## Box B: "Strong and Stable" – The Procyclicality of the CAM

This box highlights how the Commonly Agreed Methodology (CAM) used to estimate potential output for Ireland is prone to producing estimates that are very much procyclical (i.e., where estimates increase as cyclical recoveries ensue, and decline as downturns take hold).

This procyclicality is partly an issue caused by the methodology as applied to Ireland, but can also be a feature evident in many approaches to estimating potential output.[25] It is partly exacerbated by the regional nature of the Irish economy. In particular, sizeable labour market flows into and out of the country through migration can result in periods of self-reinforcing growth.[26]

One way to demonstrate the procyclical nature of CAM estimates for Ireland is through the nature of revisions to estimates. Figure B1 shows the estimates of potential output for each of the years 2005, 2006, and 2007 as estimated in real-time over a number of forecast exercises (these exercises run from *Spring 2004* to *Spring 2006*). The estimates evolve in a way that moves procyclically (i.e., such that revisions to potential output estimates chase upward revisions to actual growth rates as the cycle improves). This is in part a consequence of (i) newly available "first" estimates of real GDP; (ii) new forecasts of real GDP for years ahead; and (iii) revisions to historical real GDP estimates.

Figure B1: Upward Revisions to Potential Output Growth Rate Estimates
Percentage Change, Year-on-Year
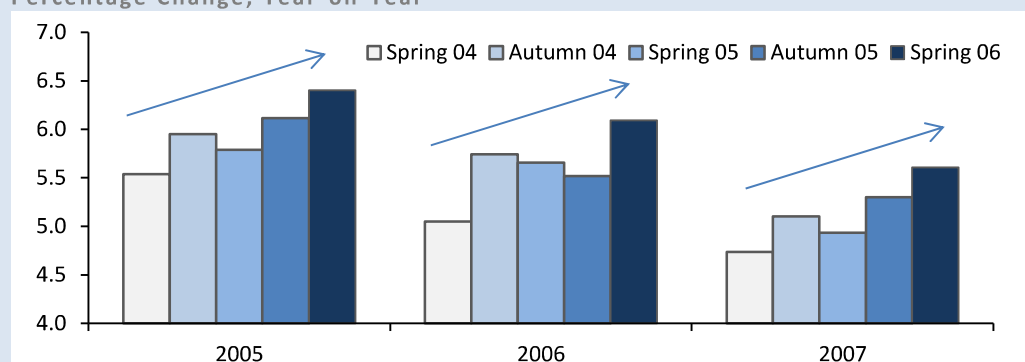
Sources: European Commission (CIRCA); and internal IFAC calculations.

Table B1 shows that this procyclicality is driven by expanding contributions from the net capital stock and from labour inputs. As the property/credit bubble took hold in the mid-2000s, rising construction activity contributed to greater levels of capital accumulation, while falling unemployment rates and rising participation rates led to greater contributions from the labour market. Both features led to rising estimates of potential output growth as the estimates failed to sufficiently account for what would ultimately prove to be transient developments.

Looking more closely at the determinants of labour inputs to potential output over the same expansionary period (2005-2007), we see that all of these inputs evolve in a way that contributes to higher estimates of potential output growth rates (Table B2). The estimated natural rate of unemployment in 2005 (the "NAWRU") falls by half a percentage point between the *Spring 2004* and *Spring 2006* vintages. As such, the view of "full employment" as implied by the CAM becomes

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[25] The European Commission also acknowledges issues with procyclicality in the same Production Function (PF) approach. Mc Morrow *et al* (2015), for instance, note that "revisions to the PF's output gap estimates in the pre-crisis period were roughly five times greater than those of the post-crisis, 2009–2014, period…a particularly humbling statistic given that one of the EU's primary motivations in 2002 for moving away from the HP filter to the PF approach was the expectation of reduced levels of procyclicality (especially in the upswing stage of cycles)". For useful explorations of the procyclicality issue in a wider context, see Borio *et al* (2014); Heimberger and Kapeller (2017); and Kuusi (2017).

[26] There is a tendency for Ireland to demonstrate characteristics more like those of a regional economy than a typical national economy. This is in part a reflection of its small and open nature. Behaviours such as periods of self-reinforcing growth may be evidenced, for example, when inward migration supports scale economies and incomes, thus attracting further inward flows.

one that is consistent with much lower unemployment rates than initially implied by the method. In addition, the expected trend participation rate for the labour force in 2005 rises by 2.7 percentage points over the successive forecast rounds, while the working age population is seen to grow at a pace that is 1.2 percentage points faster than first estimated. While the latter reflects newer historical information and population projections, the trend participation rates and NAWRU estimates are unobservable variables where procyclicality is in part a feature of the estimation process.

Table B1: Revisions to Contributions to Potential Output Growth Rates
Changes in contributions, percentage points of potential output growth rates (*Spring 2006* minus *Spring 2004* forecast exercise)

	Labour	Capital Stock	TFP
2005	0.2	1.0	-0.4
2006	0.4	1.1	-0.5
2007	0.3	1.1	-0.5

Sources: European Commission (CIRCA); and internal IFAC calculations.
Notes: TFP refers to the estimated contribution from growth in trend Total Factor Productivity.

Table B2: Revisions to Labour Input Determinants
Changes in percentage points (*Spring 2006* minus *Spring 2004* forecast exercise)

	NAWRU (% Labour Force)	Working Age Population (% change year-on-year)	Trend Participation Rates (% working age population)
2005	-0.5	1.2	2.7
2006	-0.2	1.3	3.0
2007	0.0	1.0	3.2

Sources: European Commission (CIRCA); and internal IFAC calculations.
Notes: Changes show revisions for each year's estimates between the *Spring 2004* vintage and the *Spring 2006* forecast exercise.

The problem of procyclicality suggests that potential output estimates under the CAM could evolve in future years in a way that is unduly determined by actual real GDP outturns. Upside risks to many of the determinants of potential output estimates are foreseeable in the near future. One plausible scenario for the coming years might see a sharper-than-expected construction recovery take hold as pent-up demand in housing supply is addressed. Should this scenario materialise, it could well see even higher estimates of potential output growth as measured under the CAM compared to the central scenario in *Budget 2018*. This could arise if increased labour force participation, higher inward migration flows and stronger capital accumulation arise in response to stronger residential construction activity.

How potential output growth rates evolve over time will be important for the reference rates that determine "sustainable" growth rates for government spending under the spending rule (the Expenditure Benchmark). The Department's forecasts envisage Ireland's medium-term annual growth rate as tending towards 2½ per cent by 2021 – an estimate that is largely influenced by the modelled impact of a hard Brexit on long-run growth rates. This compares to the reference rate implied by a ten-year average of potential output estimates produced under the CAM of 3.8 per cent for 2021. An issue arises if a gap of this size were to persist and if all of the space allowed under the spending rule were to be availed of. Such a policy could result in a divergence emerging over time between "sustainable" spending levels (as informed by CAM-based estimates) and "actually sustainable" spending levels (as more appropriately measured).