Box IV-1

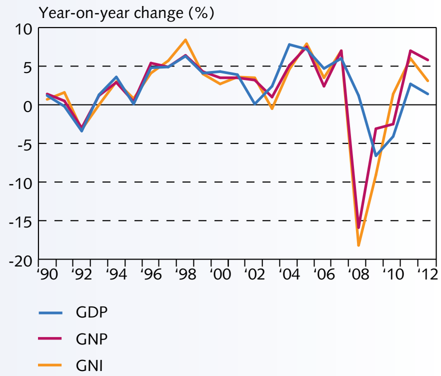
Various measures of economic activity and performance

Output growth is usually measured in terms of gross domestic product (GDP), which takes account of the market value of the goods and services produced in the economy, irrespective of whether the producer is domestic or foreign. It can also be measured in terms of the market value of the nation's output, regardless of whether the production takes place domestically or abroad. This is referred to as the gross national product (GNP). The difference between the two lies in the fact that a portion of the proceeds from domestic economic activity reverts to non-residents working in Iceland, in the form of investment income and wage income. This income is therefore included in GDP but not in GNP. By the same token, Icelanders have investment and wage income from activities abroad that are included in GNP but not GDP. The difference between GDP and GNP therefore lies in net investment and wage income from abroad – namely, the balance on income. Because Icelanders' foreign debt exceeds their foreign assets, GNP is usually lower than GDP, largely due to the interest Icelanders pay on foreign loans. The third measure of economic activity is gross national income (GNI), which measures how much the economy receives for its production. At the price level of each year, GNI is equal to GNP, but at constant prices, GNI is adjusted for the effects of terms of trade on real export revenues: if terms of trade improve, export prices rise more than import prices and GNI at constant prices rises more than GNP. The opposite is true if terms of trade deteriorate.

As Chart 1 shows, these three measures followed broadly the same path for quite a while: in terms of changes in GDP, output growth averaged 3.3% during the period 1990-2007, whereas in terms of GNP and GNI it averaged 3.2%.

Chart 1

Gross domestic product, gross national product, and gross national income 1990-2012[1]



1. Gross national product is gross domestic product adjusted for factor income. Gross national income adjusts gross national product for the effects of changes in terms of trade. Based on official balance of payments data.

Sources: Statistics Iceland, Central Bank of Iceland.

Problems in interpreting GNP and GNI in the wake of the financial crisis

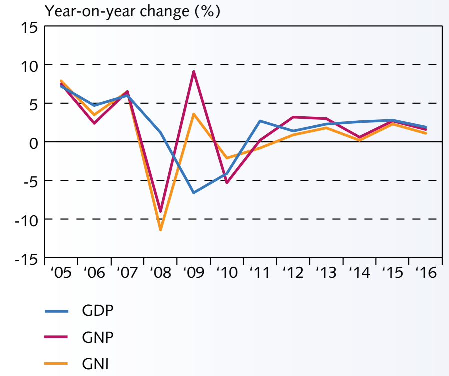
As Chart 1 indicates, these three measures of economic activity began to diverge widely when the financial and economic crisis struck in 2008. GNP appears to have contracted by almost 16% in 2008 and GNI by over 18%, whereas output growth in terms of GDP measured 1.2%. GDP then contracted by 6.6% the following year, and by another 4% in 2010. The contraction in GNP appears to have been smaller over these two years, however, and GNI began to rise again as early as 2010.

The problem with these figures lies in the fact that they are based on official income account calculations. As has been discussed frequently in *Monetary Bulletin* and other Central Bank publications,[1] the official calculations give an extremely distorted view of actual developments in the balance on income, as they include calculated accrued interest income and expense on the failed banks' foreign assets and liabilities. Because the failed banks' foreign liabilities greatly exceed their assets, these amounts are substantial, but they do not reflect actual disbursements from the estates, as they will probably never be paid. In its estimates of actual developments in Iceland's balance on income, current account balance, and foreign liabilities, the Bank has attempted to adjust for the effects of these items.[2] The same should be done for estimates of GNP and GNI from 2008 onwards in order to obtain a more accurate view of developments in these variables since the collapse of the banking system.

1. For a more detailed discussion and explanation of the methodology, see Section VII of this report and previous issues of *Monetary Bulletin* and the Central Bank report "Iceland's underlying external position and balance of payments", *Special Publication* no. 9.
2. Also adjusted for the effects of the settlement of their estates and for the effects of the pharmaceuticals company Actavis.

Chart 2

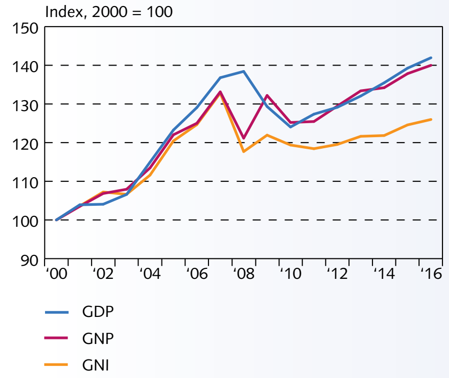
Gross domestic product, gross national product, and gross national income 2005-2016[1]



1. Gross national product is gross domestic product adjusted for factor income. Gross national income adjusts gross national product for the effects of changes in terms of trade. Based on estimated underlying factor income. Central Bank baseline forecast 2013-2016.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart 3

Gross domestic product, gross national product, and gross national income 2000-2016[1]



1. Gross national product is gross domestic product adjusted for factor income. Gross national income adjusts gross national product for the effects of changes in terms of trade. Based on estimated underlying factor income. Central Bank baseline forecast 2013-2016.
Sources: Statistics Iceland, Central Bank of Iceland.

Estimating GNP and GNI after adjusting for the effects of the failed banks on the balance on income

Chart 2 illustrates developments in these three variables from 2005 onwards, using the Central Bank's estimate of the underlying balance on income to calculate GNP and GNI. The contraction in GNP and GNI in 2008 is much smaller in terms of the underlying balance on income (i.e., if adjustments are made for the effects of the failed banks) than in terms of the official balance on income. Moreover, a slight improvement in both measures can be seen in 2009 instead of a contraction. Estimates of economic developments in 2008-2009 therefore differ greatly, depending on whether developments are viewed in terms of GDP or in terms of GNP and GNI, or whether the estimates are based on the official balance on income or the estimated underlying balance on income.

The interpretation of the estimate of underlying GNP and GNI in 2008-2009 is complicated, however by the fact that the failed banks' liabilities are included in the assessment of the underlying balance on income for the first three quarters of 2008 but are then omitted in the fourth quarter, when the banks became insolvent. As a result, the underlying income account deficit grew markedly in 2008, as did the official income account deficit,[3] but then narrowed sharply in 2009, when the factor income and expense related to the failed banks were excluded. This explains why GNP and GNI fluctuate widely between 2008 and 2009 when the underlying balance on income is used for the calculations.

In interpreting the divergent developments in the three measures of economic activity from 2008 onwards, it is therefore preferable to focus on the period as a whole rather than examining growth from year to year, particularly in the early part of the period. Such a comparison is shown in Chart 3. The chart shows that the contraction in GDP from its pre-crisis peak to its post-crisis trough measured about 10½%, while the contraction in underlying GNP was about 9% and the contraction in underlying GNI was 11½%.[4] The economic contraction in the wake of the financial crisis is therefore highly similar in terms of these three variables, although GDP contracted somewhat more than GNP. Because terms of trade deteriorated during this period, GNI contracted more than GDP.

By the same token, since the economic recovery began in 2010, it has followed a similar path in terms of either GDP or GNP. Based on the Central Bank's forecast for 2013, GDP and GNP have grown by about 6½% since 2010. The increase in GNI has been much smaller, however, at only 1.9%, owing to the above-mentioned deterioration in terms of trade. If the baseline forecast materialises, GDP and GNP will continue to develop along similar lines throughout the forecast horizon, whereas GNI growth will remain weak. Output will therefore grow somewhat faster than the economy's proceeds from its output, as the outlook for terms of trade is unfavourable.[5]

3. This abrupt widening of the income account deficit reflects, among other things, the steep depreciation of the króna in 2008.
4. Based on the official balance on income, the contraction in GNP measured 21½% and the contraction in GNI nearly 26%.
5. Further discussion of developments and prospects for terms of trade can be found in Box II-1 in this *Monetary Bulletin*.