The output gap or slack shows the difference between a country's output at any given time and the output that it could achieve with normal utilisation of production factors, referred to as potential output. Normal factor utilisation refers to the level of labour and capital utilisation that is considered consistent with wage and price stability. If output exceeds this level, pressure for more wage and price hikes will develop, and vice versa if output is below potential. An output gap or slack is therefore an important indicator of underlying inflationary pressures in the economy. Estimating capacity utilisation and developments in the potential output of the domestic economy therefore plays an important role in the Central Bank's task of maintaining low and stable inflation.

Estimating factor utilisation and the output gap

Growth in potential output is determined by underlying growth in labour supply (which reflects growth in the working-age population and its willingness to work) and growth and depreciation of the capital stock, but also by how underlying production factors are utilised; i.e., productivity growth and technological advances. Potential output is not directly observed; therefore, estimating it requires relying on a number of indicators and economic models.

Until recently, the Central Bank has estimated potential output using various versions of total-economy production functions. The production function describes how production factors are utilised in converting inputs to output, which is measured in terms of GDP (see, for example, Box IV-1 in *Monetary Bulletin* 2011/4). Also used is the estimate of the so-called natural rate of unemployment — the unemployment level consistent with wage and price stability — so as to assess whether there is a slack or a gap in the labour market (see, for instance, Box VI-1 in *Monetary Bulletin* 2013/4).

The Central Bank has also taken account of various questionnaire-based surveys in estimating factor utilisation and the business cycle position. The surveys, which cover firms' views on factor utilisation and demand for their goods and services, can provide important additional information on the business cycle position and the estimation of the output gap. For example, firms could decide to postpone layoffs during a downturn, retaining more labour than is needed for production and keeping unemployment lower than it would be otherwise. Signs of a downturn could therefore show earlier in information on labour shortages within companies or executives' responses concerning their ability to respond to increased demand. As a result, questionnaires may contain better information on the state of the real economy than can be seen in conventional labour market measures.

The RU indicator

In order to improve the estimation of the business cycle still further, it is possible to combine information from surveys and from the labour market to form a single metric that can be called the resource utilisation indicator (RU indicator).[1] In estimating the RU indicator, the Gallup survey carried out among executives from Iceland's 400 largest firms is used,[2] together with data on the number of jobs
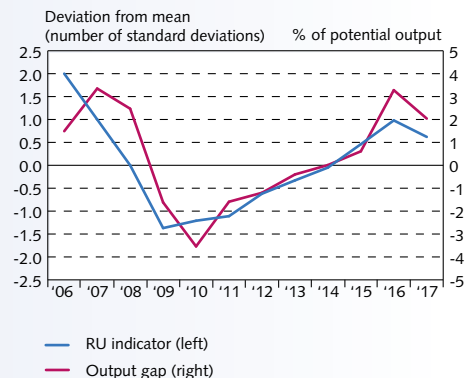
1. Based on the precedent set by Sveriges Riksbank, which has for some time used similar indicator, among others, to estimate the business cycle position of the Swedish economy. See, for instance, C. Nyman (2010), "An indicator of resource utilisation", Sveriges Riksbank *Economic Commentaries*, no. 4.

2. The responses to four questions from the survey are used: whether the firm is short-staffed, how easily it could respond to unexpected demand, how its profit margins have developed in the past six months, and how it expects them to develop in the coming six months.

Box 3

New measure of capacity utilisation

Chart 1

Resource utilisation indicator and ouput gap 2006-2017[1]

Deviation from mean
(number of standard deviations)   % of potential output


— RU indicator (left)
— Output gap (right)

1. Resource utilisation indicator (RU indicator) is the principal component of selected indicators of resource utilisation normalized so its average is 0 and standard deviation is 1. Annual averages.
Source: Central Bank of Iceland.

Chart 2

Revisions of resource utilisation indicator 2006-2017[1]

MB 2006/1 - MB 2018/2

Deviation from mean (number of standard deviations)
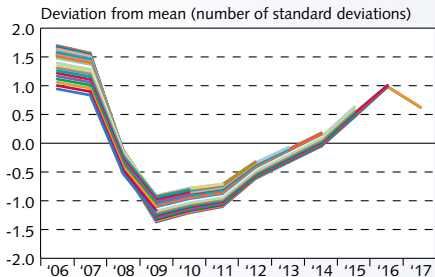
1. The resource utilisation indicator (RU indicator) is the first principal component of selected indicators of factor utilisation; it is scaled so that its mean value is 0 and the standard deviation is 1. Annual averages.
Source: Central Bank of Iceland.

Chart 3

Revisions of the output gap 2006-2017[1]

MB 2006/1 - MB 2018/2

% of potential output
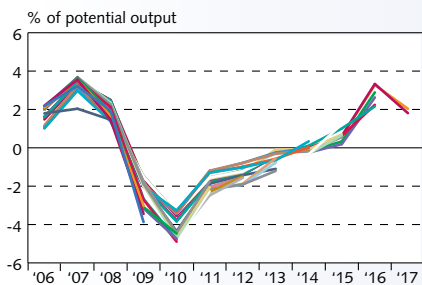
1. Annual averages.
Source: Central Bank of Iceland.

available according to employment advertisements, data on migration, and figures from the Statistics Iceland labour force survey (LFS) on unemployment, average hours worked, the employment rate, and the underemployment rate (see, for example, Box 3 in *Monetary Bulletin* 2015/2).

Principal component analysis weights the above information into a single measure. The RU indicator is the first principal component in the analysis; i.e., the component that explains the largest share of variability in the underlying data.[3] Further discussion on developments in the RU indicator can be found in Chapter V, but Chart 1 compares the indicator with the most recent estimate of the output gap. As can be seen, these two measures track one another closely, and the result is that the economy's position is very similar, although the RU indicator suggests that the turning points in the cycle during the financial crisis and the cyclical recovery soon afterwards started earlier than the estimate of the output gap indicates. The RU indicator also implies that the output gap was potentially somewhat wider during the run-up to the crisis than the official estimate of the output gap indicates.

One advantage of the RU indicator is that it tends to change less upon the arrival of new data than the Central Bank's output gap estimate, which can change when Statistics Iceland's national accounts figures are revised. Chart 2 shows the RU indicator calculated with the data available at the time of publication of each *Monetary Bulletin* from 2006 through 2017. As Chart 3 shows, the corresponding revision of the output gap is generally somewhat larger. The RU indicator can therefore be a useful supplement to the Bank's estimate of the business cycle position and as an input into the overall estimation of the domestic output gap. The Bank is currently assessing the degree to which this new measure could improve the estimate of historical developments in the output gap.

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3. The time series that are weighted together in the principal component analysis are in different units of measure; therefore, they are standardised to have an average of zero and a standard deviation of 1 before they are weighted together.