

Cost of Living Symposium

Inflation and Monetary Policy – What Next?

Reamonn Lydon
Central Bank of Ireland

(read before the Society, 8th December 2022)

Abstract: A combination of pandemic-related bottlenecks, strong demand and the war in Ukraine have contributed to record-high rates of inflation in the euro area and Ireland. Since the late-2022 inflation peak, headline inflation has started to decline, partly as a result of falling energy prices. However, underlying and core measures of inflation remain elevated and, until there is a clear shift in momentum in these metrics, policy makers are likely to see this as a potential upside risk to medium term inflation dynamics. Going forward, wage and profit developments, as well as evidence on the transmission of monetary policy to the real economy, will be key to calibrating the future path for monetary policy. Household resilience has been tested by large price increases and rising interest rates. Evidence suggests that to-date, inflation has been relatively more burdensome for households, especially for those with limited savings and where energy and food spending was already a significant share of their spending.

Keywords: Inflation, monetary policy transmission, interest rates, distribution of income and wealth.

JELs: E31, E52, E43, D31

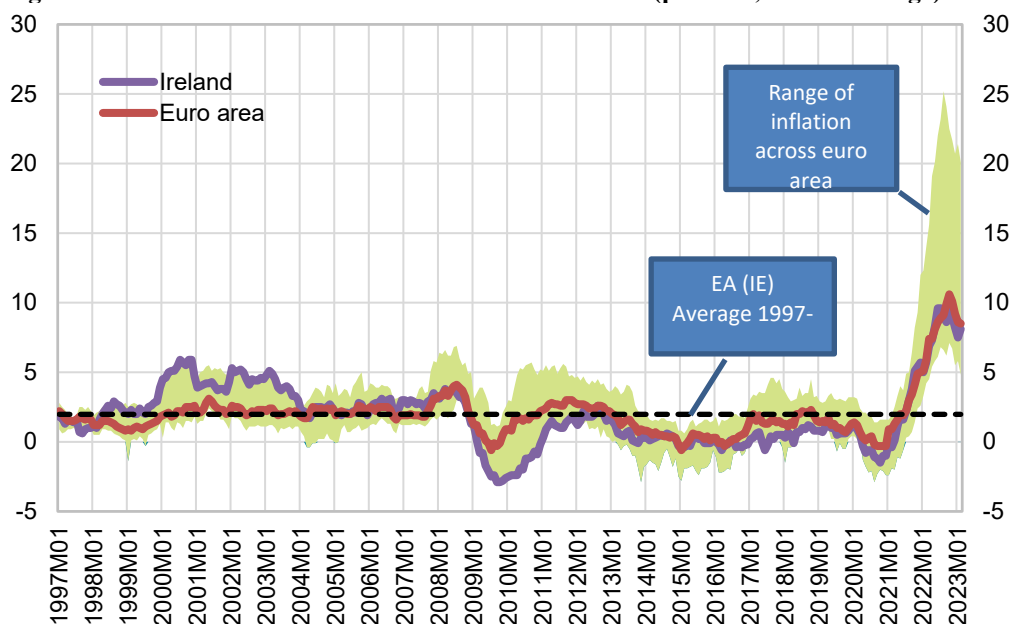
1. INTRODUCTION

The combined effects of pandemic supply chain disruptions, a rapid rebound in demand as economies re-opened after the pandemic, and war-related energy and food price shocks have all contributed to very high rates of inflation in Ireland and the euro area ('EA'). In February 2023, headline inflation was 8% in Ireland and 8.5% in the euro area. This was down from peaks of 9.4% (Ireland) and 10.6% (EA) in October (see Figure 1). The slowdown in headline inflation is, in large part, due to the fall in energy prices in the final months of 2022 and into early 2023. That said, some EA countries continue to experience inflation above 20%, in part because of a greater exposure to Russian energy imports.

Inflation is far in excess of Central Banks' price stability targets, eroding real incomes, threatening resilience and economic stability. In the euro area, the ECB aims for "2% inflation over the medium term".¹ Central Banks have raised interest rates at an unprecedented pace in order to bring supply and demand back into balance, and return inflation sustainably back to target. Since July 2022, the main ECB policy rate increased from -0.5% to 3.0% (by March 2023). As of March 2023, financial markets expect the end point for interest rates during this hiking cycle to be around 3.5%, although in recent months it has reached 4.0% at times. Policy makers have signalled that the policy rate is likely to remain elevated for several quarters, or at least until there is visible progress in *underlying* inflation coming down. As Lane (2023) points out, a key issue is how the ECB *interprets* the criterion of "sufficient progress in underlying inflation", something I return to in the second section of this paper.

¹ See the ECB (2021) online explainer on the "Two per cent inflation target", published after the 2021 Monetary Policy Strategy Review.

Figure 1. Headline inflation in Ireland and the euro area (per cent, annual change)



Source: Eurostat. Headline HICP inflation. Last observations is February 2023.

The purpose of this paper is to provide a descriptive overview of the main factors driving inflation, how monetary policy makers have responded, and how the household sector is impacted by inflation and rising interest rates. The three sections of the paper address each of these in turn. As monetary policy is set for the euro area as whole, I highlight both Irish and euro area economic developments. However, our analysis of household resilience is confined to Irish households.

2. WHAT CAUSED HIGH INFLATION?

This section provides an overview of the main drivers of inflation in recent years. More in-depth policy discussions can be found in, amongst others, Donnery (2022) and Lane (2022). For analysis on the key drivers of inflation for both the euro area and Ireland, see also the ECB's quarterly *Macroeconomic Projections* (for the latest at time of writing, see ECB (2023)) and the Central Bank of Ireland *Quarterly Bulletin 1* (CBoI 2023).

Current high rates of inflation are the result of a series of overlapping shocks that started with the onset of the pandemic in early-2020. Restrictions on economic activity to slow the spread of the virus disrupted production and distribution chains, leading to widespread supply bottlenecks. Using data up to end-2021 (i.e. pre-dating the war in Ukraine), it is estimated that around half of euro area inflation and one-third of US inflation in 2021 was driven by negative supply shocks.²

Some of the reduction in supply was itself a response to the initial pandemic negative demand shock. For example, energy producers scaled-back supply in the expectation of lower demand due to the pandemic. The subsequent increase in energy prices in the second half of 2021 – even before the start of the war in Ukraine – reflects a slow return of supply as economies reopened, as well as base effects from the initial decline in energy prices during 2020 (Figure 2).

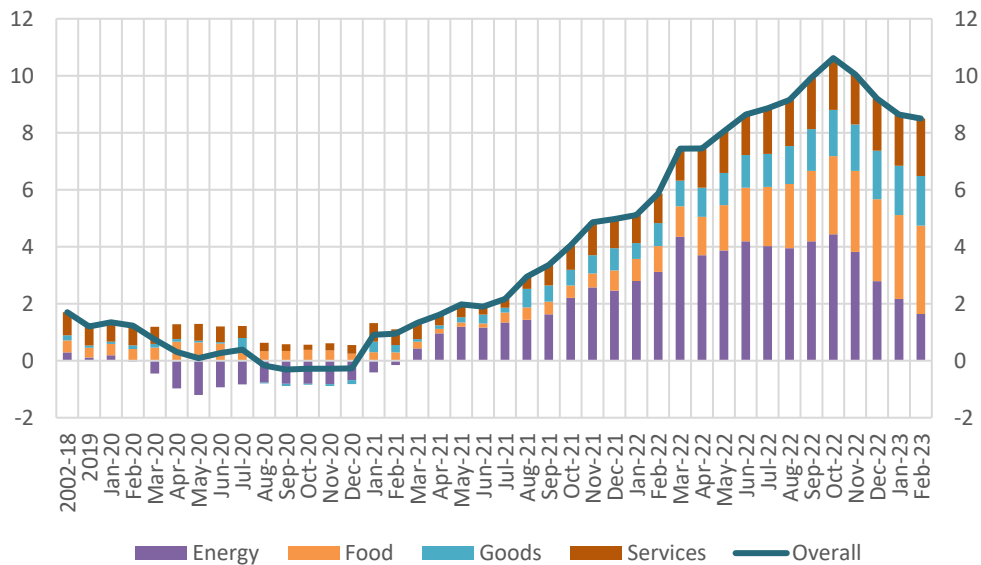
Transport bottlenecks also hit supply, with delivery times reaching more than double pre-pandemic levels – although this has eased somewhat in recent months, as the next section shows. Whilst there were country-specific dimensions to restrictions and associated disruptions – such as China's 'zero Covid' policy, for example – interconnected global supply chains meant that the ripples from supply bottlenecks were both global and slow to unwind.

A second shock, and one that is also pandemic-related, was the change in the *composition* of consumer demand away from services and towards goods. In some countries, such as the US for example, this shift was particularly large; see, for example, US Bureau Labour of Statistics (2022). In Ireland, high frequency card spending data showed a large decline in services during 2020, some of which was saved and some of which was diverted to increased spending on goods and increased food consumption in the home.³

² See Kalemli-Özcan et al. (2022). Inflation averaged averaged 4-5% in the euro area (6-7% in the US) during 2021.

³ See Hopkins and Sherman (2021), Byrne et al. (2020), Hodbod et al. (2021) and Datta et al. (2022) for a description of pandemic consumption trends in Ireland, the euro area and the US. See Lydon and McIndoe-Calder (2021) for analysis of household savings behaviour during the pandemic.

Figure 2. Contributions to euro area annual inflation (per cent)



Source: Eurostat. Headline HICP inflation. Last observation is February 2023. 2002-18 is an average of all months in that time period and 2019 is an average of the 12 monthly figures for that year.

The rapid rollout of fiscal supports for firms and households during the pandemic also mitigated the potential for significant and long-lasting negative demand shocks as a result of the pandemic. In Ireland, Conefrey, Hickey & McNerney (2021) estimated that direct and indirect COVID-19 fiscal supports amounted to between 6% (2021) and 12% (2020) of GNI*.⁴

Goods are globally traded, and increases in demand spill across borders. Goods inflation – which accounts for around a quarter of the consumer spending basket in both the euro area and Ireland – is very far above historical averages for both the euro area (6.7% in January 2023) and Ireland (5.1%). In the case of Ireland, where goods *deflation* put downward pressure on overall (HICP) inflation for much of the last two decades, this is a very large swing and remains a significant contributory factor to overall inflation.⁵

A third shock is the war in Ukraine, which exacerbated the existing pandemic-related inflationary pressures, notably by contributing to large increase in energy and food commodity inputs. As a net energy importer, the scale of the energy price changes facing the euro area and Ireland constitute an unprecedented terms of trade shock. Figure 3 illustrates this shock at the euro area level, showing how the extra-euro goods balance moved from positive to large negative territory during 2022, driven entirely by larger outward payments on energy and fuels. On aggregate, the euro area is worse off, with a far greater share of income diverted to paying foreign energy suppliers than was the case in the past. However, at the household level, those who spend more on energy (and food) are clearly more vulnerable to these shocks.⁶

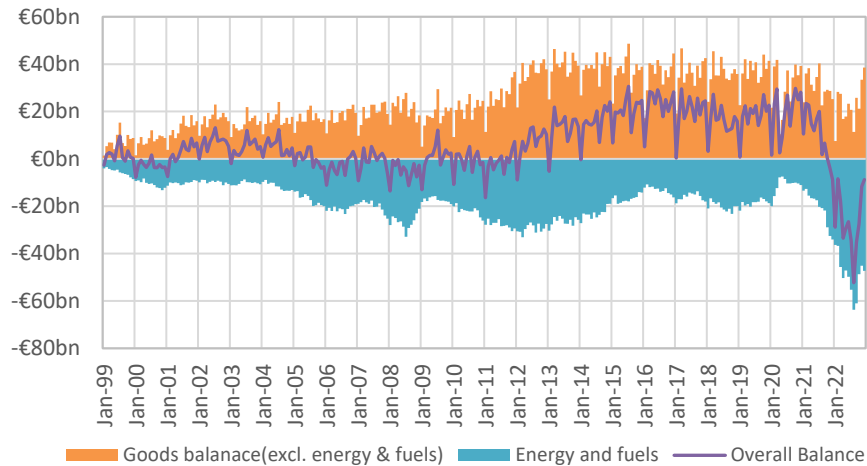
The extent to which Europe in particular is impacted by energy price shocks is illustrated in Figure 4, which shows the main components of headline inflation during October 2022 for several countries (October was the peak month for energy inflation in the euro area during 2022). Compared to the US, energy inflation was much more significant for inflation during 2022 in Ireland, the euro area and the UK. In the US, services inflation was the main driver of inflation, followed by food, energy and goods.

⁴ The IMF (2023) Covid Policy Tracker website documents the key economic responses governments took to limit the human and economic impact of the COVID-19 pandemic.

⁵ See Byrne and Scally (2018) for an analysis of services and goods price trends. For the latter, they highlight both economic drivers, such as exchange rates, and technical issues relating to the construction of goods price indices by the CSO – including difficulties relating to measuring comparable changes in the *quality* of goods in the inflation basket – as key drivers of goods deflation over the previous two decades.

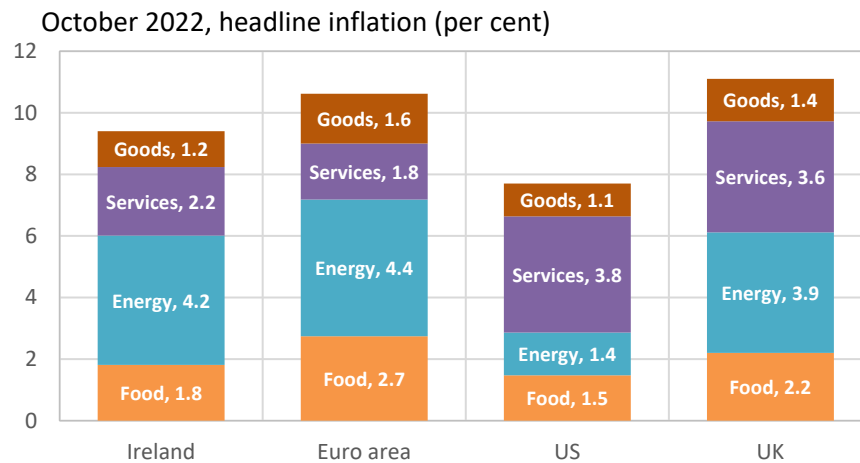
⁶ See the Flannery CSO paper in this symposium, and also Lydon (2022).

Figure 3. Terms of trade shock: monthly extra-euro area goods balance (€ billion)



Source: Eurostat. Headline HICP inflation. Last observation is December 2022.

Figure 4. Components of headline inflation: EA, Ireland, the US and UK (Oct '22)



Source: Eurostat, ONS (UK) and BLS (US). Data shown for October 2022 only.

3. THE MONETARY POLICY RESPONSE

Central Banks, including the ECB, raised interest rates at a rapid pace during 2022 and into 2023, marking an unprecedented period of coordinated global monetary tightening.⁷ As of the March 2023 policy meeting, the ECB's deposit facility rate was 3.0%, up from *minus* 0.5% in July 2022.⁸ This means that the ECB Governing Council⁹ increased rates by 3.5 percentage points over an nine month period (Figure 5), and the current rate hiking

⁷ In line with moves by other major central banks, the ECB also ended net additional purchases under its various asset purchase programmes, and commenced a gradual run down of its balance sheet. However, as indicated in Lagarde (2023), in the current circumstances the main policy tool for fighting high inflation is interest rates, and hence our focus on interest rates here. Using a suite of ECB models, Lane (2023a) shows that a cumulative €500bn reduction in the ECB balance sheet over three years – that is, approximately the €15bn per month signalled by the Governing Council in February 2023 (ECB, 2023a) – reduces inflation and output by 0.15 and 0.20 per cent respectively.

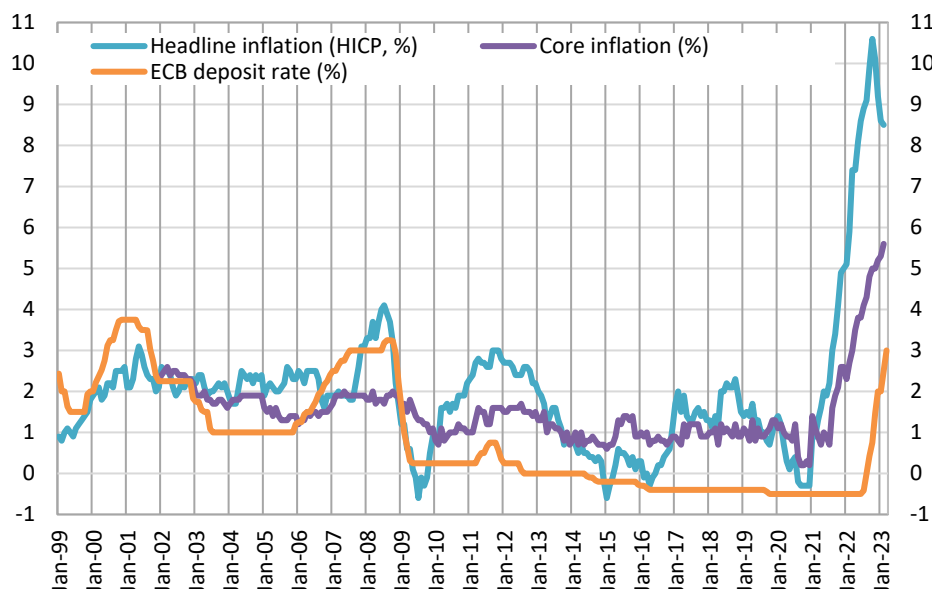
⁸ The ECB sets three key interest rates for the euro area: the rate on the *deposit facility*, for overnight bank deposits with the Eurosystem; the rate on *main refinancing operations* (MRO), which provides liquidity for the banking system; and, the rate on the marginal lending facility, for overnight credit to banks in the Eurosystem. All rates have increased by the same amount since July 2022. For brevity the discussion here focuses on the *deposit facility rate*.

⁹ The ECB Governing Council consists of the 20 Eurosystem national central bank Governors, including the Governor of the Central Bank of Ireland, and six members of the ECB Executive Board, including the President.

cycle is not yet finished.¹⁰ For comparison, previous rate hiking cycles in 1999-2000 and 2005-07 saw rates rise by 2.25 and 2 percentage points over a 13 and 21 month period, respectively.

This section focuses on two issues: (1) the rationale for raising interest rates; and (2) trends in the key data that the ECB relies on to calibrate policy. The ECB's price stability objective is for the Eurozone as whole. Thus, it takes account of inflation and other macroeconomic developments for the entire euro area, rather than any one specific country. Therefore, the analysis in this section takes more of a euro area focus.

Figure 5. ECB interest rates (deposit rate) and inflation (per cent)



Source: Eurostat, ECB. Core inflation is the overall index excluding energy, food, alcohol and tobacco. ECB deposit rate is to March 15 2023; inflation data is to February 2023.

3.1 Why are central banks raising interest rates?

The initial spurt of high inflation – driven first by the pandemic, and then the war – resulted from supply-side shocks. Monetary policy acts through the demand side of the economy and, as outlined in the ECB's Monetary Policy Strategy Review (ECB, 2021a), aims for 2% inflation over the medium term. The medium term horizon matters for two reasons. First, it allows the ECB to respond flexibly to economic shocks, taking account of uncertainties in both the inflation process and the transmission of policy. Second, it also allows for the possibility of temporary shocks dissipating of their own accord, without monetary policy inducing unnecessary volatility in output and employment.

If supply shocks are the main initial driver of inflation, and the medium term horizon means some 'looking through' shocks, why then do central banks feel the need to raise interest rates now? The answer lies with the overlapping and persistent nature of the shocks, as well as the sheer scale. Furthermore, the swift and strong recovery in demand after the pandemic has in turn supported strong labour demand, contributing to a historically tight labour market. Central Banks have highlighted the risk of second and third round effects from prices into wages, and back into prices – the so-called 'wage-price' spiral – as a potential source of persistently elevated inflation over the medium term. I return to this below in the discussion on wage developments.

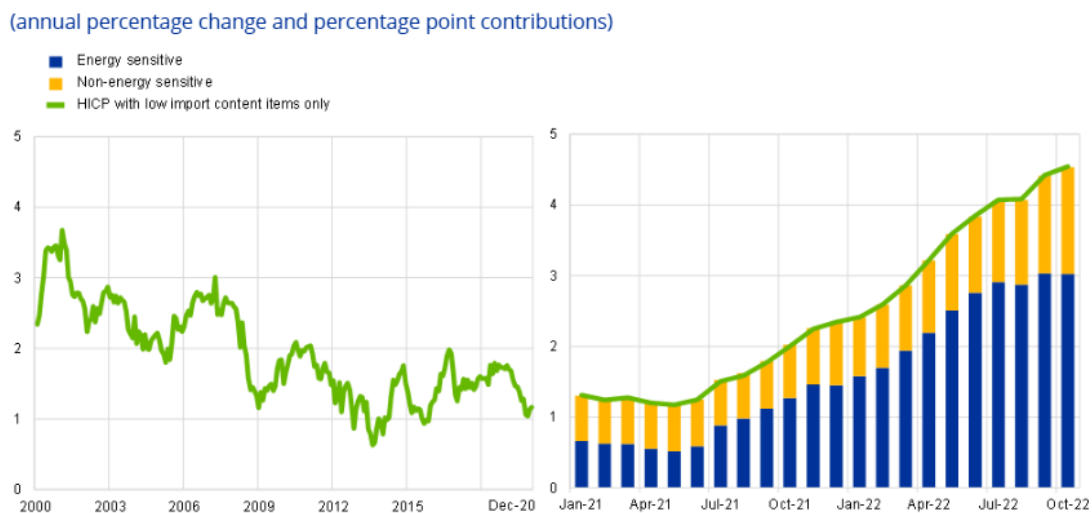
The strong rebound in demand after the pandemic, combined with persistent supply-side problems, led to demand-supply imbalances that are putting upward pressure on prices. The euro area *domestic inflation index* – based on a basket of goods with low import content – has risen from pre-pandemic levels of around 1-1.5% to 4.5% in late 2022 (Figure 6). More energy intensive domestic sectors account for an outsized proportion of the increase in domestic inflation. But non-energy sensitive sectors experiencing a post-pandemic increase in demand relative to still-constrained supply also saw prices rise.

¹⁰ At its February 2023 meeting, the Governing Council also expressed its intention to raise interest rates by a further 50 basis points at its March 2023 meeting.

With inflation persistently above target, there is a risk of longer-term inflation expectations moving away from the 2% target. As expectations play a crucial role in inflation dynamics – via both wage and price setting behaviour – the ECB closely monitors the extent to which they are aligned with the 2% target. Were expectations to become dis-anchored, it would jeopardise the ECB’s ability to sustainably achieve its medium-term inflation target. Preventing this from happening is one of the reasons the ECB gave for commencing the current rate hiking cycle in July 2022 (ECB, 2022).

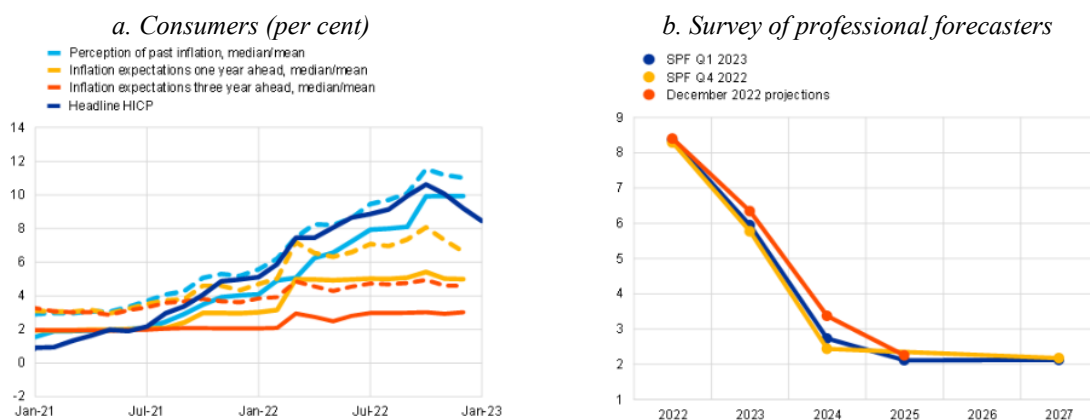
Measures of long-term inflation expectations have remained well anchored around the 2% inflation target (Figure 7.) The evidence from the ECB Consumer Expectations Survey (left panel) suggests that consumers expect the current high rates of inflation to fade gradually. Professional forecasters also expect a gradual decline before returning to target in 2025 (right panel).

**Figure 6. Domestic inflation index – euro area
(annual percentage change and percentage point contribution)**



Source: Lane (2022) based on Eurostat data. The domestic inflation index excludes items with an import content higher than 18 per cent. More energy sensitive components are those with a share of energy in total costs above the average energy share across all low import content items. Latest observation is October 2023.

Figure 7. Inflation expectations – Consumers and Survey of Professional Forecasters



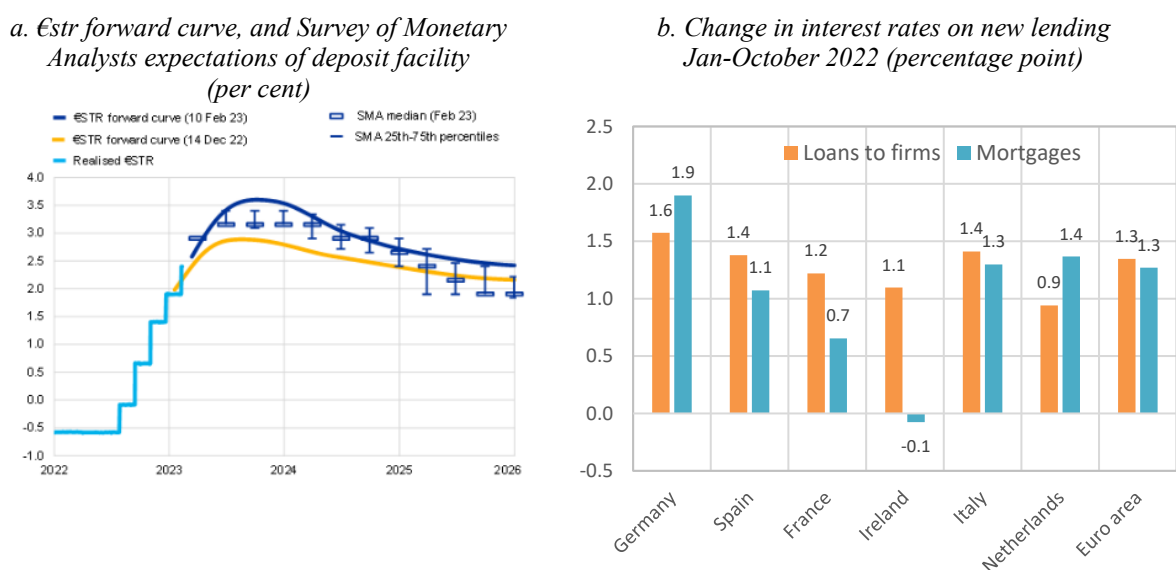
Source: Left panel: from the ECB *Consumer Expectations Survey* (ECB, 2023b) Solid/dashed lines are medians/means. Right panel: from the ECB *Survey of Professional Forecasters* (ECB, 2023c), taken from the December 2022 ECB Staff Macroeconomic Projections.

3.2 Central bank interest rates and inflation – what’s to come?

To calibrate the future path for monetary policy, the ECB looks at both the transmission of its policy so far, and incoming data on key indicators such as headline and underlying inflation, pipeline inflation pressures (e.g. input costs, including wage growth), and inflation expectations.

As monetary policy impacts economic activity with long and unpredictable lags, it is important that the ECB takes full account of how the increase in interest rates *so far* is being transmitted to the economy. This transmission is apparent in both market rates and interest rates on new lending to households and firms. The euro short-term rate (€STR) forward curve (left-hand panel in Figure 8), constructed from financial market data, shows that, as of early February 2023, markets expected overnight rates to peak above 3.5% during 2023 and remain around that level for several quarters, before drifting down to 2.5% by 2025. This expectation of higher for longer rates is reflected in large increases in interest rates on loans to firms and households during 2022 (right-hand panel in Figure 8).¹¹

Figure 8. Interest rate expectations and rates on new lending to households and firms



Source: Left panel: from the ECB in Lane (2023a). The SMA refers to the ECB ‘Survey of Monetary Analysts’. Right panel: ECB.

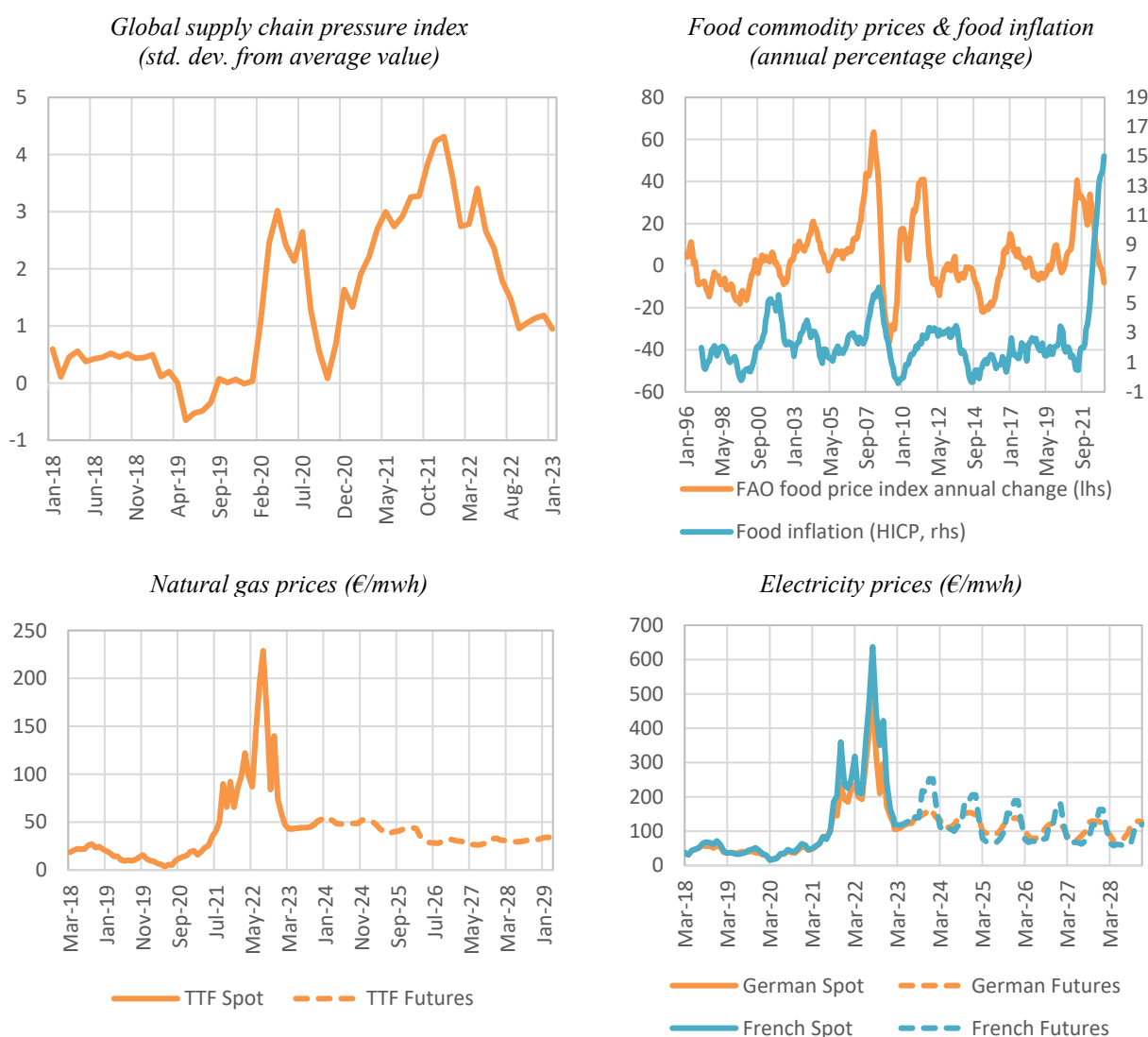
Credit demand has also decreased, and is expected to fall further, according to the responses to the January 2023 ECB *Bank Lending Survey* (ECB, 2023d). Higher interest rates and expected reductions in fixed investment were reported as the main reasons for reduced demand from firms. For households, demand is weaker as a result of higher interest rates, weak consumer confidence and deteriorating prospects for the housing market. The pass-through of higher policy rates to lending rates and loan demand represents the first stage of monetary policy transmission. To what extent these changes will reduce inflationary pressures by dampening aggregate demand, and over what time frame, remains to be seen.

The first section highlighted some of the *global* drivers of inflation, namely covid-related supply bottlenecks and energy and food prices. Recent data points to a significant easing of these pressures.

The *Global Supply Chain Pressure* index (GSPCI), which summarises data on shipping costs, delivery times and port traffic has fallen sharply from its 2021 highs (top-left panel in Figure 9). Historically, changes in the GSPCI are positively correlated with changes in goods prices. Food *commodity* inflation is now negative, which, if historical patterns hold, will put downward pressure on food inflation (top-right panel in Figure 9), although the pass-through of these upstream price changes to consumer food price changes can take anything from 6 to 18 months, with the peak usually observed after 6 months.

¹¹ See Foster and McInerney (2023) for further analysis of monetary policy transmission via the bank lending channel.

Figure 9. Supply chain bottlenecks, food commodity prices and energy



Source: (a) NY-Fed Global Supply Chain Pressure Index (NY-Fed, 2023); (b) FAO Food Price Index for commodity prices (FAO, 2023), ECB for seasonally adjusted HICP Food inflation; (c) and (d) Bloomberg.

Wholesale energy prices have also fallen back significantly from the spike that occurred after the Russian invasion of Ukraine in Spring 2022 (bottom panels in Figure 9). And, if futures prices turn out to be accurate predictors, outright energy price *deflation* is a distinct possibility for the entirety of 2023. For the year as a whole, the average decline in gas and electricity wholesale prices based on futures (Figure 9) is -57 and -47% respectively. As energy represents around one-tenth of the HICP basket, this would put significant downward pressure on headline inflation during 2023.

For more medium-term, and domestically-driven, inflation dynamics, the path of nominal wages is closely tracked by monetary policy makers. For sectors with a large labour share in overall production costs, wage developments are particularly important as a potential cost-push factor for inflation. The services sector is one important example, accounting as it does for 62% of both the euro area and Irish core (HICP less energy and food) inflation basket.¹²

Central Banks combine judgement, data and empirical analysis (i.e. Phillips Curves) to form a view on wage developments.¹³ The basic Phillips Curve formulation relates measures of average wages to slack (such as

¹² The remaining 38% of the EA core inflation basket is made up of non-energy industrial goods.

¹³ For a discussion on role of the Phillips Curve at the ECB for understanding the economic outlook and the formulation of monetary policy, see Eser et al. (2020). The ECB (2021b) Occasional Paper on “Employment and the conduct of monetary

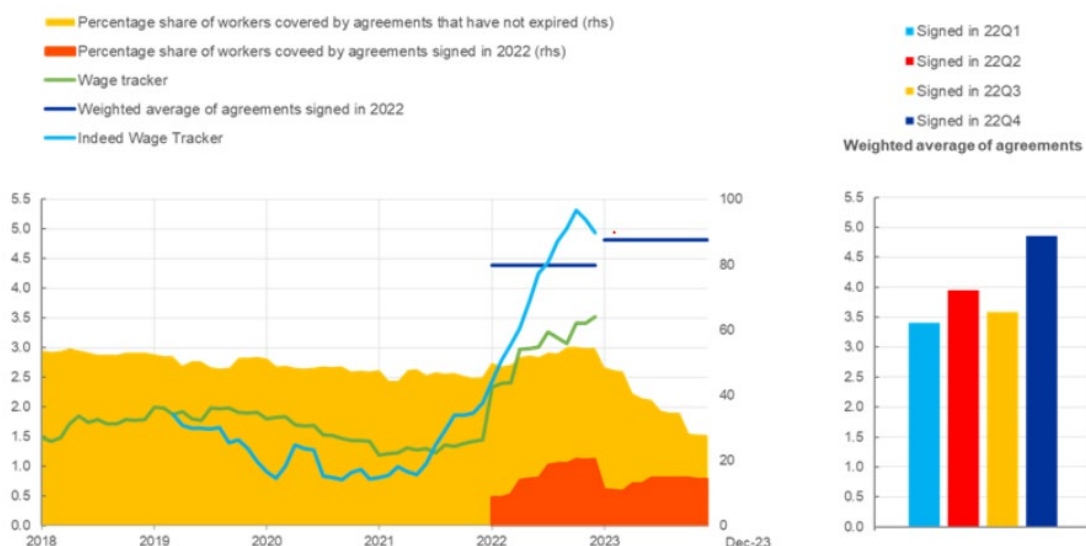
unemployment), productivity and inflation expectations. When inflation is high, and nominal wages are set in staggered fashion, some judgement around real wage catch-up to past inflation can also be included in wage growth projections. How much catch-up, and how fast it occurs, depends on workers’ bargaining power, which itself can be related back to labour market tightness.

In the current hiking cycle, with a strong emphasis on *incoming data* to calibrate the future path for monetary policy, the ECB monitors *forward* looking data on wage growth. One example is the *negotiated wage tracker*, as shown in Figure 10.¹⁴ Other forward-looked wage trackers, such as the Indeed hiring wage tracker, based on annual growth in wages posted in job ads – see Adrjan and Lydon (2022) – are also used. Both wage trackers show an acceleration in wage growth during 2022, reflecting the tight labour market and nominal wages adjusting to the higher price level.

Drawing on all of this data, as well expectations of ongoing labour market tightness, the *current* (at time of writing) ECB and Central Bank of Ireland *nominal* wage growth projections are strong. For example, nominal wages in the euro area are expected to grow at more than double the rate observed during the previous decade (Table 1). This is, of course, against a backdrop of high inflation. In real terms, wage growth is negative on average in the euro area over the period 2022-25; and only marginally positive in Ireland (0.5%).

As the supply shocks that drove inflation during 2022 gradually recede, attention has turned to (nominal) wages as the potential driver of (core) inflation developments over the medium term. It would, however, be wrong to assume that, should the nominal wage projections in Table 1 pan out, they will be passed through entirely to core inflation (adjusting for the wage share). Given the run-up in profit margins during 2022, there is also scope for higher nominal wages to be partially absorbed by lower profit margins. Lower profit margins, driven by improving supply capacity and a normalisation of demand patterns, would translate into lower inflationary pressures going forward, as set out in Lane (2023b). Figure 11 shows the profit margin assumptions in the ECB’s March 2023 projections, which suggest a return to more ‘normal’ levels over the horizon, after the rapid growth observed during 2022.

Figure 10. ECB negotiated wages tracker and *Indeed* wage tracker
Annual percentage change in wages



Source: This figure is taken from Lane (2023b). The negotiated wage data is collected by the ECB, see Koester, Benatti and Vlad (2020). The Indeed Wage Tracker is based on wage trends in job ads in Germany, France, Italy, Spain, the Netherlands and Ireland, see Adrjan and Lydon (2022) for details.

policy in the euro area”, published as part of the 2021 ECB Strategy Review, looks specifically at the wage Phillips Curve, both concepts and estimates.

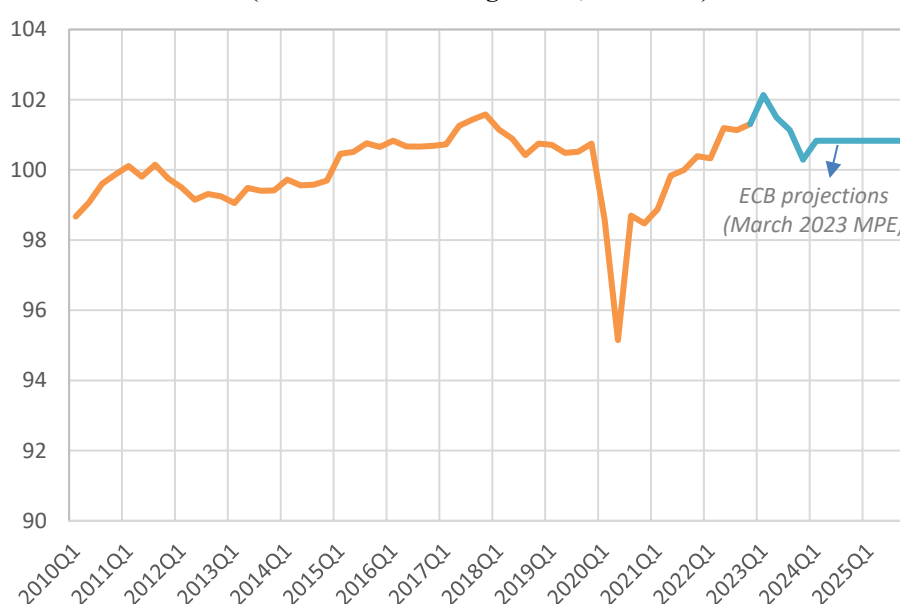
¹⁴ See Koester, Benatti & Vlad (2020) for more on the ECB’s negotiated wage tracker.

**Table 1. Wage growth projections, Ireland and euro area
(annual percentage change)**

		2022	2023	2024	2025	Cumulative change 2022-25
Ireland	Wages (nom)	4.2%	6.4%	5.2%	3.3%	20.5%
	Inflation (HICP)	8.1%	5.0%	3.2%	2.2%	19.7%
	Real wage growth	-3.9%	1.4%	2.0%	1.1%	0.5%
Euro area	Wages (nom)	4.0%	5.3%	4.4%	3.6%	18.5%
	Inflation (HICP)	8.4%	6.3%	3.4%	2.3%	21.9%
	Real wage growth	-4.4%	-1.0%	1.0%	1.3%	-3.2%

Source: Data for Ireland is from the Central Bank of Ireland Quarterly Bulletin 1, 2023 (CBoI, 2023, Table 1). Euro area projections are from the March 2023 Staff Macro Projections Exercise (ECB, 2023).

**Figure 11. Profit margin indicator
(relative to the average = 100, euro area)**



Source: The profit margin indicator is the ratio of the GDP deflator to unit labour costs. Data from Eurostat to Q4 2022, thereafter ECB March 2023 Macroeconomic Projections Exercise (ECB, 2023).

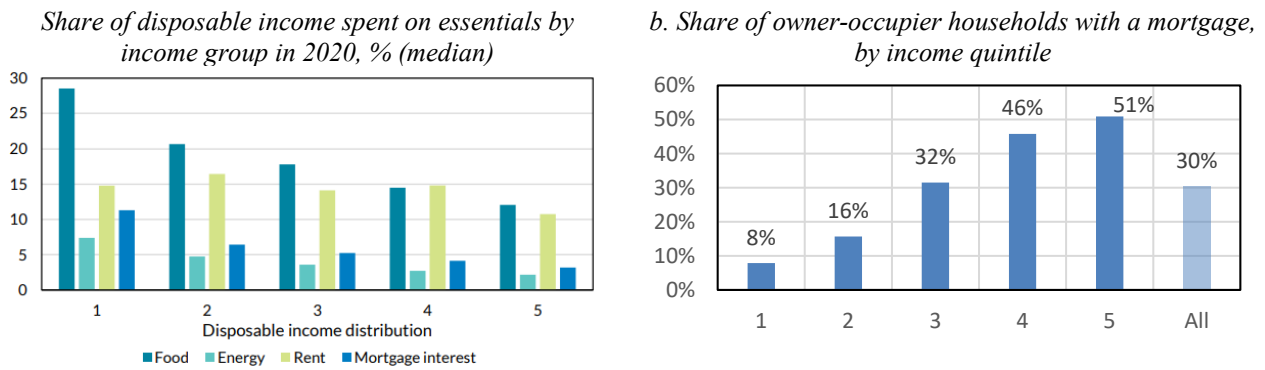
4. HOW ARE HOUSEHOLDS COPING WITH HIGH INFLATION AND RISING INTEREST RATES?

Given its financial stability mandate, quantifying the impact of the changing economic environment on household resilience is an important part of the Central Bank’s role. This section draws on a Quarterly Bulletin article on “Household Economic Resilience” by Arrigoni, Boyd and McIndoe-Calder (2022), which assesses how households are coping with higher inflation and rising interest rates.

Echoing earlier work by Lydon (2022) and the CSO analysis in this symposium in this SSISI journal volume, the article highlights that differences in the composition of consumption baskets according to household characteristics mean that not all households are affected equally by rising prices. For example, lower income households spend relatively more of their budget on food and energy and are therefore more vulnerable to inflation that is driven by higher food and energy prices, as has been the case throughout 2022 (Figure 12a). In the other direction, higher income households are considerably more likely to have a mortgage and are therefore more exposed to interest rate rises (Figure 12b). That said, as the first panel in Figure 12 shows, mortgage repayments represent a relatively small share of higher income households’ spending.

Using *Household Budget Survey* data on spending shares on energy, services, goods and food, Lydon (2022) estimates inflation for different household types. Figure 13 updates this work, showing ‘personal inflation’ rates for October 2022 (the peak month for HICP in 2022, as shown in the top panel) and February 2023 (bottom panel).

Figure 12. Household characteristics and exposure to inflation and interest rate changes



Source: (a) Arrigoni, Boyd and McIndoe-Calder (2022). Disposable income used to calculate spending shares and income quintiles. Rent and mortgage interest payments. share in income is conditional on households either paying rent or having a mortgage on their home, respectively. (b) Own estimates using the 2020 Household Finance and Consumption Survey (CSO, 2020).

Households that spend relatively more of their budget on items that have risen the most in the last year or so – i.e. energy and food in the main – have also experienced higher personal inflation rates. This includes lower income and older age-groups, rural households, and households that rely more on cars for personal transport. For example, focusing on differences by income, we see that in October 2022 when headline (HICP) aggregate inflation peaked at 9.4%, the estimated rate for the bottom 20% of households (quintile 1 of the income distribution in Figure 13) was 10.7%, whereas for the top 20% of households by income it was 8.3% (a gap of 2.4%). This low-high income personal inflation gap has narrowed in recent months as energy prices fell, falling to 1.7% (9.2-7.5%) by March 2022. In the last three months of data, the gap is practically zero.

Rising interest rates can lead to higher mortgage repayments, most immediately for households on variable rates. However, in recent years, Irish households have increasingly opted for fixed rate loans. In 2014, less than 10% of owner-occupier mortgages were on some form of fix rate; by 2021, this had risen to over 50% of households, around half of whom are on 1–2-year fixed rates.

Arrigoni, Boyd and McIndoe-Calder (2022) use the information in the 2020 *Household Finance and Consumption Survey* (HFCS) to simulate the impact of prices rises and higher interest rates on households’ budget. The work proceeds in several stages.

Using information on the joint distribution of income, consumption and wealth, households are divided into four groups depending on: (i) Ability to meet expenses out of income; (ii) whether levels of liquid financial assets provide adequate buffers in case of spending exceeding income; (iii) whether levels of illiquid financial assets are present; and (iv) ability to save once regular expenses met with current income. The four groups, ordered from most to least ‘precarious’ are labelled as follows: *precarious, limited buffers; precarious, illiquid buffers; affluent, not savers; and affluent, savers*.

For each group, the authors estimate the 2020 spending on ‘essentials’ as a share of disposable income. Essentials are defined as spending on food, energy, rent or mortgage interest.

The paper then analyse two simulations: (i) apply the price changes from October 2020 (roughly when the survey took place) to June 2022, income is assumed to grow in-line with aggregate trends, all other factors are held constant; (ii) a second *incremental* simulation assumes a further 10% increase in food prices, 25% increase in energy prices and 5% increase in rents, and, for mortgage holders, a 2 percentage point increase in *variable* rates only. Given actual developments during the second half of 2022, this second additional simulation is closer to what actually occurred.

Table 2 summarises the results for each of the four groups, focusing on the change in spending on essentials as a share of disposable income. The authors highlight three key results. First, and in-line with the descriptive analysis in Figure 13, not all households are not equally exposed to consumer price increases. Essentials account for a far larger share of income for households in the most precarious financial situations (i.e. with limited savings buffers), the changes from the baseline to the scenario 2 are large: a 7.6 percentage point increase in spending on essentials.

Second, whilst only a minority share of households, e.g. 5.7% and 8.5% in the two *precarious* groups, this still represents some 180,000 households. Third, increases in prices have a far greater impact on household finances than increases in interest rate increases. This is because the median share of monthly income spent on servicing debt is lower.

Table 2. Share of spending on ‘essentials’ by household type (median)

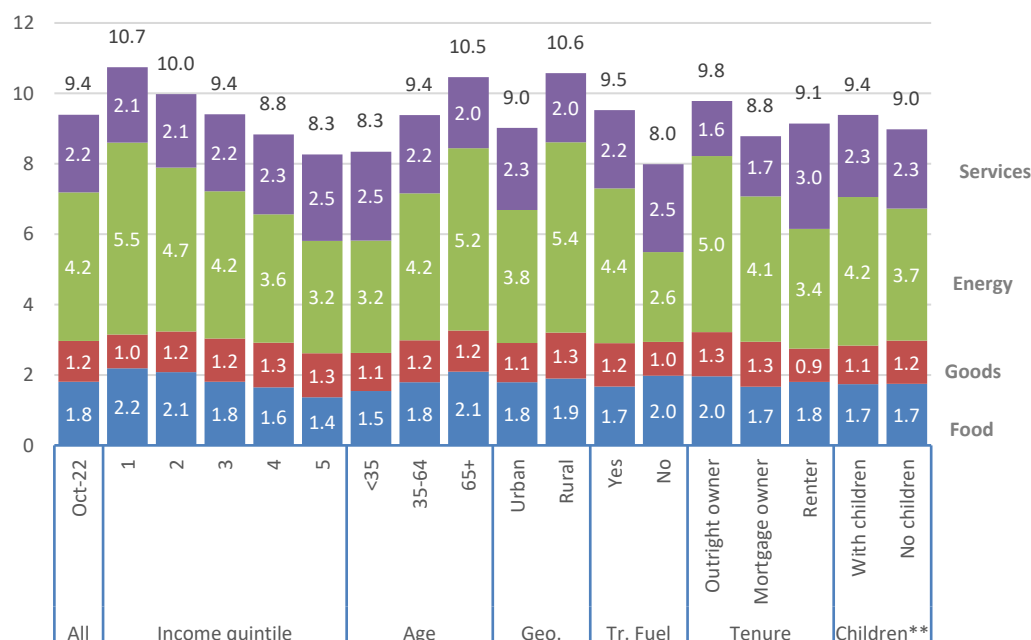
Type ->	<i>Precarious, limited buffers</i>	<i>Precarious, illiquid buffers</i>	<i>Affluent, not savers</i>	<i>Affluent, savers</i>	<i>All households</i>
Share hhllds (2020) ->	5.7%	8.5%	32.5%	53.1%	100%
Baseline	38.9	33.8	28.5	25.3	27.5
Scenario 1	42.7	37.4	30.9	27.2	30.0
Scenario 2	46.3	41.3	34.7	30.7	33.7

Notes: Results in Arrigoni, Boyd and McIndoe-Calder (2022). ‘Baseline’ is income share of spending on essentials (food, energy, rent or mortgage interest) as at October 2022; Scenario 1 applies price changes on essentials from October 2020 to June 2022; Scenario 2 further increases prices on essentials and mortgage interest (see text).

The figures in Table 2 are medians and could therefore hide significant shifts in the tails of the distribution, especially around debt sustainability when interest rates rise. Another useful metric is the change in the share of high debt-service households under the various scenarios. However, even when we look at the change in the share of households with owner-occupier mortgage debt repayments in excess of 30% of disposable income, it only rises by a small amount, from 10.3 to 11.3% of households. Given that the authors assume that the 50% or so of mortgage holders on fixed rates – around half of who are due to refinance in the next two years – had *no* change in mortgage repayments in the second scenario, this figure may end up being higher in the future. However, the paper presents a number of sensitivity checks around this assumption and, on this basis, reiterate that it is changes in prices rather than changes in debt service that represent the main risks to household resilience in the current climate.¹⁵

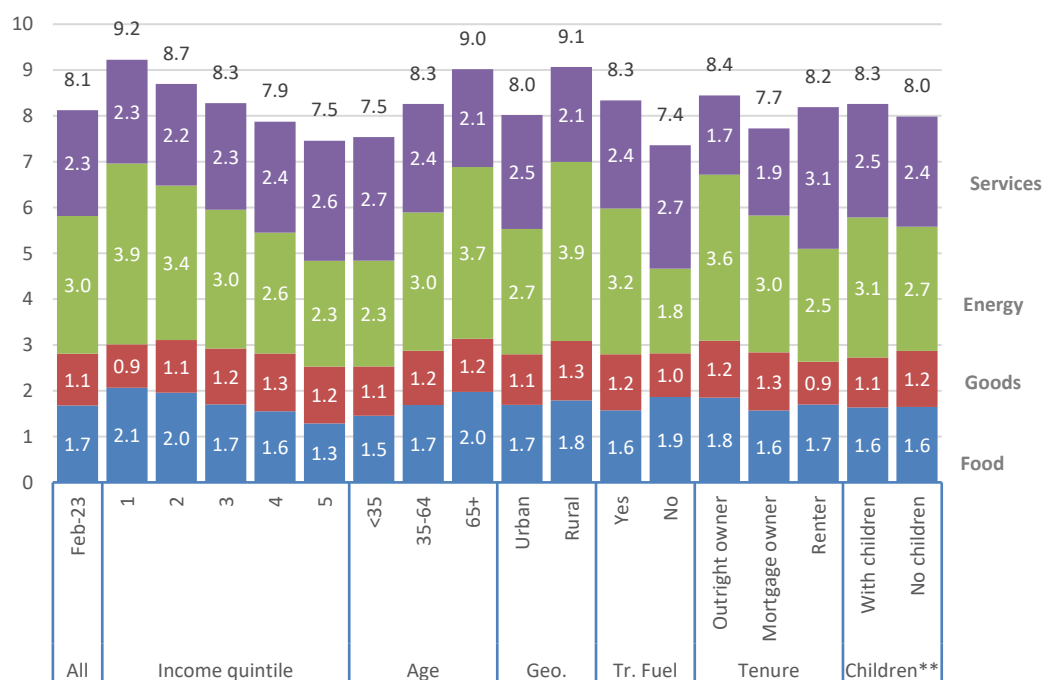
Figure 13. Inflation rates by household characteristic – October 2022 and February 2023

a. Annual rate of inflation, October 2022



¹⁵ Note that this does not imply that because of their individual circumstances, certain households may be very negatively impacted by a combination of rising prices and rising interest rates. Rather, the assessment here of ‘precariousness’ is more of an aggregate one.

b. Annual rate of inflation, March 2023



Source: own calculations, based on the methodology in Lydon (2022). (**) Households with/without children refer to those households where the head is of working age (16-65).

5. CONCLUDING REMARKS

This article is a descriptive analysis of the main factors driving inflation, how monetary policy makers have responded, and how the household sector is impacted by inflation and rising interest rates.

At the time of writing, in March 2023, headline inflation has fallen, driven by lower energy prices. And whilst some other supply-side related inflation pressures have also eased, a key focus for the future path of monetary policy will be developments in underlying inflation and the transmission of ECB monetary policy to date. On underlying inflation, recent Governing Council decisions highlight developments in wages and profit margins as two key areas of focus. A tight labour market is supporting real wage catch-up to past inflation, with nominal wages expected to well above historical averages in 2023-24, before starting to slow in 2025.

The increase in profit margins during 2022, supported in part by exceptionally strong post-pandemic demand, is expected to absorb some of these wage increases, with margins gradually returning to pre-pandemic levels by 2025. However, persistently strong wage growth is projected to contribute to core inflation above historical rates through to end-2025.

With rising interest rates, and inflation only expected to come down gradually over time, the Central Bank is closely monitoring the impact on household resilience. Evidence to date suggests that the main impact on households has been via higher prices. However, as more households face the prospect of potentially refinance pre-existing mortgages in a higher interest rate environment in the future, this is an area the Central Bank will continue to closely monitor.

References

- Adrian, P. and R. Lydon, 2022. Wage Growth in Europe: Evidence from Job Ads. Central Bank of Ireland *Economic Letters Series* Vol.2022, No.7.
- Arrighi, S. Boyd, L. and T. McIndoe-Calder, 2022. Household Economic Resilience. Article in Central Bank of Ireland, Quarterly Bulletin 4, October 2022.
- Byrne, S. Hopkins, A. McIndoe-Calder, T. and M. Sherman, 2020. The impact of Covid-19 on consumer spending. Central Bank of Ireland *Economic Letter Series* Vol. 2020, No. 15

- Byrne, S. and J. Scally, 2018. Why are prices for some consumer goods falling in Ireland. Central Bank of Ireland Quarterly Bulletin 3, 2018, Box E, Pages 38-41.
- Central Statistics Office (CSO), 2020. Household Finance and Consumption Survey 2020.
- Central Bank of Ireland (CBoI), 2023. Quarterly Bulletin QB1 - March 2023.
- Conefrey, T., Hickey, R. and N. McInerney, 2021. Covid 19 and the public finances in Ireland. Central Bank of Ireland *Economic Letter* series Vol. 2021, No. 3.
- Datta, D.D., Feiveson, L., Peneva, E., Rua, G., 2022. Bottlenecks, Shortages, and Soaring Prices in the U.S. Economy. FEDS Notes (June) No. 2022-06-24.
- Donnery, S., 2022. Inflation and labour market dynamics after the pandemic" - Sharon Donnery at 10th Annual Donal Nevin Lecture. Available at <https://www.centralbank.ie/news/article/inflation-and-labour-market-dynamics-after-the-pandemic-donal-nevin-annual-lecture-10-november-2022>
- European Central Bank (ECB), 2021a. The ECB's monetary policy strategy statement. Available at https://www.ecb.europa.eu/home/search/review/html/ecb.strategyreview_monpol_strategy_statement.en.html
- European Central Bank (ECB), 2021b. Employment and the conduct of monetary policy in the euro area. ECB Occasional Paper Series No 275 / September 2021. Available at <https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op275~e76a79539d.en.pdf?461814414213380394e6179891fa5535>
- European Central Bank (ECB), 2021. Two per cent Inflation Target. Available at <https://www.ecb.europa.eu/mopo/strategy/pricestab/html/index.en.html>
- European Central Bank (ECB), 2022. We have raised interest rates. What does that mean for you?. Available at https://www.ecb.europa.eu/ecb/educational/explainers/tell-me-more/html/interest_rates.en.html
- European Central Bank (ECB), 2023. Macroeconomic Projections *March 2023*.
- European Central Bank (ECB), 2023a. Monetary Policy Decisions. *February 2023* Available at <https://www.ecb.europa.eu/press/pr/date/2023/html/ecb.mp230202~08a972ac76.en.html>
- European Central Bank (ECB), 2023b. Consumer Expectations Survey. Available at https://www.ecb.europa.eu/stats/ecb_surveys/consumer_exp_survey/html/index.en.html
- European Central Bank (ECB), 2023c. Survey of Professional Forecasters. Available at https://www.ecb.europa.eu/stats/ecb_surveys/survey_of_professional_forecasters/html/index.en.html
- European Central Bank (ECB), 2023d. January 2023 euro area bank lending survey. Available at <https://www.ecb.europa.eu/press/pr/date/2023/html/ecb.pr230131~9ee4d2aea9.en.html>
- Eser, F., Karadi, P., Lane, P.R., Moretti, L. and Osbat, C., 2020. The Phillips curve at the ECB. *The Manchester School*, 88, pp.50-85.
- Federal Reserve Bank of New York (NY Fed), 2023. Global Supply Chain Pressure Index (GSCPI). Available at <https://www.newyorkfed.org/research/policy/gscpi#/overview>
- Food and Agriculture Organisation of the United Nations (FAO), 2023. World Food Situation – FAO Food Price Index. Available at <https://www.fao.org/worldfoodsituation/foodpricesindex/en/>
- Foster, S. and N. McInerney, 2023. Transmission of monetary policy: The Bank Lending Channel. Central Bank of Ireland Quarterly Bulletin 1, 2023, Box B. .
- Hodhod, A., Hommes, C., Huber, S.J., and I. Salle, 2021. The COVID-19 consumption game-changer: evidence from a large-scale multi-country survey. ECB Working Paper Series, No. 2599.
- Hopkins, A. and M. Sherman, 2021. Shining a light on sectoral spending behaviours through the most recent phases of the pandemic. Central Bank of Ireland *Behind the Data* series.
- International Monetary Fund (IMF), 2023. Covid Policy Tracker. Available at <https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19>
- Kalemlı-Özcan, S., di Giovanni, J., Silva, A. and M. Yıldırım, 2022. Challenges for monetary policy in a rapidly changing world: Challenges for monetary policy in a rapidly changing world. ECB Forum on Central Banking, June 2022. Available at https://www.ecb.europa.eu/pub/conferences/ecbforum/shared/pdf/2022/Kalemlı-Oezcan_paper.pdf
- Koester, G., Benatti, N., and A. Vlad, 2020. Assessing wage dynamics during the COVID-19 pandemic: can data on negotiated wages help?, in European Central Bank, *Economic Bulletin* Issue 8/2020.
- Lagarde, C. and L. de Guindos, 2023. Monetary policy statement press conference (Transcript). Available at <https://www.ecb.europa.eu/press/pressconf/2023/html/ecb.is230202~4313651089.en.html>
- Lane, P., 2022. Inflation Diagnostics. *Blog post by Philip R. Lane, Member of the Executive Board of the ECB*. Available at <https://www.ecb.europa.eu/press/blog/date/2022/html/ecb.blog221125~d34babdf3e.en.html>.

- Lane, P., 2023. *Interview with Philip R. Lane, Member of the Executive Board of the ECB, conducted on Friday, 24 February 2023 by Balázs Korányi and Frank Siebelt*. Available at <https://www.ecb.europa.eu/press/inter/date/2023/html/ecb.in230228~c78d1f2ca5.en.html>.
- Lane, P., 2023a. The euro area hiking cycle: an interim assessment. *Dow Lecture by Philip R. Lane, Member of the Executive Board of the ECB, at the National Institute of Economic and Social Research*, February 2023. Available at https://www.ecb.europa.eu/press/key/date/2023/html/ecb.sp230216_1~f8cf2cd689.en.html
- Lane, P., 2023b. Underlying inflation. *Lecture by Philip R. Lane, Member of the Executive Board of the ECB, Trinity College Dublin*, March 2023.. Available at <https://www.ecb.europa.eu/press/key/date/2023/html/ecb.sp230306~57f17143da.en.html>
- Lydon R, and T. McIndoe-Calder, 2021. Saving during the pandemic: waiting out the storm. Central Bank of Ireland *Economic Letter Series* Vol.2021, No. 4. .
- Lydon R., 2022. Household characteristics, Irish inflation and the cost of living. Central Bank of Ireland *Economic Letters* series, Vol.2022, No. 1.
- U.S. Bureau of Labor Statistics (BLS), 2023. Changes to consumer expenditures during the COVID-19 pandemic. TED: Economics Daily. Available at <https://www.bls.gov/opub/ted/2022/changes-to-consumer-expenditures-during-the-covid-19-pandemic.htm#:~:text=After%20the%20COVID%2D19%20pandemic,consumers%20had%20begun%20to%20adapt> .