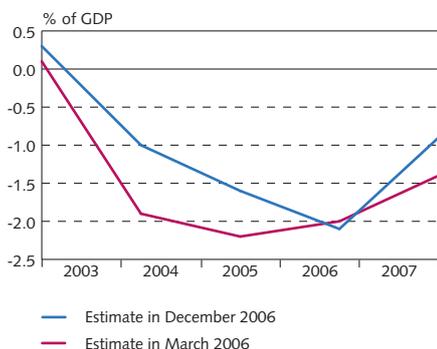
Sources: Treasury accounts, Central Bank of Iceland projections.

Chart V-6  
Structural balances 1998 - 2007



Source: Central Bank of Iceland projections.

Chart V-7  
Structural corrections of fiscal balance  
2003 -2007  
Structural balance minus fiscal balance



Source: Central Bank of Iceland projections.

in 1999 to 9% at the end of 2005, mainly because state enterprises have been borrowing more on their own account rather than through the Treasury. As a result, the central government's total debt has decreased by more than its net debt in recent years, not counting the bank deposits that the Treasury has built up.

In all these figures, the Treasury's net debt is adjusted for its bank deposits, while unfunded pension commitments are excluded for both central and local government. These amounted to 190 b.kr. and 24 b.kr. respectively at the end of 2004.

### Structural balance

As the above discussion implies, cyclical movements have a considerable impact on public sector finances and affect central more than local government. This is because indirect, corporate income and capital income taxes are sensitive to the economic cycle and real exchange rate, and Treasury revenues from personal income tax are much more cyclically sensitive than those from municipal income tax. To gauge the fiscal stance, the structural balance is often preferred to the fiscal balance. The structural balance is essentially the fiscal balance less a correction proportional to the output gap.

In *Monetary Bulletin* 2005/4 in December, the estimate of the general government surplus for 2006 was around 4½% of GDP, while the structural budget surplus was estimated to be around 2½%. Now the outlook is for a surplus of around 3½% of GDP, whereas the structural budget surplus should be around 1% of GDP. Chart V-6 shows the public sector surplus along with the structural budget surplus, while Chart V-7 shows the correction – the difference between the two surpluses. The chart also shows this difference as it was estimated in *Monetary Bulletin* in December. The estimates of both the fiscal surplus and structural surplus in 2006 are lower now than in December, but the difference is unchanged, as the estimated output gap remains the same. By contrast, the estimated correction for 2007 shrinks, i.e. it is less negative now than in December, as the output gap is expected to close slower than before.

## VI Labour market and wage developments

The unemployment rate is now close to the lowest point reached in the last upswing. Growing labour shortages have fuelled wage drift. Wage increases in 2005 were far in excess of what is compatible with the inflation target. Nonetheless, wages have gone up by less than might have been expected from the historical relationship between economic growth, labour demand and wage changes. Imports of labour have therefore clearly enhanced the resilience and flexibility of the Icelandic labour market. The domestic labour force increased its work effort last year and is likely to continue to do so, judging from the experience of the last upswing.

### Unemployment in line with forecast

Unemployment in 2005 was in line with the Central Bank's forecast from December, at 2.1%. This winter, unemployment has fallen sharply to a seasonally adjusted rate of 1.3% in February. This is the lowest rate since mid-2001 and only slightly above the 1.1% nadir during the last upswing, in October 2000. The outlook is for slightly lower rate of unemployment in 2006 than forecast in December, at 1.5%. It is expected to climb again next year to almost 2%.

Vacancies registered at employment agencies decreased in the autumn. Since December, vacancies have been down year-on-year, for the first time since January 2003. While this may herald an easing of labour market pressures, it could also be related to changes made in September to administrative procedures for work permits for citizens of the EEA accession countries, which may have shortened the time needed for vacancies to be advertised.<sup>1</sup>

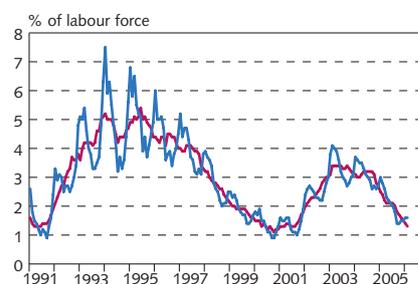
### The Icelandic labour market remains flexible ...

The Icelandic labour market still appears fairly flexible. Domestic labour supply tracks the economic cycle closely, in terms of both labour market participation and hours worked. Icelandic nationals also migrate to and from Iceland in step with labour market conditions, and increased supply of foreign labour has been an important additional factor in recent years.

Supply of domestic labour increased year-on-year in 2005 and could still grow significantly, judging from the last upswing. According to Statistics Iceland's labour market survey, labour use continued to increase in Q4/2005, and for the year as a whole a marked turn-around from 2004 was shown by all criteria for labour use. The number of employed rose by 3.3% year-on-year, total hours worked at a similar pace, and the participation rate was up by 1.2 percentage points. As in previous upswings, the main pool of extra labour was the youngest (16-24 years) and oldest (55-74) age groups, measured in both the number of employed or total hours worked.

1. Procedures for applications from nationals of the eight new EEA member countries were revised in September 2005 in order to speed up handling. For up to four weeks from September 7, exemptions were also granted from the principle that a residence and work permit must be issued before a citizen of a new EEA member country enters Iceland to work. The aim was to normalise the jobs and terms of workers from these countries who were in Iceland through, for example, temporary employment agencies.

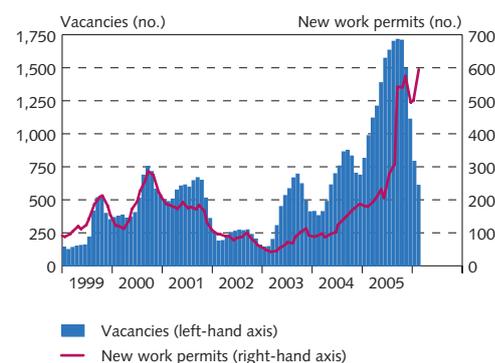
Chart VI-1  
Unemployment rate  
January 1991 - February 2006



— Unemployment rate  
— Unemployment rate (seasonally adjusted)

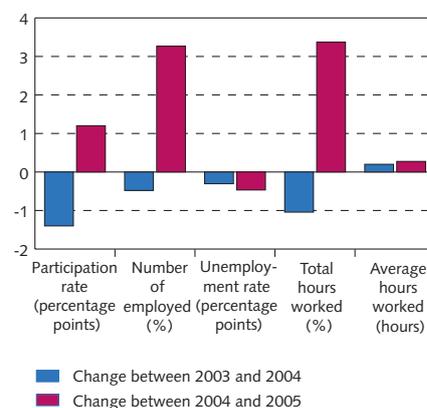
Sources: Directorate of Labour, Central Bank of Iceland.

Chart VI-2  
Vacancies registered at employment agencies  
and issuance of new work permits 1999-2006  
3-month moving average



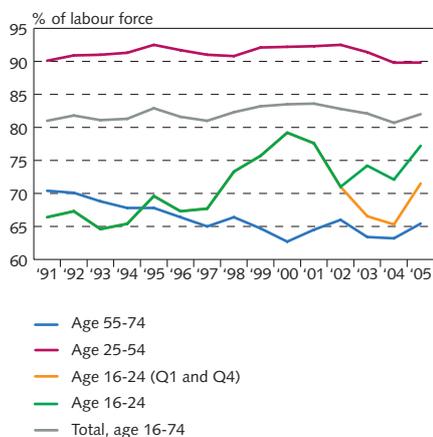
Source: Directorate of Labour.

Chart VI-3  
Changes in labour market 2003 - 2005



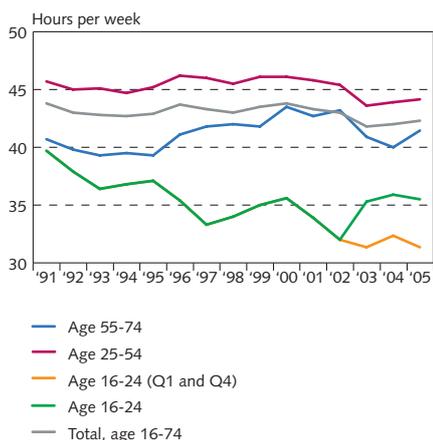
Source: Statistics Iceland.

Chart VI-4  
Labour force participation 1991 - 2005



Source: Statistics Iceland.

Chart VI-5  
Average working hours 1991 - 2005



Source: Statistics Iceland.

Chart VI-6  
Net migration by citizenship and unemployment 1980 - 2005



Sources: Directorate of Labour, Statistics Iceland.

The participation rate in 2005 was similar to that in 2003, at 82%,<sup>2</sup> but considerably below the peak of 83.5% during the boom in 2000 and 2001. The difference is even more marked in the first and final quarters of 2003-2005.<sup>3</sup> This applies to all age groups, but particularly to the most flexible segment (aged 16-24) of the labour force. In the last upswing this group's participation peaked in 2000 at just over 79%, subsequently fell sharply as labour demand dropped, to bottom out at 65.3% in 2004. In 2005, the youngest group's participation rate had climbed back to 71.5%. The pattern for average hours worked for this age group followed a similar pattern.

Migration to and from Iceland also makes a sizeable contribution. On average, more Icelandic nationals tend to emigrate than return, but the exodus is reversed at cyclical peaks. The impact of this factor on the labour force is now broadly the same as in the last upswing.

### ... and is more resilient

Foreign nationals have played an increasing part in the last two upswings, and especially the current one.<sup>4</sup> The number of foreign nationals also increased in times of contraction such as 2002, but by much more during upswings.

Work permit issuance and extensions spiralled in autumn 2005. Doubtless the increase reflects greater demand for labour, but the new procedure for handling work permits for citizens of the new EEA member countries has probably also contributed. Some 4,300 new work permits were issued in 2005. This is triple the issuance in 2004 and double the number in 2000, at the peaked of the last upswing.

The Directorate of Labour estimates that over 70% of workers on aluminium and power sector construction projects at the end of 2005 were foreign nationals. Many permits are also expected to be issued this year in connection with these programmes, but shifting from the highland Kárahnjúkar hydropower site to Reyðarfjörður in east Iceland, where a smelter is being constructed, and to southwest Iceland where geothermal projects are being launched.<sup>5</sup>

### Demand for labour will grow even further

The latest confidence survey of the 400 largest businesses in Iceland shows that labour demand can be expected to grow even further.<sup>6</sup> More companies – almost half – now plan to recruit over the next six months than in the previous survey in October 2005, and the number wanting to lay off employees has been halved. This applies equally to companies in the Greater Reykjavík Area and regional

- 2003 was the first full year when the new labour market survey methodology was applied.
- For a discussion of changes in the compilation of Statistics Iceland's labour market surveys and their quarterly findings, see Monetary Bulletin 2004/2.
- While people migrate for more reasons than employment, there is a strong cyclical correlation for inward and outward migration of both Icelandic and foreign nationals (see Chart VI-6).
- The numbers probably represent an overestimation of the additional hours worked, however, because work permits are generally restricted to periods of less than one year. For example, most permits for foreign workers at Kárahnjúkar have been for six months. Also, some foreign employees do not work for the entire duration of their permits.
- Conducted by Gallup in February on behalf of the Central Bank, Ministry of Finance and Confederation of Employers.

Iceland. Regional businesses seem to have less need to trim down now. In October, half the surveyed fisheries companies wanted to reduce staffing levels over the following six months, but only 11% in February. Some reduction in staff has probably already been achieved, because three out of four fisheries companies now want to maintain their staffing levels unchanged, and more than twice as many want to recruit, compared with the October findings. The industrial manufacturing sector also appears more upbeat, with more companies inclined to recruit and fewer favouring redundancies than in October 2005.

### Tougher competition for domestic labour ...

Excess demand for labour, especially in the construction sector, has been met with imported labour, thus sparing employers the need to counter labour shortages with wage-bidding. Wage drift in this sector has therefore been modest in historical terms.

A hefty 40% of work permits are connected with aluminium and power sector construction projects. Some 25% of permits are for the industrial manufacturing and fish processing sectors, 15% for construction contractors not involved in the aluminium and power sector projects, and roughly 20% for service industries. Not all domestic labour shortages can be met with imported staff, however, so employers have increasingly needed to compete for staff with wage-bidding.

### ... causing greater wage drift

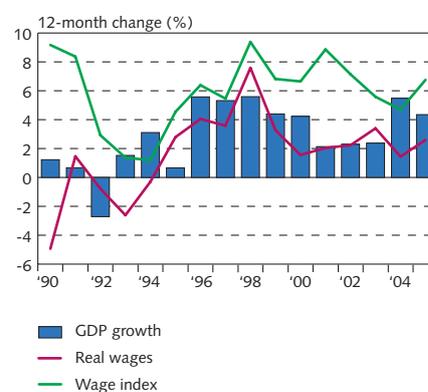
The result is greater wage drift, which has gained momentum since the autumn. The private sector wage index went up by 1.4% between Q3 and Q4/2005. Wages of civil servants and bank employees rose by less (1%), but the full impact of local government wage settlements was not reflected in the wage index until the beginning of 2006. Between annual averages for 2004 and 2005, the wage index for the whole labour market rose by 6.8% and the CPI by 4%, an increase of 2.8% in real terms.

Results of the February business confidence survey could indicate, however, that most companies hope to be able to meet their labour requirements by other means than wage-bidding. Fewer respondents than in the October survey expect wages to rise this year and more expect them to remain unchanged. Conceivably, wage costs are already stretched to the limit. However, the depreciation of the króna since the survey was conducted does create scope for wage increases in the export sector.

### Wage costs drive inflationary pressures

According to the Central Bank's current forecast, the rate of increase in unit labour costs is far beyond the rate compatible with the inflation target. This year unit labour cost is expected to increase by 6½%, broadly the same rate as in 2005. In 2007, wage drift is expected to slow down in pace with rising unemployment. Commensurably, the growth of unit labour cost is projected to slow down to 3.9%. Nonetheless, considerable uncertainty surrounds the pending private sector wage review in November. Given the current inflation outlook, it seems unlikely that the assumptions on which the wage settlements are based will hold.

Chart VI-7  
Wage index, real wages and GDP growth  
1990 - 2005



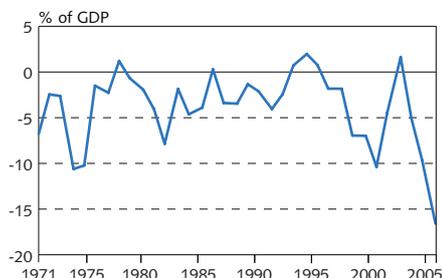
Source: Statistics Iceland.

Chart VI-8  
Unit labour cost 1999 - 2007<sup>1</sup>



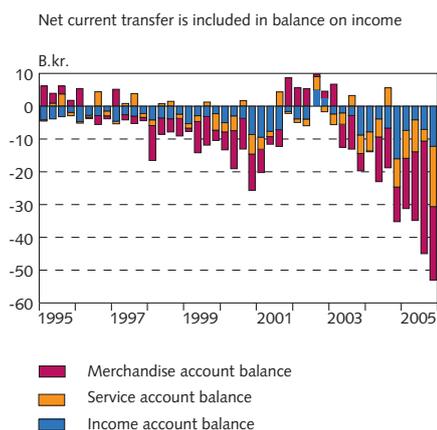
1. Estimated for 2005. Central Bank forecast 2006-2007.  
Source: Central Bank of Iceland.

Chart VII-1  
Current account balance as % of GDP  
1971 - 2005



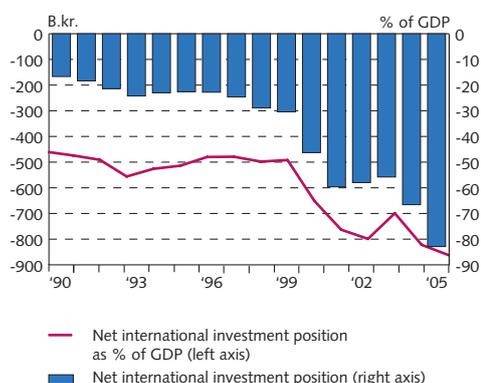
Sources: Statistics Iceland, Central Bank of Iceland.

Chart VII-2  
Current account balance components  
Q1/1995 - Q4/2005



Sources: Statistics Iceland, Central Bank of Iceland.

Chart VII-3  
International investment position 1990 - 2005



Sources: Statistics Iceland, Central Bank of Iceland.

## VII External balance

Iceland's current account deficit widened continuously in the course of last year. This development was reflected in the Central Bank's forecasts in 2005 which showed an ever-widening deficit with each successive edition of *Monetary Bulletin*. The final deficit was greater than in any of the forecasts, at more than 161 b.kr. – the largest ever recorded in Iceland. In all, the current account deficit was equivalent to 16½% of GDP. Besides being an Icelandic record, it is also the largest current account deficit among members of OECD since its foundation. The previous OECD record was set by Norway in the 1970s, when a massive programme of investment in the oil industry was launched. At its peak then, Norway's deficit was equivalent to 12% of GDP. The outlook is that Iceland's deficit will equal around 14% of GDP this year, assuming constant interest rates and exchange rate, and almost 10% next year. Higher interest rates and the lower value of the króna than assumed in the forecast could lead to a much faster adjustment, however.

### Direct impact of aluminium and power sector investments explains one-third of the current account deficit

Goods and services exports were broadly the same in value terms in 2004 and 2005, but grew in volume by 3.6%. Import growth was much faster. A shared feature of the present deficit and previous one in 1996-2000 is that both are primarily explained by import growth.

The deficit on the goods and services account amounted to just over 133 b.kr., which is more than 4/5 of the total. Investments in the aluminium and power sectors explain a large share of imports of goods and services. However, since they are not classified as such in the import figures, their direct impact on the current account balance is not known in detail. Estimates by project developers must therefore be used instead. Total estimated cost of the aluminium and power sector projects in 2005 is 90 b.kr. Of this figure, foreign cost (imported investment goods and services) are estimated at just under 55 b.kr., or around one-third of the current account deficit. The total impact, i.e. including indirect effects, could be considerably greater, however – up to half of the deficit. By comparison, the part of the deficit that is not explained by the aluminium and power sector programmes on this basis is broadly the same as the total deficit in 2000. It should be borne in mind that other major investment projects also affected the deficit, e.g. aircraft imports to the tune of almost 10 b.kr.

### Debt accumulation has not produced a corresponding rise in interest payments

Never before did Iceland's external debt grow as swiftly year-on-year as in 2005, increasing by 77%. At the end of the year, external debt was equivalent to more than three times GDP. The rising debt is partly offset by massive asset formation, however. Foreign assets of Icelandic residents more than doubled year-on-year and corresponded to almost 2½ times GDP at the end of the year. A large proportion of this debt accumulation and asset formation is connected with the Icelandic

banks' overseas expansion. Debt has mainly been in the form of bond issues, and assets in the form of growing lending to foreign borrowers and direct investments, which increased by more than 230% last year. Foreign direct investment in Iceland more than tripled year-on-year. At the end of the year, Iceland's net external debt was equivalent to more than 1½ times GDP, while the net external position, i.e. including equity capital and direct investments, was negative by the equivalent of 86% of GDP, compared with 82% at the end of 2004. Thus the net position worsened much less than the debt position. This development reflects Icelandic residents' large-scale acquisitions of foreign equities which are funded with foreign capital.

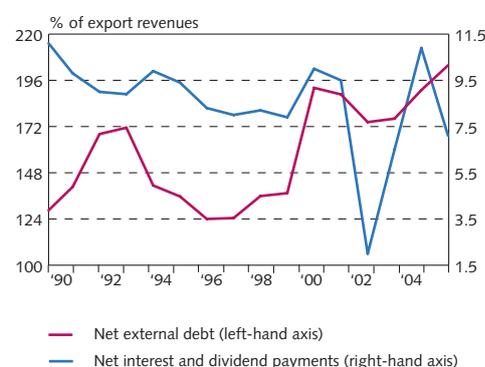
### Debt service has not grown in pace with debts

Other things being equal, rapid debt accumulation results in higher interest rate and dividend payments to abroad. In the past few years this has not happened, however. The explanation is that Iceland's foreign investments generated handsome profits at the same time as interest rates were low. Nonetheless, profits have fluctuated sharply, as Chart VII-4 shows. Last year, the revenue generated by Iceland's foreign assets exceeded the increased interest rate burden on the larger debt stock. The deficit on the income account was therefore less in 2005 than the year before. This situation cannot be relied upon to last for long, as explained in Section II. Higher interest rates could substantially affect the current account deficit in the years to come. For instance, if average interest rates on Iceland's national debt were to move back close to the average in the 1990s, i.e. roughly 6.4%, the current account deficit as a proportion of GDP would widen by more than 3%, other things being equal. Of course, such an increase would inevitably call for an adjustment which would have counteracting macroeconomic effects.

### Capital formation accounts for a larger share of the current account deficit now than in the last upswing

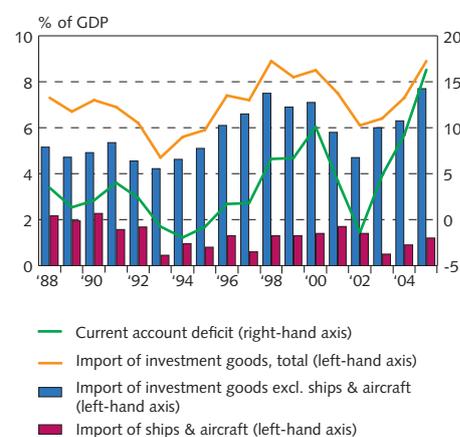
Wide current account deficit episodes rarely last long.<sup>1</sup> They soon tend to lead to an adjustment in the form of either slower demand growth or currency depreciation, or both. The aftermath is not determined by the size of the deficit alone, but also by its composition. The larger the share of profitable investments that have contributed to it, the greater the likelihood of a relatively soft landing, without a large contraction of output or a major exchange rate adjustment. Thus Norway's adjustment after the development of North Sea oil processing was relatively orderly, although some luck was involved as well.<sup>2</sup> To estimate how likely such a scenario is in the case of Iceland, it is useful to observe the respective contributions of rising investment and declining national saving to the formation of the current account deficit, compared with previous periods. As defined in the national accounts, national saving is the difference between investment and

Chart VII-4  
Foreign debt and payments 1990 - 2005



Sources: Statistics Iceland, Central Bank of Iceland.

Chart VII-5  
Import of investment goods and the current account deficit as % of GDP 1988 - 2005

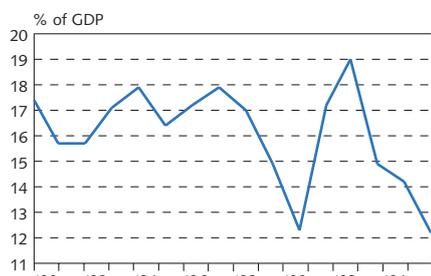


Sources: Statistics Iceland, Central Bank of Iceland.

1. See for example Edwards, Sebastian (2004): Thirty Years of Current Account Imbalances, Current Account Reversals and Sudden Stops, *IMF Staff Papers* 51, January.

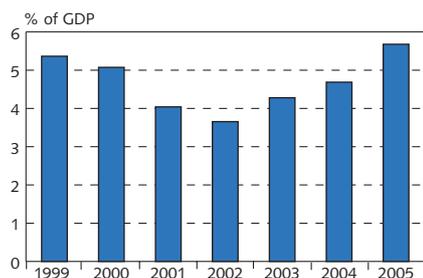
2. Oil prices surged in the years after Norway's heaviest investment.

Chart VII-6  
National saving as % of GDP 1990 - 2005



Sources: Statistics Iceland, Central Bank of Iceland.

Chart VII-7  
Imports of durable consumer goods  
1999 - 2005<sup>1</sup>



1. Including imports of semidurables.  
Sources: Statistics Iceland, Central Bank of Iceland.

the current account balance. Capital formation in 2005 amounted to 28.7% of GDP. National saving was therefore just over 12% of GDP, close to the historical low reached in 2000 and two percentage points of GDP lower than in 2004.

There was a modest surplus on the current account in 2002. In 2003, the aluminium sector investment projects were launched and the banks were privatised. This makes 2002 an obvious choice of base year for examining the contributions that increased investment and less national saving make to the formation of the current account deficit. The change in the current balance over this period corresponds to 17.7% of GDP. Of this figure, 11.3% is explained by increased investment and 6.5% by less national saving. Compared with the current account deficit built up in 1995-2000, a larger proportion is therefore explained by investment growth. However, the deficit is considerably larger as well. National saving has contracted more over the past three years than over the period 1995-2000. This only tells part of the story, however, because not all investments generate exports. Residential housing investment, for example, has grown more in recent years than during the last upswing. It is estimated at almost 6% of GDP last year and the ratio has increased every year since 1999, when it was only 3½% of GDP.

### Surging imports of consumer goods during the present deficit episode

Imports of consumer goods, especially durables, are sensitive to income and exchange rate developments. The upswing has been particularly strong during the present deficit episode, noticeably last year. For example, car imports more than doubled in 2005. Imports of household appliances were up by one-quarter and other durables by almost the same amount. Imports of consumer durables accounted for a larger share of GDP last year than in the previous deficit episode, at more than 5½%. Since 2002, increased imports of consumer durables explain part of the deficit equivalent to 2.2% of GDP. Growth in consumption by Icelanders abroad explains just over 1% and increased fuel imports less than 1% of GDP.

### An unchanged exchange rate and policy rate would still leave a sizeable deficit in 2007, but the adjustment could be faster

What conclusion can be drawn from the above figures about the likely path of the current account deficit over the next few years? An obvious analogy would be 2001-2002, when a somewhat disorderly adjustment took place after the deficit episode in 1998-2000.<sup>3</sup> The króna weakened by almost 30% from spring 2000 to November 2001, inflation hit 9.4% at the beginning of 2002 and national expenditure in 2002 was 6% lower than in 2000. There are indications of an

3. See Sighvatsson, Arnór: Formation and reversal of the current account deficit 1998-2002, *Monetary Bulletin* 2003/1, 75-97.

4. The current account deficit peaked in 2000 at over 10% of GDP but by 2002 it had swung clean over to a surplus equivalent to 1½% of GDP. Because Iceland abandoned its fixed exchange rate regime early in 2001, the adjustment following the present deficit episode will conceivably have quite different features.

even greater need for adjustment now.<sup>4</sup> The current account deficit is considerably wider and rising international interest rates would push it further, calling for even more adjustment. Offsetting this is a larger proportion of export-oriented investments.

The adjustment process will largely be determined by the interaction of exchange rate movements, inflation and interest rates. The baseline forecast presented in this edition of *Monetary Bulletin* assumes an unchanged policy rate and exchange rate. These assumptions would lead to a lengthy adjustment but still leave a hefty deficit once the investments in the aluminium and power sectors are completed and export of aluminium begins. The current account deficit would still be equivalent to almost 10% of GDP in 2007, after reaching 14% this year.

A different exchange rate and policy rate path could produce a much swifter adjustment. The massive recent growth in debt of households, businesses and the whole economy should also be borne in mind. This factor could not only weaken the króna when international interest rates go up, by widening the deficit on income and reducing the interest-rate differential, but also cause a sharp contraction in domestic demand. Forecasts of current account developments should therefore be interpreted with much caution.

#### Uncertain impact of króna-denominated Eurobond issuance

A fundamental change has taken place in Iceland's economic climate since August with issuance of króna-denominated Eurobonds in international markets for an amount equivalent to roughly one-fifth of GDP. The effect on the exchange rate of the króna when these bonds mature is difficult to predict. Volatility on the maturity dates of major bond issues is not inevitable, because their maturity profiles are already known in the markets and should therefore already be priced in (see Box III-1). However, ongoing issuance of króna bonds and renewal of outstanding ones is unsure. The króna could come under pressure around the maturity dates, especially if investors deem the spread inadequate to offset the currency risk. Higher international interest rates could also have a strong effect, not only if the differential with abroad narrows, but equally by generally reducing investor appetite for higher-risk bonds.

Table VII-1 Current account deficit 2004-2007

% of GDP	Estimate		Forecast <sup>1</sup>	
	2004	2005	2006	2007
Current account balance	-9.3	-16.5	-14.1	-9.9
Goods and services account	-5.7	-13.5	-11.7	-7.0
Balance on income	-3.6	-3.0	-2.4	-2.9

1. Central Bank of Iceland forecast in March 2006.

Sources: Statistics Iceland.

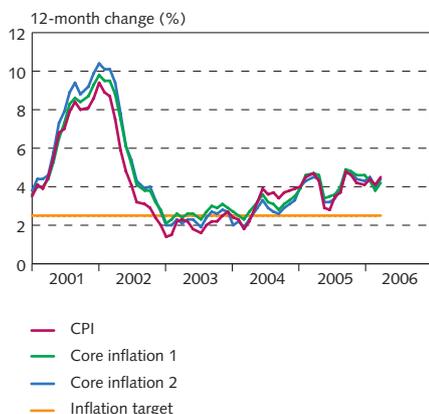
## VIII Inflation developments and inflation forecast

### Inflation developments

Inflation in recent months has remained well above the target. At the beginning of March the twelve-month increase in the CPI was 4.5%. This is the seventh successive month that inflation exceeds 4%. Core index 1, which excludes volatile items, showed marginally lower inflation, but there was less difference in Core index 2, which also excludes public sector prices – these have only increased slightly since the beginning of 2005. The main source of inflation over the past year is house price inflation. As it happens, house price inflation has slowed down noticeably since October and looks set to continue on a downward trend. At the same time, the slowdown in goods price inflation has been tailing off and this trend also seems likely to continue, while the twelve-month increase in prices of both public and private services has been decelerating. These changes in the composition of inflation largely reflects an base effect, i.e. changes in the index twelve months before, rather than any sharp turnaround in recent months. The surge in house prices in the first months of 2005 is now phasing out of the index measurement, resulting in a lower general inflation figure. This spring, however, the groceries market price war a year before will have a base effect in the opposite direction. Thus the outlook is for substantial changes in the composition of inflation this year, however overall inflation developments may turn out.

Chart VIII-1

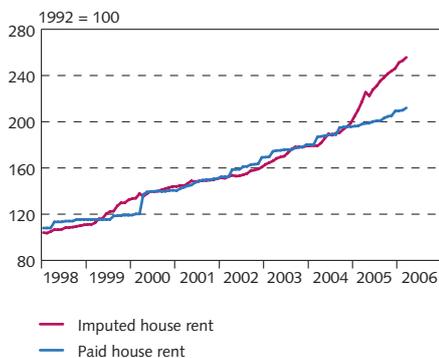
Inflation January 2001 - March 2006<sup>1</sup>



1. The core indices are compiled on the same basis as the CPI, with Core index 1 excluding prices of vegetables, fruit, agricultural products and petrol, and Core index 2 also excluding prices of public services. Source: Statistics Iceland.

Chart VIII-2

Paid and imputed house rent  
January 1998 - March 2006



Source: Statistics Iceland.

### House price inflation slows down

House price inflation has slowed down noticeably since November, when the last survey was conducted before the publication of *Monetary Bulletin* 2005/4 in December. After peaking at 18.3% in October, it had come down to 13.7% at the beginning of March. Since the housing component weighs more than 23% in the CPI, changes in it have a significant effect on inflation, and in fact it was the main driver of CPI inflation last year. The largest subcomponent of the housing component – accounting for around 15% of the CPI – is imputed owner-equivalent rent. The main determinants of owner-equivalent rent are changes in market prices of housing and interest rates.<sup>1</sup> Market prices of housing surged when general access to mortgage credit was eased in 2004 and mortgage interest rates were lowered in summer and autumn 2004.<sup>2</sup> House prices peaked early in 2005 – residential housing prices in the Greater Reykjavík Area went up by almost 10% over the first two months of the year, and by more than one-fifth over the period December 2004 to May 2005.

Although the rate of house price inflation in recent months is significantly lower than a year ago, it has still outpaced general

1. Statistics Iceland's methodology for calculating owner-equivalent rent is explained in *Monetary Bulletin* 2004/2, 29-32.  
 2. Discussed in detail in Eliásson, Lúdvík and Thórarinn G. Pétursson: The residential housing market in Iceland: Analysing the effects of the recent mortgage market restructuring, Central Bank of Iceland *Working Papers* No. 29/2006.

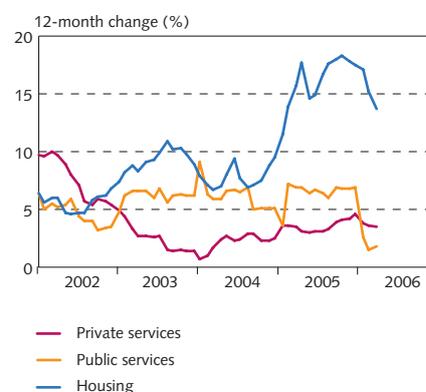
inflation, excluding seasonal and irregular short-term fluctuations. In March, for example, the three-month average market price of housing, which is used in the index to estimate owner costs, rose by 1%. This is a substantial increase, although much less than over the same period a year before. Regional house price inflation rose by proportionally more, at 2.5%, while the Greater Reykjavik Area recorded 0.61% but weighs 72% in the index calculation. House price inflation has therefore come down rather more slowly than was hoped, mainly because the base effect from the months when inflation was highest is gradually petering out. Demand for housing still appears to be buoyant, and the high bids that contractors were prepared to make for building land on the outskirts of Reykjavik in a recent auction indicates that they are optimistic that demand will remain robust. High land prices should reduce the probability of a downturn in the near future. In all likelihood the trend will persist for the next few months. A temporary spike may upset the house price deflation path in May, when the base effect of a change made to the housing component of the CPI in May 2005 disappears. This change involved shortening the reference period for interest calculations in the index from five years to twelve months, which caused a 0.45% reduction in the CPI. It will cease to affect measured inflation in May.

#### Exceptionally wide gap between market rent and imputed rent

Rental prices tend to track market prices of housing closely, although sometimes with some lag. Over the past year, however, an unprecedentedly wide gap has developed between paid (market) rent and imputed owner-equivalent rent. At the end of 2004, both components had increased by broadly the same from the CPI base month, March 1997. In the following year housing prices surged, pushing up owner-equivalent rent in the CPI by 20% in excess of market rent. This development invites conflicting interpretations about how housing costs will change over the next few months. First, the divergence possibly occurs because the rise in owner-equivalent rent does not fully reflect the impact of lower interest rates on housing costs. Lower interest costs could enable landlords to offer housing at a lower rent relative to the purchase price than before. Second, easier access to credit has conceivably eroded demand for rental accommodation, hindering landlords from raising rent in step with property prices. Third, the difference may simply reflect a lag in updating rental contracts, which have various periods of notice, or lags in the inclusion of such changes in the CPI.

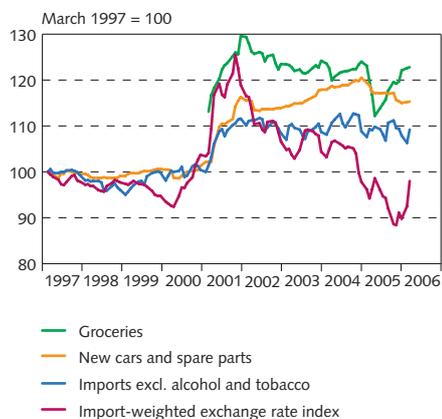
An example of the latter is when market rent rose in 2000, almost one year after it began to lag beyond owner-equivalent rent. The gap was closed when market rent went up by 14% between March and April that year. Closing the gap now in the same way as in 2000 would drive up inflation by almost half a percentage point. However, the adjustment would hardly be as sharp as in 2000, because Statistics Iceland currently surveys rent more frequently, at quarterly intervals. The gap may also be seen as an indication that house prices are out of step with fundamentals and may trend back in the direction of rents, which of course would have a disinflationary effect.

Chart VIII-3  
Prices of housing and services  
January 2002 - March 2006



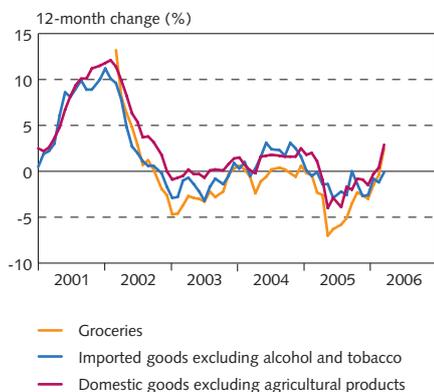
Source: Statistics Iceland.

Chart VIII-4  
Import-weighted exchange rate and  
import prices  
March 1997 - March 2006



Source: Statistics Iceland.

Chart VIII-5  
Goods prices January 2001 - March 2006



Source: Statistics Iceland.

### Goods price deflation has unwound and twelve-month inflation is likely to rise in the coming months

Goods prices fell significantly in spring last year. The main factor at work was the grocery market, where competition for market share temporarily brought down prices. Towards the end of summer and in the autumn, the price cuts were largely reversed. Due to the base effect, from this spring onwards grocery prices could show a twelve-month increase of as much as 10% if they do not change significantly over the next few months. If the pass-through of the recent depreciation of the króna to higher inflation is relatively rapid, the twelve-month increase could turn out to be even higher. These effects and the recent depreciation could contribute to an inflationary spike in the spring.

As Chart VIII-4 shows, imported goods prices by no means always track exchange rate movements. For example, the depreciation of the króna late in 2001 was never transmitted in full to the domestic price level, and nor was the appreciation over the past two years. Many factors need to be taken into account. First, the domestic content of the price level is quite large, even for imported goods. The extent varies from one good to another and is determined by factors including distribution, inventory and retailing costs. In many cases these costs account for a sizeable share of the price, which means that domestic wage and housing cost developments, for instance, can offset the impact of exchange rate movements. Hedging against currency risk may also be used on a fairly large scale, which slows down the adjustment and can even more or less eliminate the impact of short-term changes. Conceivably, the level of competition can also affect how quickly exchange rate movements are transmitted to the domestic price level. Oligopolistic behaviour, however, is not necessarily one of the explanations, since a case can be made for either enhanced correlation of prices with exchange rate movements due to oligopolistic behaviour, or for a weaker link.

### Slowdown in twelve-month increases in services prices

In recent years, prices of public services have risen well in excess of the CPI as a whole. A year ago or so, the indices of public and private sector services prices had moved broadly back in line relative to the base month of March 1997. At the beginning of 2006, preschool fees and prices of other public services went up by less than is often the case at the start of the year. A reduction in preschool fees of 10% over the past year offsets other rises. As a result, twelve-month inflation in public services slowed noticeably at the beginning of the year. In March it amounted to only 1.8%. Core index 2, which excludes public services, consequently went up slightly more than Core index 1, namely by 4.4%.

Prices of private sector services were 3.5% higher year-on-year in March. This is a marked drop from the 4.6% year-on-year rise recorded in December. In addition to fairly modest private services inflation in recent months, the 1% spike in January 2005 is now no longer included in twelve-month comparisons. The rise in January 2005 was explained by a raft of increases including telephone serv-

ices, sports and leisure costs and banking services. These items did not increase so much at the beginning of this year, although domestic transport and travel, education, accommodation, catering, hairdressing and banking services have risen substantially since then.

### Inflation in recent months was higher than forecast

In *Monetary Bulletin* 2005/4, published in December, an inflation rate of 4% was forecast for the final quarter of last year and 3.4% in Q1/2006.<sup>3</sup> In the event, the index rose by 4.3% and 4%, respectively.

### Inflation expectations on the increase after the króna depreciation

The depreciation of the króna in the wake of Fitch Ratings' report drove inflation expectations much higher, as depicted from the break-even rate on bonds and business confidence surveys. Household expectations had edged down in the most recent survey, reflecting the last inflation measurements before it was conducted.

According to a survey conducted from February 15 to 27, households expect 4.4% inflation on average over the next twelve months. This is marginally down on the previous survey conducted in October and probably reflects the lower rate of inflation in February than in preceding months. In light of the March CPI measure, household inflation expectations are likely to head upwards again.

A survey of the largest businesses in Iceland made from February 9 to March 3 reveals that they expect inflation of 4.2% over the next twelve months and a combined increase in the CPI of 7.2% over the next two years, implying an inflation rate of 3% in 2007. This is the highest value for business inflation expectations since these surveys were launched in September 2002. The previous survey, conducted in October 2005, revealed that 3.7% inflation was expected on average.

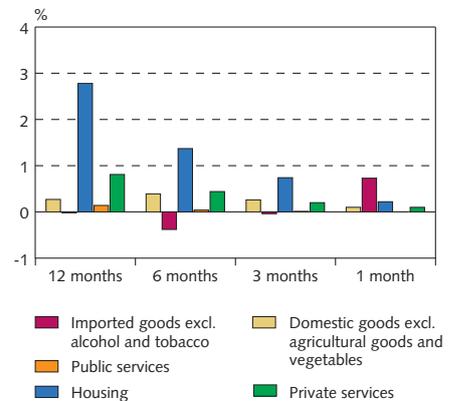
As discussed in Section III, there was a spike in the breakeven inflation rate on bonds following the depreciation of the króna in February. The slide clearly fed into inflation expectations, stimulating demand for indexed bonds and driving down yields. Over the period from the publication of the Fitch Ratings report on February 21 to March 27, market expectations of inflation, measured as the yield spread between indexed and non-indexed government bonds with a maturity of eight years, averaged 3.9% over their maturity.

### Inflation forecast

Since the last assessment of the two-year inflation outlook in December, the Central Bank has raised its policy interest rate twice by a total of 0.5 percentage points to the current 10.75%. At the same time, the króna has depreciated significantly. The exchange rate index

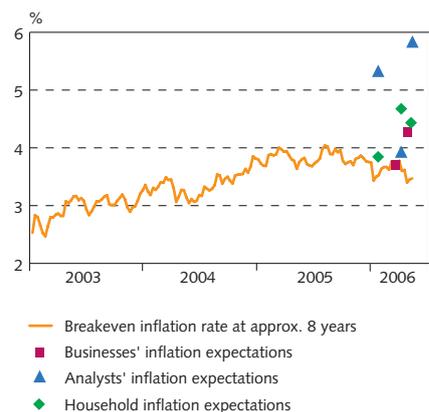
3. The November CPI was known at that time, but the December and January values are also used in calculations of the quarterly index. The October and January values have half the weights of November and December. The quarterly value for Q4 is calculated as  $(0.5 * V_{Oct} + V_{Nov} + V_{Dec} + 0.5 * V_{Jan}) / 3$ , where  $V_{Oct}$ ,  $V_{Nov}$ ,  $V_{Dec}$  and  $V_{Jan}$  are the index values for the respective months.

Chart VIII-6  
Components of the CPI in March 2006  
Contribution to CPI inflation in past 1, 3, 6 and 12 months



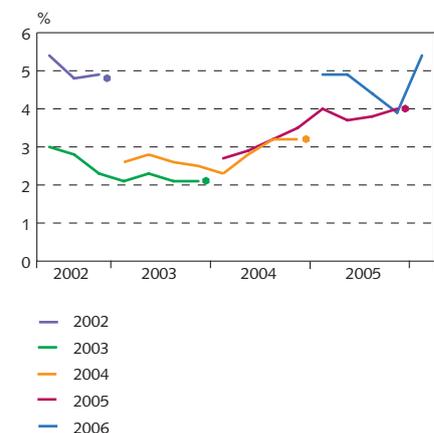
Source: Statistics Iceland.

Chart VIII-7  
Inflation expectations  
Weekly data January 7, 2003- March 14, 2006



Household and businesses' inflation expectations are based on expectations over the next twelve months and analysts' expectations on twelve-month inflation to end-2006.  
Source: Central Bank of Iceland.

Chart VIII-8  
Financial market analysts' forecasts for average year-on-year inflation<sup>1</sup>



1. Points show actual rate of inflation for each year.  
Source: Central Bank of Iceland.

## Box VIII-1

Central Bank inflation  
forecasting methods

The Central Bank of Iceland has published inflation forecasts for many years. Their importance increased significantly when the Bank adopted a formal inflation target in March 2001. Since then, the Bank has published a quarterly inflation forecast and risk profile over a two-year horizon in *Monetary Bulletin*.<sup>1</sup>

Initially the Bank based its inflation forecasts on a simple single-equation model in which inflation was assumed to be determined by prices of imported goods, measured in domestic currency, and unit labour costs, i.e. wage growth in excess of labour productivity (see e.g. Gudmundsson, 1990). This model has performed quite well for forecasting, especially of relatively short-term inflation developments. However, its shortcomings became apparent in 1999. That year the exchange rate of the króna remained relatively stable, global inflation low and growth of wage costs moderate, but inflation was far in excess of Central Bank forecasts. The forecast errors were traced to the fact that the simple model ignored the impact of the output gap, which international research has demonstrated to be an important determinant of future inflation (see, e.g., *Monetary Bulletin* 2004/2, 36-37). The Bank therefore enhanced its inflation forecasting tools by incorporating a system of equations describing the interaction of inflation and wage growth and the impact of pressures in the goods and labour markets on the development of these aggregates (Pétursson, 2002). In addition, in recent years the Bank has used two other inflation forecasting models which assume stochastic trend behaviour in the long-term determination of the price level (Gudmundsson, 2002). The Bank has thus used four models for inflation forecasting in recent years and its baseline forecast has been the weighted average of these four models. Weights of individual models have varied according to the forecast horizon: those with sounder economic properties carry more long-term weight while those based more on statistical relationships weigh heavier in the short-term forecasts.

As described in Appendix 1 on pp. 61-63, the Central Bank has adopted a new quarterly macroeconomic model which is also used in preparation of its core inflation forecast. The inflation forecasting equation in that model is only estimated with data from 1992 and differs somewhat from the Bank's earlier forecasting models. The inflation equation in the macroeconomic model is given as the following Phillips curve:

$$\pi_t = \alpha\pi_{t-1} + \beta\pi_{t+1}^e + (1 - \alpha - \beta)\pi^t + \phi y_{t-1} + \lambda x_{t-2}$$

where  $\pi_t$  is year-on-year inflation in quarter  $t$ ,  $\pi_{t+1}^e$  is expected inflation<sup>2</sup> in quarter  $t+1$ ,  $\pi^t$  is the Central Bank's inflation target,  $y_{t-1}$  is the output gap in quarter  $t-1$  and  $x_{t-2}$  is the year-on-year change in the real exchange rate in quarter  $t-2$  (an increase in  $x$  represents a real exchange rate depreciation).

The size of the parameters  $\alpha$  and  $\beta$  determines the underlying inflationary behaviour. The higher the value of  $\alpha$ , the more persistent is the impact of demand and supply shocks (changes in  $y$  and  $x$ ) on inflation; the higher the value of  $\beta$ , the greater the impact of expectations on the future inflation outlook; and the closer that the sum of  $\alpha$  and  $\beta$  is to zero, the more credible the inflation target. Since the sum of the three inflation parameters is equal to 1, this ensures

1. The determination of the risk profile for the inflation forecast is discussed in *Monetary Bulletin* 2005/1, Appendix 3, "Uncertainties in the Central Bank's inflation forecast", 60-63.
2. Inflation expectations may be either adaptive, on the basis of a simple statistical model, or rational, based on repeated total modelling.

that the Phillips curve is vertical in the long run and inflation is equal to the target.

The main advantages of this inflation equation are that it has sound theoretical characteristics, is flexible to use and appears to describe inflation developments in recent years better than earlier models. In the future, the Central Bank's inflation forecast will be broadly based on the abovementioned model. Nonetheless, independent evaluation by the Bank's experts will still perform an important function in the final assessment of the inflation outlook. The Bank's earlier inflation models will also play an important part in estimates of forecasting uncertainties and preparation of risk profiles.

#### Sources

Gudmundsson, Guðmundur (1990): Tölfræðikönnun á verðbólgu á Íslandi árin 1962-1989 [A statistical survey of inflation in Iceland 1962-1989], *Fjármálatíðindi*, 37, 43-53.

Gudmundsson, Guðmundur (2002): Samband verðbólgu við laun og innflutningsverðlag [The relationship of inflation to wages and import prices], *Fjármálatíðindi*, 49, 23-34.

Pétursson, Þórarinn G. (2002): Wage and price formation in a small open economy, Central Bank of Iceland *Working Papers*, 16.

value used in the current baseline forecast is 116, but was 102 in the previous forecast in December – and is therefore 12% lower.

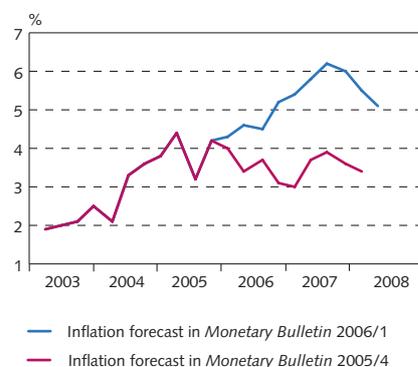
#### The inflation outlook has taken a sharp turn for the worse

Because the króna has depreciated substantially since the last forecast and underlying macroeconomic imbalances appear to be stronger than was expected, the inflation outlook has worsened considerably. This applies both to the baseline scenario, which assumes an unchanged policy rate and exchange rate over the forecast horizon, and to the alternative scenario based on a variable policy rate and exchange rate path. Both forecasts indicate that inflation will be some way above target for the whole of the forecast horizon, which now extends to Q1/2008. To prevent a persistent deviation from target, the policy rate would need to be raised substantially from its current level, and by rather more than is assumed in the alternative scenario. This is clearly shown by the forecast based on an interest rate path that is consistent with the target being attained at the end of the forecast horizon (see further Section IX).

#### Baseline inflation projections

Based on the assumptions for an unchanged policy rate and exchange rate in the baseline scenario, inflation could reach as high as 5½% one year ahead. This rate of inflation is far higher than projected in the last *Monetary Bulletin* in December, which was 3% in the same quarter. Two years ahead, the inflation outlook has hardly improved, based on the above assumptions. Inflation looks likely to peak in the

Chart VIII-9  
Revised inflation forecast



Sources: Statistics Iceland, Central Bank of Iceland.

middle of next year. It could measure more than 6% then, and 5½% two years ahead, compared with the 3½% rate for that quarter which was forecast in December.

### **Depreciation of the króna boosts inflationary pressures**

One of the main reasons for inflation prospects deteriorating on such a scale, despite a higher policy rate, is a sharp depreciation of the króna in recent weeks. Although the pass-through of exchange rate movements into inflation has probably declined over recent years, there is a risk that such a large depreciation while the economy is still severely overheated will sustain inflationary pressures far beyond the short-lived effect of a spike in import prices. The weaker króna will channel demand back into the economy, increasing the pressure on already overstretched capacity. Another risk is that a sharp depreciation will have a persistent effect on inflation expectations for as long as confidence in the inflation target and Central Bank monetary policy are not sufficient to anchor them.

### **Stronger underlying imbalances than previously estimated ...**

As described in Section IV, GDP growth has outstripped earlier estimates. Pressures in the residential housing market have also proved more persistent and partly explain the much higher inflation rate in recent months than forecast in December. For this reason, the output gap is wider than expected in December as well. It should be remembered that uncertainties are probably exaggerated by the present climate. Nonetheless, demand is clearly running far in excess of a level that output can meet. This pressure breaks out in increased inflation, unless monetary policy acts against it.

### **... are reflected in a strong increase in labour cost ...**

Macroeconomic pressures and imbalances are also present in the domestic labour market. According to the baseline forecast, unemployment is likely to hit bottom in the middle of this year at below 1½%, which is far too low to be compatible with balance in the labour market and price stability.

As discussed earlier, unit labour costs have grown well in excess of the inflation target in the recent term. Given the current macroeconomic imbalances, this pressure is likely to persist across the forecast horizon, even though access to foreign labour has eased it to some extent and helped to keep the lid on wage cost increases. According to the baseline forecast, unit labour costs will grow in the range 4-6½% over the next two years. Other things being equal, growth on such a scale will create severe pressures that threaten to feed inflation way into the future, especially if expectations become anchored at a high rate.

### **... and higher inflation expectations**

Inflation expectations also appear considerably higher than in the beginning of December. High expectations feed inflation and, if they cannot be altered, make it more difficult to contain. In the baseline forecast, this is reflected in the slow rate of decrease in inflation across

the forecast horizon. If the inflation target is more credible than the baseline forecast suggests, inflation will come down faster.

## Forecast with variable interest rate and exchange rate path

The purpose of the baseline scenario is to present an indication of the likely inflation path if the Central Bank keeps the policy rate unchanged and provided that the exchange rate remains stable over the forecast horizon. It therefore represents a useful indicator of the need to alter the monetary stance. As discussed in previous editions of *Monetary Bulletin*, the forecast becomes increasingly unrealistic when inflation is far above the target and the outlook for the entire forecast horizon is so bleak that quite large policy rate hikes seem unavoidable. The greater the imbalances, the less valuable is the information that such a scenario can provide to households and markets about probable economic developments and possible Central Bank responses to them.

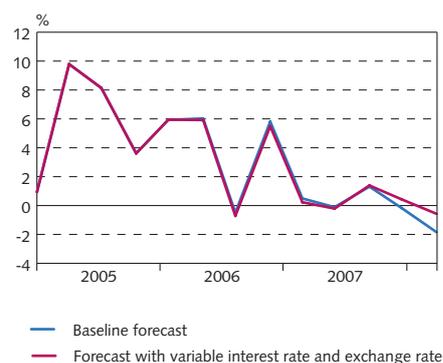
To address this problem to some extent and also for comparative purposes, the Central Bank publishes an alternative forecast based on a variable policy rate and exchange rate path. The advantage of the alternative scenario is its more realistic assumptions about monetary policy responses to a poor inflation outlook. It assumes a variable exchange rate over the forecast horizon, which may prove quite crucial when the exchange rate and interest rates are likely to be far from long-term equilibrium.

### Higher policy rate and weaker króna than assumed in the baseline forecast

As usual, market agents' and analysts' expectations are used to calculate an inflation path based on a variable interest rate and exchange rate. Recent editions of *Monetary Bulletin* have been based on analysts' expectations of the policy rate path, instead of calculating them from forward rates. This approach has run into complications recently, as discussed in Section III on Financial conditions. In their survey responses, analysts expect the policy rate to continue to climb in the near future and peak later this year at almost 12%. Subsequently they foresee a gradual decline to just over 8% two years hence (see further Box VIII-2). The alternative scenario based on this policy rate path entails a somewhat tighter monetary stance than in the baseline forecast until the middle of next year, then an easier one later along the forecast horizon.

The variable exchange rate path for the alternative forecast is calculated from the spread between the above policy rate path and a foreign implied forward rate, using uncovered interest rate parity and allowing a risk premium on domestic financial assets. On the basis of this analysis, the króna will gradually depreciate over the forecast horizon and the exchange rate index will be close to 128 at the end of the forecast horizon, which is broadly in line with the financial market analysts' forecasts in Box VIII-2.

Chart VIII-10  
Different GDP growth paths  
Forecasting period: Q1/2006 - Q1/2008



Sources: Statistics Iceland, Central Bank of Iceland.

Box VIII-2

## Financial market analysts' assessments of the economic outlook

The accompanying table shows the survey responses of financial market analysts in mid-March. Participants in the survey were the research departments of Glitnir (previously Islandsbanki), Kaupthing Bank and Landsbanki, and Economic Consulting and Forecasting.

In addition to the information presented in the table, analysts were also asked to give an assessment of the Central Bank's policy interest rate path, i.e. on the timing of the policy rate cycle's peak and trough within the forecast horizon, and at what values.

The main changes from the survey in November is that analysts have revised their forecast for output growth downwards for this year but upwards for next year, as well as forecasting higher inflation this year and broadly the same rate in 2007, and a higher policy rate and a weaker króna.

### **Analysts expect higher inflation than in the Central Bank's baseline forecast**

As in both September and November, analysts expect inflation to remain some way above the 2.5% target across the forecast horizon. Their projection for year-on-year inflation in 2006 has gone up considerably since November to 5.4%, somewhat above the Central Bank's forecast of 4.9%. In 2007, forecasters expect inflation to decline to 4.6%, while the Central Bank's baseline forecast is markedly higher at almost 6%. It should be underlined that the Central Bank assumes an unchanged policy interest rate and exchange rate over the forecast horizon, while the analysts do not. The Central Bank's alternative scenario, based on variable policy rate and exchange rate paths, gives a higher rate of inflation next year than the baseline forecast, and thus diverges even more strongly from the analysts' forecasts.

### **Growth outlook has changed**

Analysts' forecasts for output growth have changed sharply since November – downwards for 2006 but upwards for 2007. Individual forecasts diverge quite widely, especially for 2007. On average, market analysts expect 4.6% growth this year and 2.5% in 2007. The Central Bank's output growth forecast is more pessimistic, at 4.2% in the current year but only 0.4% in 2007.

### **Forecasters expect an ongoing depreciation of the króna ...**

Survey respondents have revised their forecasts for exchange rate developments sharply downwards since November after the recent depreciation of the króna and now expect it to be much weaker both one and two years ahead. They foresee an exchange rate index of 123 twelve months ahead and broadly the same value after two years. The exchange rate index stood at just over 116 on March 17. According to the Central Bank's alternative scenario, the exchange rate index will have risen past 127 two years ahead.

### **... policy rate hikes ...**

The Central Bank has made two recent rises in its policy interest rate, by 0.25 percentage points each on December 2, 2005 and January 26. The policy interest rate is now 10.75%. Analysts expect further hikes and have upped their forecasts since November. Now they forecast an average rate of more than 12% one year ahead, moving back to just below 9% after two years. However, opinions are noticeably divided, especially over a two-year horizon. Analysts were also asked to forecast the peak and trough of the policy rate over the next two years. They are very much at odds about the peak, offering values in the range 11.25-14.75%. However, the majority expect

the policy rate to peak in the second half of this year and even more forecast a low in the beginning of 2008 at around 8%. One respondent stood out by predicting that the policy rate is currently at its lowest value for the next two years and will peak in 2007.

### ... and slower asset price rises than often before

On March 15, the ICEX-15 share index stood at 6,154, which was 18% higher than when the analysts last made their forecasts in November. They do not regard this pace of growth as sustainable and forecast a slowdown. However, outlooks differ. One forecaster believes that equity prices will drop both one and two years ahead.

Finally, respondents expected real estate prices to increase by less than ever before in these surveys, which is in line with market developments. However, none expects real estate prices to decline.

### Overview of forecasts by financial market analysts<sup>1</sup>

	2006			2007		
	Average	Lowest	Highest	Average	Lowest	Highest
Inflation (within year)	6.1	5.2	7.0	4.1	3.2	5.1
Inflation (year-on-year)	5.4	4.7	5.8	4.6	2.9	5.6
GDP growth	4.6	4.0	5.1	2.5	0.8	3.5
	<i>One year ahead</i>			<i>Two years ahead</i>		
Inflation	5.8	5.1	6.7	3.9	2.9	5.0
Effective exchange rate index of foreign currencies vis-à-vis the króna (Dec. 31, 1991=100)	123.4	120.0	127.5	122.8	116.0	125.0
Central Bank policy interest rate	12.1	10.8	14.5	8.7	7.0	12.0
Nominal long-term interest rate <sup>2</sup>	8.1	7.0	9.5	7.4	6.4	8.5
Real long-term interest rate <sup>3</sup>	4.1	3.6	5.2	3.8	3.4	4.6
ICEX-15 share price index (12-month change)	6,594	5,500	7,066	7,154	5,200	8,295
Housing prices (12-month change)	5.5	2.0	10.0	6.6	4.0	10.0

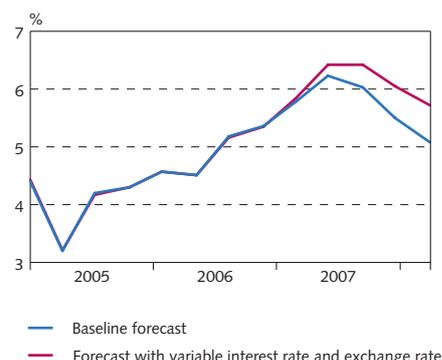
1. The table shows percentage changes between periods, except for interest rates (percentages) and the foreign exchange rate index and ICEX-15 index (index points). Participants in the survey were the research departments of Glitnir (previously named Íslandsbanki), Kaupthing Bank and Landsbanki, and Economic Consulting and Forecasting. 2. Based on yield in market makers' bids on non-indexed T-notes (RIKB 13 0517). 3. Based on yield in market makers' bids on indexed HFF bonds (HFF 150644).  
Source: Central Bank of Iceland.

### Rather poorer outlook for inflation in the alternative scenario

According to the alternative scenario, domestic demand growth will be lower this year and contract by more next year than in the baseline forecast. The explanation is the higher initial policy rate. GDP growth is marginally lower in the alternative scenario until mid-2007, when the easier monetary stance will prompt less contraction at the end of the forecast horizon.

In both forecasts, inflation prospects are broadly the same across most of the horizon, but diverge later next year. Inflation decreases more slowly in the alternative scenario – as a result of the weaker króna and wider output gap – despite a higher policy rate for the first part of the period. In the alternative scenario, inflation will be roughly 6% two years ahead, which is half a percentage point more than in the baseline forecast. Thus the alternative scenario confirms the poor inflation prospects ahead.

Chart VIII-11  
Different inflation paths  
Forecasting period: Q1/2006 - Q1/2008



Sources: Statistics Iceland, Central Bank of Iceland.



more risk that a sudden downward adjustment in the near term could cause domestic demand pressures to plunge. Some decrease in housing prices is now expected in the second half of the forecast horizon, which should reduce the probability of major deviations from the baseline scenario.

Another risk is that current wage agreements will be revoked this winter if inflation exceeds a reference limit that will trigger a review. Intense pressures in the labour market pose a risk that wage reviews could lead to higher increases and wage pressures than assumed in the baseline forecast.

### Probability distribution less asymmetric two years ahead than in the December forecast

On the basis of the above profile, the forecast risk one year ahead is broadly the same as in December, but rather less to the upside two years ahead. The estimated confidence intervals for the baseline forecast are shown in Chart VIII-12, along with those for the previous forecast in December.

### Unlikely that the inflation target will be attained over the forecast horizon

According to the baseline forecast, there is almost zero probability that the inflation target will be attained over the forecast horizon, if the policy interest rate remains unchanged. There is a significant probability that inflation will remain above 4% for the entire forecast period.

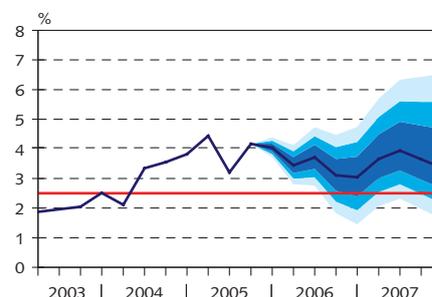
It is important to keep in mind that both the baseline scenario and the risk profile are based on an unchanged policy interest rate over the forecast horizon. Indeed, the main task of monetary policy is to ensure that the economic scenario implied by the forecast and the main risks does not materialise. In this respect, it is likely that the probability ranges in the forecast are overestimated.

Table VIII-2 Probability ranges for inflation over the next two years

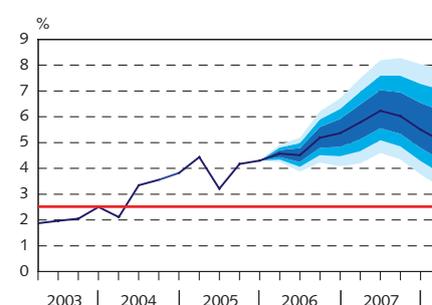
Quarter	Inflation				
	Under 1%	In the range 1% - 2½%	Under 2½%	In the range 2½% - 4%	Over 4%
Q1/2006	< 1	< 1	< 1	< 1	99
Q4/2006	< 1	< 1	< 1	4	96
Q4/2007	< 1	< 1	< 1	7	93

The table shows the Bank's assessments of the probability of inflation being in a given range, in percentage points.

Chart VIII-12  
 Previous Central Bank inflation forecast  
 – baseline scenario (in *Monetary Bulletin* 2005/4)  
 Forecasting period: Q4/2005 - Q4/2007



Current Central Bank inflation forecast  
 – baseline scenario  
 Forecasting period: Q1/2006 - Q1/2008

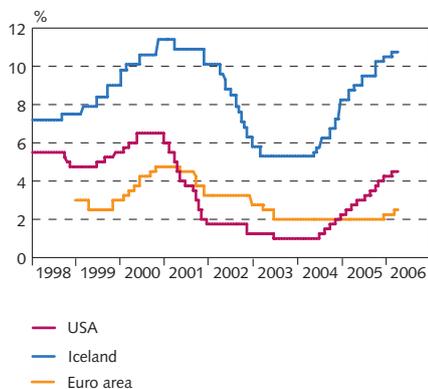


— CPI  
 — Inflation target  
 ■ 50% confidence interval  
 ■ 75% confidence interval  
 ■ 90% confidence interval

The charts present the estimated confidence intervals of the forecast for the next two years. The entire shaded area shows the 90% confidence interval; the two darkest ranges show the corresponding 75% confidence interval and the darkest range shows the 50% confidence interval. The uncertainty increases over the horizon of the forecast, as reflected in the widening of the confidence intervals. Uncertainty in the forecast is considered to be somewhat less than is shown by historical forecasting errors, which reflect volatile inflation in the period 2001-2002 immediately after Iceland moved on to an inflation target. A detailed description of how the probability distribution is calculated is given in Appendix 3 to Economic and monetary developments and prospects, *Monetary Bulletin* 2005/1.  
 Source: Central Bank of Iceland.

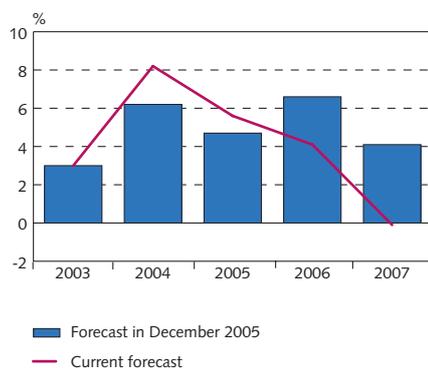
## IX Monetary policy

Chart IX-1  
Central Bank policy  
Daily data January 1, 1998 - March 17, 2006



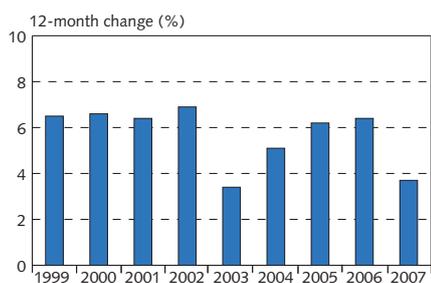
Sources: Reuters EcoWin, Central Bank of Iceland.

Chart IX-2  
GDP growth 2003 - 2007



Source: Central Bank of Iceland.

Chart IX-3  
Unit labour cost 1999 - 2007<sup>1</sup>



1. Estimate for 2005. Central Bank of Iceland forecast 2006-2007.  
Source: Central Bank of Iceland.

The period since the publication of the last *Monetary Bulletin* in December 2005 has been fairly eventful. In addition to a 0.25 percentage-point rise in the policy interest rate which coincided with the publication of *Monetary Bulletin* and the inflation forecast on December 2, 2005, the Central Bank raised the policy rate by a further 0.25 percentage points on January 26. In a press release issued on the occasion of the January policy rate increase, the Central Bank cited the weaker króna, indications of excessively rapid demand growth and labour market pressures in the form of increased wage drift. On a long-term view, it was pointed out that the highest real exchange rate since the 1980s and a record current account deficit indicated sizeable inflationary pressures ahead, even beyond the Central Bank's forecast horizon. Furthermore, that monetary policy must make a timely response to these conditions, if even tougher measures are not to be required later. Given the current outlook, the Central Bank might need to raise its policy interest rate further this year, the press release said.

### Unfolding economic developments warrant a tighter monetary stance

Unfolding economic developments since the policy rate hike in January do not give the Central Bank grounds for easing its monetary stance. On the contrary, developments have by and large been detrimental to the inflation target. Inflation is still way above target and showed a marked rise in March. The króna has depreciated markedly since the Central Bank prepared its last forecast in November 2005, and the revised national accounts show that domestic demand growth in 2004 and 2005 was stronger than the Bank had forecast or estimated. Hence, the output gap is currently estimated to be even wider than previous estimates suggested. The inflation outlook has worsened commensurably two years ahead and also on a longer horizon, given last year's greater-than-expected current account deficit. Labour market pressures are continuing to build up and unit labour costs look set to increase well in excess of the inflation target. A weaker exchange rate and higher rate of inflation exacerbate the risk of wage inflation spinning out of control. Growth of credit and money supply also gives grounds for keeping a close watch on long-term inflationary pressures. Even the real estate market, which was hoped would cool down quickly with rising interest rates, is still buoyant.

### The króna came under pressure in February and March ...

The króna came under pressure in February and the first half of March and depreciated by 14% from February 20 to March 24. In its discussions of the inflation outlook in *Monetary Bulletin*, the Central Bank has emphasised the risk profile of its forecast no less than the specific inflation paths which are presented as its baseline forecast and alternative scenario. One of the main risks of late has been the growing likelihood of a sizeable long-term depreciation of the króna. Such an appraisal is prompted by the historically high real exchange rate and unsustainable current account deficit, as well as the exchange rate

pressures that are likely to be caused by rising international interest rates in the near term. Domestic interest rates need to be high enough to counteract too swift an exchange rate adjustment. Given that short-term and long-term interest rates are likely to go on rising in international markets, domestic short-term rates probably also need to go up, if only to maintain the interest-rate differential with abroad.

**... which could increase further when króna Eurobonds mature**

The wide interest-rate differential with abroad has stimulated issuance of króna-denominated Eurobonds in international markets. Total issuance is currently 220 b.kr., corresponding to more than one-fifth of Iceland's GDP. The bond issuance in its own right does not affect the exchange rate of the króna, but derivatives trades between issuers and brokers have contributed to an appreciation. The first round of these Eurobonds will mature in Q3/2006, to a total value of 40 b.kr. If they are not matched with new issues, pressure on the króna could emerge. But if international issuers are to roll over the issues as they mature, spreads must be sufficiently wide to outweigh the currency risk, especially if the króna is less stable by then. The maturity profile of swaps connected with the króna Eurobonds, a probable rise in international interest rates, volatility of the króna and possible doubts among investors about the sustainability of economic developments in Iceland – all these factors entail that the policy interest rate will need to remain high for a long time in order to prevent the króna from depreciating by more, and faster, than is compatible with the inflation target.

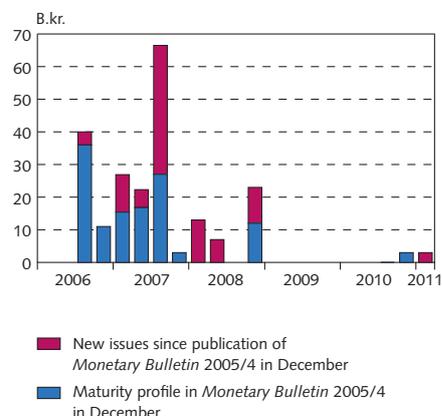
**The monetary stance has eased**

At the same time as data emerges suggesting that inflationary pressures are even greater than the Central Bank has estimated in its forecasts so far, most indications are that the monetary stance has eased. The tightness of the stance is not determined solely by how high the policy rate is at any time and expectations about its medium-term path, but also by expected inflation, exchange rate developments and how smoothly Central Bank policy rate changes are transmitted across the yield curve. Developments in all these areas have been unfavourable since *Monetary Bulletin* was last published in December 2005 and also since the latest policy rate hike.

As mentioned above, inflation expectations increased when the króna weakened. In real terms, this has brought down the effective policy rate by an estimated ½-1 percentage point since the last interest rate decision. Higher inflation expectations after the slide in the króna in February and March have also spurred demand for indexed bonds. Yields have decreased as a result, which prompted the Housing Fund to lower its interest rates again slightly in March after raising them in December. On the other hand, the banks announced small increases in their indexed lending rates in March, including mortgage lending rates.

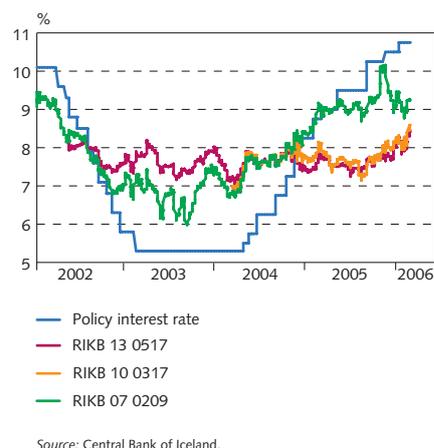
Rising inflation expectations are not the only factor operating against Central Bank monetary policy at present, because short-term market interest rates – even only one-month rates – have repeat-

Chart IX-4  
Maturity profile of króna-denominated Eurobond issues<sup>1</sup>  
Q3/2006 - Q1/2011



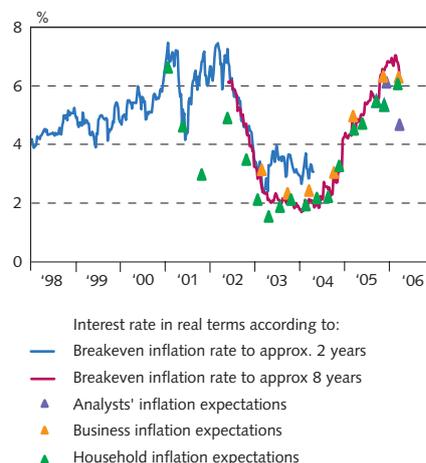
1. Data until March 15, 2006 inclusive.  
Source: Central Bank of Iceland.

Chart IX-5  
Long-term nominal Treasury bond yields and the Central Bank repo rate  
Daily data January 3, 2002 - March 17, 2006



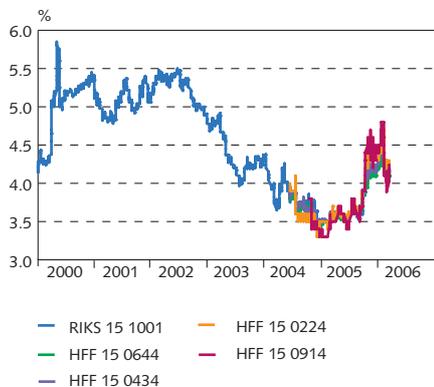
Source: Central Bank of Iceland.

Chart IX-6  
Central Bank policy rate in real terms  
Weekly data January 5, 1998 - March 17, 2006



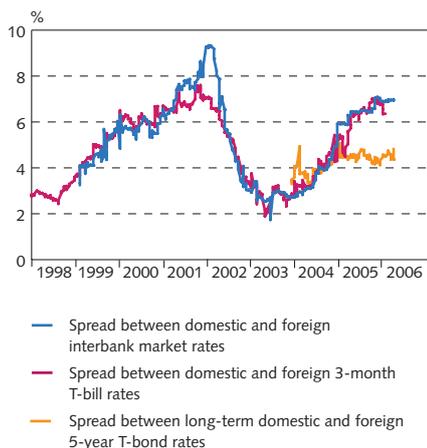
Source: Central Bank of Iceland.

Chart IX-7  
HFF bond and savings bond yields  
Daily data January 4, 2000 - March 24, 2006



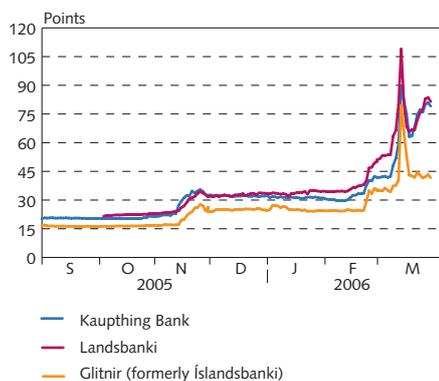
Source: Central Bank of Iceland.

Chart IX-8  
Interest rate differential with abroad  
Weekly data January 7, 1998 - March 14, 2006



Source: Central Bank of Iceland.

Chart IX-9  
Risk premium on Icelandic bank bonds  
in the secondary market  
Daily data September 1, 2005 - March 28, 2006



Source: Bloomberg.

edly failed to track the Central Bank's rates. It is inconceivable that expected Central Bank interest changes could be the explanation. This must be attributed to a market failure which inhibits the transmission of monetary policy.

Contrary to the Central Bank's aims, the rise in real interest rates achieved earlier this year has unwound at both the short and long end of the curve. If no action is taken or the state of the markets remains unchanged, there is a risk that climbing inflation expectations will undermine the monetary stance, imbalances will build up in the labour market and that the pressure on the króna will intensify.

### Weaker króna heralds a risk of provoking further wage rises

The depreciation of the króna is admittedly a relief for companies in the export and traded goods sectors, profitability of which has been squeezed by the strong króna over the past year. However, a weaker exchange rate could give businesses scope for raising wages in the present fierce competition for scarce domestic labour. Thus the depreciation also implies a laxer monetary stance, with the risk of higher inflation. Over and above the direct inflationary effect of the weaker króna on prices of imported goods, labour unions may demand an adjustment when the next wage settlement review comes around in November.

### A downturn in international financial conditions could severely affect Icelandic financial companies' lending capacity

Towards the end of 2005, risk premiums on bonds issued by the Icelandic banks began to rise in international secondary markets. Further rises in February and the beginning of March followed reports from international agencies and analysts which were fairly negative about the Icelandic banking sector and pointed out imbalances in the Icelandic economy. If the banks needed to fund their lending at current secondary market rates, they could be expected to have to raise their own lending rates. At this stage it is unclear whether this is a temporary or lasting rise in risk premia. If international interest rates continue to edge up, however, premia in general will be likely to increase as well. Higher risk premia do not necessarily cause complications for financial companies in the short run, but if the situation persists it will impair their international competitiveness. Rapid expansion by Icelandic financial companies in recent years, compounded by growing signs of overheating and imbalance in the Icelandic economy, appears to be among the main reasons for the rise in their risk evaluation in international markets, at least for the time being. To turn this situation around, they will presumably need to trim their sails, among other measures. An equally important consideration is to work towards a reduction in Iceland's macroeconomic imbalances as soon as possible. It is obvious that even the Icelandic financial companies whose activities are mainly based in other countries pay the price for imbalances in their home economy. Over-rapid expansion may also affect Iceland's credit ratings in general.

### An easier monetary stance will not consolidate financial stability

The main objective of monetary policy is to contribute to price stability. Another of the Central Bank of Iceland's main tasks is to promote financial stability, and as a rule these two objectives should not be in conflict. As has often been pointed out in *Monetary Bulletin*, price stability and economic stability contribute to financial stability in the long run. Generally speaking, therefore, there is nothing to be gained by sacrificing the main aim of monetary policy in order to ease the position of financial companies temporarily, e.g. by setting a lower interest rate than is compatible with the inflation target. In the long run, financial companies' interests are best served by a monetary policy that promotes price stability. *Monetary Bulletin* has frequently pointed out that this applies in particular in a country with an exceptionally high level of household and corporate debt which is largely indexed to the CPI or linked to foreign currencies. An untimely easing of the monetary stance would result in high inflation and exchange rate volatility which could impair the balance sheets and finances of these important debtors to the credit system – insofar as they are not hedged against such risks – and in the final analysis this would call for higher interest rates than otherwise. Part of the challenge presently faced by Icelandic financial companies is rooted in their expansionary strategies and the growing economic imbalances in Iceland. This situation will not be resolved with an excessively lax monetary stance, which would only exaggerate the imbalances and undermine financial stability.

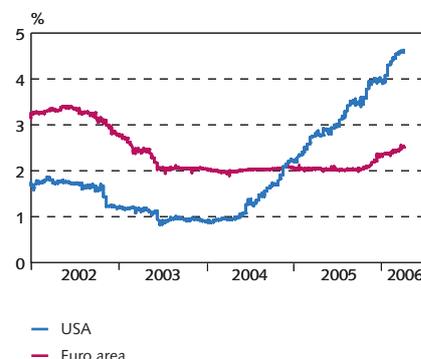
### Tight monetary stance necessary

Inflation has been significantly above target for a considerable time now. The longer this situation lasts, the greater the risk that long-term inflation expectations will become anchored above the target. The monetary stance will be correspondingly laxer for a given policy rate, and reining inflation back in more costly. In the medium term, real interest rates in Iceland will have to be sufficiently high to contain demand, and the interest-rate differential with abroad sufficiently wide for króna-denominated bonds to retain their appeal to international investors until the macroeconomic imbalances have eased. This will promote an adjustment of the króna to long-term equilibrium which is compatible with the inflation target, rather than overshooting with an accompanying wave of inflation, as happened in 2001. Clearly, in order to achieve this aim, the Central Bank's policy interest rate will need to be raised substantially from its present level, and remain high for a long time.

### Further aluminium and power sector investments could affect the adjustment

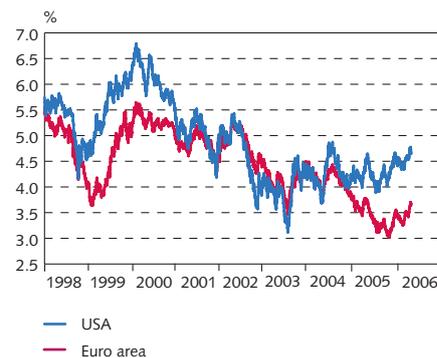
As described in Box IV-2, a number of plans for further investments in the aluminium and power sectors are under consideration. Because these plans are still highly uncertain there are not sufficient grounds for taking them into account in forecasts and assessments of the inflation outlook as yet. However, it is worth pondering what effect it would have on unfolding economic developments if new projects

Chart IX-10  
Yield on 3-month Treasury bills  
Daily data January 1, 2002 - March 17, 2006



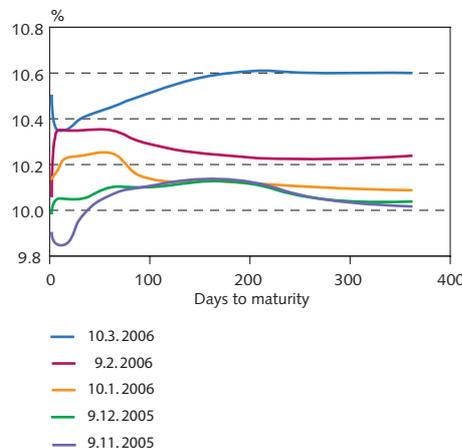
Source: Reuters EcoWin.

Chart IX-11  
Yields on 10-year Treasury bonds  
Daily data January 1, 1998 - March 17, 2006



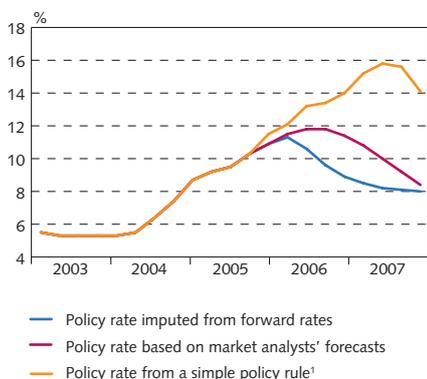
Source: Reuters EcoWin.

Chart IX-12  
Yield curve in the króna interbank market



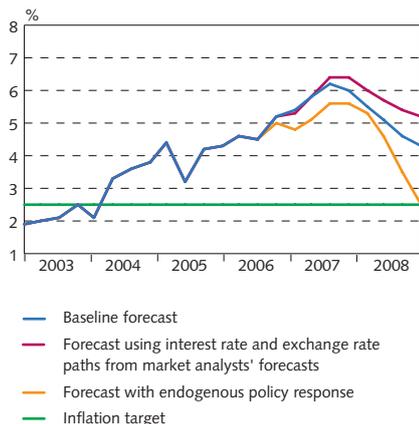
Source: Central Bank of Iceland.

Chart IX-13  
Alternative policy rate paths



1. Policy rate consistent with attaining the inflation target within the next 2-3 years.  
Source: Central Bank of Iceland.

Chart IX-14  
Alternative inflation paths



Source: Central Bank of Iceland.

were launched soon after the current ones are completed, for example at the beginning of 2008. The experience of the current projects cannot be simply extrapolated to future ones, because the economy has witnessed a number of large shocks over the period. The expansion of the financial sector, including fierce competition in the mortgage loan market, has clearly been a key factor in amplifying the impact of the aluminium and power sector investments that were launched in 2003. In future years, financial companies' lending capacity may be more restricted than at present. Also, the asset boom of recent years may come to an end shortly, dampening the impact of new investment projects. Growth in private consumption has largely been funded with credit and driven by the combination of lower interest rates and higher asset prices. Private consumption growth is likely to slow down over the next few years, even if further aluminium industry investments do materialise. While new investment projects could obviously exert a sizeable effect on expectations about inflation, interest rates and exchange rate developments, the pace of their implementation would be crucial. As things stand, they seem most likely to be spread over a long enough period to represent a lower proportion of GDP than the wave of investments that are currently under way. The impact that new industrial investment projects will have on Iceland's macroeconomic balance will need to be examined carefully before they are launched. However, the Central Bank will not take such plans into account in its forecasting, to say nothing of responding to them, until details of them are clarified.

### High cost of relaxing the inflation target

*Monetary Bulletin* has frequently cautioned against ideas for "letting through" a temporary increase in inflation while the current wave of industrial investment is taking place. These words of caution deserve to be reiterated yet again. Such a policy would immediately drive up inflation expectations, which would undermine the stance of monetary policy. Higher inflation in the present climate would soon be passed through to wage inflation and undermine even further the stability of the króna, which is already firmly on the defensive. On the contrary, there is an urgent need to reverse the developments that have eroded the monetary stance in recent years, and restore the credibility of the inflation target as soon as possible. This is particularly important in light of the Central Bank's macroeconomic forecast for the output gap to remain positive until 2010 if the policy rate is not changed. If no action is taken, this could indicate a persistent inflationary problem. The outlook is that the Central Bank will need to raise its policy rate by more than has been expected in order to attain its target. A simulation using the Central Bank's new Quarterly Macroeconomic Model indicates – although with a high degree of uncertainty – that interest rates may need to exceed 15% and remain there for a considerable time to ensure a reasonable likelihood that the inflation target will be attained within the next two years.

# New quarterly macroeconomic model

The macroeconomic forecast presented in this edition of *Monetary Bulletin* is prepared using a new macroeconomic model developed by the Central Bank of Iceland's Economics Department. It differs in many respects from the model used by the Central Bank in its evaluations of the economic outlook since 2002, but resembles those used by a number of other central banks. The following is a short comparison between the properties of the new and earlier models.

### The old annual model was unsuitable in various respects

Since the Central Bank of Iceland began publishing macroeconomic forecasts in 2002 it has used a macroeconomic model originally developed by the National Economic Institute in cooperation with the Central Bank and Ministry of Finance. Although the model served its purpose, it has a number of shortcomings. For example, it is not particularly suited for the type of analytical and forecasting tasks most needed by the Central Bank. As the model is an annual model, it proved inadequate for analysing short-term economic developments. This is a drawback for central banks that need to utilise recent data to the full in their estimates of the economic outlook, which are a cornerstone of their interest rate decisions. The annual model is also customised for analysing fiscal policy, with a detailed breakdown of different tax bases and their impacts. It focuses less on the role of monetary policy and its transmission mechanism through the economy, especially given the current framework of a floating exchange rate and inflation targeting. In such an environment, household and market expectations have a substantial effect on variables such as inflation, the exchange rate and asset prices. The annual model is very large and detailed, containing more than one thousand economic variables. Maintenance and updating of the underlying databases is therefore extremely costly. It is difficult to keep an overview of the mechanism of such an extensive model and interpret its different results. Interpretation is complicated even further by the radical changes that have taken place in the structure of the economy since the model was originally estimated.<sup>1</sup> It is some time since the model has been reviewed in its entirety and no in-depth analysis of its long-term properties has ever been made.

### New quarterly model

For the above reasons, the Central Bank launched preparations for the design of a quarterly macroeconomic model, called QMM, in 2001. Building a new database to support the model proved to be a time-consuming task, because quarterly national accounts for Iceland only went back to 1997 and many important variables were not available

1. As an annual model, it needs to be estimated over a relatively long sample period. Thus the equations are estimated over a period when, for example, interest rates were not market-determined, cross-border capital movements were restricted and the inflation rate was high and volatile.

at a quarterly frequency. Development of QMM is nearing completion and the forecast in this edition of *Monetary Bulletin* is solely based on it. In the Bank's last two forecasts, the QMM was tested alongside the older model. Design work is not finished, however – macroeconomic modelling is an ongoing task because models are continually being upgraded to incorporate new information and knowledge. In the near future it is planned to finalise the detailing of its long-term properties. Subsequently, the model will be made available and the handbook for it, which has been compiled simultaneously, will be published. The idea is to have the most recent version of the model, its underlying database and the handbook available on the Central Bank's website.

QMM is much simpler than the annual model it replaces. It is a single-sector model with around 150 variables. The quarterly frequency allows evaluation over more recent periods which are more likely to reflect the current economic structure better. In most instances, it is therefore evaluated using data that extend only to the first half of the 1990s.

Being smaller and less detailed, QMM does not provide as much information as its predecessor on the interaction of economic sectors or development of relative prices. However, this is more than outweighed by easier interpretation of the interaction of main economic variables. From a central banking viewpoint, there are two essential features: describing the main determinants of aggregate demand and its interaction with the production capacity of the economy, and presenting a realistic description of monetary policy transmission and its impact on aggregate demand, and thereby on inflation. In central banks' core forecasting and analytical work, the advantages of a relatively small model easily outweigh its disadvantages. Indeed, there has been a widespread trend towards smaller and more manageable macroeconomic models among central banks around the world.<sup>2</sup>

### Properties of the new model

The structure of QMM is standard. In the long run, economic activity is determined on the supply side, which is described by a Cobb-Douglas production function with constant returns to scale. The production function determines the long-term share of labour and capital in output, which in turn imposes long-run restrictions on the behaviour of investment and labour demand.

The demand side of the economy represents the allocation of production at any given time. Thus private consumption is determined by disposable income, wealth and interest rates; business investment by overall demand and the real cost of capital; residential housing investment by overall demand and the ratio of house prices to construction cost; exports of goods and services by global demand and the real exchange rate; and imports of goods and services by domestic demand and the real exchange rate.

2. In addition, the Central Bank has a number of small models which are suitable for addressing specific questions which QMM is not suitable to answer.

The price level is determined by a Phillips curve for the CPI. In other words, inflation is determined by inflation expectations, historical inflation, the output gap and temporary real exchange-rate shocks.<sup>3</sup> Wage growth is determined by the deviation of unemployment from the natural rate of unemployment and the long-run restriction imposed by the production function and profit maximisation on the labour share. Other prices are broadly determined as a mark-up on the relevant factor costs.

In the long run, there is complete dichotomy of the nominal and real sectors of QMM, i.e. the Phillips curve is vertical and nominal neutrality ensured. Real and nominal inertia, however, ensures that monetary policy can affect the real economy over the short- to medium-term horizon, in line with standard modern economic theory. In the long term, however, monetary policy affects only nominal variables, while the real side of the economy is determined by the production capacity of the economy along its balanced growth path.

### **What difference does QMM make?**

It is hoped that the new model will enhance the Central Bank's macroeconomic and inflation forecasting. These forecasts, however, are not only regarded as simple projections of future economic developments on the basis of specific assumptions. They serve equally – or possibly more – as tools for analysing underlying developments and interpreting their causes. The new model should enhance the Central Bank's analysis of economic developments and the reliability of its assessments of the macroeconomic effects that different economic policies and shocks have. Its relative simplicity and transparency should also facilitate the Bank in presenting its economic analysis and the assumptions on which its decisions are based to the public and market agents. In this way, it could contribute to a more credible and effective monetary policy.

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3. See also Box VIII-1 on p. 48 of this edition of *Monetary Bulletin*.

