

The financial crisis that struck Iceland in autumn 2008 had a profound impact on the country's economy. Economic activity contracted severely, a large number of jobs were lost, and unemployment rose to its highest in a long time. In spring 2010, the economy finally started to gain traction, and the recovery began. It was weak and uneven at first, but gradually it began to pick up steam, not least due to a significant improvement in terms of trade and a massive boom in tourism.

Now, ten years after the crisis struck, it is appropriate to attempt to assess how much output was lost in its wake. A comparison with the estimated trend growth rate suggests that the accumulated loss amounted to about one-third of GDP, or about 2.5 m.kr. per person.

The post-crisis contraction has reversed — and then some

According to figures from Statistics Iceland, GDP contracted by 6.8% in 2009 and another 3.4% in 2010, or a total of 10%.¹ On a per capita basis, the contraction was similar in size, as Chart 1 indicates. The contraction was deep, and the recovery was protracted: it was not until six years later, in 2015, that GDP returned to its pre-crisis level. The strong growth of the past three years has resulted in an output level this year of more than a fifth above the pre-crisis peak.

However, this strong output growth reflects a surge in population growth; therefore, the growth rate of GDP per capita has been lower, particularly in the past two years. GDP per capita did not return to its previous high until 2016. In 2018 it is expected to be more than 7% above its 2007 peak.

The contraction was larger in Iceland than in other advanced economies, but the recovery was stronger as well

The contraction in Iceland was considerably larger than that in major advanced countries, and above the OECD average (see Chart 2). In the US, the contraction measured almost 3%, and in Iceland's main trading partners it was about 3½%, which was also the OECD average. In the eurozone it was somewhat larger, or 4½%, as it was affected greatly by the situation in Ireland and Greece and on the Iberian peninsula. The reasons why Iceland's contraction was steeper than that in other advanced economies are numerous, and to a large extent they reflect the severe financial and macroeconomic imbalances that had built up during the prelude to the crisis. These imbalances were manifested, for instance, in a large current account deficit and rapidly growing debt, including in foreign currencies. As a result, Iceland's crisis was twofold, unlike the situation in other countries. In addition to a systemic banking crisis, Iceland suffered a severe currency crisis, and research shows that when a twin crisis of this sort develops, the economic contraction is generally much deeper and more protracted.²

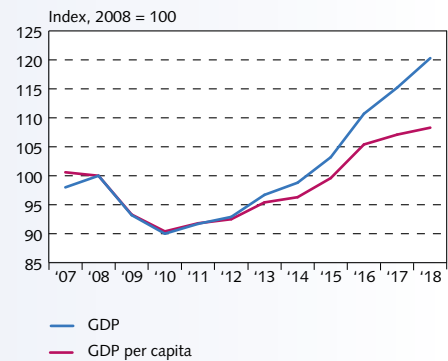
Chart 2, on the other hand, shows how rapid Iceland's recovery has been in international comparison. This is particularly true of the past five years: GDP growth averaged 4.4% in Iceland, as opposed to 2% among its trading partners and only 1½% in the eurozone.

1. The contraction is larger in terms of quarterly figures, which indicate that GDP contracted by 13% from Q4/2007 until Q1/2010, whereupon it began to grow again.
2. See, for example, Bordo et al. (2001) and Hutchinson and Noy (2005). A more detailed discussion of the financial crisis in Iceland and the underlying reasons for it, including an international comparison, can be found, for example, in Ólafsson and Pétursson (2011), Einarsson et al. (2015), and Benediktsson et al. (2017). In addition, Box IV-2 in *Monetary Bulletin* 2010/4 contains a comparison of Iceland's contraction and the experience of other severe financial crises, including the Nordic banking crisis and the Asian crisis.

Box 2

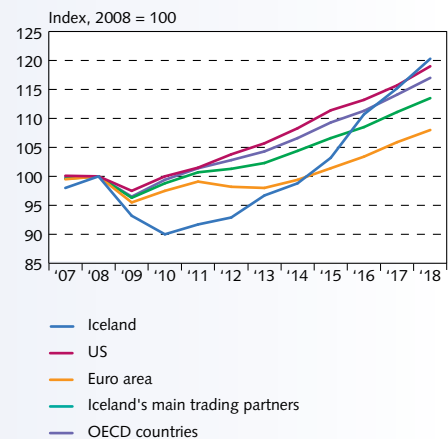
The Icelandic economy a decade after the financial crisis

Chart 1
Iceland's post-crisis economic contraction and recovery¹



1. Central Bank of Iceland forecast 2018.
Sources: Statistics Iceland, Central Bank of Iceland.

Chart 2
Post-crisis economic contraction and recovery in international comparison¹



1. Central Bank 2018 baseline forecast for all countries except the OECD, which is based on the OECD forecast.
Sources: OECD, Statistics Iceland, Thomson Reuters, Central Bank of Iceland.

Post-crisis output loss substantial and protracted

Post-crisis developments in GDP and the fact that GDP has returned to its pre-crisis peak do not tell the whole story about the severity of the crisis, however. To gain a clearer view of Iceland's post-crisis output loss, it is necessary to estimate how GDP would have developed had the crisis never occurred. Such a counterfactual assessment is always subject to major uncertainty; however, a conventional way to estimate the loss is to compare actual developments with the estimated trend path and then project the lost output as the accumulated deviation of output from the trend path during the post-crisis period.

Two issues arise, however, that could have a significant impact on the ultimate assessment of the output loss. First of all, it is necessary to select which trend path to use in the counterfactual scenario: the steeper the trend path, the greater the output loss. It is desirable that the trend path reflect as realistically as possible the growth path the economy would have taken, on average, had the crisis not occurred. A frequently used method is to use average GDP growth during the pre-crisis period, although it is best to avoid allowing that assessment to be affected too strongly by developments during the immediate prelude to the crisis if this period is characterised by growing underlying imbalances. This is particularly applicable to Iceland, where severe imbalances had developed during the run-up to the crisis and GDP growth had long been well above its realistic long-term potential. This can be seen, for instance, the International Monetary Fund's (IMF, 2018) recent analysis of the post-crisis output loss, which uses average GDP growth over the period 2000-2008 to estimate the trend growth rate. In Iceland, average output growth during this period was 3.6%, which can hardly be considered a sustainable long-term growth rate. A similar problem arises in Laeven and Valencia's (2013) international comparison of post-crisis output loss with respect to the calculations for Iceland.

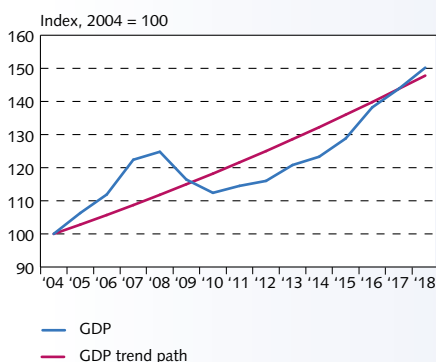
The other issue involves selecting at which time to start the trend path. The choice implicitly assumes that the GDP growth rate before that time is permanent and therefore does not reflect the accumulation of pre-crisis imbalances. The estimated output loss usually grows larger as the point of origin moves closer to the onset of the crisis, and the risk of overestimating the loss is correspondingly greater because pre-crisis imbalances are more pronounced.

Laeven and Valencia (2013) choose to start the trend path at four years before the onset of the crisis — in 2004, in the case of Iceland — which is what is done here. This accords well with the fact that economic and financial imbalances began to accumulate rapidly in the wake of structural changes in the Icelandic financial system in late 2004 and the credit growth surge that followed. In addition, the Central Bank's assessment indicates that output in Iceland was very close to potential in 2004 and resources were therefore close to fully utilised.

In order to avoid allowing the estimated trend growth rate to be affected too strongly by the surge in output during the run-up to the crisis, average GDP growth over a fairly long period excluding the pre-crisis years with the largest imbalances is used. The period selected is a twenty-year period ending with the point of origin of the trend path: i.e., 1984-2003. Over this period, GDP growth averaged 2.8%, which is very close to the Bank's estimated long-term GDP growth potential of 2.7%.

Chart 3 gives a comparison of developments in GDP and its trend path. As the chart shows, the aforementioned assumptions imply that some of the GDP growth during the pre-crisis years is viewed as unsustainable. GDP fell below its trend path in 2009 and

Chart 3
GDP in comparison with trend path¹



1. Central Bank of Iceland baseline forecast 2018.
Sources: Statistics Iceland, Central Bank of Iceland.

remained below it until 2017. The accumulated output loss (the area below the trend path) over this ten-year period from 2009 through 2018 is about 35%, which is close to the 32% loss that Laeven and Valencia estimated as the average among advanced economies following financial crises since 1970, but larger than the 25% average loss following the last crisis.³ The macroeconomic impact of the crisis was therefore profound: it is estimated that the accumulated loss of output amounted to over a third of GDP, which corresponds to a permanent loss of income amounting to 2.5 m.kr. per inhabitant.

This is similar to the 42% loss estimated by Laeven and Valencia (2013), but well below the estimate of 86% obtained by Benediktsdóttir *et al.* (2017).⁴ These different results reflect differing assumptions concerning underlying trend growth and the start of the trend path. Laeven and Valencia's (2013) higher estimate reflects their use of a higher trend growth rate than is used here; on the other hand, they estimate the loss only for the first three years after the onset of the crisis. The higher estimate obtained by Benediktsdóttir *et al.* (2017) stems from their having set the beginning of the trend path at 2007, which implies that the trend path starts at a considerably higher level than is used here. On the other hand, they assume a slower trend growth rate. The assumptions behind these two studies probably reflect the fact that their analysis focuses on international comparison, where it is important that each country be treated identically. The estimate published here, however, focuses only on Iceland, which makes it easier to choose assumptions that best fit with domestic economic developments. The differences in findings show clearly how dependent estimates of post-crisis output losses are on the two main assumptions discussed above. However, all of them show how severe and persistent the impact of the crisis was.

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3. The estimated output loss in Iceland falls to 23%, however, if the deviation for 2008 is also included, as Laeven and Valencia (2013) do. In 2008, GDP was a full 11% above its trend path (the difference in Laeven and Valencia is considerably smaller, however). Because the crisis struck late in 2008, it is considered more appropriate to base the calculation of the output loss on the period from 2009 onwards.

4. Borio *et al.* (2001) estimated the output loss with the accumulated difference between GDP growth and the trend growth rate (measured in terms of average output growth for the five years before the crisis) from the time the crisis struck until GDP growth returned to its trend rate. Using this method gives an output loss of 44%.