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Debt and Uncertainty: Managing Risks to the Public Finances

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Debt and Uncertainty: Managing Risks to the Public Finances

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The Irish public finances have improved significantly in recent years and favourable financing conditions have reduced debt servicing costs. In the absence of severe adverse shocks, government debt as a proportion of national income should continue to fall. At the same time, the crisis has left a legacy of high government debt that, in 2018, was larger than the level of national income (GNI*). Starting from this high stock of debt, there is a risk that a negative economic shock could cause the deficit and debt to start rising again, undoing the hard-won improvements of recent years. In this *Letter*, we analyse the exposure of the public finances to potential adverse shocks. Our analysis shows that a disorderly Brexit or a permanent loss of corporation tax revenue could result in the level of debt remaining above 90 per cent of national income well into the middle of the next decade. In an environment of elevated risks, reducing the level of public debt can help to improve the capacity of the public finances to withstand negative shocks.

1. Introduction

Government actions to stabilise and then repair the public finances, as well as the robust recovery in the economy, have brought about a substantial improvement in the public finances over recent years. The underlying General Government deficit,² which widened to 14.5 per cent of modified national income (GNI*) in 2009, was eliminated in 2018. The General Government debt-to-income ratio has also declined from a peak of 166 per cent of GNI* in 2012 to 104 per cent in 2018. At the same time, the cost of servicing the national debt has been reduced by historic low sovereign interest rates. Taken together, these improvements have placed the public finances on a sounder footing following the upheaval experienced during the 2008-2012 period.

¹ Irish Economic Analysis Division, Central Bank of Ireland. The views expressed in this paper are those of the authors only and do not necessarily reflect the views of the Central Bank of Ireland. We would like to thank Mark Cassidy, John Flynn, Gerard O'Reilly, Reamonn Lydon, Carina Holmes and Linda Kane for comments on an earlier draft.

² The underlying General Government balance excludes once off banking related transfers. These contributed to an increase in the headline deficit to 42 per cent of GNI* in 2010.

Despite these improvements, the scale of the borrowing undertaken during the crisis years – due to the shortfall between government spending and revenues, as well as the cost of the bank support measures – means that the level of Irish government debt remains high by historic and international comparisons. An adverse shock could cause the deficit and debt ratio to start rising again, reigniting concerns over creditworthiness.

The 2008 crisis is a vivid reminder of how negative economic shocks can trigger potentially unsustainable increases in government debt. At the outset of the 2008 crisis, government debt was low at less than 30 per cent of GNI*, well below the 60 per cent Maastricht ceiling. Despite starting from this extremely low level, the debt ratio peaked at 166 percent four years later. Irish government bond yields rose to 14 per cent, preventing the state from borrowing on international markets. At close to 100 per cent of GNI*, the current debt ratio is around four times higher than at the outset of the 2008 crisis. This highlights the potential vulnerability of the State's fiscal position; starting from a high level of debt means there is less headroom in the event of a negative shock. Both the Department of Finance (2019) and the Irish Fiscal Advisory Council (2019) have recently shown how a negative economic shock could have a significant impact on the government's fiscal position. In addition to risks from slower economic growth, IFAC (2018, 2019) and IMF (2019) examine the exceptional increases in corporation tax (CT) revenue since 2015 and the potential effect on the public finances from a loss of revenue from this source.

In a recent paper, Blanchard (2019) considers the costs of higher public debt in the current low interest rate environment in the context of the US economy. Blanchard argues that, in a situation where the interest rate on debt is expected to remain below the growth rate of the economy for a prolonged period, both the fiscal and welfare costs of higher public debt are lower. While there are likely to be some circumstances where very low interest rates allow for higher public indebtedness, it is important to consider Blanchard's arguments in the context of the characteristics of a small open economy such as Ireland. As pointed out by the Department of Finance (2019), for around one third of the period between 1970 and 2018, interest rates have exceeded the growth rate of the Irish economy. Moreover, the Irish economy is significantly more volatile than larger economies and, as the experience of the last decade has demonstrated, market sentiment can change rapidly.

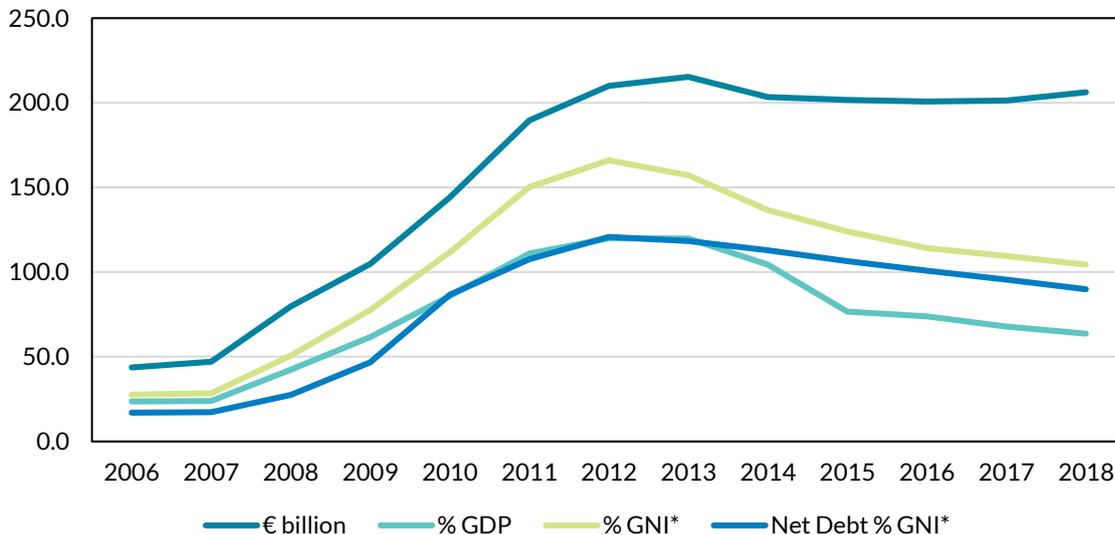
In this Economic Letter, we provide an overview of recent developments in the public finances and assess the potential impact of two key risks, namely, a disorderly Brexit and a reduction in corporation tax. Section 2 examines the evolution of the public finances since 2012 and shows how a number of exceptional factors have accounted for much of the improvement in Ireland's debt-to-income ratio since 2013, with underlying improvements in the fiscal position playing a smaller role. Section 3 examines the level of Irish public debt in a euro area context. In Section 4, we use the Central Bank's macroeconomic model of the Irish economy (COSMO) to estimate the impact on the debt of two scenarios: (i) a disorderly Brexit and (ii) a slowdown in the international economy coupled with a loss of corporation tax revenue. Section 5 concludes.

2. Recent Irish Debt Developments

2.1 Measuring Irish Government Debt

While Ireland's gross General Government debt ratio has recorded a significant decline in recent years, it remains at an elevated level as a proportion of GNI*. As the level of GDP is increasingly distorted by the effects of globalisation, and less representative of the level of domestic income and resources, the debt-to-GDP ratio has become misleading. It no longer represents an improvement in the ability to sustain a given debt level. This was most notable in 2015 when the debt ratio recorded an annual decline of almost 25 percentage points. The Central Statistics Office introduced modified Gross National Income (GNI*) as an alternative measure of national income in 2017 to exclude globalisation effects that are disproportionately impacting the measurement of the size of the Irish economy.³ Using this as the denominator reveals a debt ratio still above 100 per cent in 2018. While this is well below its recent peak, it is amongst the highest in the euro area. Figure 1 also shows the nominal level of Irish government debt. This remains close to its recent peak and significantly above its pre-crisis level following sharp growth in the period 2007 to 2013. Reflecting the holdings of corresponding financial assets the net debt position is somewhat more favourable, but still remained elevated at just under 90 per cent of GNI* last year.

Figure 1: Measures of Irish government debt, 2006 to 2018 (gross debt unless stated)



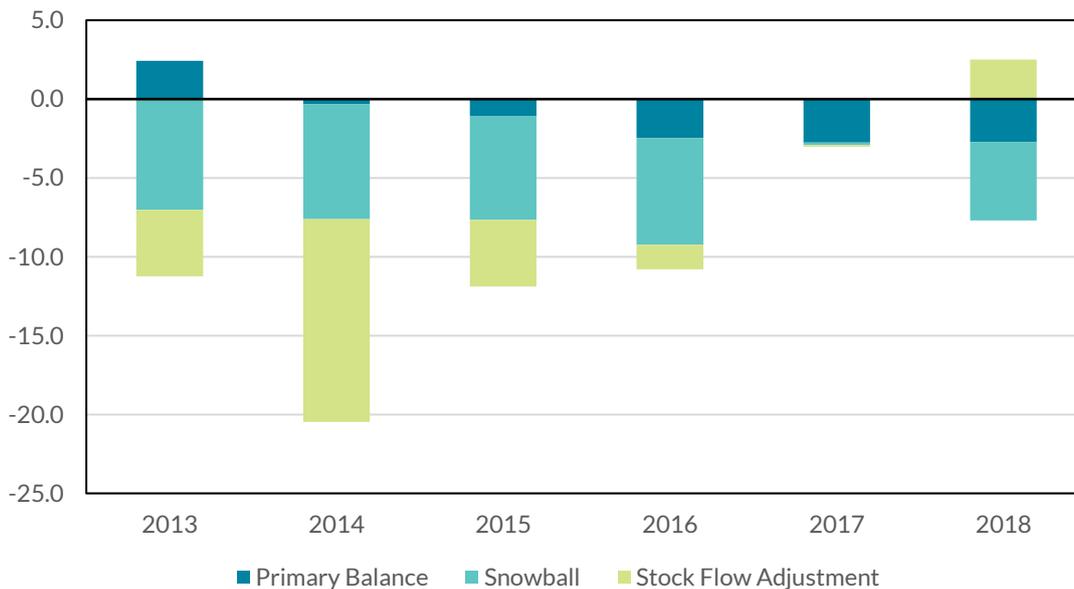
Source: Eurostat, Central Statistics Office

When assessing the risks presented by public debt it is important to also consider the structure of the debt stock. The National Treasury Management Agency (2019) has used the period of low sovereign interest rates to lengthen maturities, lower interest costs and repay

³ Modified gross national income, or GNI*, is an indicator that was recommended by the Economic Statistics Review Group. For more on the Economics Statistics Review Group see ESG (2016). For a more detailed look at how GNI* is calculated see Lane (2017).

relatively higher interest IMF loans early. The weighted average maturity of 9.6 years in Ireland is one of the longest in Europe; the euro area average, by comparison, is 7.4 years. The cost of servicing the debt, meanwhile, has consistently been lower than anticipated. The Department of Finance (2019) shows that the effective interest rate was at its lowest level in 2017 since 1996. Looking more specifically at the composition of the debt stock, more than half is financed by fixed-rate government bonds, reducing the potential impact of an interest rate shock. However, over 60 per cent of the debt is held by non-residents which increases funding vulnerability, particularly in the event of a negative shock such as a no-deal Brexit.

Figure 2: Decomposition of change in Irish debt to GNI* ratio since end-2012



Source: Eurostat, Central Statistics Office, Central Bank of Ireland calculations

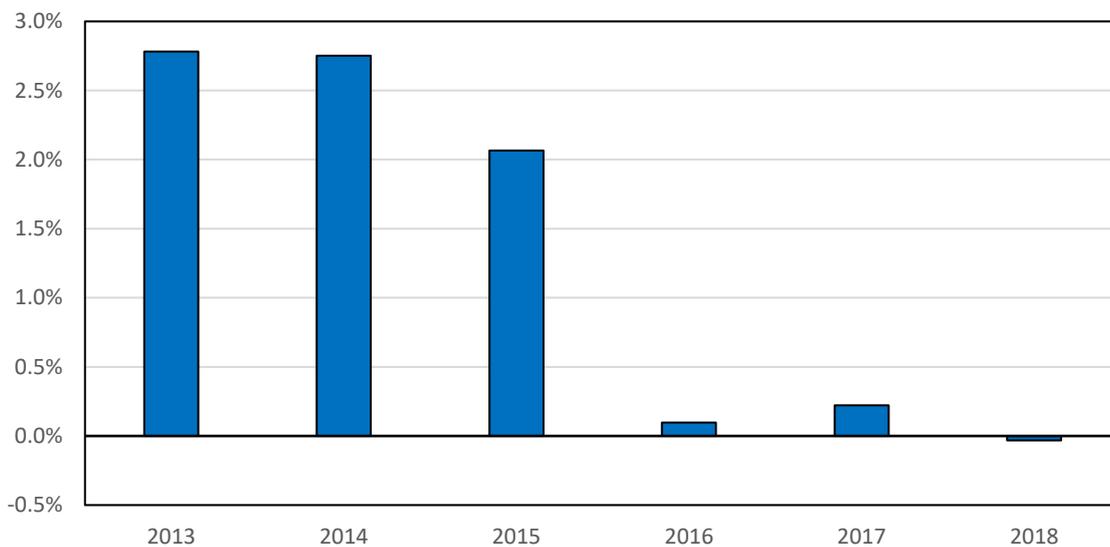
2.2 Decomposing the Change in Debt since end-2012

Figure 2 decomposes changes in the debt-to-GNI* ratio into its key drivers: the primary budget balance, snowball effect (or interest-growth differential) and the stock-flow adjustment. Running a primary budget surplus, and having stronger nominal income growth than interest rates on the national debt lead to favourable debt dynamics. The stock-flow adjustment (SFA), meanwhile, reflects factors that affect debt but are not included in the budget balance such as the sale of financial assets.⁴ More than half of the 62 per cent decline in the debt to GNI* ratio that has occurred since end-2012 has been due to a favourable snowball effect, with a further third due to a net positive SFA. Taking a closer look at the components of the snowball effect, annual nominal GNI* growth has averaged 7½ per cent

⁴ The stock-flow adjustment (also known as the deficit debt adjustment) is a residual term which takes into account changes in the stock of outstanding debt that arise for reasons unrelated to the deficit in a period. The SFA captures factors such as valuation (including exchange rate) effects, cash versus accruals accounting, privatisation receipts and in Ireland's case the unwinding of Irish Bank Resolution Company.

in this period, compared to an implied interest rate of 3¼ per cent on the national debt.⁵ The differential is considerably stronger than the longer-term average of 2 per cent (reflecting average GNI* growth of 6¼ per cent since 1995 and an average implied interest rate of 4¼ per cent). With regard to the SFA, this period has coincided with a significant recovery of revenues from the sale of financial sector assets and also the impact of the winding down of Irish Bank Resolution Corporation (in particular during 2014).⁶ The reduction in government cash balances has also had a net favourable impact, despite an increase in liquid assets driving a positive SFA in 2018. The primary balance has been in surplus since 2014. As Figure 3 shows, however, the pace of improvement in the primary balance ratio has stalled notably in recent years.

Figure 3: Change in underlying primary budget balance as percentage of GNI*



Source: Central Statistics Office

3. Irish Developments in a Euro Area Context

A number of countries in the euro area experienced sharp increases in their debt ratio in the late 2000s, while others entered the crisis with already elevated levels of government debt. As a result, we identify six countries as being ‘high debt’ at end-2012, the year that the Irish debt to GNI* ratio peaked.⁷ Amongst these countries, Ireland was the only one to show a notable decline in its debt ratio by 2018 (see Figure 4). In some – Greece and Italy for

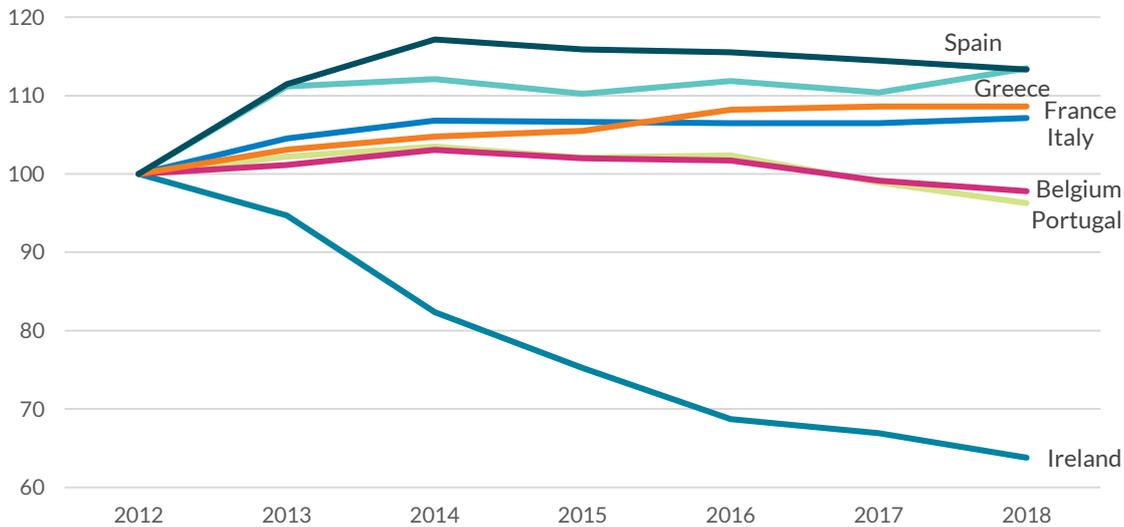
⁵ The implied interest rate on the national debt is calculated as interest payment (t) / stock of national debt (t-1)

⁶ For a more detailed look at the impact financial sector support measures have had on General Government debt see Hickey et al (2017).

⁷ We define a ‘high debt country’ as one that had a debt ratio of 90 percent or higher at end-2012. There were six of these in 2012 – Ireland, Greece, Portugal, Italy, Belgium and France – and Spanish debt had also surpassed this threshold by 2018. We identify a ‘medium debt country’ as one with a debt ratio of between 60 and 90 per cent and a ‘low debt country’ as one with a debt ratio below 60 per cent. For all countries, with the exception of Ireland, we use debt as a percentage of GDP.

example - the debt ratio was higher in 2018 than it was six years earlier, while in others - Belgium and Portugal - the position was broadly stable.

Figure 4: Change in debt to GDP ratio in euro area high debt countries (2012 = 100)



Source: Eurostat

Note: Irish figure is debt to GNI*

Table 1 examines why the Irish experience differed so significantly, decomposing the change in the debt ratio in each country into the three components introduced in Section 2. During this period, the debt position in most of the countries benefited from the running of primary surpluses. Greece (particularly since 2015) and Italy ran substantial primary surpluses during the period in question. It is in the other two components that Ireland stands out. The snowball effect for Ireland is significantly stronger than for other countries – the next closest being Malta. Growth is the key driver of the differential, as interest rates were modestly higher than the euro area average (see Figure 5) during this period.⁸ As we are using the debt to GNI* ratio in the Irish case, the extremely strong 2015 GDP growth rate is not affecting these figures. The favourable DDA impact in Ireland also stands out. While five of the seven high debt countries have experienced supportive stock flow adjustments in recent years, these are considerably lower relative to those in Ireland. The favourable SFA impact in Ireland is almost three times the next highest supportive contribution, in the Netherlands.

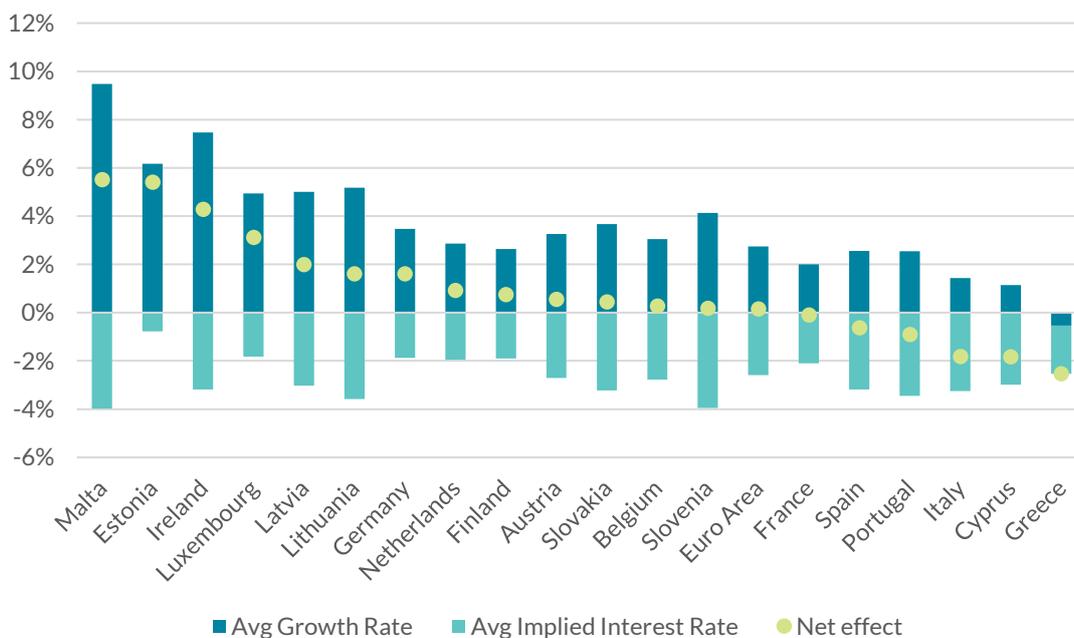
⁸ For a more detailed discussion on the latest policy debate around interest - growth differentials see ECB (2019). Its conclusion is that 'in the euro area, the current low interest rate-growth differentials on government debt should not be taken as an incentive for higher debt levels, especially where fiscal space is constrained'.

Table 1 – Change in government debt ratios in euro area countries, 2012 to 2018

	Debt 2012	Debt 2018	Change	Primary Balance	Snowball Effect	Stock Flow	
Ireland (GNI*)	166	104	-62	-7	-34	-20	
Greece	160	181	+22	-1	+27	-4	
Portugal	126	121	-5	-4	+3	-4	
Italy	123	132	+9	-9	+14	+4	
Belgium	104	102	-2	-5	+1	+1	
France	91	98	+8	+9	+1	-1.5	
Spain	86	97	+11	+10	+3	-2	
Austria	82	74	-8	-5	-2	-1	
Germany	81	61	-20	-13	-7	0	
Cyprus	80	103	+22	+1	+10	+12	
Malta	68	46	-22	-15	-18	+11	
Netherlands	66	52	-14	-3	-3	-8	
Finland	54	59	+5	+5	-3	+3	
Slovenia	54	70	+16	+8	-2	+10	
Slovakia	52	49	-3	+2	-1	-4	
Latvia	42	36	-6	-1	-5	0	
Lithuania	40	34	-6	-6	-4	+4	
Luxembourg	22	21	-1	-12	-4	+15	
Estonia	10	8	-1	0	-3	+1	

Source: Eurostat, Authors' calculations

Figure 5: Average GDP growth and implied interest rates in euro area countries 2013 to 2018



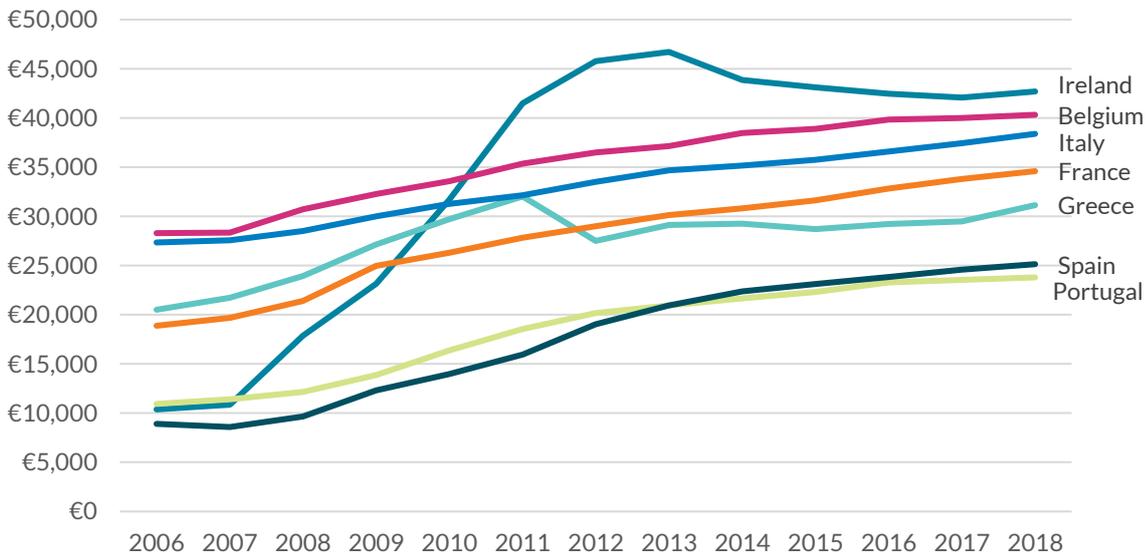
Source: Eurostat – implied interest rate on debt stock = interest payments (t) / debt stock (t-1)

Note 1: Irish figure is debt to GNI*.

Note 2: The implied interest rate is shown as a negative figure in the Chart reflecting the negative impact it has on the snowball effect. In the Irish case the implied average interest rate is actually a positive 3.2 per cent.

Figure 6 compares gross General Government debt *per capita* amongst the ‘high debt’ countries. This illustrates the considerable increase in debt per capita that occurred in Ireland following the financial crisis. Irish government debt per capita has almost doubled in the past 10 years and is higher than that in any of the other ‘high debt countries’, with Belgium being the only other of these economies to surpass the €40,000 mark.

Figure 6: Gross General Government debt per capita, 2006 to 2018 (€ per capita)



Source: Eurostat

This section has highlighted that Irish debt remains high relative to other euro area economies. The factors that have driven the improvement in the debt ratio in recent years are also exceptional when viewed from a euro area standpoint. The sustainability of the public finances must therefore be sufficiently robust to withstand sudden changes in the economic and financial environment. This suggests a bigger role for the primary balance in supporting favourable debt dynamics in the future.

4. Modelling Risks to the Public Finances

In this section, we use the Central Bank’s macroeconomic model (COSMO) to consider the effect on the public finances if a number of macroeconomic risks currently facing the Irish economy were to materialise. In the first scenario, we illustrate the effect of a disorderly Brexit on the deficit and debt. The second scenario examines the possible impact on the public finances if there is a decline in Irish corporation tax revenue accompanied by a generalised slowdown in the international economy.

As with any modelling exercise of this kind, there are a number of important assumptions underpinning the analysis. In order to isolate the effect of the scenarios on the public finances, we assume that the government does not take any corrective fiscal action in response to the shocks. The scenario results therefore show the effect on the public finances

if these shocks materialise and the government deficit and debt is allowed to vary in line with the normal operation of the automatic stabilisers.⁹ In the case of the disorderly Brexit scenario, we do not include any increase in government expenditure on mitigation measures for affected sectors.

We also assume that there is no link between changes in the General Government deficit or debt and the interest rate on Irish debt.¹⁰ It is possible that a severe deterioration in the public finances could lead to an increase in sovereign borrowing costs due to a rise in the risk premium on Irish debt, as took place during the 2008 economic and financial crisis. If this occurred in response to future negative shocks, the impact on the public finances of the scenarios we examine below would be even more severe than reported here.

For the two scenarios we examine, we show the effect on the public finances relative to a base case where these shocks do not materialise. Under our baseline scenario – which sees the General Government balance improve to a surplus of around 1 per cent of GNI*, before stabilising at that level over the medium term – public debt continues its gradual improvement in the coming years. From an outturn of 104 per cent of GNI* in 2018, the gross debt ratio is projected to fall to 78 per cent by 2025 (45 per cent as a percentage of GDP, highlighting once again the inadequacy of this measure in the Irish case). The baseline incorporates the deficit-debt adjustment outlined in April's SPU, meaning no assumption is made on when the government divests its shares in the banking sector. The contributions to the improvement from both this SFA and the snowball effect are notably lower than the role they have played over the past five years (-7.2 per cent combined compared to -42 per cent over the period 2014 to 2018). The pace of improvement in the baseline scenario would be sufficient to see Ireland overachieve the debt rule using either ratio.

4.1 Scenario 1: A Disorderly Brexit

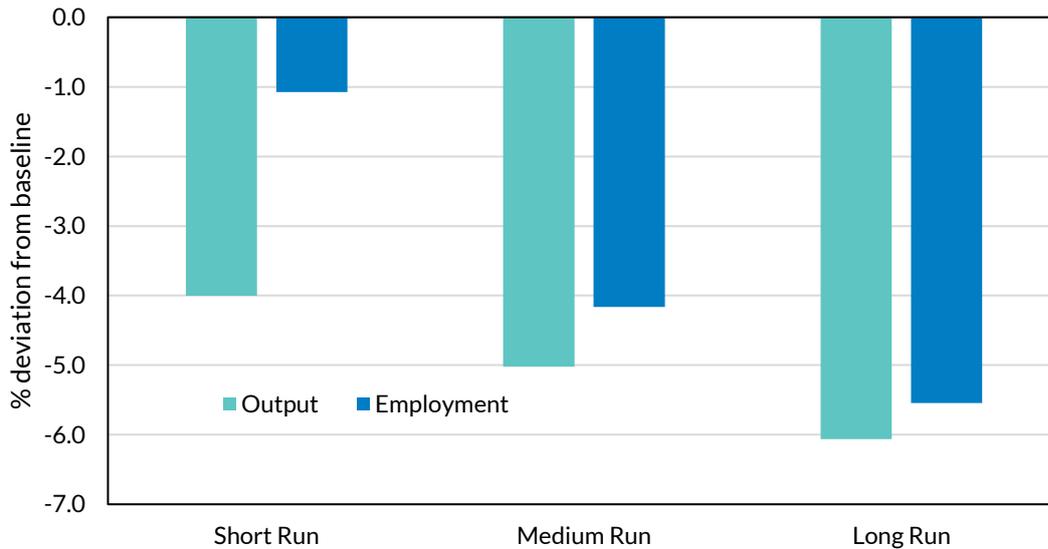
The potential macroeconomic implications of a disorderly Brexit for the Irish economy are outlined in Conefrey *et al.* (2019). Bearing in mind the uncertainties in estimating the impact of this unprecedented scenario, the results indicated that a disorderly Brexit would have significant negative implications for output and employment. There would be reductions in consumer spending and investment due to heightened uncertainty and a decline in sentiment. Imports and exports would be affected by the imposition of tariffs, lower demand from the UK and possible supply-chain disruption. It is also likely that there

⁹ The automatic stabilisers refer to features of the tax and spending system which react automatically to the economic cycle and reduce its fluctuations. As a result, the budget balance in per cent of national output tends to improve in years of high growth and deteriorate during economic slowdowns.

¹⁰ Corsetti *et al.* (2012) present evidence of a non-linear relationship between risk premia and expected debt levels. There is limited empirical research for Ireland on the relationship between government indebtedness and debt and the risk premium. FitzGerald *et al.* (2013) develop a calibration of the risk premium as a function of government borrowing and government debt. In their debt sustainability analysis, Department of Finance (2019) assume that each 1 percentage point deterioration in the primary budget balance adds 10 basis points to the effective interest rate.

would be a deterioration in financial market conditions along with a fall in the value of sterling. Putting these effects together, our estimates suggest that a disorderly Brexit would reduce the level of output in the Irish economy by around 4 per cent in the short run and by 6 per cent after 10 years. The labour market would also be negatively affected with a fall in employment and the unemployment rate would rise by over 2 percentage points in the long run (Figure 7).

Figure 7: Effect on Output and Employment of a Disorderly Brexit



Source: Simulation results from Conefrey et al. (2019).

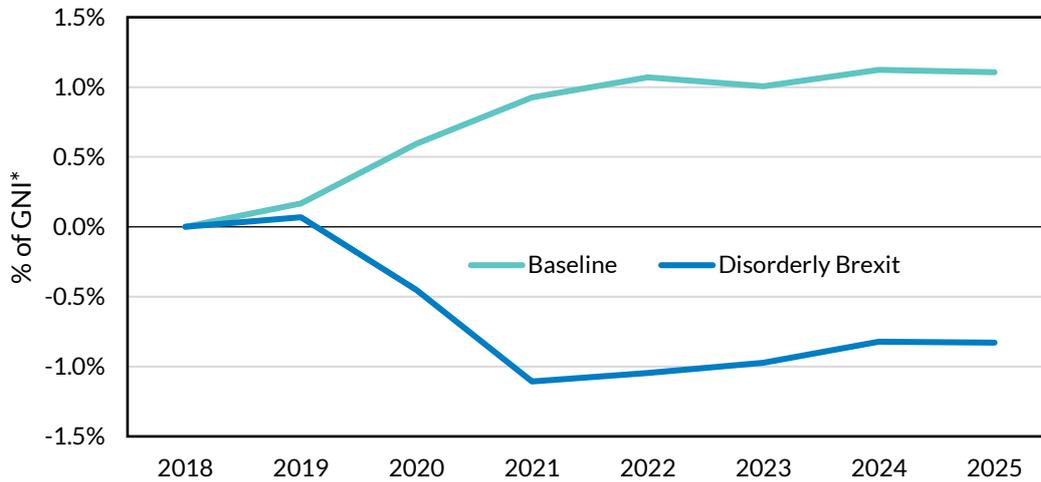
The scale of these effects on output and employment mean that a disorderly Brexit would have significant knock-on implications for the public finances. The decline in economic activity and weaker labour market conditions would reduce government tax revenue from a range of sources. The increase in unemployment would lead to higher spending on unemployment-related benefits while expenditure on debt interest payments would also rise. In the absence of any offsetting corrective fiscal measures by the government, our estimates indicate that the General Government balance would worsen by around 2 percentage points of output in the long run (Figure 8).¹¹

With larger annual deficits (smaller surpluses) and lower output, a disorderly Brexit would result in a higher General Government debt-income ratio compared to a no-Brexit case. Figure 9 below shows the path of the General Government debt in a disorderly Brexit and in a no-Brexit baseline. In a disorderly Brexit, the debt-income ratio would stabilise at a higher level out to 2023 before starting to decline thereafter. As a result, by 2025 the debt-to income ratio would increase by around 17 percentage points, with nominal debt approximately €22 billion higher than the baseline. The persistence of a debt-to-income

¹¹ The model results do not take into account any potential revenue gain from the imposition of tariffs.

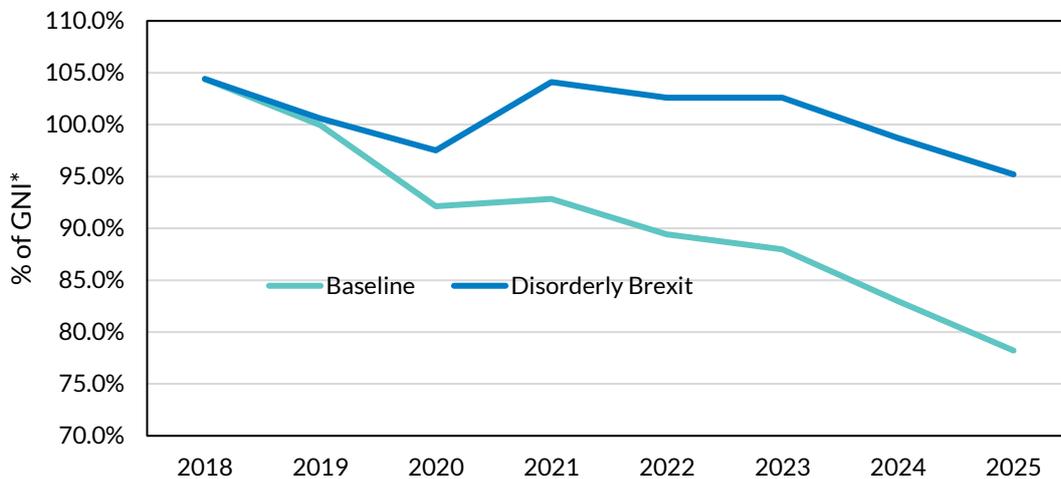
ratio of greater than 90 per cent into the middle of the next decade would increase the vulnerability of the Irish economy and public finances to further shocks. There would also be an additional direct burden on the economy owing to the cost of financing a higher level of debt.

Figure 8: General Government Balance in a Disorderly Brexit, % of GNI*



Source: Authors' calculations based on COSMO.

Figure 9: General Government Debt in a Disorderly Brexit, % of GNI*



Source: Authors' calculations based on COSMO.

4.2 Scenario 2: Corporation Tax Decline and an International Slowdown

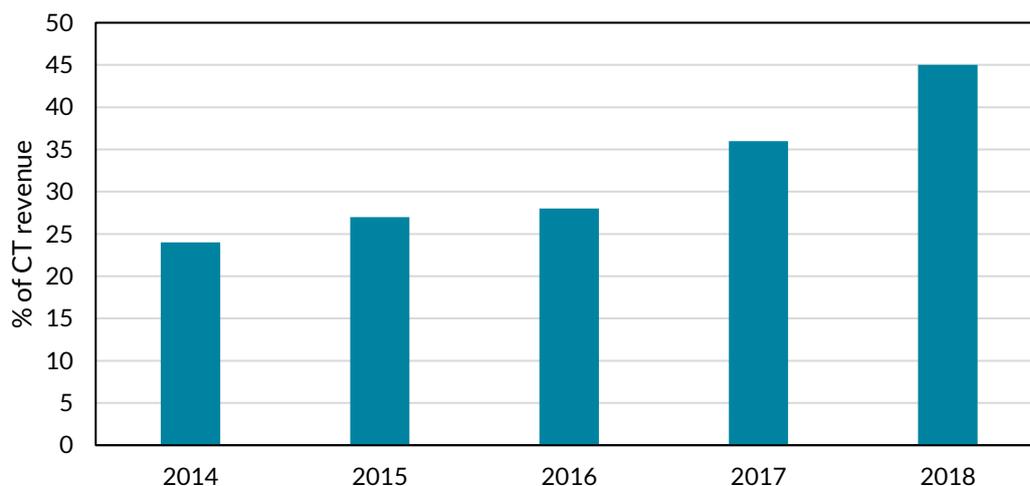
The most notable development in the public finances in recent years has been the exceptional growth in corporation tax revenues. Between 2014 and 2018, corporation tax revenue increased by 125 per cent, driving around 40 per cent of overall tax revenue growth. This rise in corporation tax receipts significantly exceeded the rate of growth in

underlying economic activity and was substantially larger than expected by the Department of Finance. Forecasts at the time of Budget 2015 anticipated corporation tax receipts would be close to €5 billion by 2018; the actual outturn was double this.¹²

Several characteristics of Ireland’s corporation tax intake have led to concern over the sustainability of the recent increases. Corporation tax receipts in Ireland have become even more concentrated: in 2018 the top ten tax payers account for over 40 per cent of CT revenue (Figure 10). In addition, corporation tax is a volatile tax heading and is prone to unexpected and sometimes large changes (See IFAC, 2019 and Hickey and Kane, 2019).

Added to these well-known concentration and volatility risks is the considerable uncertainty over the sustainability of the increases in corporation tax revenue since 2015. Revenue (2016) and Coffey (2019) identified a number of factors behind the 50 per cent increase in CT revenue in 2015 but there remains uncertainty over the precise drivers of the growth in CT revenue over recent years and how Ireland’s corporation tax take may be affected by reforms at EU and at a global level.

Figure 10: Proportion of Corporation Tax Paid by Top 10 Payers



Source: Revenue Commissioners, authors' calculations.

Weighing up these different elements, there is a clear risk that part of Ireland’s current CT revenue may not be sustainable over the long term. It is difficult to estimate the portion of current CT receipts that may be at risk, however, some insights are available from existing analysis and other benchmarks:

- An estimate of the amount of CT revenue at risk can be obtained by comparing the actual level of CT revenue in 2018 to a forecast for CT based on a measure of underlying economic growth (GNI*). Using this approach, the level of CT revenue

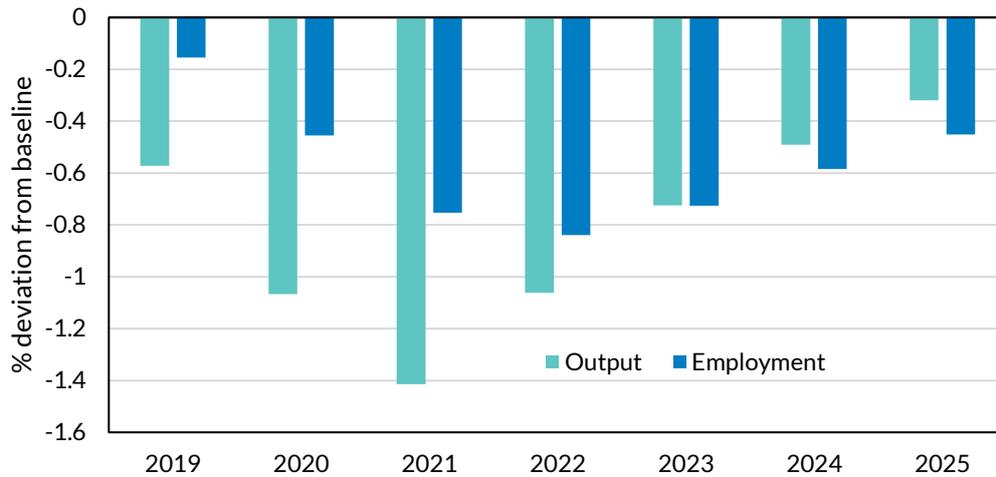
¹² See IFAC (2019) Box B: Dealing with the economic and fiscal impact of surging corporation tax receipts.

in 2018 was around €4 billion higher than the level that would have been realised had corporation tax grown in line with modified GNI (GNI*).

- Corporation tax receipts accounted for 18.7 per cent of overall Exchequer tax revenue in 2018, its highest ever proportion of overall revenue. Over the period 1990-2017, corporation tax accounted for 12.5 per cent of overall revenues. If the proportion of corporation tax in overall revenues in 2018 had matched its long-run average (12.5 percent), the CT yield would have been around €3.5 billion lower than the actual outturn.
- IMF (2019) estimate the amount of CT revenue at risk as being within the range of 1.1 to 1.8 per cent of GNI* in 2018, corresponding to €2.2-3.6 billion. The estimate is based on two approaches: the relative share of gross profits in gross value added (GVA) of the non-financial sector (NFS) compared to Ireland's peers and a measure of imputed underlying gross profits (including the financial sector) based on their past growth.
- IFAC (2019) estimate the "excess" corporation tax receipts in 2018 as being within the range €3-€6 billion based on a range of different approaches.

For this scenario, we assume that there is a permanent €3 billion reduction in CT revenues from 2019. This figure is at the lower end of the range of estimates outlined above and, as a result, can be considered conservative. The reduction in CT revenue is an exogenous shock not linked to developments in the underlying economy, but rather can be viewed as a reversal of some of the unexpected increase that has taken place since 2015. We combine this CT shock with a temporary three-year slowdown in the international economy. This represents a generalised deterioration in the external environment for Ireland, which could come about, for example, due to an escalation of current trade tensions. It is important to note that while the shocks occur at the same time, the exogenous CT reversal and the international slowdown are assumed to be unrelated.

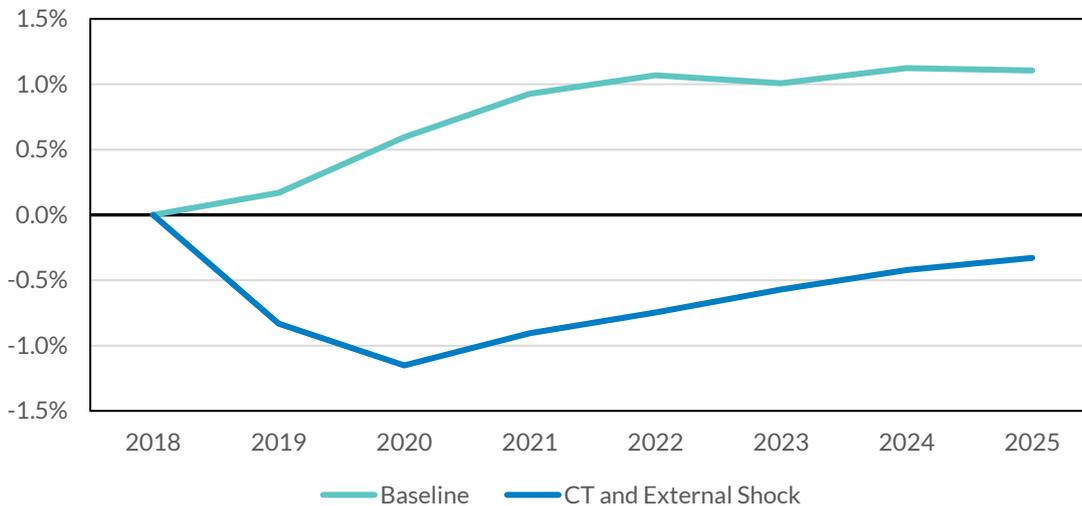
Figure 11: Response of Output and Employment to External Demand Shock



Source: Authors' calculations using COSMO.

Output and employment are negatively affected only by the decline in external demand. As shown in Figure 11, by 2025 the level of output is around 0.8 per cent lower and the level of employment around 0.3 per cent lower following the temporary weakening of the international economy. This adverse shock is transmitted to the Irish economy through lower output and exports in the tradable sector.

Figure 12: General Government Balance (% of GNI*)

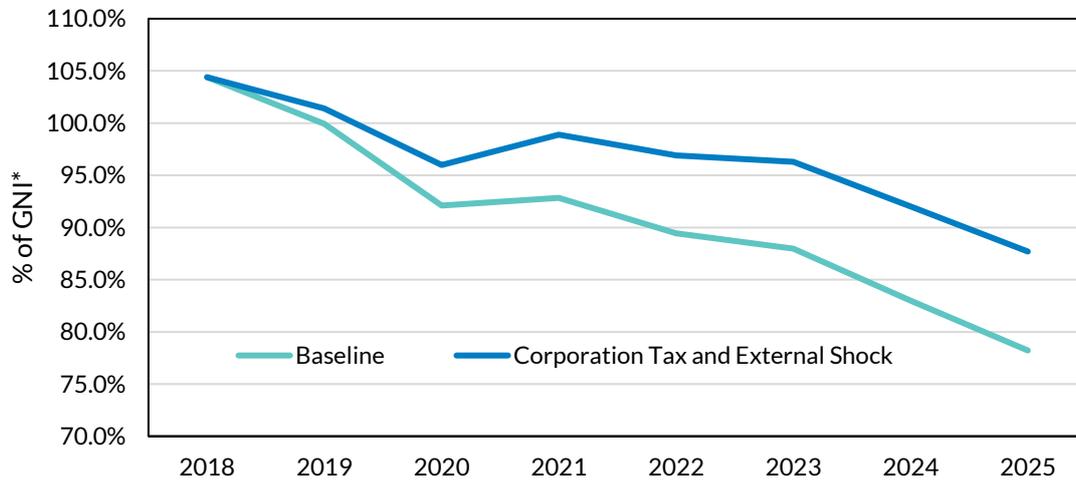


Source: Central Bank of Ireland

The negative shocks to corporation tax revenues and the international economy would have significant adverse implications for the public finances. Overall government revenue would be reduced directly via the loss of corporation tax revenue and indirectly due to slower economic growth from weaker external demand. As a result, the General Government balance would deteriorate by around 1½ per cent of output over the medium term (Figure 12). Applying this deviation to our baseline projection implies that the public

finances would remain in deficit out to 2025 if this shock materialised. The cumulative effect of larger government deficits would result in an increase in the debt. As shown in Figure 13, the General Government debt-to-output ratio would be around 10 percentage points higher than in the baseline by the middle of the next decade.

Figure 13: General Government Debt with Corporation Tax and External Shock, % of GNI*



Source: Authors' calculations based on COSMO.

5. Conclusion

In this *Economic Letter*, we assess developments in Irish government debt since the 2008 crisis and examine the exposure of the public finances to adverse shocks. Significant improvements in the State's fiscal position since 2013 have contributed to a decline in Ireland's debt ratio. Exceptionally low interest rates, rapid economic growth and once-off factors have been the main drivers of the decline in the debt-to-GNI* ratio. Underlying improvements in the fiscal position have played a smaller role. In particular, the improvement in the primary (non-interest) budget balance has stalled since 2016, with the majority of the fall in the debt-to-income ratio being driven by the strong cyclical upswing in economic growth.

The current macroeconomic environment facing the Irish economy is unusually uncertain. Although central forecasts are positive, the balance of risks to those projections is firmly weighed to the downside. Our analysis examines the effect on the government debt of two key risks currently facing the economy. A disorderly Brexit or a loss of corporation tax revenue accompanied by a slowdown in the international economy would both result in a material increase in the government debt. If either risk materialised, our estimates suggest that the government debt-to-income ratio could increase by between 10 and 20 percentage points above current central projections, leaving the level of the debt ratio in both scenarios greater than 90 per cent well into the middle of the next decade. The two scenarios we consider are modelled separately – in reality economic shocks can sometimes occur

simultaneously. If this materialised, the effects on the economy and public finances would be magnified compared to the results we report.

These results highlight the continued vulnerability of the public finances to negative growth and other shocks. To protect the hard-won improvements in the State's finances achieved since 2013 and to safeguard Ireland's long-run debt sustainability, reducing the public debt to safer levels should remain a key priority. One concrete way to lower the debt burden would be to use any windfall fiscal revenues for debt reduction (Conefrey *et al.*, 2019). This applies in particular to corporation tax given the uncertainty over the sustainability of the increases in revenues since 2015. Unexpected gains from this source should be saved rather than used to fund long-lasting spending commitments. This principle is recognised in recent publications from the Department of Finance and, if incorporated into future budgetary decisions, would help put the public finances on a sounder footing.

6. References

Blanchard, O. 2019, "Public Debt and Low Interest Rates." AEA Presidential Lecture January 2019. Available at:

https://www.aeaweb.org/aea/2019conference/program/pdf/14020_paper_etZgfbDr.pdf

Conefrey, T., O'Reilly, G. and Walsh, G. 2019. "Fiscal Windfalls: A Model-Based Analysis." Central Bank Economic Letter No. 3. Available at:

[https://www.centralbank.ie/docs/default-source/publications/economic-letters/vol-2019-no-3-fiscal-windfalls-a-model-based-analysis-\(conefrey-o-reilly-and-walsh\).pdf?sfvrsn=10](https://www.centralbank.ie/docs/default-source/publications/economic-letters/vol-2019-no-3-fiscal-windfalls-a-model-based-analysis-(conefrey-o-reilly-and-walsh).pdf?sfvrsn=10)

Corsetti, G., Kuester, K., Meier, A. and Müller, G.J. (2013), "Sovereign Risk, Fiscal Policy, and Macroeconomic Stability", *The Economic Journal*, Volume 123, Issue 566, February 2013, Pages F99–F132.

Coffey, S. (2019), "Recent Trends and Causes of Irish Corporation Tax Revenues." Presentation to Nevin Economic Research Institute, January 2019. Available at:

<https://www.nerinstitute.net/events/2019/01/30/neri-seminar-dublin-recent-trends-and-causes-of-ir/>

Department of Finance (2018), "Annual report on public debt in Ireland." September 2018. Available at: [https://assets.gov.ie/4274/111218115438-](https://assets.gov.ie/4274/111218115438-102376301fd948c2b20e3449111eff54.pdf)

[102376301fd948c2b20e3449111eff54.pdf](https://assets.gov.ie/4274/111218115438-102376301fd948c2b20e3449111eff54.pdf)

Department of Finance (2019), "Annual report on public debt in Ireland." August 2019.

Available at: <https://assets.gov.ie/24583/7ce725b34d7743d793bd98a0122d40ce.pdf>

ECB (2019), "Interest rate growth differential and government debt dynamics." ECB Economic Bulletin Issue 2/2019, Box 6.

ESRG (2016), "Report on the Economic Statistics Review Group." December 2016.

FitzGerald, J., and Kearney, I. (2013), "Medium-Term Review 2013-2020." Economic and Social Research Institute, MTR No. 12.

Hickey, R., Kane, L. and Smyth, D. (2017), "The impact of financial sector support on the public finances in Ireland and the EU." Central Bank of Ireland Economic Letter series, Volume 2017 No. 12

Hickey, R., and Kane, L. (2019), "The role of Corporation Tax in driving Irish Tax Growth, 2015-2018." Quarterly Bulletin 2 April 2019, Box E. Available at: <https://www.centralbank.ie/docs/default-source/publications/quarterly-bulletins/boxes/box-e-the-role-of-corporation-tax-in-driving-irish-tax-growth-2015-2018.pdf>

IFAC (2019), "Fiscal Assessment Report June 2019." Available at: <https://www.fiscalcouncil.ie/wp-content/uploads/2019/06/Full-Draft-Fiscal-Assessment-Report-June-2019..pdf>

IFAC (2018), "Fiscal Assessment Report November 2018." Available at: <https://www.fiscalcouncil.ie/wp-content/uploads/2018/11/Fiscal-Assessment-Report-November-2018-Final.pdf>

IMF (2019), "Staff Report for the 2019 Article IV Consultation." Available at: <https://www.imf.org/en/Publications/CR/Issues/2019/06/14/Ireland-2019-Article-IV-Consultation-Press-Release-Staff-Report-and-Statement-by-the-46994>

Lane, P. (2017), "The treatment of global firms in national accounts." Central Bank of Ireland Economic Letter series, Volume 2017 No. 1.

NTMA (2019), "Ireland: Growth momentum but risks on the horizon." May 2019.

Revenue (2016), "An Analysis of 2015 Corporation Tax Returns and 2016 Payments." Available at: <https://www.revenue.ie/en/corporate/documents/research/corporation-tax-returns-2016.pdf>