Appendix A: Debt Sustainability Analysis

This appendix looks at the sustainability of Irish debt by considering (1) the probability range for debt outcomes based on historical forecast errors, and (2) a number of common stress scenarios. Estimates are produced using the Council's Fiscal Feedbacks Model (IFAC, 2012) and the baseline scenario is taken to be that produced in the Department's latest set of forecasts. It is intended that this appendix will be extended to assess other variables relevant for debt sustainability in future reports.

Probability Distribution for Debt Forecasts

A useful way to illustrate uncertainty and the impact of alternative growth paths on the government debt ratio is through the use of a fan chart.

Figure A1 below takes the Department of Finance's latest debt forecasts as the central line. The width of the fan represents the range of possible outcomes for the debt-to-GNI* ratio based on past forecast errors.[1] For example, according to this, there is an estimated 20 per cent probability that the debt ratio would not fall below current levels by 2021, in the absence of offsetting policy adjustments.

Appendix Figure A1: Probability Outcomes for Government Debt

% GNI*, general government basis

Source: Department of Finance; internal IFAC calculations.
Note: Line shows outturns and central forecasts, while bands show 20 per cent, 40 per cent, 60 per cent, and 80 per cent likelihood ranges, respectively, as one moves outward from the central

[1] While there are some limitations with these charts, as described in Annex A of IFAC (2012), they do serve to highlight the uncertainty surrounding the fiscal position.

forecasts. Forecast errors based on 2001–2007; 2011–14 sample of Department of Finance forecast errors.

Stress Scenarios

Another useful way to examine debt sustainability is by exploring a number of common stress scenarios (see IMF 2018, for example). All scenarios assume that policy settings are not adjusted in response to the shock. We consider six stress scenarios and their impact on the forecast debt ratios in Figure A2 below:

1. **"Growth" shock**: A shock equivalent to one standard deviation of the historical nominal GDP growth rate over the period 2000–2017 (excluding 2008–2009 and 2015) is considered for two consecutive years (-4.6 percentage points per annum relative to baseline).

2. **"Primary Balance" shock**: A shock to the primary balance equivalent to half of the historical standard deviation of the underlying primary balance in per cent of GDP over the period 2000–17 (excluding 2008–2009 and 2015) is considered for the full forecast period (-2.4 percentage points). An increase in average effective interest rates of 0.25 percentage points is assumed for every 1 per cent of GDP worsening in the primary balance.

3. **"Interest" shock**: A standard 2 percentage point shock is applied to the marginal interest rate on government debt over the entire forecast period.

4. **"Combined Macro-Fiscal" shock**: Combines the three shocks above.

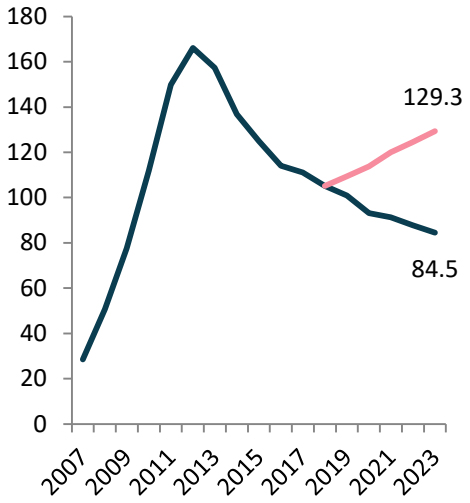
5. **"Contingent Liability" shock**: This extends the "Growth" shock above with a one-off increase in public spending equal to 10 per cent of domestic bank assets (i.e., the "Irish-Headquartered Group" of credit institutions as defined by the Central Bank of Ireland). This can be considered a tail risk as domestic banks have strengthened their capital buffers.

6. **"Custom" shock**: This draws on the analysis outlined in Box C of IFAC (2018a) and assumes that five large, foreign-owned multinational enterprises exit Ireland at the same time. A primary balance deterioration of €1.7 billion is assumed along with the "Growth" shock above.

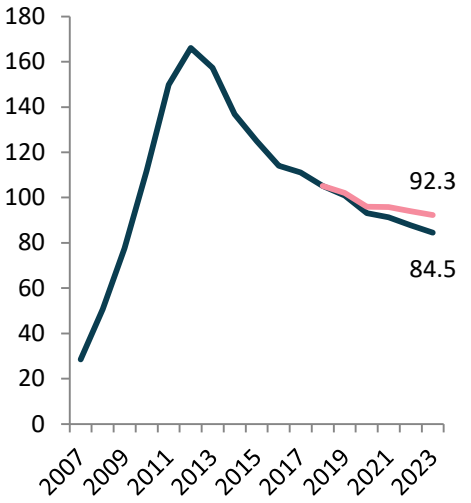
Appendix Figure A2: Stress Scenarios for Government Debt

% GNI*, general government basis

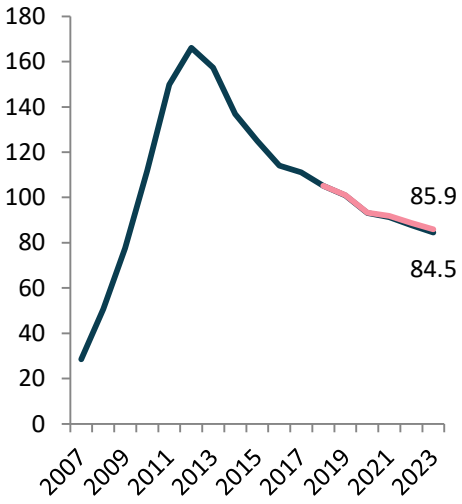
1. "Growth" shock



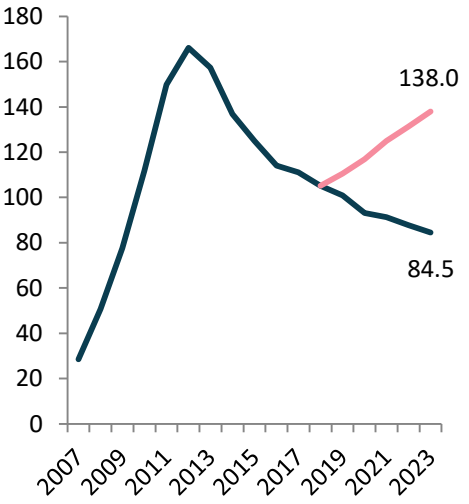
2. "Primary Balance" shock



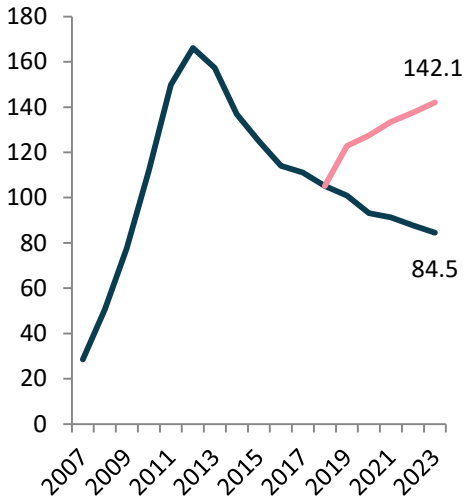
3. "Interest" shock



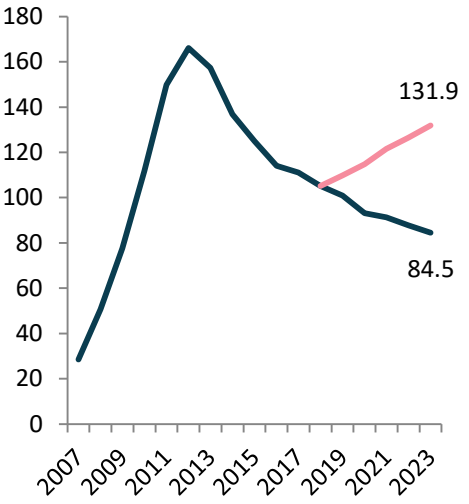
4. "Combined Macro-Fiscal" shock



5. "Contingent Liability" shock



6. "Custom" shock



Sources: CSO; Department of Finance; and internal IFAC calculations.