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Managing the Public Finances in Uncertain Times

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Abstract

The pandemic had a major impact on the public finances, resulting in an exceptional €27 billion increase in government spending up to 2021 and adding to the national debt. As the pandemic has abated, the public finances have recovered quickly. The war in Ukraine presents fresh challenges, with high inflation and new expenditure pressures adding to existing demands on the public finances. Against a backdrop of supply-side constraints and with large increases in capital spending already planned out to 2025, the analysis here shows that additional permanent current spending funded by borrowing would add to inflationary pressures and slow down the projected recovery in the public finances. These effects would be mitigated if the spending was funded by raising revenue. Lower corporation tax revenue, higher interest rates and slower growth would result in the persistence of more elevated government debt over the medium term. In the current high-inflation environment, careful management of the public finances is required to ensure sustainable economic growth and to rebuild resilience in the government's finances following successive negative shocks.

¹ Irish Economic Analysis Division. We would like to thank Mark Cassidy, Daragh Clancy, David Cronin, Giuseppe Corbisiero, Sharon Donnery, Robert Kelly, Martin O'Brien, Gerard O'Reilly (CBI) and David Purdue (NTMA) for comments. The views expressed in this Article are those of the authors and do not necessarily reflect those of the Central Bank of Ireland or the European System of Central Banks.

1. Introduction

As the pandemic has abated and the economy reopened, the public finances have improved rapidly, driven by strong growth in government revenue and reductions in pandemic-related expenditure. Just as pandemic-related pressures have subsided, the war in Ukraine is presenting new challenges. Higher inflation, while benefiting nominal tax revenue, is resulting in slower than expected real economic growth and adding to existing expenditure pressures given the need to assist those most affected by rising prices.² Following five years when borrowing costs for the government were at historically low levels, interest rates have started rising again, influenced by the more uncertain economic outlook and the normalisation of monetary policy.

Against this challenging backdrop, this *Article* examines the implications for the public finances and the economy over the medium term of a number of possible fiscal and economic risks. Since 2020, government expenditure on measures to address the pandemic, cost of living supports and the humanitarian response to the Ukraine crisis has amounted to over €35 billion. A significant proportion of this additional expenditure has been temporary and has already reduced. However, although intended to be temporary, there is a risk that some of the spending introduced since 2020 could prove more long-lasting, such as higher spending in the health area following the pandemic. In addition, excluding temporary measures, underlying core expenditure has also grown strongly in recent years. At the same time, current supply-side constraints mean that increases in demand from expansionary fiscal measures risk adding further to inflationary pressures. As well as through borrowing, part of the increase in expenditure in response to the pandemic was funded using the resources in the Rainy Day Fund.³ With no contributions to the fund since 2019, it has now been exhausted.

Our analysis examines the impact on the deficit, debt and economic activity of a further permanent rise in current government expenditure on top of the plans as set out in Stability Programme

² In May 2022, HICP inflation stood at 8.3 per cent on an annual basis. The equivalent figure for May 2021 was 1.9 per cent.

³ As part of Budget 2021 the Government decided to withdraw the full €1.5bn value in the National Surplus (Exceptional Contingencies) Reserve Fund – better known as the ‘Rainy Day Fund’ – to part finance exceptional Covid-19-related expenditure.

Update 2022 (*SPU 2022*). We examine how the effect on the economy and public finances would vary depending on whether the additional expenditure is funded by raising revenue or by an increase in debt, taking into account the current economic context. In relation to risks to government revenue, we examine the impact of a permanent loss of corporation tax along with a slowdown in international growth. As outlined elsewhere in this *Bulletin*, the widespread surge in inflation is leading all major central banks to normalise their monetary policy stance, which had reached unprecedented degrees of accommodation in response to the large negative shock of the Covid-19 pandemic.⁴ With borrowing costs rising, we assess the effect on the economy and the government finances of an increase in interest rates in excess of the path currently expected by financial markets. The results from these scenarios are conditional on the specific shocks considered. To account for a range of all feasible risk scenarios for key variables such as growth and interest rates, a stochastic debt sustainability analysis (DSA) is presented to illustrate the uncertainty around central projections for the debt-to-GNI* ratio over the longer term.

The analysis is organised as follows. Section 2 provides an overview of key changes in government expenditure, revenue and debt since before the pandemic in order to identify key risks to the public finances for the coming years. This section also outlines the operation of the State's rainy day fund (RDF) since its establishment and assesses the government's medium-term expenditure rule. Section 3 contains scenario analysis illustrating the impact on the economy and public finances of a number of potential negative shocks. Section 4 concludes.

2. Recent Performance of the Public Finances

2.1 Developments in General Government Expenditure

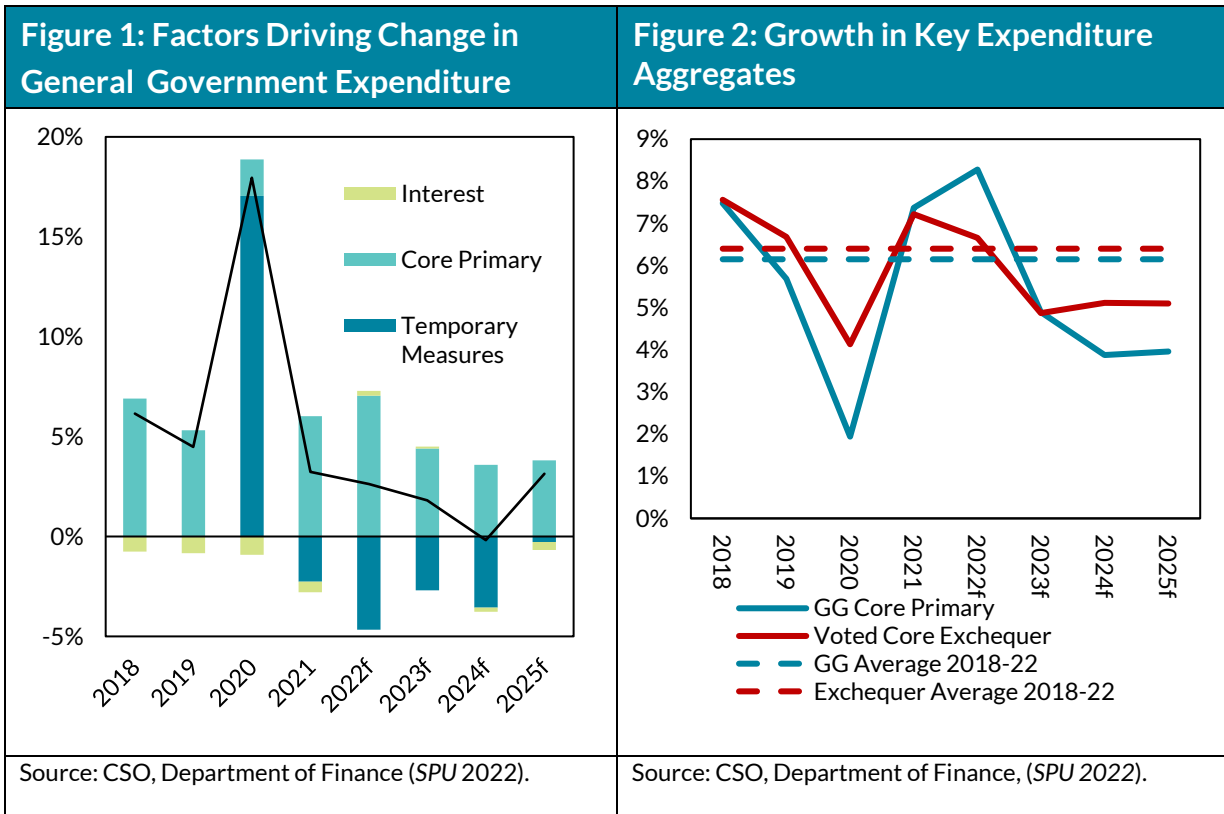
Irish government expenditure has been heavily influenced in recent years by the response to the Covid-19 pandemic, and temporary measures will continue to play an important role in the evolution of spending over the medium term. Following an average increase of 5

⁴ See Box B "Developments in Monetary Policy and the International Economic Outlook" in the main Chapter of this *Quarterly Bulletin*.

per cent in 2018-19, General Government expenditure grew by 18 per cent in 2020 as €15bn of supports were introduced to mitigate the impact of the pandemic on households, firms and the wider economy. The process of withdrawing these supports began last year, but total General Government spending continued to increase - by 3.2 per cent - reflecting strong growth in 'core' or permanent expenditure. The Department of Finance anticipates that these broad trends - declining temporary spending outweighed by increasing permanent spending - will continue to drive the evolution of government expenditure over the medium term (see Figure 1). These projections for expenditure on a General Government basis are underpinned by 5 per cent growth in core voted Exchequer spending in 2024 and 2025, consistent with the Department's Medium Term Expenditure Framework (described in more detail in Box 1).⁵ Such growth would be lower than that experienced by the Exchequer in recent years, with average growth of 6.4 per cent expected to occur over the five years to 2022 (see Figure 2).⁶

⁵ The Central Fund, or Exchequer, is the main treasury account held by the Irish Government at the Central Bank of Ireland. All government receipts and expenditures, unless otherwise determined by law, are recorded in the Central Fund on a cash basis. The difference between receipts and expenditures is called the Exchequer balance. The General Government balance (sometimes referred to as the government deficit) is a broader accrual based measure of the fiscal position on an accruals basis, for the whole of government, than the cash based Exchequer balance. It takes account of other agencies and bodies that sit outside the Exchequer giving a more complete picture of a government's fiscal performance. It is the main internationally recognised government accounting aggregate.

⁶ The forecast increase in core Exchequer expenditure for 2023 of 5 per cent contained in *SPU 2022* was revised up to 6.5 per cent in *SES 2022*.



A number of different temporary spending measures are currently included in the Government’s budgetary projections for the 2022-25 period. These need to be distinguished from permanent or core spending as they should unwind over time and, therefore, are not currently intended to have a permanent impact on the expenditure base. Alongside temporary measures linked to the Covid-19 pandemic, recent months have seen the Government introduce temporary spending to mitigate the impact of high energy prices on households and firms and to provide humanitarian support for Ukrainian refugees. There are also temporary spending increases linked to Next Generation EU receipts, although given that these are fully financed by EU grants they should have a neutral impact on the budget balance. Table 1 outlines the temporary spending measures introduced since 2020 and the Department of Finance projections for this expenditure over the medium term from *SPU 2022*. Latest estimates from the CSO suggest that Covid-19 expenditure totalled €27.1bn (12.5 per cent of GNI*) in 2020-21 with two-thirds of this reflecting the main income support schemes, that is the Employment Wage Subsidy Scheme and the Pandemic Unemployment Payment. The large Covid-19 Contingency Reserve that was included in Budget 2022 is expected to finance income support measures and

humanitarian support costs this year, while a €3bn (1.2 per cent of GNI*) contingency is provided to finance such measures in 2023.

Table 1 – Temporary Measures, (€bn)

	2020	2021	2022	2023	2024	2025
Covid: EWSS	4.2	4.7				
Covid: PUP	5.1	4				
Covid: Health Sector	2.0	2.2				
Covid: Other / Unallocated	3.4	1.5	6.0	0.8	0.5	0.2
Income Supports			0.8			
Humanitarian Supports				3		
NGEU			0.7	0.8	0.2	0.2
TOTAL	14.7	12.4	7.5	4.6	0.7	0.4

Source: Central Bank of Ireland calculations

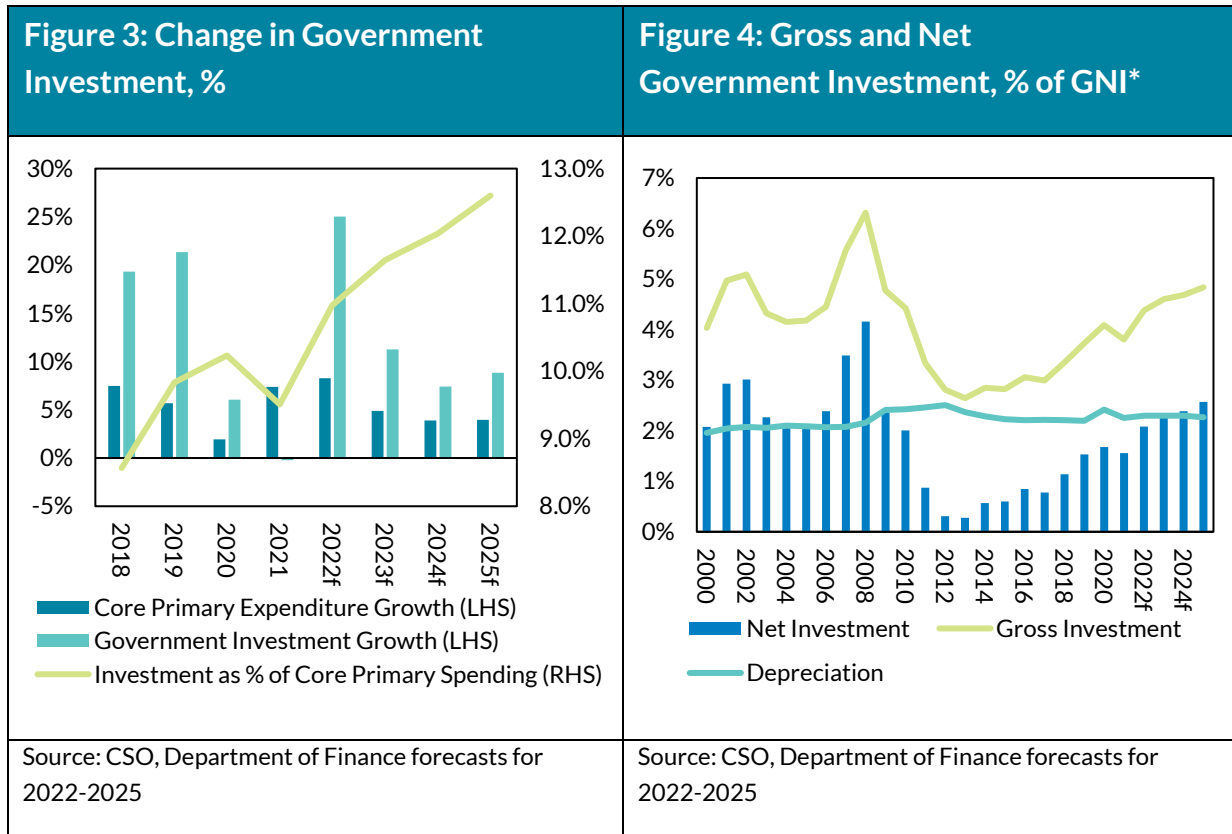
There are two notable risks related to temporary spending. The first is that the resources allocated for income and humanitarian supports might not be sufficient. It is possible that the remaining Covid-19 Contingency Reserve will not be adequate to finance income and humanitarian supports this year – the lack of timely data on the allocation of temporary spending resources makes it difficult to assess – while no funding has been provided for post 2023. A second risk generated by having large levels of temporary spending is the potential for the spending to not unwind fully as planned. Some of the temporary spending could leak into the permanent expenditure base. The lack of timely data – particularly the proportion of contingency funds that has been utilised and for what purpose – raises concerns in this regard.

Core primary spending has increased particularly strongly in recent years.⁷ Despite relatively subdued growth in 2020 – when lockdown restrictions appear to have reduced the demand for core government services – it is expected to average 6.1 per cent per annum over the five years to 2022 (see Figure 2).⁸ This follows overspendings in gross voted spending in 2018 and 2019 (by 2.1 and 1.2 per cent respectively) and the allocation of large additional budgetary resources for voted spending in Budget 2021 and Budget 2022 (of 7.7 and 5.5 per cent respectively). As Figure 2 illustrates, the

⁷ Core spending is defined as total General Government expenditure minus interest payments minus temporary spending measures.

⁸ This view is supported by a contraction in intermediate consumption (goods and services consumed by government to produce its own output), other current expenditure and government investment (reflecting the lockdown in the construction sector).

Department of Finance anticipate that total core primary spending growth will moderate sharply from its 2022 level in subsequent years, falling well below its 5-year average in 2024 and 2025. This would suggest some risk that spending will be higher than anticipated in the coming years, as further discussed in Section 3.



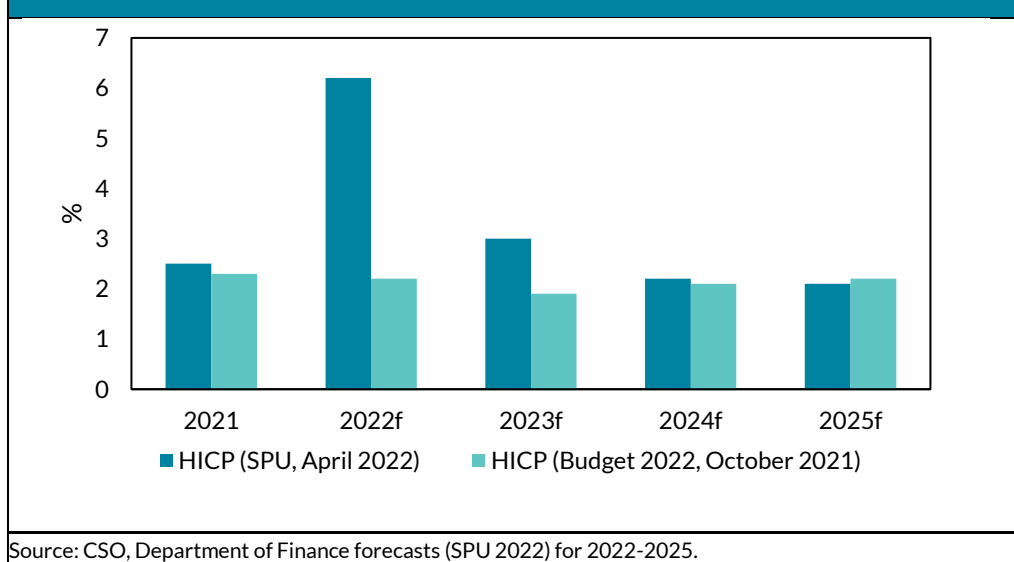
In relation to capital spending, following very strong growth in government investment in the two years leading up to the crisis (average annual growth of 20 per cent in 2018-2019), current Department of Finance spending projections anticipate further significant increases over the medium term (see Figure 3). Gross fixed capital formation is forecast to grow by an average of 13 per cent per annum in the four years to 2025, a development that is projected to result in net government investment as a percentage of GNI* continuing to recover from the lows experienced in the years following the financial crisis (see Figure 4). The recent and planned increases in capital investment are also high by international standards.⁹ Reflecting the strength of these growth rates, capital spending is projected by the Department of Finance to drive around

⁹ See IFAC (2021): <https://www.fiscalcouncil.ie/wp-content/uploads/2021/11/Irelands-next-ramp-up-in-public-investment-Nov-2021.pdf>

one-quarter of the total core primary spending increase from 2022 onwards, a notable development given that this spending represented just one-tenth of core primary spending in 2021.

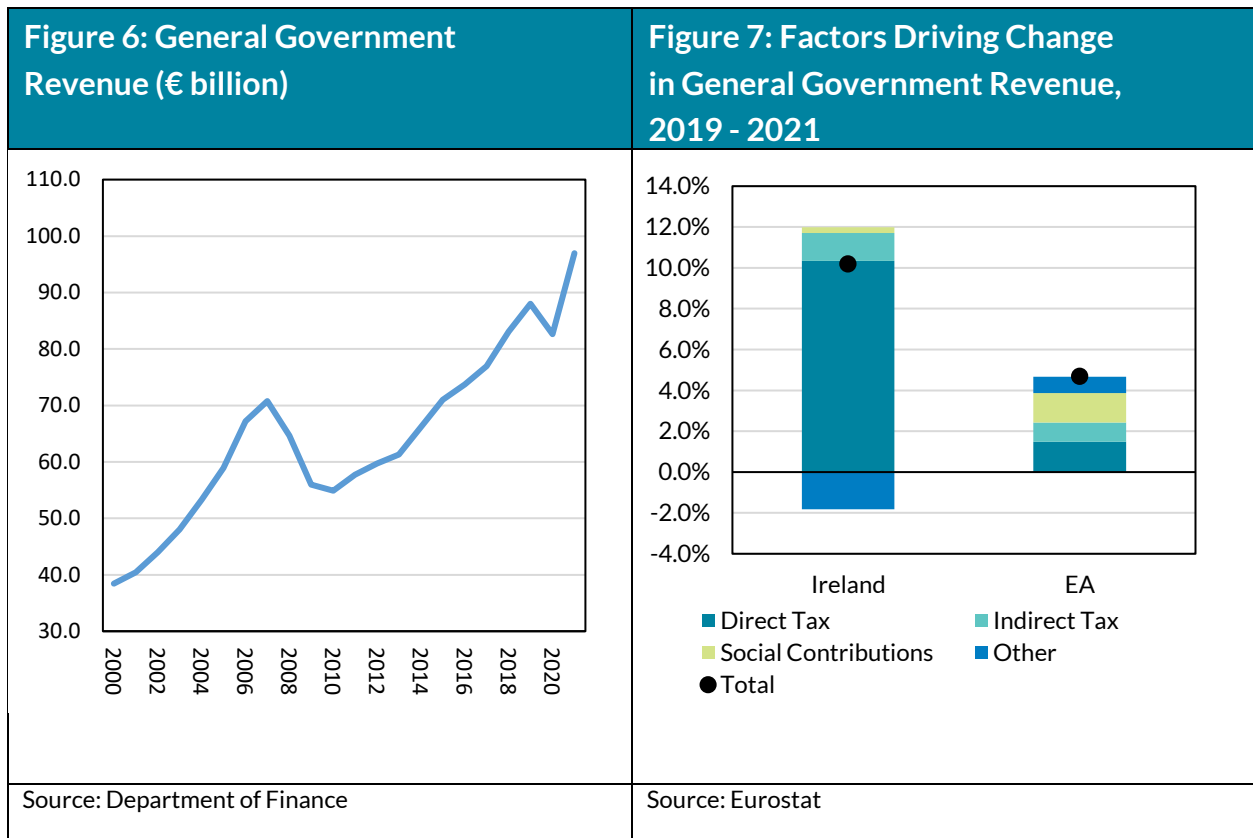
The government investment projections are underpinned by the National Development Plan (NDP) – which sets out total public spending of up to €165bn between 2021 and 2030. In the short term, against the backdrop of high inflationary pressures, achieving the real increase in capital spending that was envisaged in the plan is likely to prove challenging. Figure 5 shows the projections for inflation at the time of the publication of the NDP in October 2021 compared to the most recent Department of Finance projections from April 2022. As shown in the chart, inflation in the most recent projections is expected to be significantly higher than envisaged at the time of publication of the NDP. If nominal capital expenditure ceilings are to remain fixed, given the higher inflation environment that is projected out to 2024, real expenditure and the actual delivery of specific projects will be lower than originally planned. This points to the need for careful planning and management of capital investment to assess priority projects.

Figure 5: Inflation revised up since the publication of the NDP



Targeted and productive government investment differs from government consumption as it contributes to the stock of public capital, which can have a longer lasting impact on the economy. While estimates of the effect of public capital on growth vary - and depend on factors such as the composition and efficiency of spending - the literature typically finds a positive relationship between the

two.¹⁰ The positive impact of government investment is likely to be larger when there is spare capacity in the economy. Given the current supply-side constraints and high inflation, the overall fiscal stance – i.e. decisions on balancing current and capital expenditure and taxation – needs to be carefully calibrated to ensure there is room for higher expenditure on necessary and productive capital projects.



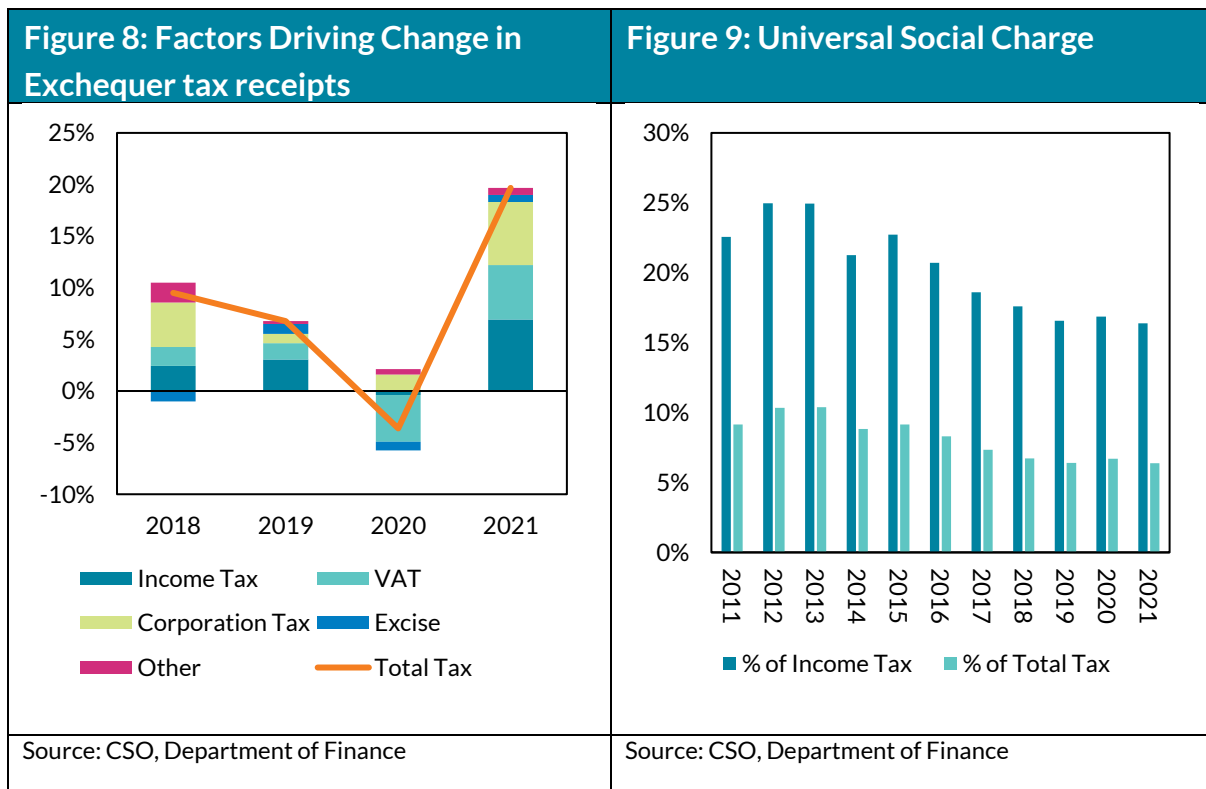
2.2 Developments in General Government Revenue

Irish government revenue performed much better during the pandemic than had initially been expected. While total revenue did experience a decline in 2020 (-6.1 per cent), the recovery in 2021 was exceptionally strong (+17.3 per cent). As a result, revenue increased by 10.2 per cent for the period as a whole (see Figure 6). This was more than double the euro area average growth rate of 4.7 per cent, with the divergence primarily driven by developments in direct taxes, the biggest components of which are income and corporation taxes (see Figure 7). Indirect taxes (mainly VAT and

¹⁰ [Ivory et al. \(2019\)](#) surveys the literature on estimating the impact of different forms of public spending and provides estimates for Ireland. See also [Broner et al. \(2019\)](#) and [Hickey et al. \(2018\)](#).

excise duty) saw broadly similar trends in Ireland and the euro area, declining in 2020 before recovering in 2021, while social contributions performed stronger in the euro area (where they make up a much bigger proportion of total revenue relative to Ireland).¹¹

The resilience of income tax receipts was one of the more notable public finance developments of the pandemic. In Exchequer terms, they declined by just 1 per cent in 2020, despite lockdowns having a negative impact on the labour market. This resilience appears to have reflected the very progressive Irish income tax system – a relatively small proportion of the tax is paid by lower income workers - coupled with the nature of the shock on the Irish labour market, which saw job losses disproportionately concentrated among workers at the lower-end of the income distribution.^{12,13}



Income tax, which remains the largest individual tax head, recovered very strongly in 2021 reflecting a broad labour market recovery, continued strong employment growth in high earnings sectors and

¹¹ Social contributions represent around one-third of total revenue in the euro area compared to around 17 per cent in Ireland.

¹² See Box: The resilience of income tax in 2020, Central Bank of Ireland Quarterly Bulletin 4, October 2020.

¹³ See Timoney (2022): <https://www.fiscalcouncil.ie/wp-content/uploads/2022/05/A-bottom-up-sectoral-assessment-of-the-strength-of-income-tax-receipts-.pdf>

part repayment of warehoused taxes (see Figure 8).¹⁴ It is projected to continue to grow strongly in the coming years, driving around 45 per cent of the overall growth in Exchequer tax revenue between 2022 and 2025. Income tax – a large and stable tax base – playing a key role in driving overall revenue growth is a positive feature of the fiscal outlook. As noted by the Department of Finance, however, broadening the income tax base – almost one in three workers are outside the tax net – would be one way to reduce fiscal vulnerabilities, leaving the public finances less exposed to idiosyncratic shocks.¹⁵ The Universal Social Charge (USC) remains an important component of income taxes and source of total revenue (see Figure 9). The USC, which has helped to broaden the tax base, generating almost €4.5bn – or 16 per cent of income tax receipts – in 2021. To put this figure in context, it represented more than half of total government investment spending last year.

2.3 Corporation Tax

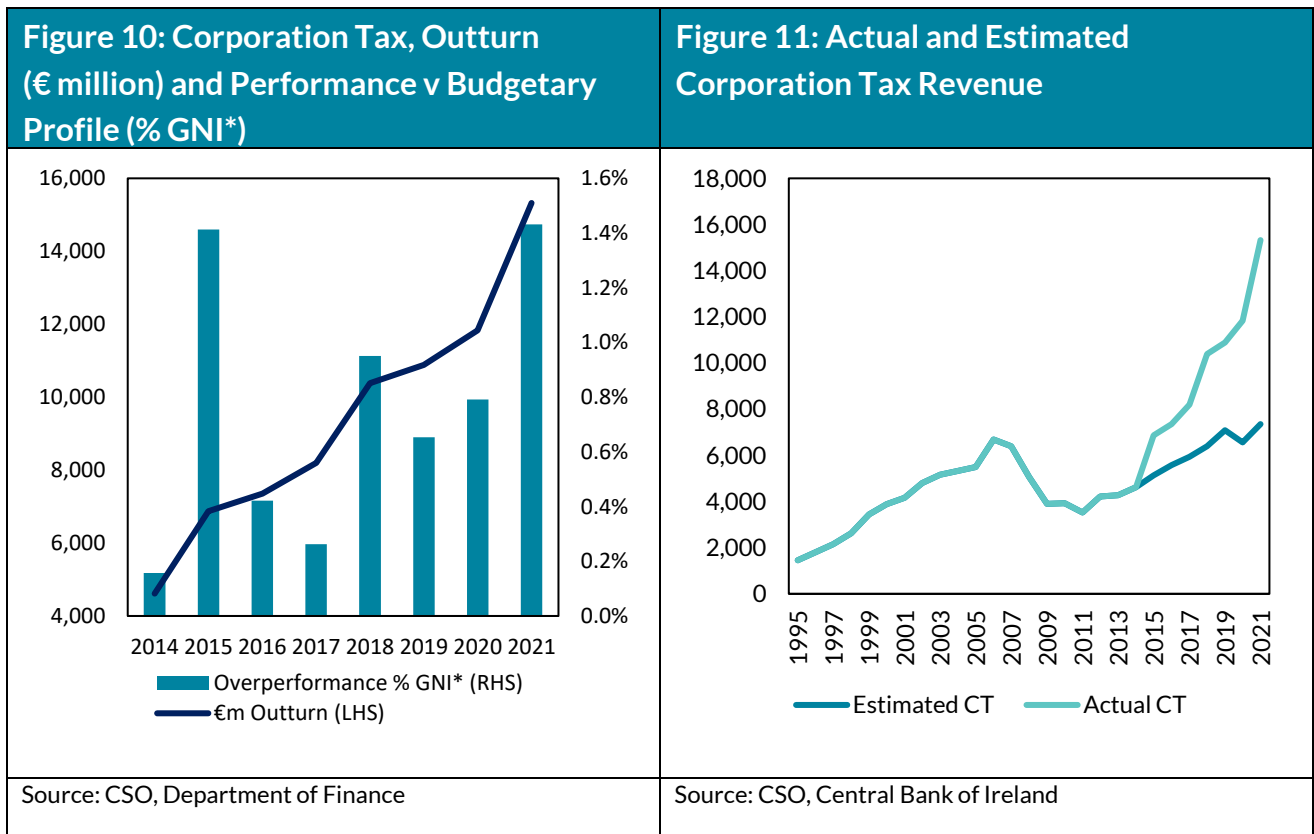
Corporation tax (CT) receipts have continued to grow strongly during the pandemic, ending last year 40 per cent higher than they were in 2019 (see Figure 10). As a result, CT represented 22 per cent of all taxes received and were in line with VAT as the country's second largest tax head. To put the latter point in context, just five years earlier CT receipts amounted to only 60 per cent of VAT. CT remains extremely difficult to forecast, as its growth has decoupled from the underlying economic bases that would normally be used to predict it. Over the period 2020-2021, receipts were a cumulative €4.9bn or 2.2 per cent of GNI* higher than had been profiled by the Government in Budgets 2021 and 2022. This continues a longer run trend. Since 2015, CT receipts have been a cumulative €11.7bn or 6 per cent of GNI* ahead of budgetary expectations (see Figure 11). In the Department of Finance projections, CT receipts are expected to play a smaller role in driving overall tax growth in the coming years, reflecting the anticipated negative impact of the OECD Base Erosion and Profit Shifting (BEPS) reforms on the tax head. The

¹⁴ While warehoused taxes are accrued back to the year in which they were due in the General Government accounts, this is not the case in the Exchequer accounts where they are recorded in the year in which they were paid.

¹⁵ See Department of Finance, 'Submission to Commission on Taxation and Welfare', February 2022.

Government’s tax revenue projections assumes that these reforms will reduce the CT tax take by €2bn over the medium term.¹⁶

It is worth examining what increase in CT we would expect to have seen had this tax heading grown broadly in line with underlying economic activity. The difference between this Central Bank of Ireland estimate and the actual corporation tax outturn can be considered a measure of windfall revenues and may also be instructive in providing an estimate of how much of the recent inflow could be considered as potentially unsustainable.¹⁷ We use GNI* as the base to determine the deviation from the expected level as, prior to 2015, GNI* performs reasonably well as a predictor of CT receipts. Furthermore, given GNI* has been specifically designed to exclude globalisation effects unrelated to developments in the Irish economy, it is a suitable indicator for this exercise.



¹⁶ The draft EU Council Directive on the implementation of the BEPS Pillar II reforms proposes a transposition deadline of 31 December 2023 for the new arrangements, with the Income Inclusion Rule to become effective for fiscal years beginning on or after this date. See: <https://data.consilium.europa.eu/doc/document/ST-7495-2022-INIT/en/pdf>

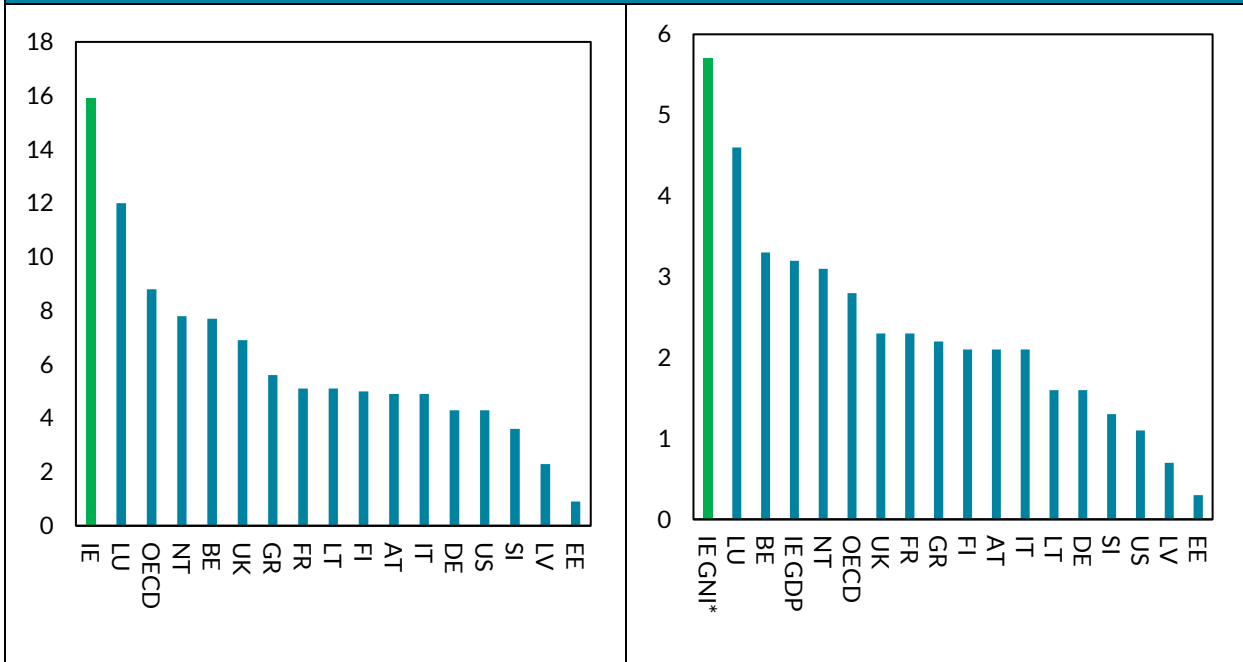
¹⁷ This is, of course, only one way of trying to identify the unsustainable element of corporation tax receipts, with other methodologies having been employed by the IMF, IFAC and Department of Finance amongst others.

We use a model-based approach to compare actual CT receipts since 2015 to an estimate of CT revenue from a simple equation that relates changes in GNI* to changes in CT revenue (see Figure 11).¹⁸ The results suggest that, given the historical relationship between CT and GNI*, €8 billion (3.5 per cent of GNI*) of the CT collected in 2021 was unexpected given the realised growth in modified national income. Estimating excess or windfall CT is an uncertain exercise and in addition to using GNI*, other approaches can be employed. These include substituting alternative measures of income or profits such as net entrepreneurial income for GNI* or comparing realised CT outturns to what corporation tax would have been had its share of overall revenue remained unchanged at its 2014 level. These approaches yield estimates of excess CT broadly in line with the GNI*-based approach. The €8 billion figure using GNI* is similar to IFAC's "central" estimate of excess CT revenue in 2021 of €7.6 billion.¹⁹ Looking at the period 2015-21 as a whole, around €26bn more in CT has been collected than would be expected given growth in GNI*. The estimate of excess corporation tax using GNI* is likely to represent an upper bound. While GNI* is the best available measure of modified national income, removing from GDP and GNP certain distortionary MNE effects, GNI* excludes some activity that is part of the sustainable tax base.

¹⁸ The equation we use is: $d\log(\text{CT}) = c(1) + c(2) * d\log(\text{GNI}^*)$. The sample is 1995 to 2014.

¹⁹ See <https://www.fiscalcouncil.ie/wp-content/uploads/2022/05/FAR-May-2022-Box-G-Exchequer-has-benefited-from-some-E22-billion-excess-corporation-tax-.pdf>

Figure 12: Corporation Tax, % of Total Tax Revenue (LHS Chart) and Percentage of GDP/GNI* (RHS Chart)



Source: OECD Global Revenue Statistics Database.

Note: Total tax revenue includes social contributions.

Irish CT receipts are high in an international context when compared to other euro area countries and the OECD more generally (see Figure 12). With just 10 large companies responsible for around half of all receipts, meanwhile, there is also a considerable concentration risk. Were some of these large companies to relocate for tax purposes, or in the event of adverse shock to specific large sectors such as ICT or pharmaceuticals, it could have a significant negative impact on the overall fiscal position. The exposure of the public finances to negative shocks to the MNE sector is not limited to corporation tax. Employees of foreign owned multinationals paid 54 per cent of the income tax from all companies in 2020.²⁰ In the same year, foreign-owned MNEs accounted for around 46 per cent of VAT paid by all companies in the economy.²¹

²⁰ This figure includes foreign-owned multinationals that service the domestic market.

²¹ See Revenue Commissioners, 'Corporation tax – 2021 payments and 2020 returns', May 2022.

2.4 The Rainy Day Fund

The National Surplus (Reserve Fund for Exceptional Contingencies) Act 2019) which established the Rainy Day Fund was commenced on 31 October 2019. The stated purpose of the fund is to mitigate severe economic shocks, in excess of the normal fluctuations of the economic cycle. In November 2019, the government initially transferred €1.5 billion into the fund from existing resources held in the Irish Strategic Investment Fund (ISIF). Under the Act establishing the fund, the Minister for Finance is required to make a payment from the Exchequer of €500 million to the rainy day fund every year from 2019 to 2023.²² The Act also provides that in any given year the Minister may make a proposal to the Dáil not to transfer the €500 million contribution into the fund. A decision to withhold payments to the fund can be made in exceptional circumstances if the Minister assesses that payment of the prescribed amount would place an undue burden on the public finances.

The first €500 million payment due into the Rainy Day Fund in 2019 was withheld on the basis that the UK's impending departure from the EU amounted to exceptional circumstances. Similarly, in 2020, the second €500 million payment to the fund did not proceed due to the unforeseen circumstances of the pandemic. In October 2020, the government announced the drawdown of the full €1.5 billion in the fund in order to contribute to meeting the cost of the pandemic response. Combined with the cancellation of the 2019 and 2020 payments, there are currently no remaining resources in the fund.

The original rationale for the establishment of the rainy day fund – to build up resources that could be used to mitigate the effects of future negative shocks – remains valid in the current context of the Irish economy. Moreover, as outlined above, corporation tax receipts have continued to grow since the establishment of the fund and the observed increases since at least 2015 are likely to contain a significant windfall element. If further unexpected corporation tax increases were used to fund higher expenditure on top of current plans over the coming years, this would risk adding to excess demand and existing inflationary pressures in the economy, as discussed below. Resuming payments to the RDF and extending its lifespan beyond 2023 would help ensure that a greater proportion of

²² See <https://www.irishstatutebook.ie/eli/2019/act/18/section/5/enacted/en/html>

government revenue is saved and would assist in rebuilding the resilience of the public finances and the economy.

Box A: The Government's Medium-Term Expenditure Rule

In the [2021 Summer Economic Statement](#), a new medium term budgetary strategy was announced by Government. The strategy includes a commitment to keep annual growth in Exchequer expenditure fixed at 5 per cent in nominal terms, in line with the economy's estimated trend nominal growth rate. This expenditure rule was announced in the context of the activation of the Stability and Growth Pact's general escape clause in May 2020, which meant the requirement for EU countries to meet various targets related to debt and deficits was temporarily suspended to help Governments respond to the Covid-19 pandemic. In light of the recent expenditure growth set out in this article, and the temporary suspension of certain EU fiscal rules, a budgetary framework for managing expenditure over the medium term is warranted.

A key advantage of a rule based on expenditure growth is that it avoids the procyclicality issues associated with rules that target the General Government balance. When revenue is lower than expected, maintaining planned expenditure growth can support economic activity and maintain long run Government investment plans. When revenue is temporarily stronger than expected, the windfall gains must be saved once expenditure growth reaches the 5 per cent limit. The rule is explicitly defined so that expenditure is linked to the medium-term sustainable growth rate of the economy in nominal terms, rather than to actual growth in a given year. Adjusting expenditure growth based on the latter would raise the risk of government spending changing based on temporary fluctuations in nominal output.

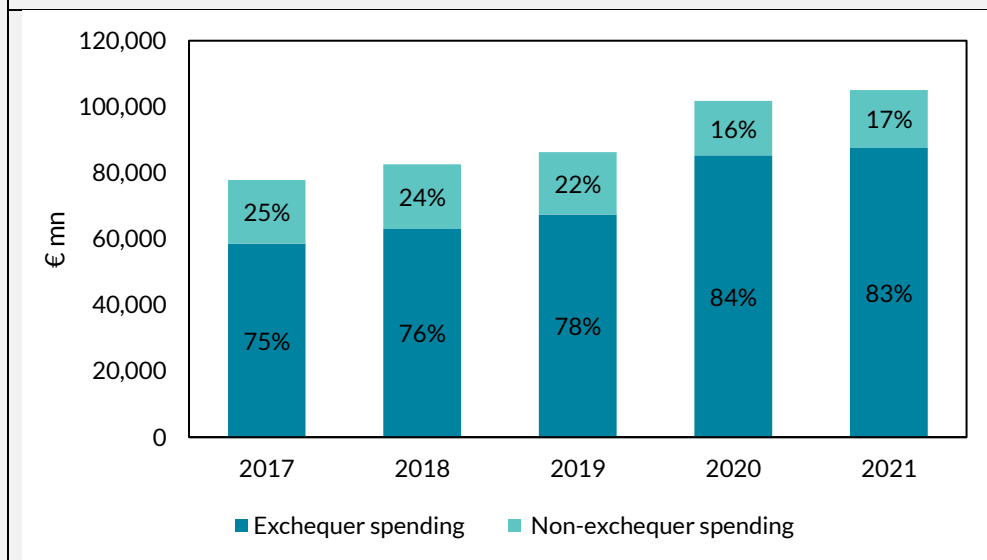
A weakness in the expenditure rule announced by the Department of Finance in 2021 is that, since the 5 per cent annual limit only applies to Exchequer spending, overall General Government expenditure can grow at a higher rate. This is evident in Figure A below which breaks General Government expenditure into Exchequer (covered by the rule) and non-Exchequer spending (not covered by the rule). With one-fifth of General Government expenditure outside the rule, growth in non-exchequer spending could push General Government expenditure to excessive levels without technically breaching the rule. This is in contrast to the EU

rules – the expenditure benchmark under the SGP is calculated on a General Government basis.²³

Another significant difference between the EU and the Government's spending rule is that in calculating the allowable growth in spending under the EU rule, discretionary tax changes are netted off.²⁴ The Government's expenditure rule does not take account of discretionary tax changes. As outlined by IFAC (2021), to ensure the public finances remain on a sustainable footing, if tax cuts are implemented, expenditure should grow at a correspondingly lower growth rate than the trend growth rate under the rule (in the case of the government's current rule, 5 per cent nominal growth).¹⁶ If expenditure is set to grow in line with the maximum 5 per cent allowed under the rule and if tax cuts were introduced that lowered government revenue, this would raise the risk of a structural imbalance opening up in the public finances. Similarly, if revenue-raising measures were introduced, this should allow expenditure to grow at a correspondingly higher rate.

Figure A: About one fifth of Government expenditure is not covered by the expenditure rule

Chart: General Government Expenditure: Exchequer and Non-Exchequer



Source: CSO, Department of Finance Fiscal Monitors

²³ The expenditure benchmark under the SGP is a more complex calculation than the domestic fiscal rule, and depends on whether the member state is at its Medium Term Objective. See section 1.3.6 of [European Commission \(2019\)](#) and [Marinheiro \(2021\)](#).

²⁴ For a description of the Expenditure Benchmark see https://ec.europa.eu/info/sites/default/files/economy-finance/ip101_en.pdf or <https://www.fiscalcouncil.ie/wp-content/uploads/2020/01/FAR-NOV-2013-BOX-I-The-EU-Expenditure-Benchmark.pdf>

The overall European economic governance framework is currently under review, with the European Commission expected to indicate possible changes later this year. It is likely that the revised framework will favour the use of expenditure rules over rules that rely on unobserved variables like the output gap. This will support a primary objective of the reform – to make the rules simpler and more enforceable. In addition, debt sustainability will remain a prominent part of the rules, by balancing a focus on medium term debt reduction with the need to allow for quality, growth-enhancing public spending to meet ongoing fiscal challenges such as the green transition and demographic change.

The suspension of EU fiscal rules under the general escape clause is expected to remain in place until 2024.²⁵ In the *Summer Economic Statement 2022* (SES 2022), the Government announced that core Exchequer spending would increase by 6.5 per cent in 2023, in excess of the 5 per cent limit under the rule as initially set out in July 2021.²⁶ The domestic expenditure rule could be strengthened by addressing some of the drawbacks outlined here, to ensure it is an effective anchor for the public finances over the medium term.²⁷

2.5 Developments in General Government Debt

The effects of the pandemic ended the downward trend in the General Government debt ratio that began following the financial crisis in 2013. Ireland experienced a broadly similar increase in its debt ratio to that of the euro area over the period 2020-2021 (11 percentage points). While the peak of the debt ratio – estimated by the Department of Finance to be 105.6 per cent of GNI* – was significantly lower than that experienced at the peak of the financial crisis (165.5 per cent), the nominal debt stock is nevertheless expected to be around €27bn higher in 2025 than it was in 2019 (see Figure 13). The ratio is expected to decline once again over the medium term, with debt dynamics primarily driven by the very

²⁵ [European Commission Q&A](#), 23 May 2022: “Heightened uncertainty and strong downside risks to the economic outlook in the context of war in Europe, unprecedented energy price hikes and continued supply chain disturbances warrant the extension of the general escape clause of the Stability and Growth Pact through 2023.”

²⁶ Department of Finance, (2022b). [Summer Economic Statement 2022](#).

²⁷ [IFAC \(2021\)](#) Box B outlines a number of elements of the domestic expenditure rule that could be developed and improved.

favourable interest-growth differential (see Figure 14). GNI* growth is projected by the Department of Finance to average 6.4 per cent growth per annum in the four years to 2025, while the effective interest rate is expected to be much lower, averaging just 1.5 per cent. While interest rates have increased noticeably since the turn of the year (see Figure 15), it is important to note that the effective rate represents the average interest rate over the entire stock of debt. As a result, changes to the marginal rate – unless very large – have a limited impact over the short to medium term. The projected return to primary surplus in the *SPU 2022* forecasts is also expected to have a favourable impact on the debt ratio from this year onwards, but the ratio is still expected to be at an elevated level in 2025 at just under 80 per cent of GNI*.

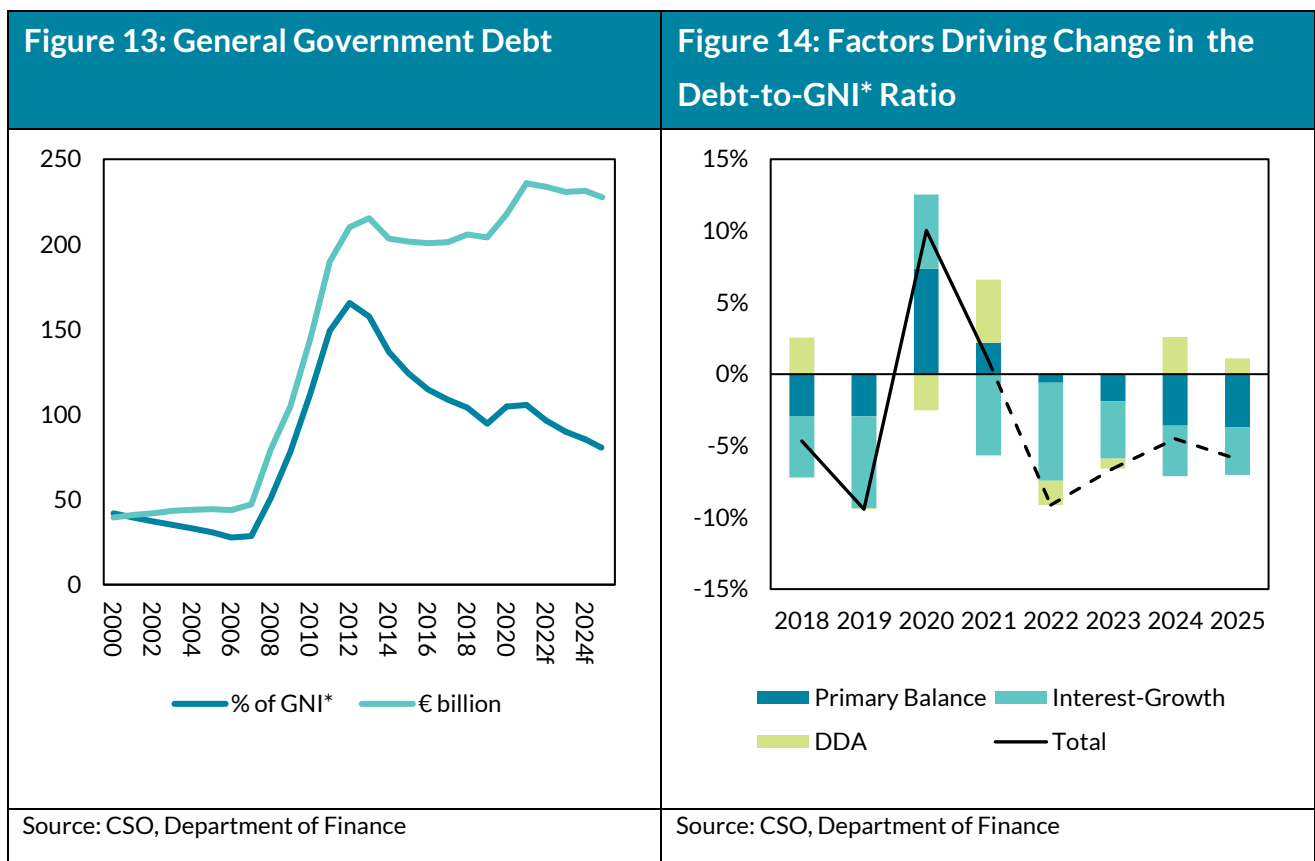
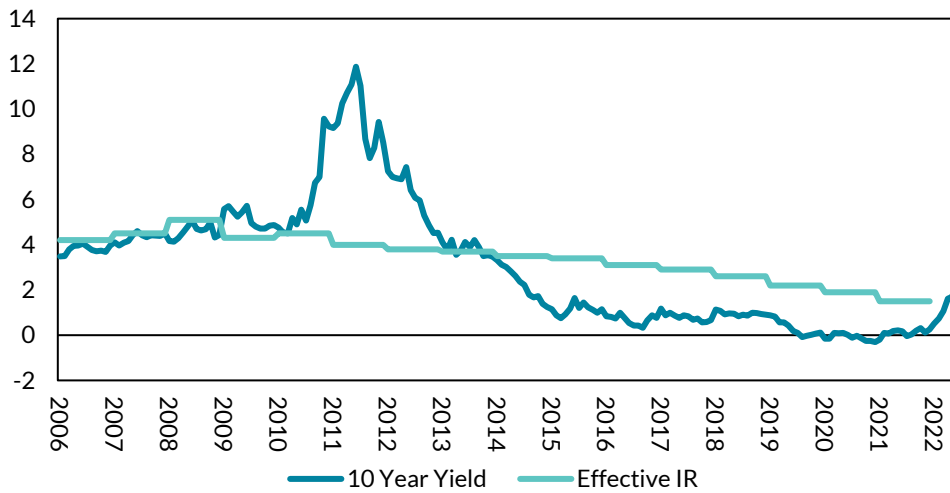


Figure 15: Ireland 10-year bond yield and effective interest rate, 2006 to 2022



Source: Datastream monthly bond data and CSO annual effective interest rate

Note: The effective interest rate is calculated based on interest expenditure in a given year relative to the entire stock of outstanding Government debt.

3. Modelling Risks to the Public Finances

In this section, we use the Central Bank's macroeconomic model of the Irish economy (COSMO) as well as the NiGEM global model to perform a scenario analysis of a number of risks to the public finances. The scenarios draw on the analysis in the previous section that identified particular risks to the government's finances and the economy from adverse shocks to government revenue, expenditure, interest rates and economic activity. The scenarios considered for the modelling analysis include (i) a loss of corporation tax revenues (ii) higher interest rates in the euro area (iii) higher public spending than currently projected and (iv) a scenario including a combination of these adverse shocks.

3.1 A loss of corporation tax revenue

This section considers two variations of a scenario involving a loss of corporation tax revenues. The first scenario illustrates the macroeconomic and fiscal effects of an exogenous loss of corporation tax revenues. The loss of corporation tax revenues can be interpreted as a reversal of some of the exceptional increases in corporation taxes since 2014. In this version of the scenario, we assume that there is no loss of economic activity due to this exogenous loss of revenue – the fiscal position deteriorates, but economic activity is unaffected. We assume that corporation tax

revenue falls permanently by €8bn and that the reduction in revenue occurs gradually over a 3 year period. The timing and profile of any potential loss of corporation taxes, however, is uncertain. The €8bn figure used in this scenario is based on the measure of “excess” corporation tax revenue estimated in Section 2.

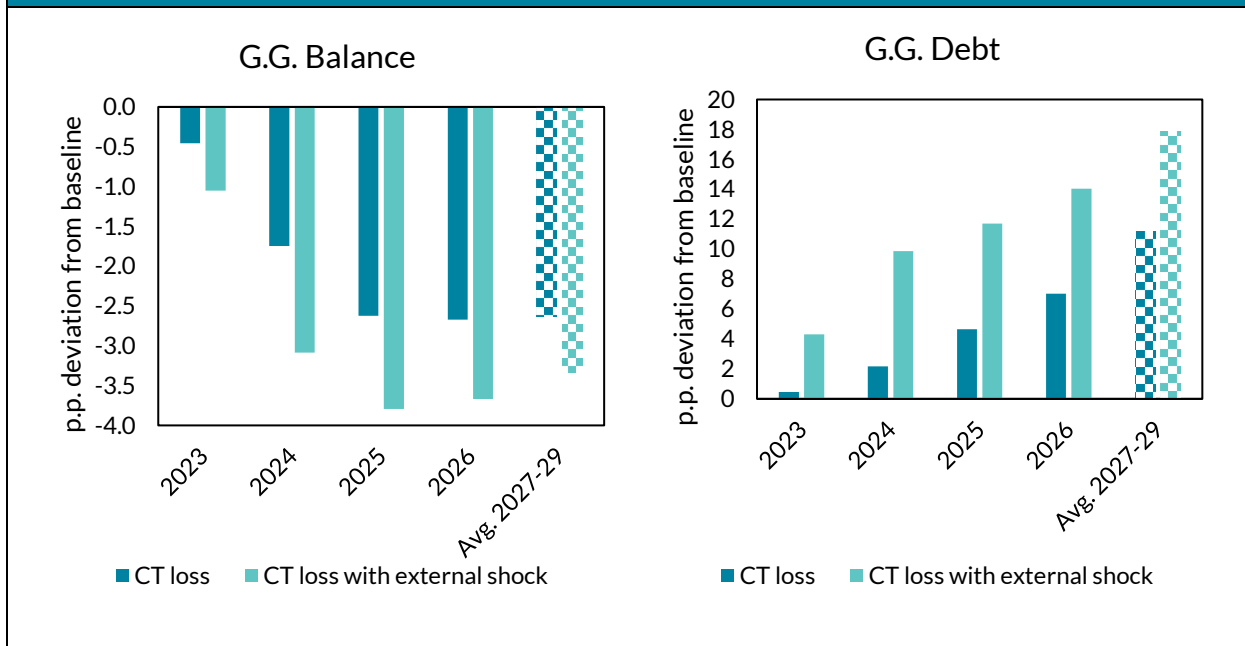
Figure 16 shows the estimated impact of the first scenario on the public finances. The loss of corporation tax revenue would result in a deterioration in the General Government balance (% of GNI*) of around 2.5 percentage points in 2025 relative to baseline. General Government debt-to-GNI* would increase by around 5 percentage points.

It is possible that a loss of corporation tax revenue could be accompanied by a decline in economic activity. To highlight the risk around this type of event, we consider a second version of this scenario where the loss of corporation taxes occurs alongside a negative growth shock caused by a downturn in the international economy. We assume that the negative growth shock corresponds to a temporary one standard deviation shock based on the historical volatility in modified national income (GNI*). This amounts to a decline in nominal GNI* of 4.7 per cent in 2023 and is implemented by reducing external demand for Irish exports. The negative effects of the shock persist beyond that year as the impact of the reduction in external demand on the traded sector filters through to other parts of the economy.

In the second scenario, the loss of CT revenue is assumed to be accompanied by lower external demand. In this case, output would decline reflecting the direct negative impact on the traded sector and the reduction in demand for Irish exports. The drop in traded sector activity would spill over to the non-traded sector following the reduction in labour demand and lower overall incomes. As a result, households and firms would reduce consumption and investment. Overall output in the scenario would fall by 4.4 per cent in 2023 and gradually return to the baseline (reflecting the size and profile of the one standard deviation shock). The deterioration in economic activity would add to the negative effect of the loss of CT revenue on the public finances. The reduction in economic activity would lower the overall tax intake while automatic stabilisers (e.g. higher social spending due to the rise in the unemployment rate – of 1 percentage

point) would add to total spending. In the scenario, the General Government balance would disimprove by 3.5 percentage points by 2026. General Government debt-to-GNI* would be 14 percentage points higher in 2026 relative to baseline.

Figure 16: Impact of CT loss and external shock on General Government balance and debt, p.p. deviation from baseline



Source: Own calculations using COSMO

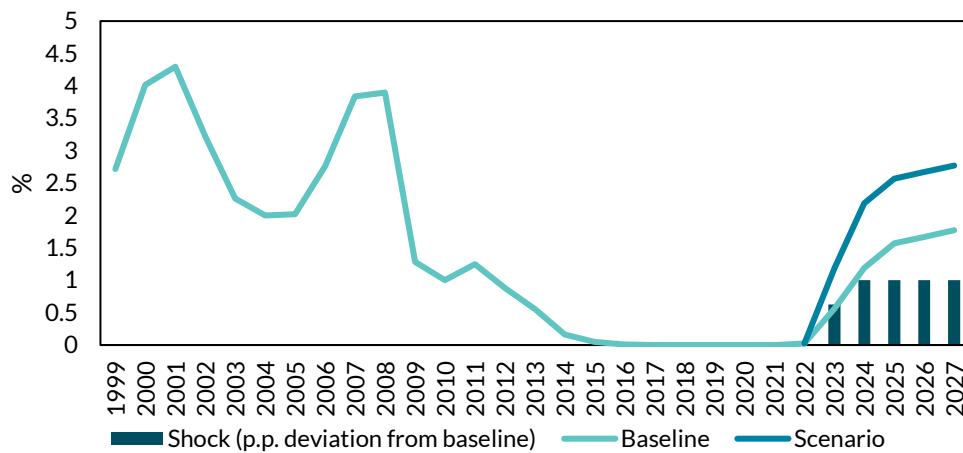
For the scenarios in this section, Figure 22 and Figure 23 show the implications of the scenario results for the levels of the General Government balance and debt ratios relative to the current *SPU* 2022 forecasts. For the corporation tax scenario, applying the changes to the deficit and debt reported above to the baseline projections for the public finances implies that the General Government balance in 2025 would be around -1.1 per cent of GNI* compared to a surplus of 2.7 per cent in the baseline (see Figure 22). The debt-to-GNI* ratio would stand at around 91 per cent of GNI* compared to just under 80 per cent in the baseline (see Figure 23).

3.2 A higher interest rate path

In this section, we illustrate the impact of a 1 percentage point increase in euro area interest rates over and above the current baseline market- implied path for interest rates. The scenario is implemented as an additional 1 percentage point increase in the main ECB policy rate. We assume that such an additional increase in interest rates begins in 2023Q3 and occurs incrementally in steps of

25 basis points per quarter (see Figure 17). An increase in interest rates above the current market-implied path could come about in the event that higher and more persistent inflationary pressures emerged over the coming years, resulting in the need for monetary policy to react to protect price stability. To perform this analysis, we use the NiGEM model to simulate the impact of the shock on the global economy.²⁸ Having simulated the effects on the international environment, we then use the COSMO model to examine the impact on the Irish economy.

Figure 17: Interest rate scenario assumption, euro area interest rate increases by 1 percentage point above market-implied path over 5-years



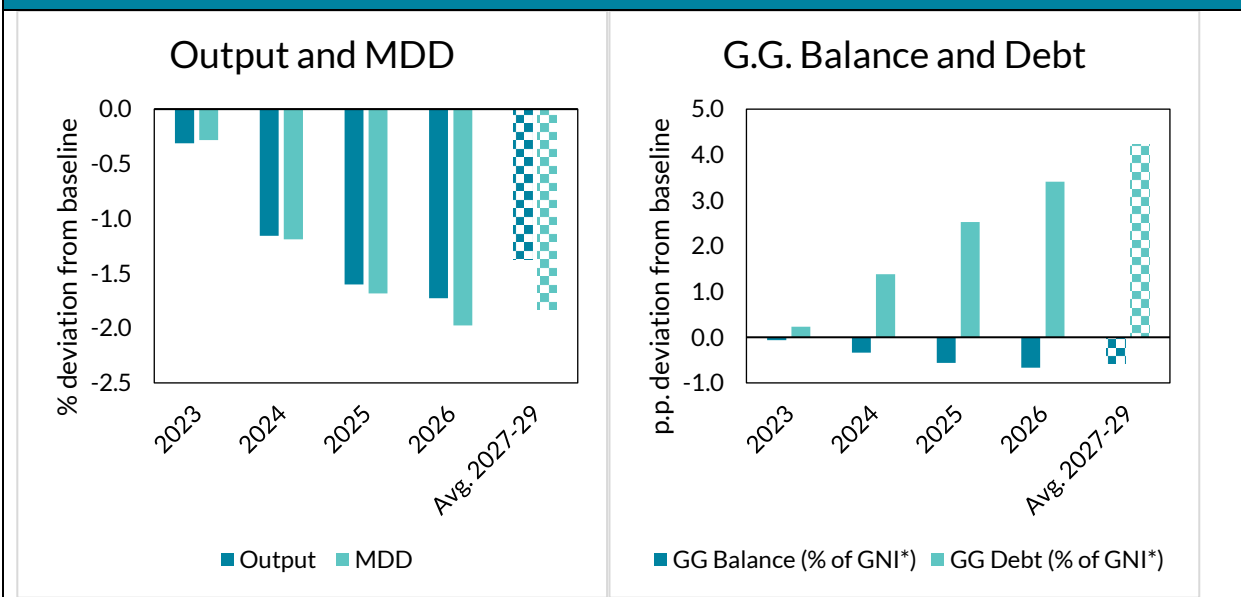
Source: author's calculations. Baseline market-implied interest rate path from NIESR Global Economic Outlook, Spring 2022.

Increasing the euro area interest rate would affect the economy through the following key channels as captured in NiGEM: (i) reflecting higher borrowing costs and increases in the cost of capital, investment and consumption in the euro area would be reduced relative to a baseline (ii) lower activity and demand would put downward pressure on prices and (iii) the euro appreciates relative to other major currencies given the change in the interest rate differential. The primary transmission of the shock to the Irish economy occurs through the traded sector where lower euro area

²⁸ NiGEM is a global macroeconomic model developed by the National Institute of Economic and Social Research (NIESR) in the UK. See <https://www.niesr.ac.uk/nigem-macroeconomic-model>.

output would reduce external demand for Irish exports. The exchange rate appreciation would further contribute to the external shock by eroding competitiveness. Weaker external demand along with the effect of higher interest rates on the domestic economy would reduce Irish output and modified domestic demand by around 2 per cent in 2026 compared to the baseline (see Figure 18). The fiscal position would worsen due to higher social spending, lower tax revenue and higher interest payments. The latter effect is small given the maturity profile of Ireland’s debt and relatively low refinancing needs out to 2025.²⁹ Overall, the General Government balance would deteriorate by about 0.8 percentage points in 2025 relative to baseline. The General Government debt would be about 4 percentage points higher on average by the end of the decade (Figure 18). Taking these changes, the implied paths of the General Government balance and debt-to-GNI* ratio in this scenario compared to the current baseline forecasts are shown in Figure 22 and Figure 23.

Figure 18: Impact of 1 percentage point increase in euro area interest rates above market-implied path over a 5-year horizon, deviation from baseline



Source: Own calculations using COSMO

3.3 A permanent increase in government expenditure

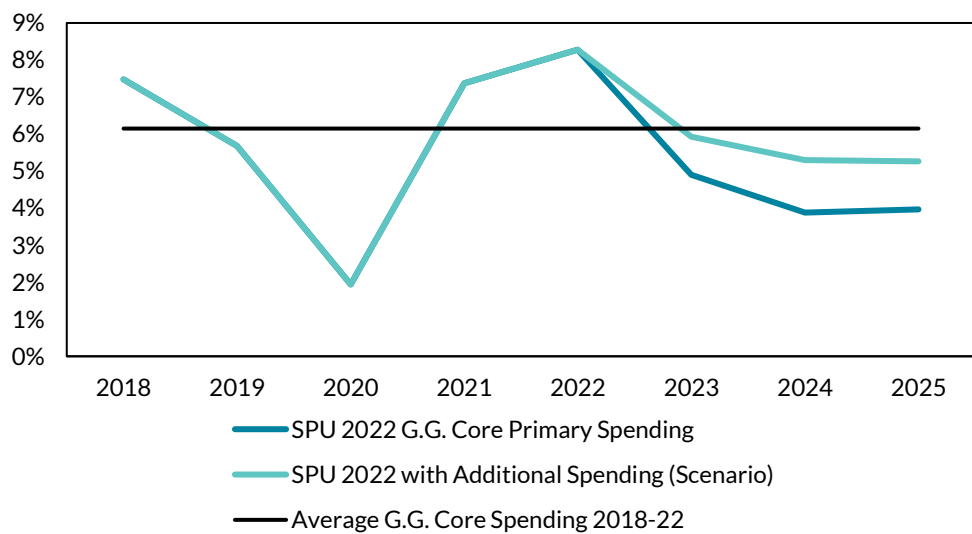
The purpose of this scenario is to illustrate the implications for the public finances and the economy of a permanent increase in current

²⁹ See <https://www.ntma.ie/business-areas/funding-and-debt-management/statistics/maturity-profile>

spending in addition to current plans. As outlined in Section 2, the budgetary forecasts in *SPU 2022* already envisage significant increases in capital expenditure out to 2025.

The economic environment in Ireland and internationally at present is characterised by supply-side constraints driven by developments in energy and other commodity markets. In the presence of these supply-side constraints, the impact of higher demand on the overall economy is likely to be different compared to periods when such constraints are absent or less binding. To take the current inflationary environment and unusual supply-chain pressures into account, we use the non-linear Philips curve estimate for Ireland in this simulation, following the lines of Linehan et al. (2017), [Faubert \(2021\)](#), and Byrne (2022). Including this non-linear mechanism allows us to capture more fully how changes in demand affect the economy in the presence of supply-side constraints as well as labour market tightness.

Figure 19: General Government Expenditure Growth: SPU Projections and CBI Scenario

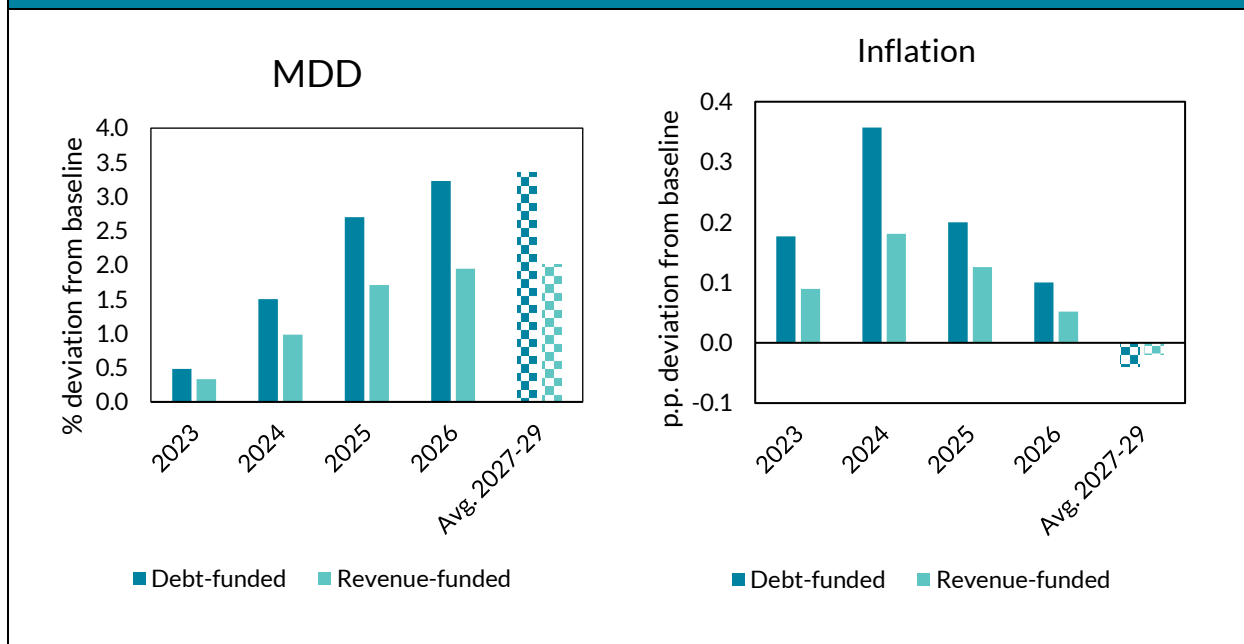


Source: DoF, CBI calculations.

The scenario assumes that current government expenditure increases permanently by an additional €4 billion. The increase is assumed to occur gradually with a €1bn increase in 2023 and an

additional €1.5bn in each of the following two years.³⁰ We compare the macro and fiscal implications of this higher spending when it is *debt-funded* and *revenue-funded*. The €4bn estimate used in the scenario represents a purely technical assumption for the purpose of the analysis. It is designed to illustrate the economic and fiscal impact of a scenario where core primary spending grows at a rate closer to its five-year (2018 to 2022) average growth rate in the period 2023 to 2025. This compares to the more pronounced slowdown in spending growth envisaged in the Department of Finance *SPU 2022* projections (Figure 19). This is not a forecast, but rather an illustration of the potential implications of higher government expenditure than is currently planned. Section 2 discussed some of the factors that could give rise to higher government spending over the coming years, such as a leakage of temporary measures into core spending (see Table 1). The increase in current spending is split between government consumption and transfers.

Figure 20: Macroeconomic impact of permanent increase in government expenditure, deviation from baseline



Source: Own calculations using COSMO

The results indicate that higher government spending funded by borrowing would stimulate domestic economic activity. As shown in Figure 20, domestic demand would be about 3 per cent higher by

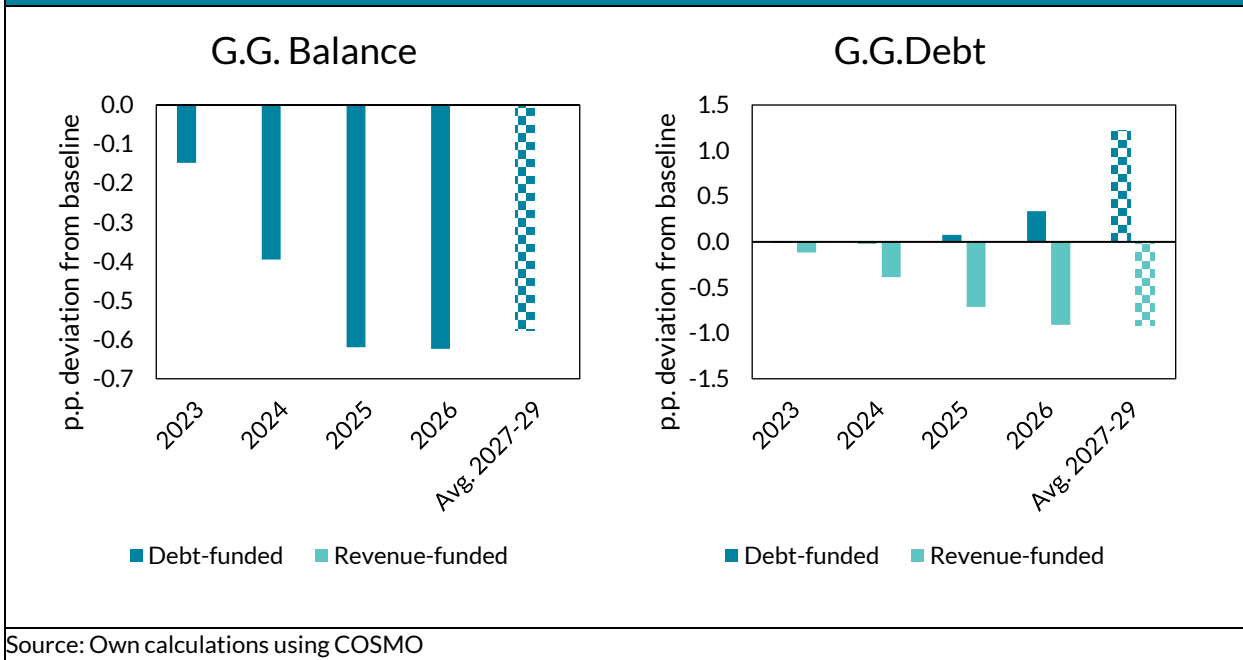
³⁰ SES 2022 announced an additional €1.7 billion increase in core Expenditure expenditure for 2023 compared to the forecast in *SPU 2022*.

2025 in the debt-funded case. Given the current baseline projections for economic activity and unemployment, there is no evidence that the economy requires such an additional stimulus to demand at present. The latest Department of Finance economic forecasts (*SPU 2022*) indicate that the estimated negative output gap in the economy of -0.5 per cent in 2022 is expected to close to -0.1 in 2023 with a small positive output gap projected by 2025. These forecasts imply that output in the economy is expected to reach its long-run sustainable level over the coming years without the need for any further fiscal stimulus.

Moreover, in the current circumstances additional demand would risk aggravating existing supply-side constraints. The modelling results indicate that the increase in non-traded sector activity in this scenario would put upward pressure on prices and wages leading to some crowding out of the tradable sector of the economy over time. The increase in demand would add to price pressures with HICP inflation 0.4 percentage points higher in 2024 (see Figure 20). This combination of developments would result in a larger positive output gap in the Irish economy in the period to 2025 relative to the current baseline forecasts in *SPU 2022* – actual output would exceed its long-run sustainable level – raising the risk of economic imbalances emerging over time. As noted, the modelling of this scenario attempts to take into account supply-side constraints and labour market tightness; however, these effects may not be fully captured and the magnitude of the inflation effects could be larger than reported here.

In the revenue-funded case, higher income taxes would dampen the growth and price effects when compared to the debt-funded case. With revenue funding, domestic demand would be about 2 per cent higher in 2025 and inflation would be roughly 0.2 percentage points higher in 2024 (see Figure 20).

Figure 21: Fiscal impact of permanent increase in government expenditure, p.p. deviation from baseline



Source: Own calculations using COSMO

In terms of the fiscal implications, there would be a disimprovement in the General Government balance in the debt-funded case of around 0.6 percentage points of GNI* in 2025 (Figure 21). Applying these changes to the *SPU 2022* projections for the General Government balance would imply a surplus of around 2 per cent in 2025 in the scenario with additional debt-financed expenditure, compared to a figure of 2.7 per cent in the baseline. The General Government debt (as % of GNI*) would be about 0.5 percentage points higher in 2026, rising to 1.5 percentage points over the medium run (average 2027-29 period). By design, there is no change to budget balance in the case with revenue funding and, in contrast to the debt-funded case (see Figure 21).³¹

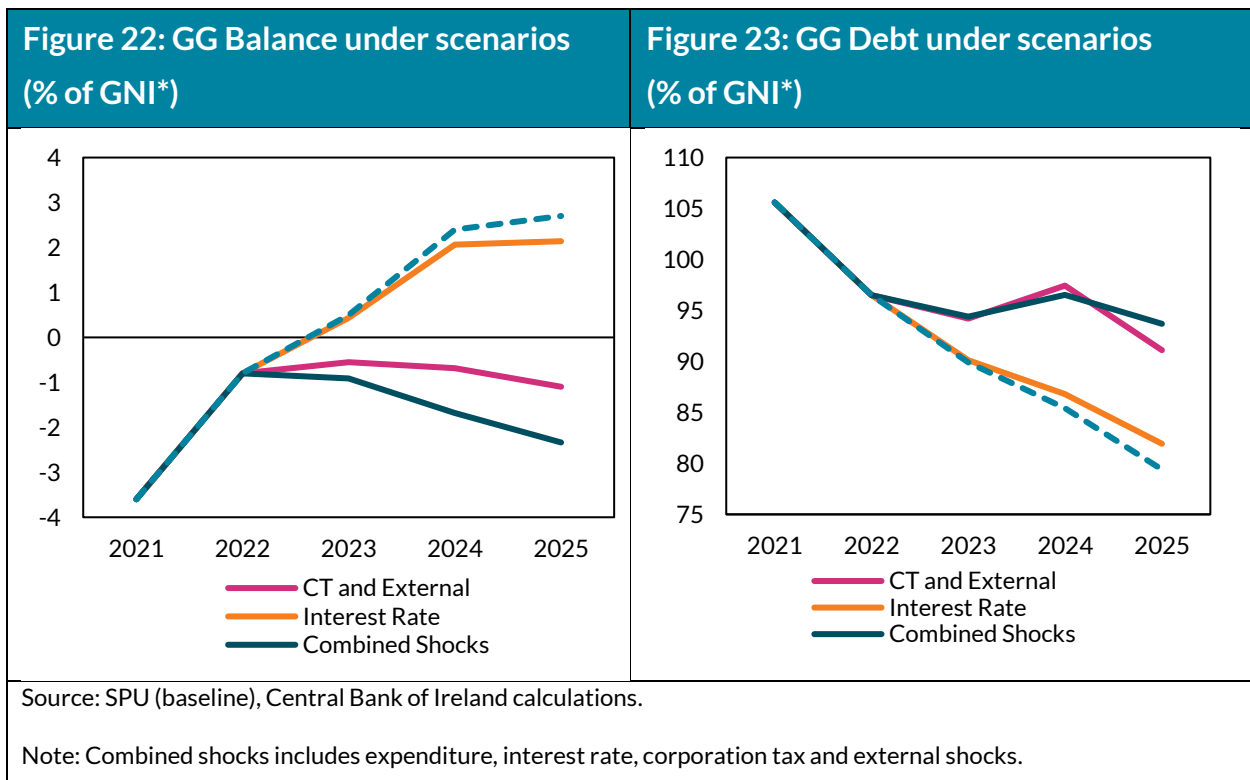
With capital spending already forecast to grow by 15 per cent per annum out to 2025 and with capacity constraints and high inflation affecting the economy at present, this scenario illustrates that a boost to economic activity from additional permanent current spending would risk creating excess demand and adding to existing price pressures. This result points to the need to ensure that any

³¹ The simulation results indicate that there would be a small reduction in the debt-to-GNI* ratio in the revenue-funded scenario. This is because the direct fiscal cost of the additional expenditure is offset by higher revenue from income tax while output is boosted by the higher spending - raising the denominator in the debt-to-GNI* ratio.

additional increases in current spending, for example to address cost of living pressures or other needs, are temporary and targeted.

3.4 Combined shock scenario

The scenarios outlined above show the impact of individual shocks on key macroeconomic variables and the public finances. It is possible that two or more of these adverse shocks could occur at the same time, particularly given the characteristics of a small open economy such as Ireland. An external shock could occur, for example, alongside a deterioration in the primary balance (caused by higher than expected government spending and a decline in corporation tax receipts) and higher interest rates.



To take account of this risk, Figure 22 and Figure 23 show the impact on the General Government balance and debt ratios relative to the current baseline forecasts when the shocks to expenditure, corporation tax, growth and interest rates discussed above are combined. The combined shock would see the emergence of a deficit of -2.3 per cent of GNI* in 2025 relative to the SPU 2022 baseline projection for a surplus of 2.7 per cent. The debt ratio in this scenario would stand at around 94 per cent of GNI* in 2025, compared to just under 80 per cent in the baseline. The persistence of a high debt-to-GNI* ratio of above 90 per cent out to 2025 in this scenario would increase the exposure of the public finances to negative

shocks. As illustrated in the section below, at this elevated level of debt, additional shocks could cause the debt ratio to start rising again.

4. Longer-Term Debt Sustainability

The modelling results displayed in Section 3 assess the impact on the public finances of pre-determined economic shocks. The results are therefore sensitive to the specific shock scenarios that are used. To account for a range of all feasible scenarios, stochastic debt sustainability analysis (DSA) can be used.^{32,33} A stochastic DSA builds on the modelling framework in Section 3 by allowing for uncertainty in the path of GNI* growth, the effective interest rate, and the primary balance. By creating a large number of potential paths for these key variables, central debt forecasts can be produced along with potential outcomes in the upper and lower tails of the distribution. Essentially, instead of having a single estimate of the debt ratio for each time-period, the model produces a wide distribution of possible outcomes.

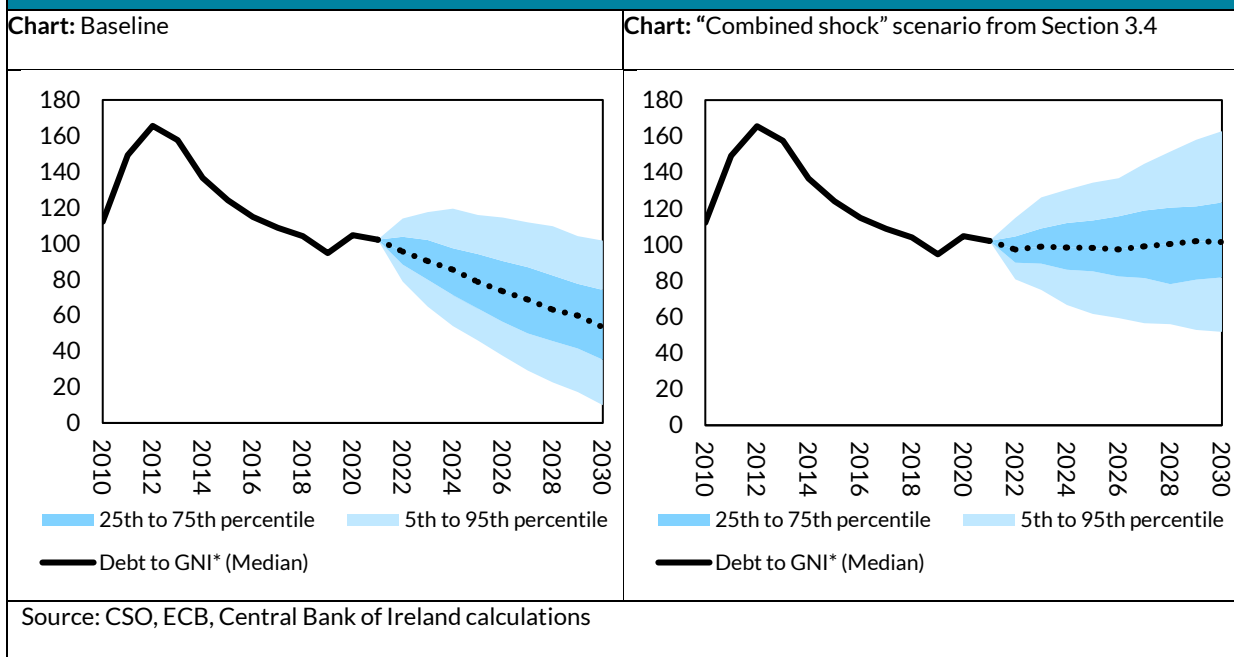
The stochastic DSA used here relies on a standard debt dynamic equation, which shows that the debt ratio in any period is a function of the previous period's debt ratio, the effective interest rate, output growth, and the primary balance.³⁴ The model is supplied with a baseline forecast for each of the variables. Then shocks to interest rates, growth, and the primary balance are applied to give a large number of possible debt trajectories over the forecast horizon. The size of the shocks to each variable is calibrated based on its historic standard deviation. This creates a distribution of forecasts for the debt ratio in each forecast period, from which chosen percentiles can be extracted and used to construct a fan chart. Conventionally, the median (50th percentile) of this distribution is treated as the central outcome, with the 5th and 95th percentiles representing the lower and upper tails. The results of the baseline stochastic DSA are shown in the first panel of Figure 24.

³² For an overview of Stochastic DSA methods, see [Di Bella \(2008\)](#). [Casey and Purdue \(2021\)](#) also include a stochastic DSA for Ireland.

³³ See [Cronin and Dowd \(2013\)](#).

³⁴ $d_t = \frac{1+r_t}{1+g_t}(d_{t-1}) - pb_t$, where d_t is the debt ratio, d_{t-1} is the previous period's debt ratio, r_t is the effective interest rate, and g_t is growth in GNI*.

Figure 24: Stochastic DSA fan chart of debt to GNI* under two scenarios



The baseline results suggest that while the most likely path for the debt ratio sees a decline to around 60 per cent of GNI* by 2030, there is a greater than 5 per cent chance that the ratio does not improve from current levels and remains above 100 per cent of GNI*. This outcome would occur if simultaneous adverse shocks to interest rates, growth, and the deficit were to occur over the projection period. The second panel in Figure 24 shows the path for the debt-to-GNI* ratio if the combination of adverse shocks described in the scenarios in section 3.3 were to materialise. Applying the DSA to this significantly higher debt path implies that the risks to the debt ratio would increase considerably - in the 95th percentile scenario, debt rises above 160 per cent of GNI* by 2030. Of course, this outcome represents the upper tail of a distribution based on an already negative scenario so a somewhat extreme result should be expected. Taken as a whole, the stochastic DSA implies a favourable outlook for the Irish debt ratio - the vast majority of scenarios surrounding our baseline projection do not indicate an increase in the debt ratio by 2030.

It must be noted that these figures do not take into account how policymakers will respond to shocks in real time. For example, in adverse scenarios Government may choose to take corrective action to minimise the borrowing requirement and limit the increase in

debt, for example by increasing taxes or reducing planned expenditure.

5. Conclusions

Strong growth in tax revenue as the economy recovered from the pandemic is likely to bring the government's finances close to balance in 2022, having recorded a deficit of almost 9 per cent of national income in 2020. Despite this significant progress, important risks to the public finances remain. While the ending of certain pandemic-related and other temporary expenditure measures should see the rate of growth in public expenditure moderate over the coming years, our analysis points to particular challenges in managing expenditure. Permanent increases in current spending over and above existing plans would slow down the improvement in the public finances. Moreover, the analysis indicates that the additional demand stimulated by this higher spending would add to inflationary pressures given the supply-side constraints currently facing the economy. These risks would be heightened if expenditure was increased in the absence of offsetting revenue-raising measures. This points to the need to ensure that any additional current expenditure, such as to address cost of living pressures, should be carefully targeted and temporary.³⁵

Compared to projections at the time of the publication of the NDP in 2021, inflation forecasts have been revised upwards out to the middle of the decade. Given supply-side pressures and the higher inflationary outlook, careful management and prioritisation of overall expenditure plans will be required to ensure the benefits of increases in public spending are maximised and to reduce the risk of fiscal policy adding to existing capacity constraints and price pressures.

The exceptional growth in corporation tax revenues observed from 2014 continued during the pandemic, bringing the share of tax from this source to over one-fifth of revenue. The sustainability of these receipts over the long term is highly uncertain. Furthermore, any decision to potentially increase expenditure from unexpected revenue gains would need to consider the implications for the sustainability of overall economic growth. Achieving the effective

³⁵ See Barrett, Farrell and Roantree (2022). "Energy Poverty and Deprivation in Ireland." Available at: <https://www.esri.ie/system/files/publications/RS144.pdf>

delivery of existing capital expenditure plans in an environment of high inflation and supply-side constraints will be challenging. Further adding to demand with additional permanent current expenditure could create imbalances in the economy, undermining the sustainability of economic activity. Instead, saving a portion of current corporation tax revenue, either by commencing payments into the rainy day fund or by other means, would help to reduce the exposure of the public finances in the event of a loss of CT revenue in the future and would lessen the risk of the overall fiscal stance adding excessively to demand in the economy.

In relation to interest rates, the favourable maturity profile of Ireland's debt provides some insulation from rising rates. Nevertheless, further increases in interest rates, should this be needed in order to protect price stability, would dampen economic activity in Ireland and abroad and would lead to a less favourable outlook for the deficit and debt over the medium term. The public finances have benefited from significant savings on interest costs since 2015 but with rates now rising, the scope for additional gains in the coming years are likely to be limited.

This analysis has focussed on challenges facing the public finances in the more immediate future. Over the medium to longer-term, Ireland will face pressing budgetary pressures arising from the need to increase expenditure due to population ageing and to achieve the country's climate change objectives.³⁶ These considerations emphasise the need to rebuild the resilience of the public finances to ensure that these priorities can be sustainably addressed and so that there is scope for a counter-cyclical fiscal response to future crises, as benefitted the economy since 2020.

³⁶ See Department of Finance (2022a). "Annual Report on Public Debt in Ireland 2021." <https://www.gov.ie/en/publication/c9954-annual-report-on-public-debt-in-ireland-2021/>

6. References

Barrett, M., Farrell, N. and B. Roantree. (2022). "Energy Poverty and Deprivation in Ireland." Available at:

<https://www.esri.ie/system/files/publications/RS144.pdf>

Byrne, D. and Zekaite, Z. (2019), "Non-linearity in the wage Phillips curve: Euro area analysis", Economics Letters,

<https://doi.org/10.1016/j.econlet.2019.07.006>

Casey, E. and Purdue, D. (2021), "Maq: A Macro-Fiscal Model for Ireland", Working Paper No. 13, February 2021

Cronin, D. and Dowd, K. (2013) "Fiscal fan charts - A tool for assessing member states' (likely?) compliance with EU fiscal rules," Research Technical Papers 15/RT/11, Central Bank of Ireland.

Department of Finance. (2022). "Draft Stability Programme Update 2022, (April 2022). <https://www.gov.ie/en/publication/1ca1d-draft-stability-programme-update-2022/>

Department of Finance. (2022a). "Annual Report on Public Debt in Ireland 2021." Available at:

<https://www.gov.ie/en/publication/c9954-annual-report-on-public-debt-in-ireland-2021/>

Department of Finance, (2022b). "Summer Economic Statement 2022." Available at: <https://www.gov.ie/en/publication/29e0b-summer-economic-statement-2022/>

Di Bella, G. (2008) "A Stochastic Framework for Public Debt Sustainability Analysis", IMF Working Paper No. 08/58

Faubert, V. (2021), "Is the Irish Phillips Curve broken?," The Economic and Social Review, 52(4), 397-437.

<https://www.esr.ie/article/view/1376>

Irish Fiscal Advisory Council, (2022). "Fiscal Assessment Report, June 2022." Available at: <https://www.fiscalcouncil.ie/fiscal-assessment-report-may-2022/>

Irish Fiscal Advisory Council, (2021). "Ireland's next ramp-up in public investment." Available at: <https://www.fiscalcouncil.ie/wp-content/uploads/2021/11/Irelands-next-ramp-up-in-public-investment-Nov-2021.pdf>

Linehan, S., Lydon, R., McIndoe-Calder, T., Reddan, P. and D. Smyth. (2017). "The Labour Market and Wage Growth after a Crisis," Quarterly Bulletin Signed Article, Central Bank of Ireland.

[https://www.centralbank.ie/docs/default-source/publications/quarterly-bulletins/quarterly-bulletin-signed-articles/the-labour-market-and-wage-growth-after-a-crisis-\(linehan-lydon-mcindoe-calder-reddan-and-smyth\).pdf?sfvrsn=4](https://www.centralbank.ie/docs/default-source/publications/quarterly-bulletins/quarterly-bulletin-signed-articles/the-labour-market-and-wage-growth-after-a-crisis-(linehan-lydon-mcindoe-calder-reddan-and-smyth).pdf?sfvrsn=4)

NIESR. (2022). "Walking the line", National Institute Global Economic Outlook, No. 6, Vol. Series B.

<https://www.niesr.ac.uk/publications/walking-line?type=global-economic-outlook>

Timoney, K. (2022). "A bottom-up sectoral assessment of the strength of income tax receipts." Available at:

<https://www.fiscalcouncil.ie/wp-content/uploads/2022/05/A-bottom-up-sectoral-assessment-of-the-strength-of-income-tax-receipts-.pdf>

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