

services exports shows the value in forecasting these series separately rather than simply forecasting aggregate exports.

#### **Box D: Modelling Goods Exports**

This box sets out a new approach to forecasting goods exports using customs data to avoid recent problems related to contract manufacturing. There are two estimates of goods exports produced by the CSO. The monthly trade (or “customs”) data records the value and volume of goods imported into and exported out of Ireland.<sup>39</sup> The Quarterly National Accounts (QNA) and Balance of Payments (BoP) also record the exports and imports of goods in to and out of Ireland. The levels recorded in the QNA/BoP differ from those recorded in the monthly trade data as adjustments are applied to the trade data to bring the data to national accounting standards.<sup>40</sup> The CSO (2015) has previously noted that the reasons for adjustments to the monthly trade series usually relate to the recognition of changes in economic ownership. As well as occurring due to contract manufacturing, such adjustments may take place due to the recording of merchanting activities and due to conceptual adjustments relating to the valuation of goods, such as in cases where certain exports may be undervalued.

Due to these adjustments, goods exports in the QNA have diverged substantially from those seen in the customs data, the latter giving a better sense of the goods being produced in Ireland for export. Prior to 2015, contract manufacturing activities were of a much smaller scale and had been largely GNP-neutral. In some instances, contract manufacturing would be GDP neutral due to imports of royalties (payment for the use of intellectual property). Even when these imports did not occur, outward profit flows (from foreign-owned multinational enterprises) would mean that GNP would not be impacted by contract manufacturing. In 2015, contract manufacturing made a large positive contribution to GDP (and GNP) growth, as the huge increase in these activities was not fully offset by increased services imports (or profit outflows). By contrast, contract manufacturing has acted as a drag on goods exports recorded in the National Accounts in 2016 and in the first half of 2017.

The diverging performance of goods exports recorded in the trade data and the National Accounts poses a dilemma for forecasters. If one is trying to forecast underlying activity in the Irish economy, then one might want to focus on drivers of customs exports, rather than the National Accounts measure which may be distorted by activities of multinational enterprises that have relatively less impact on incomes, employment and taxes. In Conroy and Casey (2017) the National Accounts measure of goods exports are modelled, with a dummy variable used to account for the level shift in goods exports that occurred in 2015. However, given that the divergence between the national accounts and the customs data has continued since that level shift, the focus may need to shift to the customs data.

With this in mind, an error correction model is estimated for customs goods exports (volumes) using standard predictors such as external demand and competitiveness. The dependent variable in the short-run equation is the log-difference in goods exports (i.e.  $\Delta \ln(XG_t) = \ln(XG_t) - \ln(XG_{t-4})$ ). Column (1) in Table D1 shows the long-run relationship between goods exports and external demand and competitiveness. Column (2)

<sup>39</sup> Details on the methodology employed by the CSO can be found here:

<http://www.cso.ie/en/media/csoie/methods/externaltrade/explanatorynotes2015.pdf>

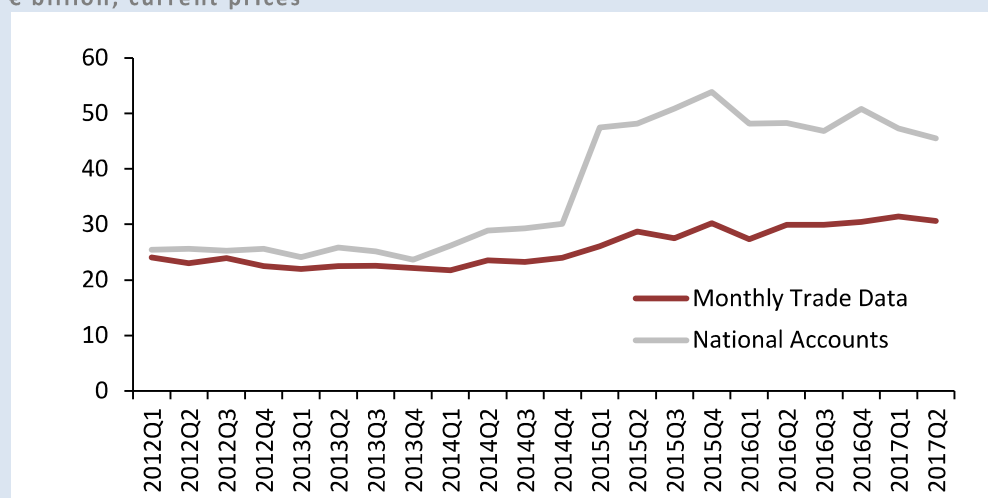
<sup>40</sup> See CSO information note on contract manufacturing

<http://www.cso.ie/en/media/csoie/methods/balanceofinternationalpayments/ContractManufacturingInformationNotice.pdf>

shows estimates of the short-run relationship, with the short-run impacts of the two explanatory variables, as well as the error correction coefficient.

**Figure D1: Goods Exports**

€ billion, current prices



Sources: CSO.

As one would expect, external demand for Irish goods exports is positively associated with customs goods exports both in the long-run and short-run. Competitiveness is captured here by the Real Effective Exchange Rate ( $REER_t$ ). The error correction coefficient is negative as one would expect, and implies a fast pace of correction when customs goods exports deviate from the long-run equilibrium relationship estimated in column (1).

**Table D1: Long-run (1) and short-run (2) equations.**

Percentage change (year-on-year)

	(1)	(2)
	$\ln(XG_t)$	$\Delta \ln(XG_t)$
Constant	1.27*	0.03**
$\ln(\text{Demand}_t)$	0.57**	
$\ln(REER_t)$	-0.15*	
$\Delta \ln(\text{Demand}_t)$		0.16
$\Delta \ln(REER_t)$		-0.14
ECM		-0.49**
R <sup>2</sup>	0.54	0.39
Sample	1998Q1 – 2017Q2 (78)	1999Q1 – 2017Q2 (74)

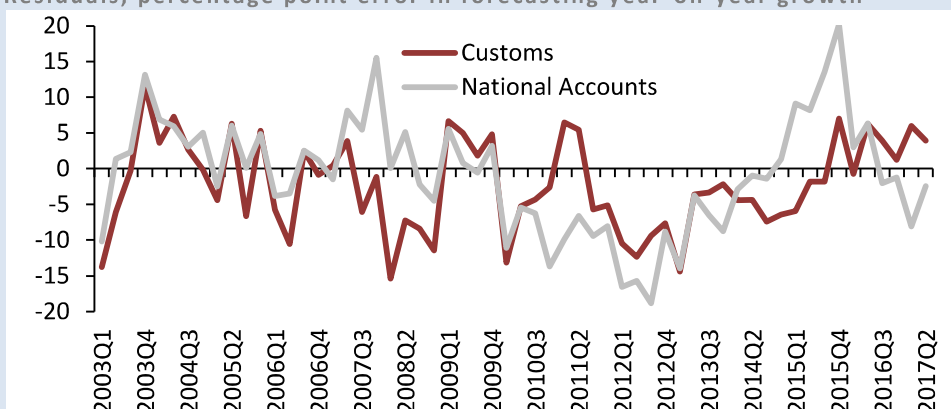
Statistical significance: \*\* 5 per cent; \* 10 per cent

While the quarterly movements of customs goods exports may be quite large and difficult to model, the new model provides a better fit than does the corresponding model for goods exports as measured in the National Accounts. The mean absolute error using the new model is 5.7 percentage points, while the mean absolute error using the National Accounts-based model is 6.4 percentage points.<sup>41</sup>

<sup>41</sup> Both models are assessed from 2003Q1 on, as the “missing trader” fraud artificially increased goods exports in the early 2000s. Exports of electrical machinery, appliances etc. (SITC 77) fell by more than half in 2003 after the fraudulent activities were detected.

**Figure D2: Customs goods exports and National Accounts models**

Residuals, percentage point error in forecasting year-on-year growth

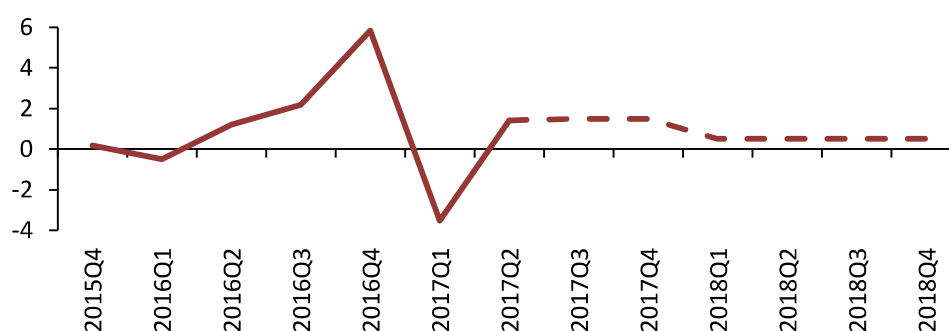


Sources: CSO and internal IFAC calculations.

*Budget 2018* forecasts real **GDP** growth of 4.3 per cent this year, followed by a 3.5 per cent expansion in 2018. These forecasts are almost unchanged from *SPU 2017*, although the composition of growth has changed (see below). The carryover for 2017 now stands at 3.1 per cent, reflecting the momentum present in the economy.<sup>42</sup> Taken at face value, the *Budget 2018* forecasts imply that a quarter-on-quarter growth rate of 1.5 per cent would be needed in the remaining two-quarters to be consistent with the Department's 4.3 per cent forecast for annual GDP growth in 2017.<sup>43</sup> A significant slowdown in quarterly growth is implied for 2018, with only 0.5 per cent quarter-on-quarter growth required to achieve 3.5 per cent annual growth.<sup>44</sup>

**Figure 2.4: Real GDP Growth Rates**

Percentage change (quarter-on-quarter, seasonally adjusted)

Source: CSO; *Budget 2018*; and Internal IFAC calculations.Notes: Solid line represents historical outturns; dashed line represents *Budget 2018* forecasts.

<sup>42</sup> The carryover for 2017 refers to the growth rate that would be observed in 2017 if seasonally adjusted real GDP remained unchanged at its Q2 2017 level for the second half of this year.

<sup>43</sup> If the revisions to services consumption anticipated in *Budget 2018* were to materialise and boost GDP in the first half of 2017 then slightly lower quarter-on-quarter growth (approximately 0.1 percentage points) would be required to achieve 4.3 per cent annual growth.

<sup>44</sup> *Budget 2018* documentation included a box on revisions to quarterly data and the role they can play when producing forecasts of the Irish economy. While noting that the Irish quarterly data are heavily revised and volatile, the box also noted that "carryover analysis and implied quarterly profiles can, in principle, be useful tools to inform short-term forecasts."