Box II-1

Reasons for the post-crisis deterioration in terms of trade

Since onset of the global financial crisis in 2007, Iceland's terms of trade have deteriorated by about 15%. As of last year, they were some 7% below the post-World War II average. If the Central Bank's current baseline forecast materialises, they will continue to deteriorate, to roughly 11% below the long-term average by 2016. By that time, they will have worsened for eight consecutive years, falling by a total of 18½%, something not seen since 1964.

These unfavourable developments in terms of trade have had broad-based impact on domestic economic developments in recent years. For example, Icelandic exports have lost some of their share in global export values as a result. This is particularly the case for goods exports, where Iceland's trade share has declined steadily since 2007, even though Icelandic export industries have withstood the post-crisis contraction in world trade volumes better than most other countries' exports have. As Chart 2 indicates, Iceland's goods exports grew markedly as a share of global export volume in 2007-2009, although they have tapered off again in the past three years.

As has been discussed in previous issues of *Monetary Bulletin*, poorer terms of trade have been the most important cause of the gradual narrowing of Iceland's trade surplus. As a result, they have exerted pressure on the exchange rate and complicated the resolution of the current balance of payments problem. Poorer terms of trade have also contributed to reduced national income and a slowdown in the recovery of domestic demand. If the erosion proves to be permanent, the domestic income level will also fall permanently relative to trading partners.

But what are the main reasons for these unfavourable developments, and is the erosion of terms of trade unusually pronounced in view of recent developments in global output growth and the price of Iceland's main export products? What explains the outlook for a continuing deterioration in terms of trade throughout the forecast horizon?

Terms of trade and global economic developments

Because it is a small, open economy, Iceland is largely a price-taker in international trade; that is to say, its import and export prices are mainly determined by international economic conditions rather than by domestic factors.[1] The same is true of terms of trade (defined as the ratio of export prices to import prices). As Chart 3 shows, terms of trade have a tendency to evolve in line with global economic developments, particularly those in Iceland's trading partner countries, and they generally deteriorate during global economic downturns.[2] Chart 4 shows clearly the importance of terms of trade for domestic economic developments. It also suggests the importance of terms of trade shocks for the transmission of international business cycle shocks into the domestic economy.[3]

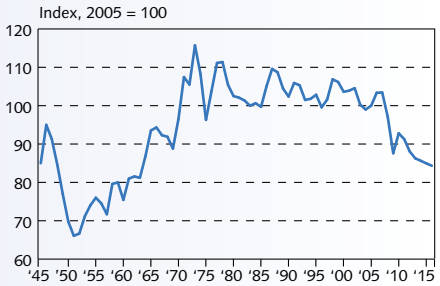
Comparison of developments in terms of trade following three global contractions

Since the onset of the global economic crisis in 2007, Iceland's terms of trade have deteriorated by about 15%, the largest decline since

1. For certain product types, it can be argued that Icelanders have some price-setting power, but in the main, Iceland is a price-taker in international trade.
2. As is commonly done, global economic contractions are defined as periods when global output growth falls below 3%.
3. The importance of terms of trade shocks for the domestic business cycle is analysed in M. Gudmundsson, A. Sighvatsson and T. G. Pétursson (2000). "Optimal exchange rate policy: The case of Iceland". In *Macroeconomic Policy: Small Open Economies in an era of Global Integration*, (eds.) G. Zoega, M. Gudmundsson and T. T. Herbertsson. Reykjavík: Háskólaútgáfan.

Chart 1

Terms of trade for goods and services[1]



1. Central Bank baseline forecast 2013-2016.
Sources: Statistics Iceland, Central Bank of Iceland.

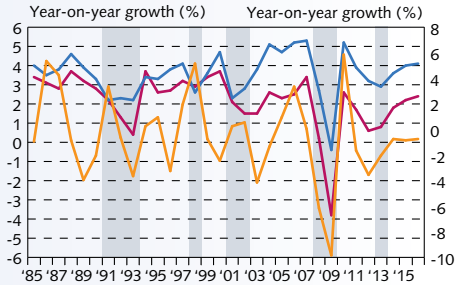
Chart 2

Terms of trade and Iceland's share in world trade

Sources: OECD, Statistics Iceland, United Nations database.

Chart 3

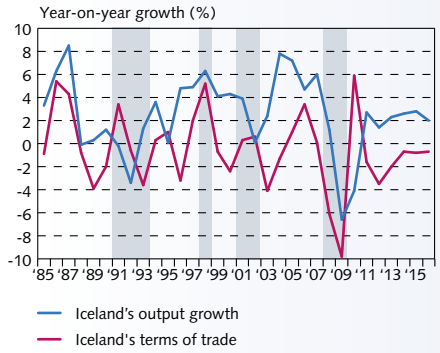
Global output growth and Iceland's terms of trade[1]



1. Periods during which global output growth falls below 3% are shaded. Global output growth in 2013-16 is IMF forecast from *World Economic Outlook,* October 2013. The terms of trade forecast is from the Central Bank of Iceland.
Sources: IMF, Macrobond, Central Bank of Iceland.

Chart 4

Iceland's output growth and terms of trade[1]

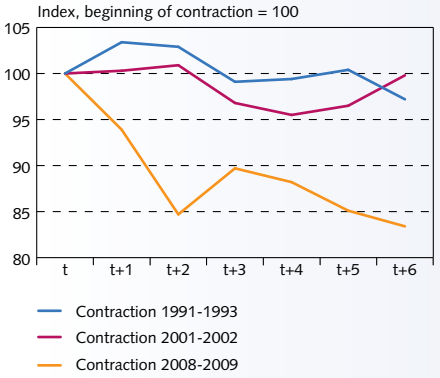


1. Periods during which global output growth falls below 3% are shaded. Global output growth in 2013-16 is IMF forecast from *World Economic Outlook*, October 2013. The terms of trade forecast is from the Central Bank of Iceland.

Sources: IMF, Macrobond, Central Bank of Iceland.

Chart 5

Developments in terms of trade following three global contractions[1]

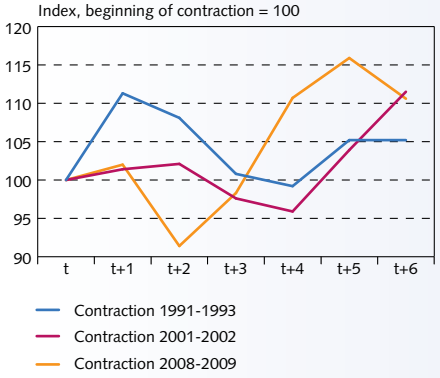


1. For the 1991-93 contraction, year t is 1990, for the 2001-2 contraction it is 2000, and for the 2008-9 contraction it is 2007.

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

Chart 6

Developments in foreign currency prices for marine products following three global contractions[1]



1. For the 1991-93 contraction, year t is 1990, for the 2001-2 contraction it is 2000, and for the 2008-9 contraction it is 2007.

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

the late 1940s. As Chart 3 shows, this reflects in part the severity of the recent global contraction. This can also be seen in Chart 5, which compares developments in terms of trade for a period of six years following three global contractions.[4] As the chart shows, terms of trade improved immediately after the recession in 1991, but the effects had all but disappeared three years later. The effects of the 2001-2002 contraction were somewhat more pronounced early on but had disappeared six years later. They were nowhere near as strong as in 2008-2009, when terms of trade had deteriorated by about 15% two years after the onset of the crisis. After a brief turnaround a year later, they began to worsen again, and now, six years after the crisis struck, they are over 16% poorer.

As Charts 6 and 7 show, the price of marine products and aluminium products fell in the wake of the 2007 crisis. For the first two years after crisis struck, marine product prices developed much more unfavourably than in the wake of the two previous contractionary periods. They began to rise again a year later, and five years after the contraction started they were somewhat higher than at the onset. If the Bank's forecast materialises, however, they will fall somewhat this year. Aluminium prices fell much more sharply after the 2007 crisis than after the contraction at the beginning of the century. Early on, they developed in a manner similar to that following the contraction in the early 1990s, although the two patterns diverged somewhat as time passed. In comparing the most recent crisis and previous contractionary periods as regards the effects of fluctuations in aluminium prices on Iceland's terms of trade, it is appropriate to bear in mind that aluminium has become a much more important export product for Iceland in recent decades. For instance, exports of aluminium and ferrosilicon products accounted for an average of 8% of goods and services exports in 1991-1993, just under 15% in 2001-2002, and almost 27% by 2008-2009 (see Chart 8).

The main reasons for recent developments in terms of trade

A simple regression analysis can be used to assess the most important determinants of developments in terms of trade. This can provide a better understanding of the main reasons for the unfavourable developments in terms of trade in recent years and the continued erosion projected in the Bank's forecast. It can be assumed that the global price of Iceland's most important export products – marine products and aluminium – will weigh heavily, as will the above-described effects of the global business cycle. The estimated equation in the appendix to this Box explains about 80% of the fluctuations in terms of trade between 1985 and 2012.

As Chart 9 indicates, trading partner output growth and falling marine product prices are the main causes of the deterioration in terms of trade in 2008-2009, although declining aluminium prices are a factor as well. The turnaround in 2010-2012 is due primarily to rising marine product prices, although it is offset by rising export prices and weak output growth among Iceland's main trading partners. The baseline forecast assumes that terms of trade will continue to deteriorate from this year through 2016. As Chart 9 indicates, this is due largely to the drop in marine product prices this year and the prospect of a continued decline throughout the forecast horizon. Although the baseline forecast assumes that GDP growth will gain pace in trading partner countries, for most of the forecast horizon it will not be strong enough to turn this trend around. As the chart

4. The global contraction in 1998 is omitted from this comparison because of its short duration and limited impact in Iceland. The Central Bank's baseline forecast is used for 2013, the sixth year following the most recent crisis.

shows, factors not explained by the estimated equation have an offsetting effect. The deterioration in the next few years will therefore be somewhat greater according to the equation than according to the baseline forecast, which could indicate that the forecast is too optimistic, at least in view of the projected decline in marine product prices.

On the whole, it appears therefore that the deterioration between 2008 and 2016 is due primarily to weak output growth among Iceland's main trading partners and a sharp decline in marine product prices relative to trading partners' export prices. Furthermore, fluctuations in marine product prices seem to be the major cause of the recent volatility in terms of trade and the forecasted developments for the next few years. The effects of adverse developments in aluminium prices, however, are considerably less pronounced, according to the empirical relationship between these variables. It should be noted, however, that aluminium product exports increase in importance somewhat at the expense of marine products during the period analysed. As a result, the empirically estimated relationship may underestimate to a degree the effects of fluctuations in aluminium prices on terms of trade in recent years. Furthermore, the effect of global output growth could be underestimated, as it will also affect terms of trade indirectly through its impact on the price of aluminium and marine products.

Appendix

Fluctuations in terms of trade between 1985 and 2012 can be explained by trading partner output growth and the price of two of Iceland's most important export products relative to global export prices (figures in parentheses are *t*-values; R^2 represents the portion of the variability of terms of trade that the equation explains, and *SE* is the standard deviation of the residual of the equation):[5]

$$\Delta\overline{tot} = \underset{(2.3)}{0.044}(\Delta\overline{pxa} - \Delta\overline{wpx}) + \underset{(6.1)}{0.366}(\Delta\overline{pxm} - \Delta\overline{wpx}) + \underset{(2.9)}{0.767}\Delta\overline{wy}$$

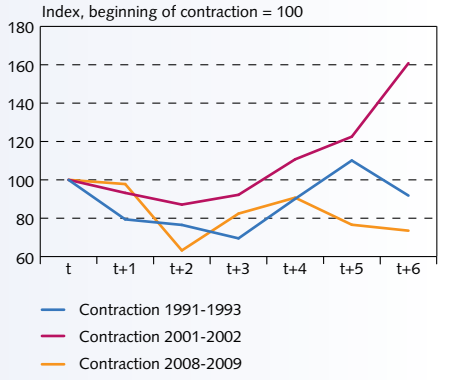
$R^2 = 0{,}78$, $SE = 1.8\%$, sample period: 1985-2012

where $\Delta\overline{tot}$ is the deviation of annual changes in terms of trade from the 1985-2012 average, $\Delta\overline{pxa}$ is the deviation of annual changes in the foreign currency price of aluminium from the 1985-2012 average, $\Delta\overline{pxm}$ is the deviation of annual changes in foreign currency marine product prices from the 1985-2012 average. $\Delta\overline{wpx}$ is the deviation of annual changes in Iceland's trading partners' foreign currency export prices from the 1985-2012 average, and $\Delta\overline{wy}$ is the deviation of output growth in Iceland's main trading partners from the 1985-2012 average.

5. The equation was originally estimated without any parameter restrictions on trading partner export prices, but the possibility that the price effects were proportional was not rejected statistically (that is, that the sum of the parameters on the three price variables was zero). An attempt was also made to include the effects of global commodity and oil prices, but the effects of these two variables proved statistically insignificant from zero.

Chart 7

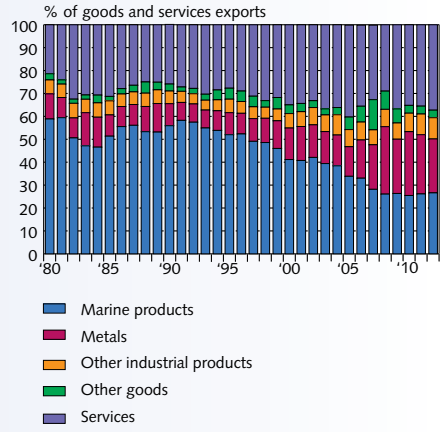
Developments in foreign currency prices for aluminium following three global contractions[1]



1. For the 1991-93 contraction, year t is 1990, for the 2001-2 contraction it is 2000, and for the 2008-9 contraction it is 2007.
Sources: IMF, Statistics Iceland, Central Bank of Iceland.

Chart 8

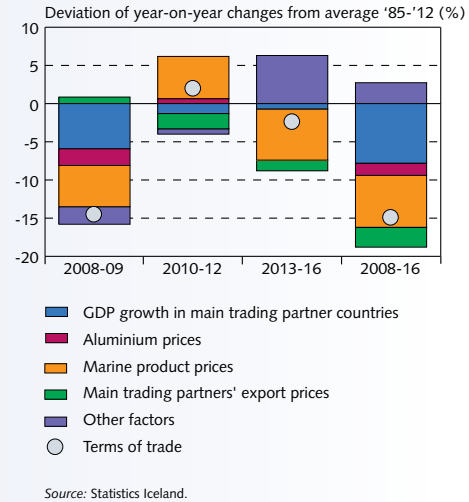
Composition of Iceland's exports 1980-2012



Source: Statistics Iceland.

Chart 9

Contribution of factors determining developments in terms of trade 2008-2016



Source: Statistics Iceland.