Post-crisis developments in unemployment



A steep economic contraction followed the financial crisis of 2008, and the domestic labour market was not spared the effects of it: unemployment as registered by the Directorate of Labour (DoL) rose by 8.2 percentage points from Q1/2008 to Q1/2010, peaking at 9.2%. Unemployment as measured by the Statistics Iceland labour market survey rose by 5.4 percentage points over the same period, to 7.7% (see Section VI for a discussion of the difference between the two measures).

There is usually a negative correlation between changes in unemployment and output growth (often referred to as the Okun relationship). Chart 1 illustrates this relationship for Iceland. The contraction in output growth usually does not emerge fully in elevated unemployment, however, as labour market flexibility mitigates the impact of the economic contraction on employment; for instance, firms respond to reduced demand by cutting back working hours and households respond to the drop in labour demand by reducing their labour participation. How – and how much – labour market flexibility mitigates the impact of the contraction on unemployment can have a strong effect on developments in the labour market when the economic recovery gains momentum and the slack in the labour market disappears.

This Box traces developments in unemployment in the wake of the autumn 2008 economic crisis, based on figures from the Statistics Iceland labour market survey. The bulk of the domestic labour market adjustment took place through a reduction in average hours worked. Although reduced labour participation and emigration from Iceland counteracted elevated unemployment, the impact appears to have been weaker than the impact of the reduction in average hours worked.¹ In recent quarters, the recovery of the labour market has emerged in an increase both in hours worked and in the number of employed persons, and the labour market survey indicates that the recent decline in unemployment was driven primarily by an increase in the number of jobs.

Breakdown of changes in unemployment into components

It is necessary to look to the mathematical relationships between labour market variables to determine what factors played a key role, both in the surge in unemployment in the immediate aftermath of the crisis and in the subsequent decline. Unemployment is defined as

(1)
$$u = (L - E)/L$$

where u is unemployment measured as the jobless as a share of the total labour force, L is the total labour force, and E is the number of employed persons. Changes in unemployment between two periods can therefore be expressed as:

(2) $\Delta u \approx \Delta \ln L - \Delta \ln E$

where $\Delta \ln L$ and $\Delta \ln E$ represent the percentage log-change in *L* between two periods.²

Total hours worked in each period can be expressed as $TH=H\times E$, where TH represents total hours worked and H is the average number of hours worked per person; therefore, Equation (2) can be rewritten as follows:

2. The approach is based on: $\Delta \ln x_t = \ln(x_t/x_{t-1}) = \ln(1 + \Delta x_t/x_{t-1}) \approx \Delta x_t/x_{t-1}$.

2

Chart 1

Because of a shortage of data, assessing the effect of emigration on unemployment is problematical. Because of the surge in emigration, a number of those who would otherwise be unemployed are not included in unemployment figures, but it is not certain how many of them would have obtained jobs or exited the labour market if they had not emigrated. See Box VI-1 in *Monetary Bulletin* 2011/4.

In addition, labour productivity measured in total hours worked can be defined as Y/TH, where Y is GDP. Inserting this into Equation (3) (see Burda and Hunt, 2011) yields the following:

(4)
$$\Delta u \approx -\Delta \ln Y + \Delta \ln (Y/TH) + \Delta \ln H + \Delta \ln L$$

where Δ ln *Y* represents output growth. Finally, the total labour force can be split into the labour participation rate and the working-age population, $L = pa \times N$, where *N* is the working-age population (defined as the number of persons aged 16-74) and *pa* is the labour participation rate; that is, *L*/*N*. Inserting this into Equation (4) gives the following:

(5) $\Delta u \approx -\Delta \ln Y + \Delta \ln (Y/TH) + \Delta \ln H + \Delta \ln pa + \Delta \ln N$

Declining unemployment between two periods can therefore reflect growth in output, reduced productivity, shorter working hours, reduced labour participation, and/or a reduction in the working-age population. It is appropriate to emphasise that this does not reflect a causal relationship between the individual subcomponents and unemployment. On the other hand, it does shed light on the contribution of individual factors to the increase in unemployment following the crisis and the decline in unemployment beginning in the first half of 2010.

In order to see more clearly the contribution of changes in the number of working persons, it is possible to use Equation (1) and the definition of the total labour force to obtain:

(6) $\Delta u \approx \Delta \ln pa + \Delta \ln N - \Delta \ln E$

The first half of the right side of Equation (6) (that is, $\Delta \ln pa + \Delta \ln N$) therefore describes the contribution of changes in labour supply to changes in unemployment, while the second half ($\Delta \ln E$) describes the contribution of changes in labour demand to changes in unemployment.

Contribution of components to change in unemployment

Table 1 shows the contribution of the subcomponents described in Equations (5) and (6) to changes in unemployment as measured by the labour market survey. Unemployment rose by 5.4 percentage points from Q1/2008 to Q1/2010. The most important factor there was the steep contraction in GDP, although the increase in productivity in late 2008 and 2009 also contributed, as Chart 2 indicates. Labour market flexibility is shown clearly, however, in the adjustment of working hours to reduced labour demand; the reduction in average hours worked was the major reason why the economic contraction did not surface in full measure in elevated unemployment.³ The ease with which working hours adapt to changes in labour demand is one of the characteristics of the Icelandic labour market. It came to light clearly in the post-crisis downturn, when employers immediately responded by cutting back working hours (see Chart 2). This scope to reduce working hours reflects, among other things, the fact the average work week is long in Iceland, particularly during an upswing. Icelandic companies generally have the latitude to respond

^{3.} Iceland's post-crisis labour market adjustment through reduced average hours worked was considerably greater than that, for instance, in the US, Germany, and Spain (see Burda and Hunt, 2011, and Bentolila, Dolado and Jimeno, 2011).

Chart 2



Breakdown of changes in unemployment¹

1. Breakdown of changes in unemployment according to equation (5). Sources: Statistics Iceland, Central Bank of Iceland.





Source: Statistics Iceland.

to a contraction in labour demand by cutting working hours during a downturn and increasing them again during the upswing.

As Table 1 indicates, the labour market adjustment took place primarily on the demand side and less on the supply side. It can also been seen that the lion's share of the rise in unemployment is reflected in a decline in the number of jobs, which was similar to the drop in average hours worked. This accords with the findings of Sigurdsson (2011), which indicate that the adjustment in total hours worked takes place through average hours worked (per person) and the number of employed in equal measure.

The results in Table 1 show as well that the impact of labour supply on changes in unemployment was limited because the labour force contracted by only 0.6 percentage points during the entire period. This is due to two countervailing factors: the labour supply contracted when labour participation fell by 2.1 percentage points. This decline in labour participation emerged primarily in 2009 and reflects, among other things, the fact that many workers responded to layoffs or reduced job opportunities by going to school, retiring early, working inside the home, or participating in other projects that fall outside the labour market. Offsetting this decline in labour participation, however, was an increase in the working-age population. Chart 2 shows a decline in the working-age population in H2/2009 and early 2010, in spite of a 1.5% rise in the total population over the entire period. These changes in population reflect two factors: natural population growth and labour migration to and from the country. In general, it can be assumed that natural population growth is relatively stable and not overly sensitive to the business cycle.⁴ Migration to and from the country is more closely related to the business cycle, however, as Chart 3 indicates.⁵ The chart also shows strong emigration in 2009 and 2010, which offset the rise in unemployment. In 2009, about 2,500 more Icelandic nationals and 2,400 more foreign nationals left Iceland than moved to the country. Net emigration totalled 2.7% of the labour force, or 2.2% of the working-age population. Since then, emigration among foreign nationals has declined rapidly as the economic recovery has gained a foothold, while emigration among Icelandic nationals has declined more slowly.

Table 1 Breakdown of changes in unemployment – contribution of individual components $^{1} \ \ \,$

Q1,	/2008-Q1/2010	Q2/2010-Q2/2012	Q1/2008-Q2/2012
Unemployment	5.4	-1.6	4.2
GDP	-12.5	2.9	-9.0
Productivity	0.2	2.0	3.2
Hours worked per person	-7.0	-0.4	-7.3
Labour participation	-1.5	-0.8	-2.1
Working-age population	1.3	0.5	1.5
Total labour force	-0.2	-0.3	-0.6
Number of employed perso	ons -5.6	1.3	-4.8

1. Seasonally adjusted data. Changes, apart from changes in unemployment, are in logarithms. Productivity is measured GDP per hour worked.

As Table 1 shows, unemployment began to fall in Q2/2010 and, by Q2/2012, had declined by 1.6 percentage points from the peak measured by the Statistics Iceland labour market survey. The

4. During the period 1952-2012, annual growth in the working-age population (aged 16-74) averaged 1.5%.

5. For further discussion, see Box VI-1 in *Monetary Bulletin* 2011/4, and Chapter 14 in Central Bank of Iceland (2012).

most important factor in this is the economic recovery, which shows in growth in GDP, although the continued decline in the labour participation rate is also a factor. Offsetting this is increased population and labour market productivity. The contribution of changes in labour supply to changes in unemployment therefore remains relatively small, and the reduction in unemployment is driven largely by the number of jobs, which has increased by 1.3% since mid-2010. As expected, the labour market recovery surfaced in the number of hours worked before showing up clearly in rising numbers of jobs because, even though average hours worked declined over the period as a whole, they rose by 1.7% in 2011. According to the most recent data from Statistics Iceland, however, average hours worked have declined again in 2012.

Conclusion

The post-crisis labour market adjustment appeared first as a decline in average hours worked, which accounted for the bulk of the adjustment. The reduction in the number of jobs and the rise in unemployment emerged later. Because of the flexibility of the labour market, which appears mostly in a rapid adjustment of average hours worked but also in labour supply, unemployment rose less in the aftermath of the crisis than it would have without such flexibility. As the economy recovers, unemployment has declined, primarily due to a rise in the number of jobs, although reduced labour participation is a factor as well.

References

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