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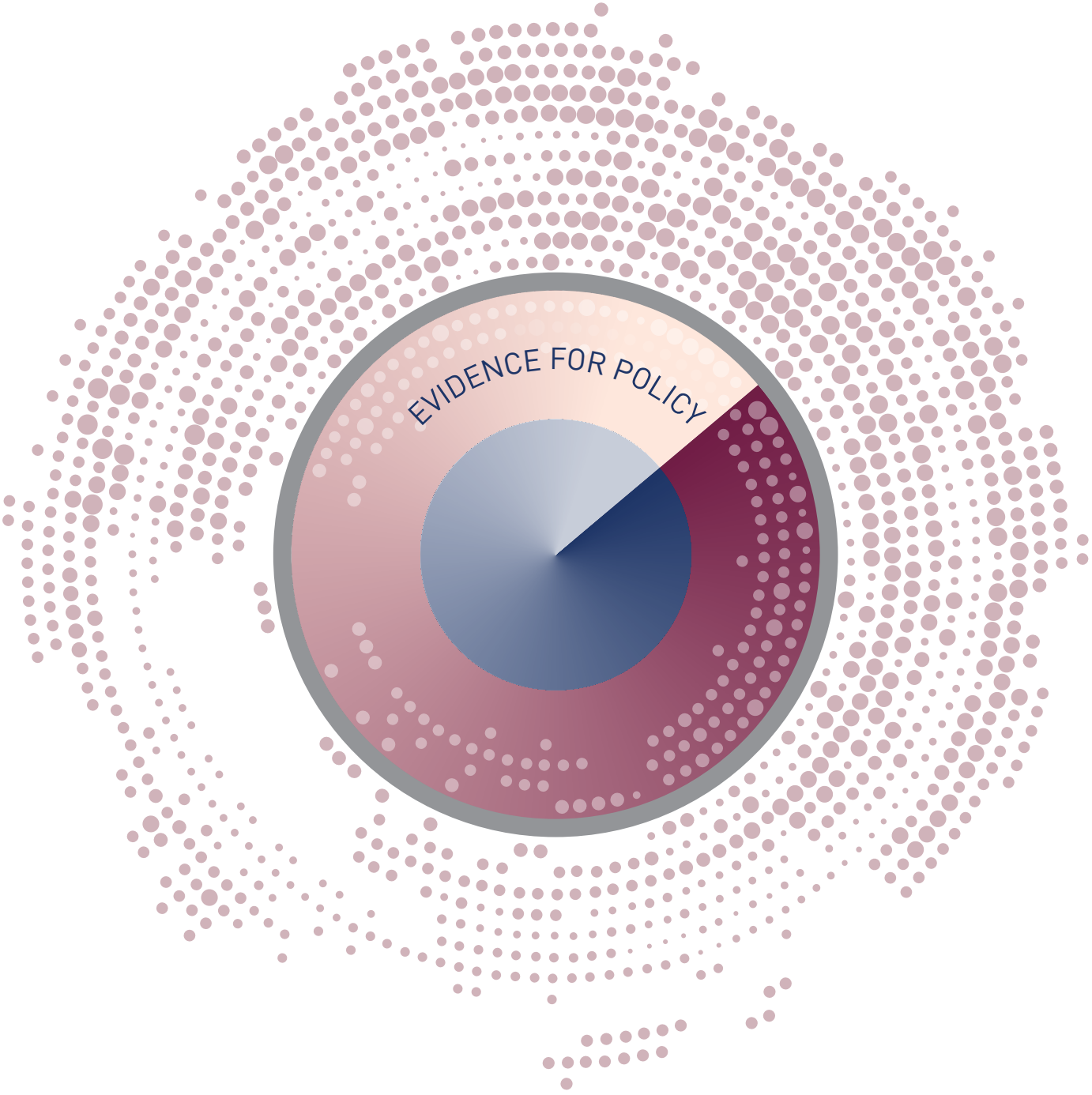
QUARTERLY ECONOMIC COMMENTARY

SUMMER 2024

KIERAN MCQUINN, CONOR O'TOOLE AND LEA HAUSER



AN INSTITIÚID UM THAIGHDE EACNAMAÍOCHTA AGUS SÓISIALTA
ESRI ECONOMIC & SOCIAL RESEARCH INSTITUTE

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Special Articles are published in the *QEC* in order to foster high-quality debate on various aspects of the Irish economy and Irish economic policy. They are subject to refereeing prior to publication.

TABLE OF CONTENTS

SUMMARY TABLE

	2023	2024	2025
Output (Real Annual Growth %)			
Private Consumer Expenditure	3.1	2.6	3.1
Public Net Current Expenditure	1.7	1.5	1.2
Investment	2.9	1.3	3.4
Modified Investment	*-7.1*	*1.8*	*4.0*
Exports	-4.8	4.0	3.8
Imports	0.4	2.5	3.8
Gross Domestic Product (GDP)	-3.2	2.5	3.2
Gross National Product (GNP)	4.4	5.4	3.1
Modified Domestic Demand	*0.5*	*2.2*	*2.9*
Domestic Demand (excl. Stocks)	2.8	1.9	2.3
Labour Market			
Employment Levels ('000)	2,685	2,732	2,743
Unemployment Levels ('000)	120	116	115
Unemployment Rate (as % of Labour Force)	4.3	4.1	4.0
Public Finances			
General Government Balance (€bn)	8.3	8.5	9.7
General Government Balance (% of GDP)	1.7	1.6	1.8
Price Developments			
Inflation (CPI)	6.3	2.3	1.9
Inflation (HICP)	5.2	2.0	2.0

The Irish Economy – Forecast Overview

- Headline and underlying indicators of the Irish economy both suggest the economy will grow in a robust fashion in 2024 and 2025. This is driven by a better-than-expected international outlook and robust domestic growth.
- We now believe MDD will grow by 2.2 per cent in 2024 and by 2.9 per cent in 2025. This is largely influenced by an expected increase in real income this year and next of approximately 3 per cent per annum.
- Underpinning this increase in real income is a strong expected increase in nominal income and a continued deceleration in the rate of inflation in both 2024 and 2025 of 2.3 and 1.9 per cent respectively.
- The unemployment rate, another key indicator of underlying growth in the economy, is now set to fall to 4.1 per cent in 2024 and to 4.0 per cent in 2025.
- The *Commentary* highlights the important role played by net inward migration in increasing the labour force in the domestic economy and, by association, the potential output of the economy.
- Risks to the outlook emanate from the continued tensions in the geopolitical situation which, if escalated, could have significant implications for a small open economy such as Ireland's.
- Given the low rate of unemployment and the robustly growing domestic economy, the issue of capacity constraints is critical. Recent data from the Housing Commission suggest an upward revision in housing supply targets will be needed to cater for demographic demand for housing.
- Overall, it is evident that while housing supply is on an upward trajectory, it needs to increase at a faster pace if it is to meet the underlying demand for housing in the Irish economy. In addition to housing supply, critical infrastructure around the carbon transition will also draw on resources, putting pressure on labour in the construction sector in particular.

Domestic and International Outlook

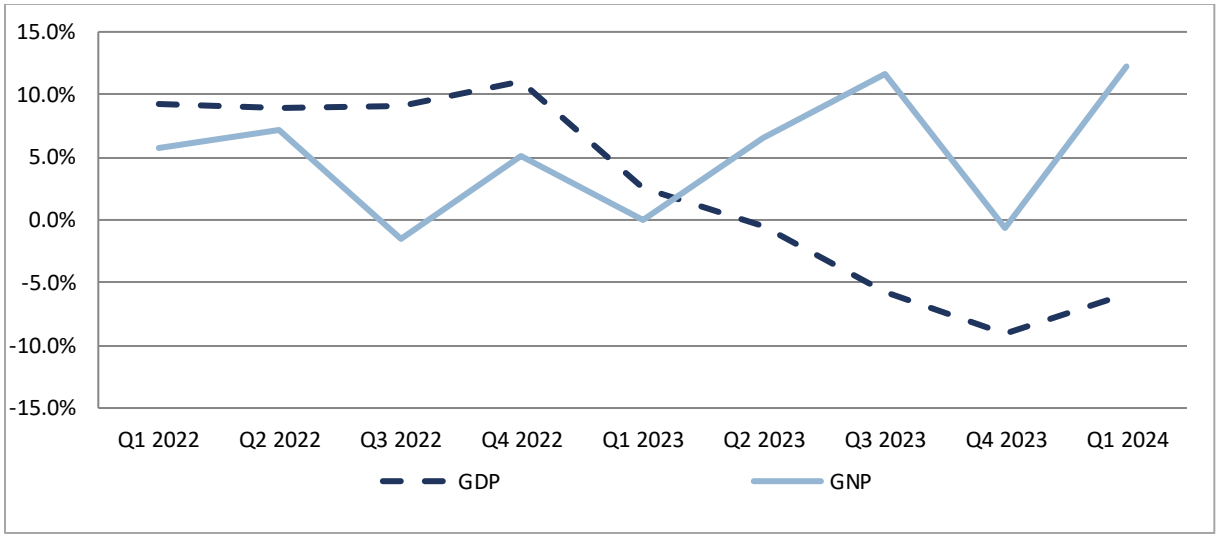
OVERALL OUTLOOK

Headline indictors continue to display huge volatility

As documented in the previous *Commentary*, Ireland's economy, on the basis of headline indicators, shrank in 2023 on the back of a decline in multinational export activity. While world trade slowed in 2023, following higher interest rates, persistent inflation and geopolitical tensions, much of this decline in the Irish context related to specific sectoral developments in key goods export product areas.

Figure 1 highlights the drop in GDP for the final three quarters of 2023 and the continued fall into Q1 2024. In the first quarter of 2024, GDP continued to decline but at a slower pace than at the end of 2023. GNP did not fall in 2023 due to changes in factor income flows from the multinational sector.

FIGURE 1 GDP AND GNP GROWTH – YEAR-ON-YEAR (CONSTANT PRICES, SEASONALLY ADJUSTED)

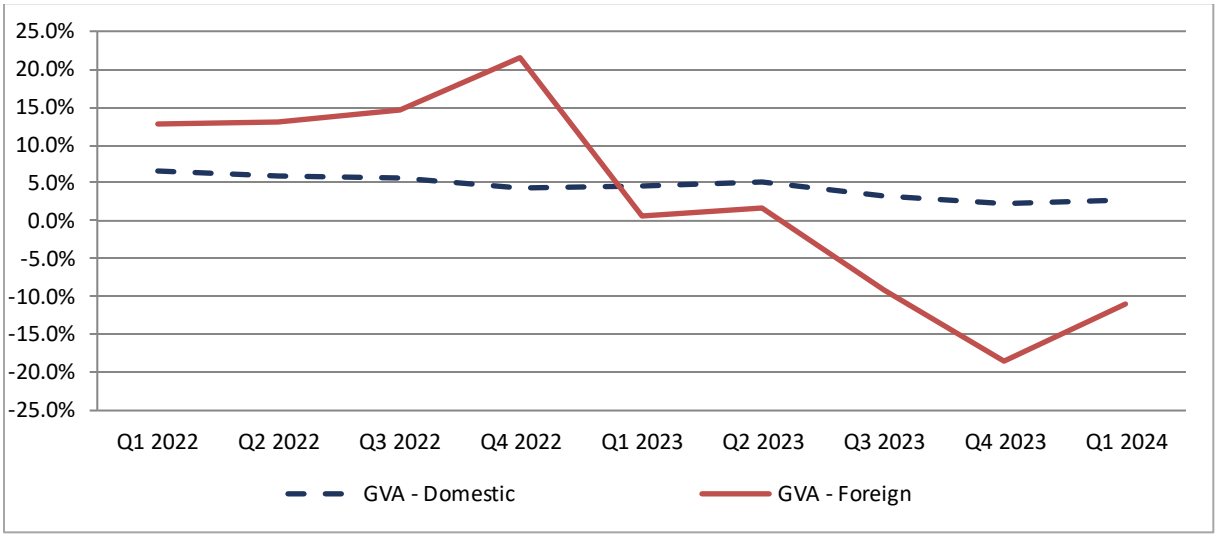


Source: Central Statistics Office.

Given the dual nature of activity in Ireland (between FDI-led exports and domestic activity), it is important to understand the factors contributing to the slowdown in growth. Figure 2 presents the breakdown of the growth in gross value added (GVA) by foreign-dominated sectors as well as domestic-oriented sectors (as defined by the CSO). It can be clearly seen that the major downward pressure in terms of GVA comes through the foreign-dominated sectors. Having grown at considerable double-digit levels in the period 2020 through 2022, the sharp downturn which was documented in the previous *Commentaries* has continued throughout 2023 and into 2024. On the other hand, the domestic-oriented sectors are experiencing a

steadying of the growth rate following the volatility of the COVID-19 period. The stabilisation of growth in the domestic economy, albeit at a lower rate, points towards a degree of resilience despite the inflationary pressures and higher interest rates.

FIGURE 2 GVA GROWTH – YEAR-ON-YEAR – DOMESTIC VS FOREIGN DOMINATED SECTORS (CONSTANT PRICES, SEASONALLY ADJUSTED)



Source: Central Statistics Office.

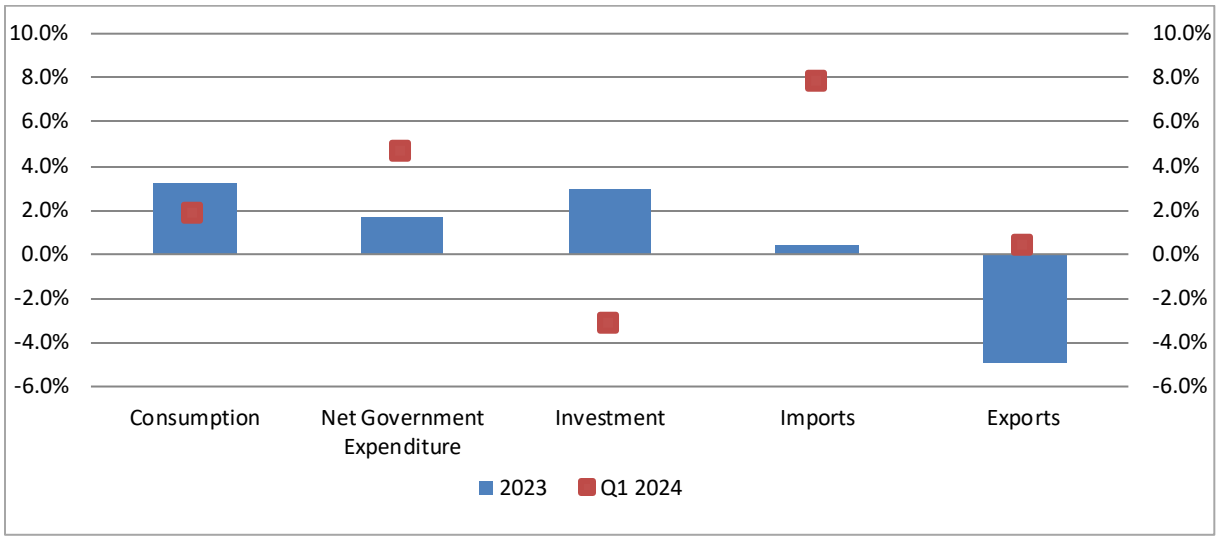
This divergence can be seen more clearly in Figure 3 which presents data for the expenditure components of GDP; consumption, government spending, investment, exports and imports. The data are presented as the year-on-year growth for 2023 compared to 2022 (in blue) and the year-on-year quarterly growth for Q1 2024 (red). Household consumption grew strongly in 2023, by approximately 3 per cent. For the first quarter of the present year, the growth slowed somewhat to just under 2 per cent. Investment expenditure was up slightly in 2023 from 2022 levels. For the first quarter of 2024, investment fell back notably. As previously discussed, the decline in headline exports caused the economy to shrink in 2023. For the first quarter of 2024, exports registered modest growth, reversing the previous trend.

Figure 4 presents the ESRI's Nowcast for modified domestic demand (MDD) that is published on a monthly basis (see Egan and Kren (2024) for details).[1] The left panel in Figure 4 presents the full historical fit of the Nowcast model while the right-hand panel shows the most recent Nowcast estimate for Q2 2024. As of 19 June, the ESRI's Q2 2024 Nowcast estimates that MDD is growing at 3.0 per cent year-on-year. Decomposing the key drivers of this month's Nowcast estimate shows that strong growth in certain sectors of industrial production (output) relative to April

[1] https://www.esri.ie/news/esri-nowcast.

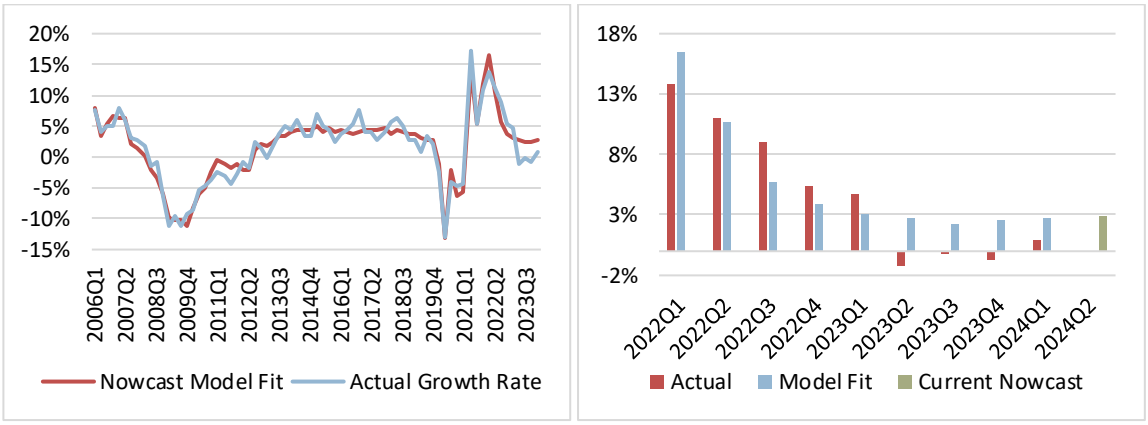
2023 contributed significantly to the estimated growth as did the growth in house prices, which is included in the 'other' component of the decomposition. Weaker consumption data as well as lower business sentiment compared to April 2023 had a negative impact on the estimate.

FIGURE 3 COMPONENTS OF GDP GROWTH – YEAR-ON-YEAR (CONSTANT PRICES, SEASONALLY ADJUSTED)



Source: Central Statistics Office.
Notes: This chart presents the year-on-year growth rate for 2023 compared to 2022 and Q1 2024 compared to Q1 2023.

FIGURE 4 NOWCAST OF MODIFIED DOMESTIC DEMAND (MDD)



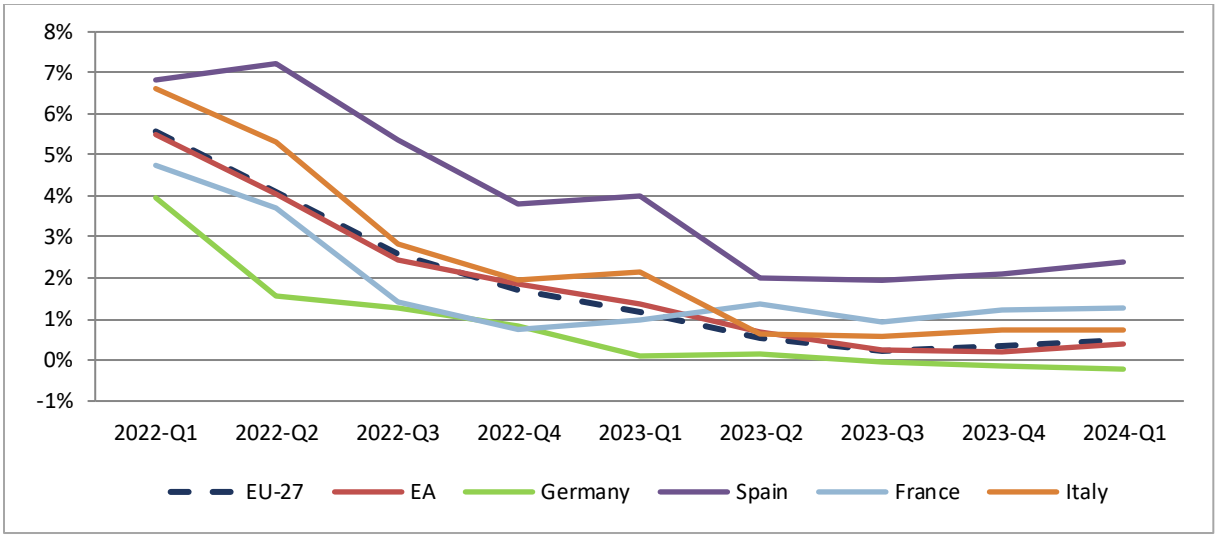
Source: Central Statistics Office and authors' calculations

Given the well-known difficulties in interpreting trends in key indicators for Ireland, it is useful to contextualise our performance against other European economies. This is also important due to our status as a small open economy and our reliance on external demand. Figure 5 presents the year-on-year growth for selected European economies as well as the Eurozone and European Union aggregates. The picture across these countries and groupings is mixed. Germany continues to

experience economic challenges with three quarters of negative growth to Q1 2024. France and Spain have seen a recovery in economic activity in recent quarters. From an Irish perspective, the European growth trajectory is important both in terms of its impact on European Central Bank monetary policy but also, as noted, in terms of external demand. These developments suggest a relatively weak European growth performance, driven by Germany's malaise, but with some potential pick-up in other European economies.

Given these developments, we expect GDP to grow by 2.5 per cent and 3.2 per cent in 2024 and 2025. Each of the subcomponents is discussed below but the overarching factors shaping the outlook are the quicker than expected disinflation, the likelihood of further interest rate declines towards the end of 2024, and the robust labour market in Ireland. Factors weighing on the outlook include the high interest rate environment at present, the geopolitical tensions in the Middle East and its impact on global trade, as well as the ongoing risk of second round inflationary effects from a domestic economy close to capacity.

FIGURE 5 GDP GROWTH – YEAR-ON-YEAR – SELECTED EUROPEAN COUNTRIES (CALENDAR AND SEASONALLY ADJUSTED)



Source: Eurostat.
Note: Calendar adjusted series are produced across the EU for harmonisation purposes. EA is euro area.

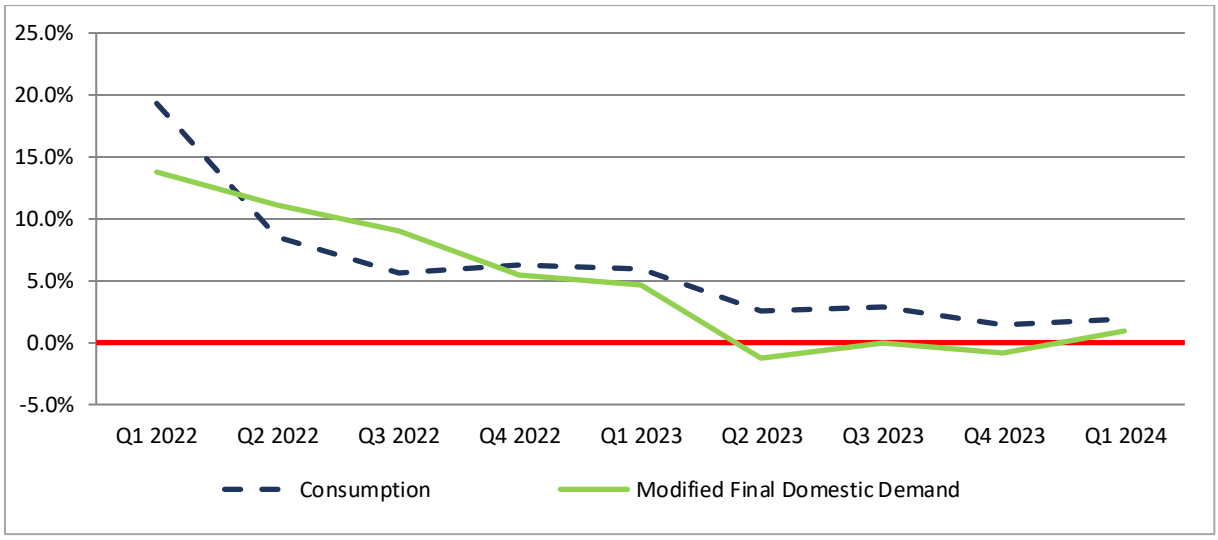
Household spending to continue to grow with real income boost expected

As noted above, the underlying domestic economy continued to grow robustly in 2023 and into 2024. Figure 6 presents the growth rate in personal household consumption and modified domestic demand (this is the adjusted domestic demand calculation which replaces overall investment with the modified series removing aircraft leasing and R&D IP). The growth in both modified domestic demand and consumption had moderated throughout 2023. This stabilised in the first quarter of 2024 with both variables posting faster growth than at the end of 2023. Modified domestic demand growth had been lower than consumption as

investment activity has been very subdued throughout 2023; the reason for the decline in MDD in 2023 was low investment. Some recovery in investment was evident in Q1 2024 leading to a rise in modified domestic demand. Government net spending was also higher in Q1 2024.

The main drivers of consumption (both income growth and changes in the savings ratio) are presented in Figure 7. In terms of income developments, Figure 7 presents the year-on-year growth in total household disposable income (constant prices). Since the second half of 2023, real incomes have been on an increasing trajectory as inflationary effects have begun to abate. This is very evident in the first quarter of 2024 with real income growth (in total household income terms) of approximately 5 per cent.

FIGURE 6 CONSUMPTION AND MODIFIED FINAL DOMESTIC DEMAND – YEAR-ON-YEAR (CONSTANT PRICES, SEASONALLY ADJUSTED)

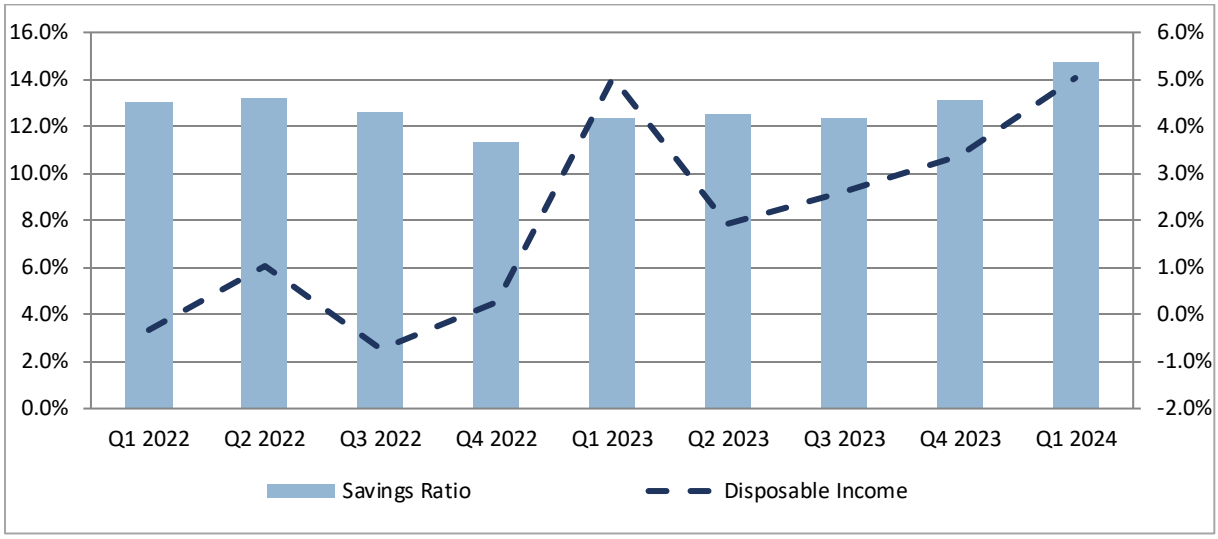


Source: Central Statistics Office.

Savings rates (light blue bar in Figure 7) which were elevated following the COVID-19 pandemic had fallen back to more normal rates throughout 2023. This was likely due to many households using savings buffers to maintain consumption in the face of rising prices. Over time the savings ratio is likely to stabilise at long-term rates leaving consumption growth to track income growth in a more significant manner than in the past two years. However, the most recent data for Q1 2024 indicate a rise in the savings ratio. This suggests that consumption is likely to continue to grow strongly into 2024 and 2025 as real incomes recover and the higher-than-expected savings ratio continues to provide a potential boost to expenditure.

Given these developments, we expect consumption expenditure to increase by 2.6 per cent in 2024 and 3.1 per cent in 2025 on the back of rising real incomes. This represents an upward revision of our current forecasts relative to the Spring 2024 *Commentary*.

FIGURE 7 HOUSEHOLD TOTAL DISPOSABLE INCOME (%) AND SAVINGS RATIO (CONSTANT PRICES, SEASONALLY ADJUSTED)



Source: Central Statistics Office.

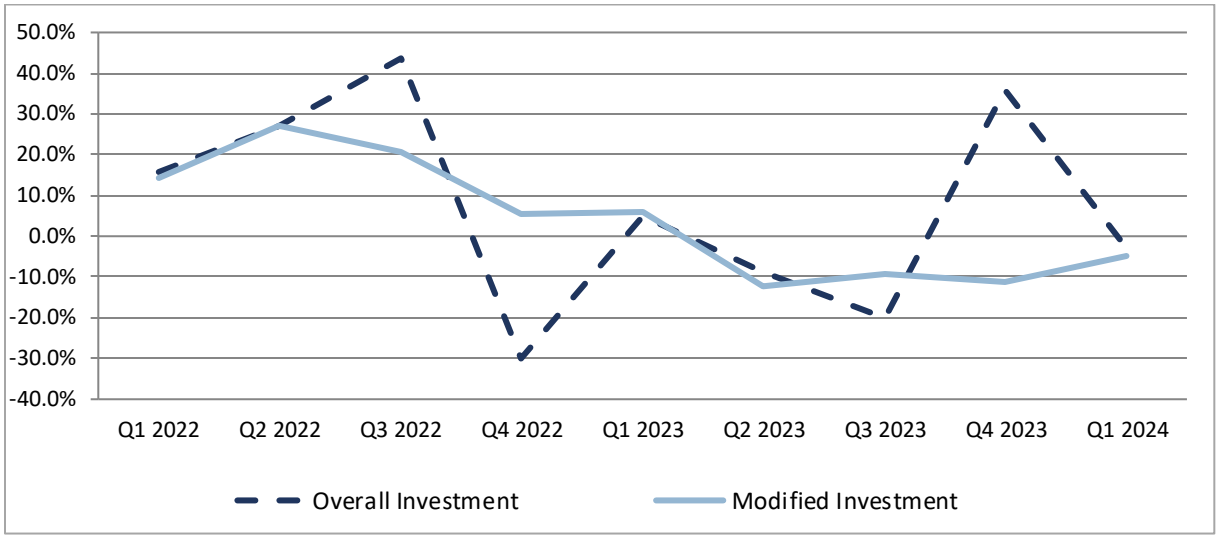
Investment activity declines with drops through multinationals and construction

Underlying investment in the Irish economy faltered in 2023 as interest rates increased the cost of financing and global uncertainties weighed on the business outlook. Figure 8 presents the year-on-year growth rate in overall investment and modified investment (which removes the aircraft leasing and R&D intellectual property assets). Overall in 2023, modified investment fell back by approximately 7 per cent, while total investment increased by 2.9 per cent.

To focus further on the investment subcomponents, Figure 9 presents the year-on-year growth rate on a quarterly basis for the following sub-series: building and construction investment, modified investment excluding construction, and other investment. Other investment is calculated as total investment minus modified investment to capture distortionary investments from IP and aircraft leasing.[2] It is clear that both building and construction and other modified investment displayed notable weakness in 2023, likely due to the ongoing global uncertainties and higher interest rates. In the first quarter of 2024, modified non-construction investment rebounded, which may be related to the relatively more resilient international economy. Construction investment remained subdued in Q1 2024.

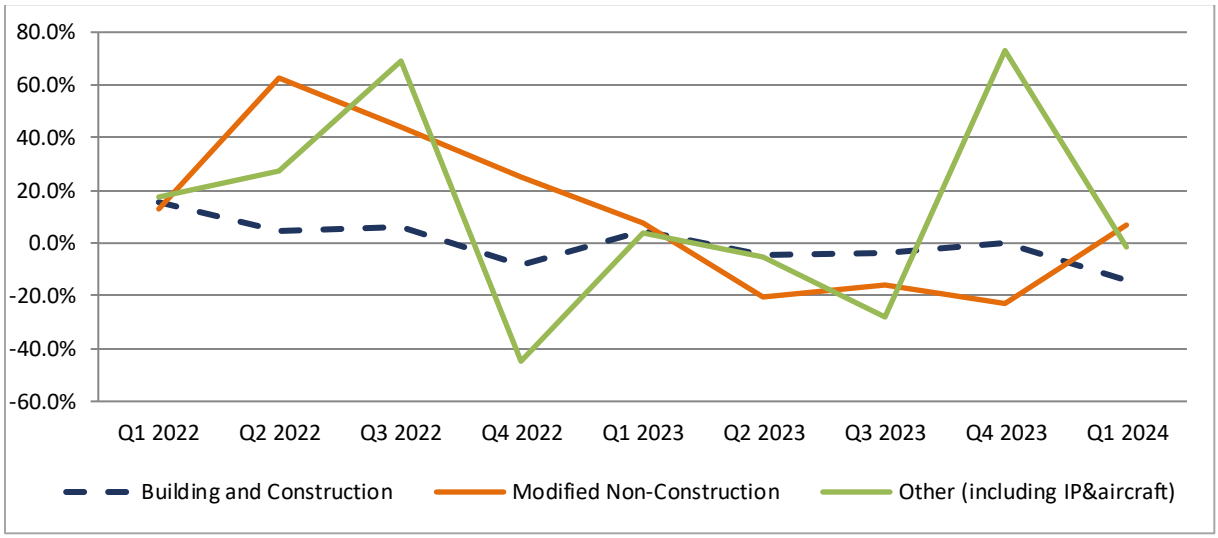
[2] These calculations are undertaken due to redactions in the underlying data.

FIGURE 8 OVERALL INVESTMENT AND MODIFIED INVESTMENT (CONSTANT PRICES, SEASONALLY ADJUSTED)



Source: Central Statistics Office.

FIGURE 9 COMPONENTS OF INVESTMENT – YEAR-ON-YEAR CHANGE (%) (CONSTANT PRICES, SEASONALLY ADJUSTED)

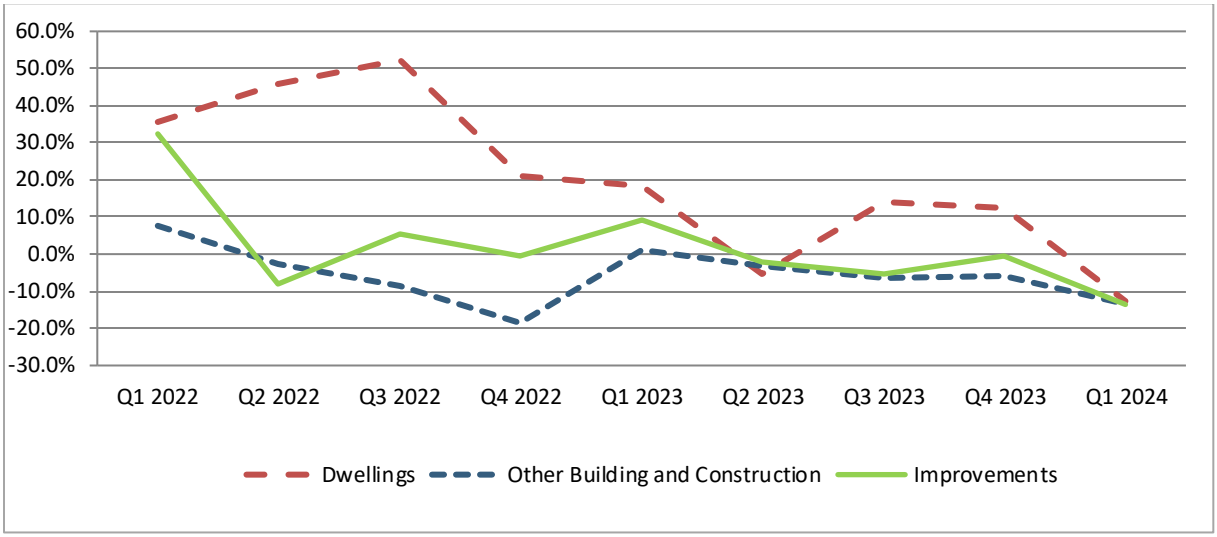


Source: Central Statistics Office.
Note: Modified non-construction series is calculated by subtracting building and construction from total modified investment. Other investment is calculated by removing modified investment from total investment.

Within construction, as shown in Figure 10, the notable downturn in 2023 was characterised by countervailing effects across the sub-sectors with residential dwelling investment increasing by over 9 per cent, while non-dwellings construction dropped by 4 per cent. This reflects the ongoing challenges faced by the commercial real estate sector which has suffered a notable downturn on the back of changing work practices and higher interest rates. However, in the first quarter of 2024, dwellings also posed a notable decline, which is a worrying

development given the residential housing deficit that Ireland is experiencing at present.

FIGURE 10 COMPONENTS OF BUILDING AND CONSTRUCTION INVESTMENT – YEAR-ON-YEAR CHANGE (%) (CONSTANT PRICES)



Source: Central Statistics Office.

The 2023 increase in housing investment documented above translated into a housing output of just under 33,000 units which is the highest level since the onset of the financial crisis in 2007. However, in the first quarter of 2024, housing completions dropped back to just over 5,800 units. This is presented in Figure 11.

For the present year, a number of factors are likely to be weighing on the housing outlook; even though the ECB has begun the process of moderating interest rates, the relatively high rate is likely to continue to exert downward pressure on investment. The elevated cost of materials and other inputs as well as capacity constraints from the labour market are also factors that could negatively affect investment in housing. Other factors include planning timeframes and land availability.

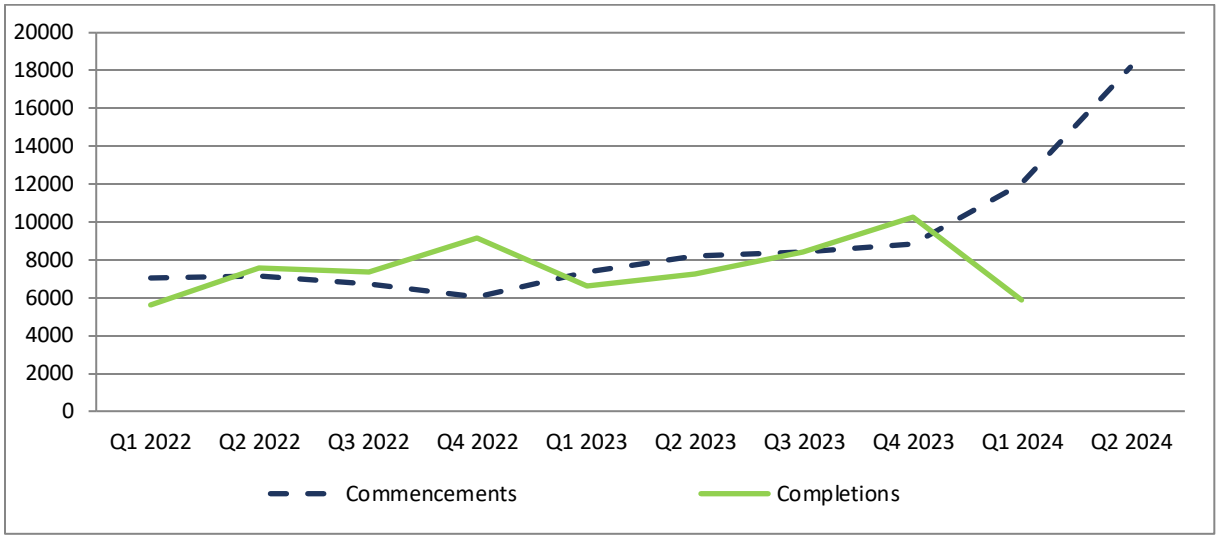
From the start of 2024, however, we have seen a notable pick-up in housing commencements. In April 2024 alone, 18,000 housing units commenced. While some of this is potentially due to changes in policy (such as the development levy and water connection waiver),[3] this may lead to higher housing output in 2025 if commencements follow a traditional 9-18 month transition period into completions. However, there is a risk that these starts are artificially high in order to benefit from the above waivers and consequently their time-to-completion may

[3] On 25 April 2023, the Government approved measures which introduce a temporary time-limited arrangement for the waiving of local authority 'section 48' development contributions and the refunding of Uisce Éireann water and wastewater connection charges. It was due to end in April 2024 but this has been extended.

not follow typical patterns.

Overall, we expect investment to pick up in 2024 relative to 2023 as the global outlook has stabilised, inflation has moderated more rapidly than expected, and financing costs are likely to ease further towards the end of 2024. We forecast investment to grow by 1.3 per cent in 2024 and 3.4 per cent in 2025. We expect modified investment to grow by 1.8 per cent and 4.0 per cent in 2024 and 2025 respectively.

FIGURE 11 QUARTERLY LEVEL OF DWELLING COMPLETIONS AND COMMENCEMENTS



Source: Central Statistics Office.
Note: Q2 2024 for commencements includes only the data for April which showed over 18,000 units.

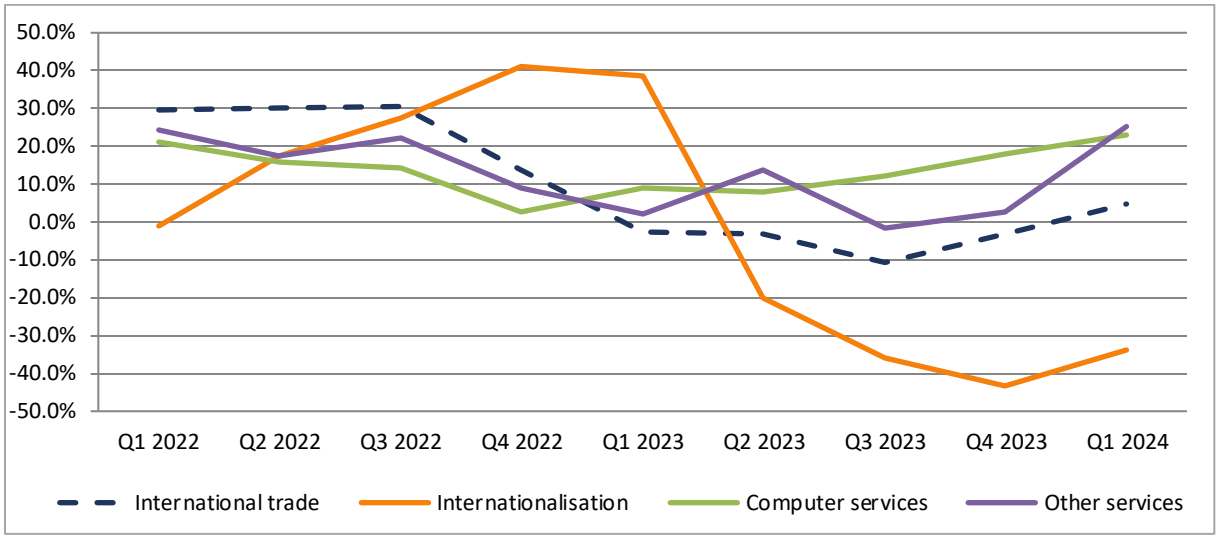
Exports likely to recover following recent declines

Export growth from multinational activities has been the cornerstone of the extremely high headline growth rates seen in Ireland in recent years. The growth in exports had been supported by exceptional performances in key foreign-dominated sectors such as computer services and pharmaceuticals. Additionally, it has been driven by increased exports due to globalisation activities of multinationals (such as merchanting, contract manufacturing and other activities). However, in 2023, export growth dropped notably by nearly 5 per cent, reversing these trends. While the global economy slowed in 2023, the magnitude of the reversal in the performance of Irish exports is mainly driven by sector-specific effects and a reversal in globalisation activities.

Figure 12 presents the year-on-year change in exports (in value terms) on a quarterly basis. The grouping of the categories splits exports between international goods trade, internationalisation activities, computer services, and other services. A very clear trend can be seen with a reversal in the internationalisation exports and a downturn in international trade. Computer services have continued to grow strongly, and other services returned to robust growth in Q1 2024. Given the

challenges faced by some large firms in the IT sector, the continued strong export of computer services is an area of considerable strength for the Irish economy.

FIGURE 12 COMPONENTS OF EXPORTS – VALUE – YEAR-ON-YEAR CHANGE

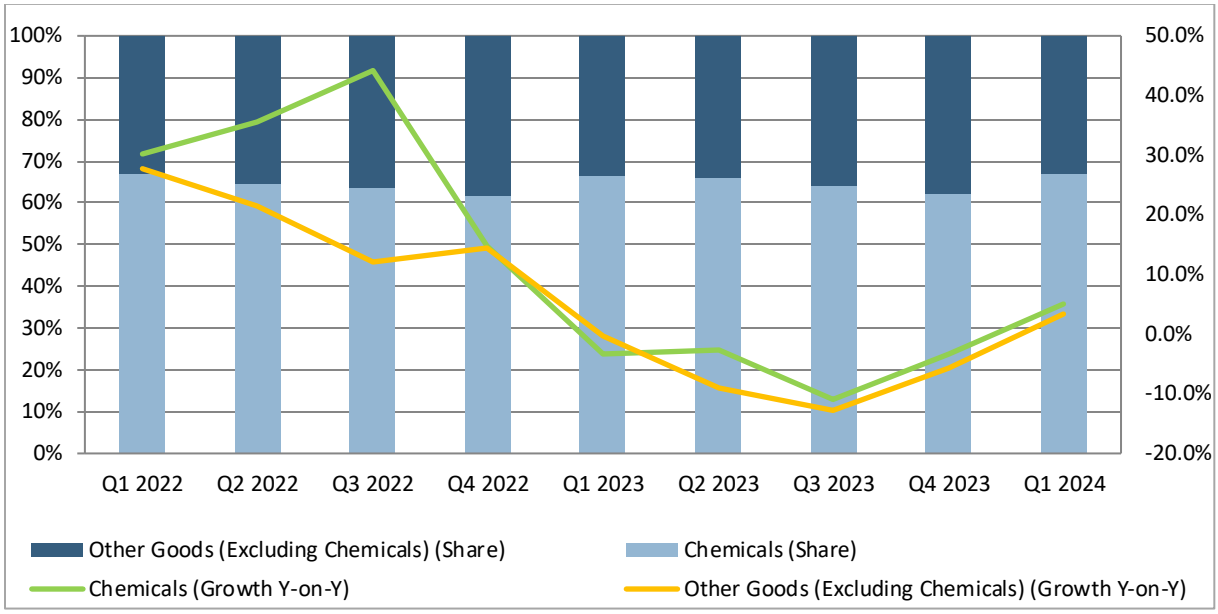


Source: Central Statistics Office.
Notes: International data series corresponds to the sub-series as presented in the quarterly Balance of Payments data.

Within the international goods trade activities, the main export product is pharmaceuticals and chemicals. This can be seen in Figure 13. The bars (left axis) show the percentage of total goods exports represented by chemicals relative to all other exports. At 66 per cent, chemical exports are relatively steady over time. The trends in the year-on-year growth rate (for the two series) are presented on the right axis. In 2023 both categories declined, but a recovery in Q1 2024 is evident.

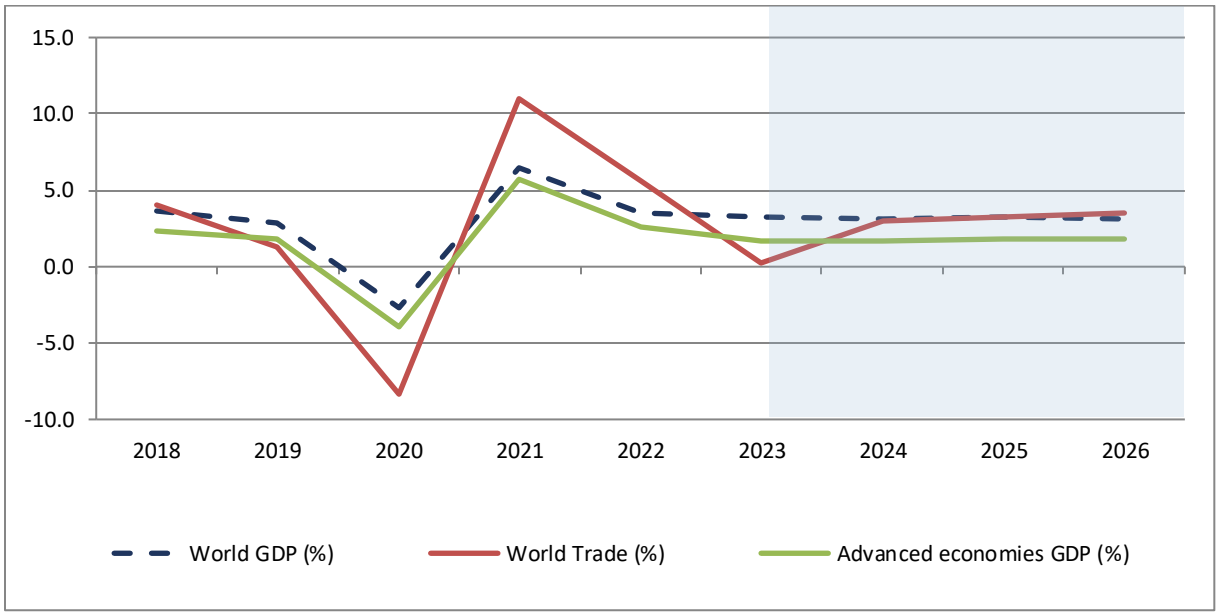
Alongside the sector-specific nature of the fall-off in Irish exports, international trade slowed in 2023 on the back of persistently high inflation, higher interest rates, and geopolitical challenges. This is presented in Figure 14 which displays the IMF's latest World Economic Outlook forecasts for global growth, global trade and advanced economy GDP growth. Global trade is expected to pick up in 2024 and grow strongly in 2025 and into 2026. The growth rate across advanced economies is expected to increase marginally from 2023 into 2024. Given the small and highly globalised nature of the Irish economy, these projections signal an improvement in the international environment.

FIGURE 13 GOODS EXPORTS – VALUE – BY COMPONENT – YEAR-ON-YEAR CHANGE (%) (SHARE OF TOTAL)



Source: Central Statistics Office.
Note: Other Goods is calculated by taking chemicals from the total value of goods exports.

FIGURE 14 WORLD AND ADVANCED ECONOMY OUTLOOK – YEAR-ON-YEAR CHANGE (%)



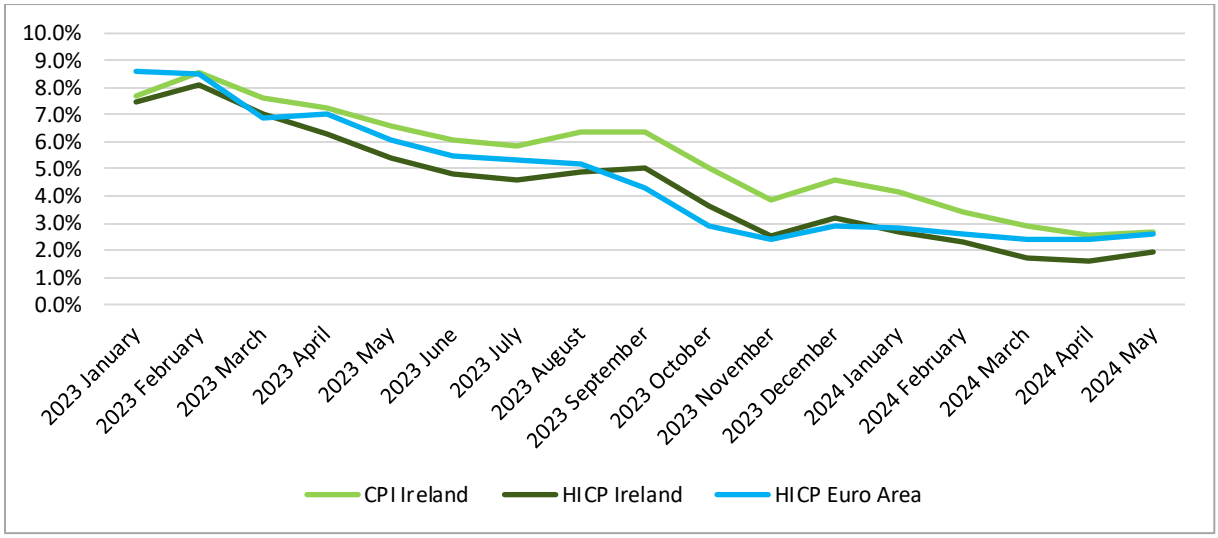
Source: IMF World Economic Outlook, April 2024.
Note: Forecast period in blue.

Given these considerations, we expect a return to export growth in 2024, in line with international trends as well as sector specific developments. We also expect a continued level of growth into 2025. We forecast exports to grow by 4.0 per cent in 2024 and 3.8 per cent in 2025.

INFLATION

Since the Russian invasion of Ukraine, price pressures have presented a major challenge to the Irish and international economies. However, over the past number of months, we have seen a persistent decline in inflationary pressures. Figure 15 illustrates the decline in the rate of inflation measured by both Consumer Price Index (CPI) and Harmonised Index of Consumer Prices (HICP) for Ireland and the euro area. According to the Flash Estimate of the CSO, as of May 2024, the Irish HICP stands at 1.9 per cent, up from 1.6 per cent in April 2024. The average year-on-year HICP growth in the euro area was 2.6 per cent in May 2024, up from 2.4 per cent in April. Despite the slight increase in May, the Irish HICP inflation growth is below the ECB's target of 2 per cent, indicating a stabilisation from the recent high inflation environment. In contrast to the CPI, the HICP measurement excludes mortgage rates, which is considered the main difference between the two measures for inflation. Mortgage interest in Ireland continues to experience positive growth – as illustrated in Figure 19 – explaining the difference of the Irish CPI and HICP.

FIGURE 15 IRISH CPI AND HICP COMPARED TO EURO AREA HICP



Source: Central Statistics Office and Eurostat.

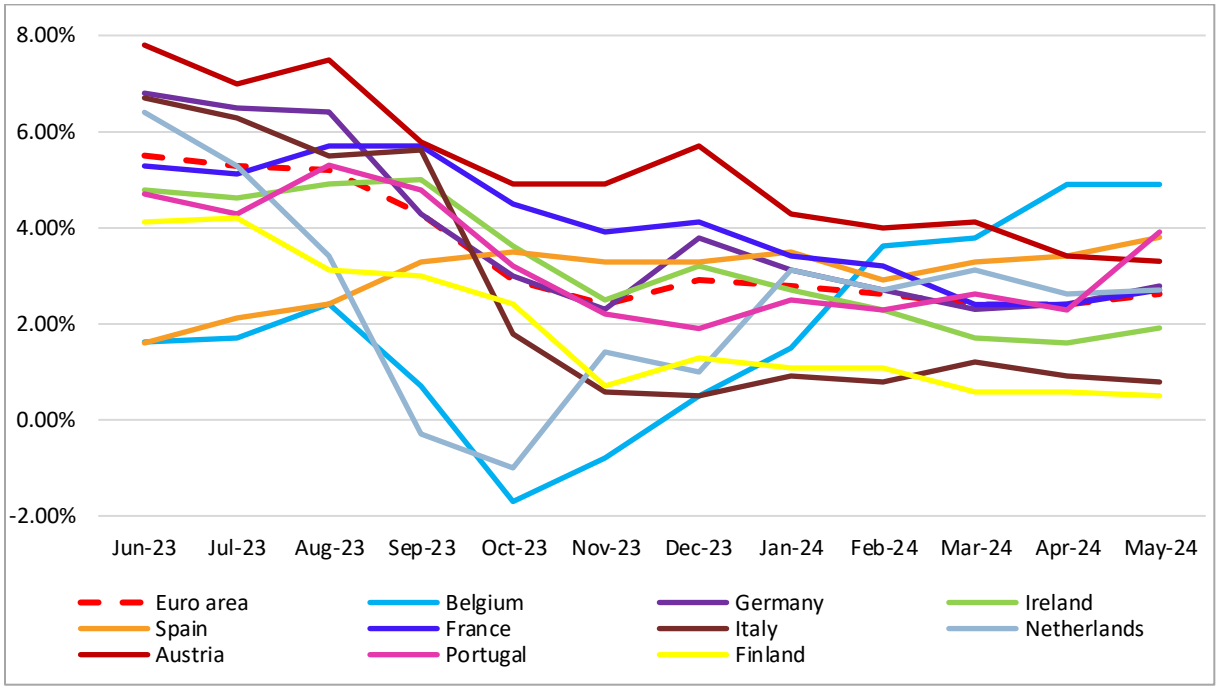
Inflation across Europe

On a cross-country basis it is clear that not all countries have returned to moderate inflation numbers. Figure 16 shows the HICP inflation in different European countries over the last 12 months. Among the selected countries, Belgium has the highest HICP inflation rate in May 2024, standing at 4.9 per cent, despite a period of negative price growth at the end of 2023. Spain and Portugal's inflation is currently standing at 3.9 per cent and the Austrian rate is at 3.3 per cent. Only France and Finland are currently experiencing a lower HICP inflation rate than Ireland. However, most of the countries considered experienced a slight increase

in May 2024 compared to April 2024. As mentioned, Ireland's HICP increased from 1.6 to 1.9 per cent and most other countries – apart from Austria and Italy – also experienced a month-on-month increase between 0.1 and 1.6 percentage points.

The detailed data for the subcomponents of the HICP for May are not yet available. However in April, the components that showed the highest rates of HICP inflation across Europe were 'Alcoholic beverages and tobacco', which continued to experience an average price increase of 5.3 per cent in the euro area. The 'Restaurants and hotels' category had an average increase of 4.9 per cent. Austria and Germany are experiencing the highest growth rates in that sector at 7.2 and 6.4 per cent whereas Ireland's price growth stands at just below 3 per cent. It should be mentioned that inflation rates in the mentioned sectors are decreasing overall; however they remain elevated. 'Recreation and culture' and 'Transport' are the two sectors where Ireland is experiencing the highest year-on-year price increase compared to the other countries and the overall average in the euro area.

FIGURE 16 HICP IN IRELAND AND SELECTED EUROPEAN COUNTRIES



Source: Eurostat.

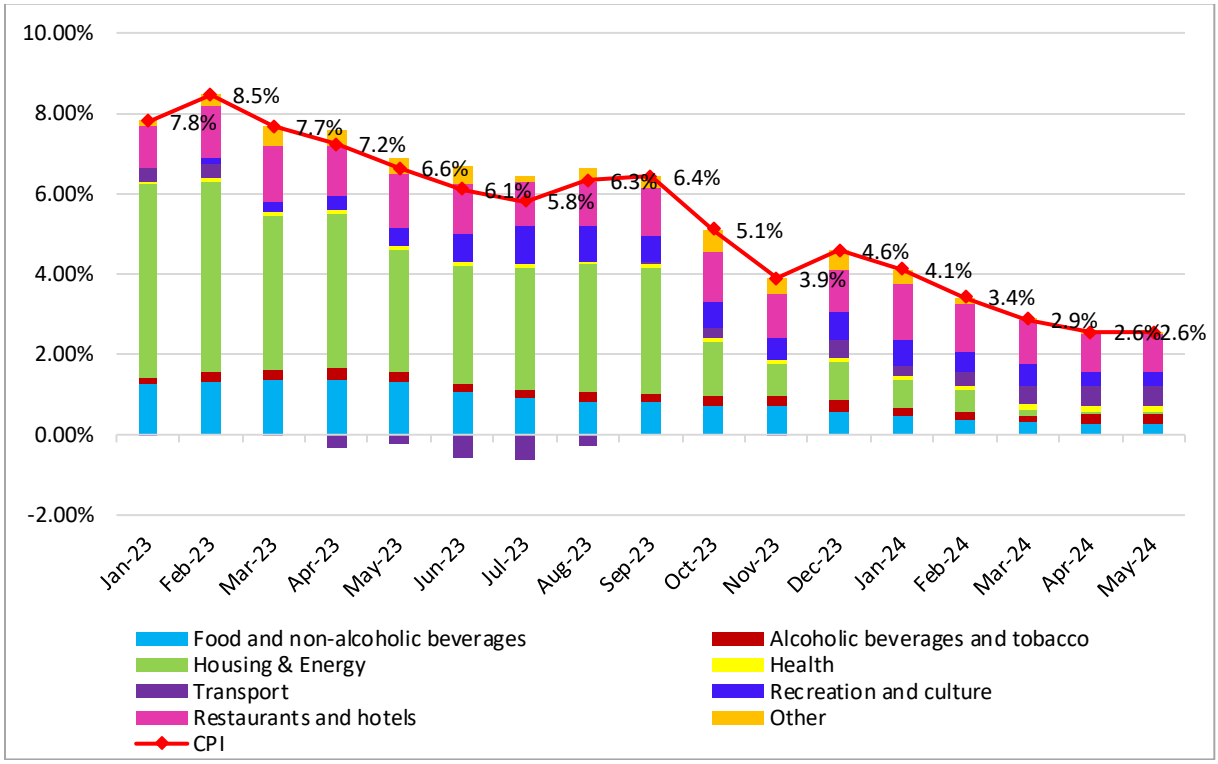
The sector experiencing the greatest variability among the European countries is the 'Housing and energy' sector. For instance, in April 2024, Belgium recorded a 13 per cent year-on-year price increase, while Ireland, Italy, and Finland experienced negative growth.[4]

[4] Here it is worth emphasising again that the HICP excludes mortgage interest. This exclusion explains why Ireland shows negative growth in this sector according to the HICP, despite displaying positive growth when assessed using the CPI.

Drivers of CPI inflation

Figure 17 depicts the development and drivers of CPI inflation throughout 2023 and the first five months of 2024. In May 2024, a persistent driver of inflation is the subcomponent 'Restaurant and hotels' (with a 4.7 per cent year-on-year increase), contributing 0.9 per cent to the overall 2.6 per cent inflation. Additionally, as mentioned in the European comparison, 'Transport' (with a 6.7 per cent increase) accounts for 0.8 per cent of overall inflation, while both 'Recreation and culture' and 'Food and non-alcoholic beverages' contribute 0.3 per cent each. These areas appear to be impacted by second-round effects resulting from high energy prices.

FIGURE 17 WEIGHTED CPI DEVELOPMENT



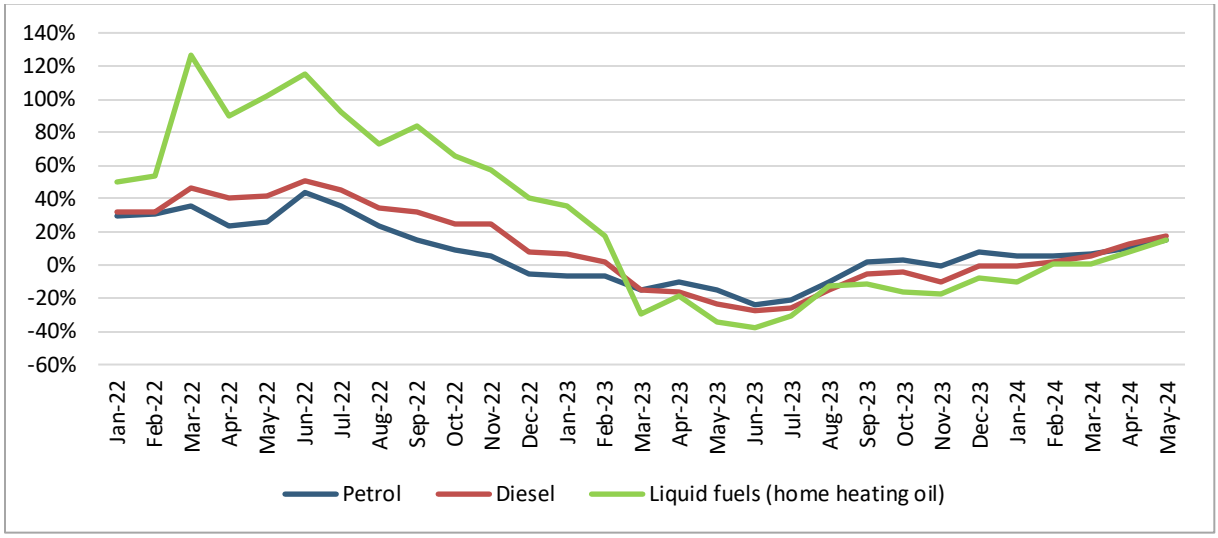
Source: Central Statistics Office and authors' calculation.

In the 'Restaurant and hotel' sector, all categories have experienced inflation rates above the average. Notably, 'Restaurants, cafes, fast food, and take-away food', along with 'Canteens', have seen the highest price increases, exceeding 7 per cent. However, all sub-categories within this sector have registered a year-on-year price increase of at least 3.6 per cent.

The 'Transport' component warrants attention due to its relatively high year-on-year increase in 2024. The price increases from this category appear to be from private means of transportation whereas shared or public transportation remained the same or experienced negative price growth compared to last year. Specifically, prices for petrol and diesel have risen by 14.5 and 17.5 per cent compared to May

2023, while 'Transport services'[5] have remained roughly unchanged. Furthermore, liquid fuels (home heating oil) have also experienced a 15 per cent year-on-year price increase. This is shown in Figure 18, where it is evident that prices moderated in the beginning of 2023 and started increasing again by the end of 2023. A possible explanation for the increase in prices is the recent disruptions in the Red Sea and the Suez Canal as highlighted by O'Toole (2024) in the Spring *Quarterly Economic Commentary*.[6] Shipping companies have altered their routes to avoid these affected areas, rerouting trade goods. This situation has indirectly impacted global trade flows and shipping costs.

FIGURE 18 PETROL, DIESEL, AND LIQUID FUELS PRICE GROWTH – YEAR-ON-YEAR



Source: Central Statistics Office.

Figure 19 displays the year-on-year price increase in the 'Housing and energy' sector and the contributions of the different subcomponents. It is interesting to observe that this sector has experienced almost no year-on-year price change (0.7 per cent) overall. However, a detailed examination of the subcomponents reveals a more nuanced picture. On the one hand, electricity and gas prices are experiencing significant negative price growth, ranging from 13.6 to 20.7 per cent. On the other hand, mortgage interest, actual rentals paid by tenants, and liquid fuels (see Figure 18) are experiencing positive price growth, which contributes to the sector experiencing price increases on a year-on-year basis.

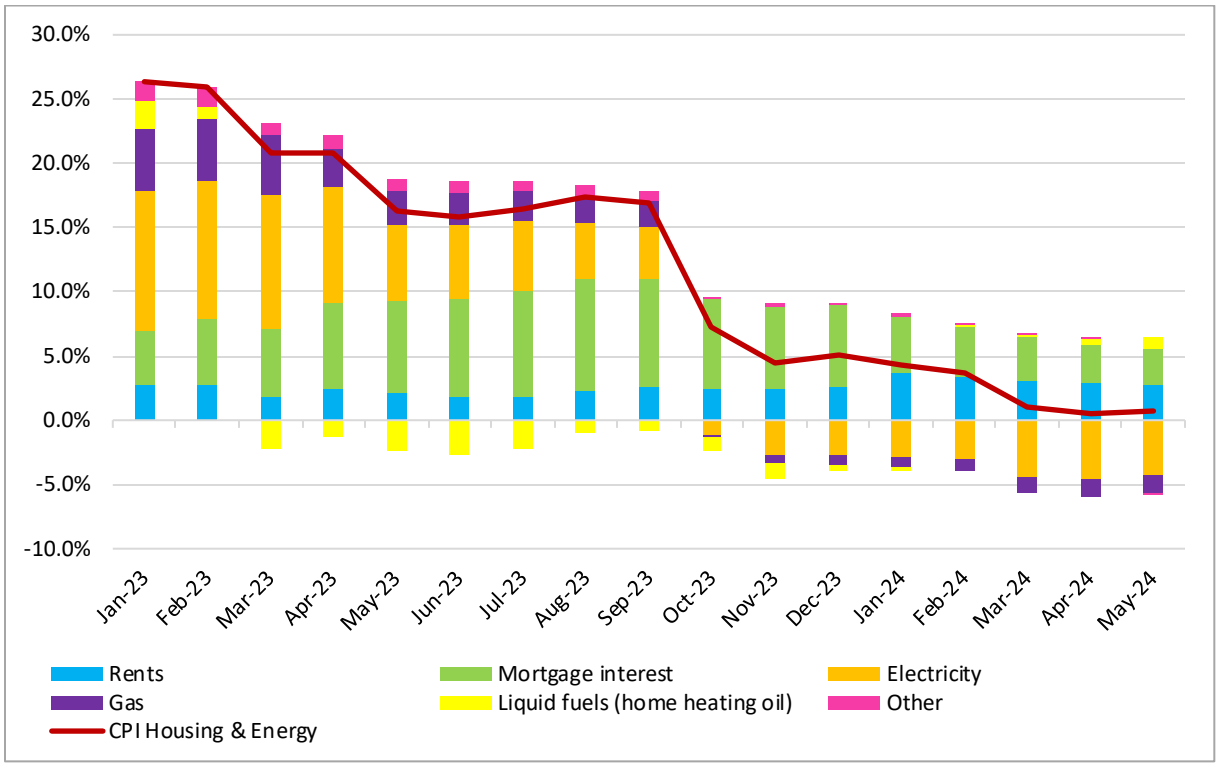
The trajectory of mortgage interest rates remains uncertain. Due to the general easing in inflation, the European Central Bank (ECB) has reduced key interest rates

5 Passenger transport by railway, road, bus fares, and taxi fares have remained unchanged while passenger transport through air and passenger transport through sea and inland waterway have increased by 6.6 per cent and 2.2 per cent.

6 Box C: Where is the global economy headed in 2024 and beyond?

following ten successive increases since July 2022.[7] However, it is unclear whether further reductions will occur, given the persistent nature of some inflationary pressures.

FIGURE 19 WEIGHTED CPI COMPONENTS OF THE CATEGORIES 'HOUSING AND ENERGY'



Source: Central Statistics Office and authors' calculation.

Summary

Overall, a moderation in inflation can be observed in Ireland. This reduction, combined with an increase in nominal wages, has resulted in real income growth for the first time in two years. A comparison of Ireland's HICP inflation with that of other European countries reveals that Ireland is among the nations experiencing relatively low and decreasing price growth, whereas other countries are facing greater inflationary challenges. However, in the 'Recreation and culture' and 'Transport' sectors, Ireland is experiencing the highest price increases amongst euro area countries. While energy prices almost did not grow compared to last year, petrol, diesel and liquid fuels experienced a sharp increase in price growth again, very likely due to the disruptions in the Red Sea and Suez Canal. Therefore we expect CPI inflation to grow by 2.3 per cent in 2024 and to drop below 2 per cent in 2025.

[7] Key ECB interest rates: https://www.ecb.europa.eu/stats/policy_and_exchange_rates/key_ecb_interest_rates/html/index.en.html.

LABOUR MARKET

The Irish labour market continues to experience a robust performance, with an increasing number of individuals being in employment. This growth is evident among both men and women, as employment levels have risen for both groups. Overall unemployment stands at 4 per cent in March, April and May 2024. Figure 19 illustrates that the unemployment rate has remained consistently low since mid-2022, fluctuating around 4.5 per cent and standing at 4 per cent in the second quarter of 2024. Female unemployment is at 4.1 per cent, while male unemployment is at 3.8 per cent in May 2024. These indicators collectively suggest that the Irish labour market is operating at full capacity, with limited potential for further growth in the absence of inward migration.

Vacancies

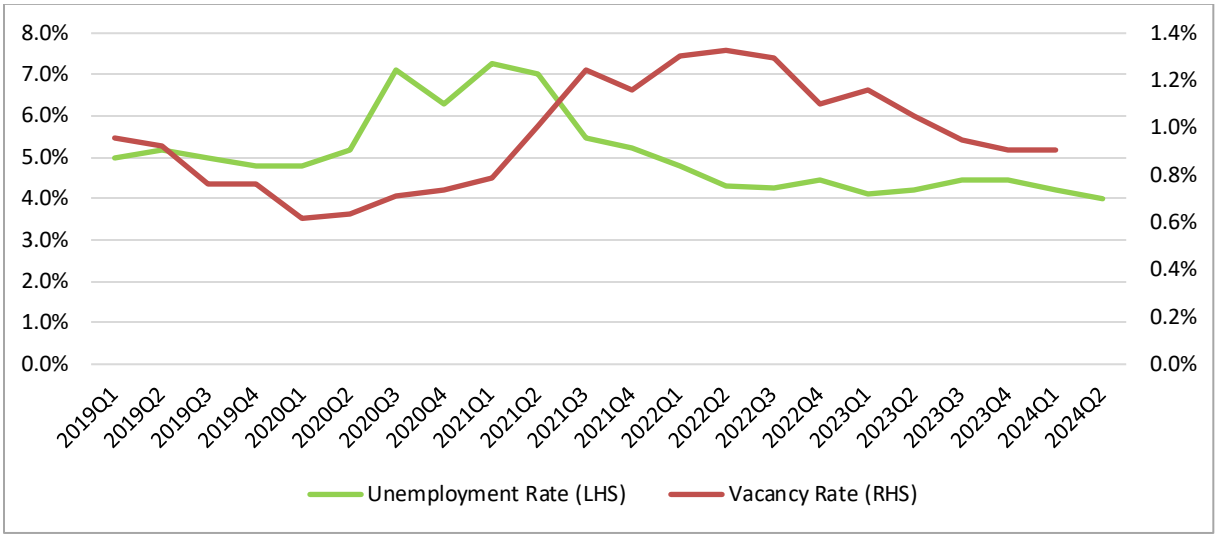
The job vacancy rate has been declining since its peak in mid-2022 and remains at 0.9 per cent in the first quarter of 2024, consistent with the rate in the last quarter of 2023. This is the lowest vacancy rate in two years. While this pattern holds true for most sectors, 'Administrative and support service activities' and the 'Education' sector have experienced an increase in vacancies compared to the first quarter of 2023. In the past four years, the 'Education' sector has been one of the sectors that has shown an increasing number of vacancies almost all the time.

The highest decline in year-on-year vacancies is recorded in the 'Arts and entertainment' sector, the 'Financial, insurance and real estate activities' sector, and the 'Wholesale and retail trade' sector. In addition, for the first time in four years (except for the second quarter of 2021), the 'Human health and social work activities' sector recorded a year-on-year decline in vacancies after the number of vacancies had risen continuously.

Real wage growth for the first time in over two years

In April 2024, nominal wage growth exceeded price growth for the first time in over two years, indicating an increase in real wages. As illustrated in Figure 21, this is due to both the ongoing decline in CPI inflation and the 4.5 per cent increase in average nominal hourly wages in the first quarter of 2024. Furthermore, Figure 21 displays our forecast for CPI inflation, nominal wage growth and real wage growth for 2024 and 2025. Considering our projections for declining inflation in 2024 and an average inflation rate slightly below 2 per cent in 2025, coupled with relatively stable nominal wage growth, we anticipate real wages to increase during 2024 by 2.2 per cent and by 3.1 per cent in 2025.

FIGURE 20 UNEMPLOYMENT AND VACANCY RATE



Source: Central Statistics Office and authors' calculation.

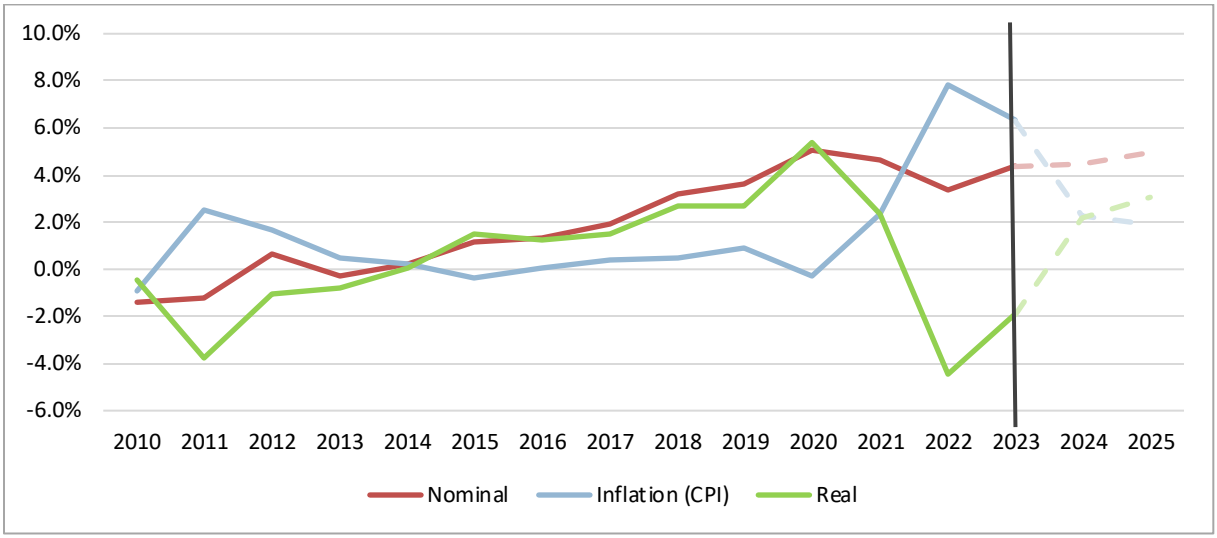
Sectors that experienced the highest year-on-year increase in hourly wages are the 'Electricity, water supply and waste management' sector (10.3 per cent), the 'ICT' sector (7.1 per cent), and the 'Construction' sector (7.1 per cent). Looking at the wage levels, the sector paying on average the highest hourly wages are the 'ICT' sector, the 'Education' sector, and the 'Financial and insurance activities' sector, in that order.

Employment patterns

Overall employment increased by 1.9 per cent in the first quarter of 2024, which is the lowest increase observed within the last three years. Female employment increased by 2.4 per cent while male employment increased by 1.5 per cent.

Looking closer at different types of employment it appears that year-on-year full-time employment among women has increased by 5.4 per cent compared to 0.4 per cent for men. Furthermore, for part-time employment, a changing pattern seems to appear. After a peak in female part-time employment of just under 400,000 in the third quarter of 2023, there has been a slight decline in the subsequent two quarters. Therefore, the year-on-year decline in female part-time employment stands at 3.4 per cent in the first quarter of 2024.

FIGURE 21 NOMINAL AND REAL WAGE GROWTH FORECAST



Source: Central Statistics Office and authors' calculation.

Employment by sector and nationality

As discussed in the Winter 2023 *Quarterly Economic Commentary*, there have been significant shifts in the Irish population structure. The higher-than-expected population growth in the past few years has been driven by higher numbers of immigration. This is reflected in the employment numbers, as over the past three years the number of people from inside and outside of the EU working in Ireland has more than doubled, as illustrated in Figure 22. To better understand the impact of this influx of people on the Irish labour market, it is essential to analyse the sectoral employment distribution of immigrants. The groupings are as follows: Irish, EU (excluding Ireland), and non-EU.[8]

The CSO publishes data on sectoral employment by nationality only since the beginning of 2021. Even within this short period, the overall amount of people from outside of the EU employed in the Irish labour market has almost doubled, while the number of people from within the EU (excluding Ireland) has increased by more than 30 per cent. Figure 22 illustrates the number of non-Irish individuals from both EU[9] and non-EU countries employed across various sectors of the labour market. In 2024, the sector in which most people from EU countries are employed is the 'Wholesale and retail trade' sector while the highest number of people from outside of the EU is employed in 'Human health and social work activities'.

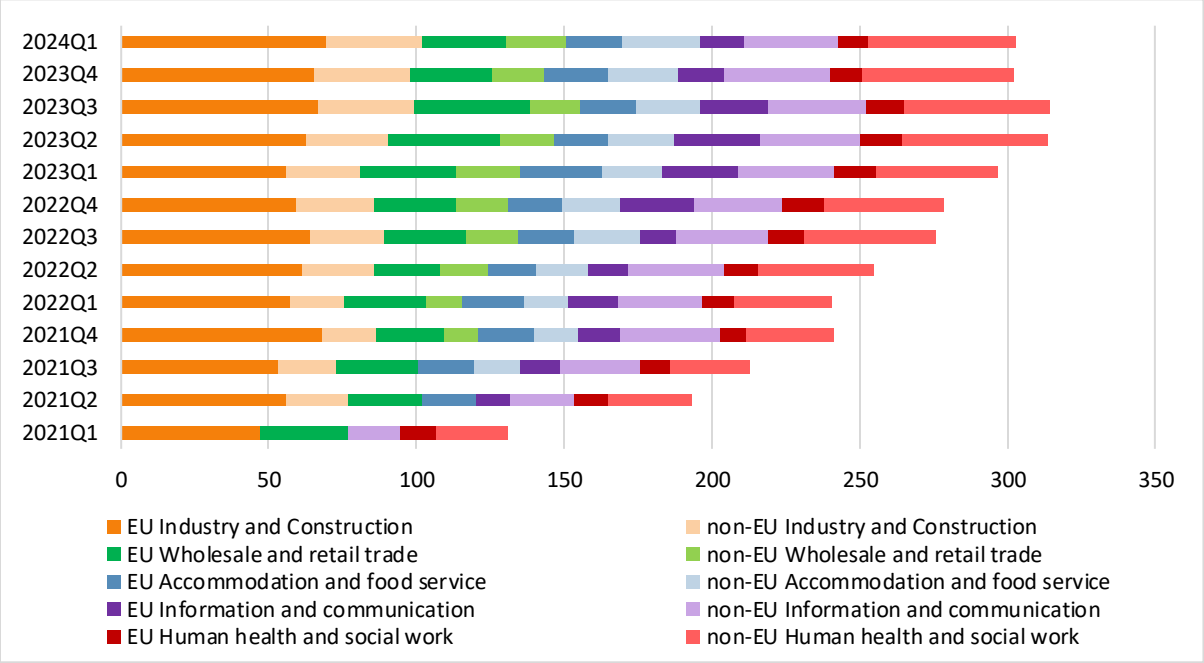
That is not a new development, as McGinnity et al. (2020)[10] examine working patterns of non-Irish nationals pre-COVID-19 and find that non-EU citizens are

8 Limited information is available for the UK, but this is not included due to the large number of missing data points.
9 Excluding Ireland.
10 McGinnity, F., Russell, H., Privalko, I. and Enright, S. (2020). *COVID-19 and non-Irish nationals in Ireland*. ESRI.

most likely to work in either the 'Accommodation and food service' sector, the 'Human health and social work activities' sector, or the 'Information and communication' sector. According to McGinnity et al. (2020), in 2018 and 2019 around 15 per cent of the people from outside of the EU were employed in 'Human health and social work activities'. The most recent data suggest that this share has increased to over 20 per cent in 2021 and over 22 per cent in 2024, as shown in Figure 22. The absolute number of people from outside of the EU working in the 'Human health and social work' sector has more than doubled between the first quarter of 2021 and the first quarter of 2024.[11] In the same period (Q1 2021 to Q1 2024), the number of people from other EU countries than Ireland employed in 'Human health and social work activities' has decreased by more than 20 per cent and remains in absolute numbers at a much lower level than people from outside of the EU.

Taking these together means that by the beginning of 2024, over one-quarter of the people employed in this sector are not from Ireland.

FIGURE 22 NUMBER OF NON-IRISH PEOPLE IN EMPLOYMENT BY SECTOR ('000)



Source: Central Statistics Office.

The contribution of immigration to the Irish labour market is clear and underscores the recent observation in the US by Dynan (2024)[12] that immigration has helped boost domestic economic growth by increasing the productive capacity of the macroeconomy.

11 It is important to note that until early 2022, some countries were still affected by COVID-19 measures such as social distancing, lockdowns and travel restrictions.

12 Dynan (2024). *Immigration has helped boost US economic growth*. PIIE.

As the demand for healthcare professionals, particularly in health and social care, continues to rise in the medium term, as detailed in a report by Keegan et al. (2022)[13] and considering the longstanding emigration trend among Irish doctors and nurses (Humphries et al., 2019),[14] greater inward migration will be necessary to support these sectors.

Summary

Considering the stable low rate of unemployment, the increasing numbers in employment and the decreasing job vacancy rate, the labour market is currently acting at or very near to capacity. Furthermore, as the period of high inflation is moderating, we are witnessing real wage growth for the first time in nearly two years. This is driven by both the growth in nominal wages and the decrease in inflation. The consequences of real wage growth will help to underpin future consumption growth in the domestic economy.

For 2024, we forecast the unemployment rate to average 4.2 per cent throughout the year, and in 2025 we expect that the unemployment rate will fall to 4 per cent by the end of the year.

PUBLIC FINANCES

Overview and forecast of tax revenue

Figure 23 displays the growth in the four tax headings that yield the highest Exchequer receipts for the government: income tax, corporation tax, Value Added Tax, and excise duty. The share of each contribution, however, has changed over time as shown in Figure 23. The largest source of income in 2023 was income tax followed by corporation tax, Value Added Tax (VAT), and excise duty in that order. Overall, in 2023 all four of them grew robustly. In Figure 23, the growth in corporation tax is particularly evident, surpassing revenue from VAT since 2021.

This is due to the immense growth of corporation taxes between 2020 and 2023 during which time the absolute amount of corporation receipts almost doubled. This pace of growth, however, is unlikely to be sustained, as already noted in previous *Commentaries*.

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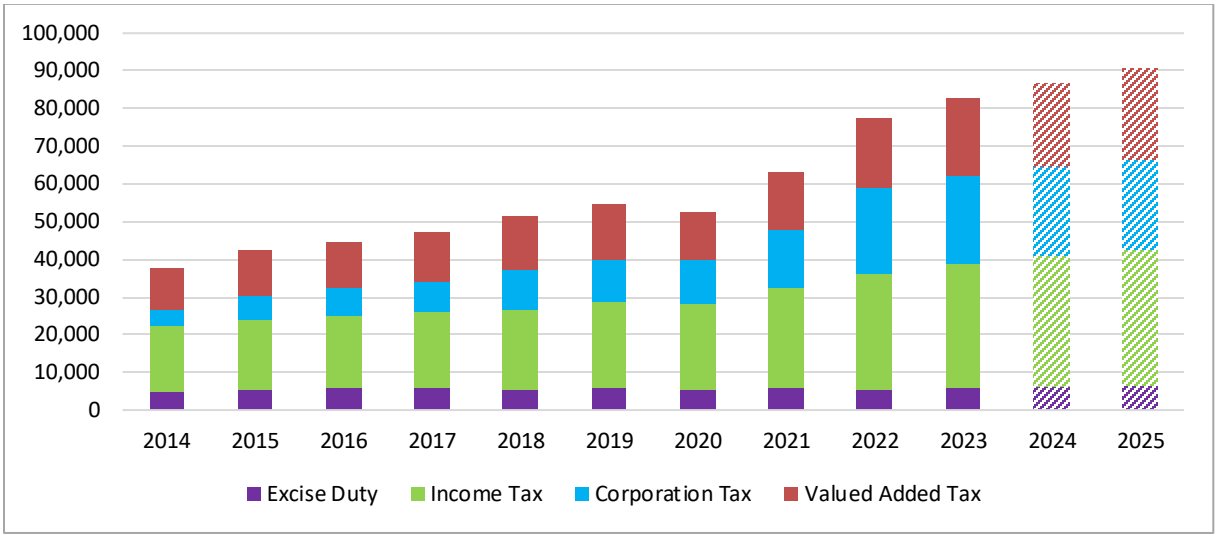
13 Keegan, C., Brick, A., Garcia Rodriguez, A. and Hill, L. (2022). *Projections of workforce requirements for public acute hospitals in Ireland, 2019–2035: A regional analysis based on the Hippocrates model*. ESRI.

14 Humphries, N., McDermott, A.M., Conway, E., Byrne, J.-P., Prihodova, L., Costello, R. and Matthews, A. (2019). 'Everything was just getting worse and worse": deteriorating job quality as a driver of doctor emigration from Ireland', in *Human Resources for Health* (Vol. 17, Issue 1). Springer Science and Business Media LLC.

FIGURE 23 GROWTH RATE AND FORECAST OF MAIN TAXATION HEADINGS ('000)



Source: Department of Finance and authors' calculation.

Corporation tax receipts

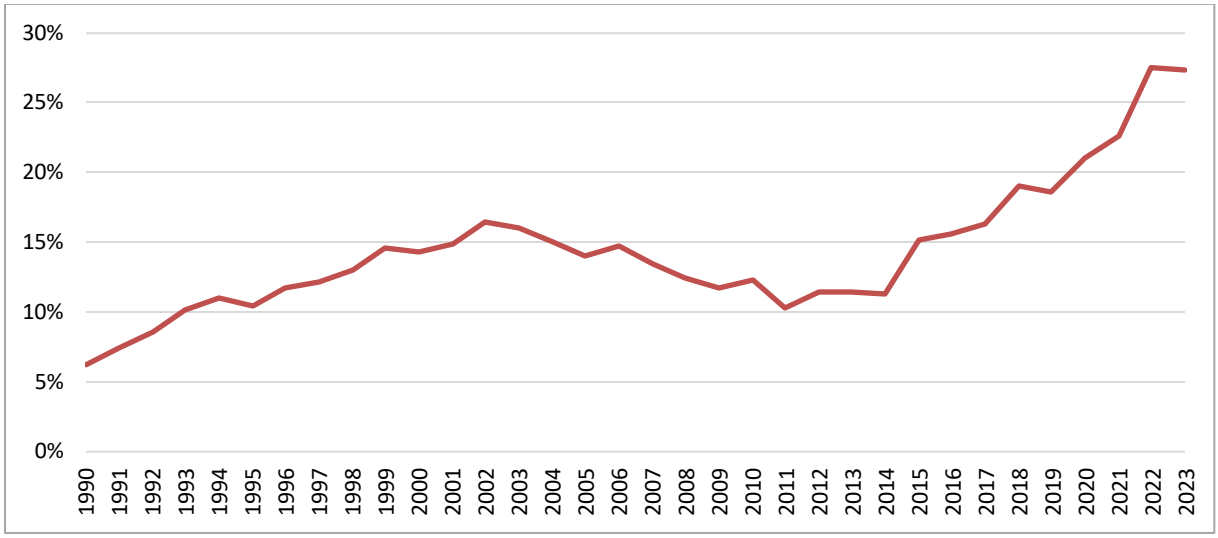
Figure 24 highlights further the increasing importance of corporation tax over time as it illustrates corporation taxes as a share of total Exchequer receipts since 1990. Since 2014 there has been a rapid increase in the importance of corporation taxes as a source of income for the Irish government. In the past ten years it increased from 11 per cent in 2014 to 27 per cent in 2023, thereby making up over one-quarter of total Exchequer receipts.

The sustainability of this source of revenue is a concern given, as noted by the Irish Fiscal Advisory Council,[15] only three companies paid around 43 per cent of all the corporation tax in 2022. While headline Irish exports and other macroeconomic variables are vulnerable to international uncertainty such as the recent increase in geopolitical tensions, this uncertainty can also impact Government receipts via lower corporation profits. Therefore, the performance of these companies plays a crucial role in shaping the economic outlook and the health of Ireland's finances.

In this context it is relevant to emphasise the importance of instruments such as the Future Ireland Fund (FIF) and the Infrastructure, Climate and Nature Fund (ICNF) which will facilitate a more sustainable and prudent usage of corporate tax revenues. Such instruments can play a crucial role in strengthening the resilience of public finances, while also providing funds for investment in key social and economic infrastructure.

15 Irish Fiscal Advisory Council (2024). *Fiscal Assessment Report*, June 2024.

FIGURE 24 SHARE OF CORPORATION TAX RECEIPTS TO TOTAL REVENUE

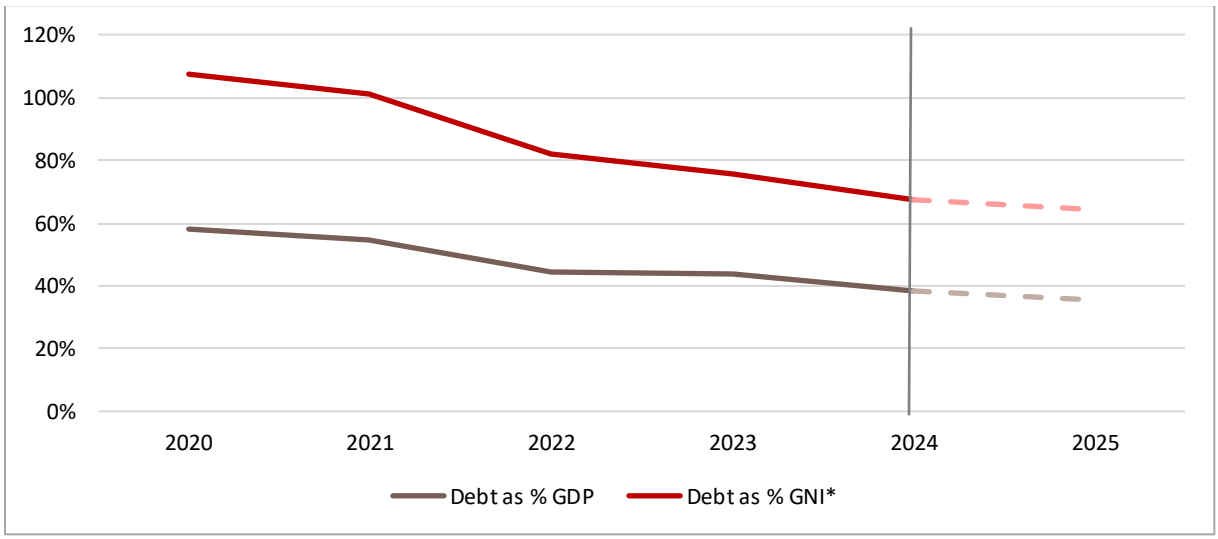


Source: Department of Finance and authors' calculation.

Debt-to-output ratio

As can be seen in Figure 25, there has been a steady decline in both the debt-to-GDP ratio and the debt-to-GNI* ratio in recent years. This downward trend is expected to continue in the coming years, also shown in Figure 25. The outlook is supported by the expectation of continuing moderate growth in both output concepts, accompanied by a growing surplus in the General Government Balance (GGB). This surplus will be generated by the expected increase in tax revenues (see Figure 1) and social security contributions. While expenditure levels are also expected to grow, the relative increase in Exchequer receipts will likely result in continued surpluses.

FIGURE 25 DEBT-TO-OUTPUT RATIO (%)



Source: Department of Finance Stability Programme Update 2024 and authors' calculations.

Summary

Overall, the improvement in public finances is expected to continue in 2024 and 2025. The General Government Balance is projected to be above 1.6 and 1.7 per cent of GDP in both years, which will lead to a decline in the total debt-to-GDP ratio and the debt-to-GNI* ratio to 38.4 per cent and 67.4 per cent respectively by the end of 2025.

General Assessment of the Irish Economy

Current expected outlook – real income set to increase

As we progress through 2024 the Irish economy continues to perform in a robust manner. While 2023 saw a marked divergence between headline indicators such as GDP and other indicators like MDD which better capture the underlying performance of the economy, 2024 to date has seen a greater realignment between these indicators of economic performance. While investment and export levels were subject to certain multinational related issues in 2023, both variables have witnessed more stable growth in the current year. Headline investment is expected to grow in 2024 along similar lines to 2023; within that category, modified investment which had experienced a sharp decline in 2023 is now forecast to increase by just under 2 per cent in the current year.

The consistently robust performance of the economy coupled with the declining rate of inflation means that Irish households will experience an increase in real income of 2 per cent in 2024. Furthermore, in the face of an expected decline in inflation in 2025, we believe real incomes will increase by over 3 per cent that year. Inflation rates are now growing at a slower pace than was previously expected; the CPI is expected to increase by 2.3 per cent in 2024 and 1.9 per cent in 2025. This is almost half a percentage point lower than was the case in the Spring *Commentary*.

In Q4 2023, employment levels in the Irish economy exceeded 2.7 million workers for the first time in modern history. This constitutes a 30 per cent increase in employment since 2006 and a 45 per cent increase since the trough of the Global Financial Crisis (GFC) in early 2011. By any yardstick, this is a remarkable achievement and while the growth in employment has eased in Q1 2024, on average, employment growth has been approximately 3 per cent per annum since 2017.[16]

This does mean, however, that going forward, labour market constraints are going to be significant, particularly as the unemployment rate hovers around the 4 per cent rate. This will have implications for the delivery of the National Development Plan, a revision of which is set to be outlined in Autumn 2024. Care will have to be taken, especially in Budget 2025 to ensure that fiscal policy does not exacerbate the capacity constraints which may arise and lead to inflationary pressures. As noted in the previous *Commentary*, significant investment is required in the domestic economy across a number of sectors. Therefore, it is imperative that fiscal policy be disciplined to ensure that, while the Government increases expenditure particularly in investment, it does not additionally stimulate the economy in other areas such as taxation policy.

16 Excluding the substantial changes that occurred during the COVID period.

Vulnerability to international uncertainty

Exports are expected to register positive growth, in contrast to the decline witnessed in 2023. There are still sector-specific issues which are impacting the overall domestic performance; the pharmaceutical sector, for example, continues to witness subdued output in the present year. However, overall, global conditions generally are improving in 2024 and expected to continue to grow in 2025. In particular, inflation rates are growing at a slower pace across most Western economies than was previously expected.

While international conditions do appear to be improving, the potential for adverse shocks related to geopolitical developments remains heightened. The increased tension between the United States and China has already had adverse implications for Irish trade, with a significant decline registered in the exports of microchips, for example, in 2023. This highlights how vulnerable the small open nature of the Irish economy is, particularly with global tensions increasing on a number of fronts.

Another area where geopolitical tensions may impact the overall economy is through multinational related activity such as contract manufacturing. Much of the activity associated with contract manufacturing is where an Irish based multinational (MNE) contracts with foreign firms to manufacture goods on behalf of the MNE in factories owned by independent companies in foreign locations. Many of these firms are located in the far-east and China in particular. If geopolitical tensions were to reduce this type of activity, any significant contraction in contract manufacturing would have a significant impact on a number of key headline Irish economic variables.

Importance of immigration to the domestic economy

The labour section of the *Commentary* notes the contribution of foreign workers to key sectors of the Irish economy. This is particularly important given the current tight nature of the Irish labour market with the unemployment rate set to remain at or close to the natural rate of unemployment. The forthcoming revised national development plan will outline the investment priorities for the Irish State over the medium term. Net inward migration will play an important role in providing much needed labour supply for many of these capital projects as well as the other day-to-day requirements of the economy. The difficulties experienced by many sections of the UK labour market in sourcing requisite supply after Brexit serves as a salutary reminder of this source of growth to the domestic economy and how it can be taken for granted.

Housing market issues

While housing supply has been increasing in recent years, the issue of an under-provision of housing relative to demographic demand continues to be a feature of the market. Recent data published by the Housing Commission would suggest an upward revision of housing targets will be required given the increase in underlying

housing formation as well as 'pent-up-demand' for housing. Providing additional supply in an environment with a robust domestic economy, low additional capacity in terms of construction sector labour and high levels of input prices will continue to be a challenge. The adoption of productivity enhancing reforms in the construction sector such as automation and robotics as well as the use of modern building techniques such as modular housing may help enhance the productive capacity of the sector.

Other recent ESRI work has also addressed housing market issues. The volatility of land prices is a key consideration on the supply side of the Irish housing market. Effective land management is one key area where policymakers can impact the cost of actually building a property. In the absence of an official residential land price series, McQuinn (2024)[17] outlines a new series of regional land price estimates using the 'residual'[18] approach. The estimates suggest that Irish land prices have been even more volatile than house prices over the period 1995 to 2022. Such volatility is likely to have an adverse impact on the supply side of the residential market. The need for better land management[19] in the domestic market is heightened by the greater presence of a number of agents in house building; Approved Housing Bodies (AHB), the Land Development Agency (LDA) and Local Authorities are all now active in the supply of housing. It is imperative that their need for residential land will not add further pressure to land prices.

Finally, a recent working paper by Egan et al. (2024)[20] highlights the role played by changing credit conditions in affecting recent house price developments. While the impact of credit factors on house prices waned following the financial crisis, this research notes that such factors are beginning to re-emerge as having an influence on prices. Even though the current Irish credit market is notably safer than in previous decades due to stricter financial regulations, and systemic risk in the mortgage market is likely to be low, continued vigilance is needed over time to ensure that house-price credit effects do not re-emerge, requiring a strong macroprudential framework.

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17 McQuinn, K. (2024). 'Residential land prices for the Irish property market: An initial examination', ESRI Working Paper No. 778, Dublin: ESRI, https://www.esri.ie/publications/residential-land-prices-for-the-irish-property-market-an-initial-examination.

18 The residual approach essentially takes the residential land price as the difference between the cost of building or rebuilding a property and the actual sales price of the property.

19 See, for example, some of the measures proposed in Sweeney (2022). 'Trading places: Tasc report on land and housing', available online at: https://www.tasc.ie/assets/files/pdf/170957016729418001.pdf.

20 Egan, P., McQuinn, K., and O'Toole, C. (2024). How supply and demand affect national house prices: The case of Ireland. *Journal of Housing Economics*, 65(102006), 102006.

Special Article

This Article has been accepted for publication by the Institute, which does not itself take institutional policy positions. Special Articles are subject to refereeing prior to publication. The author is solely responsible for the content and the views expressed.

HOUSEHOLD SIZE IN IRELAND: STYLISED FACTS IN A CROSS-COUNTRY CONTEXT

Conor O'Toole and Rachel Slaymaker[1]*

ABSTRACT

This paper uses cross-country data to explore the trends in household size in Ireland and to place these trends in a European context. Using cross-country data from the EU-SILC survey, the research presents a range of stylised facts regarding how Ireland differs from other countries, and attempts to explore what might explain the variation. We find that Ireland has a high average household size on a cross-country basis. However, this appears to be strongly influenced by demographics, with high fertility rate, younger population and thus high share of households with children being important factors in explaining the cross-country trends. Indeed, a majority of the differences between Ireland and other countries disappear in a regression setting when socio-demographic and basic economic factors are controlled for. In terms of the change over time in household size, we find little association with time-varying economic factors but, again, a strong effect of ageing and the proportion of households with children. We do find a negative relationship with housing supply; any change in household size would be, to a degree, affected by availability of housing. In terms of the long run trend in Irish household size, the level is likely to change in line with population ageing i.e. demographic factors are likely to be the most important driver going forward, subject to availability. Projections for future household numbers or housing demand would likely benefit from the deployment of age-specific household size trends which allow natural population dynamics to influence household size.

1. INTRODUCTION

The issue of new household formation is a key element in the development of housing and planning policy. Ensuring that sufficient housing is available to suit a growing population requires an understanding of the main elements that drive household formation and broader population dynamics. To appropriately assess housing demand based on population developments and other factors requires a detailed methodology which combines assumptions around a range of factors including population dynamics (ageing, natural increase, migration), housing

[1] This research was completed under the Joint Research Programme on Housing Economics between the ESRI and the Department of Housing, Local Government, and Heritage. The views expressed in this paper are those of the authors and they should not be regarded as an official position of the Department of Housing, Local Government, and Heritage. We are grateful to Eurostat for facilitating access to the Survey of Income and Living Conditions (SILC) Research Microdata Files. Thanks also to the members of the Research Programme Steering Committee for their helpful comments and guidance.

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market developments (obsolescence) and also a key input assumption around household size or headship. The headship rate measures the share of the population that is the head of a household. The inverse of the headship rate is the number of people in the household. Household size is therefore critical to these analyses as it turns population estimates into households and thus can provide a key lens into housing requirements.

As a key parameter in the broader methodology for determining structural housing demand from population estimates, determining the forward path for household size has been relatively unexplored as a standalone topic in the Irish literature, but also under-explored in an international context. Previous research (Bergin and Garcia-Rodriguez, 2020; Byrne et al., 2014) has considered the structural housing demand requirements for Ireland in a regional context and made assumptions around household size as an input into this. Their assumptions provided a range of estimates based on historical data but also some suggested convergence scenarios such as Irish household size moving to the UK level over time. Furthermore, Lyons (2021) provides an overview discussion of trends in household size in Ireland in a cross-country context and indicates a notable role for housing supply constraints as well as demographics.

However, few research papers have explored in detail the trends in household size specifically and what might be driving these trends in a cross-country setting. Indeed, it is also likely that headship itself is affected by a range of factors including demographics, norms and preferences, social structures and economic factors such as income growth and employment, credit markets and other housing-related issues.

In this research, we aim to address this gap in the literature. To do this, we undertake a cross-country assessment using the EU-SILC microdata to present some stylised facts around household size and then explore the correlation of household size to potential determinants such as demographics as well as economic (incomes, house prices, housing supply) and social factors (such as education and marital/co-habitation status). This exploration will aim to provide important context as to what factors are likely to impact the future trends in household size in Ireland. Our estimates and findings are best interpreted as stylised facts rather than a causal analysis. Causal analysis of household formation over time would require an individual-level panel dataset which is unavailable. It would also need to be undertaken across a longer timeframe than what is available within the EU-SILC dataset.

A number of findings emerge. We find that Ireland has a high average household size on a cross-country basis. However, this appears to be strongly influenced by demographics, with high fertility rates, a younger population and thus high share

of households with children important factors in explaining the cross-country trends. Indeed, a majority of the differences between Ireland and other countries disappear in a regression setting when socio-demographic (household head age, share of families with children, educational attainment, marital status) and basic economic factors (income and employment status) are controlled for.

In terms of the change over time in household size, we find little association with time-varying economic factors but, again, a strong effect of ageing and the proportion of households with children. We do find a negative relationship with housing supply; any change in household size would be, to a degree, affected by availability of housing. In terms of the long-run trend in Irish household size, the level is likely to change in line with population ageing i.e. demographic factors are likely to be the most important driver going forward, subject to availability of housing.

There are a number of implications from our research for policy. First, any projections for future household numbers or housing demand would likely benefit from the deployment of age-specific household size trends which allow natural population dynamics to influence household size. We do not find any major moderation or convergence in the household size level in Ireland to the level of other countries in our sample period and this is affected by the demographic structure. Indeed, in our research we find little difference between Ireland and other countries in terms of household size for older age cohorts, with the younger age cohorts being the driving factors behind Irish household size levels. Given Ireland's continued high fertility rate, it is unlikely that major drops in household size will occur unless these demographic features abate. We do find a role for housing supply to act as a counterweight to any moderation in household size. However, the relative magnitudes of the effects suggests that supply would have to increase notably to offset the demographic effects and put major downward pressure on household size. Thus any scenarios should incorporate, at least implicitly, feasible ranges for housing supply. More generally, estimates of future housing supply requirements should be grounded in, among other factors, well-evidenced considerations of household size that take into consideration realistic assessments of population dynamics over time.

The rest of this paper is structured as follows. Section 2 presents the dataset and outlines some stylised facts on Irish household size trends in a cross-country context. Section 3 presents cross-country regression analysis to explore the correlation between household size and country-time and household specific factors. Section 4 draws out some potential scenarios for policy given the research and Section 5 concludes.

2. DATA AND STYLISED FACTS

2.1 Data description

The main dataset used in this research is Eurostat's cross-country Survey on Income and Living Conditions (EU-SILC). The survey is undertaken in European Union Member States and selected other countries, and aims to provide nationally representative household-level information on tenure, household structure, housing costs, incomes and other socio-economic characteristics. The main aim of the EU-SILC survey more generally is to collate information for the measurement of poverty and living conditions on a pan-European basis. However the richness of the dataset in terms of the scope of the data across variables and the geographic coverage make it a useful source for housing research. For example, a number of studies such as Corrigan et al. (2019), Disch and Slaymaker (2023) and Doolan et al. (2022) have used the data for work on housing affordability. The data have also been used to explore other cross-country research topics such as mortgage arrears (Gerlach-Kristen and Lyons, 2018).

In terms of the coverage and scope of the dataset, it contains both household-level files and personal files with detailed information across a range of areas such as age, education, nationality, employment, occupation, hours worked and labour market contract type. There are also critical information linkages across the relationships within households such as partners and parent/child relationships. The data also contain a range of indicators on household tenure (such as rental status), housing affordability issues such as mortgage and rental payments, as well as information on household incomes and other economic indicators.

While Census data provide the most authoritative picture on household size as they capture all households, they are only collected every five years in Ireland. Estimates from the nationally representative EU-SILC surveys may differ slightly,[2] but have the advantage of being collected annually, comparable across countries and combined with a rich set of socio-demographic characteristics for each household, thus permitting the econometric assessment of which factors are associated with differences in household size. We return to the longer-term trends in Irish household size from historical Census data in Section 4.

For the purposes of this research, we use a sample of the EU-SILC for a subset of 16 western European economies, covering the period 2005-2021. The breakdown of the overall sample in terms of the country coverage is presented in Figure A.1 in

[2] For comparison, Irish Census vs Irish EU-SILC figures for average household size: 2.81 vs 2.85 in 2006; 2.73 vs 2.7 in 2011, 2.75 vs 2.7 in 2016 and 2.74 in 2022 Census vs 2.6 in 2021 EU-SILC. From 2018-2021 the EU-SILC figures declined slightly, falling to 2.6 in 2021, a fall not observed in the Census data for 2022 where the average household size remained at 2.74.

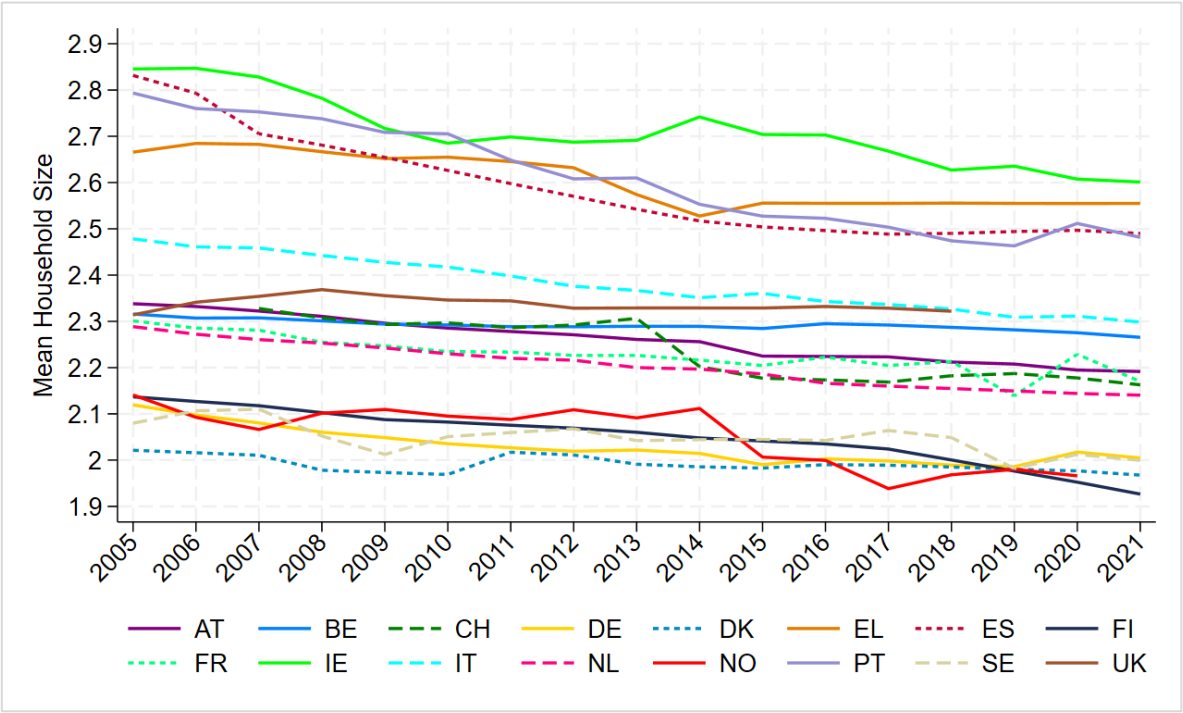
the Appendix. In total, over 2.2 million observations are contained in the sample over the full period. For the purposes of this research, we exclude central and eastern European countries for both data availability reasons and due to their lack of comparability in terms of housing systems relative to the Irish case. See Disch and Slaymaker (2023) for further discussion. In the remainder of Section 2, we present a series of descriptive statistics and stylised facts on Irish household size and other socio-demographic trends in a cross-country context.

2.2 Trends in household size and composition across countries

Figure 1 presents the trend in household size (average number of persons per household) for the countries in our sample for the period 2005-2021.[3] Ireland is a very clear outlier for much of the period with consistently high household size levels; since 2011 onwards Ireland has had the highest level of average household size of all the countries presented. Another notable feature of the data is a general downward trend across all households over time, albeit with somewhat of a decline in the pace of reduction. A further feature is the apparent grouping of the data with three distinct country groups: Ireland is highest with Spain, Portugal and Greece; a second group of countries in the middle range of the household size distribution including Italy, France, the UK, Austria, Belgium, Netherlands, and Switzerland. The group of countries with the lowest household sizes are the Nordic countries of Denmark, Sweden, Finland, Norway and also Germany. The trend over time in these groups also highlights that the differences across countries in the level, what could be considered the country fixed effect or time-invariant country factors, appears extremely large and persistent. This has implications for what is driving these differences, as slow-moving factors such as cultural or institutional influences may be extremely influential, as are factors relating to population dynamics and fertility.

[3] It must be kept in mind here that the Central Statistics Office (CSO) notes a break in the Irish SILC data series from 2020 onwards due to several methodological changes. Of relevance to Figure 1 is the change in how households are defined, moving from an address-based definition to one based on shared income and expenditure. On the one hand, the move from address-based to shared income and expenditure means that those living together but not sharing expenditure i.e. unrelated flatmates will now be treated as separate households which would increase the overall number of households and therefore reduce average household size. On the other hand, students living away from the family home but who are substantially supported by their families are now considered part of the family home household, thus likely increasing average household size. The ex-ante overall likely impact of this change in definition is therefore unclear. In practice there is a small downward change in the average Irish household size from 2.64 in 2019 to 2.61 in 2020.

FIGURE 1 HOUSEHOLD SIZE (AVERAGE NUMBER OF PERSONS PER HOUSEHOLD): 2005–2021

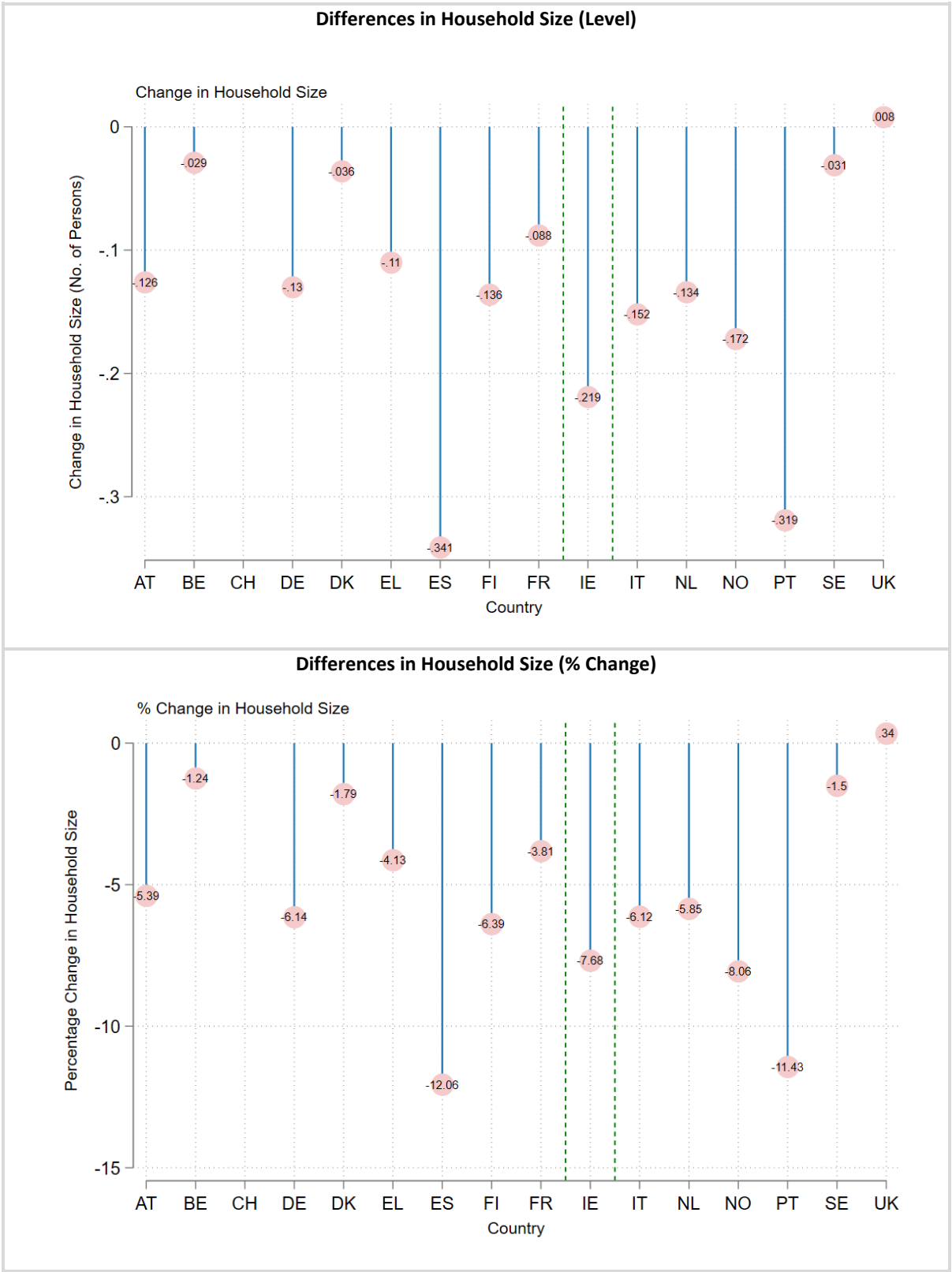


Source: Authors' analysis of Eurostat EU-SILC data.

To gain some insight into the changes over time, Figure 2 presents the level and percentage differences across countries between the time periods 2005 to 2018. The second date is selected to pre-date the COVID-19 pandemic which may have had impacts on both the household size directly but also on the sampling activities of the survey collection during the pandemic.[4] A number of findings emerge from these data. It is noticeable that, with the exception of the UK which has remained virtually constant, all other countries have experienced some decline in household size over the period thus indicating a general co-moving downward trend. Second, some of the largest declines in percentage terms are in the countries with the highest levels of household size. For example, the greatest percentage reductions were in Spain and Portugal. However, the percentage change was similar in places like Norway and Finland relative to Ireland, and given the very large level differences between these areas, this does not suggest that a major convergence occurred for Ireland in this time period.

4 We limit to 2018 rather than 2019 to include the UK for which data are only available until 2018.

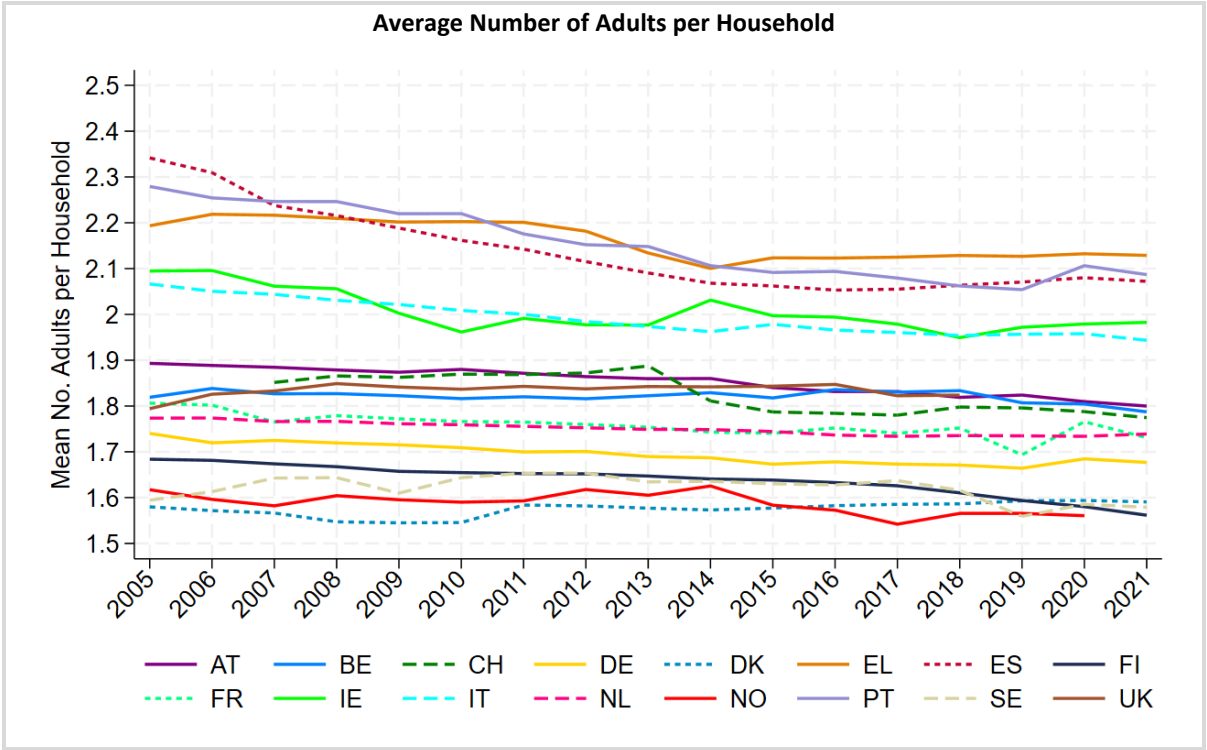
FIGURE 2 CHANGE IN HOUSEHOLD SIZE: LEVEL AND % DIFFERENCES: 2005–2018



Source: Authors' analysis of Eurostat EU-SILC data.

Given the range of different factors that are likely to be driving differences across household size, we attempt to explore further differences that might explain some of the above trends. For example, two more straightforward explanations are differences in fertility or variation in the level of multi-generational living. To unpick the data in more detail, Figure 3 presents the average number of adults and children per household over time. Focusing in on the number of adults, it is clear that Ireland is no longer the highest and an outlier. Rather, it is grouped more centrally relative to the basket of countries presented. There also appears to be a huge degree of stability over time with very few countries experiencing notable changes in the average number of adults per household. Some evidence of a change in the ordering is notable, with Germany moving away from the Nordic countries towards the middle group.

FIGURE 3 AVERAGE NUMBER OF CHILDREN AND ADULTS PER HOUSEHOLD: 2005–2021



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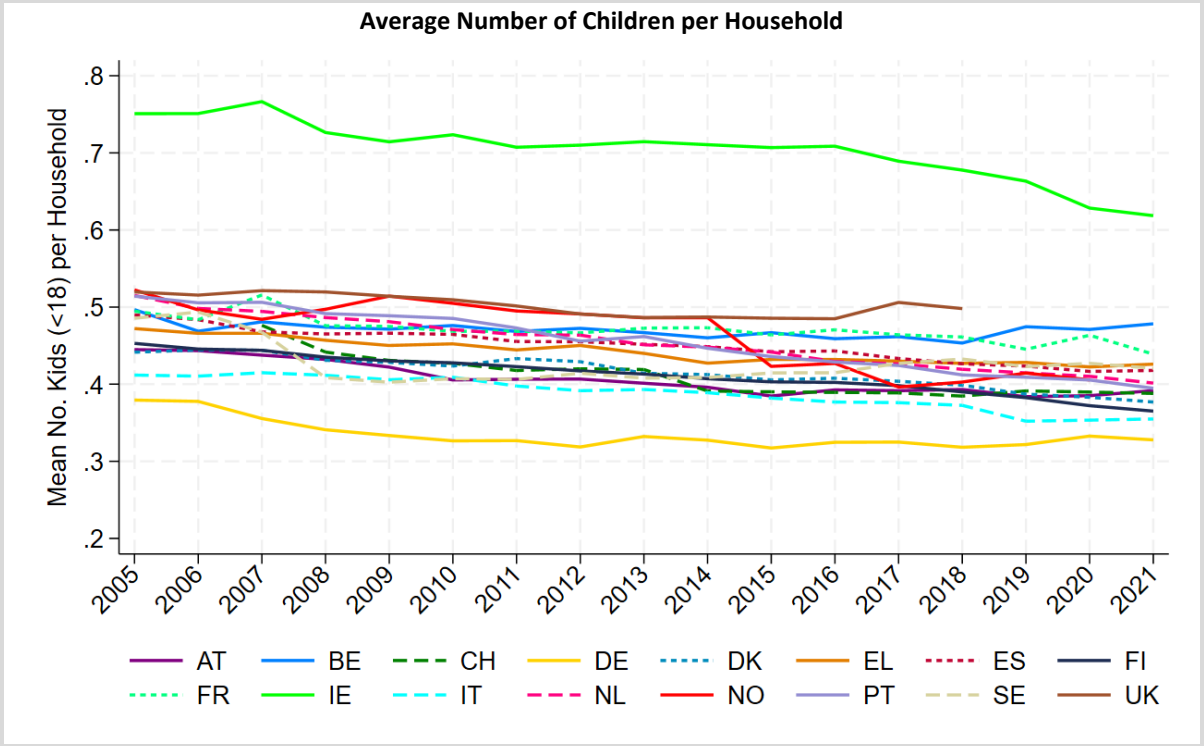
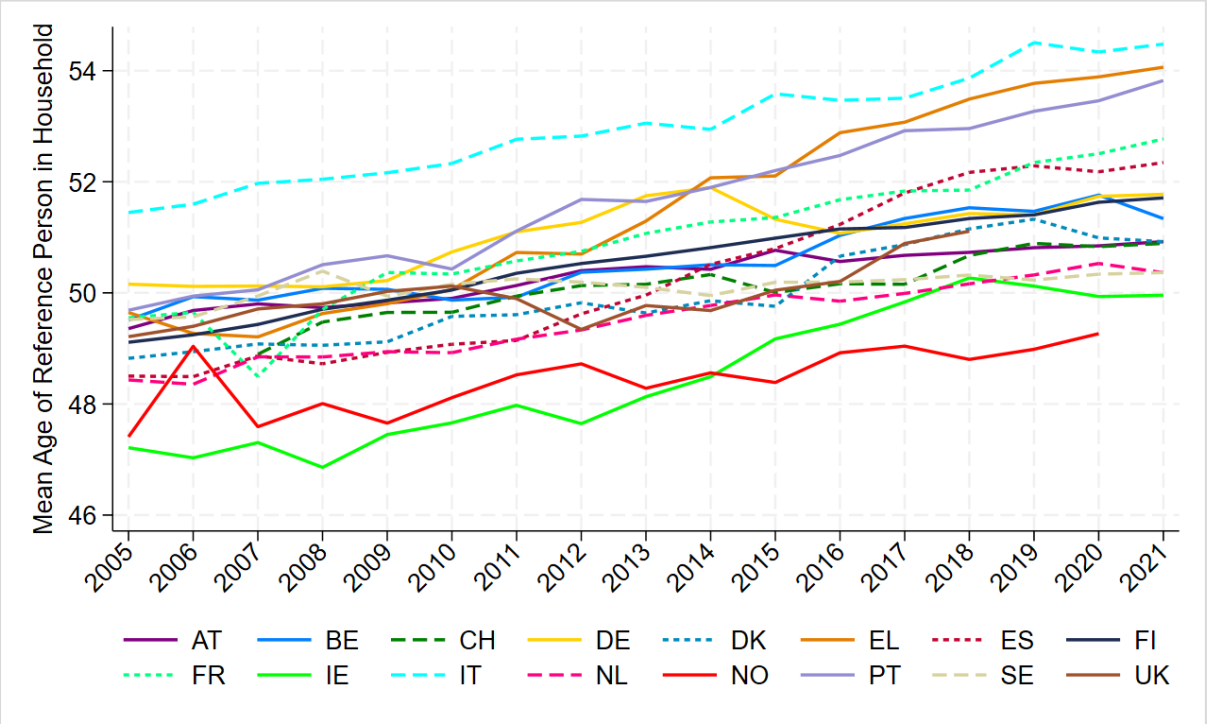


Source: Authors' analysis of Eurostat EU-SILC data.

Focusing in on the number of children per household, this clearly shows Ireland as a considerable outlier as it has the highest average number of children throughout the sample period. Thus Ireland's high ranking in terms of household size is more driven by higher levels of fertility than any major concentration of adults living together. This has some potential implications for Ireland's future household size trajectory as ageing impacts will likely lead to lower household sizes over time relative to other countries. These differences can clearly be seen in Figure 4 which shows the average age of the head of household. All countries are affected by ageing, but with clear variation in levels. For example, Italy has the oldest adults, and the age profile of household heads has been rising steadily over time. Ireland has the second lowest age of adults per household with only Norway lower. It is important to keep in mind that this age profile refers to the head of household and not the population as a whole, so will likely also be impacted by differences in who is actually able to enter different housing tenures and live independently.

FIGURE 4 AVERAGE AGE OF HEAD OF HOUSEHOLD: 2005–2021

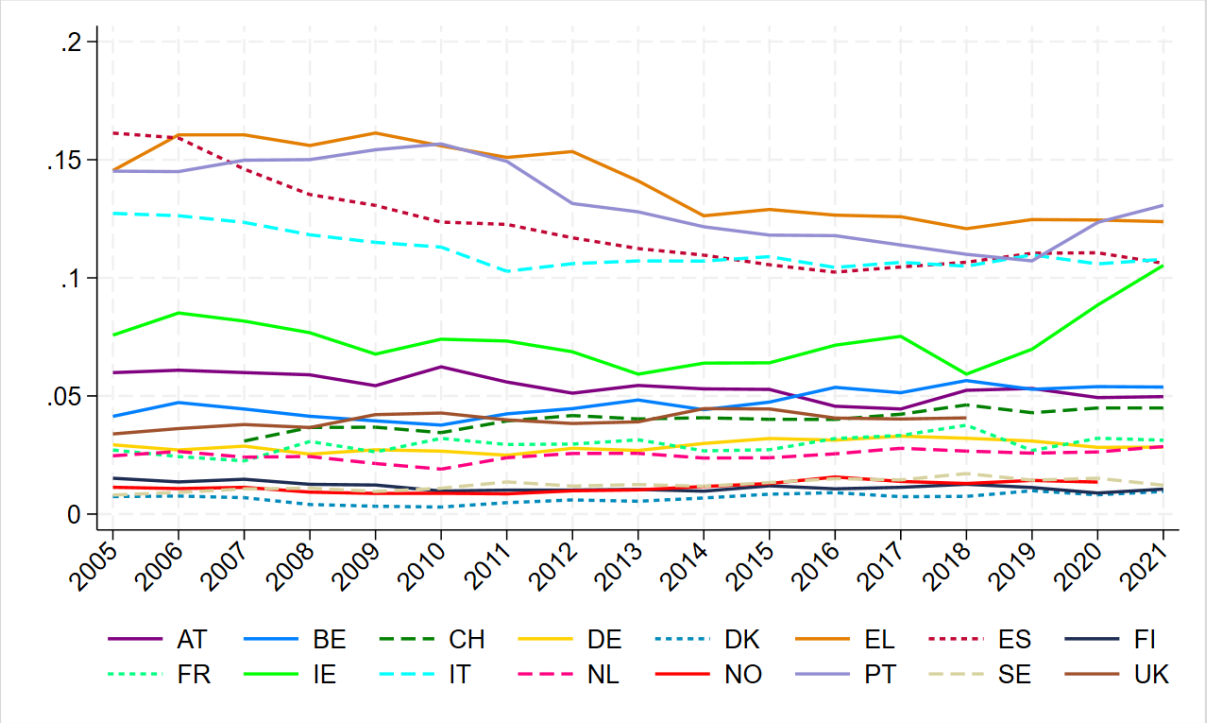


Source: Authors' analysis of Eurostat EU-SILC data.

The question of whether young adults are able to form independent households also has implications for household size. Figure 5 explores the cross-country trends in the share of households that contain a son or daughter aged 25-34 and still living in the family home, which may be a potential family formation constraint indicator. Note this is considered from a household perspective i.e. how many households contain an adult child aged 25-34 rather than how many of this age group continue to live in the family home. Some households may therefore contain more than one adult child. Between 2005-2018 there was a clear distinction, with households in Greece, Portugal, Spain and Italy much more likely to contain adult children than elsewhere (ranging from 10-15 per cent). At the other end of the spectrum, a consistently low 1 – 1.5 per cent of households contain adult children aged 25-34 in the Nordic countries. Ireland sat at the top of the remaining countries, seeing rates of 6-8 per cent. However, the 2020 and 2021 figures have rapidly increased for Ireland, bringing it up to 10.5 per cent and in line with Italy and Spain. Some caution is however warranted with these Irish figures for the last few years in this sample. Discrepancies have been noted between the 2022 Census figures on young adults remaining in the family home and the corresponding Eurostat figures which come from the EU-SILC datasets, with the Census figures notably lower. It is important here to reiterate the break in the Irish SILC data series from 2020 onwards and the change in how a household is defined, moving from an address-based concept to one based on shared income and expenditure. Of particular relevance for Figure 5 is that students living away from the family home but who are substantially supported by their families are now counted as a member of the

family household. It is therefore possible that the increase in adult children living at home observed in Figure 5 may at least partly result from this change in the household definition.

FIGURE 5 PROPORTION OF HOUSEHOLDS WITH ADULT CHILD: 2005–2021



Source: Authors' analysis of Eurostat EU-SILC data.

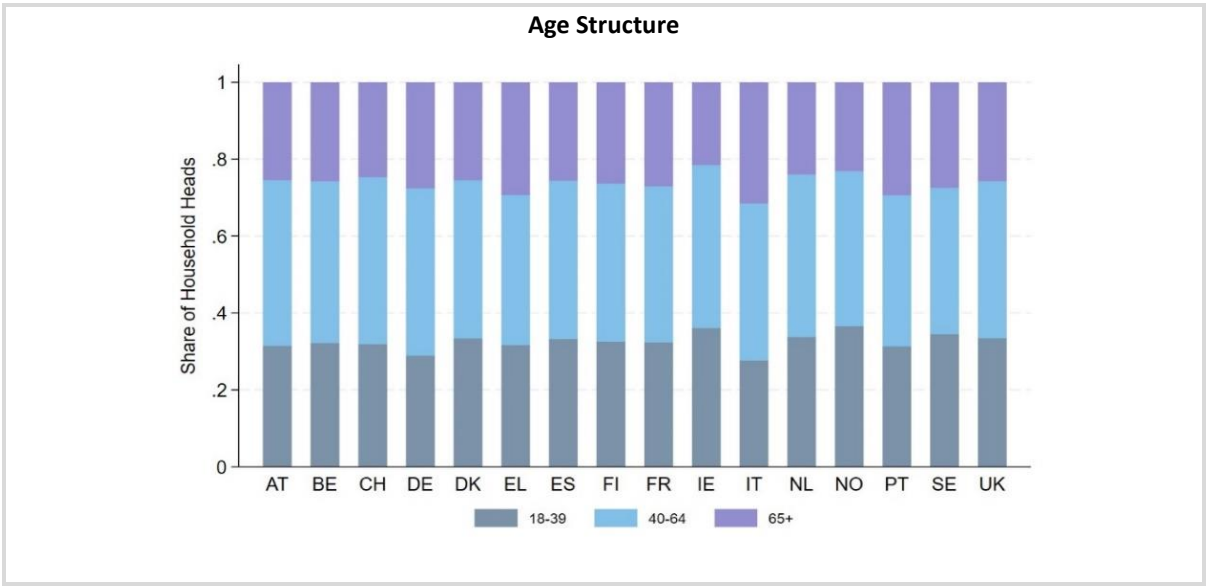
2.3 Exploring cross-country differences

In the previous section we established that trends in household size vary considerably across countries, with Ireland having the largest households among the western European countries studied. There are a range of different factors that are likely to be contributing to cross-country differences in household size. In this section we examine descriptively how households in different countries vary across a number of socio-economic characteristics and how these factors may correlate with the observed differences in household size.

Figure 6 presents four key characteristics of the heads of households in each country: age, marital status, employment status and educational attainment. Consistent with Figure 4, Ireland and Norway see the highest share of household heads aged under 40, while Italy, Greece and Portugal see the highest numbers of households headed by over 65s. Sweden interestingly has a relatively high share of both over 65s and under 40s, with fewer middle-aged household heads. There are notable differences in marital status patterns across countries. The share of

household heads who have never been married ranges from little over 20 per cent in Greece to more than 40 per cent in Sweden and Norway. A higher share of individuals are married in the southern European countries, namely Greece, Portugal, Spain and Italy, along with Ireland. Divorce rates are also notably lower in Greece, Spain Italy and Ireland (below 10 per cent) and higher in the Nordic countries (around 20 per cent), as well as in Germany, Austria, Switzerland, Belgium and the UK. Looking at labour market status, the share of heads of households in employment ranges from just over 40 per cent in Greece to around 60 per cent in Switzerland. Ireland, along with the Netherlands, has a lower share of households headed by retired individuals, but almost 30 per cent are headed by those otherwise inactive in the labour market. Regarding educational attainment, Ireland sees the highest share of household heads educated to third-level standard, but also 20 per cent with only primary level or no education. Elsewhere, Portugal in particular sees nearly 50 per cent of household heads educated only to a maximum of primary level, followed by around 30 per cent in Greece. It seems likely that in part this may be related to the higher numbers of households headed by older individuals in those countries. It is important to reiterate that Figure 6 refers only to heads of household and not trends across the population as a whole.

FIGURE 6 CROSS-COUNTRY PATTERNS IN SOCIO-ECONOMIC CHARACTERISTICS: 2020



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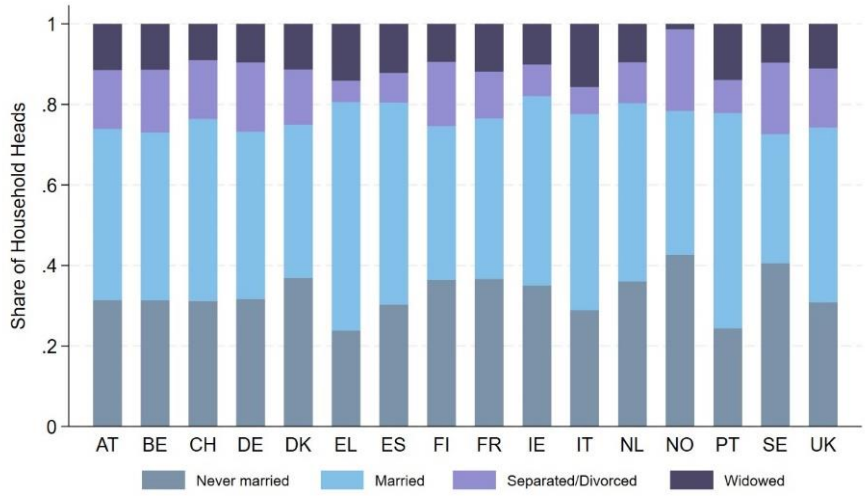
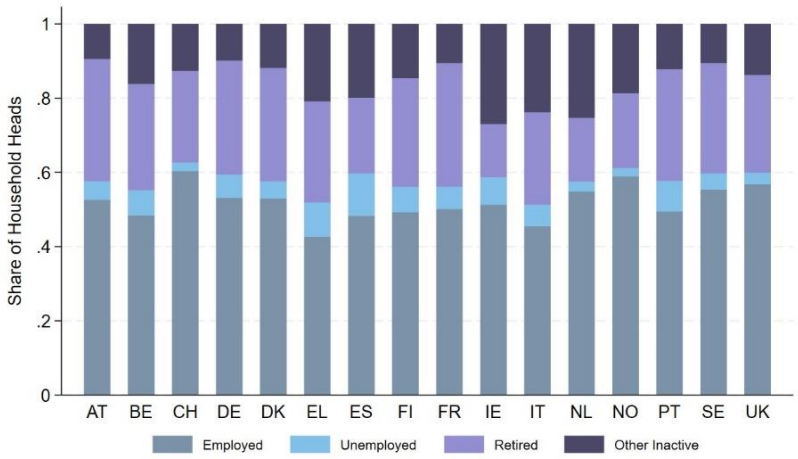
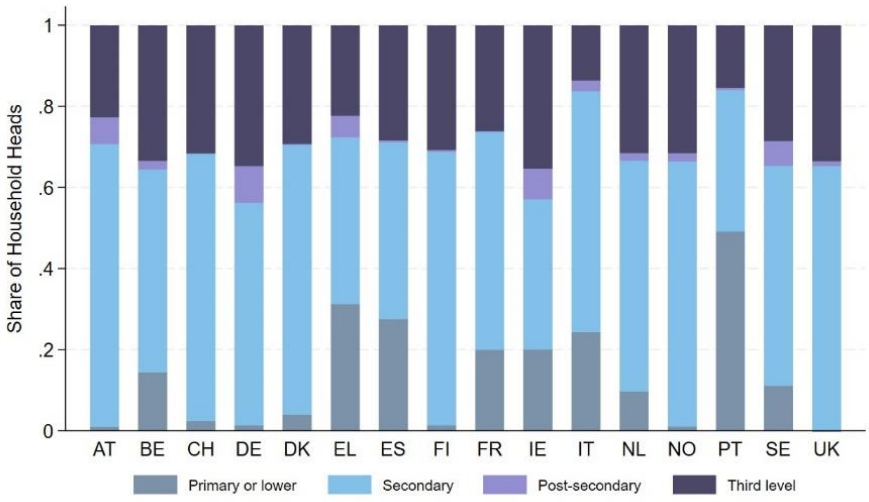
Marital Status



Employment Status



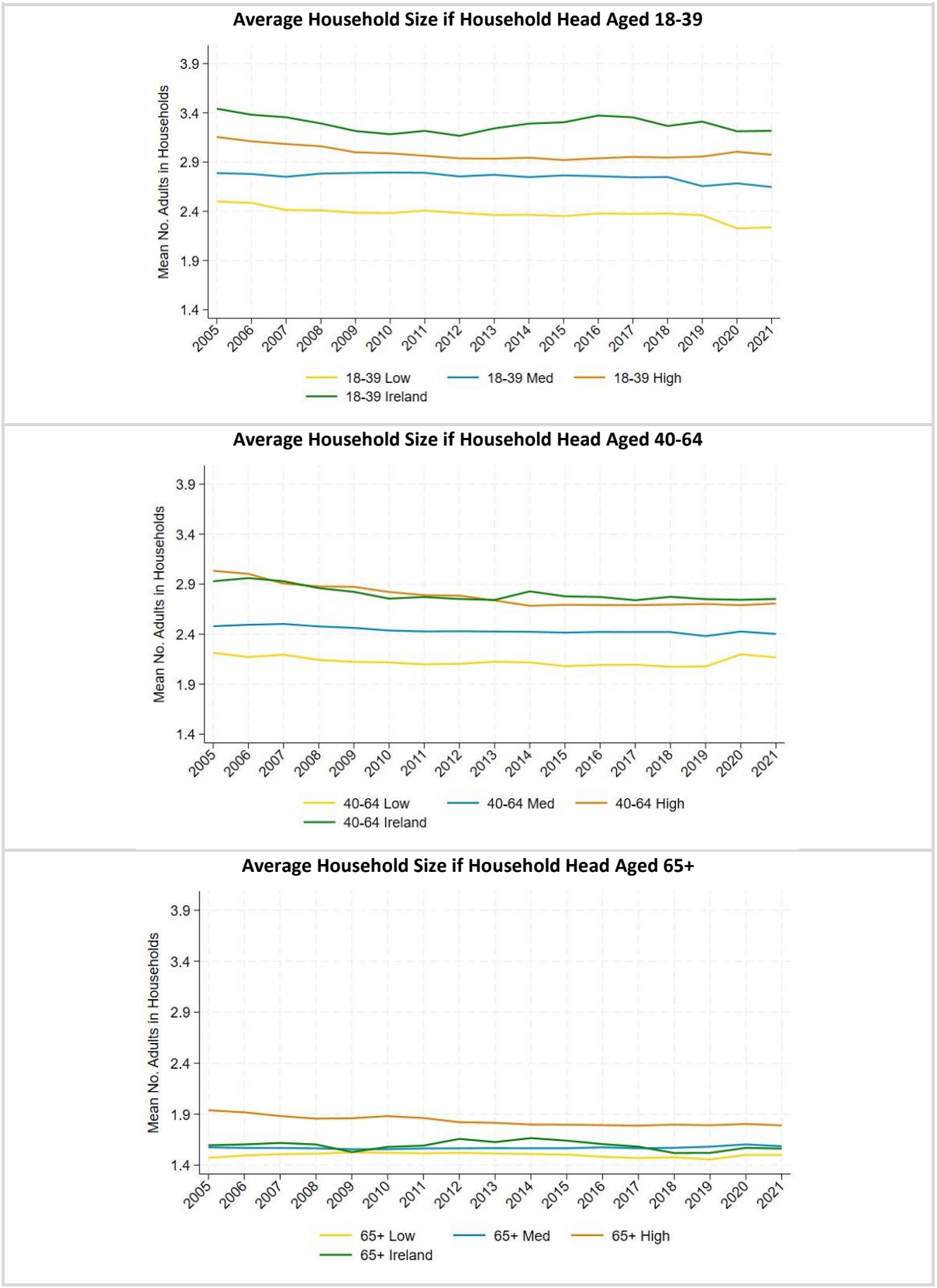
Educational Attainment



Source: Authors' analysis of Eurostat EU-SILC data.

Having observed differences in the age structure across countries, Figure 7 presents the average household size separately for each of the age groups. We compare Ireland with three country groupings based on Figure 1: high (Portugal, Greece and Spain); medium (Italy, UK, Belgium, Austria, France, Switzerland and Netherlands); low (Germany, Sweden, Denmark, Finland and Norway). Households are larger on average for younger age groups compared to older ones and there is little change in the patterns over the period 2005-2021. For those aged 65 and over, Ireland's household size falls in the middle of the countries studied, below the likes of Portugal, Greece and Spain, countries which are typically associated with higher levels of multi-generational living, and only marginally above the rate in the Nordic countries. For households headed by someone aged 40-64, Ireland's household size is broadly in line with the high group, with a slightly higher rate from 2014 onwards. Younger (18-39) Irish households are clearly substantially larger than elsewhere, containing on average one extra person relative to the low group of Nordic countries and Germany. These findings are consistent with those of Disch and Slaymaker (2023) who highlight the comparatively low share of young single adults living alone. Among households under 40, just 11 per cent are composed of single adults with no children in Ireland, compared to 40 per cent in other western European countries.

FIGURE 7 AVERAGE HOUSEHOLD SIZE BY AGE AND COUNTRY GROUP: 2005–2019

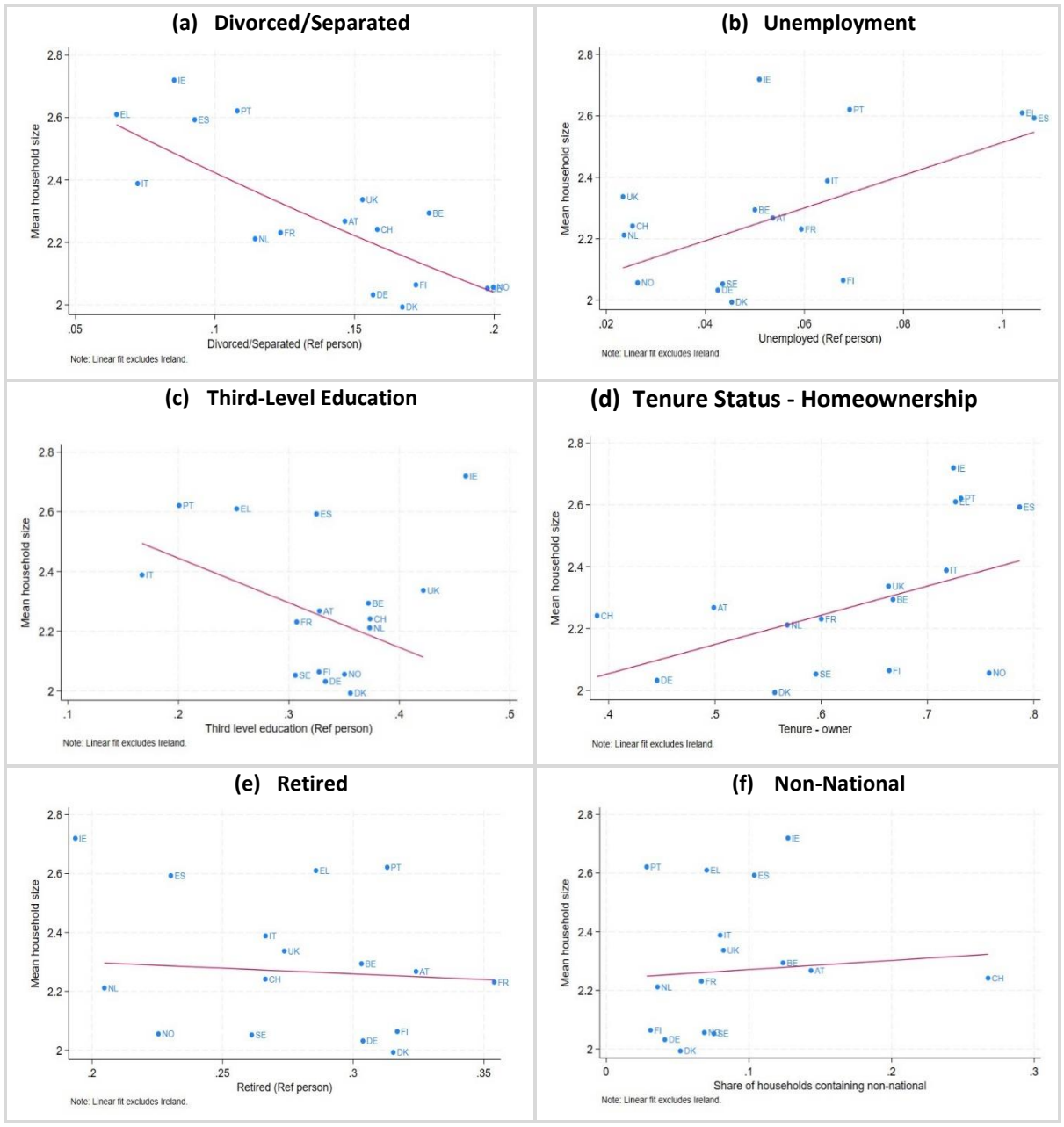


Source: Authors' analysis of Eurostat EU-SILC data.

Notes: Low: Germany, Sweden, Denmark, Finland and Norway; Medium: Italy, UK, Belgium, Austria, France, Switzerland and Netherlands; High: Portugal, Greece and Spain.

Up to this point we have observed differences across countries in both the average size of households and across a number of socio-demographic factors. Figure 8 presents simple pairwise correlations between household size and these other characteristics. Note that in each case Ireland is omitted from the line of best fit. A higher rate of divorce or separation is unsurprisingly associated with smaller household size on average. While Ireland is a clear outlier, elsewhere higher rates of third-level education are associated with smaller household size. Conversely, countries with higher rates of homeownership typically have larger households and a higher rate of unemployment is also associated with larger household size. In the final two panels of Figure 8, we see that the share of head of households who are retired appears to be unrelated to household size patterns. There is also only a very slight positive correlation between the household being headed by a non-national and household size. It appears that Switzerland here is a clear outlier with high levels of migration and low household size and may be driving this finding. It is important to note that the findings presented in Figure 8 are just simple pairwise correlations and we will test these relationships between household size and socio-economic characteristics more formally in Section 3.

FIGURE 8 PAIRWISE CORRELATIONS BETWEEN HOUSEHOLD SIZE AND SOCIO-DEMOGRAPHIC CHARACTERISTICS



Source: Authors' analysis of Eurostat EU-SILC data.

3. ECONOMETRIC ANALYSIS OF HOUSEHOLD SIZE

To this point, we have presented and discussed a range of stylised facts and trends which provide insights into the development of household size across a group of western European countries. The aim has been to contextualise Ireland's progress across a range of indicators and explore the factors that may be associated with Ireland's position. It is clear from this descriptive analysis that average household size in Ireland is high, and this appears to be strongly correlated with factors such

as a young population with a high proportion of children. However, there may be other factors which also play a role.

In this section, we attempt to undertake a more structured assessment of the factors that are associated with differences in household size across countries. Our econometric set-up proceeds in two stages. First, we undertake a micro-level assessment on the pooled cross-sectional data across countries to explore the impact different household characteristics have in explaining the level of household size. Second, we create a country-year panel dataset from the microdata to explore the impact of country-time varying factors on the changes in average household size.

3.1 Differences in household characteristics

Our first assessment explores the relationship between household level demographic and household economic characteristics and household size. To do this, we estimate a simple regression framework on the pooled cross-sectional data for each household *i* in country *c* at year *t* as follows:

$$lnHS_{i,ct} = \alpha + X_{i,ct}\beta + Z_{i,ct}\gamma + (\tau\ x\ \omega) + \varepsilon_{i,ct} \quad (1)$$

where $lnHS_{i,ct}$ is the log of household size, $X_{i,ct}$ is a vector of demographic or social variables relating to the household and $Z_{i,ct}$ is a vector of household economic characteristics. Note the purpose of Equation (1) is purely to examine the relationship between key household characteristics and the level of household size.

To ensure that, in this exercise, the estimates are not being affected by any country-time varying factors such as macroeconomic conditions, credit markets or country time varying housing market factors, we include a full set of country-time fixed effects which will purge any of these influences from our model. We return specifically to examine how changes in these types of countrywide factors over time may influence changes in household size in Section 3.2. The model is estimated over the timeframe 2005-2020 as some household variable/country combinations have missing data in 2021.

In terms of the household characteristics, we include the following variables in the model (relating to the head of household unless otherwise specified): marital status, education level, age group, whether the household is headed by a non-national and whether the household contains children under 18. Please note the marital status and children variables are included as binary dummy variables. In this

regard, they can be interpreted as fixed effects for the groups of households which have these characteristics and thus are an intercept control for differences across households in the different countries. In the vector of economic controls at the household level we include household disposable income (in logs), employment status (employed, unemployed, retired, other inactive), and whether the household lives in the rental sector. The estimated coefficients are presented in Table 1. In the first column (1), we include the household demographic and social factors, and in the second column (2), we add the economic variables. The country-time fixed effects are included in both regressions.

TABLE 1 HOUSEHOLD CHARACTERISTICS – ESTIMATED MARGINAL EFFECTS

	(1)	(2)
Married	0.422***	0.304***
	(0.001)	(0.001)
Separated	-0.102***	-0.053***
	(0.003)	(0.002)
Widowed	-0.147***	-0.148***
	(0.001)	(0.001)
Divorced	-0.100***	-0.057***
	(0.001)	(0.001)
Secondary	-0.011***	-0.053***
	(0.001)	(0.001)
Post-secondary	-0.061***	-0.127***
	(0.002)	(0.002)
Third level	-0.054***	-0.162***
	(0.001)	(0.001)
Age 30-39	-0.262***	-0.217***
	(0.002)	(0.001)
Age 40-49	-0.265***	-0.231***
	(0.002)	(0.001)
Age 50-59	-0.241***	-0.226***
	(0.002)	(0.001)
Age 60-69	-0.319***	-0.295***
	(0.002)	(0.002)
Age 70+	-0.365***	-0.320***
	(0.002)	(0.002)
Children	0.655***	0.602***
	(0.001)	(0.001)
Unemployed		0.158***
		(0.002)

Contd.

TABLE 1 CONTD.

	(1)	(2)
Retired		0.061***
		(0.001)
Other Inactive		0.144***
		(0.001)
lnYi		0.270***
		(0.001)
Renter		-0.059***
		(0.001)
Non National		0.068***
		(0.001)
Constant	0.711***	-2.034***
	-0.007	(0.010)
Observations	2,318,869	2,266,963
R-squared	0.646	0.733

Source: Authors' analysis of Eurostat EU-SILC data.
Notes: Standard errors in parentheses, * p<0.10, ** p < 0.05, *** p < 0.01.

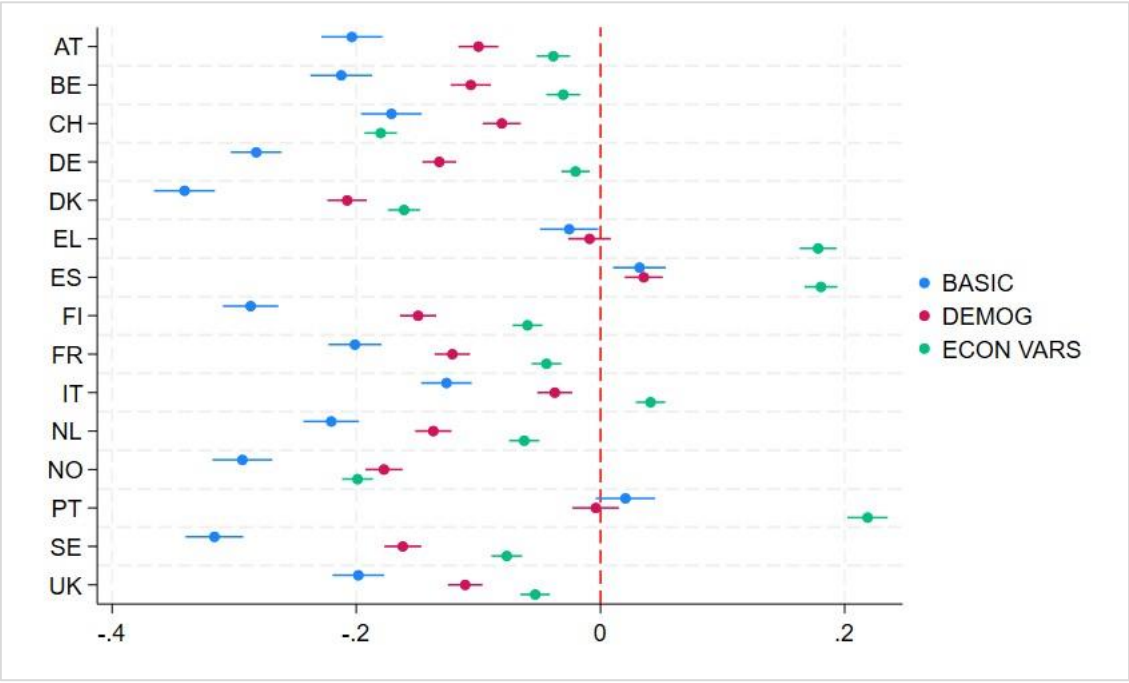
A number of findings emerge. First, being married, relative to unmarried, has a very strong positive effect on household size. Being divorced, separated or widowed reduces the average household size relative to being unmarried. These effects are in line with our prior expectations that households who are married are more likely to co-habit which raises the expected household size. We also find a negative impact of increasing education on household size: as households remain longer in education, this can potentially delay the household formation decision and potentially delay the decision to have children. We find very strong and increasing age effects: as households age, the average size of the household declines. A very strong effect comes through from having children; a household having at least one child is associated with on average larger households. While this is an expected relationship, the fact that Ireland has such a high share of households with children is a strong explanatory factor for its higher average household size. Households headed by a non-national also have a higher average household size.

In terms of the household economic variables, we find that relative to employed households, being unemployed, retired or inactive increases the average household size. It must be noted that these effects are over and above all the age, family status and other controls, and thus are comparing households holding these other factors constant. Older households (who would be more likely to be retired) have much lower household size on average. We also find a positive association between household income and average household size. We find that renters on average, across these European countries, tend to have smaller household sizes.

When we consider the structure of the European rental market, relative to Ireland, this finding would correspond to more mature rental sectors predominating. In this model the R-squared is 73 per cent which is high for a microdata model; the suite of variables included here appears to do a good job at explaining the variation in household size across countries.

The main objective of this research is to understand what is different about Ireland's average household size relative to other countries. With this aim in mind, it is informative to explore how the various household characteristics that capture some of the cross-country effects can explain the differences to Ireland. To do this, we run three models. First, we first run a parsimonious (BASIC) model which only includes the country-time dummies, and we then pull out the country fixed effects relative to Ireland. These country fixed effects will capture how different each country's household size appears relative to Ireland, when no household controls are included. Second, we then run models (1) and (2) from Table 1 to see whether some of these country fixed effects are explained by the (1) socio-demographic and (2) household economic status variables.

FIGURE 9 CROSS-COUNTRY FIXED EFFECTS ACROSS MODELS



Source: Authors' analysis of Eurostat EU-SILC data.

The country fixed effects are presented in Figure 9. The countries are listed on the y-axis and the coefficient size represents the fixed effect. Standard error bars (at the 5 per cent level) are also presented, thus any coefficient whose standard errors cross the 0 line is not statistically significantly different from Ireland. Focusing first

on the blue coefficients which represent the parsimonious specification, it is clear that all countries except Spain, Portugal and Greece have a significantly lower average household size compared to Ireland. The difference is greatest to Denmark, Norway, Sweden, Finland and Germany, a fact which was evident from the trend charts presented in Section 2.2.

However, if we move from the blue coefficients to the red coefficients, this represents the country fixed effects from the model with the household demographic variables (marital status, age, education, presence of children). In nearly all cases, the country fixed effect is now notably smaller, indicating that the variation across countries can be explained in large part by differences in these demographic characteristics. Indeed, relative to some of the Nordic countries, nearly half of the coefficient size falls away. Moving further to the green coefficients, which control for the household economic status variables (in addition to the household demographic characteristics) as in specification (2) above, again we can see the differences relative to Ireland shrink as the economic variables explain a notable part of the variation across countries. Controlling for both socio-demographic and household economic status variables brings Ireland's household size much closer to Austria, Belgium, Germany, Finland, France, Italy, Netherlands, Sweden and the UK. In contrast, the addition of the economic status variables moves Ireland further away from Greece, Spain and Portugal. This suggests that while the raw averages may have been more similar, structurally Ireland is quite different from those countries.

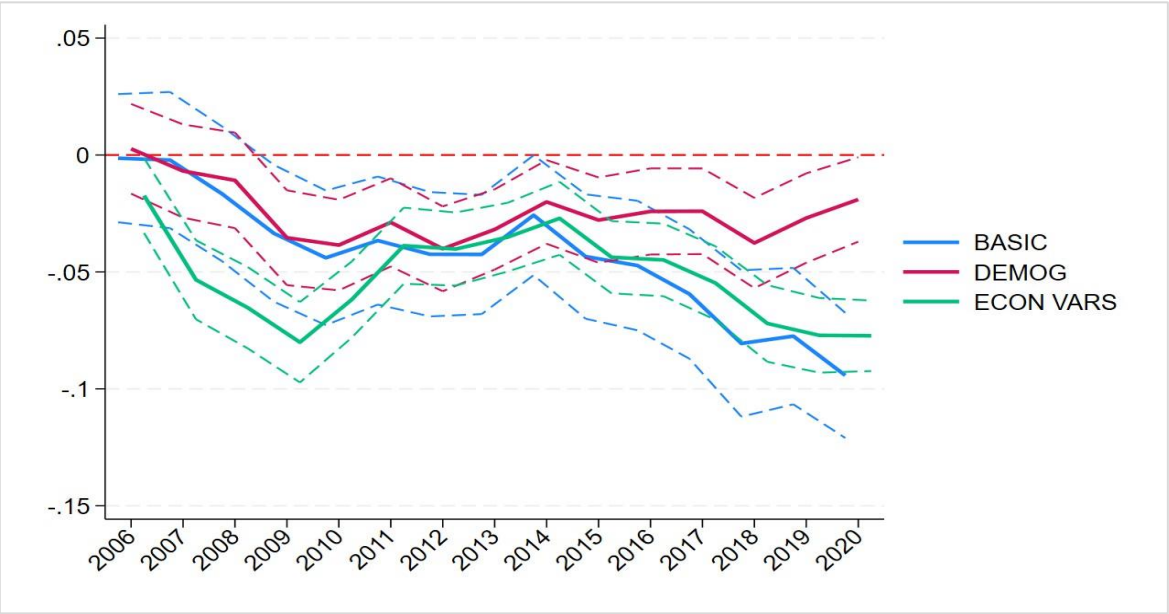
From an Irish perspective, these findings have the following implications: Ireland has a high average household size in a cross-country context but a large component of that is well explained by differences in demography (e.g. age, number of children) and social structures (marital status), as well as the economic differences in employment and incomes.

3.2 Do time varying country factors matter?

While the differences across countries are clearly evident from the descriptive charts presented in Section 2.2, as well as the country differences, the initial statistics also indicate that somewhat of a downward trend is evident across countries over time from 2005 onwards. A question arises as to whether this is related to changes in demographic structures over time or whether it can be attributed in part to time-varying macroeconomic, housing market, credit market or other factors. For example, it is possible that changes over time in house prices, credit availability, housing supply and interest rates may all exert pressure on the change in average household size if they impact household formation, overcrowding etc.

To explore whether this may in fact be the case, rather than present the country dummies from the above regressions, we instead extract the time fixed effects to test whether a trend is evident. If a statistically significant trend is evident in the data, and it changes after we control for the aforementioned factors at the household social and economic level, this allows us to infer whether the trend is unexplained by the model or captured by the set of variables we include. Figure 10 presents the relative trends over time for the three models; 5 per cent confidence intervals are also presented which allow us to judge the difference in the time coefficients from zero (red line). The base year is 2005 for all coefficients. In the basic model, a statistically significant downward trend is evident. When we consider the household demographic characteristics model (red) and the full model with all variables (green), some differences exist over time, but most years continue to show a lower level of the average household size over time. The overlapping confidence intervals also suggest that any differences across the models are not statistically significant.[5]

FIGURE 10 TIME EFFECTS ACROSS MODELS – MARGINAL EFFECTS



Source: Authors' analysis of Eurostat EU-SILC data.

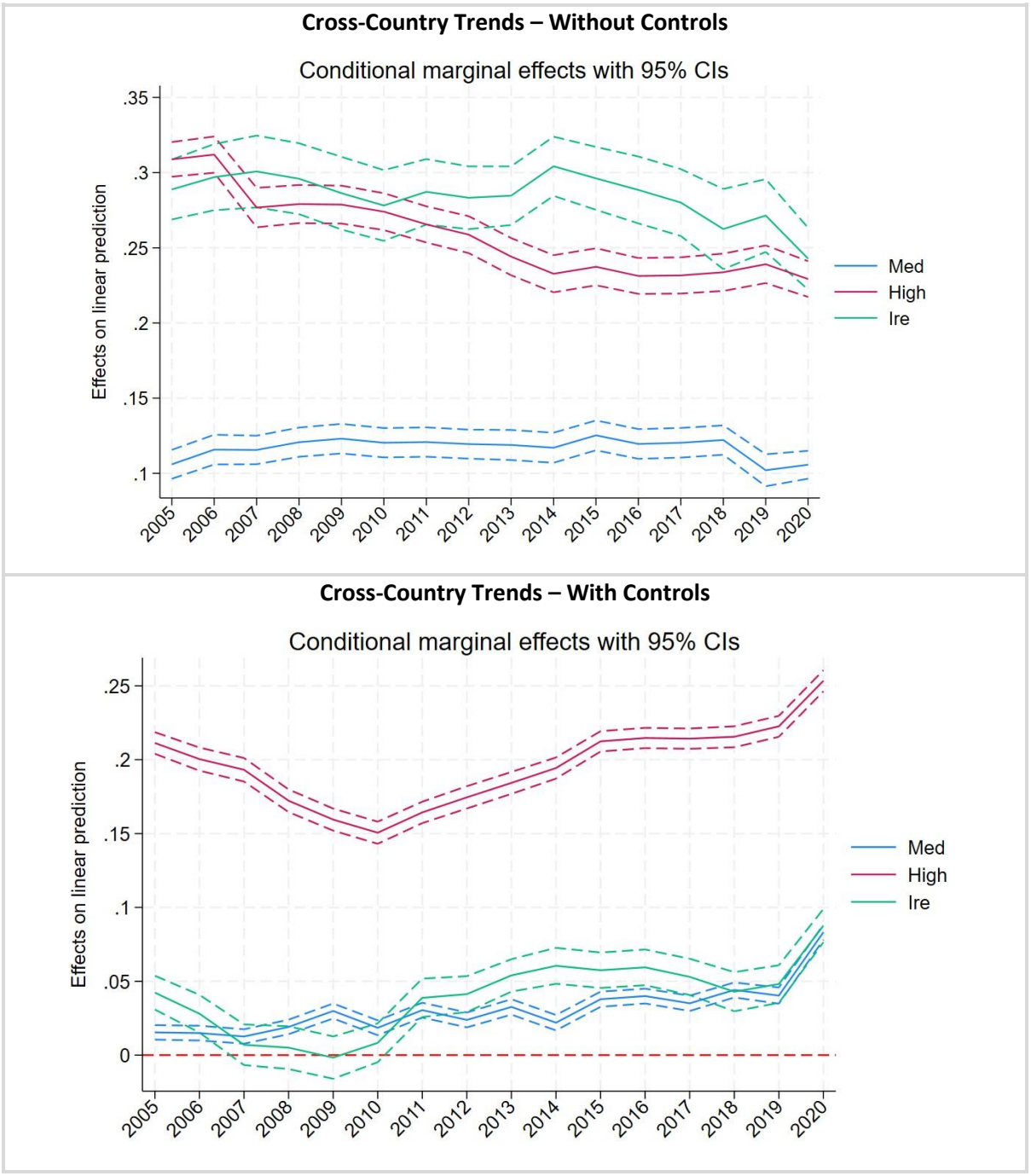
To this point, we have considered both the differences across countries and also the differences over time. However, we have not considered the trend in different country groups over time. To understand this in some more detail we alter the model and replace the country dummies with the country groups outlined in

5 If the confidence intervals from the two regressions overlap, this indicates that they are not statistically different from each other at that confidence level.

Figure 7. We run two models: a) first with these country groups interacted with time dummies; and b) with the interactions and all the controls. The aim is to explore whether the differences over time in the groups are explained by the characteristics. The first group (which includes Germany, Finland, Norway, Denmark and Sweden) is set as the reference category. The trend over time across the groups is presented in Figure 11. In the first figure, the differences across the groups are very clearly evident. The middle group (in blue) is statistically different from the low group (reference category) in all years. No clear trend is evident however. Ireland and the high group (Spain, Portugal and Greece) are relatively similar and notably higher than the reference (low) and middle group.

In the second figure, what is interesting is that Ireland converges down to the middle and low groups as well as a notable change in the trends over time. This occurs as we have included the household controls in the model both for the socio-demographic variables as well as the economic variables at the household level. This indicates that the raw differences in average household size between Ireland and the other country groups (in particular to the middle group) can be explained in the main by observed differences in household characteristics. The high group appears to be structurally different from Ireland and this is unexplained by the household socio-demographic and economic status variables in our model.

FIGURE 11 DIFFERENTIAL COUNTRY TIME TRENDS – MARGINAL EFFECTS



Source: Authors' analysis of Eurostat EU-SILC data.
Notes: Medium: Italy, UK, Belgium, Austria, France, Switzerland and Netherlands; High: Portugal, Greece and Spain. Omitted reference group: the low group (Germany, Finland, Norway, Denmark and Sweden).

To explain the mechanisms behind this shift in a little more detail, the first chart shows that Ireland has a much higher level of household size to the lowest group, similar to the group of high countries. However, when we include the control variables, the differences between Ireland and the medium group are eliminated i.e. the variables that we have included explain the difference and it no longer remains in the cross-country trend coefficient. However, the difference with the

high group remains, suggesting we cannot explain why that group have such high household size rates and these are structurally different. The implication for Ireland is that the socio-demographic and economic variables we include can explain why it is different, and thus give us clarity on why Ireland is higher than the medium group of countries.

3.3 Do time varying country factors matter?

The analysis to this point highlights that a large component in the variation in household size across countries is explained by differing socio-demographic structures. In these analyses we have removed the effects of time-varying country level factors using country-time fixed effects, which has allowed us to isolate the impact of household socio-demographic and economic status variables. However, a final question arises as to whether some of the time-varying factors actually matter, in particular where changes in a country's financial, economic or housing market variables occur.

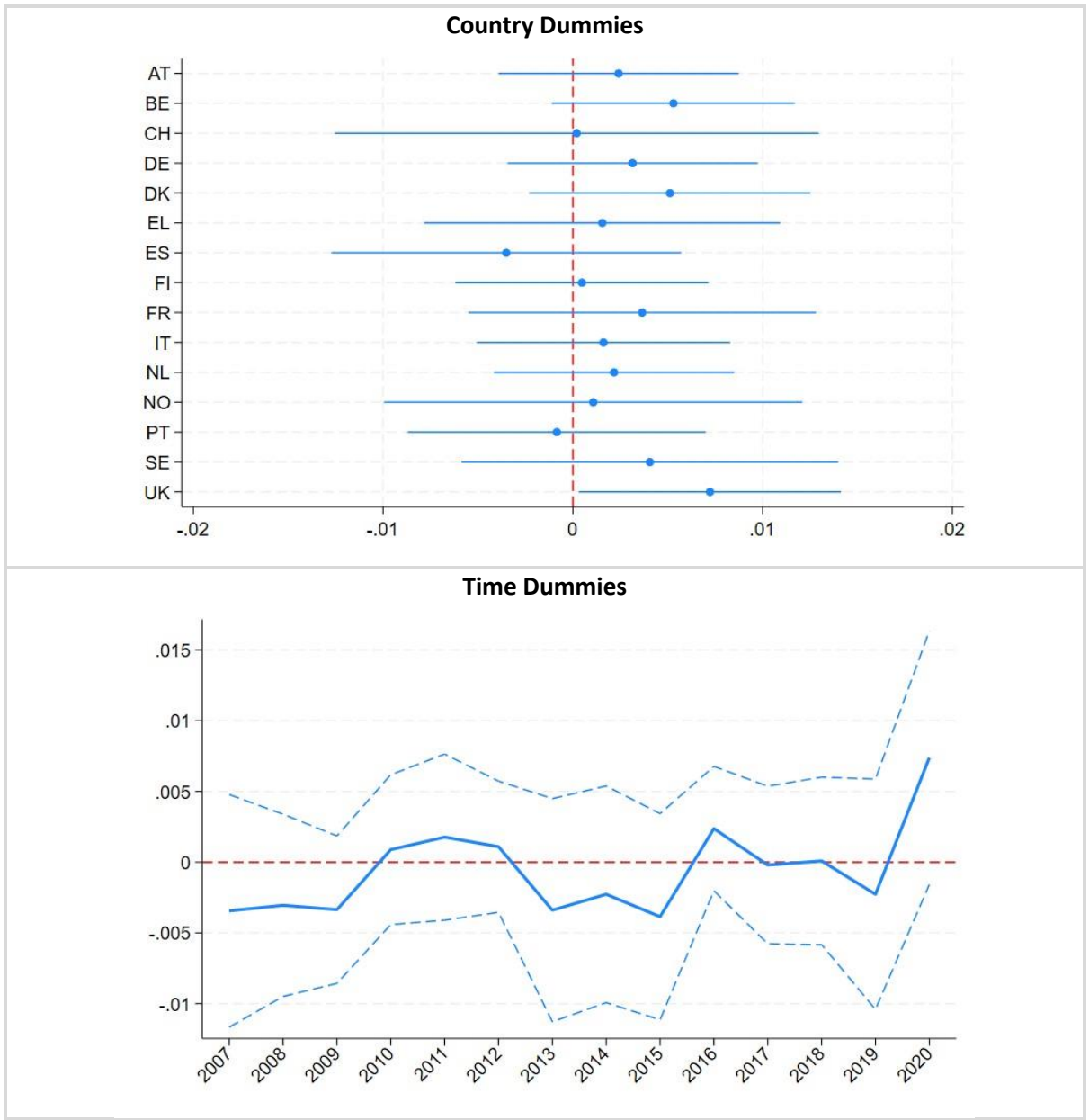
To attempt to shed some light onto this, we collapse the microdata at the country-year level at the average of key variables. We then run a cross-country panel model which attempts to explain changes in the log average household size ($\Delta lnHS_{ct}$) across countries as follows:

$$\Delta lnHS_{ct} = \alpha + \Delta lnX_{ct}\beta + \Delta lnG_{ct-1}\gamma + \tau_t + \omega_c + \varepsilon_{ct} \quad (2)$$

where ΔlnX_{ct} is a vector of socio-demographic variables that were important in the first set of household-level regressions, including the average share of married persons, the average age, the proportion of third-level education and the proportion of households with children (all in logs). Controls are also included for the share of households who are renters as well as the share of households whose household head is a non-national. We also include the share of employed persons and the average disposable income level (in logs). All of these variables are entered into the model in first differences to test the impact of changes in these factors on changes in household size. The economic variables are entered with a one-year lag to avoid any contemporaneous reverse causality. In addition to these variables, in the vector ΔlnG_{ct-1}, we include a number of housing market and financial variables to test whether any of these factors can explain the variation in household size. These variables include changes in house prices, changes in the housing stock per capita (to measure housing supply), changes in mortgage lending interest rates and changes in mortgage credit. These variables are also included with a lag to remove any contemporaneous reverse causality concerns. All variables are included in logs. In all specifications, we include fixed effects for time and country. As the regression is a log-log specification, coefficients can be interpreted as an elasticity i.e. a 1 per cent change in the explanatory variable impacts the dependent variable by the size of the coefficient.

To begin, and in a similar vein to our previous analysis, we first run a parsimonious model which includes only country fixed effects and time fixed effects. The country and time dummies are presented in Figure 12. The reference category for the country fixed effects is Ireland. There does not appear to be any major downward trend over time and no major differences are evident across countries.

FIGURE 12 PANEL REGRESSION – TIME AND COUNTRY FIXED EFFECTS



Source: Authors' analysis of Eurostat EU-SILC data.

We now come to the results of our regression analysis. These are presented in Table 2. In column (1) we only include the household variables. There is a strong impact of the change in marital status as well as the change in the share of

households with children. These variables are highly significant and positive: a 1 per cent increase in the share of married households and a 1 per cent increase in the share of households with children increases the average household size by 0.21 per cent and 0.19 per cent respectively. The age effects are of a similar magnitude but the coefficient is negative and insignificant. The insignificance of age is likely to reflect the fact that this variable is correlated with other factors such as the impact of children and marital status (these likely capture differences in the age structure across countries, thus the ageing factors are being controlled for using the other variables). There is no effect evident of the increase in the third-level education share or increases in average incomes. The R-squared in this regression is nearly 0.6 which suggests a large proportion of the variation in the change in household size is driven by these variables.[6]

[6] Additional specifications with the inclusion of lagged net migration and changes in the Gini coefficient are reported in Table A1. Neither were found to be statistically significant. While we do not find evidence in the short-term that changes in migration flows impact changes in household size, the positive statistically significant coefficient for non-nationals in Table 1 does aim to capture this migration channel. This suggests that any impact of migration on household size is likely to be a longer-term effect.

TABLE 2 TIME VARYING CHARACTERISTICS – MARGINAL EFFECTS

	(1)	(2)	(3)	(4)	(5)	(6)
ΔlnMarried t	0.214***	0.214***	0.212***	0.213***	0.213***	0.211***
	(0.042)	(0.041)	(0.043)	(0.043)	(0.041)	(0.043)
ΔlnAge t	-0.170	-0.200*	-0.168	-0.166	-0.169	-0.192
	(0.115)	(0.116)	(0.115)	(0.117)	(0.114)	(0.117)
ΔlnThird Level t	0.01	0.011	0.01	0.011	0.01	0.011
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
ΔlnKids t	0.188***	0.190***	0.187***	0.187***	0.188***	0.189***
	(0.029)	(0.028)	(0.029)	(0.029)	(0.028)	(0.028)
ΔlnEmploy t-1	0.037	0.037	0.040	0.038	0.039*	0.041*
	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.024)
Δln(Y) t-1	0.005	0.003	0.008	0.005	0.01	0.009
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
ΔlnNon-National t	-0.003	-0.002	-0.002	-0.003	-0.001	-0.001
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)
Δln(HS.p.c) t-1		-0.090**				-0.083*
		(0.042)				(0.043)
Δln(HP) t-1			-0.009			-0.004
			(0.015)			(0.016)
Δln(r) t-1				-0.002		-0.002
				(0.005)		(0.005)
Δln(C) t-1					-0.016*	-0.014
					(0.009)	(0.010)
Observations	216	216	216	216	216	216
R-squared	0.584	0.590	0.586	0.585	0.590	0.595

Source: Authors' analysis of Eurostat data.
Notes: Standard errors in parentheses * p<0.10, ** p<0.05, *** p<0.01.

For the housing and financial variables, we include these separately in regressions (2) to (5) and then jointly in regression (6). In our specifications, we do not find an impact of changes in house prices, interest rates or credit on changes in household size. We find some slight effect of additional credit (column 5), but this does not hold when all other factors are controlled for, meaning the finding is not robust (column 6). However, we do find evidence of a housing supply effect that is statistically significant at the 10 per cent level. As housing supply rises (as proxied by a higher housing stock per capita) by 1 per cent, the growth in household size declines by 0.083 per cent. It must be noted that while we may not find impacts of other housing variables in this analysis, it does not necessarily mean that they do not have an influence over the household size in the long run. If a longer sample was available, or if more countries were included, the results of these findings might change. Furthermore, we do not claim that these findings are causal in nature as we do not deal with omitted variables and other sources of endogeneity (outside

reverse causality). For example, changes in mortgage credit availability and the cost of borrowing may impact specific cohorts of the market seeking to access credit, and therefore may not come through as large-scale effects for the population as a whole.

These findings suggest opposing effects of additional housing supply and demographics, whereby a population with more children and married couples increases household size by raising the growth rate, and increased housing supply lowers the growth in household size. It appears from the elasticities in the regression that the effect of the demographics is stronger than the housing supply effect. However, the unit differences in these variables mean this is not necessarily a straightforward conclusion. To test the impact of economic magnitude of these variables, we run an exercise similar to that in McClean et al. (2012) which explores the impact of a one standard deviation shock to each variable on the sample mean. The benefit of this is that it allows each variable to impact the sample average change in household size by the type of shock seen in the data for that variable. It is therefore a plausible shock to deploy into the data. It also allows the difference in the levels of the independent variables to be controlled for as the standard deviation is unique to each level. Our calculations use the following formula:

$$\Delta\mu_{\Delta lnHS} = \mu_{\Delta lnHS} + \beta_{var}\, x\, \sigma_{var}$$

where $\mu_{\Delta lnHS}$ is the sample average change in the log of household size. We take each of the significant variables (housing stock, marital status, children), use the coefficient from Table 2 (β_{var}) which is multiplied by the standard deviation for each variable (σ_{var}) and then added to the mean to see how a typical shock impacts the mean. The figures are presented in Table 3.

TABLE 3 EXPLORING THE ECONOMIC MAGNITUDES

Variable	(1) β_{var}	(2) σ_{var}	(3) $\beta_{var}\, x\, \sigma_{var}$	(4) $\Delta\mu_{\Delta lnHS}$
Δln(HS.p.c) t-1	-0.083	0.0105	-0.0009	-0.0051
ΔlnMarried t	0.211	0.0235	-0.0049	0.00007
ΔlnKids t	0.189	0.0219	0.004	-0.000

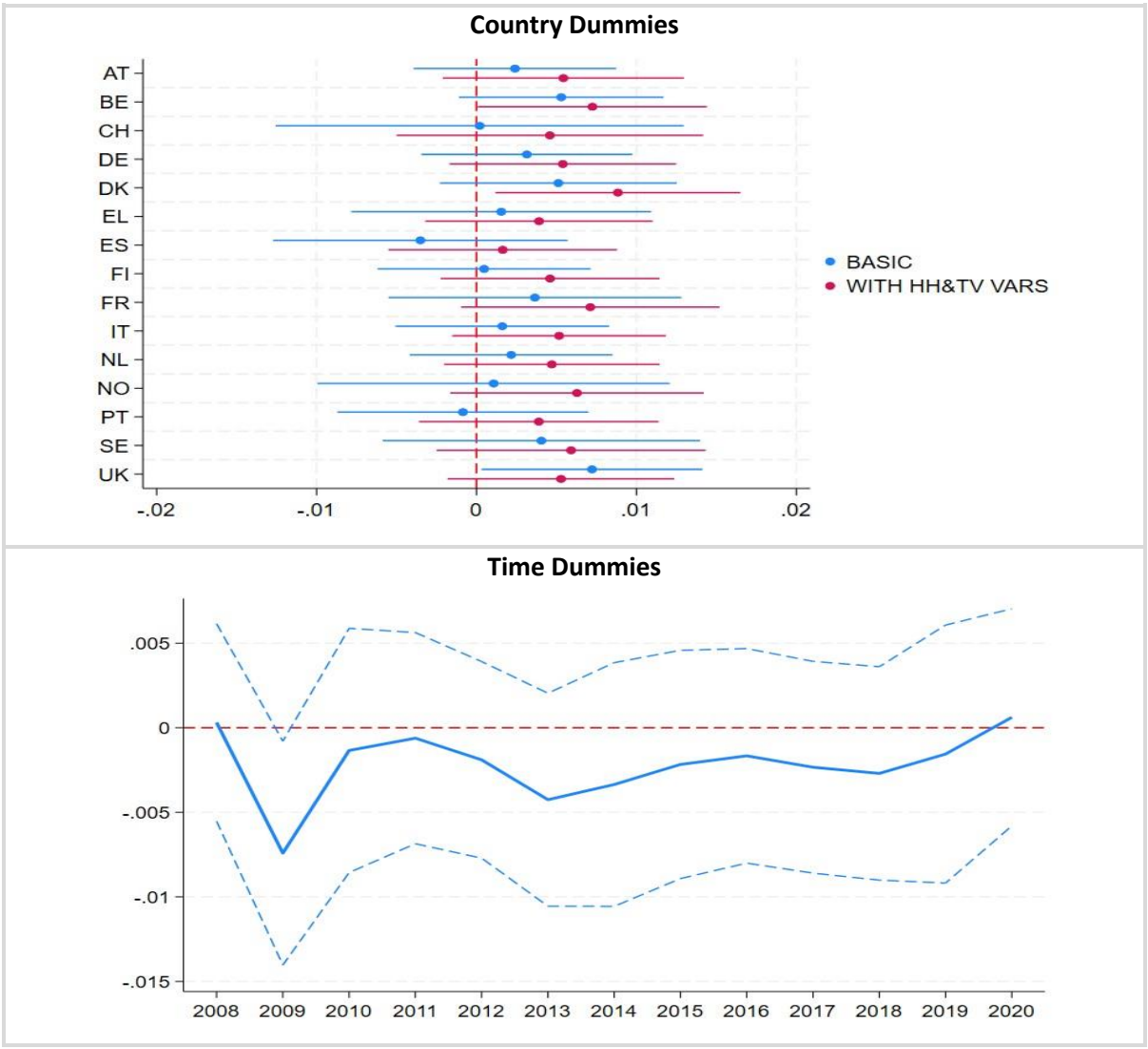
Source: Authors' analysis of Eurostat EU-SILC data.
Note: μ_ΔlnHS = -0.0043.

Firstly, the average change in household size across the sample is negative and amounts to -0.0043 on average (less than -0.43 per cent). This suggests the level of household size is very slow moving across the sample. The impact of a shock to housing supply reduces the mean change in household size by 0.0009 to -0.0051. The impact of a shock to marital status is larger than that of housing supply at

0.0049. In the case of marital status, the mean change in household size actually becomes positive. The magnitude of the impact for a shock to age is similar in magnitude to that for housing supply.

A final test we conduct is to re-calculate the time and country dummies for the model with all the controls (Model 6). We also include for the country dummies (Model 1). The results are presented in Figure 13. Again there does not appear to be any downward trend over time and no major differences are evident across countries.

FIGURE 13 PANEL REGRESSION – TIME AND COUNTRY FIXED EFFECTS AFTER CONTROLS



Source: Authors' analysis of Eurostat EU-SILC data.

4. WHAT DOES THIS MEAN FOR HOUSEHOLD SIZE IN IRELAND?

In the previous sections we documented large differences in average household size across countries and that differences in socio-demographic characteristics help to explain a large portion of these differences. In particular, we saw that the differences observed in household size between Ireland and the middle group of countries (Austria, France, Belgium, Netherlands, Italy, Switzerland and the UK) can in the main be explained by differences in household socio-demographic and economic status characteristics such as age, number of children, marital status, income and employment. In addition, over and above the differences driven by socio-demographic factors, we also find evidence that shorter-term changes in household size are affected by short-run changes in housing supply. The question arises as to what implications these findings have for the likely trajectory of household size patterns in Ireland. The aim of this section is to provide indicative inputs into Bergin and Egan's (forthcoming) broader research on household formation trends in Ireland.

Household size is a key parameter when projecting future housing demand as it turns population estimates into households and therefore any assumptions made about the likely future path of household size will have implications for housing demand estimates. In previous work, Bergin and Garcia-Rodriguez (2020) assume a constant headship rate i.e. that household size remains unchanged over their projection period. Similarly, Conefrey and Staunton (2019) also assume a constant headship rate in their housing demand projections. They also conduct an alternative scenario where the headship rate increases (i.e. household size falls) in a linear fashion to UK levels over time.

Bergin and Garcia-Rodriguez (2020) utilise narrow five-year age bands for headship rates in their projections. In Table 4 we therefore present average household size for narrower age bands in both 2007 and 2018, as well as documenting the changes in household size over this time period. Figures are presented overall and separately for Ireland as well as for the low, medium and high household size country groupings previously used in Section 2.2. Note only ten-year age bands are feasible using the EU-SILC household survey data and the ages here refer to the head of household.

TABLE 4 LEVEL OF HOUSEHOLD SIZE OVER TIME

Age Group < 30 Years					
	Low	Med	High	Ireland	Total
2007	1.92	2.27	2.90	3.08	2.54
2018	1.92	2.33	2.84	3.22	2.58
CAGR	0.0%	0.2%	-0.2%	0.4%	0.1%
Age Group 30-39 Years					
	Low	Med	High	Ireland	Total
2007	2.22	2.48	2.66	2.98	2.58
2018	2.15	2.44	2.51	2.82	2.48
CAGR	-0.3%	-0.1%	-0.5%	-0.5%	-0.4%
Age Group 40-49 Years					
	Low	Med	High	Ireland	Total
2007	2.21	2.59	2.87	2.95	2.65
2018	2.20	2.48	2.67	2.81	2.54
CAGR	-0.1%	-0.4%	-0.6%	-0.4%	-0.4%
Age Group 50-59 Years					
	Low	Med	High	Ireland	Total
2007	1.73	1.98	2.52	2.39	2.15
2018	1.66	1.96	2.31	2.27	2.05
CAGR	-0.4%	-0.1%	-0.8%	-0.4%	-0.5%
Age Group 60-69 Years					
	Low	Med	High	Ireland	Total
2007	1.50	1.67	1.98	1.77	1.73
2018	1.44	1.61	1.86	1.63	1.64
CAGR	-0.4%	-0.3%	-0.6%	-0.7%	-0.5%
Age Group 70+ Years					
	Low	Med	High	Ireland	Total
2007	1.36	1.38	1.60	1.41	1.44
2018	1.37	1.40	1.54	1.37	1.42
CAGR	0.1%	0.2%	-0.3%	-0.3%	-0.1%

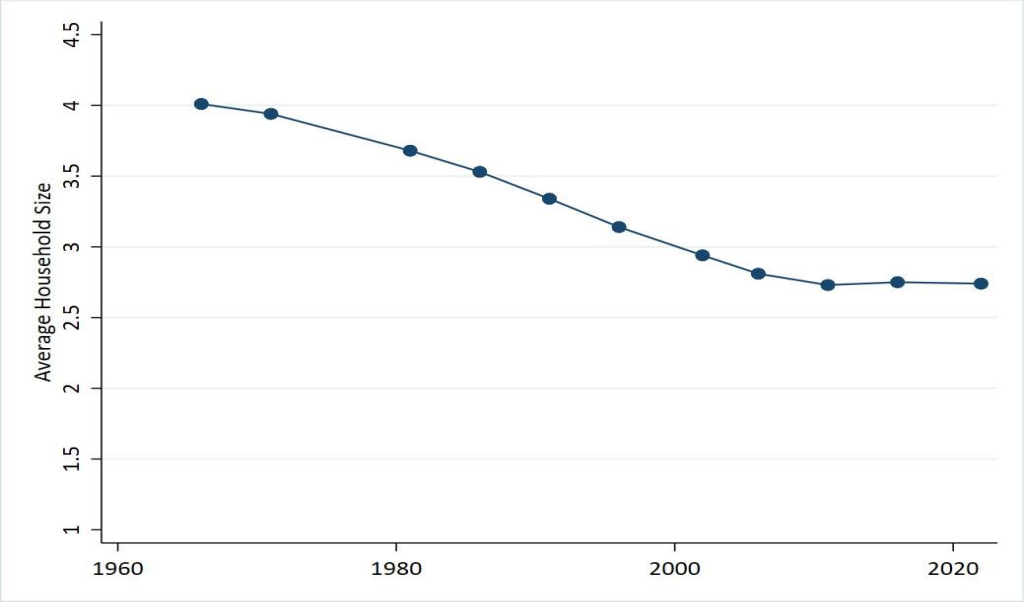
Source: Authors' analysis of Eurostat EU-SILC data.
Notes: We use 2007 and 2018 as these are the first and last years for which we have data for all countries in the sample. Stopping in 2018 also avoids the fall in household size seen in the EU-SILC data for 2018-2021 which is not observed in the Irish Census data. Low - Finland, Denmark, Sweden, Norway, Germany. Med - Austria, Belgium, Netherlands, France, Switzerland, Italy, UK. High - Spain, Greece, Portugal.

For households headed by individuals aged 70 plus, Ireland's household size is very similar to those seen in the low and medium group countries and lower than in the high group countries. This likely reflects higher levels of multi-generational living in the high group southern European countries. At the other end of the age spectrum,

households in Ireland headed by someone under the age of 30 see the highest household size, above those seen in the high group countries. These findings are consistent with Disch and Slaymaker (2023) who show that Ireland has the lowest share of single adult households amongst independently formed households under 40. Looking at the changes over the 2007-2018 period, falls in household size have generally been concentrated across middle-aged households in all of the country groupings. The magnitude of the falls has been pretty small over this period across the various age groups. The under 30s are the only age group in Ireland to see an increase in household size over the 2007-2018 period. It is plausible that this may have been influenced by the well-documented housing affordability and availability issues identified by Disch and Slaymaker (2023) but could also be due to high birth rates and demographic factors.

A limitation of the EU-SILC household datasets used in Sections 2 and 3 above is that they only permit analysis from the mid-2000s onwards, a relatively short timeframe in the context of observing changes in household size and key demographics. At this juncture it is useful to take a longer-term perspective on these trends. Using historical Census data, Figure 14 shows that the average household size in Ireland decreased with every Census between 1966 and 2011, falling from around 4 to 2.73 in that time. Since the 2011 Census it has remained static, standing at 2.75 in 2016 and 2.74 in 2022.[7] Note that these figures refer to the trends for the population as a whole, not for separate age groups.

FIGURE 14 AVERAGE HOUSEHOLD SIZE IN IRELAND: 1966–2022



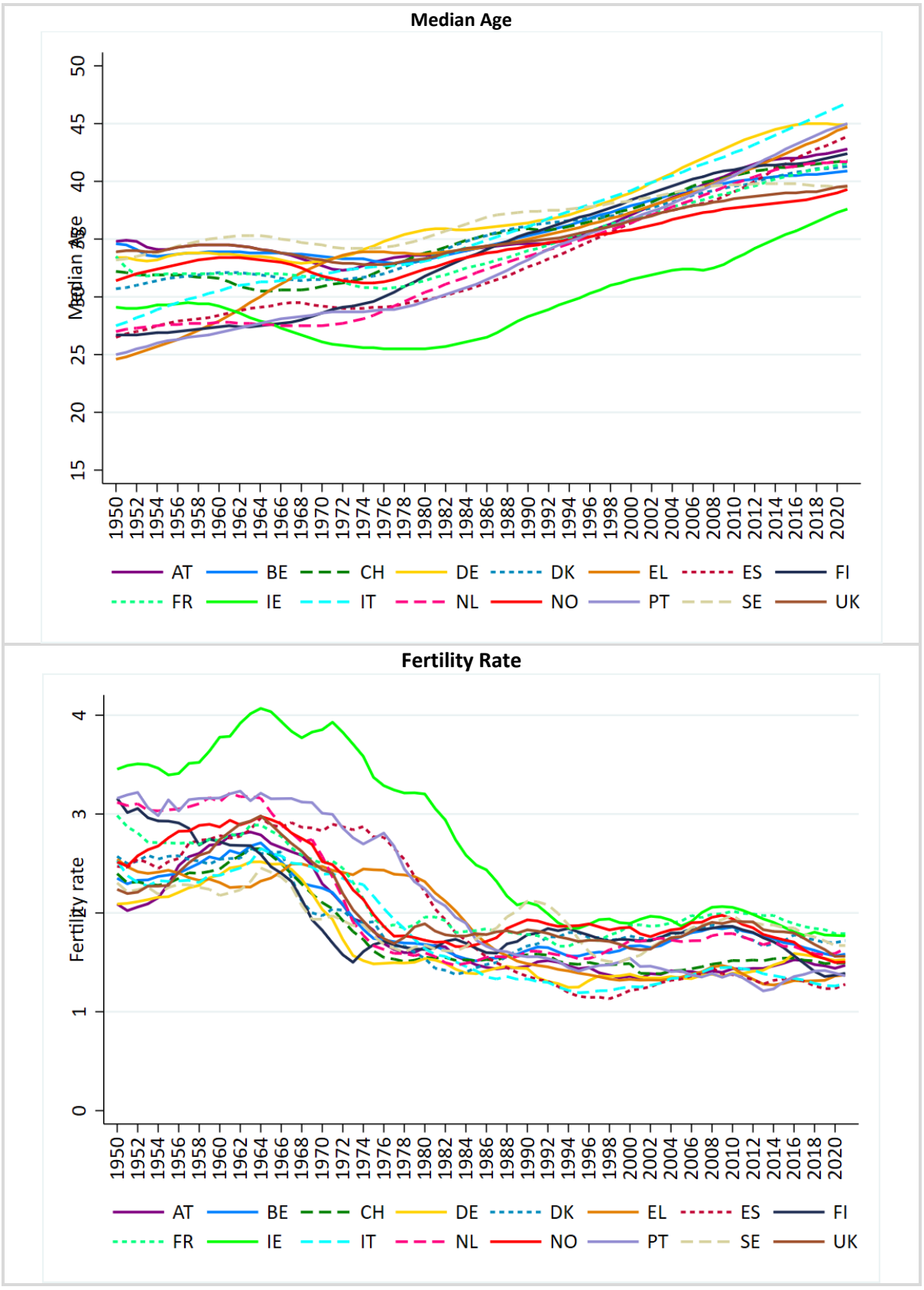
Source: Authors' analysis of CSO data.

7 For comparison the corresponding figures from EU-SILC for Ireland were 2.7 in both 2011 and 2016. From 2018-2021 the EU-SILC figures declined slightly, falling to 2.6 in 2021, a fall not observed in the Census data for 2022 where the average household size remained at 2.74.

Two key factors associated with Ireland's higher average household size in our analysis in Section 3 were Ireland's younger age structure and higher numbers of children. Cross-country data from the UN on median household age and fertility rates on a long-term cross-country basis dating back to 1950 are presented in Figure 15. The most striking difference is how much higher Ireland's fertility rate was compared to other countries up to the mid-1990s. In the early 1970s Ireland's fertility rate stood at just under 4, with Portugal the next highest around 3 and the majority of countries between 1.5 and 2.5. Between the mid-1970s and the mid-1990s Ireland's fertility rate declined drastically, halving from around 4 to just under 2 over that period. This coincided with a fairly rapid fall in Ireland's average household size (Figure 14). From the 1990s onwards Ireland's fertility rate has remained one of the highest amongst these western European countries, standing at 1.77 in 2021, second only to France (1.79).

However, while Ireland's fertility rate is at the top end of the countries studied, it is not now drastically out of line as it was prior to the 1990s. This may suggest that any major, rapid convergence in Ireland's household size relative to other western European countries may have already occurred and any future convergence may be more gradual. However, the recent stalling in the decline in household size from 2011 onwards may indicate other factors have become important, and this longer term trend may re-emerge over time as discussed below.

FIGURE 15 CROSS-COUNTRY DEVELOPMENTS IN MEDIAN AGE AND FERTILITY RATES: 1950–2021



Source: Authors' analysis of UN data.

Our findings indicate that future changes in household size are likely to be driven primarily by demographics; Ireland's age and fertility dynamics in particular would suggest we would expect to see average household size fall over time. Over and above this, our findings also highlight that changes in housing supply are likely to impact the rate at which this happens. With Ireland seeing the highest average household size amongst the western European countries studied, we might have expected to see some convergence towards the other western European countries over the 2007-2018 period, but this was not the case. Indeed, from the Census figures in Figure 14, household size remained pretty much constant between 2011 and 2022 in Ireland. It is important to acknowledge the very low levels of construction in Ireland during much of this period, particularly in the years following the Global Financial Crisis. While demographics are likely to drive the majority of changes in household size patterns, sustained increases in housing supply could result in a continuation of the previously observed downward trajectory in household size. Both the composition as well as the level of housing supply are likely to matter; i.e. as the Irish population ages, it is probable that household size will drop, but this finding is likely contingent on the type of housing supply that is available. Ensuring that the housing stock is rightsized to the population (for example the balance across smaller housing units like apartments and larger houses) is another aspect of the link between population dynamics and household size which needs further exploration.

5. CONCLUSION

The aim of this work has been to present some stylised facts around trends in household size on a cross-country basis and then to explore the correlation of household size to potential determinants such as socio-demographic characteristics, economic factors and other influences. To do so we have utilised the cross-country nationally representative EU-SILC dataset and a subset of 16 western European countries. Our modelling framework had two components. First, we undertook a micro-level assessment on the cross-sectional data across countries to explore the impact household factors have in explaining the level of household size. Second, we created a country-year panel dataset from the microdata to explore the impact of time varying factors on the changes in household size.

It is clear from our analysis that average household size in Ireland is high. The countries fall into three distinct groups: Ireland is highest with Spain, Portugal and Greece; a second group of countries in the middle including Italy, France, the UK, Austria, Belgium, Netherlands and Switzerland. The group of countries with the lowest household sizes are the Nordic countries of Denmark, Sweden, Finland, Norway and also Germany. The EU-SILC datasets also show a downward trend in household size across countries between 2005-2021 although Census data for

Ireland show the long-term downward trajectory stalled in Ireland between 2011 and 2022.

We find the differences observed in household size between Ireland and the middle group of countries can in the main be explained by differences in household socio-demographic and economic characteristics such as age, number of children, marital status, income and employment. On the other hand, the other countries with high household size, Greece, Portugal and Spain, appear to be structurally different and these differences are not explained by the variables in the model. In addition, over and above the differences driven by socio-demographic factors, we also find evidence that shorter-term changes in household size are affected by short-run changes in housing supply, with an increase in supply associated with a fall in household size. It must be noted that while we may not find statistically significant impacts of other housing variables in this analysis, ours is a short-run analysis based on yearly changes in these factors; it does not necessarily mean that key housing factors and policies do not have an influence over the household size in the long run. These may be longer-run, more structural factors and therefore remain part of the unexplained country specific component in the model. If a longer sample was available, or if more countries were included, the results of these findings might change.

The magnitude of our findings suggests that demographic factors (ageing, marital status and children) are likely to outweigh the effects of changes to housing supply, thus changes are likely to be driven by demographics. However, that notwithstanding, the fact that housing supply exerts a negative influence on the household size indicates that a sustained period in which a society encounters difficulties in achieving increases in housing could well offset any change due to demographics. i.e. if the population ages, has fewer children etc., one would expect household size to fall. However, without sufficient supply these effects may not be able to materialise.

For Ireland, the high birth rate and relatively young population compared to other countries indicate that any convergence, not seen in the period of our SILC analysis, will only come if the demographic conditions change. The timeframe for any re-emergence of convergence factors is likely to be generational as the population ages. Over and above this though, our findings highlight that changes in housing supply are likely to impact the rate at which this happens. This is consistent with (but not fully explained by) the pause in the downward trajectory in Ireland's household size between 2011-2022, which coincided with the low levels of housing supply in the wake of the Global Financial Crisis. The magnitude of our estimated coefficients and our illustrative economic shocks would suggest that the combined effect of the demographic factors is much larger than any housing supply impacts

when considering the change in household size across countries, over our sample period.

That notwithstanding, as we do find a role for housing supply to impact household size, any future scenarios for housing demand requirements should incorporate, at least implicitly, feasible ranges for housing supply. Furthermore, any projections for future household numbers or housing demand would likely benefit from the deployment of age-specific household size trends which allow natural population dynamics to influence household size. Indeed, in our research we find little difference between Ireland and other countries in terms of household size for older age cohorts, with the younger age cohorts being the driving factors behind Irish household size levels. However, given the lagged impact of housing supply on household size (as indicated in our model), the achievement of future housing formation levels is going to depend on the path of housing supply i.e. in an Irish context, any reduction in household size which impacts housing demand will be likely predicated on achieving sufficient near-term housing supply levels to enable this.

At this juncture it is important to highlight the dynamic and endogenous nature of household size patterns. While we are not able to make causal statements, our findings show that holding other factors constant, household size is affected by a series of socio-demographic and economic factors. This interdependence highlights the need for regular monitoring and reappraisal of key parameters such as household size, and any resulting impacts on housing demand, as these factors are not static.

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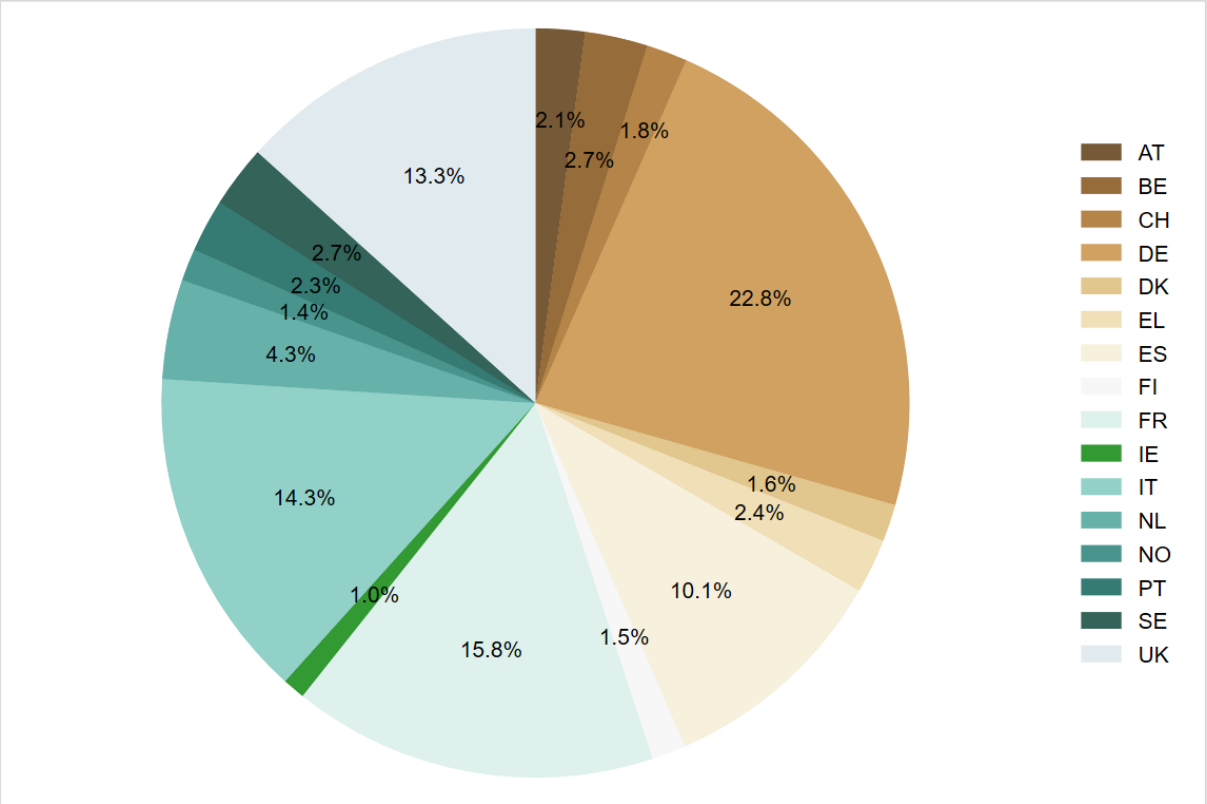
APPENDIX 1 EU SILC SAMPLE DESCRIPTIVES AND ADDITIONAL REGRESSIONS

FIGURE A.1 OBSERVATIONS ACROSS COUNTRIES (% OF TOTAL): 2005–2021



Source: Authors' analysis of Eurostat data. Data are weighted.

TABLE A.1 TIME VARYING CHARACTERISTICS – MARGINAL EFFECTS WITH MIGRATION AND GINI COEFFICIENT

	(1)	(2)	(3)
Δln(HP) t-1	-0.014	-0.013	-0.015
	(0.016)	(0.017)	(0.016)
Δln(HS.p.c) t-1	-0.094**	-0.075*	-0.094*
	(0.048)	(0.041)	(0.048)
Δln(r) t-1	-0.005	-0.005	-0.005
	(0.005)	(0.005)	(0.005)
Δln(C) t-1	-0.007	-0.010	-0.009
	(0.013)	(0.014)	(0.014)
Δln(Gini) t-1	-0.035		-0.038
	(0.025)		(0.025)
ln(Net Migration) t-1		0.000	0.001
		(0.001)	(0.001)
Observations	216	216	216
R-squared	0.587	0.593	0.588

Source: Authors' analysis of Eurostat EU-SILC data.
Notes: Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

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