Box A: Alternative Potential Output Estimates and "A Modular Approach"

Estimates of potential output and the output gap represent critical inputs to the design of sustainable fiscal and macroeconomic policies. This box provides an update of the progress[1] the Council is making towards developing appropriate measures for assessing the fiscal stance and in assessing medium-term forecasts produced by the Department of Finance.

Alternative Baseline Estimates of Potential Output

The Council has examined several approaches to producing estimates of potential output. It is anticipated that these will be supplemented with various indicators of disequilibrium, particularly those of relevance to the public finances. Before incorporating these, however, several methods of obtaining baseline estimates of potential are examined.

The nature of the Irish economy, in particular the large presence of multinational-dominated sectors, may warrant the use of alternative measures of economic activity other than GDP when estimating potential output. While GNP may be considered a better measure of domestic economic activity, it is also subject to its own accounting issues (FitzGerald, 2013). A focus on domestic sectors of the economy where fiscal impact is of greatest interest could also be satisfied by using a more specific separation of domestic and multinational-dominated sectors.

One approach, which mirrors approaches developed by the IMF (also Box B, IFAC, 2015b), is to use estimates of "domestic" GVA (i.e., the GVA of sectors not dominated by foreign-owned multinational enterprises (MNEs)). A basic Kalman filter (with drift) is employed to identify cyclical activity and underlying "potential domestic GVA". The output gap denominator then incorporates the GVA of MNE-dominated sectors.[2]

$$\frac{"Domestic"\ GVA - Kalman\ Filtered\ ("Domestic"\ GVA)}{Kalman\ Filtered\ ("Domestic"\ GVA) + MNC\ GVA} * 100$$

A second approach is to use standard measures of economic activity: real GDP and real GNP. Cumulative Foreign Direct Investment (FDI) inflows are controlled for in the filtering process to account for any associated structural changes in the economy over time.[3]

Figure A.1.A shows the output gap estimates produced under each method. The variation is not especially wide across estimation techniques, albeit the GDP and GNP approaches show a more pronounced peak and trough in potential than estimates under the "domestic GVA" approach. All estimates suggest that the economy approached equilibrium between 1998 and 1999, before a large positive gap opened up. The estimates are also relatively consistent for the most recent period, suggesting an output gap in 2016 that is either closed or slightly negative. Estimates of potential growth underpinning these approaches range between 2½ - 3½ per cent per annum over the medium term.

Comparing the output gap estimates to official estimates produced by other institutions for GDP, we can see that the range of estimates outlined above displays relatively smaller magnitudes. For more recent years, the range lies closer to IMF estimates, which contrast with

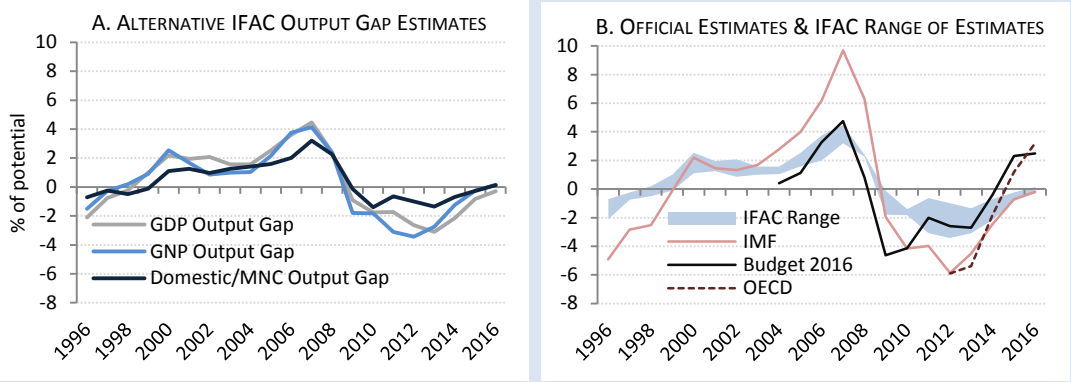
[1] See, for example, IFAC (2015a), Box B, and IFAC (2014b), Analytical Note 2.

[2] MNE activity is assumed to be relatively unconstrained by domestic resource utilisation and is taken to scale up or down the economy's overall level of potential output. By scaling the gap between actual "domestic" activity and its potential level against the sum of MNE-led activity plus the potential level of domestic activity, this gives a sense of how domestic activity is performing relative to wider economic potential. For forecast years, a simplifying assumption is made whereby domestic GVA is assumed to grow in line with final domestic demand less investment in intangibles and aircraft, to which its growth rates are highly correlated.

[3] This approach is similar to that outlined in Šrámková *et al.* (2010) where cumulative greenfield FDI is used. The rationale is that FDI inflows contribute to changes in potential growth rates over time. For 2015 and 2016, FDI inflows are assumed to run at a similar pace to the most recent annual outturns.

Budget 2016 and OECD estimates that signal an emergence of large positive output gaps.

FIGURE A.1: ALTERNATIVE OUTPUT GAP ESTIMATES AND COMPARISONS WITH OFFICIAL ESTIMATES



Sources: Internal IFAC calculations; CSO; *Budget 2016* Projections; IMF (*WEO*, Oct 2015); OECD (Sep 2015).

TOWARDS A *MODULAR APPROACH*

The use of univariate filters similar to those used in the analysis above can lead to a failure to detect other critical imbalances that matter for public finances, such as housing bubbles. To counteract this, the Council is also developing a *Modular Approach* to better understand the cyclical position of the economy. This involves assessing key sources of imbalances that can explain the deviation of the economy from its potential, with a view to examining these "*modules*" in a more systematic manner. Means of incorporating this information directly into baseline estimates of potential output can then subsequently be explored.[4]

To better understand the current budget balance relative to a balance when the economy is operating at more normal levels, cyclical indicators that matter most for the public finances are of central importance. In this respect, indicators of credit, housing, labour market, and current account imbalances are among some of the initial areas of focus.

Incorporating additional indicators that might point to disequilibria in the economy formally into an econometric specification of potential output poses several difficulties. First, finding suitable indicators as well as measuring these correctly can be an extensive process. Second, incorporating the information into estimates of potential in an appropriate manner can also present problems. Third, chosen indicators of disequilibria may subsequently prove insignificant or inappropriate when included, requiring further iterations of earlier steps.

As an input to producing suitable indicators for estimates of potential and to ensure that imbalances are monitored more rigorously, the Council has begun documenting imbalances related to the "modules" specified above (Appendix E). This has a number of advantages. It mirrors more closely how economists actually think about the existence of overheating or slack in the economy. It also allows for more substantive analyses of specific areas, compared to a situation in which a statistical filter or alternative estimate of potential is applied in isolation. The various indicators used (Section 2.3.2) suggest that the output gap is unlikely to be strongly positive at present,[5] albeit the considerable pace of growth anticipated for coming years suggests that any negative gap could close rapidly, while uncertainty levels surrounding such estimates remain high.

[4] Additional indicators can be incorporated through output gap equations as proposed by Borio *et al.* (2014).

[5] As suggested by CAM-based *Budget 2016* projections and OECD projections, for example.