While the timing of any future slowdown or downturn is hard to predict, it is inevitable that – at some point in future years – the state of the economy will become less favourable than it is today. Box A notes that post-war expansions in employment and output have tended to last around 4½ –6 years on average. The Department's latest forecasts suggest that employment will continue to expand nine years on from its most recent contraction, which ran from 2008 to 2012. Age (or duration) is a poor predictor of turning points, yet there are foreseeable risks and potential imbalances in the economy that should be monitored closely.

Quantifying the impact of the downside risks is difficult given the relatively limited historical precedent for such events. It is therefore important that the Government develops more robust scenario analyses building on potentially more-adverse-than-assumed outcomes relative to its central forecasts. Box C in Chapter 2 examines some of the avenues that should be explored in relation to the possible impact of a large, foreign-owned multinational firm exiting Ireland.

### Box A: The Duration of Cycles: Death by Illness, Not by Age

This box examines cycles in economic output and employment to give a sense of how long these typically last.

In the US, the National Bureau of Economic Research (NBER) acts as the official arbiter of the business cycle. It provides timings of peaks and troughs in economic activity. Its definition of recessions is broad and comprises an assessment of many measures of broad activity including real GDP, employment and real income. Correspondingly, expansions are recorded as periods outside of recessions (i.e., between a trough and a peak in output).

Table A.1 shows the typical duration of expansions in output as documented by the NBER. For the longest available period of data up to the financial crisis (1854–2009), the typical length of an expansion in real GDP in the US has been just over three years, with contractions lasting close to 1½ years on average. Looking at the post-war period (1945–2009), the NBER shows that the average expansion duration lengthened to almost five years, with typical contractions shortening to just under one year.

#### Table A.1: Durations of Expansions in Output and Employment

| Country | Source | Sample | No. of Cycles | Contraction (years) | Expansion (years) |
|---|---|---|---|---|---|
| **Output Cycles** | | | | | |
| US | NBER | 1854–2009 | 33 | 1.5 | 3.2 |
| US | NBER | 1945–2009 | 11 | 0.9 | 4.9 |
| US | IFAC Workings | 1948–2009 | 9 | 0.5 | 5.8 |
| **Employment Cycles** | | | | | |
| US | IFAC Workings | Q1 1948–Q1 2009 | 10 | 0.8 | 4.7 |
| UK | IFAC Workings | Q2 1960–Q1 2009 | 8 | 1.0 | 5.2 |
| Ireland | IFAC Workings | 1960–2009 | 7 | 2.5 | 4.4 |

*Sources:* NBER; and internal IFAC calculations.
*Notes:* Durations are taken as an average of the Bry and Boschan (1971) and Markov-Switching model except in the case of Ireland where the latter fails to converge.

Table A.1 also replicates some approaches that are commonly used to identify business cycle durations. First, the Bry and Boschan (1971) dating algorithm is used, which is commonly applied to examine business cycle peaks and troughs. Second, a Markov-Switching model similar to that of Hamilton (1989) is implemented.[3] The average durations from the two approaches are shown (these typically correspond quite closely). For US output, the durations of expansions are similar to those identified by the NBER, albeit a little longer (expansions are estimated as closer to six years whereas contractions are estimated to typically last half a year).

Applying the approaches used for US output to employment, we can derive estimates of employment cycles. The approaches suggest that for the US, expansions in the employment cycle typically last close to five years, with contractions lasting close to one year (very similar to those for output). UK data show virtually the same durations as the US. For Ireland, employment expansions are estimated to average close to 4½ years.

### Imbalances and Rigidities Are More Important

While the typical length of expansions and recessions is somewhat informative, it is important to note that these historical averages are drawn from relatively small samples and they may not be good predictors of when an expansion might end. The end of any individual expansion may be said to have more to do with the build-up of imbalances and rigidities in the economy than it has to do with age itself. In other words, the fact that an expansion has lasted for a long time does not tell us very much about the likelihood of a coming recession.

Rudebusch (2016) uses a survival analysis akin to actuarial assessments for people's expected lifespan to assess the end of US expansions historically. The findings suggest that since the 1940s, US expansions into their 80th month (6th year) have the same probability of ending as expansions in their 40th month (3rd year).

Recognising the importance of assessing imbalances in the economy so as to understand the sustainability of the budgetary position, the Council uses a "Modular Approach" (Chapter 2). The Modular Approach involves assessing a broad range of indicators of potential imbalances in the economy. This approach can help to deal with the fact that macroeconomic models tend to have a poor track record in terms of identifying turning points. There are also obvious risks of these occurring over the medium term. In particular, Brexit negotiations could lead to more adverse outcomes for Ireland than expected, while further risks are posed by international tax policy.

### Fiscal Context

Against a backdrop of high debt levels, improvements on the budgetary front have slowed in recent years even as the cyclical recovery continues and is reinforced by a number of favourable tailwinds. Non-interest spending has risen at essentially the same pace as buoyant cyclical tax revenue since 2015. This means that the budget balance excluding interest and one-offs has remained close to 2–2½ per cent of GNI* over the period 2015–2017 and it is forecast to stay around this level out to 2021.

Assessing the government's budget balance is complicated by factors such as one-off items; the effects of the cycle; and spending outside of the government's control.

---

[3] As noted in Owyang *et al.* (2005), a key shortcoming of the BB approach relative to the MS approach is that the magnitude of growth rates needed to trigger a regime shift does not change from state to state, instead remaining constant over time.