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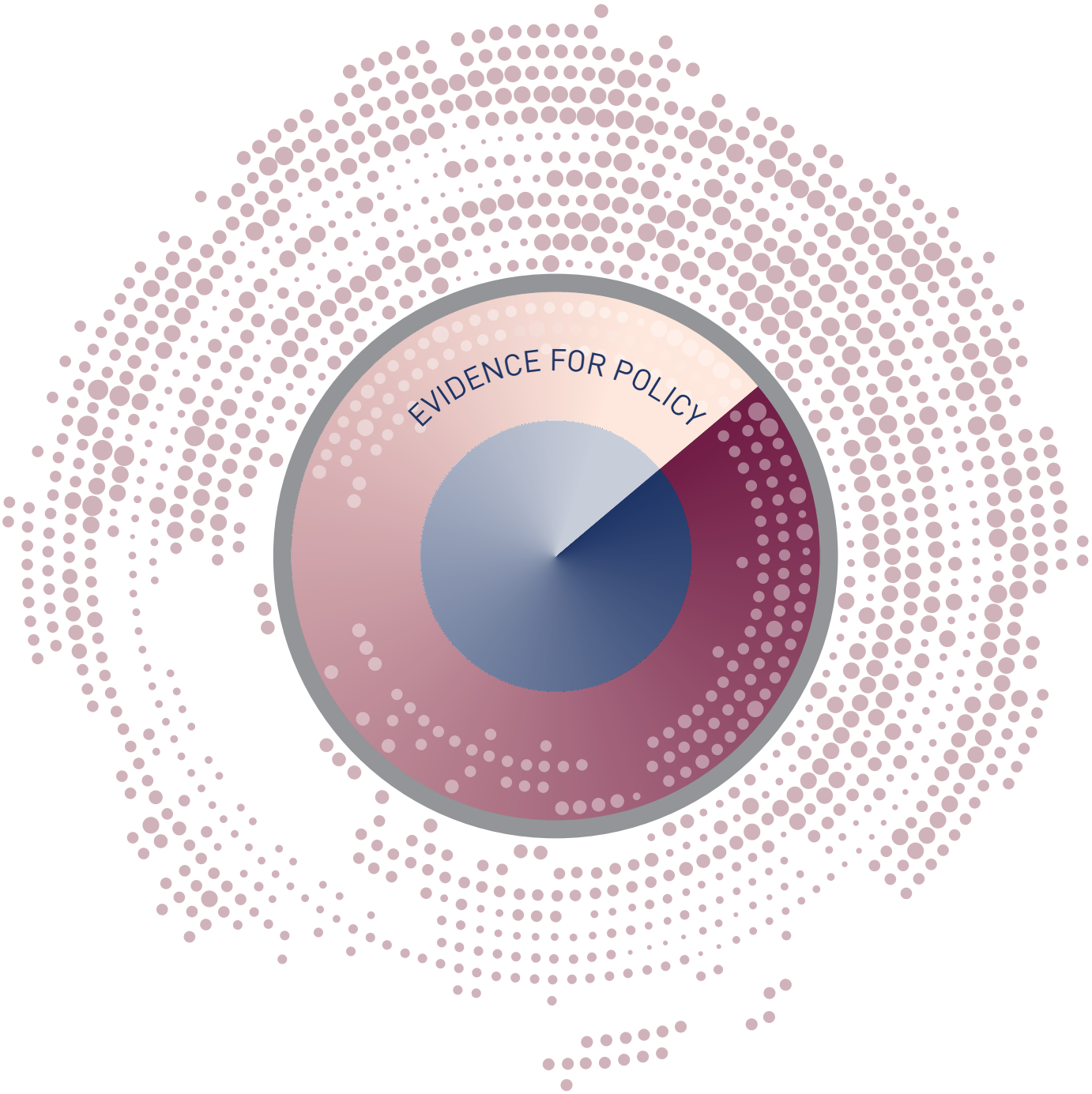
QUARTERLY ECONOMIC COMMENTARY

SPRING 2023

KIERAN MCQUINN, CONOR O'TOOLE, WENDY DISCH, EOIN KENNY AND EVA SHIEL



ESRI ECONOMIC & SOCIAL RESEARCH INSTITUTE

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THE AUTHORS

The *Commentary* is edited by Kieran McQuinn and Conor O'Toole. Kieran McQuinn is a Research Professor and Conor O'Toole is an Associate Research Professor at the Economic and Social Research Institute (ESRI). Wendy Disch, Eva Shiel and Eoin Kenny are Research Assistants at the ESRI.

Research Notes are short papers on focused research issues. They are subject to refereeing prior to publication.

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SUMMARY TABLE

	2022	2023	2024
Output (Real Annual Growth %)			
Private Consumer Expenditure	6.6	4.7	5.0
Public Net Current Expenditure	0.7	1.7	0.5
Investment	25.9	5.6	6.3
Modified Investment	*19.8*	*3.5*	*4.5*
Exports	15.0	8.0	5.8
Imports	19.0	7.0	5.0
Gross Domestic Product (GDP)	12.0	5.5	6.0
Gross National Product (GNP)	12.6	5.0	5.4
Modified Domestic Demand	*8.2*	*3.8*	*3.9*
Domestic Demand (excl. Stocks)	13.2	4.6	4.9
Labour Market			
Employment Levels ('000)	2,537	2,593	2,604
Unemployment Levels ('000)	130	114	113
Unemployment Rate (as % of Labour Force)	4.9	4.2	4.0
Public Finances			
General Government Balance (€bn)	5.0	4.7	9.8
General Government Balance (% of GDP)	1.0	0.9	1.7
Price Developments			
Inflation (CPI)	7.8	4.5	3.5

Notes: The unemployment rate and level through February 2022 are based on the monthly unemployment and the COVID-adjusted monthly unemployment series published by the Central Statistics Office (CSO).
Import forecasts for 2023 and 2024 refer to underlying activity. However, if National Accounts data reveal a significant impact of distortionary activity on import levels later in the year, modified and headline forecasts will be provided in future *Commentaries.*
Modified Domestic Demand refers to Modified Final Domestic Demand, which excludes large transactions of foreign corporations that do not have a large impact on the domestic economy. Definition available here: https://www.cso.ie/en/interactivezone/statisticsexplained/nationalaccountsexplained/totaldomesticdemandandmodifiedtotaldomesticdemand/#:~:text=Modified%20Total%20Domestic%20Demand%20goes%20further%20in%20trying,to%20exclude%20certain%20items%20that%20are%20in%20TDD. Modified investment excludes investment in aircraft for leasing and investment in R&D from abroad.
Inflation is measured by the annual percentage change in CPI.

The Irish Economy – Overview

- The pace of growth in the domestic and international economies is set to be stronger in 2023 than had previously been expected.
- While inflation is expected to slow in the present year due to falling energy costs, second round effects may still exert upward momentum on general price levels. Furthermore, while inflation is expected to moderate, price levels are going to remain high which is likely to pose cost of living challenges.
- Overall, we now forecast that modified domestic demand (MDD) will grow by 3.8 per cent in 2023 and 3.9 per cent in 2024. We expect inflation (CPI) to be 4.5 per cent in 2023 before easing to 3.5 per cent in 2024.
- Two Boxes in the *Commentary* assess inflation related issues; Doorley, Duggan and Keane assess the distributional implications of the latest cost-of-living measures introduced by the Government in February while Disch and McQuinn present evidence to suggest domestic inflation may actually be running at a somewhat slower pace than official estimates suggest.
- In another Box, Disch, McQuinn and O'Toole examine the sectoral contribution to corporation tax receipts in the Irish economy. This highlights the increasingly concentrated nature of these returns.
- The domestic labour market continues to display a significant degree of resilience. While the ICT sector experienced a significant fall in the numbers employed during 2022, employment levels in the sector appeared to recover swiftly by the end of the year. Employment numbers also show a substantial increase in those employed in the pharmaceutical sector since the onset of the pandemic.
- The higher-than-expected growth rate in the domestic economy does give rise to concerns about overheating over the short- to medium-term. The economy has performed particularly well during the pandemic and appears to have weathered the energy crisis emanating from the war in Ukraine.
- In a Research Note to the *Commentary*, Walsh and Brick estimate the amount of inpatient bed capacity in Ireland in 2023. Their analysis reveals that in the present year there may be a bed capacity deficit of approximately 1,000 inpatient beds. They outline a number of policy measures to address this issue.

Risk Analysis

Despite the ongoing resilience of the Irish economy, concentration risks in the ICT sector, a tighter monetary policy environment, ongoing uncertainties in the international economy and persistently high price levels pose major challenges to the economy.

Vulnerabilities in ICT sector

While total tax intake continued to grow in a robust manner in 2022 and unemployment levels were at record lows, the growing vulnerability of the domestic economy to concentration risks is particularly apparent, as the ICT and pharma-related sectors continue to account for the majority of corporation tax receipts and have contributed significantly to recent employment gains. The labour market remained resilient through Q4 2022, despite high-profile tech layoffs. In Q3 2022, the ICT sector lost 10,900 workers, yet gained 9,700 additional workers the following quarter. Across all sectors, employment increased by over 20,000 workers in Q4. However, as large tech companies continue to experience difficulties and additional interest rate increases are expected, the risk of further layoffs and reduced profits could lead to a downward revision in our outlook for the labour market and public finances. Indeed, the growth in exports of computer services has been trending downwards. As computer services exports account for approximately half of Irish service exports, any fall-off will strongly pass through to overall trade levels.

Monetary policy and risks to financial sector

Despite the expectation that inflationary pressures seem likely to abate more quickly than anticipated, central banks have continued with monetary policy tightening. The recent failures of Silicon Valley Bank (SVB) and Signature Bank in the US highlights the ongoing challenge of the global economy in adjusting to higher interest rates. While the policy action taken with respect to Credit Suisse by international monetary authorities appears to have limited the contagion from the financial sector in the short term, further propagation of banking distress may occur from interconnectedness of institutions, general banking distress or the tighter monetary policy stance. Any tightening of financial conditions would adversely impact investment which is also likely to be dampened by the higher interest rates and the general industrial challenges in the tech sector.

International conditions: energy and uncertainty

While energy prices remain high, declines in wholesale gas and other fuel prices have contributed to a modest slowdown in energy prices across Europe. Energy prices, and overall inflation, could improve beyond our current forecast in the event that greater progress is made in providing an effective EU-wide energy

policy. A recent proposal by the European Commission indicates that greater protection for consumers, reductions in energy demand and an acceleration in the use of renewables may be achieved in the near term.[1] Given a significant improvement in energy prices, consumption and overall economic activity would likely improve above our expectations in 2023.

However, continued uncertainty in the international environment poses significant downside risks to our outlook. In response to the ongoing war in Ukraine and its humanitarian crisis, the Temporary Protection permissions granted to Ukrainian refugees have been extended through March 2024.[2] The extent of the war and the size of the influx of refugees could put further strain on the public finances as governments across Europe provide the essential services required to house and support refugees. Further shocks from the war, or an escalation in tensions emerging in other large economies, could contribute to greater economic uncertainty and pose challenges to international trade.

The changing nature of inflationary pressures

Over and above the contribution of energy prices to the inflationary environment, data for a number of large economies, in particular the US, indicate that core inflation appears to be remaining stubbornly high. While a moderation in energy inflation can dampen price growth in a relatively short period, rising core inflation, in particular through wage growth, can be much more difficult to subdue. If core inflationary pressures begin to be replaced by second-round or wage-based price rises, a higher-for-longer interest rate cycle would likely be followed to address this. Such a policy could take longer to be effective and thus presents downside risk to the global macroeconomy particularly in light of recent difficulties amongst certain financial institutions.

A further macroeconomic challenge from prolonged inflation rates is the risk of a reduction in competitiveness. If cost inflationary pressures persist above those peer-economies, this may cause a notable decline in Irish competitiveness which can affect trade, production and investment activity.

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1 See: EU unveils power market reform to tame volatile electricity prices – EURACTIV.com.

2 gov.ie - Minister for Justice announces extension of the Temporary Protection permissions granted to persons fleeing the war in Ukraine (www.gov.ie).

The Domestic Economy

OUTPUT

Key Points

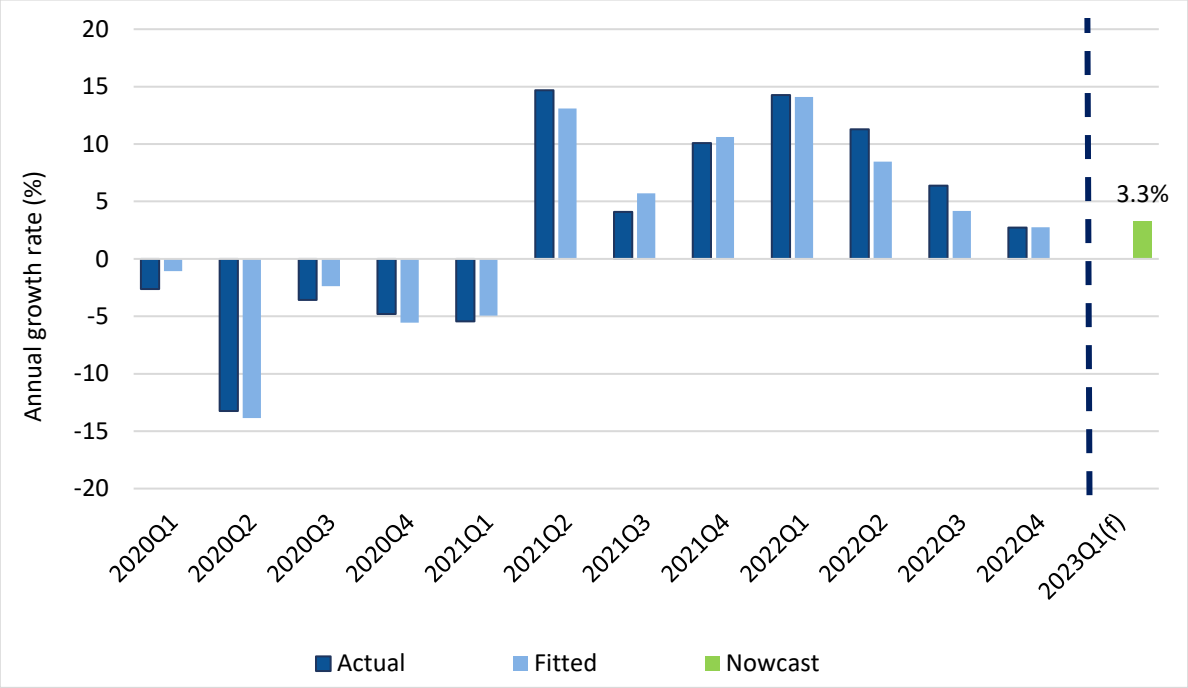
- *Domestic growth in 2023 set to be somewhat stronger than previously expected as inflationary pressures are beginning to ease.*
- *Modified domestic demand is now set to grow by 3.8 per cent in 2023 and 3.9 per cent in 2024.*
- *Performance of ICT and pharmaceutical sectors continues to drive output growth through strong exports.*

The Irish economy now looks set to grow at a somewhat faster pace in 2023 than had previously been expected. Central to this is the improving nature of international macroeconomic conditions where the prospect of a global recession has rescinded considerably as the present year evolves. This is mainly due to the easing of inflationary pressures, with the cost of energy, in particular, abating somewhat in the present year. Inflationary pressures are still elevated, and uncertainty still surrounds the extent to which easing energy pressures will be offset by increased prices of key components of the CPI such as food.

Nonetheless, with the improved international macroeconomic context, most elements of domestic economic performance are set to register somewhat stronger growth than had been previously forecast. Consumption is now set to grow by 4.7 per cent in 2023 while modified investment looks set to increase by 3.5 per cent. Exports and imports are both set to grow at a more significant pace, experiencing increases of 15.7 and 15 per cent respectively. Overall, we now believe modified domestic demand will increase by 3.4 per cent in 2023. Our preliminary estimate for 2024 suggests the economy will grow by 4.1 per cent. This reflects the continuing easing of inflationary pressures next year in both an international and domestic context.

The quicker pace of the Irish economy over the past quarter is evident from the monthly annual Nowcast estimates which are now published on the ESRI website. The Nowcasting model (Egan, 2021), currently employed to support the regular forecasting exercise in the *Commentary*, indicates that MDD is expected to grow by 3.3 per cent in Q1 2023 on an annual basis. Figure 1 shows the performance of the Nowcasting model compared to actual growth in MDD since Q1 2020. We now expect MDD to increase by 3.8 per cent in 2023 and 3.9 per cent in 2024.

FIGURE 1 NOWCAST OF MODIFIED DOMESTIC DEMAND FROM Q1 2020 TO Q1 2023



Source: Central Statistics Office and authors' calculations.
Note: Nowcast figures for Q1 2023 include data available through 16 March 2023. Unemployment data for the nowcast reflect COVID-adjusted figures for the period March 2020-February 2022.

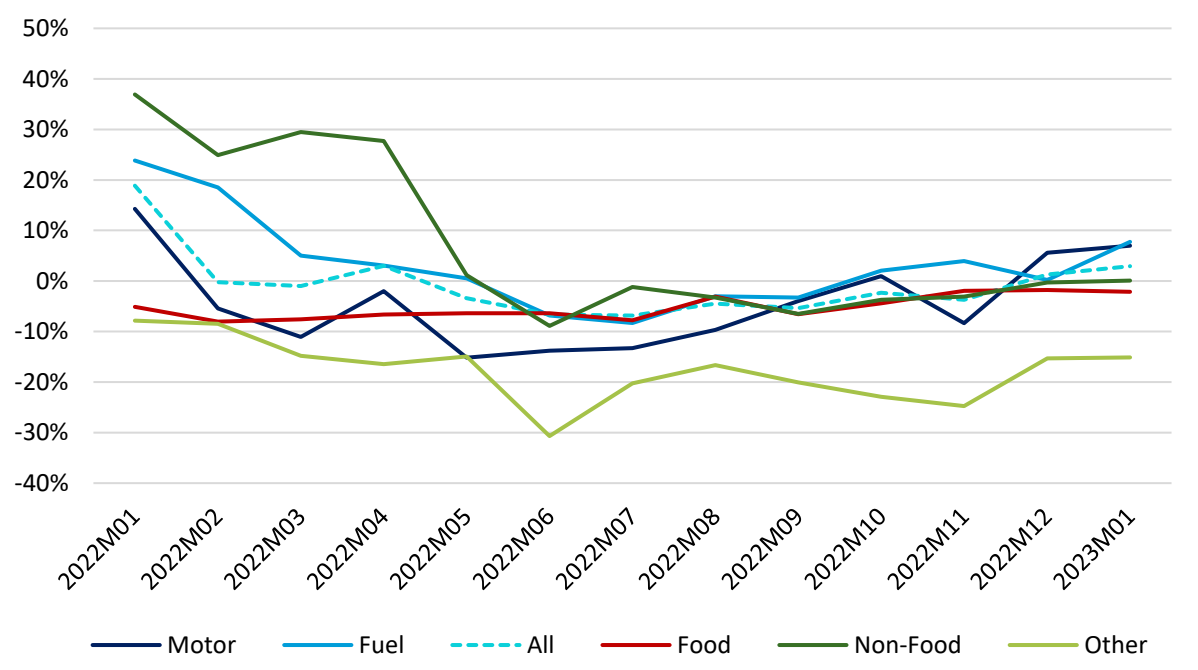
DEMAND

Key Points

- *Personal expenditure on consumer goods and services grew by 4.2 per cent on an annual basis in Q4 2022.*
- *We expect the savings ratio to continue to fall through 2023.*
- *Consumption is forecasted to grow by 4.7 per cent in 2023 and 5.0 per cent in 2024.*

Household expenditure is closely associated with developments in retail sales. Figure 2 shows the annual growth rate of the volume of retail sales from January 2022 to January 2023. The volume of sales experienced an annual increase of 3.0 per cent in January 2023, having experienced negative annual growth rates since April 2022. However, there is some variation across different items. For instance, the volume of motor retail sales and fuel retail sales increased annually by 7.0 per cent and 7.8 per cent respectively, while other spending had the largest annual drop in the volume of retail sales in January 2023, falling by 15.1 per cent. In addition, the volume of food retail sales fell by 2.1 per cent in January 2023 on a year-on-year basis. Overall, in 2022, total retail sales fell by 1.3 per cent when compared to levels in 2021.

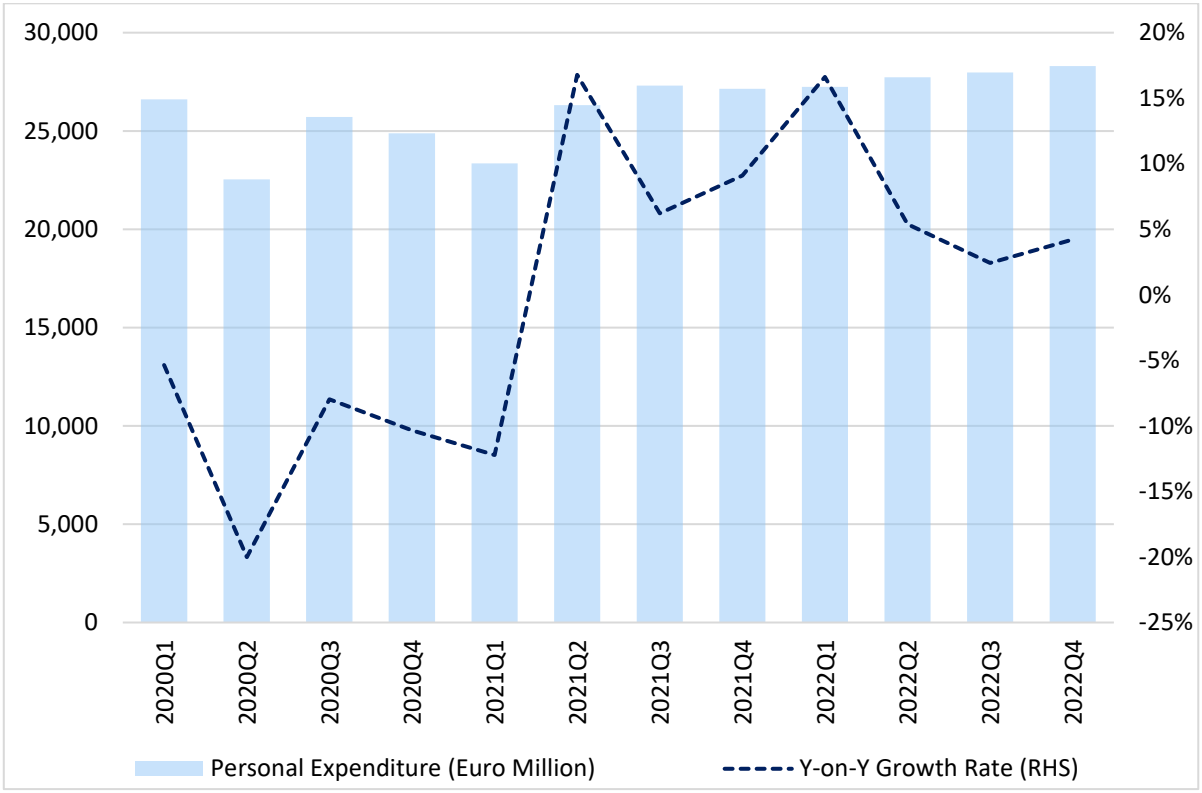
FIGURE 2 RETAIL SALES INDEX: ANNUAL GROWTH OF VOLUMES (ADJUSTED)



Source: Central Statistics Office.

In Q4 2022, personal expenditure (in € millions) on consumer goods and services increased by 1.1 per cent on a quarterly basis and 4.2 per cent on an annual basis (Figure 3). Overall, personal expenditure on consumer goods and services grew by 6.6 per cent in 2022 compared to 2021.

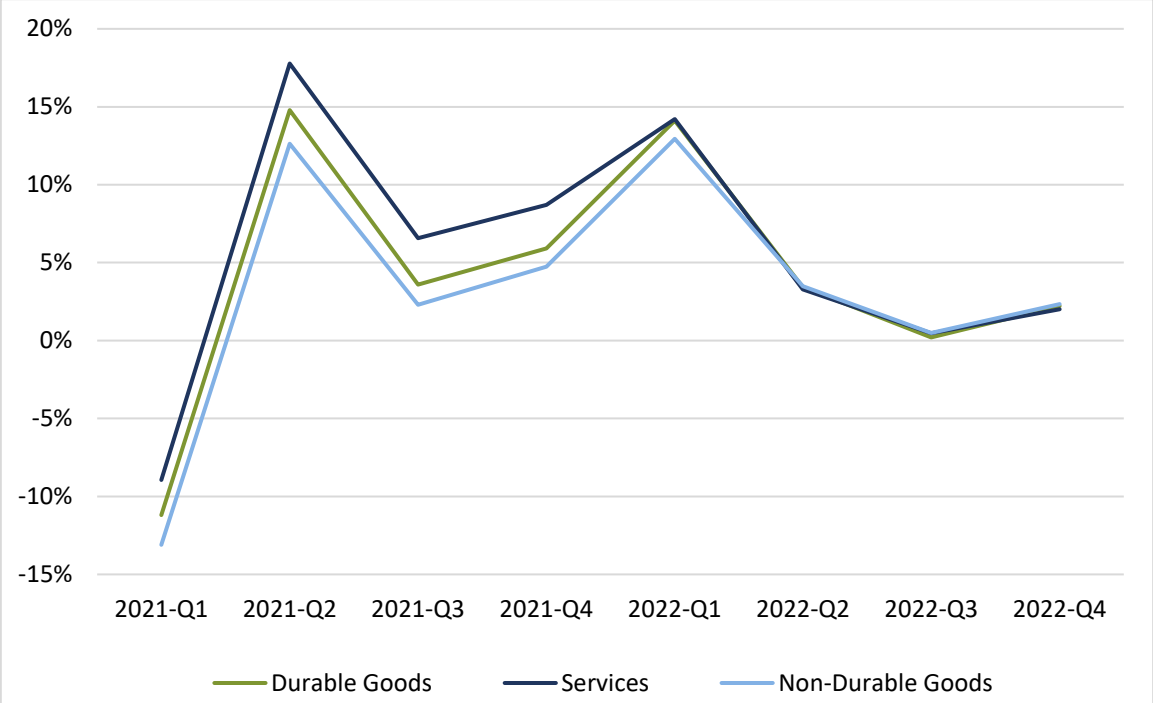
FIGURE 3 PERSONAL EXPENDITURE ON CONSUMER GOOD AND SERVICES LEVEL AND ANNUAL GROWTH RATE (CONSTANT MARKET PRICES, SEASONALLY ADJUSTED)



Source: Central Statistics Office.

Figure 4 splits final consumption of households into goods (durable and non-durable) and services. The graph reveals that the year-on-year growth rates of final household expenditure on durable goods, non-durable goods, and services were very similar in Q4 2022, with durable goods, non-durable goods and services growing at 2.2 per cent, 2.3 per cent and 2.0 per cent respectively.

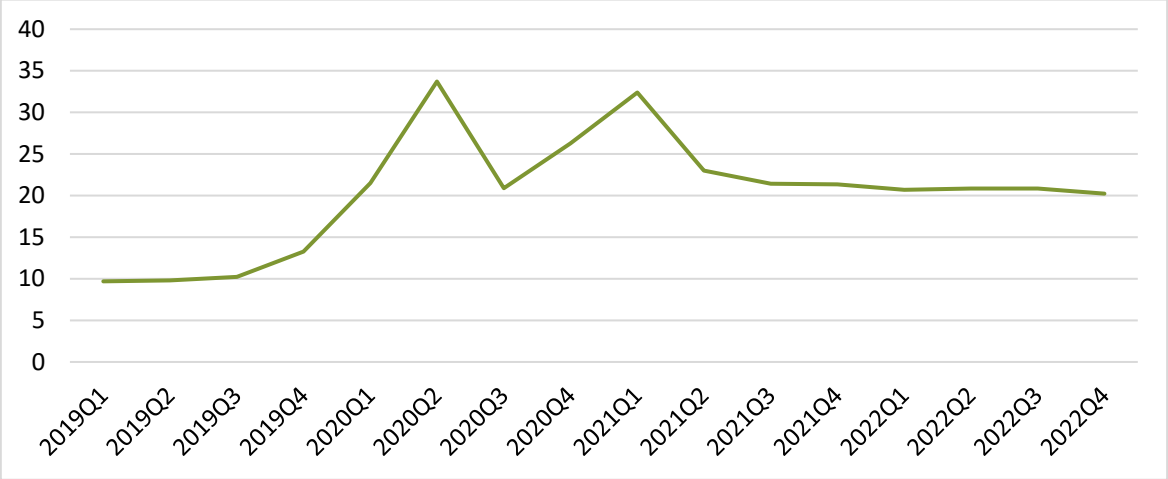
FIGURE 4 FINAL CONSUMPTION EXPENDITURE OF HOUSEHOLDS FOR DURABLE GOODS, NON-DURABLE GOODS AND SERVICES: ANNUAL GROWTH RATE (CHAIN-LINKED VOLUMES, INDEX 2015 = 100, SEASONALLY AND CALENDAR ADJUSTED)



Source: Eurostat.
Note: Unit is chain linked volumes.

The savings ratio in Ireland increased significantly during the pandemic as consumption was greatly reduced due to public health restrictions, especially in Q2 2020 and Q1 2021 (Figure 5). The domestic savings ratio started to decline gradually throughout the latter half of 2021 as public health restrictions were lifted. The savings ratio continued to fall gradually throughout 2022. This may have been due to households using their savings to cushion against the heightened inflationary pressures brought about by the Russian invasion of Ukraine. In Q4 2022, while still above the pre-pandemic level, the Irish savings ratio was down 5.3 per cent year-on-year. The overall savings ratio fell from 24.5 per cent in 2021 to 20.6 per cent in 2022.

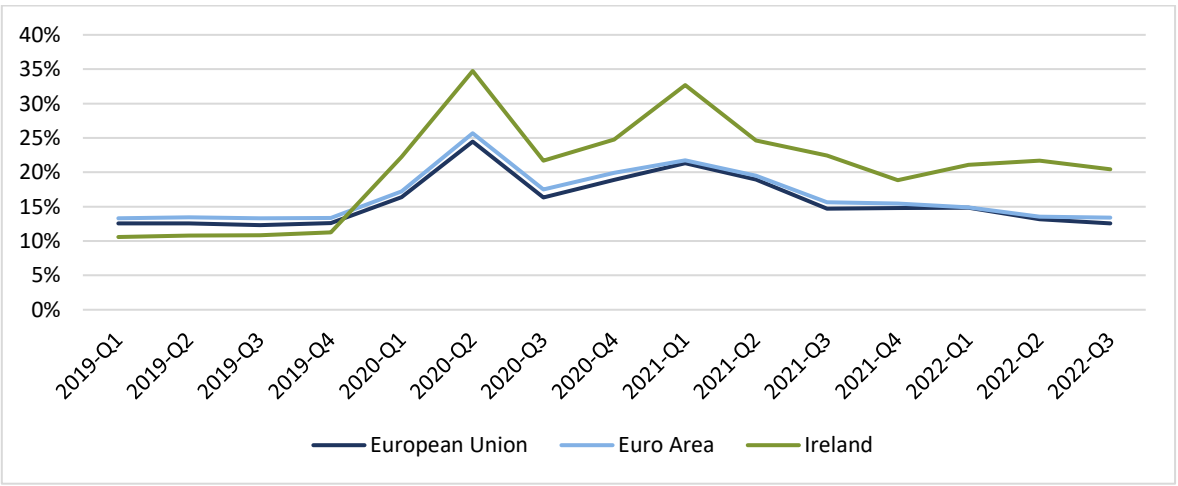
FIGURE 5 SAVINGS RATIO (SEASONALLY-ADJUSTED) (%) – IRELAND.



Source: Central Statistics Office.

Ireland's official savings ratio is higher than other indicators of savings across euro area countries. However, as noted by Timoney (2022),[3] this could be a consequence of consumption being underestimated due to inaccurate weighting in the consumption basket since the pandemic. When compared to our European peers (Figure 6), Ireland's savings ratio (20.4 per cent) is at a much higher rate than both that of the EU (12.6 per cent) and of the euro area (13.4 per cent). If the level of savings in the domestic economy is in fact overestimated, this means that, while households are likely to still have high savings and be able to reduce the savings ratios to maintain consumption as the cost-of-living pressures tighten, the extent of this 'capacity' is less than the headline rate suggests.

FIGURE 6 SAVINGS RATIO (SEASONALLY AND CALENDARLY ADJUSTED) – IRELAND, EU AND EURO AREA

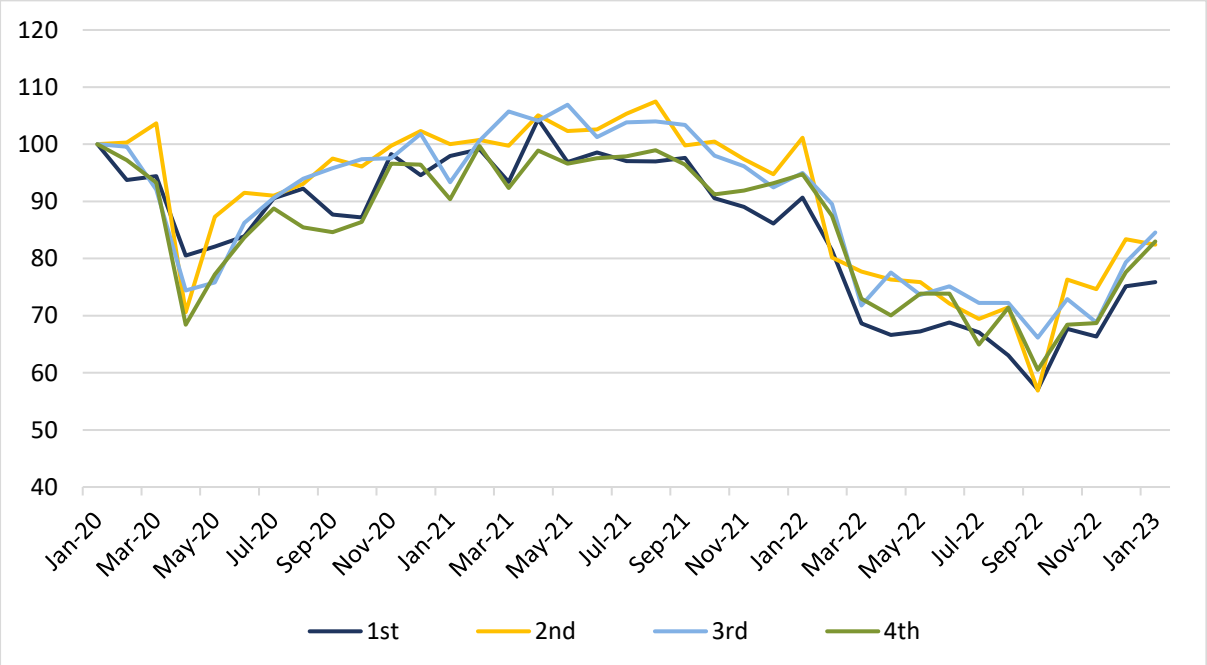


Source: Eurostat and authors' calculations.

[3] See: https://www.fiscalcouncil.ie/wp-content/uploads/2022/11/Household-Consumption-and-Savings-in-Ireland-Since-the-COVID-19-Pandemic-Fiscal-Council-Analytical-Note-18-by-Kevin-Timoney.pdf.

While fears of an international recession may have diminished somewhat, there is still uncertainty around the future rate of inflation. Households' use of the increased savings accumulated since the pandemic will likely vary across the income distribution; many lower income households may have to use their savings to withstand the increased cost of living, while also having to reduce their consumption levels. On the other hand, many higher-income households may be able to withstand the increased cost of living by using a proportion of their savings without having to reduce their consumption levels. Figure 7 compares different income quartiles' expectations of their financial situation over the next 12 months. In January 2023, after an improvement in sentiment since the lowest dip seen in September 2022, the 1st quartile (the lowest income bracket) is expecting to be in a worse financial situation in the next 12 months than the other quartiles expect to be in.

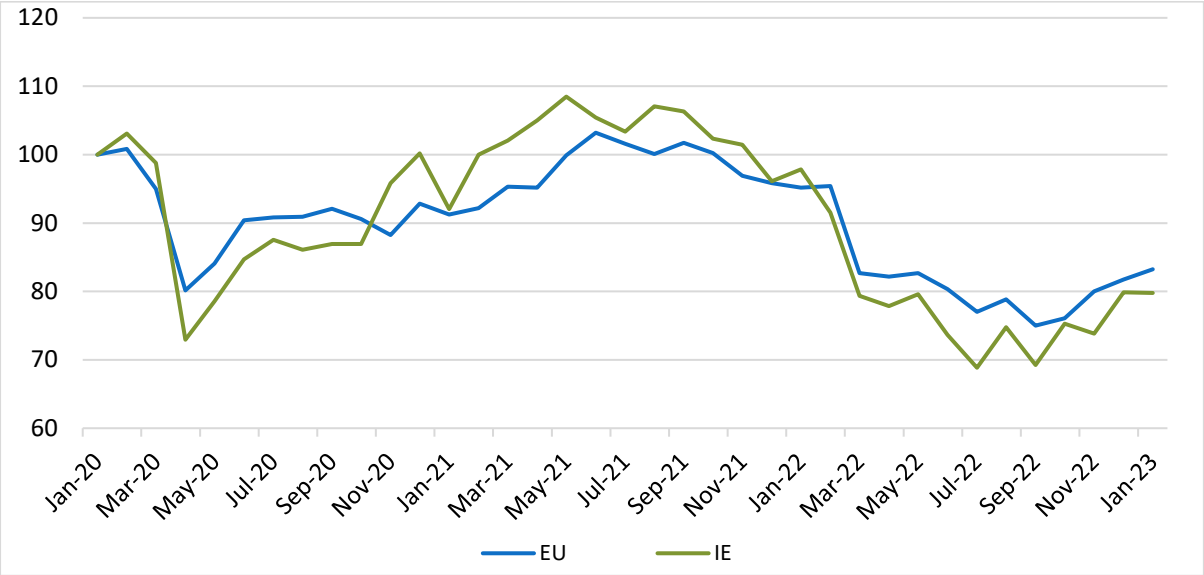
FIGURE 7 FINANCIAL SITUATION CONFIDENCE BY QUARTILE (SEASONALLY ADJUSTED)



Source: Eurostat and authors' calculations.

As shown in Figure 8, consumer confidence also dipped significantly at the start of 2022 in both Ireland and the EU, with heightened global uncertainty due to inflationary pressures and geopolitical insecurity, both of which stem from the Russian invasion of Ukraine in February 2022. While consumer confidence has generally been improving since Q3 2022, in January 2023 Ireland's consumer confidence was lower than that of the EU's, and was lower than its level in January 2022.

FIGURE 8 CONSUMER CONFIDENCE INDICATOR



Source: European Commission.

Consumption forecasts

Despite ongoing economic uncertainties, the economy is growing at a stronger pace at the start of 2023 than previously expected, with inflation forecast to be lower in 2023 than originally assumed. This lower level of inflation will likely increase consumption; thus, consumption is forecasted to grow by 4.7 per cent in 2023 and 5.0 per cent in 2024. We expect the savings ratio to decline somewhat next year and again in 2024, as households continue to cushion their expenditure levels by reducing savings.

TRADED SECTOR

Key Points

- *Irish net exports were €187 billion in 2022, up €11 billion on 2021.*
- *Imports for the year grew by 23.6 per cent, driven by R&D related imports throughout 2022.*
- *Export activity may moderate in 2023 due to continued monetary tightening by the European Central Bank.*

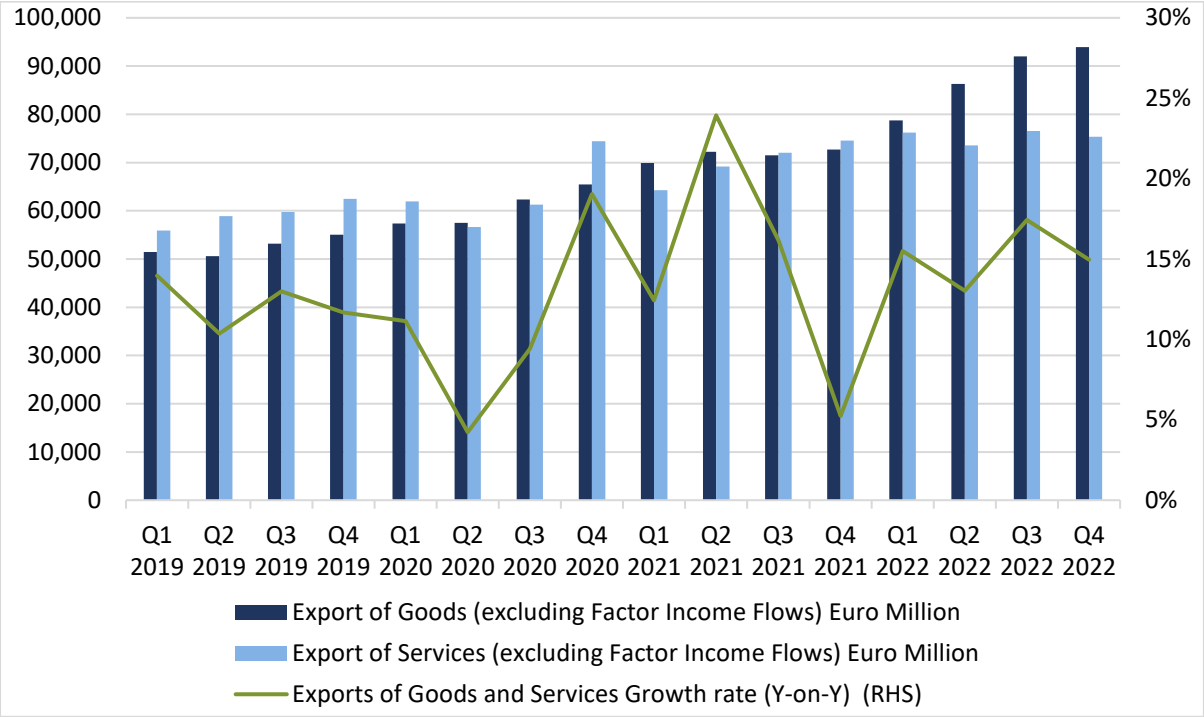
Import and export activity

Annual export growth has been consistent over several years and continued to grow by double digits in 2022, with exports increasing by 20.1 per cent. This strong showing from the export sector was a large reason for the country's economic growth in 2022. Net exports in 2022 amounted to €187 billion, up from €176 billion in 2021. This growth in net exports is on the back of significant annual growth in 2021, when exports increased by 150 per cent.

Figure 9 shows the annual growth in Irish exports by quarter as well as the level of exports. The growth in the level of services exports slowed in 2021 and 2022, while exports of goods has continued to grow throughout 2021 and 2022. The growth in exports in 2022 was, therefore, largely driven by exports of goods. In Q4 2022, exports of goods and services increased by 15 per cent and 1.1 per cent on an annual basis, respectively.

This is likely due to a slowdown in activity in the ICT sector, which has been highlighted by a number of announcements from large firms in the sector regarding substantial staff layoffs. On the other hand, the Pharmaceutical and chemicals sector, as well as the Food sector, have maintained their strong economic performance, shown by the continued increases in exports of goods.

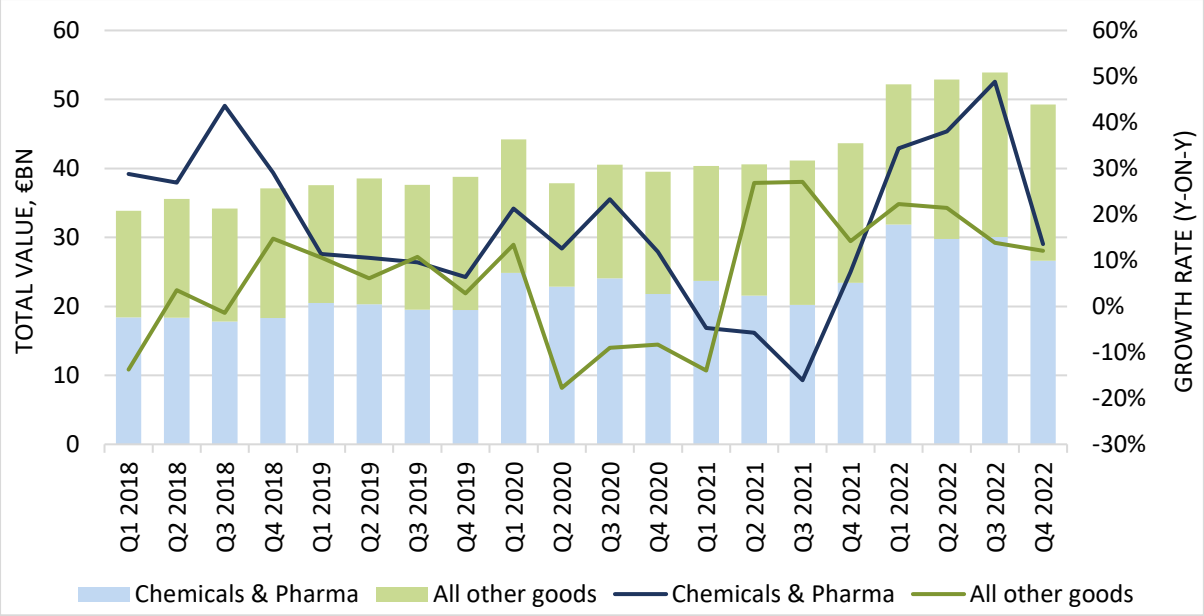
FIGURE 9 SEASONALLY-ADJUSTED EXPORTS (VOLUME, % CHANGE YEAR-ON-YEAR)



Source: Central Statistics Office, Quarterly National Accounts.

As has been the case for some time now, Irish exports are heavily influenced by pharmaceutical-related and ICT industries. Figure 10 provides a breakdown of the value and annual growth rates of goods exports by these industries and all other goods.

FIGURE 10 GOODS EXPORTS: COMPONENT VALUE AND GROWTH RATE (% CHANGE YEAR-ON-YEAR)

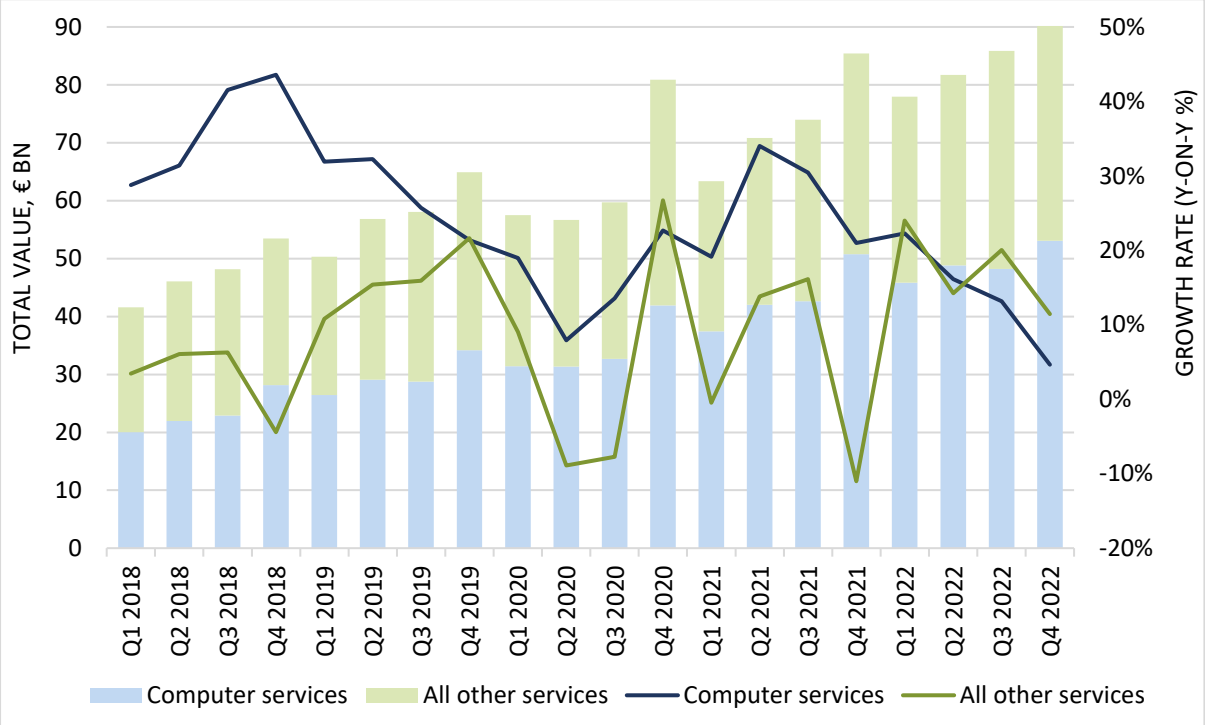


Source: Central Statistics Office, Current Account: Merchandise and Services.

Chemicals and pharma-related goods accounted for 57 per cent of goods exports in 2022, with a total value of over €118 billion. Exports of these pharma-related goods increased by 33 per cent compared to 2021. The value of all other goods, which includes food, machinery, manufactured articles and all other commodities, was €90 billion in 2022. This is an annual increase of 17 per cent.

In services exports, a similar pattern of sectoral concentration emerges, with computer services from the ICT sector accounting for a large proportion of services exports. This is shown in Figure 11.

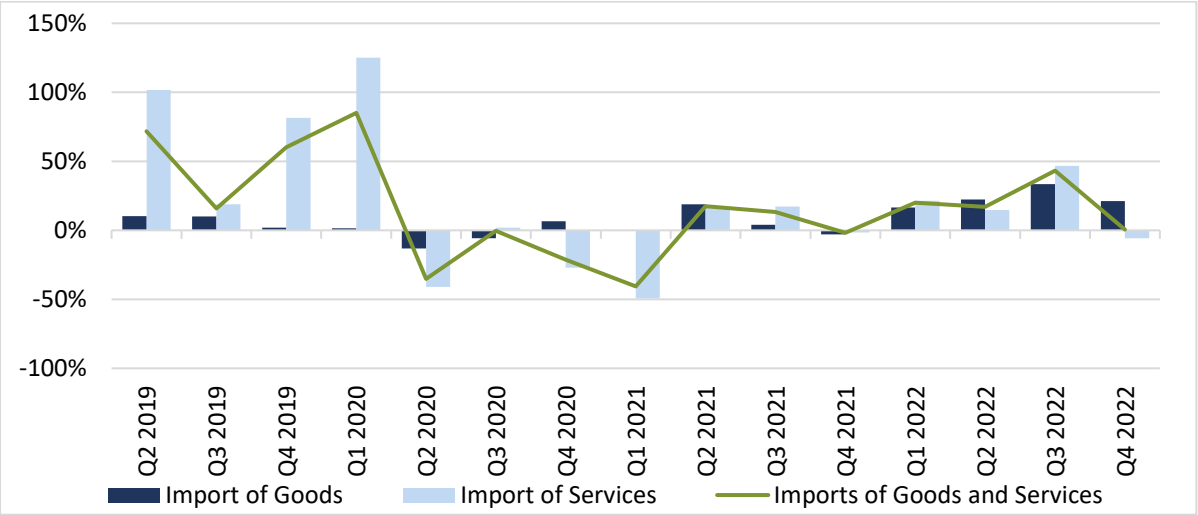
FIGURE 11 SERVICE EXPORTS: COMPONENT VALUE AND GROWTH RATE (% CHANGE YEAR-ON-YEAR)



Source: Central Statistics Office, Current Account: Merchandise and Services.

Figure 12 shows the annual change in seasonally-adjusted imports of goods and services. Imports grew by 23.6 per cent in 2022. This reflects the increasing levels of consumption after two years of declining imports due mainly to the effects of the COVID-19 pandemic. As illustrated in Figure 12, the growth in imports in 2022 has been driven by both goods and services. Imports of goods grew by 23 per cent in 2022 while imports of services grew by 17 per cent.

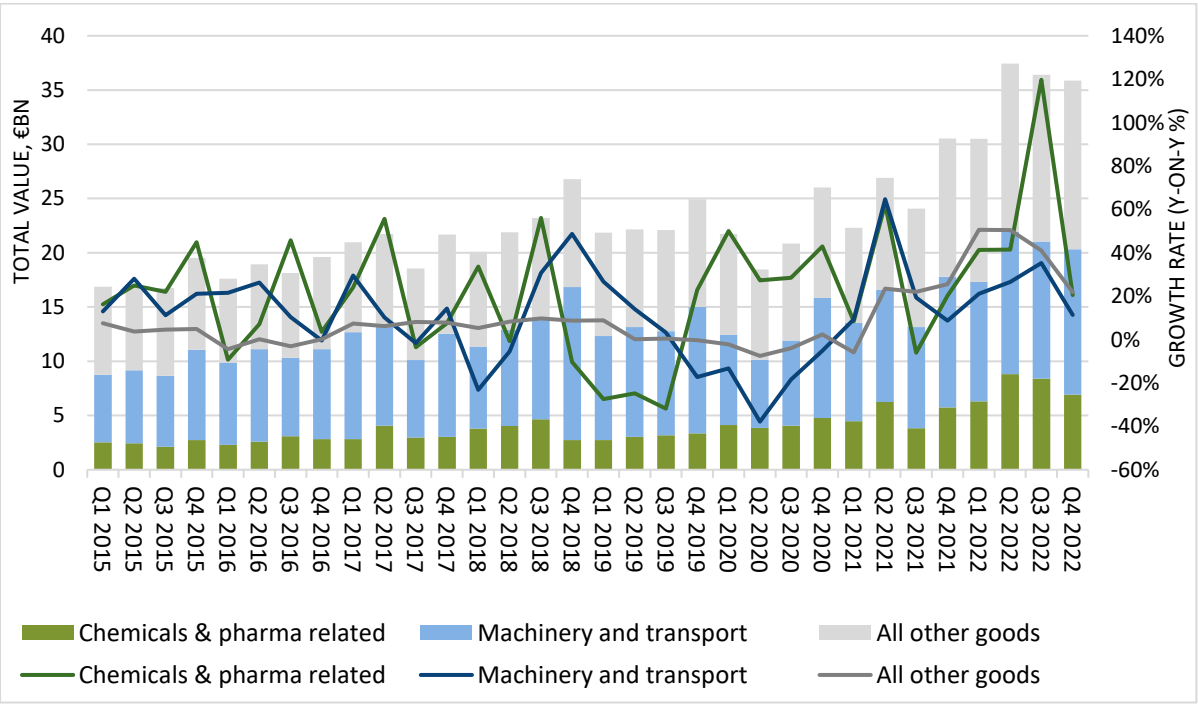
FIGURE 12 SEASONALLY-ADJUSTED IMPORTS (VOLUME, % CHANGE YEAR-ON-YEAR)



Source: Central Statistics Office.

The value of imports also increased, with an increase of €95.1 billion in 2022. Goods imports amounted to €128.6 billion in 2022, an increase of €24.4 billion compared to 2021. Pharmaceutical-related goods accounted for €30.4 billion, or 24 per cent, of goods imports. Machinery and transport also represented a large share of goods imports, with €50.1 billion of machinery and transport imports in 2022, representing 39 per cent of goods imports. These contributions are illustrated in Figure 13.

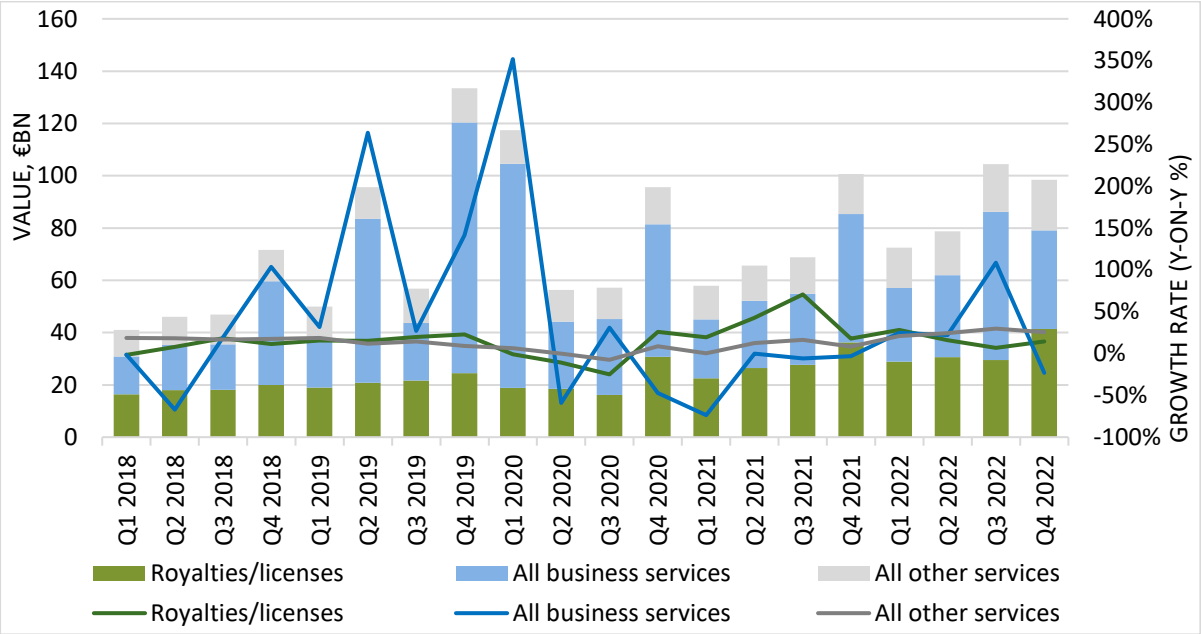
FIGURE 13 GOODS IMPORTS BY COMMODITY GROUP (VALUE, € BILLION)



Source: Central Statistics Office.

Services imports increased by €49.8 billion on an annual basis, amounting to €335.8 billion in 2022. Much of the growth in the value of services imports over the last couple of years can be attributed to the large imports of research and development related business services, as well as royalties/licenses. These 'business services' imports accounted for €153 billion in 2022 compared to €124 billion in 2021. Business services accounts for over 40 per cent of service imports. Royalties and/or licenses also contribute heavily to services imports, and they make up a further 37 per cent. Therefore, the ICT sector is influential in both the imports and exports of services. The breakdown of services imports is shown in Figure 14.

FIGURE 14 SERVICE IMPORTS BY COMMODITY GROUP (VALUE, € MILLION)



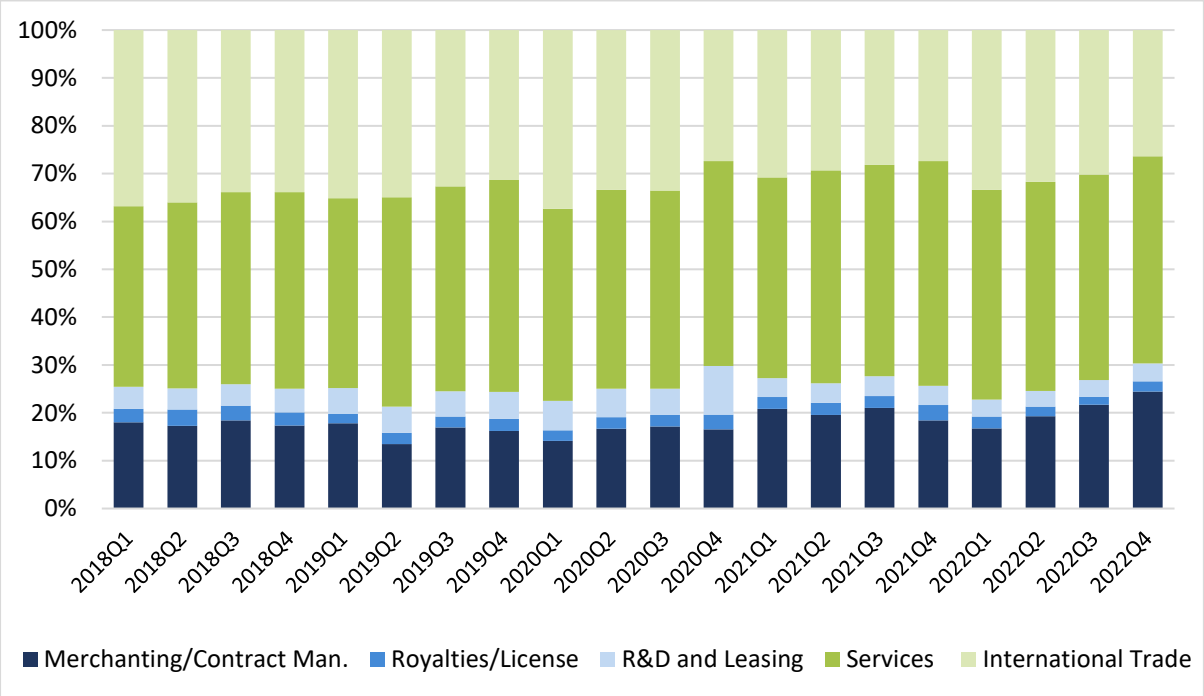
Source: Central Statistics Office.
Note: 'All other services' relate to transport, tourism and travel, communications, insurance, financial services, computer services, and other services.

Given the international nature of many firms in these sectors, a certain level of globalisation activities affect the Irish National Accounts. It is important to examine the headline Irish trade data without these globalisation effects. To do this, certain accounts have been identified as 'globalisation activities' whereas other accounts have been identified as 'non-globalisation'. The globalisation activities comprise of merchanting and contract manufacturing, royalties/licensing, and R&D and leasing. The omission of these elements from exports and imports leaves non-globalisation elements of trade – services and international trade.

Exports from globalisation activities accounts increased by 18.5 per cent in 2022 and represented 26.3 per cent of total exports. They amounted to €181 billion in 2022. The vast majority of these exports arises from merchanting and contract

manufacturing. Merchanting refers to net sales by Irish merchants of foreign goods bought from and sold to non-residents without entering or leaving Ireland.[4] Contract manufacturing refers to a company in Ireland engaging a company abroad to manufacture products on its behalf (and vice versa).[5] The shares of the globalisation activities and non-globalisation accounts to overall exports are shown in Figure 15. Clearly, the effects of globalisation activities accounts are notable, however the majority of exports can be attributed to non-globalisation trade activity.

FIGURE 15 SHARE OF 'GLOBALISATION' AND 'NON-GLOBALISATION' A/C TO OVERALL EXPORTS

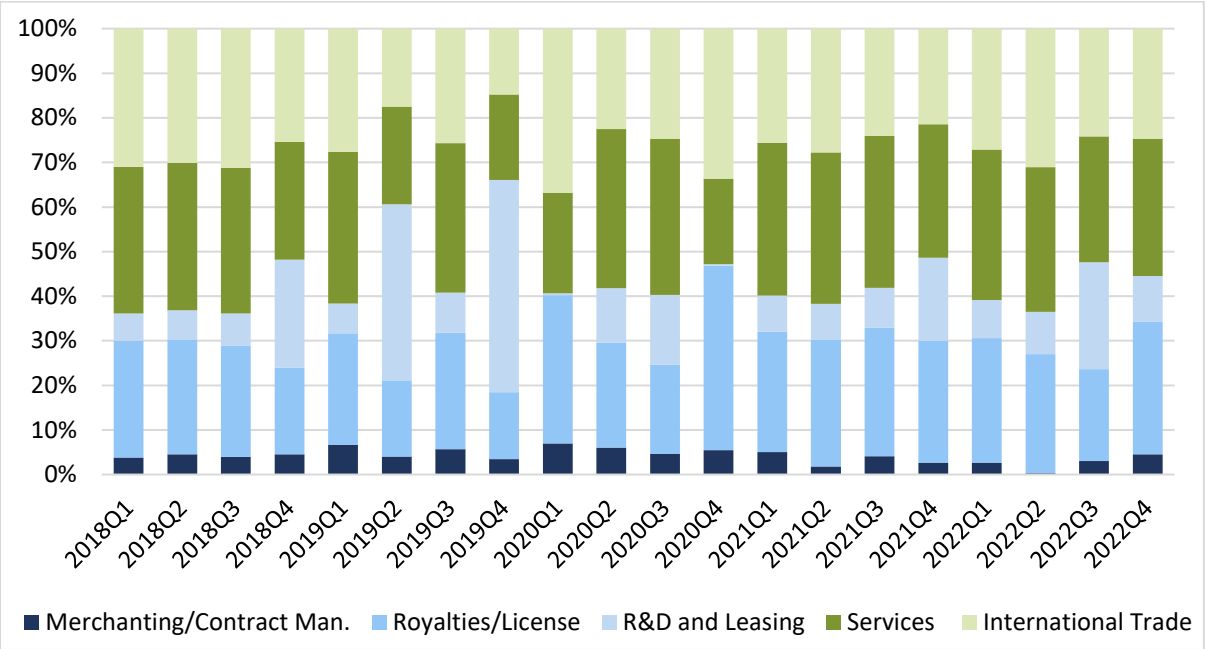


Source: Central Statistics Office.

Imports, on the other hand, are more heavily affected by the practices of large multinational enterprises. Imports from the identified globalisation accounts amounted to €212 billion in 2022, increasing by 22.3 per cent on 2021. This accounted for 42.5 per cent of imports in 2022. The main element behind these figures is the importation of royalties and/or licenses. This is often due to intellectual property (IP), patents, and/or licenses being held by Irish firms, who charge a royalty or payment of some sort for use of IP or technologies by non-Irish firms/subsidiaries. The shares of the globalisation activities and non-globalisation accounts to overall imports are shown in Figure 16.

4 See: Central Statistics Office Balance of Payments for more information.
5 See Contract Manufacturing - rebrand.indd (cso.ie) for more information.

FIGURE 16 SHARE OF 'GLOBALISATION' AND 'NON-GLOBALISATION' A/C TO OVERALL IMPORTS



Source: Central Statistics Office.

The influence of royalties/licenses as well as R&D leasing is clear. When the globalisation activities accounts are omitted, however, the positive growth in trade remains. The non-globalisation accounts of services and international trade increased by 17.2 per cent and 26.1 per cent, respectively, in 2022 on an annual basis. Imports for services and international trade increased by 17.1 per cent and 34.6 per cent, respectively.

Therefore, although there are elements of Irish trade data that are distorted by multinational activity, growth in exports and imports is evident even when some of these distortions are removed.

Trade Outlook

As for the outlook for trade in the near future, considerable uncertainty remains. In 2023, monetary tightening will continue as the ECB looks set to introduce two further 0.5 per cent increases to policy rates by the summer. This will lead to higher rates for firms and will increase the cost of credit for both firms and households.

However, the rate of inflation is easing, with energy costs decreasing and stabilising over the last number of months. A continued easing of inflation rates is likely to see international trading conditions improve somewhat in 2023 relative to what had been previously expected.

Risks to our trade outlook include ongoing developments in the new Windsor Framework between the European Union and the United Kingdom concerning the Protocol agreement. The recent agreement with the European Union may be an important first-step in what Posen and Rengifo-Keller (2022)[6] have called the necessary 're-engagement' between the UK and the EU on regulatory convergence. This agreement offers a welcome opportunity to bring both political and economic stability to Northern Ireland and to enhance relationships between the United Kingdom and the European Union.

Given the strong performance of the traded sector, exports and imports are projected to grow by 8.0 per cent and 7.0 per cent in 2023, respectively. In 2024, we expect growth in trade to continue, particularly as upward pressures on both prices and interest rates abate. Therefore, exports in 2024 are expected to increase by 5.8 per cent with imports rising by 5.0 per cent. However, if the ICT computer service exports continue on their current downward trajectory, this is likely to impact overall export growth.

6 Posen A. and L. Rengifo-Keller (2022). 'Brexit Britain in a changing global economy', in J. Portes (ed.) *The Economics of Brexit: What Have We Learned?* CEPR press, London.

INVESTMENT

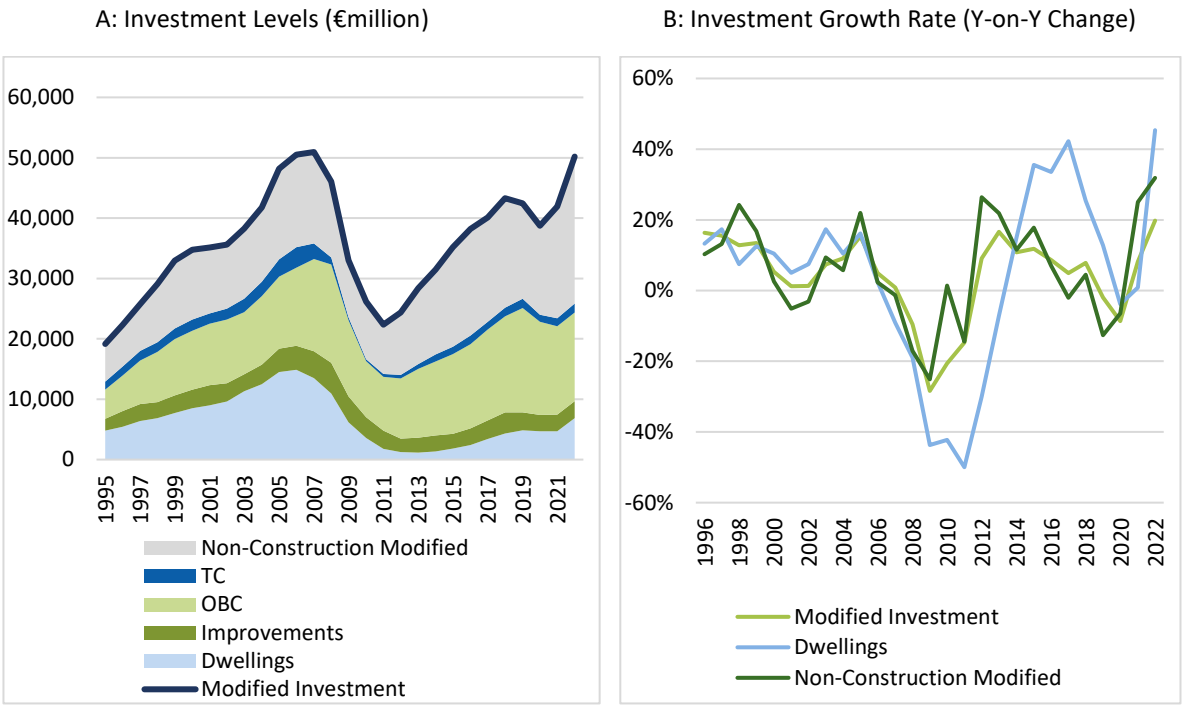
Key Points

- *In 2022, investment across most asset classes was strong in Ireland, driven by the recovery from COVID-19 and strong continued multinational activity.*
- *International headwinds are likely to moderate the growth in investment into 2023 and 2024 as interest rates continue to increase and uncertainty remains high.*
- *Housing completions in 2022 were at the highest level since the financial crisis at just under 30,000 units.*
- *However, labour scarcity and cost inflation are likely to impact completions into next year; we expect 27,000 units to be completed in 2023.*

Capital investment into the Irish economy grew strongly in 2022, despite the international economic challenges of the war in Ukraine, rapidly increasing interest rates and slowing global growth. Figure 17 presents the level of modified gross fixed capital formation in constant price terms for the period 1995 to 2022; modified investment excludes investment in aircraft leasing and investment in research and development-related intangible assets. The level of investment grew significantly in 2022, increasingly nearly 20 per cent annually (Figure 17 Panel B). This is a notable rise from 2021 when investment grew by 8 per cent.

Considering the differing assets within overall investment, a notable acceleration in dwellings investment occurred in 2022 with a 45 per cent increase on the 2021 level. Non-construction investment, which includes machinery, equipment, other intangible assets etc. (but excludes the items noted above in the definition of modified investment) also grew rapidly in 2022 indicating the broad-based expansion in capital expenditure.

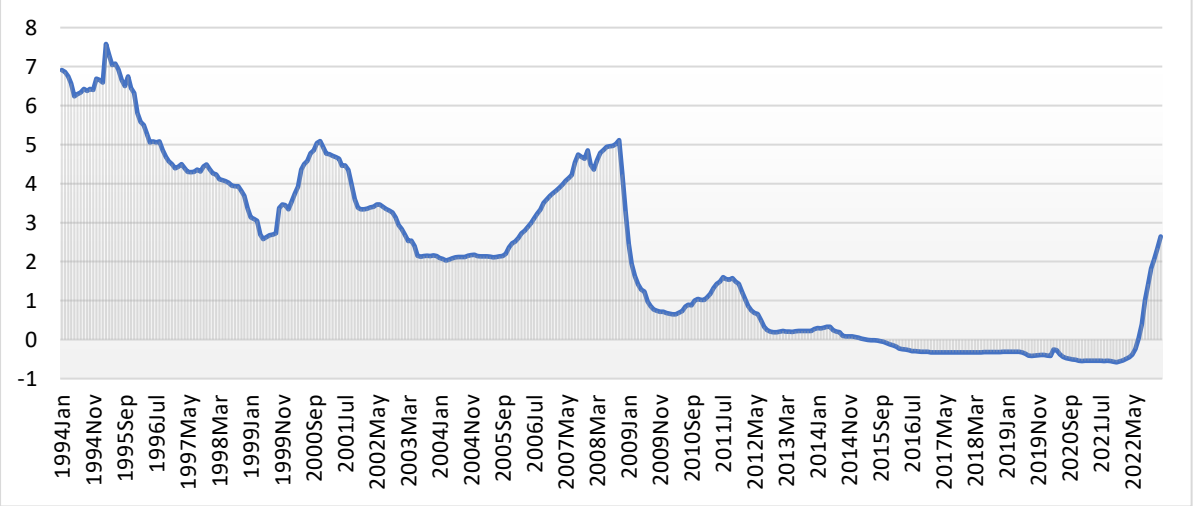
FIGURE 17 MODIFIED GROSS DOMESTIC FIXED CAPITAL FORMATION



Source: Central Statistics Office.
Note: Data are annual sum of constant price, seasonally unadjusted quarterly data. TC refers to transfer costs, OBC is other building and construction (commercial etc).

Despite the positive performance of investment in 2022, there are a number of likely headwinds which may moderate the growth in capital expenditure for 2023 and 2024. First, in an effort to manage above-target inflation, central banks have been increasing policy rates in the past number of months. Figure 18 presents the European Interbank Overnight Offer Rate (Euribor) and the recent uptick in the costs of funds is evident as the ECB has significantly increased policy rates.

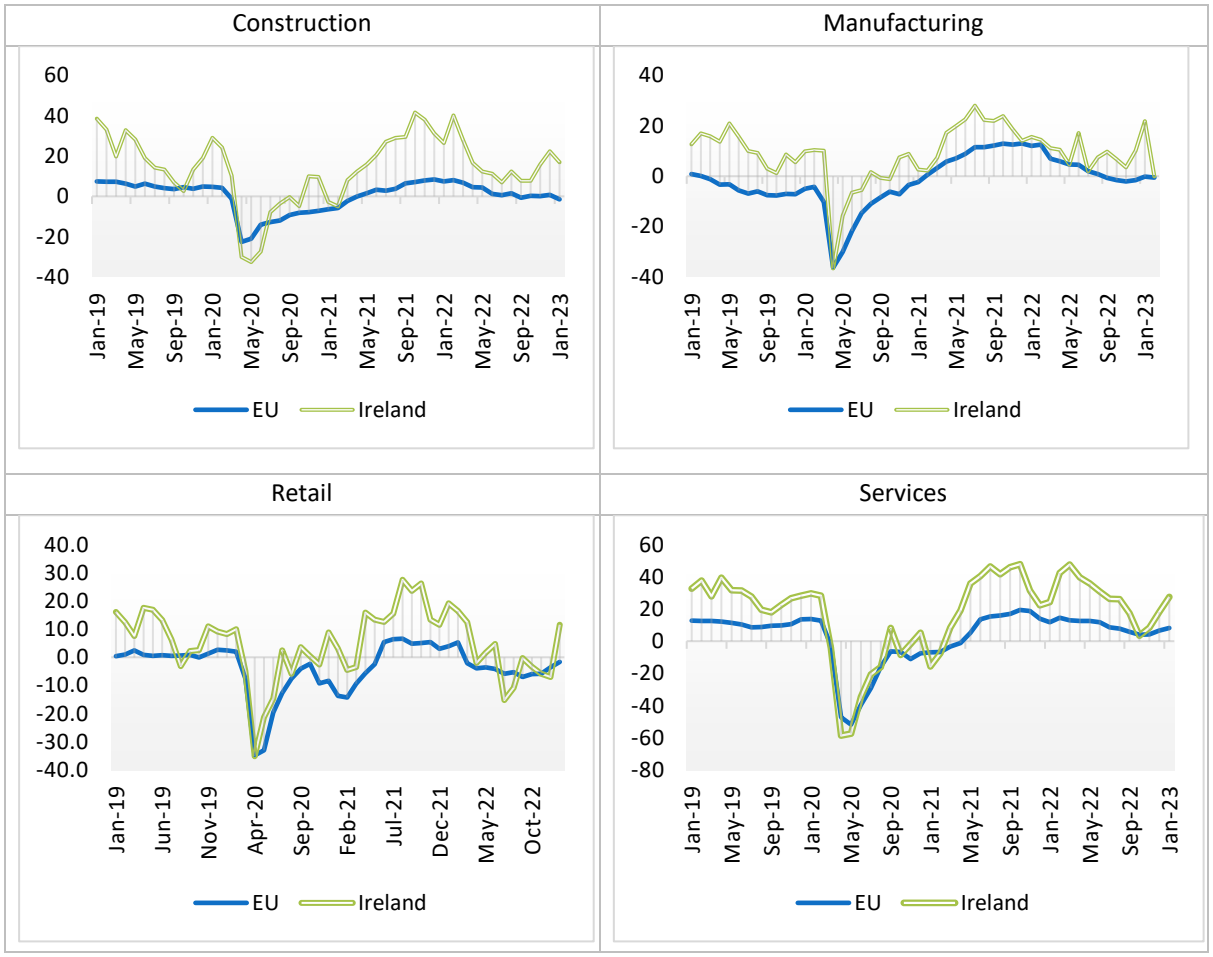
FIGURE 18 EURIBOR – THREE-MONTH AVERAGE OVERNIGHT RATE



Source: ECB, Statistical Data Warehouse.

Interest rates are now at a level unseen since the late 2000s and the higher cost of funds is likely to impact firms' investment choices, increase the burden of debt servicing costs and alter the viability of investments. Furthermore, the recent financial turmoil in the US (with the failure of Silicon Valley Bank and Signature Bank)[7] is likely to increase the economic adjustments in the tech sector if financial conditions tighten after years of rapid growth in a low interest rate environment. If these banking sector failures begin to tighten general financing conditions or de-risk the provision of capital for companies, this could have a negative impact on global investments. For Ireland, which is highly dependent on foreign investment, this is likely to lower the trajectory of investment growth.

FIGURE 19 CONFIDENCE INDICATORS – IRELAND VS EU BY SECTOR



Source: European Commission, Sentiment Indices.

Before the recent banking turmoil and notwithstanding the cost of financing, there have been some signs that the deterioration in firm-level economic sentiment seen in 2021 and the first half of 2022 has begun to reverse. This is particularly the case

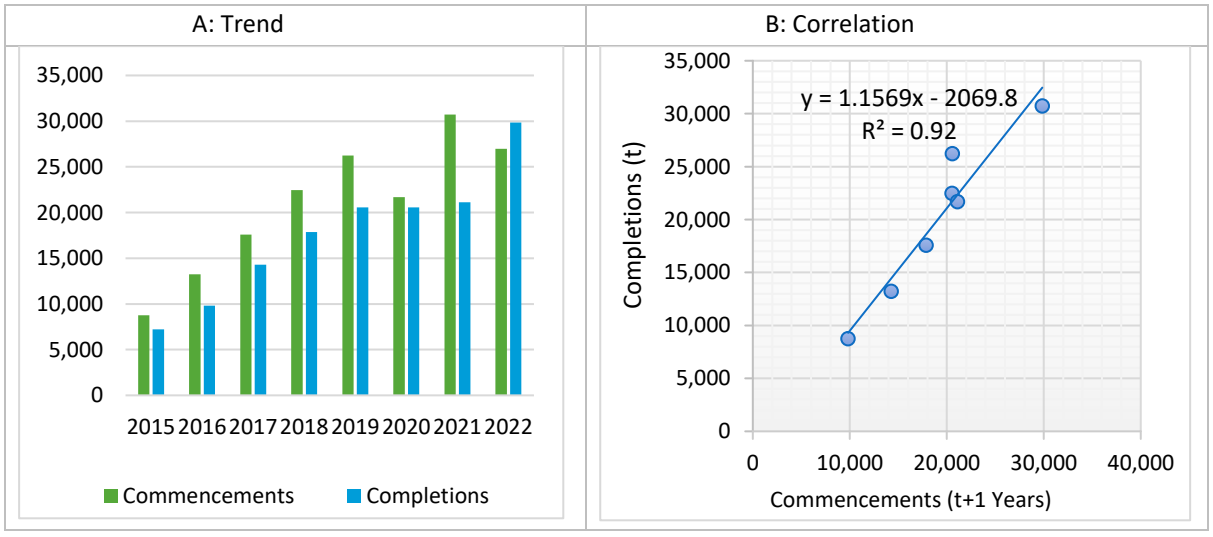
7 See: https://home.treasury.gov/news/press-releases/jy1337.

for retail and services firms who both posted increases in confidence in the most recent European Commission sentiment indices (Figure 19 which displays Ireland and the EU for context). This may be due to recent data indicating that energy price inflation outlook is moderating, thus providing a pathway towards a return of inflation to lower rates and a moderation in interest rate increases. The construction and manufacturing firms do not appear to have experienced such an increase in confidence.

Construction outlook

In 2022, the number of housing completions increased notably on 2021 levels; just under 30,000 units were completed in 2022 as measured by new ESB connections, which is a sizable increase on the 21,000 units in 2021 (Figure 20 Panel A). While housing completions were strong in 2022, the outlook appears to be somewhat more subdued for 2023. Housing commencements in any period provide a good correlation with housing completions one year later. The correlation can be seen in Figure 20 Panel B. As housing commencements dropped back to just under 27,000 units in 2022, it is likely that completions will fall back in 2023 to somewhere in this region.

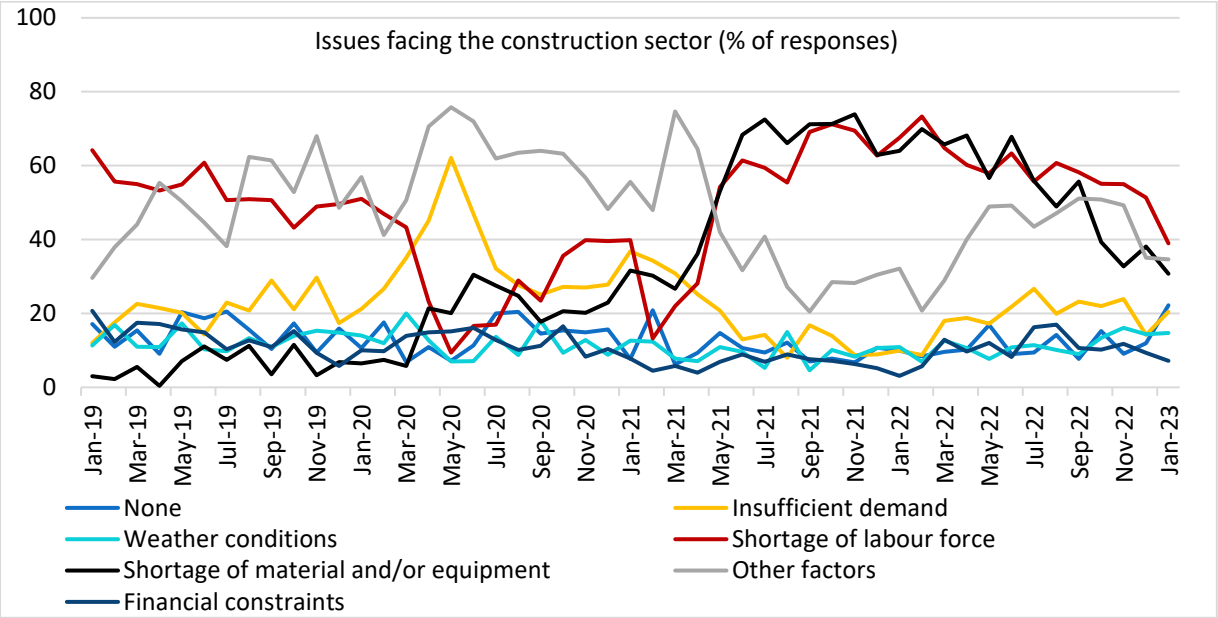
FIGURE 20 TREND IN HOUSING COMPLETIONS AND COMMENCEMENTS



Source: Central Statistics Office; Housing Agency.

The outlook beyond 2023 is more uncertain but a number of factors are pointing towards an uptick. First, data on the challenges facing construction enterprises collected by the European Commission indicate that fewer firms are reporting difficulties in sourcing raw materials or noting that labour is a constraint on activity. This can be seen in Figure 21 and may point towards the waning of some of the bottlenecks in terms of industry inputs and supply that built up over the COVID period.

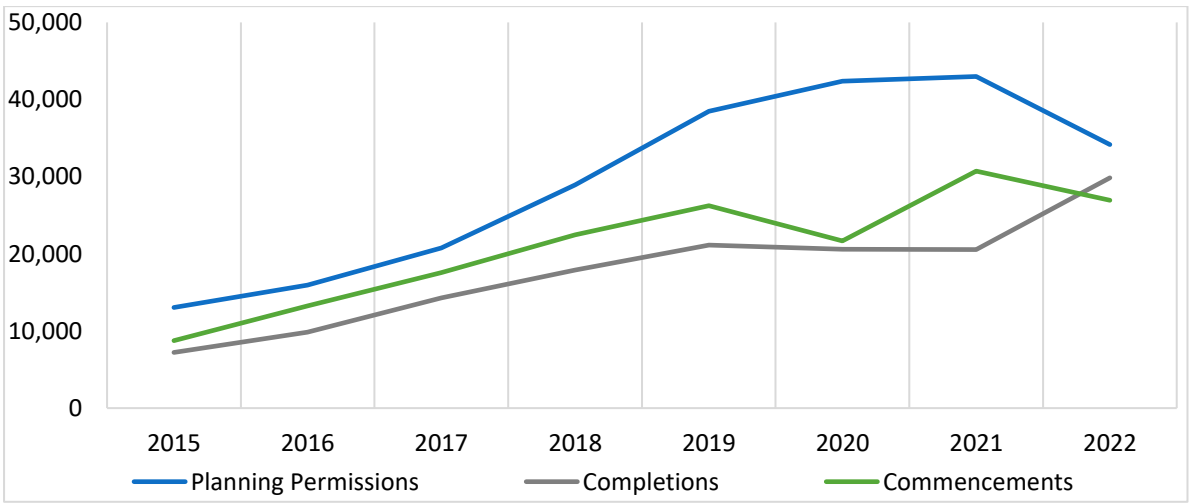
FIGURE 21 CONSTRUCTION OUTLOOK – CONFIDENCE INDEX – IRELAND VS EU



Source: European Commission.

The notable level of outstanding planning permissions for residential dwellings provide another source of potential growth for completions in 2024. It appears the number of planning permissions passing through to commencements has dropped back notably in recent years (Figure 22). This is likely to be impacted by many factors. However, if these permissions become activated following the easing of supply bottlenecks, this could provide a stimulus to completions in 2024. Continued State investment and policy action in the housing market may also provide upside momentum. There are, however, risks to this activation including the rising cost of financing, the high cost of construction and other land market constraints which may all threaten the viability of sites and thus the activation of the building process.

FIGURE 22 PLANNING PERMISSIONS, COMMENCEMENTS AND COMPLETIONS



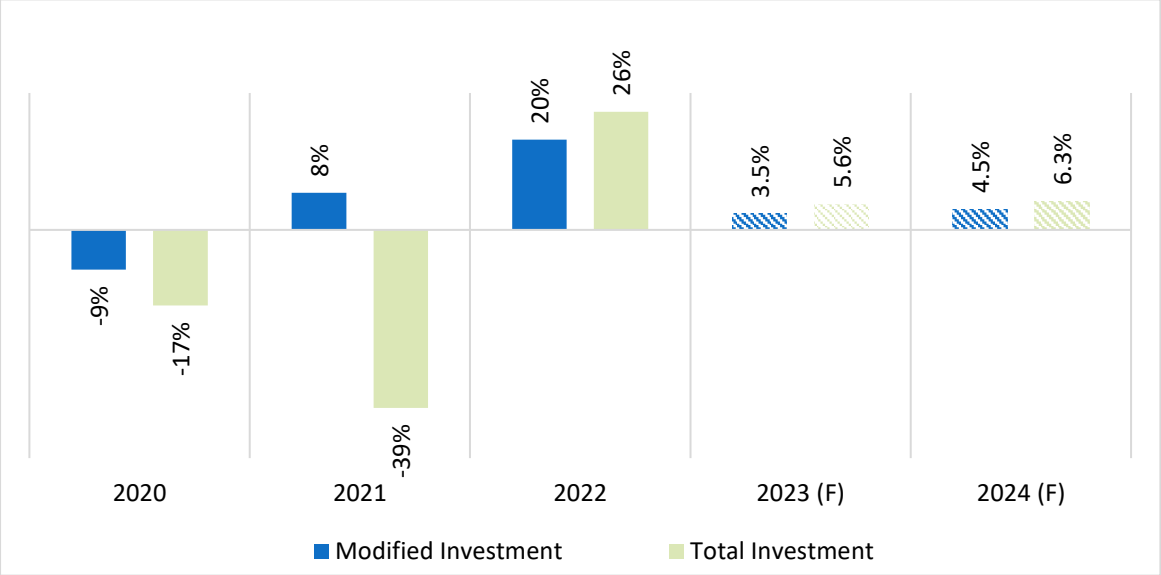
Source: Central Statistics Office

Given the level of commencements in 2022, we forecast 27,000 new housing completions in 2023. For 2024, due to the moderation in some of the constraining factors, and the continued State commitment to housing provision, we expect a rebound to 31,000 new housing units for 2024. However, there are numerous risks on the downside to these forecasts (such as the interest rate increases, broad financial stress and further inflationary factors).

Investment forecasts

Our forecasts for 2023 and 2024 for investment are presented in Figure 23. Given the strong investment experienced in 2022, we expect modified (MI) and non-modified investment (I) to grow this year but at a much-reduced rate, reflecting the growing downside factors. We expect MI to grow by 3.5 per cent in 2023 and overall investment to growth by 5.6 per cent. For 2024, our forecast for MI is 4.5 per cent growth and for I is 6.3 per cent growth.

FIGURE 23 FORECASTS FOR INVESTMENT (% CHANGE YEAR-ON-YEAR)



Source: Central Statistics Office and *QEC* Authors.

LABOUR MARKET

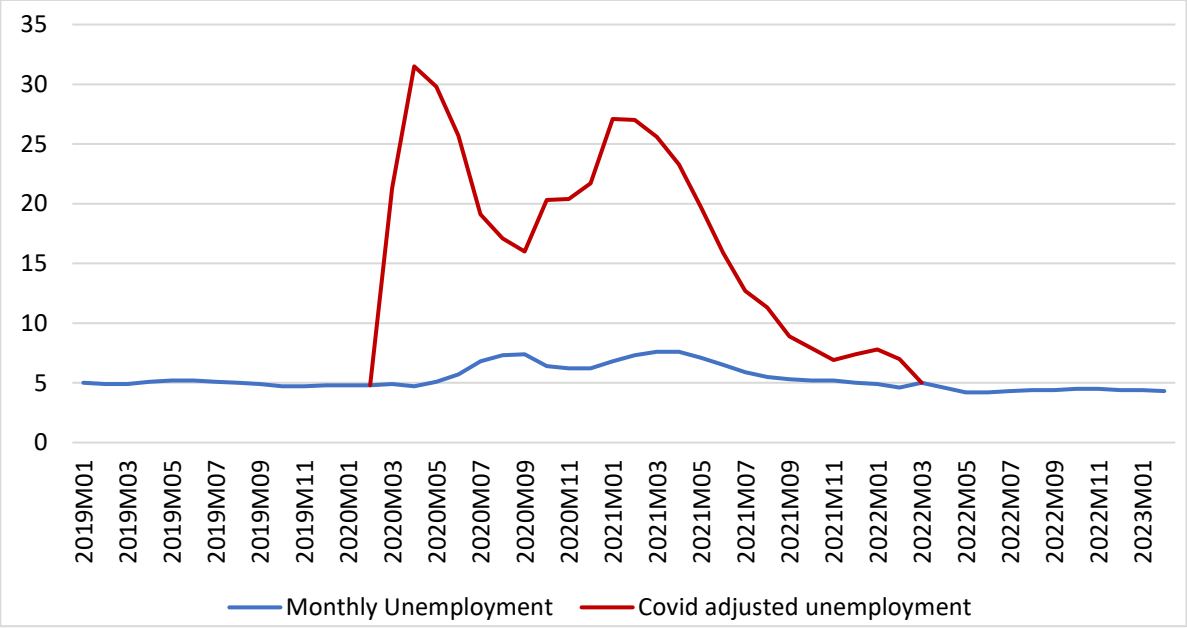
Key Points

- *Historically low levels of unemployment are expected to continue through 2024.*
- *Employment in some sectors, such as pharma-related activities, have rebounded considerably since the pandemic.*
- *Other sectors such as accommodation and food services have yet to fully recover.*
- *Overall wage growth increased 3.3 per cent in 2022.*
- *Further wage growth is expected in 2023.*

Rapid employment growth

The first few months of 2023 have been marked by continued resilience and buoyancy in the labour market; the unemployment rate was 4.3 per cent in February 2023 (Figure 24) and has remained around 4 per cent for a number of months.

FIGURE 24 UNEMPLOYMENT RATE BY MONTH (SEASONALLY-ADJUSTED, %)



Sources: Seasonally-Adjusted Monthly Unemployment Rate Series for ages 15-74. Central Statistics Office.
Note: The COVID-19 Adjusted Monthly Unemployment Rate Series is used for the period March 2020 – February 2022.

Alongside the dramatic recovery in the unemployment rate since the pandemic, the number of persons employed has increased significantly. Approximately 2.5 million people were employed in 2022, an increase of 6.6 per cent from 2021

and 9.9 per cent from 2019. Figure 25 shows the breakdown of these changes in employment by sector.

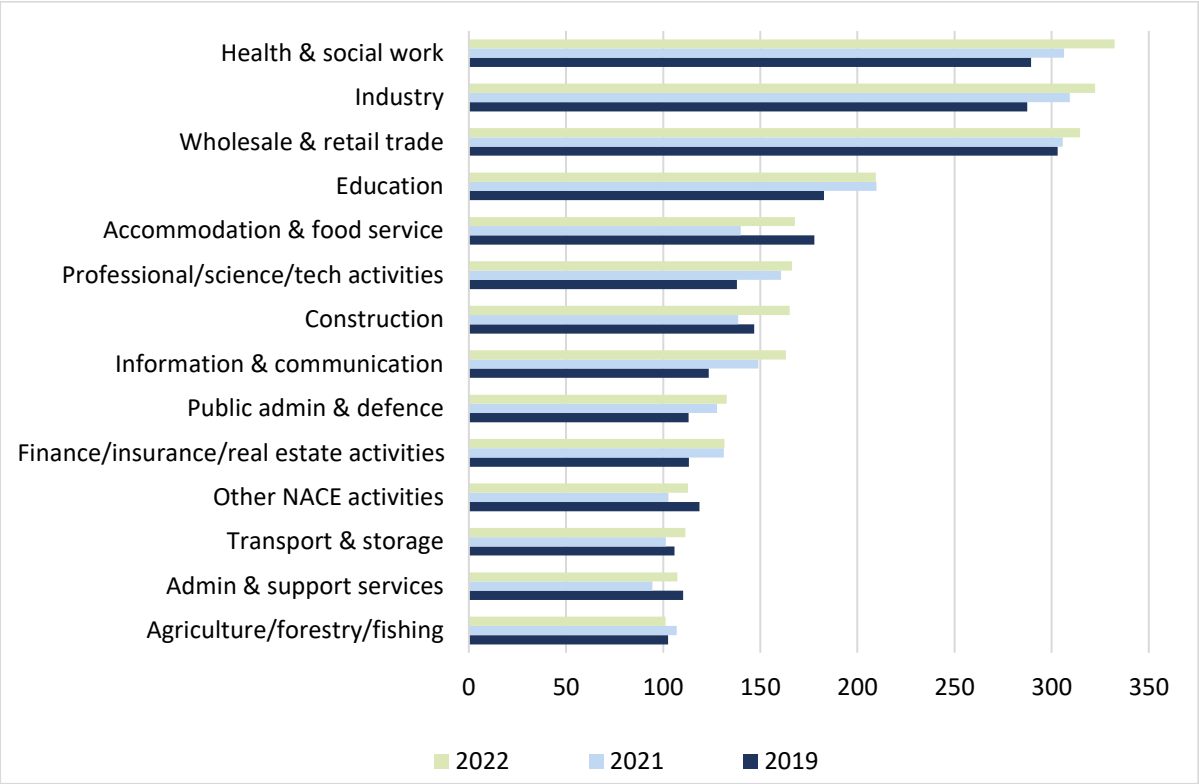
While most sectors now exceed their pre-COVID employment levels, one notable exception is Accommodation and food services. Despite employment increasing by 20 per cent in 2022 compared to 2021 (+27,900 persons), there are roughly 10,100 fewer persons employed in the sector compared to 2019.

While there were high profile job losses in Q3 2022 amongst some large ICT firms (-10,900 persons from Q2 2022), a large share of these workers appeared to be re-hired within the sector in Q4 2022 (+9,700 persons). Overall, employment in the ICT sector in 2022 increased 9.5 per cent compared to 2021 and 32.2 per cent from 2019.

The Health and social work sector accounted for the largest share of total employment in 2022 (13.0 per cent or over 332,000 workers). This sector has also had one of the largest increases in total employment, with 43,000 additional workers employed in the sector since 2019.

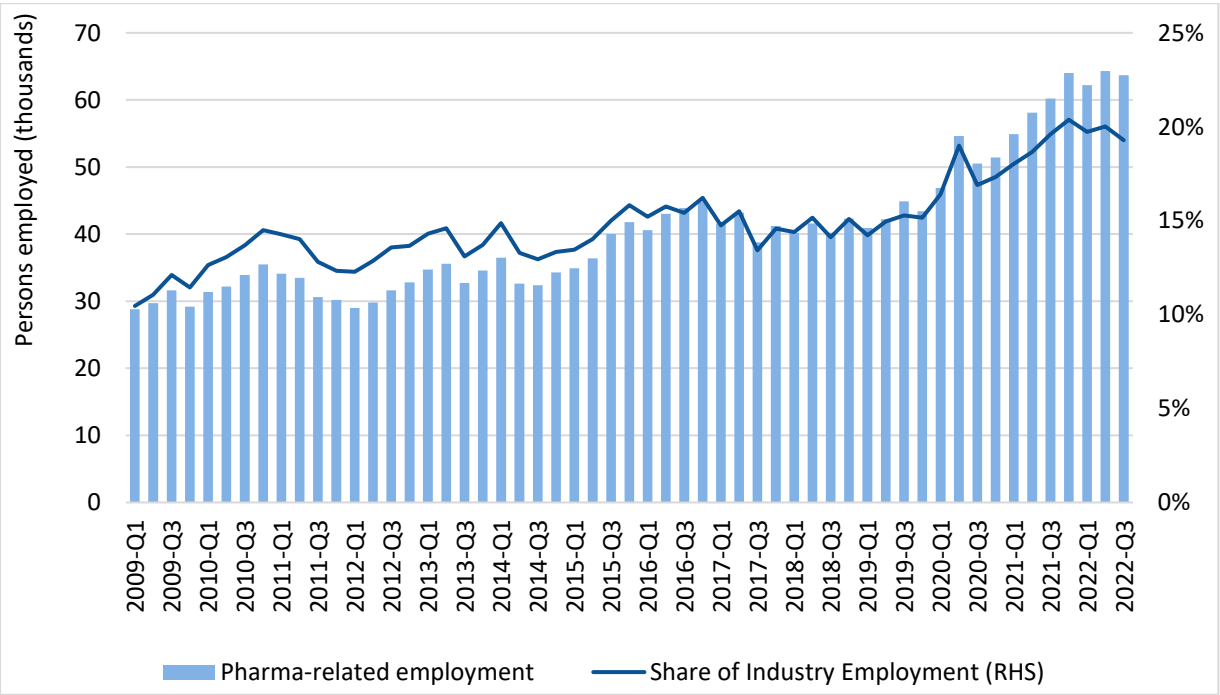
The Industry sector, which is largely comprised of manufacturing activities, had the second largest share of workers in 2022 (over 332,000 workers). Employment in the sector increased 12.2 per cent from 2019 to 2022, an increase of 35,000 workers. Increasingly, employment related to pharma-related activities has been driving this trend. Figure 26 shows the increase in employment in the manufacturing of basic pharmaceuticals products and pharmaceutical preparations, a subsector of the Industry sector. Prior to 2020, this subsector accounted for approximately 15 per cent of total Industry employment. In just the past two years, it has increased to 20 per cent, employing over 63,000 workers in 2022.

FIGURE 25 EMPLOYMENT BY SECTOR (PERSONS EMPLOYED, THOUSANDS)



Sources: Labour force survey, Central Statistics Office.

FIGURE 26 EMPLOYMENT IN PHARMA-RELATED ACTIVITIES

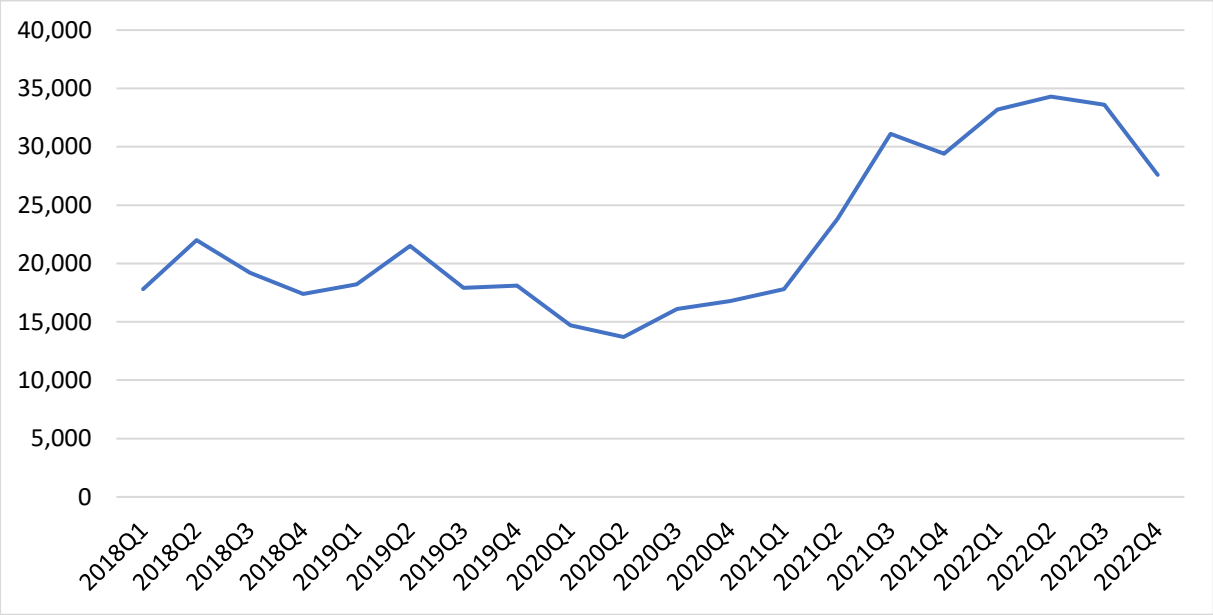


Sources: Eurostat (Labour Force Survey by NACE Rev. 2) and Central Statistics Office.
Note: Pharma-related employment relates to those employed in manufacturing of basic pharmaceutical products and pharmaceutical preparations.

Vacancies beginning to slow

A key development in the post-COVID recovery of the labour market was the unprecedented increase in vacancy rates, as the reopening of the economy resulted in a rush to fill workforce needs. Figure 27 shows the significant increase in job vacancies across all sectors from early 2021, reaching a peak of 34,300 vacancies in Q2 2022. While total vacancies in Q4 2022 declined significantly on a quarterly basis (-17.9 per cent), total vacancies remain elevated on a historical basis.

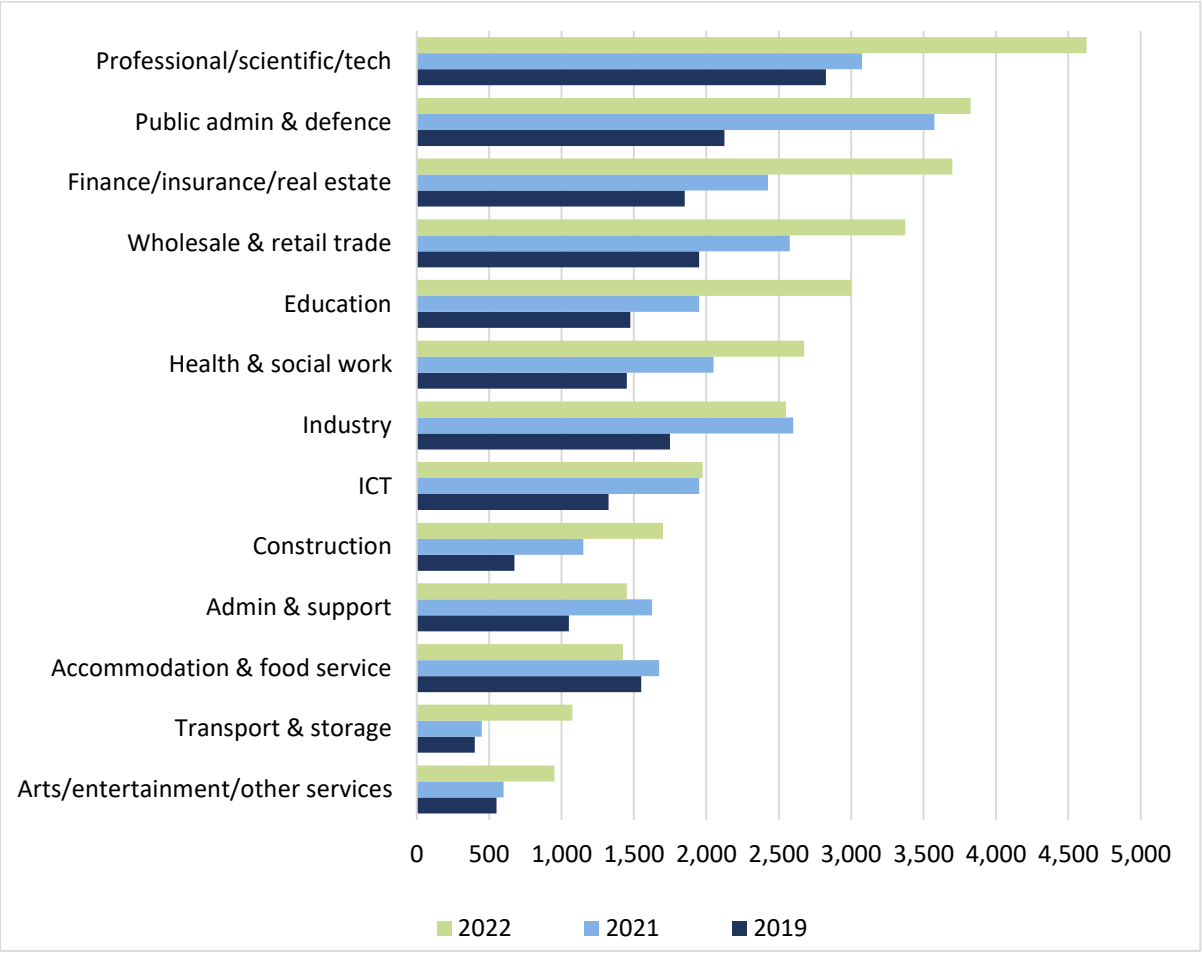
FIGURE 27 JOB VACANCIES, ALL SECTORS



Sources: Central Statistics Office.

By sector, the differences in hiring patterns are quite interesting. Vacancy rates in the Professional, scientific and technical activities sector was the highest of all sectors in 2022. On average, this sector had 4,625 job vacancies and a vacancy rate of 3.7 per cent in 2022. As shown in Figure 28, job vacancies across most sectors in 2022 were far above 2021 and 2019 even as employment levels in most sectors have grown far above their pre-pandemic levels. One notable exception is the Accommodation and food services sector; as noted above, this sector has not seen employment recover from 2019 and is also one of the only sectors to have fewer job vacancies listed in 2022 than 2021.

FIGURE 28 JOB VACANCIES BY SECTOR



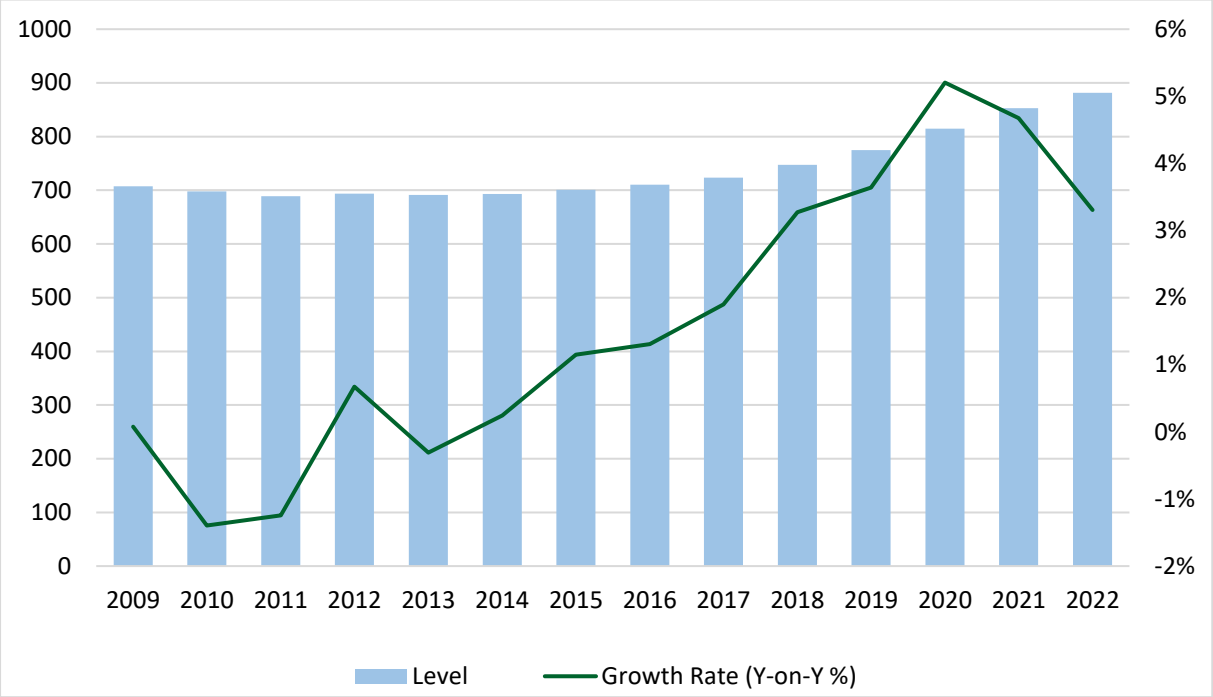
Source: Central Statistics Office.

Developments in wages

As noted in our Autumn *Commentary,* wage growth tends to increase as vacancy rates increase. Given the substantial rise in the cost of living, it is important to assess whether wages are keeping pace with inflation. It is also important to gauge whether wage growth in some sectors may be contributing to further inflationary pressures.

Figure 29 shows the level and annual growth rate of average weekly wages from 2009 through 2022. Weekly wages have been increasing since 2014, with a peak growth rate of 5.2 per cent in 2020. In 2022, average weekly wages increased to just over €880 (+3.3 per cent from 2021). Due to some distortions in wage data during COVID, it is also useful to compare wages in 2022 to their pre-pandemic average in 2019. Over this period, average weekly earnings increased 13.8 per cent.

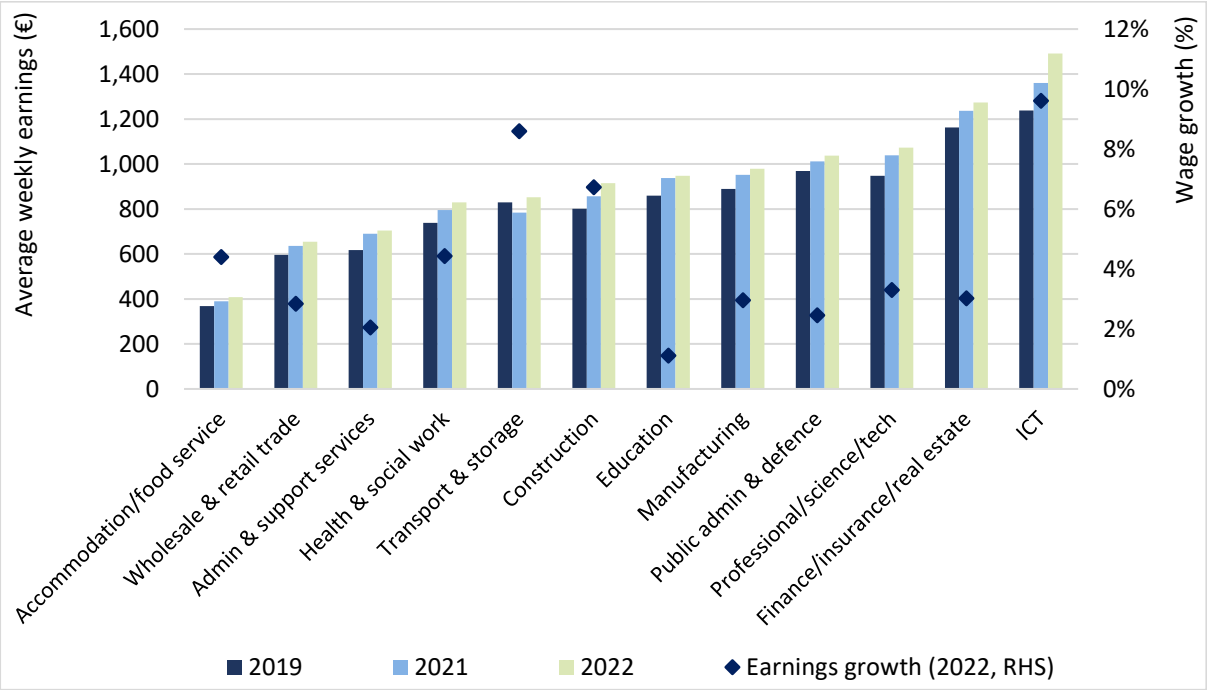
FIGURE 29 AVERAGE WEEKLY EARNINGS



Sources: Central Statistics Office.

While wages across all sectors have increased compared to pre-pandemic levels, this growth varies considerably across sectors. With an inflation rate of 7.8 per cent in 2022, just two sectors experienced real earnings growth last year. Wages in ICT, the highest across all sectors, grew by 9.8 per cent in 2022, while wage growth in the Transport and storage sector was 8.6 per cent. While wage growth in the Accommodation and food service sector outpaced growth across all sectors (4.4 per cent compared to 3.3 per cent), average weekly wages in this sector were 53.8 per cent lower than those across all sectors (€408 vs €881). However, it is worth noting that significant changes in employment levels by sector, such as the occurrence of large layoffs, may lead to compositional changes in earnings. Nevertheless, differences in earnings growth will continue to have distributional impacts as households face persistently high living costs through 2023.

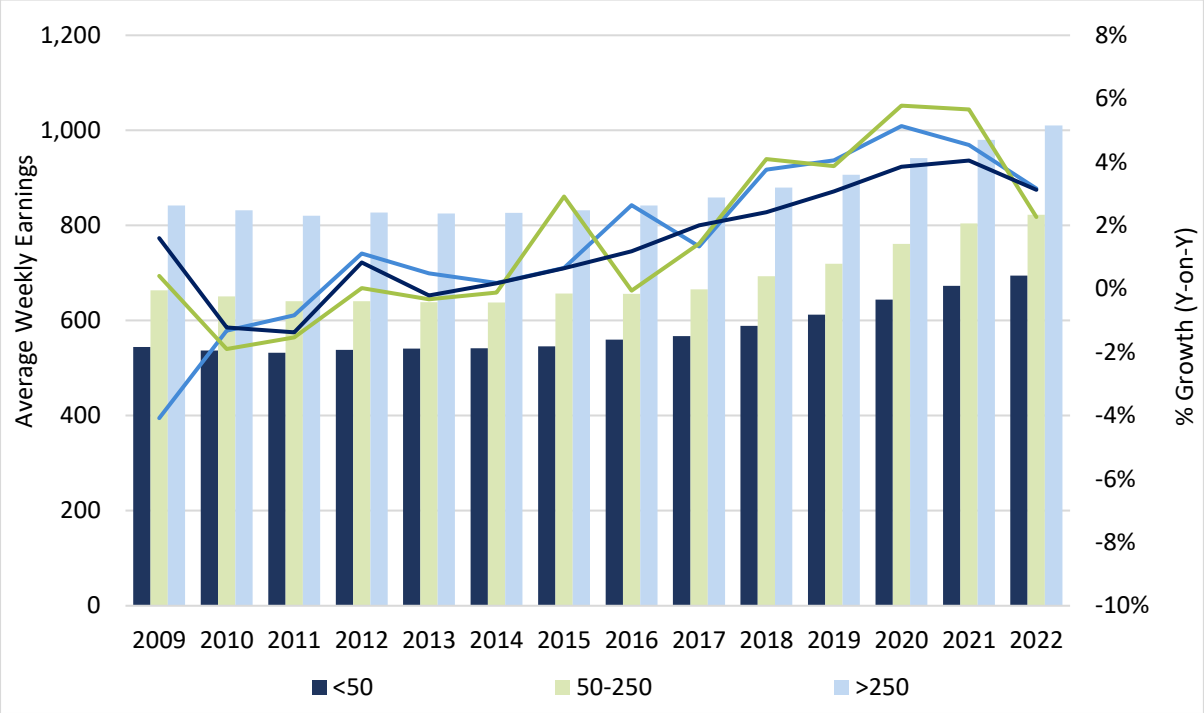
FIGURE 30 AVERAGE WEEKLY EARNINGS BY SECTOR (€)



Sources: Central Statistics Office.

Differences in wages are also evident when we look at firm size. Figure 31 compares the levels and annual growth rates of weekly earnings across firm size. In general, earnings growth amongst firms with over 250 workers has been less volatile than among smaller firms, and earnings are typically significantly higher in these firms. In 2022, average weekly wages amongst firms with less than 50 workers were €694. This is just over 15 per cent less than wages in firms with 50-250 workers (€823/week) and over 30 per cent less than wages in firms with over 250 workers (€1,010/week).

FIGURE 31 AVERAGE WAGES BY FIRM SIZE



Sources: Central Statistics Office.

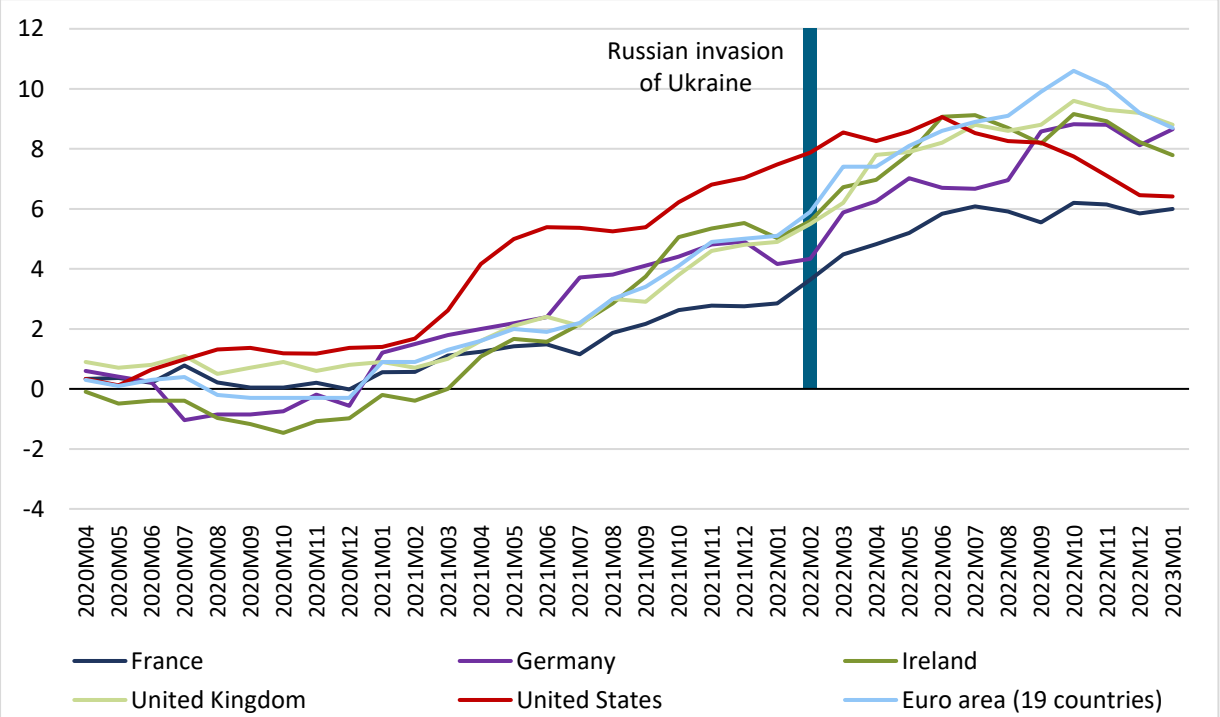
Labour outlook

Given the rapid recovery of the labour market throughout 2022 and stronger-than-anticipated economic activity in the first few months of 2023, we anticipate continued strength in the labour market. We now anticipate an unemployment rate of 4.2 per cent and 4.0 per cent in 2023 and 2024, respectively. As outlined in the risk assessment, downside risks to this forecast include a potential slowdown in certain domestic sectors as investment activity cools in 2023 compared to 2022 and uncertainty remains high.

INFLATION OUTLOOK

One of the key risks to both the international and domestic economy is the persistence of inflationary pressures. Figure 32 depicts the annual rate in CPI across a selection of European countries, the UK and the US. The significant increase since Russia's invasion of Ukraine is evident. However, inflation rates are showing some signs of slowing in recent months. In the US, inflation has declined to 6.4 per cent in January 2023 from its peak of 9.1 per cent in June 2022. Across Europe and the UK, peak inflation occurred in October 2022 and has been slowing in recent months. In Ireland and the euro area, inflation stood at 7.8 and 8.7 per cent, respectively, in January 2023.

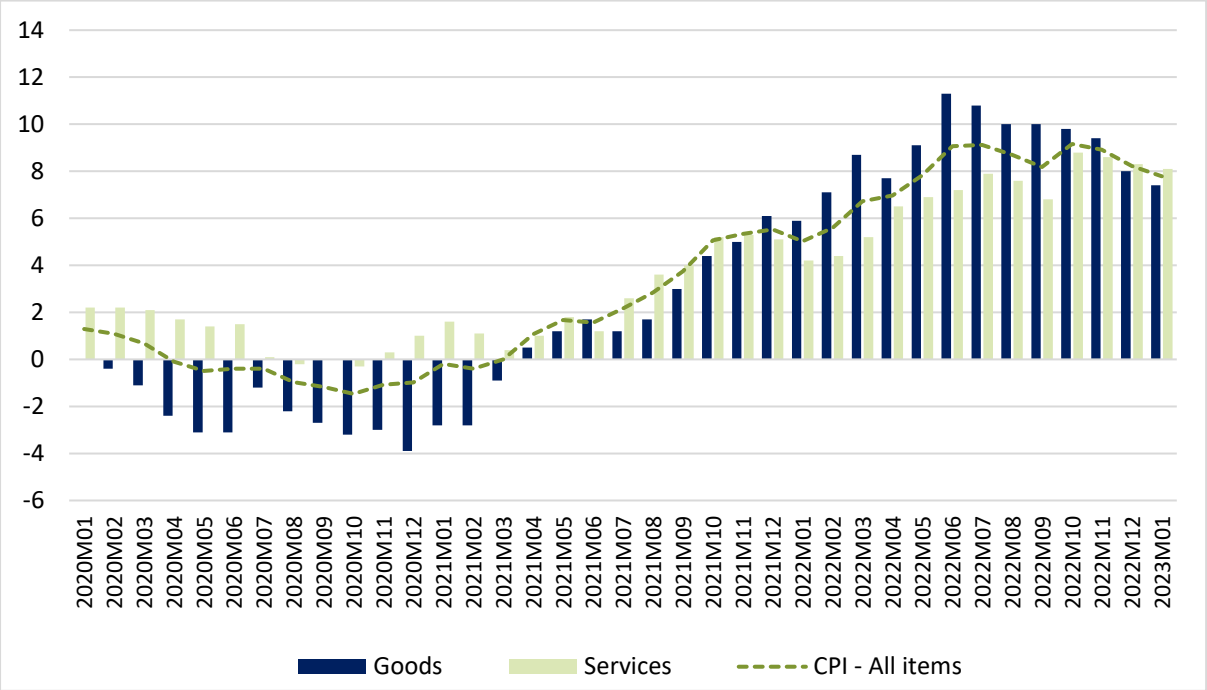
FIGURE 32 CPI ALL ITEMS, CROSS COUNTRY COMPARISON (YEAR-ON-YEAR %)



Source: OECD.

Both goods and services are driving overall inflation. In January 2023, prices of goods and services were 7.4 and 8.1 per cent higher than the year prior respectively (Figure 33). Within the services sector, prices have shown some signs of slowing from their peak growth of 8.8 per cent in October 2022. Recent declines in transport and accommodation-related services are contributing to this slowdown. From October 2022 to January 2023, prices in these services have declined 11.4 per cent and 11.8 per cent, respectively. Meanwhile, prices of energy related items continue to be the largest contributor to the increase in goods prices, with electricity and gas prices increasing 62.7 and 86.3 per cent respectively in January 2023.

FIGURE 33 DECOMPOSITION OF ANNUAL CPI GROWTH INTO GOODS AND SERVICES GROWTH (%)



Source: Central Statistics Office.

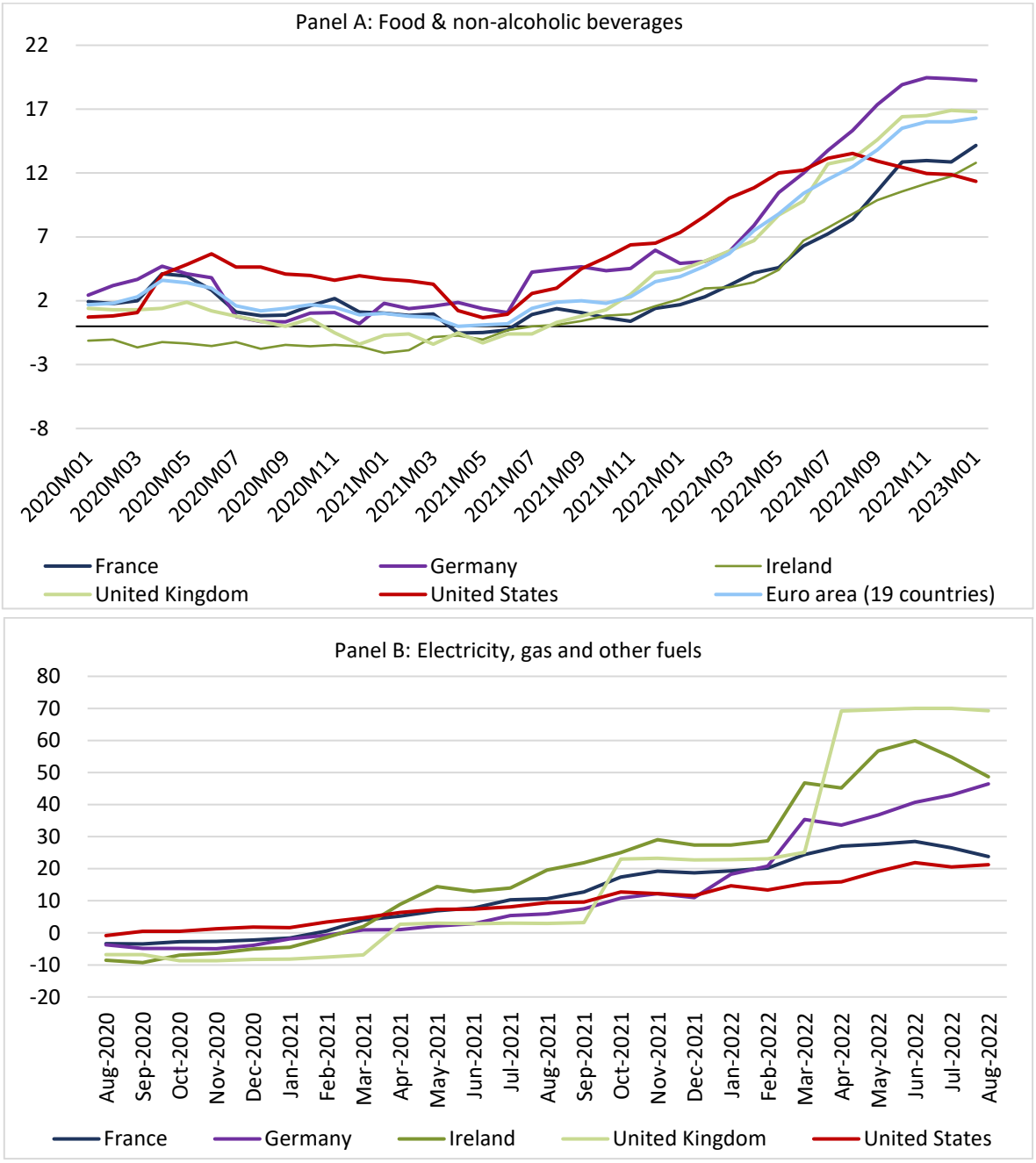
Food and energy

Food and energy products represent a large share of households' and business' core spending and have been acutely impacted by the inflationary pressures of the past year. Panel A of Figure 34 displays inflation rates amongst food and non-alcoholic beverages. Apart from the US, all countries are experiencing further increases in these products. In Ireland and the euro area, the price of food products in January 2023 were 12.8 and 16.3 per cent above their level in 2022, respectively.

In comparison, Panel B displays the growth in energy-related prices since Autumn 2020. While these increases are still notably high in January 2023 (59.5 per cent in Ireland), we can see a gradual decline in growth rates amongst most countries apart from Germany. We also see a greater spread in inflation rates in this sector, which is due in part to differing policies related to capping price increases in the energy sector.[8]

[8] In France, for example, increases have been relatively subdued due to the implementation of a tariff shield effectively blocking rising prices of gas and electricity at the end of 2021, while the UK has adopted price caps which were increased in October 2022 and are set to last through March 2023 (https://www.gov.uk/government/publications/energy-bills-support/energy-bills-support-factsheet-8-september-2022).

FIGURE 34 CPI, CROSS COUNTRY COMPARISON (YEAR-ON-YEAR %)



Source: OECD.

Given recent indications of a potential slowdown in inflation and the unprecedented volatility in price increases throughout 2022, it is useful to explore additional measures of inflation, particularly in the context of aggressive monetary policy tightening. In the following Box, Disch and McQuinn gauge the direction of change in current inflationary patterns by providing an alternative estimate of Irish CPI.

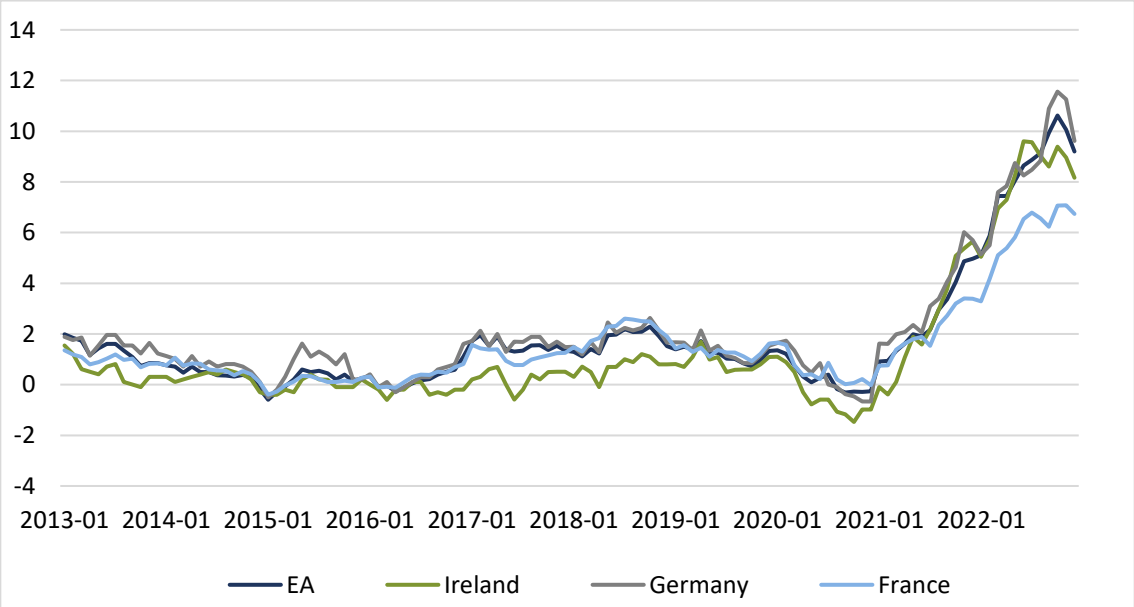
BOX A WHAT IS THE ACTUAL PRESENT RATE OF IRISH INFLATION?

Background

The recent surge in inflation rates experienced across Western economies has prompted considerable debate about the nature of present price increases (see Obstfeld (2022) and Blanchard (2022) for example). When inflation started to increase originally during the COVID-19 pandemic in the summer of 2021, many felt that this was a temporary phenomenon associated with disruptions to international supply-chain processes. The war in Ukraine and the resulting pressure on energy prices saw inflationary pressures exacerbate through 2022, leading some to indicate that such pressures were more permanent in nature.

This has resulted in monetary authorities such as the Federal Reserve, the European Central Bank and the Bank of England taking policy measures which have seen an increase in official and subsequently market interest rates. Figure 1 plots the annual change in the harmonised consumer price index (HICP) for the Euro Area and select European countries over the period 2013 to 2022. The significant increase in prices from mid-2021 is clearly apparent.

FIGURE A.1 ANNUAL INCREASE IN HICP ACROSS SELECT EUROPEAN COUNTRIES (%): 2013–2022



Source: Department of Finance.

However, recently certain technical work has emerged which has proposed an alternative methodology for how inflation rates are calculated particularly at a time of volatile price changes. In particular, Eeckhout (2023) proposes a measure of 'instantaneous' inflation arguing that the standard measure of average annual inflation is biased towards data too far in the past. This, Eeckhout (2023) argues, is particularly relevant during a period of significant and volatile changes in the price level, and the measure he proposes places greater weighting on recent observations of monthly inflation in the estimate of the overall annual rate.

Using such a measure Eeckhout (2023) estimates that the rate of inflation in the euro area in December 2022 is approximately 2 per cent, which is significantly lower than the official estimate of 6.5 per cent. Such a variation in inflation estimates has, of course, major implications for monetary policy. If inflation in the euro area, for example, is already back to the target rate of 2 per cent then there is no rationale for any further increases in euro area official policy rates.

In this Box we apply the Eeckhout (2023) approach to the Irish Consumer Price Index (CPI) to see what it suggests the actual present rate of inflation in the Irish economy is.

Measuring Irish CPI

The Eeckhout (2023) approach can be outlined as follows; the annual rate of inflation can be decomposed into the chain of the differences in month-by-month inflation:

$$i_t^y = \frac{p_t}{p_{t-12}} - 1 \quad (1)$$

$$= \frac{p_t}{p_{t-1}} \times \frac{p_{t-1}}{p_{t-2}} \times \ldots \times \frac{p_{t-11}}{p_{t-12}} - 1 \quad (2)$$

$$= (1 + i_t^m) \times (1 + i_{t-1}^m) \times \ldots \times (1 + i_{t-11}^m) - 1 \quad (3)$$

$$= \prod_{\tau=0}^{11}(1 + i_{t-\tau}^m) - 1 \quad (4)$$

For the measure of instantaneous inflation, a kernel-based estimator[9] is adopted which attributes higher weights to the more recent observations of monthly inflation. The standard measure of annual inflation attributes the same weight to the monthly change in inflation from t-11 as it does to the change at t-1.

The kernel is denoted by $\kappa(\tau)$ where κ is decreasing in τ: in the current period, τ = 0 and has the highest weight whereas in the period t – 11 (the earliest period in the sample), $\tau = 11$ and hence has the lowest weight. Eeckhout (2023) assumes a polynomial kernel which can be described as

$$\kappa(\tau, a) = \frac{(T-\tau)^a}{\sum_{\tau=0}^{T-1}(T-\tau)^a} \text{T, } \forall a \geq 0 \quad (5)$$

Using this a number of special cases apply:

1. Uniform kernel: a = 0, this is where there is an equal weighting for all the monthly changes in inflation as $\kappa(\tau, a)$ = 1.
2. Linear kernel: a = 1, with T = 12, then $\kappa(\tau, 1)$ = (12 - τ)$\frac{12}{78}$, where κ =1.8 today when τ = 0 and κ = 0.15 a year ago when τ = 11.
3. Convex kernel: a > 1.

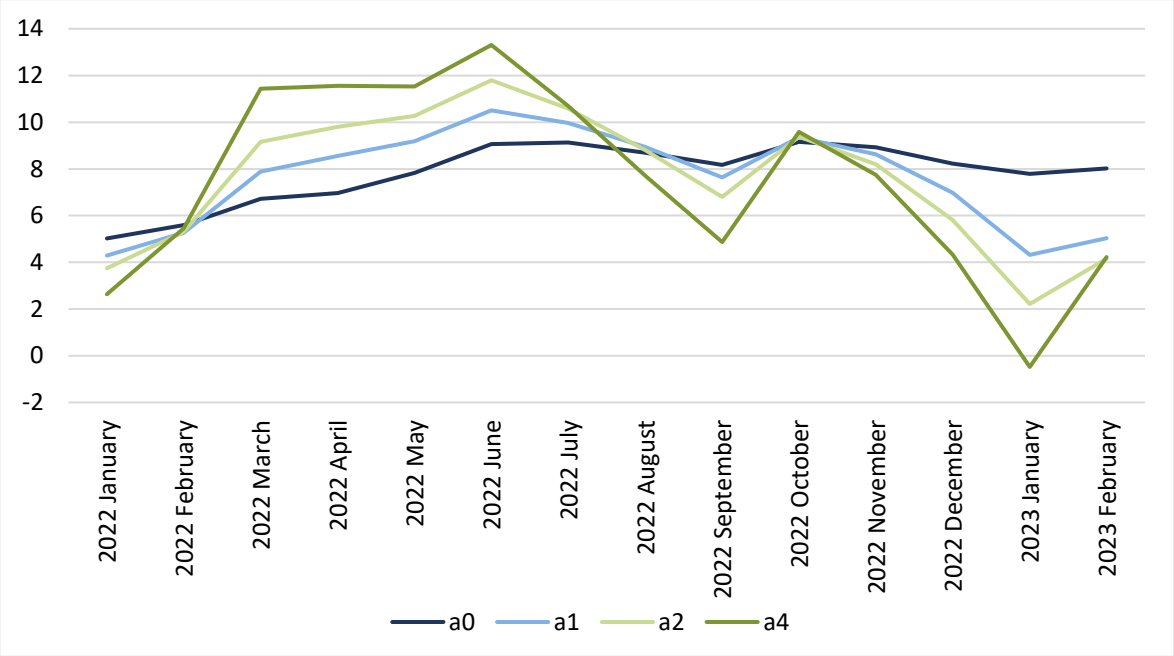
Given the estimates of the kernel, the measure of instantaneous inflation is determined as follows:

$$i_t^\kappa = \prod_{\tau=0}^{11}(1 + i_{t-\tau})^{\kappa(\tau)} - 1 \quad (6)$$

9 The kernel-based measure follows earlier work by Silverman (1986) and Härdle (1990).

Using this approach, in Figure A.2, annual inflation rates for the past year for a=0, a=1, a=2 and a=4 are plotted for the domestic economy.

FIGURE A.2 ANNUAL IRISH INFLATION RATES (%): M1 2022 – M2 2023



Source: QEC calculations.

The a0 series is the official annual inflation rate for the Irish economy. This is where each monthly episode of inflation for the period in question receives the same weighting. In January 2023 this stood at 7.8 per cent. The series a1 is where the weighting is determined in accordance with (2) above. This indicates that the rate of inflation in the Irish economy in January 2023 is more in the region of 4.2 per cent when greater weightings are given to the more recent monthly inflation estimates. Furthermore, if greater weightings again are given to more recent months (a = 2 and 4), then the present rate of inflation is even lower again at 2.2 and -0.5 per cent.

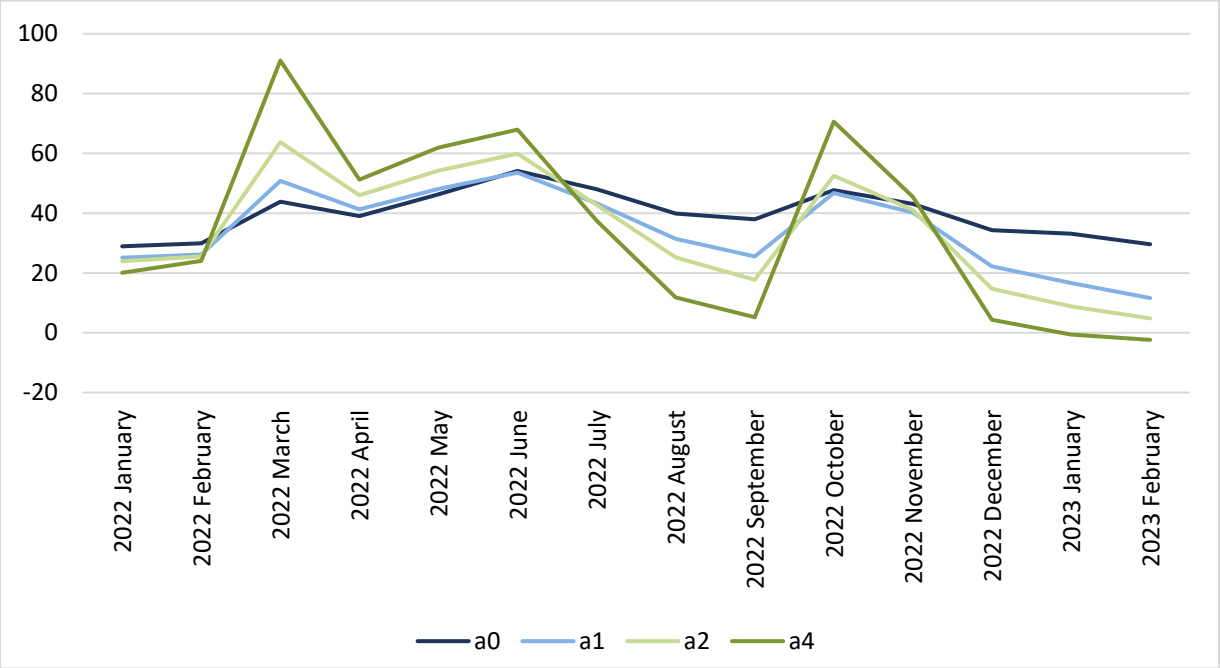
Note also that the instantaneous measures of inflation indicate that inflation was running at a more elevated pace in the first half of 2022 vis-à-vis what the official estimates state. Again, this reflects the fact that the instantaneous measures are attributing more weight to the more recent monthly observations which at that time (Q2 2022) were quite high, compared to those in late 2021.

Food and energy: diverging trends

Energy products have had the most significant contribution to inflationary pressures of the past year. While energy prices had already begun to increase dramatically in the final quarter of 2021, Russia's invasion of Ukraine and the subsequent outbreak of war resulted in a dramatic shock to the energy market, including a drastic reduction of natural gas flows from Russia to Europe. While the price level of energy products remains elevated in the early months of 2023, estimated prices in February 2023 showed the third consecutive

month of month-on-month declines in the price of energy products from their peak in November 2022. The recent declines in energy prices suggest that the traditional measure of CPI may be overstating the jumps in price that occurred earlier in 2022. Figure A.3 shows the wide range in the inflation rates for energy products when we apply our estimates of instantaneous inflation. Compared to the traditional measure which indicates that energy prices are nearly 30 per cent higher than their level in February 2022, our alternative weights give a measure of 11.6 and 4.8. When the recent declines in prices are weighted most heavily (a=4), then we see deflation in the energy series of 2.4 per cent.

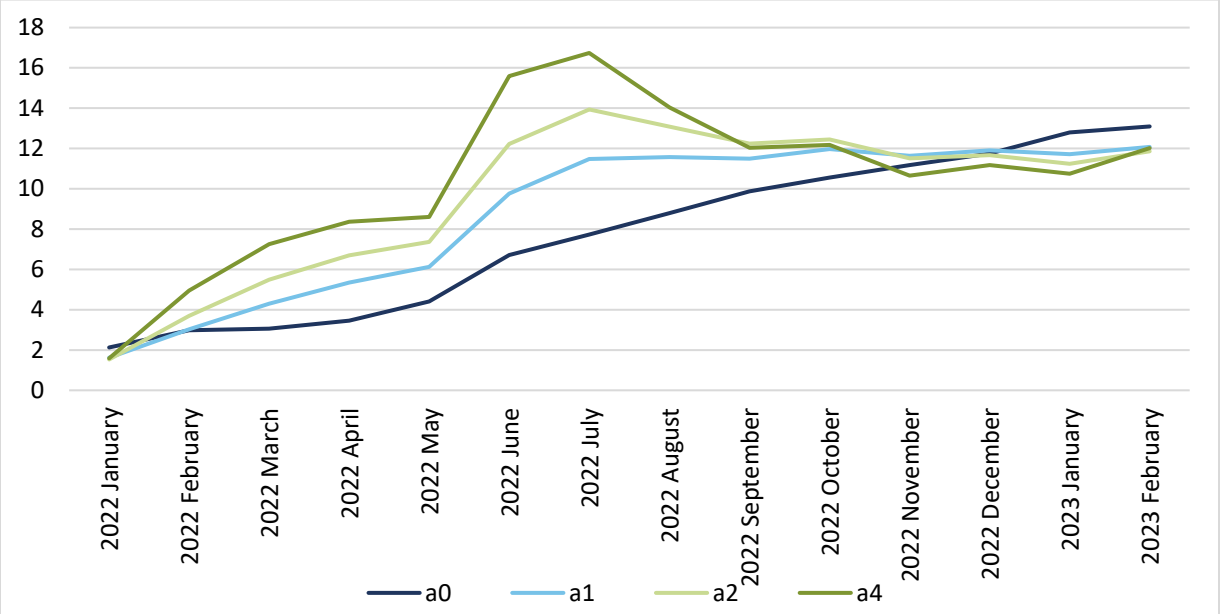
FIGURE A.3 ANNUAL IRISH INFLATION RATES FOR ENERGY PRODUCTS (%): M1 2022 – M2 2023



Source: Central Statistics Office and *QEC* calculations.

When we look at the food series, a very different effect can be seen. Unlike energy products, which have begun to experience declining prices in recent months, food prices have continued to increase at a steady pace in the year to February 2023. Therefore the separate estimates of food prices are much less varied; each measure indicates that in February 2023 food prices were approximately 12 per cent above their level in February 2022.

FIGURE A.4 ANNUAL IRISH INFLATION RATES FOR FOOD (%): M1 2022 – M2 2023



Source: Central Statistics Office and *QEC* calculations.

Concluding comments

The volatile nature of recent inflation rates makes a precise estimate of present inflationary pressures difficult to gauge. There is always a danger with monetary policy that policy actions such as making a change to official policy rates can operate with a lag, i.e. that by the time the change in the policy rate is effective, the inflationary period which prompted the change has passed. This danger is accentuated if current estimates of inflation are unduly influenced by historical estimates. Therefore it is useful to accompany the standard measures of inflation with estimates such as the instantaneous inflation presented in this Box, to provide a gauge of price developments after a period of exceptional volatility.

References:

Blanchard O. (2022). 'Why I worry about inflation, interest rates, and unemployment'. Peterson Institute for International Economics blog: https://www.piie.com/blogs/realtime-economic-issues-watch/why-i-worry-about-inflation-interest-rates-and-unemployment.

Eeckhout J. (2023). 'Instantaneous inflation', Working Paper Universitat Pompeu Fabra (UPF) Barcelona.

Härdle W. (1990). *Applied nonparametric regression*, Cambridge University Press.

Obstfeld M. (2022). 'Uncoordinated monetary policies risk a historic global slowdown'. Peterson Institute for International Economics blog: https://www.piie.com/blogs/realtime-economic-issues-watch/uncoordinated-monetary-policies-risk-historic-global-slowdown.

Silverman B. (1986). *Density estimation for statistics and data analysis*, Chapman and Hall.

This Box was prepared by Wendy Disch and Kieran McQuinn.

While the inflation rate is expected to moderate more quickly than previously anticipated, overall price levels remain historically high, presenting vulnerable households with significant challenges in meeting cost of living pressures. In the following Box, Doorley et al. assess the impact of recent cost of living measures across households.

BOX B THE DISTRIBUTIONAL IMPACT OF THE FEBRUARY COST-OF-LIVING PACKAGE

On 21 February 2023, leaders of the three coalition parties announced a suite of new cost-of-living (COL) measures designed to aid businesses, families struggling with the cost of living and vulnerable groups on fixed incomes. The package, at an estimated total cost of €1.2 billion (Department of the Taoiseach, 2022), is comprised of a mix of lump-sum payments to social welfare recipients, extensions to cuts on VAT and excise duties, supports directed at businesses, and measures aimed at families with children of school-going age. This Box presents a distributional analysis of this package, both in terms of the average effects on household incomes and on the aggregate effects across the income distribution.

A brief summary of the measures announced follows. A €200 lump-sum payment will be made to recipients of long-term social welfare payments, while a €100 lump-sum payment will be made to recipients of Child Benefit (on a per-child basis) and the Back to School Clothing and Footwear Allowance. The reduction of VAT on gas and electricity from 13.5 per cent to 9 per cent will be extended to 31 October, and the reduction of VAT on hospitality from 13.5 per cent to 9 per cent will be extended to 31 August. There will also be a phased reintroduction of the full rates of excise on petrol, diesel, and market gas oil, with rate increases at the beginning of June, September, and October. For businesses there will be an extension of the Temporary Business Energy Support Scheme to May 31, along with a reduction in the qualifying threshold and an increase in the level of relief; a new grant will be introduced for businesses using kerosene or liquefied petroleum gas. Finally, charges on school transport will be reduced for children in primary and secondary school relative to the academic year 2021-2022 (charges had been suspended for 2022-2023), and the Hot School Meals programme will be extended to DEIS primary schools.

We model the effect of a number of these policies on household disposable income using SWITCH, the ESRI's tax-benefit microsimulation model, and ITSIM, an indirect tax microsimulation model developed jointly by the ESRI and the Department of Finance. SWITCH is linked to data from the 2019 Survey of Income and Living Conditions (SILC), with the data adjusted in terms of structure and incomes to be representative of the 2023 population. ITSIM uses the latest available wave of the CSO's nationally representative Household Budget Survey (HBS)[10] to estimate the quantity of indirect taxes (VAT, excise duties, and carbon tax) paid by Irish households.

In modelling the COL package, we include the following components:

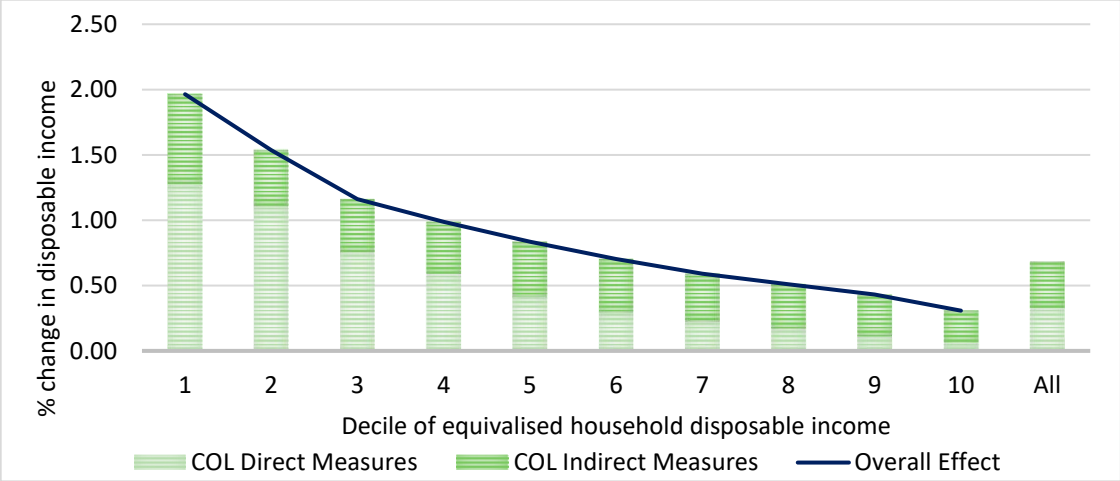
[10] The 2015-2016 wave.

- Lump-sum payments of €100 for recipients of Child Benefit and the Back-to-School Clothing and Footwear Allowance[11] and of €200 for recipients of long-term social welfare payments (for a full list see Citizen's Information, 2023), and Working Family Payment.
- Extensions to the reduced rates of VAT on gas, electricity, and hospitality and of excise on diesel, petrol, and market gas oil.

Given our focus is on the distributional impact on households, supports directed at businesses are not modelled. Data limitations and conceptual difficulties mean we do not model the extension of the Hot School Meals programme or the reduced charges on school transport. Excluding the grant on LPG / kerosene, we estimate that the cost of measures not modelled is less than €82 million and that we model at least 90 per cent of the package.[12]

Figures B.1 and B.2 show the results of this analysis. Households are ranked from the poorest tenth of the population (decile 1) to the richest tenth (decile 10). Figure B.1 presents the average change in disposable income by income decile, expressed as a percentage of household income; Figure B.2 presents the aggregate change in disposable income by income decile, expressed in euro per annum. In each case, the reforms are compared to the 2023 tax-benefit system before these additional COL measures were introduced.

FIGURE B.1 DISTRIBUTIONAL IMPACT OF FEBRUARY COST-OF-LIVING PACKAGE BY INCOME DECILE; AVERAGE % CHANGE IN HOUSEHOLD DISPOSABLE INCOME



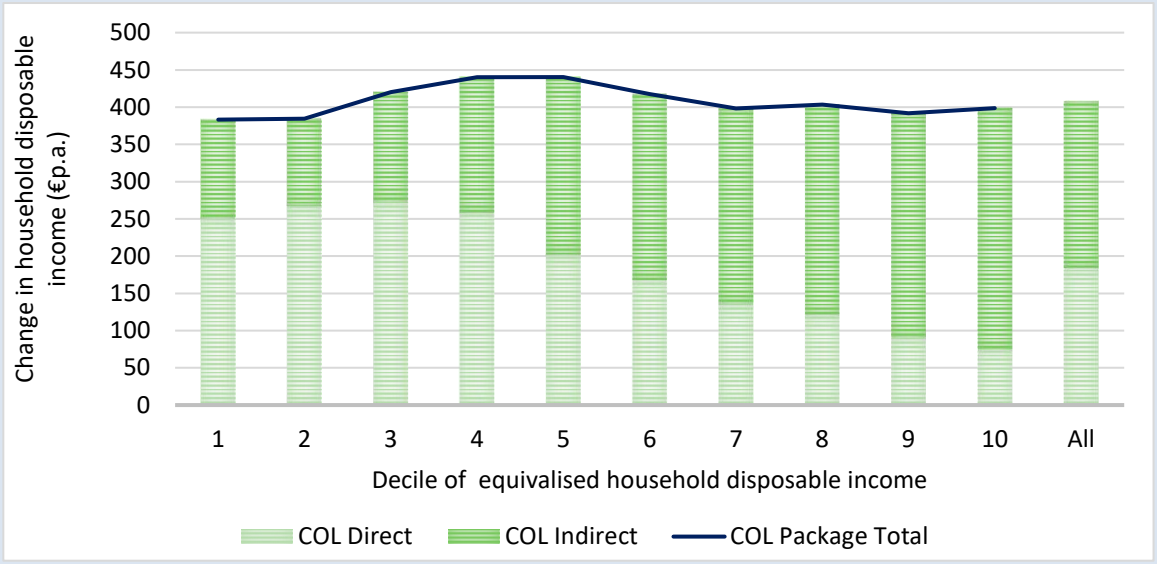
Source: Authors' calculations using ITSim linked to the 2015-2016 Household Budget Survey and SWITCH run on 2019 Survey of Income and Living Conditions data.
Notes: Deciles are based on equivalised household income, using CSO national equivalence scales.

11 The Back to School Clothing and Footwear Allowance is cumulated with a number of other small social welfare schemes in the data underlying SWITCH (carer's benefit, deserted wife's allowance, deserted wife's benefit, guardian's contributory payment, guardian's non-contributory payment). Since recipients of all of these payments receive a €200 lump-sum apart from the Back to School Clothing and Footwear Allowance, we assign a €200 lump-sum to recipients of this aggregated payment.

12 Estimated costs of these measures, or estimates used to bound the costs, are presented in Dáil Debate 24 May 2022, Questions 467-471; Dáil Debate 12 July 2022, Questions 532, 558, 563; and Department of Finance and Department of Enterprise, Trade, and Employment, 2023. No costing for the grant on LPG / kerosene was available at the time of writing.

On average, households can expect to gain around 0.7 per cent of disposable income as a result of the COL package. The measures are progressive. The bottom income decile gains around 2 per cent of disposable income while the top decile gains around 0.3 per cent of disposable income. The direct welfare measures in the COL package – lump-sum payments to recipients of certain social welfare benefits – drive this progressivity, reflecting the targeted nature of these changes. The indirect measures exhibit a somewhat weaker progressivity. While the bottom decile gains most and the top decile gains least; there is little difference in gains by other deciles groups.

FIGURE B.2 DISTRIBUTIONAL IMPACT OF FEBRUARY COST-OF-LIVING PACKAGE BY INCOME DECILE; CHANGE IN ANNUAL DISPOSABLE HOUSEHOLD INCOME



Source: Authors' calculations using ITSim linked to the 2015-2016 Household Budget Survey and SWITCH run on 2019 Survey of Income and Living Conditions data.
Notes: Deciles are based on equivalised household income, using CSO national equivalence scales.

Figure B.2 presents the average cash effect of the COL measures on the annual disposable income of households in each income decile. By this measure, the COL package is neither strongly progressive nor regressive: the effect is somewhat uniform in cash terms across deciles, with slightly higher gains in the middle of the income distribution. So, while the package represents a larger *proportion* of disposable income for low-income households, it is similar in *cash* terms for low- and high-income households. This is primarily due to the effect of the indirect measures: households higher in the income distribution spend more in absolute terms on the goods for which excise and VAT cuts have been extended, i.e. energy products and hospitality. Accordingly, these households stand to benefit more in absolute terms from measures which, effectively, provide a discount on such goods. We estimate the effect of the direct welfare measures to be more than twice as generous in cash terms for low-income compared to high-income households. For indirect taxation measures, the opposite is true.

Budget 2023 insulated households, on average, from expected inflation in 2023 through a range of permanent and one-off measures (Doolan et al., 2022). The February COL package – which contains further temporary measures – benefits low-income households relatively more than high income households. However, the cost of the COL package is relatively

evenly distributed across the income distribution so that high income households gain the same in cash terms as low-income households. The recent rise in inflation has disproportionately affected lower-income households with Lydon (2022), Doorley et. al. (2022) and CSO (2022) estimating that inflation rates are 0.8-1.5 percentage points higher at the bottom of the income distribution than at the top. The targeting of any future COL measures should be carefully considered to reduce the risk of adding additional demand-side inflationary pressures to the economy. Budget 2024 should consider the core rates of social welfare payments which have not increased in line with inflation in recent years and which risk eroding the permanent living standards of those on fixed incomes once temporary measures have expired.

References

Central Statistics Office (2022). 'Estimated Inflation by Household Characteristics, September 2022'. Available at: Estimated Inflation by Household Characteristics September 2022 - CSO - Central Statistics Office.

Citizen's Information (2023). 'Christmas Bonus'. Available at: Christmas Bonus (citizensinformation.ie).

Department of Finance and Department of Enterprise, Trade, and Employment (2023). '€9.5 million approved for payment to businesses under government's new energy support scheme'. Available at: gov.ie - €9.5 million approved for payment to businesses under government's new energy support scheme (www.gov.ie).

Department of the Taoiseach (2023). 'Government announces new cost-of-living measures for families, businesses, and the most vulnerable'. Available at: gov.ie – Government announces new cost-of-living measures for families, businesses and the most vulnerable (www.gov.ie).

Doolan, M., K. Doorley, M. Regan and B. Roantree (2022). 'Distributional impact of tax and welfare policies: Budget 2023', Q*uarterly Economic Commentary* Winter 2022.

Doorley, K., M. Regan and B. Roantree (2022). 'The distributional effects of inflation and prospects for income growth', Box B in *Quarterly Economic Commentary* Spring 2022.

Lydon R. (2022). 'Household characteristics, Irish inflation and the cost of living'. *Economic Letter* Vol. 2022(1). Central Bank of Ireland.

This Box was prepared by Karina Doorley, Luke Duggan and Claire Keane.

Outlook

Recent indicators suggest that inflation is likely to moderate at a faster rate than previously expected in our Winter *Commentary*. As such, we have revised down our expectation of inflation to 4.5 per cent in 2023 and 3.5 per cent in 2024. Downside risks to this outlook include further disruptions in the European energy market or potential overheating in the domestic economy as consumption continues to grow beyond prior expectations.

PUBLIC FINANCES

Key Points

- *An Exchequer surplus of €5 billion was recorded in 2022.*
- *Total tax receipts in 2022 amounted to €83.1 billion, which was 21.5 per cent higher than 2021.*
- *Debt ratios projected to continue to fall 2023 and 2024.*
- *Income tax, corporation tax and VAT continue to show signs of growth in 2023.*

Taxation receipts for 2022 saw strong growth across a range of tax headings despite economic disruptions in the form of cost-of-living pressures and interest rate increases. The level of tax revenues in 2022 was 21.5 per cent above those collected in 2021. This corresponds to an extra €14.7 billion in revenue. This increased level of receipts has been driven by income tax, VAT and in particular, corporation tax.

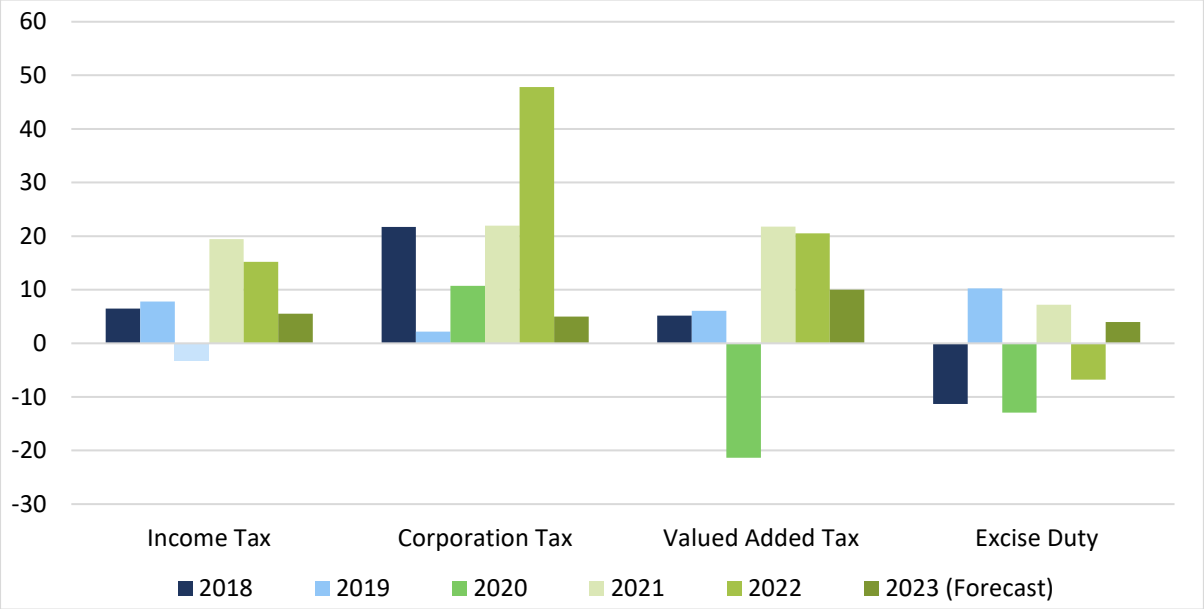
Income tax for year amounted to €30.7 billion, which is €4.1 billion, or 15 per cent ahead of 2021. This is illustrative of the strength of the labour market, with unemployment continuing to fall and wages increasing. Exchequer receipts have continued to increase into 2023, with receipts for the first two months of the year coming in 7.5 per cent ahead of the same period in 2022.

VAT receipts were also reflective of the significant recovery in consumption in 2022, with revenues of €18.6 billion recorded for 2022 compared to €15.4 billion in 2021 – a 20.5 per cent increase. These strong receipts have continued in 2023, with an increase of 21 per cent in VAT collected in the first two months of 2023 compared to the same period last year.

The largest increase in tax revenue, however, came from large increases in corporation tax receipts. In 2022, they amounted to €22.6 billion compared to 15.3 billion in 2021, representing a €7.3 billion increase in corporation tax collected. This is a 48 per cent increase, which is a substantial increase, and in 2022 corporation tax became the second-largest source of tax revenue, overtaking VAT.

The growth rates across the main tax headings are shown in Figure 35.

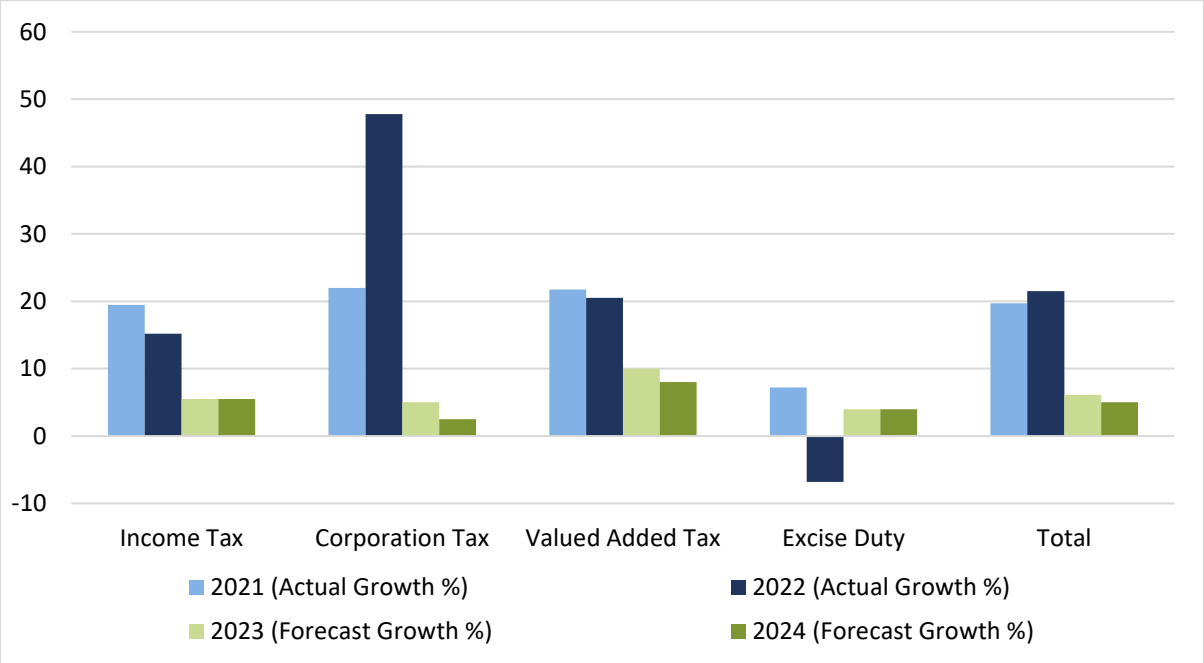
FIGURE 35 GROWTH RATES OF MAIN TAXATION ITEMS



Source: *QEC* calculations.

Figure 36 presents the forecasts of the main taxation items for 2023 and 2024.

FIGURE 36 FORECAST OF KEY TAXATION AGGREGATES



Source: Department of Finance and *QEC* calculations.

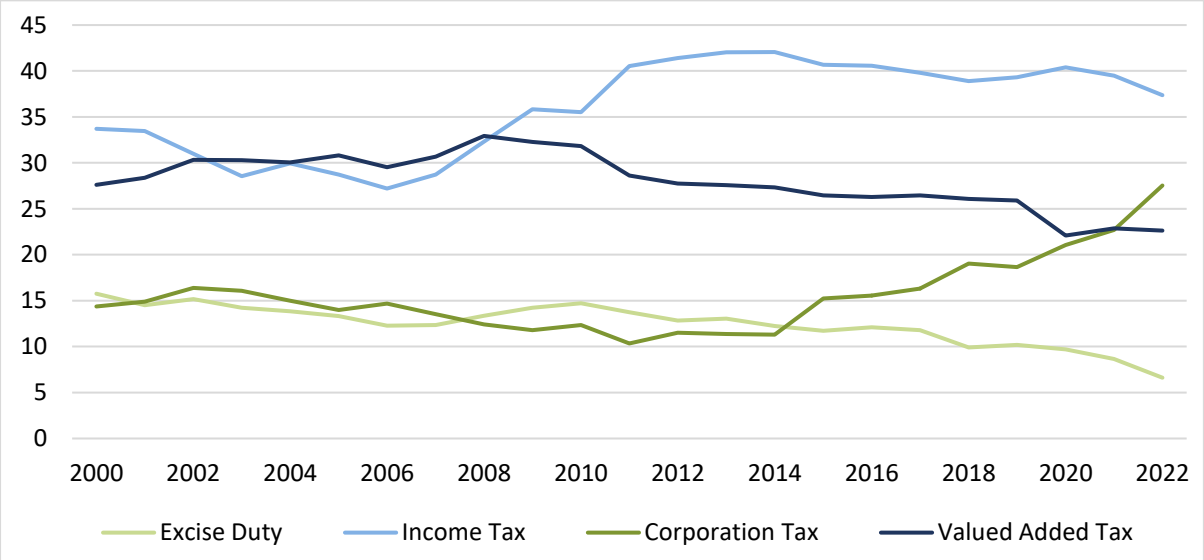
The forecasts above assume that the substantial growth of corporation tax will not continue. However given the continued profitability of large corporations across a wide range of sectors, as well as the strong receipts gathered in the first two

months of the year, modest growth in corporation tax is expected in 2023. Income tax is expected to continue to grow as wages increase this year and the labour market continues to perform strongly. Tax revenue, overall, is expected to increase in 2023 and 2024.

Given the changing nature of the Irish tax revenue, it seems appropriate to examine some of the recent trends. The shares of each tax heading have changed over time, particularly since 2008. As shown in Figure 37, excise duty and VAT have declined as a share of total tax revenue. Income tax's share increased throughout the 2010s in line with the economic recovery after the financial crash, and has remained relatively stable over the last number of years.

Since 2014, corporation tax as a share of total Exchequer receipts has increased sharply, overtaking VAT in 2022, as mentioned previously. With the decline of the contribution of excise duty to total receipts, and the increases in that of corporation tax, much of Irish tax revenue is concentrated in the three largest tax headings – namely income tax, corporation tax and VAT.

FIGURE 37 SHARE OF TOTAL EXCHEQUER RECEIPTS FOR MAIN TAX HEADINGS



Source: QEC calculations.

In the following Box by Disch, McQuinn and O'Toole, the greater concentration of Exchequer taxation receipts is examined using data from the Revenue Commissioners.

BOX C ASSESSING THE CONCENTRATION OF CORPORATION TAXES BY SECTOR

Background

The substantial increase in corporation taxation receipts observed again in 2022 has compounded previously expressed concerns about the sustainability of this source of revenue stream for the Exchequer. Figure C.1 plots the share of total Exchequer receipts accounted for by corporation tax revenues from 1984 to the present. In recent years there has been a sharp and persistent increase in the share; from just over 11 per cent in 2014 to a record 27.5 per cent in 2022. Inevitably, this has given rise to question marks about the stability of such a source going forward. A Box in the Winter *Commentary* examined the performance of the ICT sector in the Irish economy focussing on the exceptional returns to that sector over the past 20 years (McQuinn, O'Toole and Disch, 2022). From a policy perspective, the establishment of a rainy-day fund in Budget 2023, where receipts deemed to be of a windfall nature are allocated to such a fund, is in direct, and appropriate, response to this issue.

Recently, the Revenue Commissioners published a specific breakdown of corporation receipts over the period 2011–2021 according to NACE industrial sector specification. This allows us some further understanding of this increasingly important revenue stream for the State.

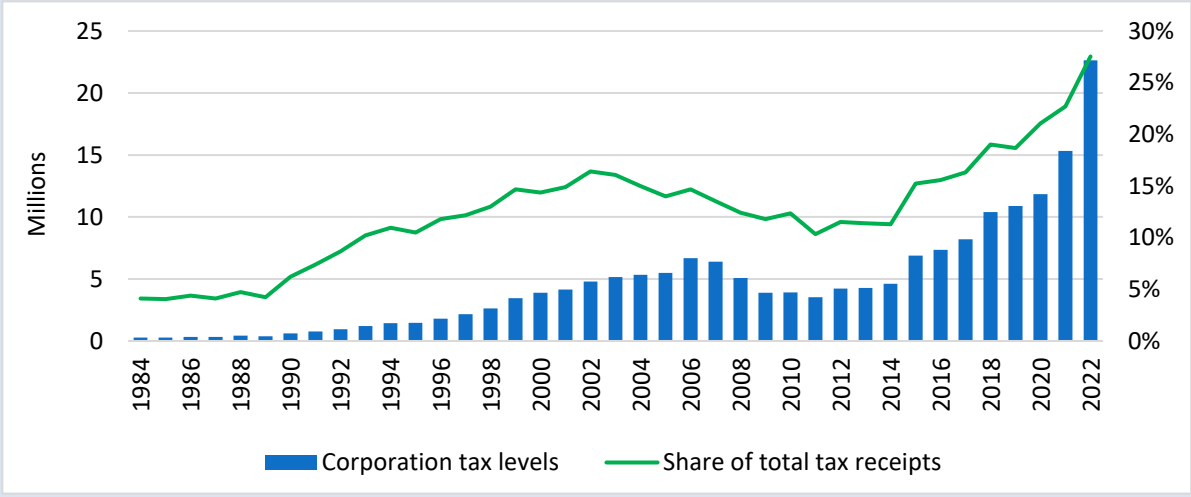
Popular commentary in this area tends to indicate that the pharmaceutical and ICT sectors are two sectors where profit levels earned by multinationals are heavily influenced by tax related strategies as opposed to underlying economic activity (see Setser, 2020, for example).

In this Box we examine these data to see if some insight can be provided as to the concentrated nature of corporation tax revenues from these sectors.

Recent trends in sectoral taxation levels

The growing importance of corporation tax revenue as a significant contributor to total Exchequer receipts can be seen in Figure C.1. While the share of these receipts increased gradually from the 1990s onward, they accounted for just over 13 per cent from 1995 to 2015. From 2015 onwards, the pace of growth clearly accelerated, as the level of receipts more than tripled from 2015 to 2022, resulting in a share of total tax receipts of 27.5 per cent in 2022.

FIGURE C.1 CORPORATION TAX LEVELS (LHS) AND SHARE OF TOTAL EXCHEQUER RECEIPTS (%, RHS): 1984-2022



Source: Department of Finance.

Using Revenue data, we disaggregate total corporation taxes by a selection of key sectors. Amongst all sectors we see a notable increase from 2015, with a particular pick-up in tax receipts between 2019 and 2022. The manufacturing sector, which is largely dominated by pharma-related activities, has been the largest contributor to corporation tax receipts in recent years. While the level of total tax receipts from the manufacturing sector continues to rise, its share of total corporation taxes has been declining (Panel B, Figure C.2). In 2011, manufacturing accounted for nearly half of corporation tax receipts compared to 28.8 per cent in 2021. Meanwhile, the ICT sector's share of CT has more than doubled over the same period, increasing from 9.8 to 21.3 per cent. The share of receipts from the wholesale and retail trade sector have remained relatively constant, while admin and support services have increased slightly.

FIGURE C.2 SELECT SECTORAL CORPORATION TAX LEVELS (€MILLION) AND SHARE OF TOTAL TAX RECEIPTS: 2011-2021

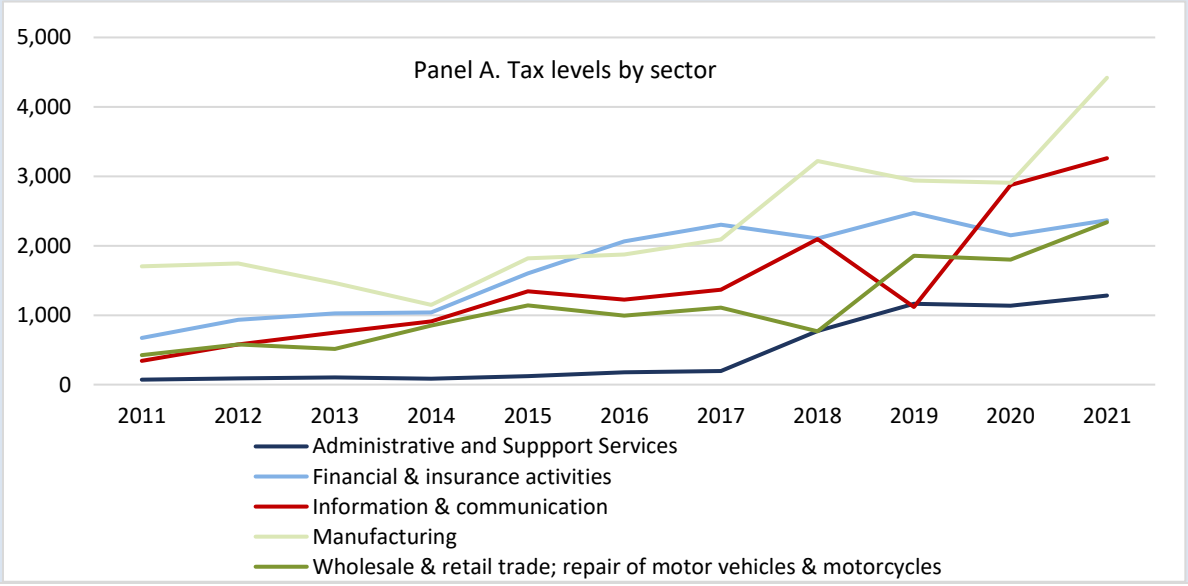
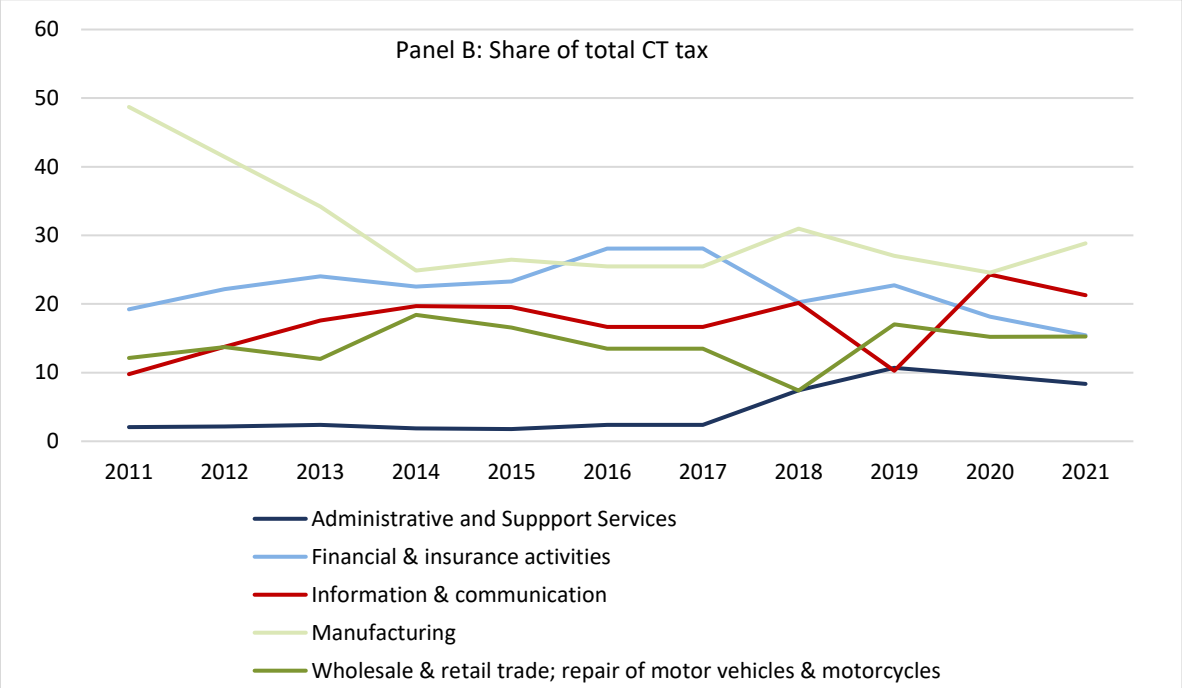


FIGURE C.2 CONTD.

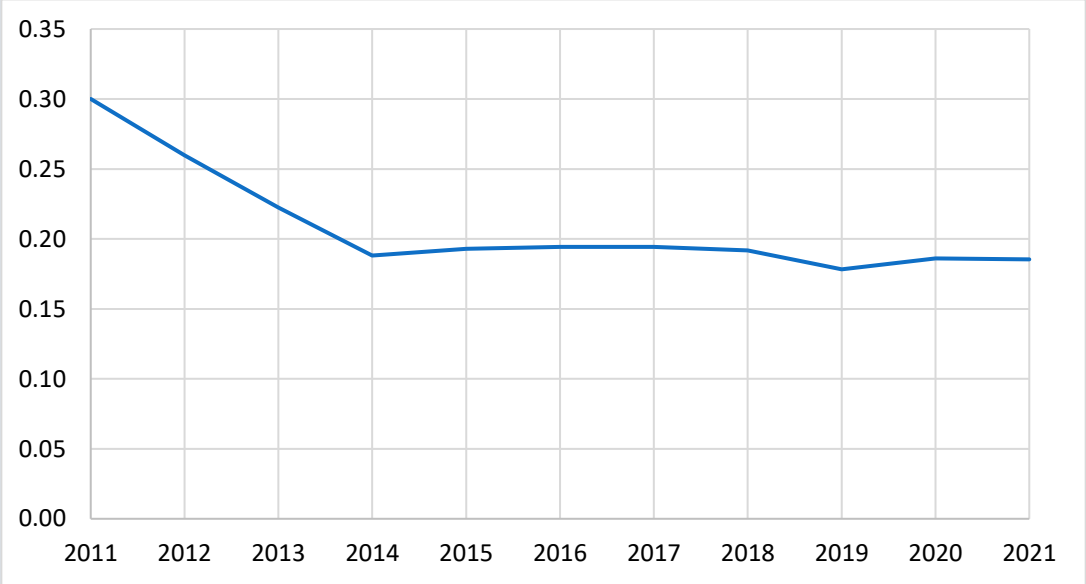


Source: Revenue Commissioners.

The concentration of corporate profits amongst a small number of multinational firms has given rise to concerns over firm-specific risks to the public finances. However, we explore whether the public finances are also vulnerable to idiosyncratic risks by assessing the concentration of receipts by sector. Figure C.3 shows the Herfindahl-Hirschmann Index (HHI), a measure of the level and trend of concentration in a particular market, for corporate tax receipts. The index is calculated by squaring each sector's share of tax receipts (relative to total CT receipts) and summing the values attained. A higher index represents more concentration, while a decrease in the index indicates the opposite. We see that the index has had a notable decline between 2011 and 2014 and thereafter has remained relatively stable. This trend is in line with the decline in tax shares from the manufacturing sector shown in Figure C.3, as other sectors' shares of receipts have increased.

The decline in the index therefore indicates that the recent growth in corporation tax receipts has not been associated with an observed increase in sector-specific concentration. However this does not mitigate the presence of idiosyncratic or firm-specific risk, nor does it provide evidence of within-sector concentration such as the dominance of pharma within manufacturing.

FIGURE C.3 HERFINDAHL INDEX OF CORPORATE TAX RECEIPTS



Source: Revenue Commissioners and *QEC* calculations.

Using more disaggregated data for 2021 provided by Revenue it is clear the manufacturing sector is highly concentrated in Pharma and ICT with over 65 per cent of the tax take accounted for by the pharma sector, with a further 20 per cent from ICT manufacturing. If we take these subsectors as a share of total corporation tax receipts, just under 50 per cent of all revenues come from pharma and ICT including services and manufacturing. This is an extremely concentrated sectoral structure.

FIGURE C.4 PROPORTION OF CORPORATION TAX PAID BY SECTORS IN 2021

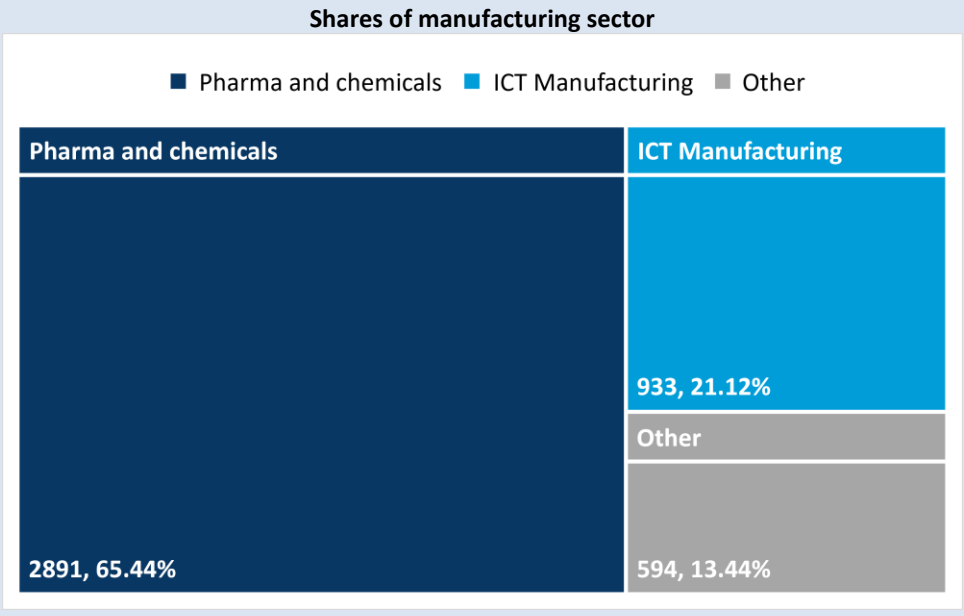
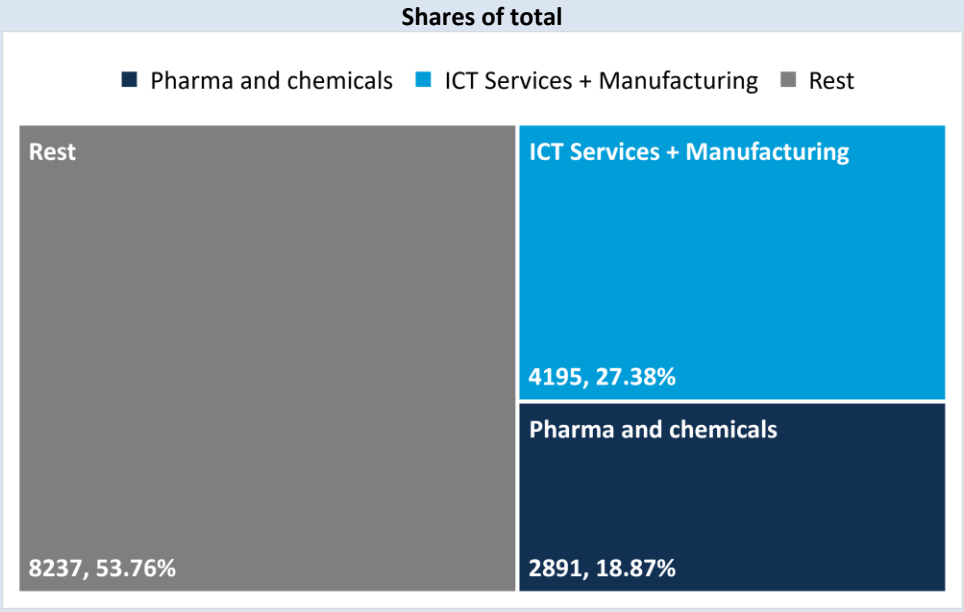


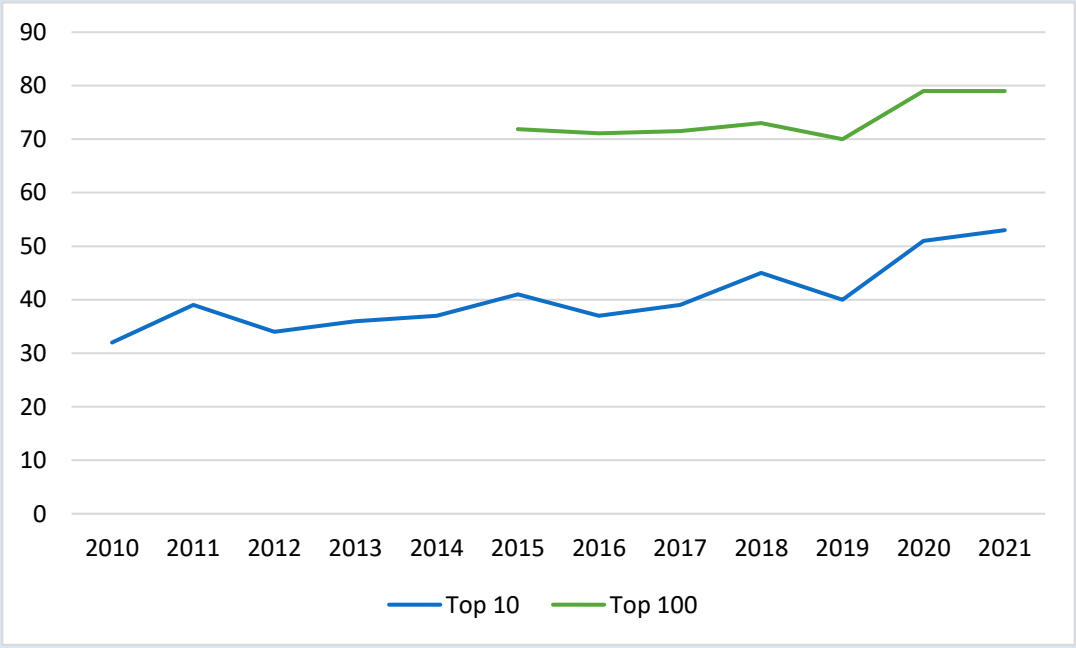
FIGURE C.4 CONTD.



Source: Revenue Commissioners and *QEC* calculations.

To provide some insight into the company-specific risk assessment, we report data from Revenue calculating the total corporation tax receipts by the top ten and top 100 largest contributors. The share of tax paid by the largest companies has increased to over 50 per cent from 30 per cent between 2015 and 2021. Similarly the top 100 companies now account for over 80 per cent of the total revenues. This highlights the risk from any withdrawal or removal of operations from the Irish market of some of these companies.

FIGURE C.5 CONTRIBUTION TO NET TAX RECEIPTS BY FIRM SIZE (% OF TOTAL)



Source: Revenue Commissioners and *QEC* calculations.

Concluding comments

The issue of corporation tax sustainability has become increasingly salient in the Irish context as these revenues have increased as a share of total tax revenues. This Box aims to explore elements of the concentration risk of these returns. The findings suggest that sectoral concentration risk has not increased concurrent with the rise in tax revenues. However, this does not necessarily dampen the extremely concentrated firm-specific risk that has been identified whereby a very small number of firms are paying a disproportionate contribution to the corporation tax.[13] This extreme idiosyncratic risk is more problematic as it leaves the Exchequer vulnerable to developments at the firm level.

References:

Disch, W., K. McQuinn and C. O'Toole (2022). 'The contribution of ICT growth in the Irish economy' Analytical Box in *Quarterly Economic Commentary*, Economic and Social Research Institute, Winter.

Setser B. (2020). 'Ireland Really Shouldn't be Driving the Details of the Euro Area's GDP Data', blogpost Council for Foreign Relations available at: https://www.cfr.org/blog/ireland-really-shouldnt-be-driving-details-euro-areas-gdp-data.

This Box was prepared by Wendy Disch, Kieran McQuinn and Conor O'Toole.

Exchequer expenditure was also greater in 2022 compared to 2021, with the State spending €101.7 billion in total. Capital expenditure increased €1 billion from 2021, largely due to increased spending on housing, while current expenditure increased €200 million. Altogether, the State spent €101.7 billion in 2022, however this was lower than targeted for the year. Capital spending was €600 million below target while current spending was €1.3 billion below profile.

Due to the strong revenues from tax receipts, the Government recorded a general Government Balance (GGB) surplus of €5 billion in 2022. This is a significant turnaround in the public finances given that 2021 saw a GGB deficit of €7.4 billion. It is indicative of the post COVID-19 economic recovery throughout 2022. Given the forecasts for the main tax headings in 2023, it is believed that the State will record another surplus of €4.7 billion in the present year. However, it should be noted that €4 billion is to be transferred to the National Reserve Fund (NRF), which has been created due to claims of the windfall nature of corporation tax receipts.

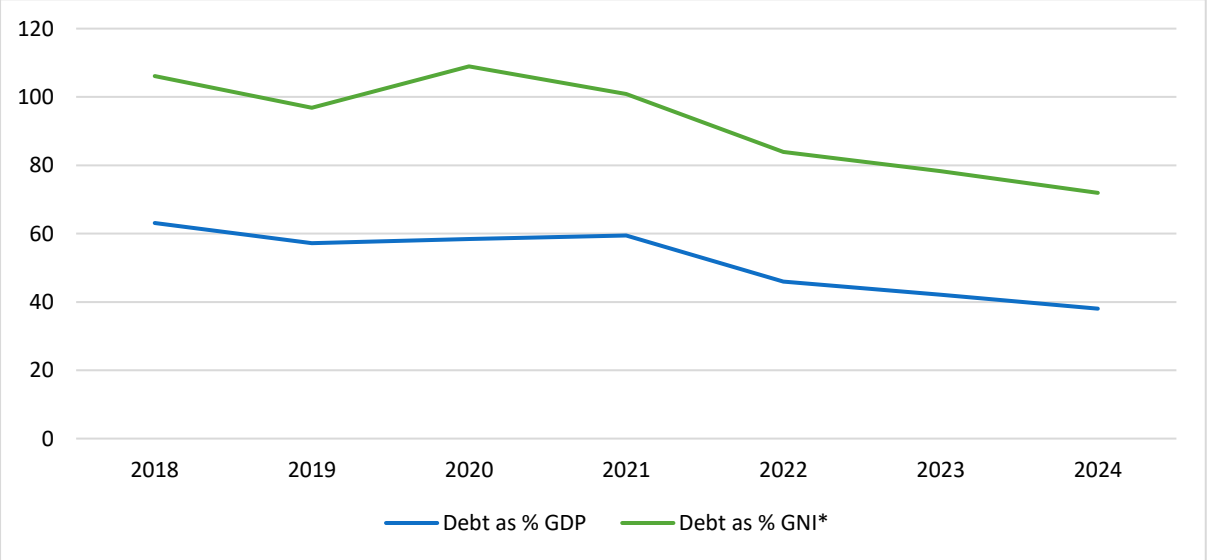
[13] Recent research by Revenue (2022) shows that ten companies pay over 53 per cent of the corporation tax revenues in Ireland. https://revenue.ie/en/corporate/documents/research/ct-analysis-2022.pdf.

As mentioned in previous *Commentaries*, a greater degree of transparency and clarity on the windfall nature of these receipts and their purpose would be beneficial in terms of their optimal long-term benefit to the economy. Issues which would need to be addressed include the manner in which the windfall tax components are determined, and how much of these components are then allocated to the NRF. It is also important to consider what the use of the funds should be for the economy over the medium to longer term. There are clearly a number of competing demands in terms of addressing longer-term structural issues in areas such as housing, climate change and health. One particular issue would be an assessment as to whether the economy could absorb such large increases in investment expenditures without inflationary pressures ensuing.

Additionally, there are a number of complexities surrounding the use of the Fund from an international perspective. For example, how compatible would using revenues from the NRF be with the new fiscal rules of the European Union, as well as the uncertainty about the OECD GLoBE rules and how they will be implemented.

The large surpluses recorded will continue to result in further declines in headline debt-to-output ratios. The debt-to-GDP ratio is projected to be 42.2 per cent by the end 2023, while the debt-to-GNI* ratio is projected to fall to 78.3 per cent by the end of the year. In 2024, debt-to-GDP and debt-to-GNI* will continue to fall to 38.0 per cent and 71.9 per cent, respectively.

FIGURE 38 PROJECTED PATH OF DEBT RATIOS



Source: *QEC* calculations.

General Assessment

Better than expected international environment

Economies across most Western countries have performed at a stronger pace in the first quarter of 2023 than many had previously expected. Fears of a general international recession for the present year, which had grown towards the end of 2022, now appear to have receded. From the domestic economy's perspective this is good news, with international trade now set to contribute more robustly to Irish economic growth in 2023 than was forecast in the previous *Commentary*.

Some of the main reasons for the better-than-expected outlook have been the easing of energy prices experienced across Western economies to date in 2023 and the improvements in supply bottlenecks in areas such as car manufacturing.

However, the overall international outlook for inflation in 2023 is still somewhat uncertain. While energy-related pressures are clearly abating, there is growing evidence of second round effects, with estimates of core inflation still remaining quite high. The presence of second round effects may have implications for the proposed response of monetary authorities to the inflation issue as these inflationary pressures may be more challenging to subdue. Nonetheless inflation rates both from an international and domestic perspective are set to be lower in 2023 than had been expected at the end of 2022.

As far as the domestic economy is concerned, the relatively lower rate of inflation will likely result in greater rates of household consumption than previously expected, thereby also leading to greater rates of overall economic growth. Modified investment, which had grown very strongly throughout 2022, is expected to grow at a slower pace in 2023, however it will also contribute to growth in the present year. Therefore, we now believe modified domestic demand (MDD) will grow by 3.8 per cent in 2023, with our preliminary forecast for 2024 indicating a growth rate of 3.9 per cent in MDD. The stronger pace of growth in 2024 reflects the expected continued slowing of inflationary pressures and the resulting tempering of monetary policy tightening by central banks.

This will exert further downward pressure on an already very low rate of unemployment in the Irish labour market; we now believe unemployment will be at 4.2 per cent in 2023 before falling further to a historical low of 4.0 per cent next year. The historically low rates of unemployment will inevitably result in higher wage growth over the medium term and this is likely to feed back into core inflation.

As with most Western economies, the inflation outlook for the domestic economy is now set to be somewhat more benign than was initially thought at the end of 2022. In a Box to the present *Commentary* Disch and McQuinn examine an alternative approach to estimating the annual rate of inflation. This approach, which attributes greater weighting to more recent monthly estimates of inflation, indicates that the present annual rate may be somewhat below that of the official estimate.

Our overall forecast for inflation in 2023 indicates that the annual rate for the year is now set to be 4.5 per cent before falling again in 2024 to 3.5 per cent. A crucial issue for the domestic economy over the next 12 to 18 months is that while external sources of inflation such as energy are likely to ease, domestic sources may well intensify as the economy continues to grow in a robust manner.

In a Box to the *Commentary* Doorley, Duggan and Keane assess the distributional implications of the cost-of-living measures introduced by the Government in February 2023. They contend that the measures benefit low-income households relatively more than high income households. However, they argue that any future measures should be targeted in nature to avoid generating additional inflationary pressures in the economy. Doorley, Duggan and Keane also call for the core rates of social welfare payments to be re-examined in future budgets as they have not been increasing in line with inflation in recent years.

The sustainability of MNE activity and corporation taxes

In the previous *Commentary* Disch, McQuinn and O'Toole published a Box which highlighted the substantial difference in productivity levels between the Irish ICT sector and that of all other European Union countries. In this *Commentary* the same authors examine the sectoral distribution of corporation tax receipts to assess the concentration or otherwise of this substantial revenue stream for the Exchequer. The Box highlights the contribution of the major NACE sectors to corporation receipts and highlights the significant contribution of both the ICT and pharma sectors. This reinforces the idea that a major correction in either sector would not just adversely impact headline economic indicators such as value added and employment, but would also have substantial repercussions for the public finances.

Overheating in the domestic economy and the housing market

From a macroeconomic perspective, as the Irish economy emerges relatively unscathed from recent challenges such as COVID-19 and inflationary pressures, there is a significant risk that the country may face overheating challenges particularly in the face of a historically tight labour market. In such a context, it may

be appropriate to deploy fiscal measures to decelerate the growth path and temper inflation.

From a competitiveness perspective, any such increases in taxation may be better deployed on unproductive forms of economic activity, such as land, and not on labour or capital. Furthermore, in the context of broadening the tax base, the proposal by the Commission for Taxation for a site value tax (SVT) is of particular note.[14] The general case for such a tax has been made in Kumhof et al. (2021).[15] They argue that tax reform in general should shift taxes away from productive labour and capital, where they reduce incentives to work and save, and onto land, where they do not distort any such incentives. In an international context such a policy, Kumhof et al. (2021) and Wolf (2023)[16] argue, would provide sustainable Government revenue over the medium term while not adversely impacting overall economic activity.

One area where the domestic economy is likely to face continued pressure over the medium term is in the housing market. The impact of high housing costs in an Irish context has been documented in Corrigan et al. (2019).[17] Housing supply levels reached a 15 year high in 2022 of 29,000 units. While the number of units supplied in 2023 is likely to be less than this owing to the reduced number of commencements in 2022, the underlying trend is an upward one as far as completions is concerned. However, in light of new population estimates which will be available in Q3 2023, it is now likely that the structural demand for housing will be revised upwards. This means that the demand for housing is likely to exceed the supply over the medium term. As a result, house price inflation and increases in rents are likely to continue, albeit, in the case of house prices, at a slower pace than was the case in 2022.

The Government has committed to increase the funding available for housing construction generally; a necessary measure owing to the funding gap in the housing market identified for example by Duffy et al. (2016).[18] However, it is important that every effort is still made to reduce the cost of building a house and avoid adding to inflationary pressures in the housing market.

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14 See Commission on taxation and welfare secretariat (2022). *Proposed site value tax*. Progress paper.

15 Kumhof M., N. Tideman, M. Hudson and C. Goodhart (2022). *Post-Corona balanced fiscal stimulus: The case for shifting taxes onto land*. CEPR discussion paper no. 16652.

16 Wolf M. (2023). 'The case for a land value tax is overwhelming'. *Financial Times* 5 February. Available online at: https://www.ft.com/content/fadfbd9e-29ca-4d53-b69a-2497cc3ed95d.

17 Corrigan E., D. Foley, K. McQuinn, C. O'Toole and R. Slaymaker (2019). 'Exploring affordability in the Irish housing market', *The Economic and Social Review*, Vol. 50, pp. 119-157, No 1, Spring.

18 Duffy D., D. Foley, N. McInerney and K. McQuinn (2016). 'Demographic change, long-run housing demand and the related challenges for the Irish banking sector', in I*reland's Economic Outlook.* The Economic and Social Research Institute, December.

Climate change policies and recent developments

The war in Ukraine and the subsequent disruptions to global energy markets has had significant implications for the implementation of climate change policies. In a recent contribution, Lonergan and Sawers (2022)[19] and Wren-Lewis (2023)[20] argue that the increase in relative competitiveness of certain types of green power such as solar energy vis-à-vis traditional fossil fuels, means that policymakers should increasingly incentivise the provision of such green industries through subsidies and public investment as a means of achieving climate change targets.

The Inflation Reduction Act (IRA) bill in the United States, which contains many such incentives, is offered as an example. This policy offers a number of initiatives to promote greener industries. The overall cost of promoting such a package is now relatively cheaper because the green sources of energy which it encourages have now become relatively cheaper, owing in no small way to the war in Ukraine.

Social infrastructure: Hospital bed capacity

Further challenges for fiscal policy are implicit in a Research Note to the *Commentary* by Walsh and Brick (2023)[21] which outlines projected public acute hospital bed requirements in Ireland for 2023. Based on previous work by the ESRI, the Department of Health's *Health Service Capacity Review* and the National Development Plan, they estimate that in 2023 there may be a bed capacity deficit of approximately 1,000 inpatient beds in public acute hospitals. Walsh and Brick (2023) argue that this deficit is a key contributor to recent overcrowding issues. The Note acknowledges that the implementation of Sláintecare and the move towards community and lower care settings would ease the situation. However in the medium term, additional Government investment in the acute hospital system is required to meet both unscheduled care demand and to alleviate hospital waiting lists.

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19 Lonergan E. and C. Sawers. *Supercharge me, net zero faster*. Columbia University Press.

20 Wren-Lewis S. (2023). 'The political economy and worldwide implications of the Inflation Reduction Act in the US'. Blog post available online at: https://mainlymacro.blogspot.com/2023/02/the-political-economy-and-worldwide.html.

21 Walsh B. and A. Brick (2023). 'Inpatient bed capacity requirements in Ireland in 2023: Evidence on the public acute hospital system'. Research Note, *Quarterly Economic Commentary*, Spring.

Research Note

INPATIENT BED CAPACITY REQUIREMENTS IN IRELAND IN 2023: EVIDENCE ON THE PUBLIC ACUTE HOSPITAL SYSTEM

Brendan Walsh* and Aoife Brick[22]

ABSTRACT

In this Note, we provide estimates of public acute hospital inpatient bed requirements in Ireland in 2023, based on earlier ESRI research published by Keegan et al. (2018), the Department of Health's Health Service Capacity Review (2018) and the National Development Plan (2018-2027). Each of these analyses projected hospital bed capacity requirements in Ireland based on a variety of projection scenarios. The Note finds that while absolute, and per capita, public acute hospital inpatient bed capacity has increased in recent years, large bed capacity deficits remain. Focusing on scenarios that assume an 85 per cent occupancy rate, we estimate that in 2023 there may be a bed capacity deficit of approximately 1,000 inpatient beds in public acute hospitals. This bed capacity deficit is likely a key contributor to recent overcrowding issues experienced in public acute hospitals. In addition to the deficit that currently exists in the system, over 300 additional inpatient beds are required per annum to keep up with demand pressures arising from an increasing and ageing population.

1. INTRODUCTION

OECD and European Union statistics consistently find the public acute hospital system in Ireland to have amongst the lowest inpatient bed per capita rate compared to comparator countries (Walsh et al., 2020a; OECD and European Union, 2022). In 2019, Ireland reported the highest average occupancy rate, 90 per cent, in the OECD (OECD and European Union, 2022), which is much higher than the frequently referenced 85 per cent occupancy rate above which patient safety risk can arise (Bagust et al., 1999). In its recent *Economic Survey of Ireland*, the OECD included a detailed analysis of health sector performance and efficiency (OECD, 2022). This report further reiterated low levels of capital investment in health infrastructure and capacity constraints, including low numbers of hospital beds associated with inpatient bed occupancy rates above international safety standards. Winter 2022/2023 also saw severe overcrowding experienced by the public hospital system; on 3 January 2023, there were 749 people waiting on trolleys in public acute adult hospitals.[23] It has been acknowledged by the HSE that

22 Financial support for this work was provided by the Department of Health through the ESRI/Department of Health Research Programme in Healthcare Reform. The views expressed in this Note and Keegan et al. (2018) paper are those of the authors and not necessarily the Department of Health.

23 TrolleyGAR: http://137.191.241.85/ed/ED.php?EDDATE=03%2F01%2F2023.

this overcrowding was caused in part by insufficient bed capacity in public acute hospitals, and may continue for a number of years as the 'process to build beds is a long one'.[24]

The objective of this Note is to provide estimates of projected public acute hospital inpatient bed requirements in Ireland in 2023, and the additional capacity needed in the coming years to meet demand. The estimates are based upon existing public acute hospital inpatient bed projections for Ireland from three published sources; the ESRI (Keegan et al., 2018), the Department of Health's Health Service Capacity Review (2018) (PA Consulting, 2018), and the National Development Plan (2018-2027). The analysis based on the existing evidence linearly projects bed requirements for 2023.

The three publications on which these updated estimates are based are:

- Keegan et al. (2018). *How many beds? Capacity implications of hospital care demand projections in the Irish hospital system, 2015-2030*.
- PA Consulting (2018). *Health Service Capacity Review (HSCR) 2018*. The analyses in this review were compiled by PA Consulting on behalf of the Department of Health.
- Government of Ireland (2018). *National Development Plan (NDP) 2018-2027*.

2. PROJECTION SCENARIOS

Each of the publications provided projections, rather than forecasts, based upon demand and capacity in a baseline year (varying from 2015-2018) and a range of underlying assumptions and scenarios outlined in Tables 1-3. The use of more recent base year data (e.g. 2022) may result in differing demand and capacity estimates.

2.1 ESRI projections (Keegan et al., 2018)

This paper projected public acute hospital bed capacity requirements in Ireland from 2015-2030 based on the ESRI Hippocrates model.[25] Table 1 outlines the main assumptions made across the six scenarios included in the paper and projected inpatient bed requirements in 2030. Each scenario varies assumptions about

[24] Comments from the interim HSE CEO to the Joint Committee on Health, January 17, 2023. https://data.oireachtas.ie/ie/oireachtas/debateRecord/joint_committee_on_health/2023-01-17/debate/mul@/main.pdf.

[25] Financial support for the development of the Hippocrates model was provided by the Department of Health through the ESRI/Department of Health Research Programme in Healthcare Reform.

population size, unmet demand (inpatient waiting lists), Healthy Ageing (this reflects the assumed changes in health and life expectancy), and efficiencies that could be made by reducing average length of stay (ALOS) and avoidable hospitalisations. Varying assumptions allow the wider possibility of needs to be accounted for, and provide controls for the inherent uncertainty in all projection exercises.

TABLE 1 ESRI 'HOW MANY BEDS?' PROJECTION SCENARIOS AND ASSUMPTIONS

Scenarios	ASSUMPTIONS						2015 Baseline beds	2030 Projected bed requirements
	Population growth	Healthy ageing[a]	Unmet demand	Public hospital inpatient occupancy rate	Public hospital ALOS	Avoidable hospitalis-ation rate reduction		
1. Status Quo	Central	EM	None	No change	No change	No	10,363	14,797
2. Healthy Ageing	Central	DE	None	No change	No change	No	10,363	13,359
3. High Population growth	High	DE	None	No change	No change	No	10,363	13,917
4. (2) + addressing unmet demand	Central	DE	Yes	No change	No change	No	10,363	13,740
5. (4) + reducing bed occupancy	Central	DE	Yes	Converge to 85% by 2030	No change	No	10,363	15,308
6. (5) + reducing ALOS + reducing avoidable hospitalisations	Central	DE	Yes	Converge to 85% by 2030	Reduce ALOS by 10% by 2030	33% reduction in avoidable hospita-isation rate by 2030	10,363	12,983

Source: Adapted from Keegan et al. (2018).
Note: The 'expansion of morbidity' (EM) hypothesis assumes that additional life years gained are spent in bad health. The 'dynamic equilibrium' (DE) hypothesis posits that as life expectancy increases, all gains in life expectancy are spent in good health (or mild ill-health).

2.2 Health Service Capacity Review (2018) and NDP projections (2018-2027)

Tables 2 and 3 outline the main assumptions made across all scenarios within the HSCR and NDP reports, to the best of the authors' interpretation of the published reports. In Table 3, the Note assumes the base year (2018), and projections end year (2027) equate to the time-period of the NDP.

TABLE 2 PROJECTION SCENARIOS FROM HEALTH SERVICE CAPACITY REVIEW (HSCR)

Scenarios	Assumptions	2016 Baseline beds	2021	2026	2031 Projected bed requirements
Baseline (85%)		10,500	13,000	14,500	16,300
Reform Scenario 1 (85%)	Improved health and wellbeing	10,500	13,100	14,200	15,500
Reform Scenario 2 (85%)	Improved management of patients with complex comorbidities	10,500	12,400	12,900	14,400
Reform Scenario 3(B) (85%)	Improvements to patient flow through hospitals	10,500	12,700	13,800	15,500
All Reforms (85%)	1+2+3(B)	10,500	13,100	14,200	12,600

Source: Adapted from PA Consulting (2018).

TABLE 3 PROJECTION SCENARIO FROM NATIONAL DEVELOPMENT PLAN (2018-2027)

Scenario	Assumptions	2018 Baseline beds	2027 Projected bed requirements
NDP scenario	2,600 additional acute hospital beds (assumed 2018-2027).	10,856	13,456

Source: Authors' interpretation of Government of Ireland (2018).

The 2015 baseline figure of 10,363 in the ESRI paper differs slightly from the 10,473 available inpatient beds reported in *Health in Ireland: Key Trends 2022* (Department of Health, 2022). Similarly, the 2016 baseline figure in the HSCR of 10,500 differs slightly from the 10,592 available inpatient beds reported in *Health in Ireland: Key Trends 2022*.

In this Note, only projection scenarios that assume a maximum of 85 per cent average bed occupancy are examined. There is growing evidence that insufficient bed capacity and high bed occupancy rates are linked to higher patient mortality, poor in-hospital outcomes, and risks to hospital staff welfare (Keegan, 2010; Madsen et al., 2014; Bosque-Mercader and Siciliani, 2022). High bed occupancy also results in overcrowding on hospital corridors and in Emergency Departments (as regularly experienced in Ireland, particularly in Winter 2022/2023) (Morley et al., 2018; Turner et al., 2020). The 85 per cent average occupancy rate threshold has been adopted by the OECD and other systems as an upper average threshold for hospitals to aim for. In Ireland, the Irish Paediatric Critical Care Audit (Healy et al., 2022), and recent Department of Health research (Shine and Hennessy, 2022) have used 85 per cent as a recommended limit when examining bed occupancy rates. The HSCR stated Ireland's 'occupancy rate is abnormally high' and estimated their bed projection based upon 'a more acceptable occupancy rate of 85 per cent' (PA Consulting, 2018, p.61).

3. INPATIENT BED AND POPULATION DATA

3.1 Inpatient bed data

Public acute hopsital inpatient bed information from 2015-2021 were sourced from *Health in Ireland: Key Trends 2022* (Department of Health, 2022).[26,27] At the time of writing, no data on the number of inpatient beds available in December 2022 had been published. In this Note we estimate the December 2022 figure by adding the 907 acute beds that have been stated to have been delivered since 1 January 2020 according to the 2022/2023 HSE Winter Plan.[28] The December 2023 figure reflects an additional 321 beds funded and due by year end 2023 according to the 2022/2023 HSE Winter Plan.

3.2 Population data

Published Census 2016 and Census 2022 data were used for each respective year to estimate:

- beds per 1,000 population (all ages), and
- beds per 1,000 population aged 65+.

Intercensal year populations are estimated by taking a linear trend between Census 2016 and Census 2022. Per capita estimates in Figures 3 and 4 include the published populations in Census 2016 and Census 2022.

4. RESULTS

Figure 1 outlines the 'actual' inpatient beds in public acute hospitals, and the projected inpatient bed requirements in Ireland using scenarios within the ESRI, HSCR, and NDP reports. Only projection scenarios that include an 85 per cent occupancy rate assumption are included in this Note. While five scenarios were presented in the HSCR, only the baseline 'without reforms' and the 'with all reforms' scenarios are included.

Figure 1 shows that between 2015 and 2022, an estimated 1,385 inpatient beds were opened in public acute hospitals. The majority of these beds (1,000) were opened since 2018. However, projected requirements have outpaced actual inpatient bed capacity for all scenarios, except for the HSCR 'with all reforms'

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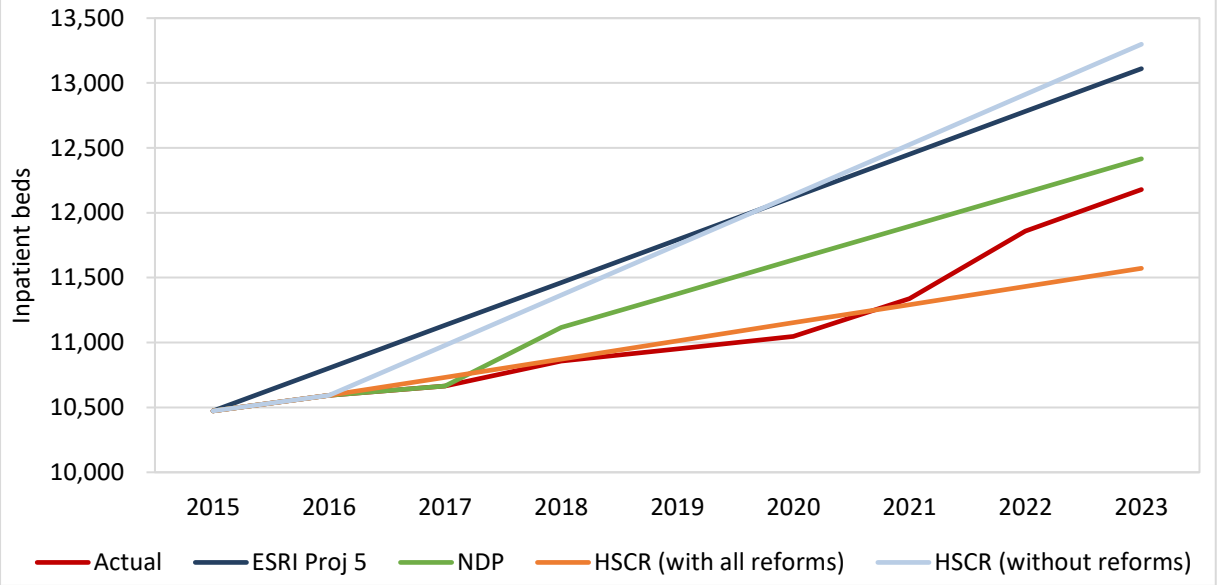
26 We assume that bed information relates to end of year beds available, based upon the fact that in some years (e.g. 2020) the bed number equates to that reported in the Department of Health *Open Beds Report* for December of that year. https://assets.gov.ie/126246/5d94fe72-9a9d-4118-9b99-0412d2c5506a.pdf.

27 Since 2021, the National Rehabilitation Hospital acute beds (104 beds) were included in the Department of Health *Open Beds Reports,* but were not included previously.

28 https://www.hse.ie/eng/services/news/media/pressrel/winter-plan-2022-23.pdf.

scenario. Based on ESRI projection Scenario 5, an approximate 330 inpatient beds are required per annum to meet demand projections.

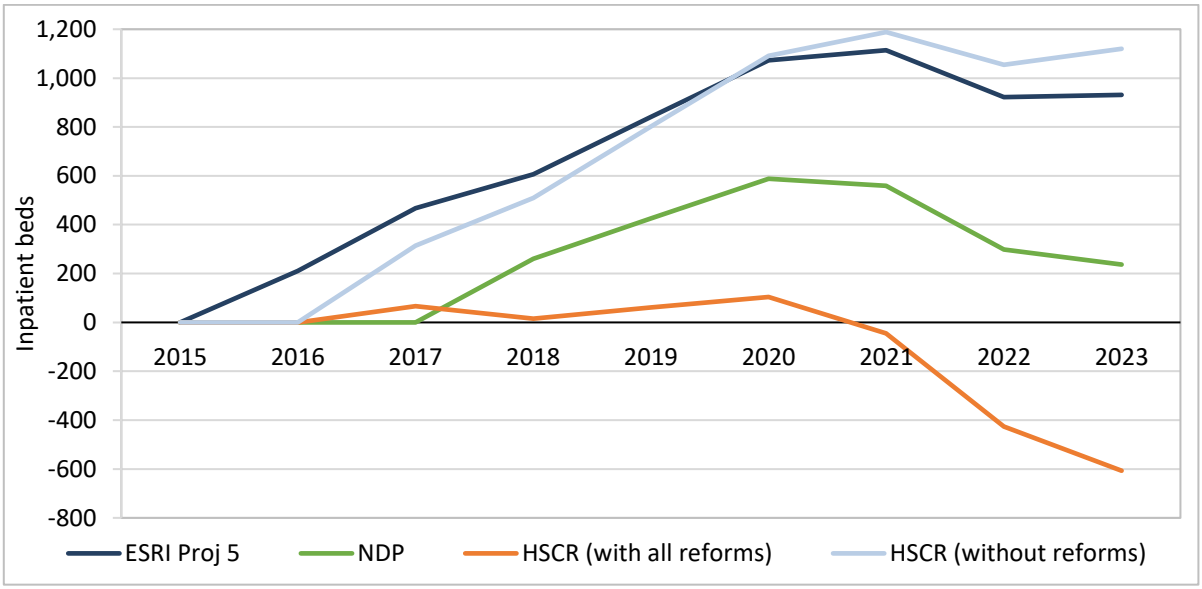
FIGURE 1 PUBLIC ACUTE HOSPITAL INPATIENT BEDS AND ESTIMATED INPATIENT BED REQUIREMENTS



Sources: Authors' calculations based on Government of Ireland (2018); Keegan et al. (2018); PA Consulting (2018); Department of Health (2022); Health Service Executive (2022).
Note: Series break: 2022 and 2023 'actual' beds based upon 2022/2023 HSE Winter Plan.

Figure 2 shows the estimated bed shortfall by subtracting projection estimates (Figure 1) from actual beds reported for each year. The HSCR 'without reforms' scenario and ESRI projection Scenario 5 show the largest shortfall of over 1,100 and 900 beds by the end of 2023 respectively. This equates to a relative shortfall of up to 8 per cent. The NDP scenario shows a shortfall of almost 240 beds. The 'with all reforms' HSCR scenario estimates that current levels are over 600 beds above the estimated requirements.

FIGURE 2 PUBLIC ACUTE HOSPITAL INPATIENT BEDS ESTIMATED SHORTFALL



Sources: Authors' calculations based on Government of Ireland (2018); Keegan et al. (2018); PA Consulting (2018); Department of Health (2022); Health Service Executive (2022).

The ESRI analyses (Keegan et al., 2018) estimated a number of other projection scenarios not included in Figures 1 and 2 (see Table 1). Projection Scenario 6 examined efficiency and model of care changes, and showed that reducing ALOS by 10 per cent and avoidable hospitalisations by 33 per cent would considerably reduce inpatient bed requirements. We do include this scenario in this analysis as ALOS actually increased in the intervening years.[29]

The ESRI analyses also estimated bed capacity requirements using both central and high population assumptions.[30] Projection Scenario 5 included a central population assumption. In reality, recent data from Census 2022 show a national population that was approximately halfway between the central and high population projections. Therefore, ESRI projection Scenario 5 bed requirements estimated in Figure 2 may be an underestimate based upon recent population increases.

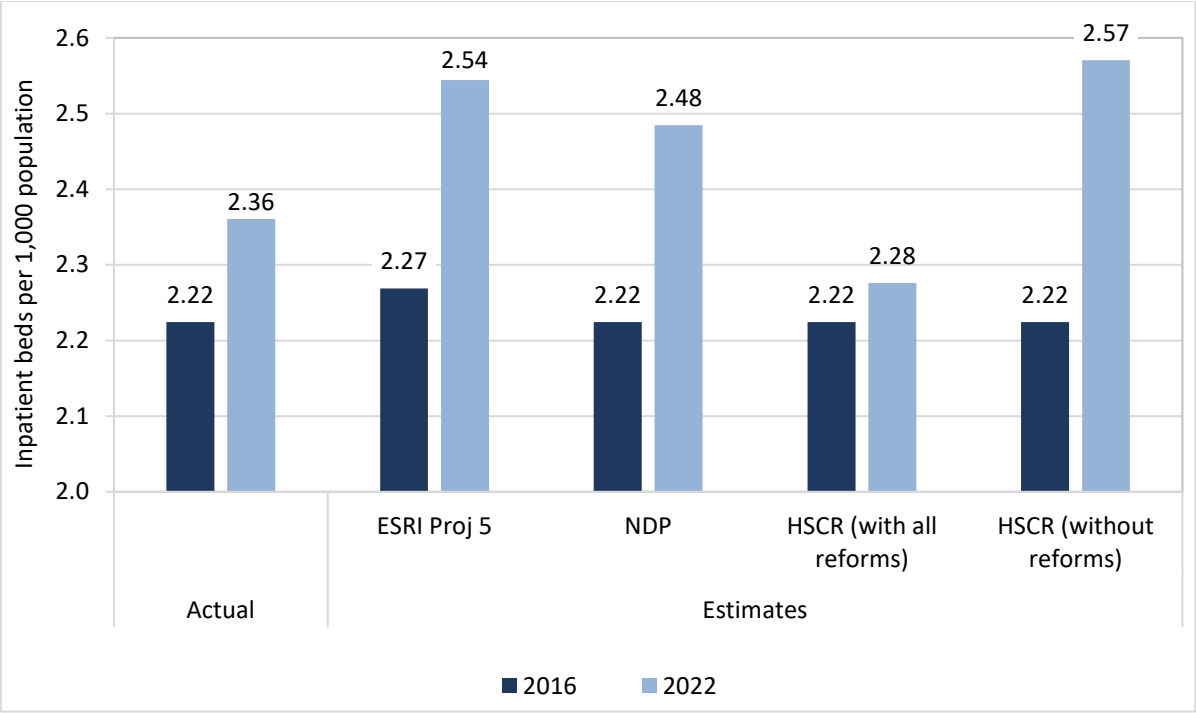
Figure 3 presents estimates of inpatient beds per 1,000 population in 2016 and 2022, the years in which censuses were carried out. We divide the number of actual and projected beds in 2016 and 2022 by the population size in each census year. The increases in public acute hospital inpatient bed capacity that have occurred in recent years have increased beds per capita. However, these increases have come off historically low bed capacity levels. The HSCR baseline scenario and ESRI

29 See *Activity in Acute Public Hospitals in Ireland* 2019-2021 reports at http://www.hpo.ie.

30 Details on both population assumptions can be found in Keegan et al. (2018) and Wren et al. (2017).

projection Scenario 5 show per capita bed deficits of 0.18 and 0.21 beds per 1,000 population.

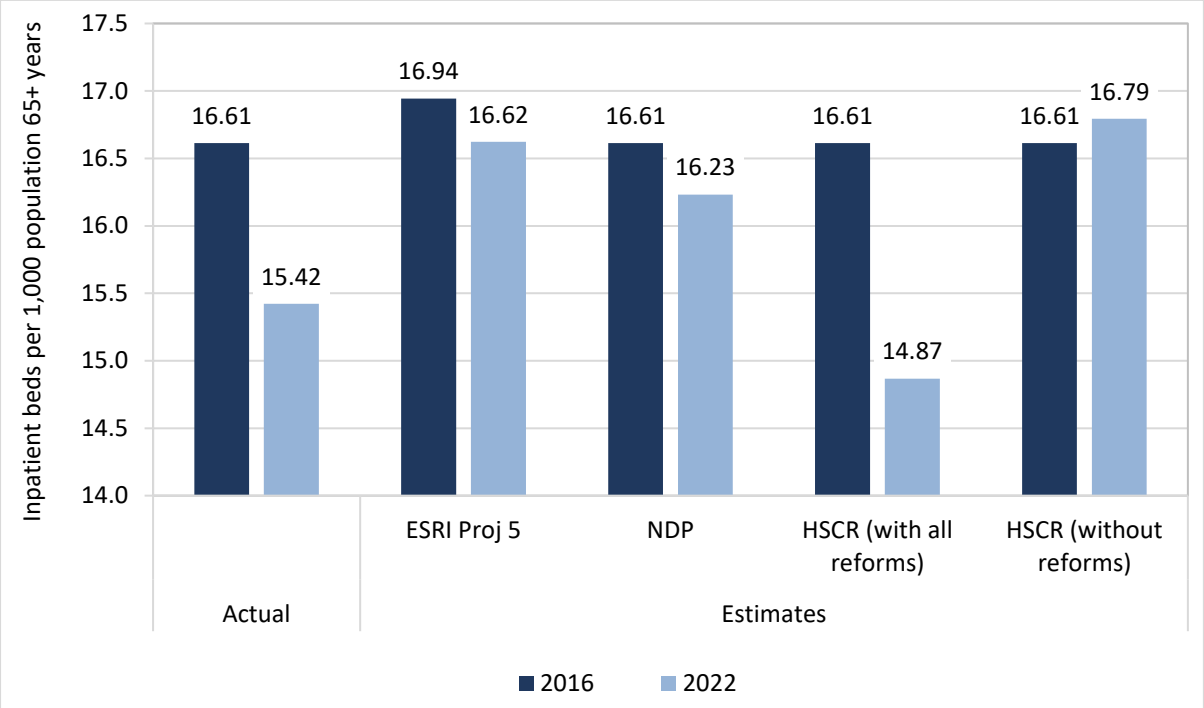
FIGURE 3 PUBLIC ACUTE HOSPITAL INPATIENT BEDS AND ESTIMATED INPATIENT BED REQUIREMENTS PER 1,000 POPULATION



Sources: Authors' calculations based on Government of Ireland (2018); Keegan et al. (2018); PA Consulting (2018); Central Statistics Office (2022); Department of Health (2022); Health Service Executive (2022).
Note: Series break: 2022 and 2023 'actual' beds based upon 2022/2023 HSE Winter Plan.

Patients aged 65+ used over 55 per cent of all inpatient bed days in 2021 (Healthcare Pricing Office, 2022). Figure 4 estimates inpatient beds per 1,000 population aged 65+ in 2016 and 2022, the years in which censuses were carried out. We divided the number of actual and projected beds in 2016 and 2022 by the population size aged 65+ in each census year. The HSCR 'without reforms' baseline scenario is the only scenario where bed requirements per population aged 65+ increase over time. The optimistic dynamic equilibrium healthy ageing assumption, and population growth at older ages, made within ESRI projection Scenario 5 may explain some of the small reductions in bed requirements per population aged 65+.

FIGURE 4 PUBLIC ACUTE HOSPITAL INPATIENT BEDS AND ESTIMATED INPATIENT BED REQUIREMENTS PER 1,000 POPULATION AGED 65+ YEARS



Sources: Authors' calculations based on Government of Ireland (2018); Keegan et al. (2018); PA Consulting (2018); Central Statistics Office (2022); Department of Health (2022); Health Service Executive (2022).
Note: Series break: 2022 and 2023 'actual' beds based upon 2022/2023 HSE Winter Plan.

5. CONCLUSIONS

Population increases, especially at older ages, will continue to increase demand for hospital care. The Irish population is projected to increase by 1 per cent on average per annum out to 2035, with the population aged 65+ projected to increase by 3.5 per cent on average per annum. This means that additional public acute hospital capacity will be required. Where appropriate, transferring care from hospitals into the community and lower acuity care settings (e.g. step-down and rehabilitation facilities) in line with Sláintecare is also needed. For instance, on 10 January 2023, there were 524 people in public acute hospitals categorised as delayed in the transfer of care (DTOC) awaiting discharge.[31] Previous ESRI evidence has shown that increases to post-acute care supply, such as home support, can reduce length of hospital stays, especially for those who are likely to be DTOC patients (Walsh et al., 2020b). Adopting Sláintecare proposals to reduce DTOC numbers will also reduce hospital bed capacity needs. However at least in the medium term, and in the context of Ireland's rapidly changing demographic position and long waiting lists for care, policymakers should be realistic about the need to invest in the acute hospital system. In this context, some of the more

[31] Comments from the HSE CEO to the Joint Committee on Health, January 17, 2023. https://data.oireachtas.ie/ie/oireachtas/debateRecord/joint_committee_on_health/2023-01-17/debate/mul@/main.pdf.

optimistic projection scenarios listed in the HSCR and NDP may underestimate bed capacity needs, especially without substantial improvements in primary and community-based care, and patient flow into post-acute settings, occurring. Meanwhile additional bed capacity will also require sufficient workforce to provide care. To inform workforce planning, a recent ESRI analysis using the Hippocrates Model also projected the workforce requirements for public acute hospitals to 2035, at both a national and regional level (Keegan et al., 2022).

This Note estimates that in 2023, based on ESRI projection Scenario 5 from Keegan et al. (2018), there may be a shortfall of over 900 beds in Irish public acute hospitals. This is despite the additional hospital bed capacity added in recent years. This shortfall increases the likelihood of overcrowding issues remaining a common feature of the Irish public acute hospital system in the short term. Examining average annual bed capacity requirements, ESRI projection Scenario 5 also estimates that an additional 330 inpatient beds may be required in the public acute hospital system, in addition to the over 900-bed shortfall that exists in 2023.

Keegan et al. (2018) estimated a number of sensitivity analyses that examine the percentage change in projected bed capacity if key assumptions (e.g. population size, healthy ageing, inpatient bed occupancy, ALOS) were altered. Those analyses highlighted that assuming a higher occupancy rate, e.g. 90 per cent, would reduce estimated bed requirements. However, the evidence linking high occupancy rates to poor patient- and system-level outcomes means the benefits of using high occupancy to determine bed capacity requirements would ultimately result in insufficient supply and continued periods of overcrowding in the system.

The Note finds that while inpatient beds per capita have increased, they remain amongst the lowest in the OECD. While the Note also finds that despite the population aged 65+ using more than half of all inpatient bed days, beds per 1,000 population aged 65+ have decreased considerably in recent years.

A number of caveats should be remembered when interpreting analyses in this Note. First, including a more recent base year data (e.g. 2022) may result in differing demand profiles and therefore different bed capacity estimates. Second, the impact of COVID-19 on population health and hospital demand is not incorporated in the estimates for this Note as all projection analyses exercises preceded the pandemic. The lasting effects in terms of infection control measures, COVID-19 outbreaks in hospitals, and increases in public hospital waiting lists may mean the estimates in Figure 2 underestimate the bed capacity shortfall in 2023. Third, it was necessary to estimate 2022 and 2023 inpatient bed figures as at the time of writing no published data exist on current bed numbers. Up-to-date validated day patient and inpatient bed data from a single source would allow for

an increased ability to examine hospital bed capacity requirements. Finally, while the analyses highlighted inpatient beds, it is important to understand that bed requirements must be considered in the context of infrastructure, workforce (clinical and non-clinical requirements; see Keegan et al., 2022), and overheads.

REFERENCES

Bagust, A., M. Place and J.W. Posnett (1999). 'Dynamics of bed use in accommodating emergency admissions: stochastic simulation model', *BMJ* 319(7203): 155-158. https://doi.org/10.1136/bmj.319.7203.155.

Bosque-Mercader, L. and L. Siciliani (2022). 'The association between bed occupancy rates and hospital quality in the English National Health Service', *The European Journal of Health Economics*. 10.1007/s10198-022-01464-8.

Central Statistics Office (2022). *Census of Population 2022 - Preliminary Results*. https://www.cso.ie/en/releasesandpublications/ep/p-cpr/censusofpopulation2022-preliminaryresults/.

Department of Health (2022). *Health in Ireland: Key Trends 2022*. Department of Health, Dublin. https://assets.gov.ie/241598/8a6472b4-83cf-45ec-88c9-023e0c321d8c.pdf.

Government of Ireland (2018). *Project Ireland 2040: National Development Plan 2018-2027*, Dublin. https://www.gov.ie/pdf/37937.

Health Service Executive (2022). *Winter Plan October 2022 – March 2023*. Health Service Executive, Dublin, https://www.hse.ie/eng/services/news/media/pressrel/winter-plan-2022-23.pdf.

Healthcare Pricing Office (2022). *Activity in Acute Public Hospitals in Ireland Annual Report, 2021*. Health Service Executive, Dublin, http://hpo.ie/latest_hipe_nprs_reports/HIPE_2021/2021_HIPE_Activity_Report_v2022-12-21.pdf.

Healy, M., H. Bruel, D. Doherty, C. Gibbons, E. Brereton, M.H. Tan, M. Lawlor, A. Geraghty, G. Nevin and C. McGarvey (2022). 'Irish Paediatric Critical Care Audit National Report 2017-2019'.

Keegan, A.D. (2010). 'Hospital bed occupancy: more than queuing for a bed', *Med J Aust* 193(5): 291-293, https://www.ncbi.nlm.nih.gov/pubmed/20819049.

Keegan, C., A. Brick, G. Rodriguez and L. Hill (2022). *Projections of workforce requirements for public acute hospitals in Ireland, 2019-2035: A regional analysis based on the Hippocrates model*. *ESRI Research Series 147*. Economic and Social Research Institute. https://doi.org/10.26504/rs147.

Keegan, C., A. Brick, B. Walsh, A. Bergin, J. Eighan and M. Wren (2018). 'How many beds? Capacity implications of hospital care demand projections in the Irish hospital system, 2015-2030', *The International Journal of Health Planning and Management* 34(1). https://doi.org/10.1002/hpm.2673.

Madsen, F., S. Ladelund and A. Linneberg (2014). 'High levels of bed occupancy associated with increased inpatient and thirty-day hospital mortality in Denmark', *Health Aff (Millwood)* 33(7): 1236-1244. https://doi.org/10.1377/hlthaff.2013.1303.

Morley, C., M. Unwin, G.M. Peterson, J. Stankovich and L. Kinsman (2018). 'Emergency department crowding: a systematic review of causes, consequences and solutions'. *PloS one* 13(8): e0203316.

OECD (2022). *OECD Economic Surveys: Ireland 2022*.

OECD and European Union (2022). *Health at a Glance: Europe 2022*.

PA Consulting (2018). *Health Service Capacity Review 2018*. Department of Health, Dublin. https://assets.gov.ie/10132/7c2a2299ca924852b3002e9700253bd9.pdf.

Shine, C. and M. Hennessy (2022). *Spending Review 2022 Health Capital Investment in Ireland*.

Turner, A.J., L. Anselmi, Y.S. Lau and M. Sutton (2020). 'The effects of unexpected changes in demand on the performance of emergency departments, *Health Economics* 29(12): 1744-1763.

Walsh, B., C. Keegan, A. Brick and S. Lyons (2020a). *How is Ireland's healthcare system coping with coronavirus?* Retrieved 22 October, 2020, https://www.coronavirusandtheeconomy.com/question/how-irelands-healthcare-system-coping-coronavirus.

Walsh, B., S. Lyons, S. Smith, M.A. Wren, J. Eighan and E. Morgenroth (2020b). 'Does formal home care reduce inpatient length of stay?', *Health Econ*. https://doi.org/10.1002/hec.4158.

Wren, M.-A., C. Keegan, B. Walsh, A. Bergin, J. Eighan, A. Brick, S. Connolly, D. Watson and J. Banks (2017). *Projections of Demand for Healthcare in Ireland, 2015-2030. First Report from the Hippocrates Model*. *ESRI Research Series 67*. Economic and Social Research Institute, Dublin. https://doi.org/10.26504/rs67.

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