3. PRICES, COSTS AND COMPETITIVENESS

Consumer price pressures eased further during the quarter under review. Annual inflation, as measured by the HICP, stood at 2.1% in September, down from 2.2% in June. This was driven by a smaller contribution from processed food and NEIG inflation. Annual inflation based on the RPI – which only considers expenditure by Maltese residents – fell to 1.2% in September, from 1.3% in June.

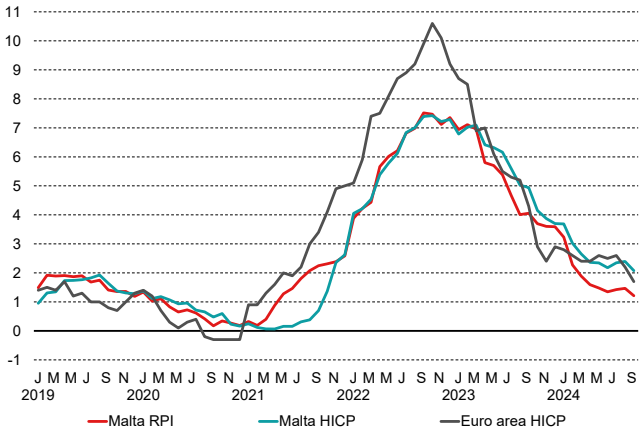
When measured over four quarters, ULCs increased at a faster pace in the third quarter of 2024, with its growth rate reaching 2.3%, from 1.4% in the previous quarter. Meanwhile, annual growth in other input cost indicators regularly monitored by the Bank generally continued to moderate, with the exception of the CCI which recorded a slightly higher year-on-year growth rate than that observed in the second quarter.

Inflation

HICP inflation eases

Annual HICP inflation eased slightly to 2.1% in September, from 2.2% in June (see Table 3.1).[1] Chart 3.1 shows that overall HICP inflation in Malta stood higher than that recorded in the euro area, which ended the quarter at 1.7%. Malta's higher inflation rate in September when compared to that of the euro area reflects a higher contribution from food and energy inflation (see Chart 3.2). In Malta, the latter retained an unchanged contribution, while the contribution of energy inflation turned negative in the euro area. On

Chart 3.1
INFLATION RATES IN MALTA AND IN THE EURO AREA
(annual percentage changes)



Sources: NSO; Eurostat.

Table 3.1
HICP INFLATION
Annual percentage change

	2023			2024								
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
Unprocessed food	4.0	6.7	12.2	13.4	5.2	3.5	4.3	5.2	3.7	5.8	3.9	4.5
Processed food including alcohol and tobacco	8.2	7.3	7.1	7.4	6.1	5.4	4.7	3.9	3.1	3.0	2.8	2.7
Energy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NEIG	2.6	2.2	2.2	1.6	1.7	1.2	1.3	0.9	1.1	0.7	0.4	0.2
Services (overall index excluding goods)	4.0	3.9	3.0	3.1	2.8	2.7	2.1	2.4	2.3	2.7	3.2	2.7
All Items HICP	4.2	3.9	3.7	3.7	3.0	2.7	2.4	2.3	2.2	2.3	2.4	2.1

Source: Eurostat.

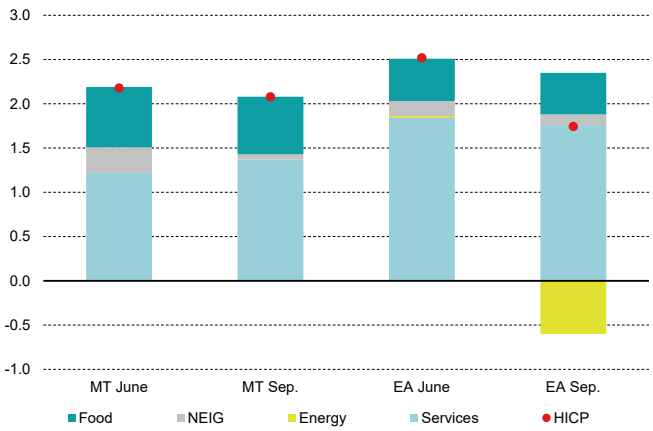
[1] The HICP weights are revised on an annual basis to reflect changes in overall consumption patterns. In 2024, the weight allocated to services stood at 44.7%, while that of NEIG was 27.5%. Food accounted for 21.5% of the index, while the share allocated to energy stood at 6.2%. These were revised from 44.3% for services, 27.9% for NEIG, 21.4% for food and 6.5% for energy in 2023.

the other hand, the contribution of services to HICP inflation in September was lower in Malta than in the euro area.

Core inflation, or the annual rate of change of HICP excluding energy and food, stood at 1.9%, and thus well below the 2.7% recorded in the euro area.

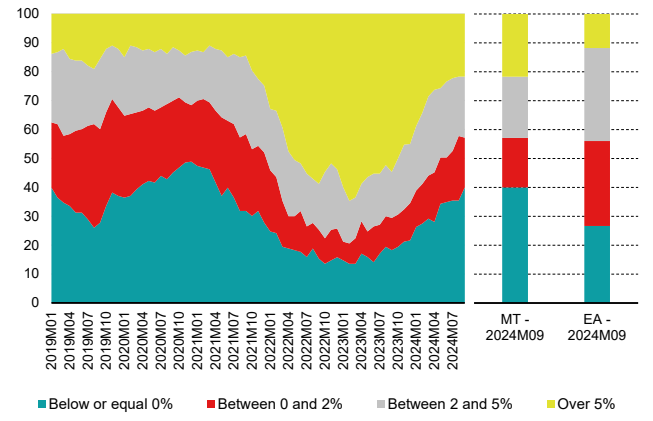
Chart 3.3 shows a distribution of price changes whereby subcomponents of the HICP are categorised into four classes of inflation rates: i) below or equal to 0%; ii) between 0% and 2%; iii) between 2% and 5%; and iv) over 5%.[2] This analysis indicates whether developments in inflation are broad-based across HICP items or driven only by selected components of the consumption basket.

Chart 3.2
HICP AND MAIN CONTRIBUTIONS
(annual percentage changes; contributions)



Sources: Eurostat; SDW; Central Bank of Malta calculations.

Chart 3.3
PROPORTION OF HICP BASKET BY INFLATION PACE
(percentage point)



Source: Central Bank of Malta calculations.

The share of subcomponents registering inflation rates of more than 5% declined further during the quarter under review as the impact of recent shocks on imported inflation continued to dissipate. Compared to three months earlier, this ratio dropped by 1.7 percentage points to reach 21.7%. Likewise, the bracket holding items with inflation between 2% and 5% decreased by 5.1 percentage points since June 2024, to stand at 21.1% in September.

On the other hand, the bracket holding items with negative inflation rates grew by 5.1 percentage points, standing at 40.0%. The increase in this bracket mainly reflects a drop in the prices of a number of household items, including cleaning equipment and small household appliances. Similarly, the bracket holding items with inflation between 0% and 2% increased by 1.7 percentage points, to stand at 17.1% over the same period.

In the euro area, the share of items with price increases exceeding 5% also decreased during the third quarter of 2024. Furthermore, the share of items in this bracket remained significantly lower than that in Malta, with a difference of 9.9 percentage points in September. In part, this reflects

[2] The calculation of the shares in this chart does not take into account the weights of individual HICP sub-components. This analysis includes 175 sub-indices of the HICP for Malta and 289 sub-indices for the euro area based on the five-digit COICOP classification. On average since 2001, 30.6% of items in Malta's basket fell in the 0% or negative inflation rates interval, while this figure stood at 17.6% for the euro area. Around 47% of the Maltese basket fell in the 0-2% and 2-5% intervals – in almost equal parts. These shares stood at 39.5% and 32.6% respectively in the euro area. While 22.4% of the Maltese basket fell in the over 5% interval, only 10.3% of the euro area basket fell in this interval.

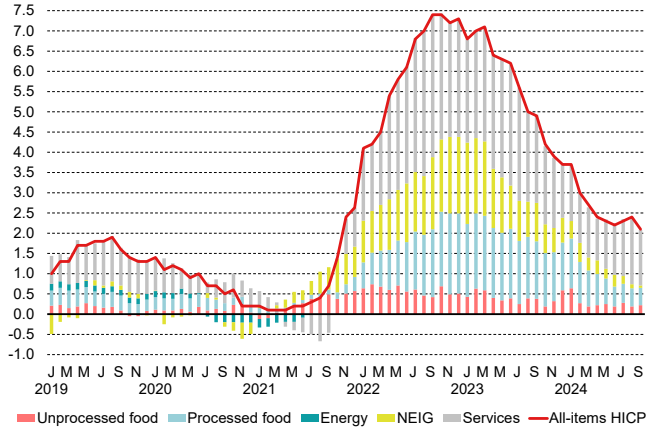
higher inflation for some food products – including fish and vegetables – as compared to that in the euro area. Maltese data also show higher inflation rates for a number of household items such as cookers, food processing appliances and cleaning and maintenance products. Increases in international passenger freight rates were also higher in Malta. However, while items with price increases of between 2% and 5% accounted for 32.2% of the euro area basket in September, in Malta this share was significantly lower at 21.1%, as was the share of items with inflation rates of between 0% and 2%. On the other hand, Malta had a higher share of items with negative inflation rates.

Main components of inflation

The drop in Malta's HICP inflation between June and September stemmed from processed food and NEIG inflation. Unprocessed food and energy inflation retained the same contribution, while the contribution from services inflation increased (see Chart 3.4).

Processed food inflation (including alcohol and tobacco) fell to 2.7% from 3.1% in June, supported by lower imported prices and the Stabbilta' scheme. Consequently, the contribution of processed food to HICP inflation decreased by 0.1 percentage points, standing at 0.4 percentage points in September. On the other hand, unprocessed food inflation edged up to 4.5% from 3.7% in June and retained a similar contribution to June's. As a result, overall food inflation including alcohol and tobacco, eased slightly during the quarter under review, standing at 3.2%, as compared to 3.3% in June. This is lower than the historical average of 3.6%.

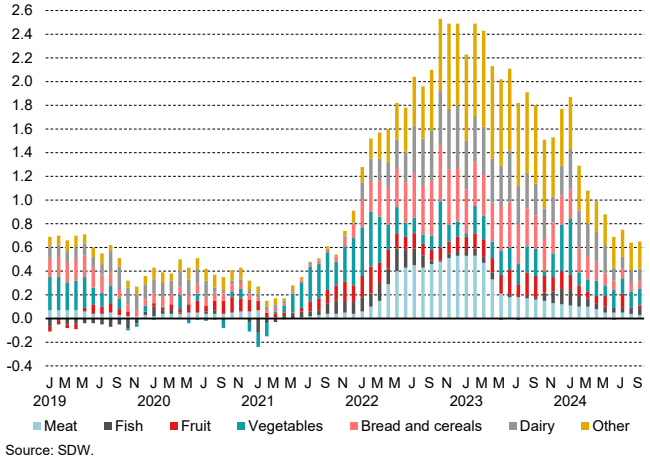
Chart 3.4
CONTRIBUTIONS TO YEAR-ON-YEAR HICP INFLATION
(percentage points; annual percentage change)



Source: SDW.

The moderation in food inflation since June partly reflected a decline in contributions from the prices of sugar, chocolate and confectionery items which form part of the 'other' category. This was followed by smaller contributions from the prices of bread and cereals and meat products. Vegetable products also contributed to the moderation in food inflation, although to a lesser extent (see Chart 3.5). On the other hand, there was an increase in the contribution from fish and fruits following higher prices for fresh fish and fruits.

Chart 3.5
CONTRIBUTIONS FROM FOOD TO HICP INFLATION
(percentage points)



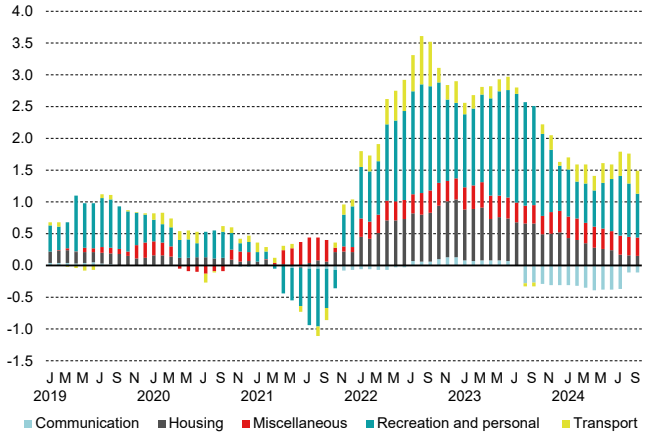
Source: SDW.

NEIG inflation fell from 1.1% in June to 0.2% in September. Looking at the sub-components, prices of durables contracted at a faster pace of 1.6% in annual terms, following a drop of 1.1% three months earlier. At the same time, prices of non-durables rose at a slower pace of 2.7%, down from 3.6% in June. At the same time, prices of semi-durables contracted by 0.1% year-on-year, following a growth of 1.3% in June.

Services inflation increased from 2.3% in June to 2.7% in September, contributing 1.4 percentage points to overall HICP inflation (see Chart 3.6). This mostly reflected a smaller negative contribution from the communication component, as prices of communication services contracted at a slower rate. Furthermore, the contribution from transport services increased on the back of higher prices for international flights.

On the other hand, the contribution from the recreation and personal component, which is the main contributor to services inflation in Malta, decreased as the prices charged for hairdressing, restaurants and accommodation services rose at a slower pace when compared to three months earlier. At the same time, the contribution from housing fell, mainly reflecting weaker growth in rental prices. Meanwhile the contribution from miscellaneous services remained largely unchanged.

Chart 3.6
CONTRIBUTIONS FROM SERVICES TO HICP INFLATION
(percentage points)



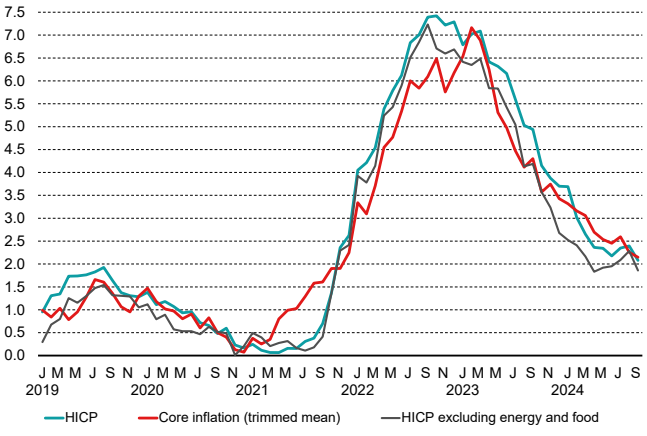
Source: SDW.

Energy inflation remained at 0.0% in September, as electricity, gas, and transport fuel prices were kept unchanged from their level a year earlier, through government support measures shielding the economy from changes in international energy prices.

Core HICP inflation declines

The Bank's measure of core inflation, which excludes the more volatile items in each month, fell to 2.1% in September 2024, from 2.5% three months earlier (see Chart 3.7).[3]

Chart 3.7
HICP IN MALTA: OVERALL AND CORE MEASURE
(annual percentage change)



Sources: Eurostat; Central Bank of Malta estimates.

[3] The Bank uses a 'trimmed mean' approach to measure core inflation, whereby the more volatile subcomponents of the index are removed from the basket of consumer goods so as to exclude extreme movements from the headline inflation rate. See Gatt, W. (2014), "An Evaluation of Core Inflation Measures for Malta", *Quarterly Review* 2014(3), pp. 39-45, Central Bank of Malta.

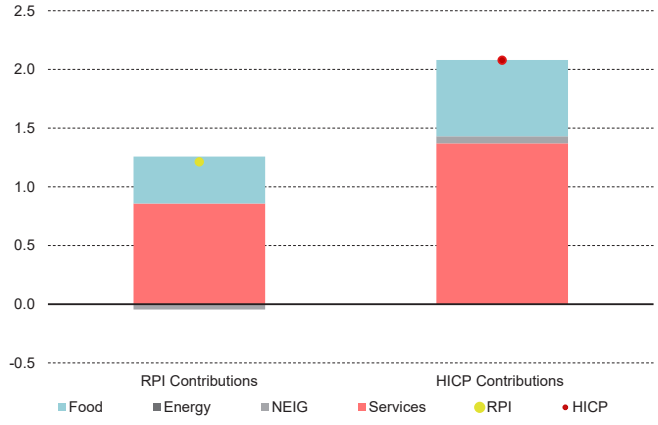
An alternative measure of underlying inflationary pressures – HICP excluding energy and food – also eased slightly in September, reaching 1.9%, from 2.0% in June.

RPI inflation edges down

Annual inflation based on the RPI index fell to 1.2% in September, from 1.3% in June, reflecting mixed developments across components. While the contributions of food, housing, household equipment and personal care and health decreased, the contribution of transport and communication turned less negative while that of recreation and culture also rose marginally (see Table 3.2).[4] Despite the moderation, food remained the main contributor to RPI inflation, followed by personal care and health.

While the methodology underlying RPI and HICP is similar, they differ in that the RPI includes private households only, while HICP covers also institutional households and foreign visitors to Malta. Consequently, the difference between HICP and RPI inflation in part reflects the different structure of weights applied to the two indices. Furthermore, unlike the RPI weights, which were last updated in 2017, weights applied to the HICP index are updated annually. Chart 3.8 shows the contributions of the main sub-components to overall RPI and HICP inflation, respectively. While the contributions of HICP are official

Chart 3.8
RPI AND HICP MAIN CONTRIBUTIONS
(annual percentage changes; contributions)



Sources: Eurostat; NSO; Central Bank of Malta calculations.

Table 3.2
CONTRIBUTIONS TO YEAR-ON-YEAR RPI INFLATION
Percentage points

	2023			2024								
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
Food	1.5	1.6	1.9	1.9	1.2	1.1	1.0	0.8	0.6	0.6	0.5	0.5
Beverages and tobacco	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Clothing and footwear	-0.1	-0.1	-0.1	0.0	0.1	-0.1	0.0	0.0	0.0	0.1	0.0	0.0
Housing	0.5	0.4	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0
Water, electricity, gas and fuels	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Household equipment and house maintenance costs	0.3	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	-0.1
Transport and communications	0.0	-0.1	-0.3	-0.4	-0.5	-0.6	-0.8	-0.5	-0.4	-0.2	0.0	-0.1
Personal care and health	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3
Recreation and culture	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other goods and services	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.4	0.3	0.4	0.3	0.3
RPI (annual percentage change)	**3.7**	**3.6**	**3.6**	**3.2**	**2.3**	**1.9**	**1.6**	**1.5**	**1.3**	**1.4**	**1.5**	**1.2**

Source: NSO.

[4] The RPI index differs from the HICP index in that RPI weights are based on expenditure by Maltese households, while HICP weights also reflect expenditure patterns by tourists in Malta, such as accommodation services. See Darmanin, J. (2018), "Household Expenditure in Malta and the RPI Inflation Basket", *Quarterly Review* 2018(3), pp. 33-40, Central Bank of Malta.

Eurostat figures, the RPI contributions are internal estimates based on an approximate mapping of individual RPI sub-items into corresponding HICP categories.[5,6] These estimates indicate that the largest difference between RPI and HICP inflation in September, stemmed from services and food inflation.

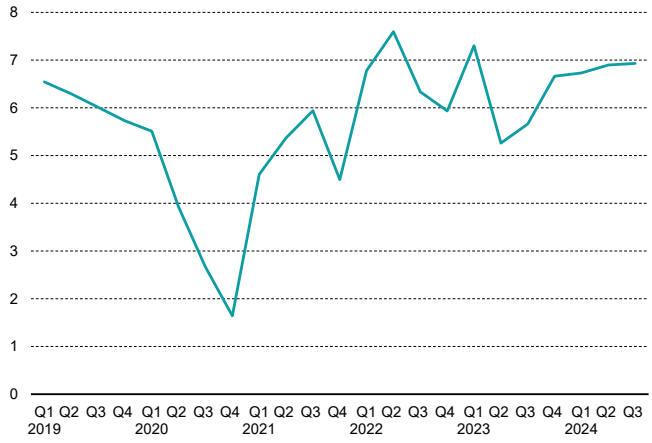
The housing market

Residential property price inflation unchanged from the previous quarter

The NSO's Property Price Index (PPI) – which is based on actual transactions involving apartments, maisonettes, and terraced houses – continued to increase in annual terms. The annual rate of change stood at 6.9% in the third quarter of 2024, unchanged from the previous quarter (see Chart 3.9).[7] Meanwhile, in the euro area, prices on average increased at an annual rate of 2.6%.

Residential property prices in Malta continue to be supported by a number of Government schemes supporting demand for property, including the first-time and second-time buyers' schemes, the purchase of properties located in Urban Conservation Areas (UCA) and in Gozo, as well as refund schemes for restoration expenses. Moreover, a dynamic tourism sector, and significant migrant worker flows continue to support demand for accommodation and hence, property prices.

Chart 3.9
MOVEMENTS IN RESIDENTIAL PROPERTY PRICES
(annual percentage changes)



Source: Eurostat.

Misalignment indicator suggests prices are moderately below fundamentals

As part of its ongoing macroeconomic analysis, the Bank calculates a house price misalignment index to provide an indication of the evolution of house prices against fundamentals.[8,9] This indicator consists of five sub-indices that capture household, investor, and system-wide factors, with the weights being derived using principal component analysis.

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[5] The RPI grouping of sub-components is intended to be as close as possible to the HICP grouping. For example, restaurants services and take-aways were included within 'Services' sub-component rather than within the 'Food" sub-component. Nonetheless, figures should be interpreted with caution as they might not reflect HICP grouping entirely.

[6] The contributions of RPI sub-components are made to sum to the overall inflation by allocating a residual chain-linking component to the aforementioned sub-components.

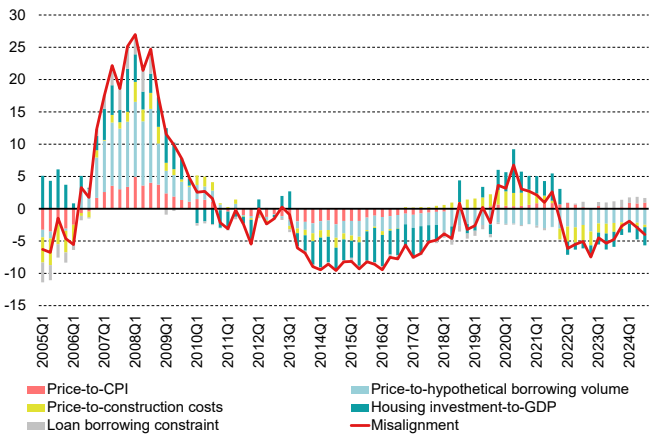
[7] 'Apartments' are defined as dwellings with self-contained rooms or a suite of rooms that have a separate entrance accessible from a common passageway, landing or stairway. 'Maisonettes' have a separate entrance that is accessible from the street and are either at ground-floor level with overlying habitation, or at first-floor level with underlying habitation. 'Terraced houses' are dwellings with at least two floors, own access at street level and airspace, and with no underlying structures that are not part of the house itself. They are attached to other structures on both sides.

[8] See Micallef, B. (2018), "Constructing an index to examine house price misalignment with fundamentals in Malta", *International Journal of Housing Markets and Analysis*, 11(2), pp. 315-334.

[9] The actual numerical results presented in this section should not be overstated given the limitations in the construction of this indicator. For example, relevant variables such as foreign capital inflows are not included, and the unavailability of an official rental index precludes the use of the price-to-rent ratio in the indicator.

According to this indicator, house prices, as measured by the NSO's PPI, were below the level consistent with fundamentals in the third quarter of 2024. The degree of undervaluation increased somewhat when compared with the second quarter of 2024, largely reflecting a more negative contribution from the housing investment-to-GDP ratio (see Chart 3.10).[10]

Chart 3.10
HOUSE PRICE MISALIGNMENT INDICATOR
(percentage points; based on transaction prices)



Source: Central Bank of Malta.

The latter also explains most of the misalignment for this quarter, followed by the house price-to-hypothetical borrowing ratio. The house price-to-construction cost ratio also contributed, albeit in a more limited way. By contrast, the loan borrowing constraint and house price-to-CPI ratio contributed positively to the misalignment index.

Number of final deeds decline in quarterly terms but increase in annual terms

NSO data on residential property transactions show that 3,006 final deeds of sale were registered in the quarter under review, a decline of 5.7% compared to the number of sales concluded in the previous quarter, but 4.7% higher than the number of deeds registered a year earlier (see Table 3.3). Around 93% of transactions concluded in the third quarter of 2024 involved purchases by individuals.

The year-on-year increase in deeds in the third quarter of 2024 reflected a larger number of transactions in the Northern region, followed by the Northern Harbour and Southern Harbour regions. The other regions recorded decreases. In value terms, there was a year-on-year increase of 1.9%, although the increase in the case of individual buyers was more significant, at almost 14%.

Table 3.3
RESIDENTIAL PROPERTY TRANSACTIONS
Levels

	2023				2024		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3
Residential transactions							
Promise of sale	3,116	3,492	3,076	3,501	3,497	3,492	3,108
Final deeds of sale	3,101	3,007	2,870	3,202	3,161	3,187	3,006

Source: NSO.

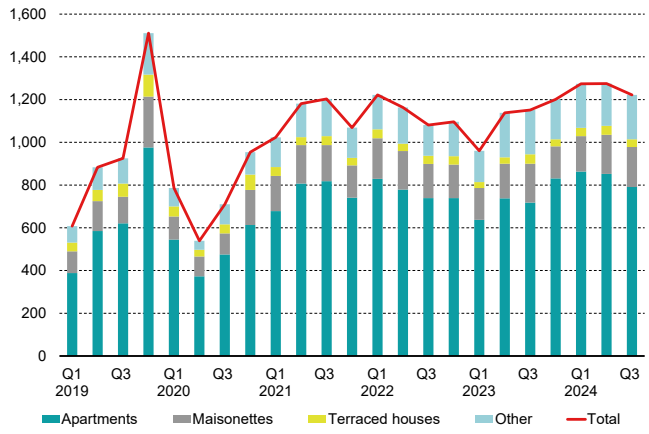
[10] A separate assessment based on advertised house prices can be found in Gatt, W., Micallef, B. and Rapa, N. (2018), "A macroeconometric model of the housing market in Malta", *Annual Research Bulletin*, Central Bank of Malta, pp. 11-18.

At 3,108 the number of promise-of-sale agreements was 11% lower than the number registered in the previous quarter, and up by 1.0% from the same quarter of 2023. The year-on-year increase in the quarter under review was mainly driven by the Southern Harbour and Western regions.

Mortgage transactions increase year-on-year[11]

In the third quarter of 2024, the number of new mortgage contracts stood at 1,222. When compared with the third quarter of 2023, they rose by 6.2% (see Chart 3.11). Increases were observed for all main property categories except for terraced houses, farmhouses and villas. However, the biggest contributors to the latest increase were apartments and maisonettes.

Chart 3.11
MORTGAGE CONTRACTS
(number of contracts)



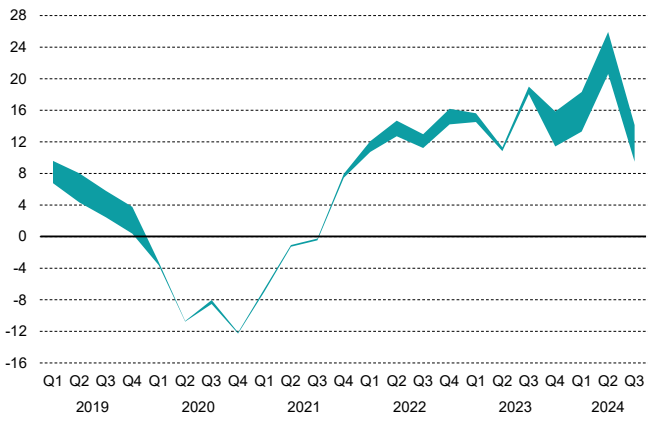
Source: Central Bank of Malta.

The total number of mortgage contracts in the third quarter of 2024 stood below the peak of 1,511 transactions recorded in the last quarter of 2019, but above the average of 973 transactions per quarter recorded since 2017.

Advertised rent prices continue to increase

The annual rate of change of advertised rents collected by the Bank from internet sources recorded another significant increase in the third quarter of 2024.[12] The range of estimates from various methods indicate that rents have increased at annual rates of between 9.5%and 14.1% in the quarter under review (see Chart 3.12).

Chart 3.12
ADVERTISED RENTAL PRICES
(annual percentage change)



Source: Central Bank of Malta.

[11] The data used in the section are collected by the Central Bank of Malta from four commercial banks and relate only to properties which have been purchased with a mortgage. The dataset excludes properties that have either been transacted using other means of financing, as well as mortgages that have been refinanced. The property types included are flats, penthouses, maisonettes, terraced houses, town houses, houses of character, farmhouses, bungalows, and villas. Other property types included in the previous section such as airspace, boathouses, garages, and plots of land are excluded.

[12] The empirical analysis is based on hedonic regression models as described in Debono et al., (2020) and different indices are constructed using alternative methodologies, namely the time dummy method, the rolling time dummy method with a window length of two periods (Q=2) and the average characteristics method chained using the Laspeyres, Paasche and Fisher methods. The properties considered in this analysis include apartments, maisonettes, and penthouses.

Compared with the previous quarter, the rate of increase included in the range of estimates has narrowed slightly and shifted down. In the quarter under review, the level of advertised rents was almost a third higher than its average in recent years.[13]

Cost indices

Most indicators of producer costs grow at a slower pace

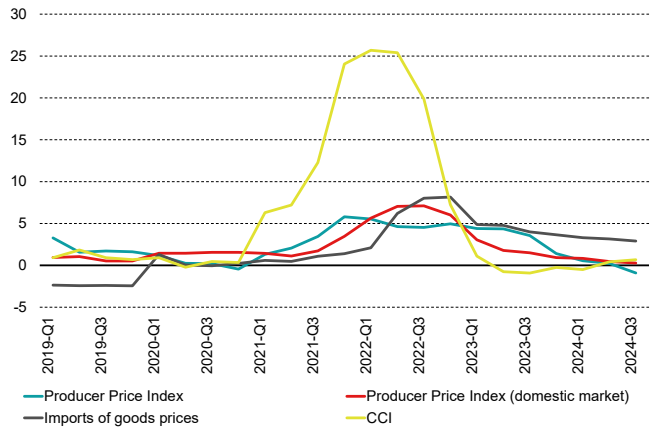
The industrial producer price index is a measure of the prices of goods sold by producers in the industrial sector. Annual inflation according to this index stood at -0.9% on average in the quarter under review, down from 0.2% in the previous quarter (see Chart 3.13).[14] This drop was driven by developments in producer prices for capital goods, intermediate goods and consumer goods. The annual rate of change of the latter grew at a slower pace of 0.8% in this quarter, down from 1.6% in the previous quarter. At the same time, the annual rate of change of producer prices of capital goods grew at a slower pace of 3.5% in the quarter under review, down from 6.2% in the previous quarter. Meanwhile, the annual rate of change of producer prices of intermediate goods became more negative, standing at -5.0% in the third quarter of 2024, compared to -3.3% in the second quarter. Energy producer price inflation remained unchanged.

Other indicators affecting the domestic market also show easing cost pressures. The domestic producer price index rose at a slightly slower annual rate of 0.3%, from 0.5% in the second quarter, mainly driven by slower growth in producer prices of consumer goods.[15] The imports of goods deflator also shows somewhat weaker growth of 2.9%, from 3.2% in the second quarter of 2024.[16] The CCI for new residential buildings published by Eurostat increased at a slightly higher rate in the third quarter of 2024, standing at 0.7% after it had increased by 0.4% in the previous quarter. Notwithstanding the recent declines, its level remains above that observed before 2020.

ULCs increase at a faster rate on a four-quarter moving average basis

Malta's ULC index – measured as the ratio of CPE to labour productivity – increased in annual terms, but decreased slightly in quarter-on-quarter terms in the third quarter of 2024.

Chart 3.13
COST INDICATORS
(annual percentage growth)



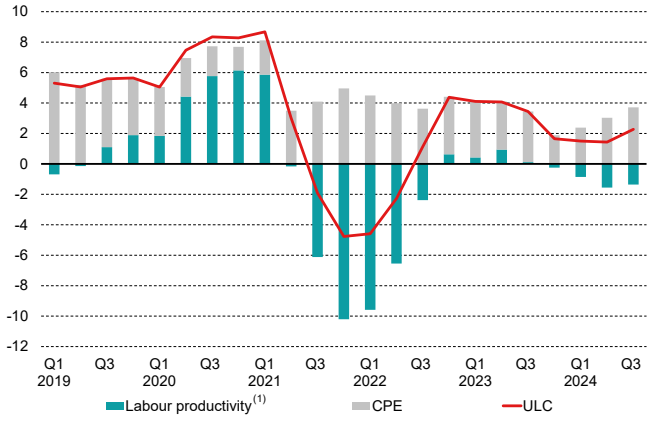
Sources: Central Bank of Malta estimates; Eurostat data; NSO data.

[13] This index is available from 2017Q4.
[14] The industrial producer price index measures the prices of goods at the factory gate and is commonly used to monitor inflationary pressures at the production stage. The index used here refers to the B-E36 aggregate of the EU's statistical classification of economic activities.
[15] The domestic producer price index refers to the producer prices relating to the domestic market only, whilst the producer price index relates to the total market, i.e., including both the domestic and non-domestic markets.
[16] This index is derived from national accounts data published by the NSO.

When measured on a four-quarter moving average basis in headcount terms, ULCs in Malta rose at an annual rate of 2.3%. This followed an increase of 1.4% in the previous quarter (see Chart 3.14). The pick-up in in ULC growth largely reflects an acceleration in CPE. This rose by 3.7% in annual terms, from 3.0% in the second quarter. To some extent, the increase in ULC growth also reflected slower growth in productivity per person. This rose by an annual rate of 1.4% in the third quarter, from 1.6% in the previous one.

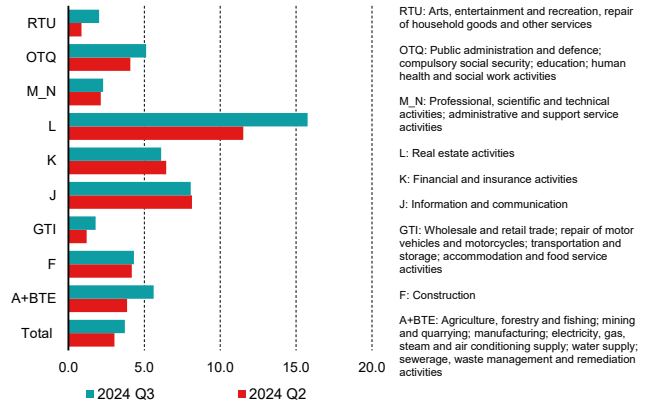
When measured on a four-quarter moving average basis, growth in CPE was fastest in the real estate activities sector (see Chart 3.15). Wage growth was also significant in a number of other sectors, including the information and communication sector and financial and insurance services. Overall, compared with the previous quarter, compensation per employee grew at a faster rate in most sectors.

Chart 3.14
DECOMPOSITION OF ULC (PER PERSON) IN MALTA
(annual percentage change; four-quarter moving average)



Sources: NSO; Central Bank of Malta estimates.
(1) A rise (drop) in productivity contributes negatively (positively) to ULC growth.

Chart 3.15
CPE BY SECTOR
(annual percentage growth; four-quarter moving average)



Source: NSO.

BOX 2: INFLATION PERSISTENCE OVER TIME: DEVELOPMENTS AND CONTRIBUTING FACTORS[1]

This box examines the persistence of inflation in Malta and compares its evolution over time and across various subcomponents with that of the euro area. Using time-varying autoregressive models and Bayesian techniques, the study highlights the increasing trend of inflation persistence in Malta, particularly since the onset of the COVID-19 pandemic and the subsequent global economic disruptions. The analysis identifies key factors that might have contributed to this persistence, including supply shocks, inflation expectations, and labour market tightness.

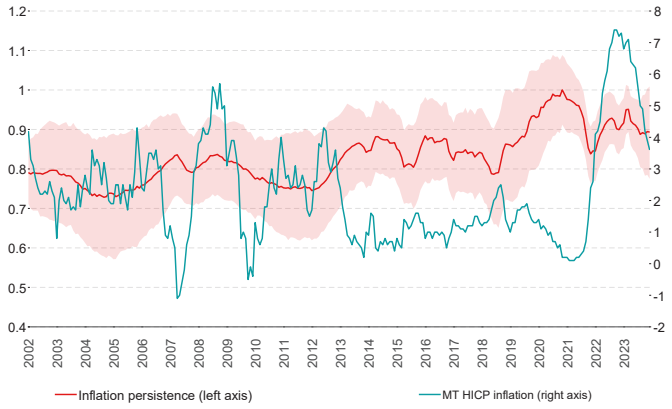
How inflation persistence in Malta has evolved for headline and its main subcomponents

The uneven global economic recovery from the pandemic in 2020 and 2021, as well as the onset of the Russia-Ukraine War in 2022, brought about significant supply-imbalances that caused an extraordinary episode of very high inflation. As a small open economy, Malta also underwent a period of elevated inflation. According to the HICP, inflation in Malta peaked at 7.4% in October 2022, the highest rate recorded since the index's inception in 1997. The recent surge in inflation in Malta closely mirrors that of the euro area, which has also experienced both a higher peak and a longer duration of inflation above its historical average.

In this box we analyse the recent developments in inflation persistence, defined as the tendency for past inflation to stay near where it has been recently, absent any other economic counteracting forces (Fuhrer, 2009). To this end, separately for each inflation series of interest, we estimate an autoregressive model featuring time-varying parameters and stochastic volatility and we define the month-specific persistence parameter as the sum of the autoregressive coefficients.[2]

Chart 1 shows the estimated evolution of Maltese inflation persistence for headline HICP from

Chart 1
TIME-VARYING PERSISTENCE ESTIMATES OF OVERALL INFLATION



Source: Author's estimates.
Notes: Left-hand axis shows the estimated time-varying persistence parameters. Right-hand axis shows annual percentage changes.

[1] Prepared by Germano Ruisi, Principal Research Economist of the Economic Research Department at the Central Bank of Malta. The analysis presented in this box is based on the authors' study: Ruisi and Borg (2024), "Inflation persistence over time: Developments and contributing factors", Central Bank of Malta *Policy Note*. Helpful comments by Mr Alexander Demarco, Dr Aaron G. Grech, Mrs Rita Schembri, Dr Massimo Giovannini, Mr Noel Rapa, Mr John Farrugia, and all the participants in an internal seminar are gratefully acknowledged. The views expressed are the author's own and do not necessarily reflect the views of the Central Bank of Malta.

[2] For more details on the model please refer to Ruisi and Borg (2024) "Inflation persistence over time: Developments and contributing factors", Central Bank of Malta *Policy Note*.

2002 to 2023, along with the 68% credible bands. It also plots the series of headline HICP inflation.

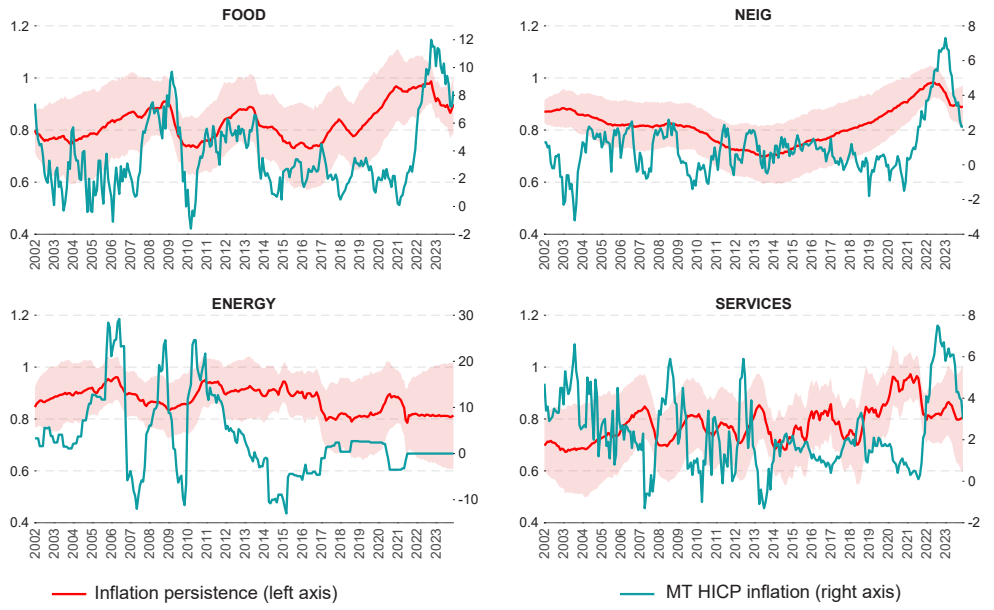
Despite the erratic movements in HICP inflation between 2002 and 2012, inflation persistence hovered close to 0.8. However, estimates of inflation persistence began trending upwards from 2012, stabilising at around 0.85 by 2019. This period, characterised by generally below-average inflation, suggests that the estimated inflation persistence reflects a persistently low inflation environment.

Inflation persistence increased sharply following the onset of the pandemic in 2020, peaking in November of the same year and coinciding with some of the lowest inflation rates since the declines experienced in 2010. This rise in persistence might be linked to the historically low inflation levels before the pandemic.

Since 2021, estimates of inflation persistence have been relatively unstable but have remained historically high throughout the high inflationary period that emerged in 2022. By the end of 2023, inflation persistence had settled at around 0.9, confirming that the last two years have been characterised by both high and persistent inflation.

Chart 2 delves into the subcomponents of HICP and shows how the drivers of persistence in headline inflation have been rather diverse over the last 20 years.

Chart 2
TIME-VARYING PERSISTENCE ESTIMATES OF SUBCOMPONENTS



Source: Author's estimates.
Note: Left-hand axis shows the estimated time-varying persistence parameters. Right-hand axis shows annual percentage changes.

With regards to food inflation, persistence increased during the 2000s and peaked in 2008, mirroring a period of high food inflation due to the food price shock in 2007/2008.[3] Persistence then declined after 2013 as food inflation shifted from a rather prolonged period of high inflation to a lower inflation regime. As food inflation settled at persistently low levels between 2015 and 2021, inflation persistence rose and peaked in the latter part of this period. The increase in food inflation in the post-COVID period led to an elevated estimate of inflation persistence, which remained elevated even as food inflation moderated somewhat since mid-2023.

Turning to NEIG, estimates show a consistent decline in an otherwise elevated inflation persistence measure until 2013. This was followed by an upward trend in inflation persistence that occurred over the following decade. Despite the sudden increase in goods inflation since 2021, inflation persistence continued to increase markedly, and hovered close to 1 by 2022, suggesting that the sharp rise in goods inflation experienced in the post-COVID period was highly persistent. As goods inflation eased during 2023, the estimated inflation persistence also moderated but remained rather high from a historical perspective.

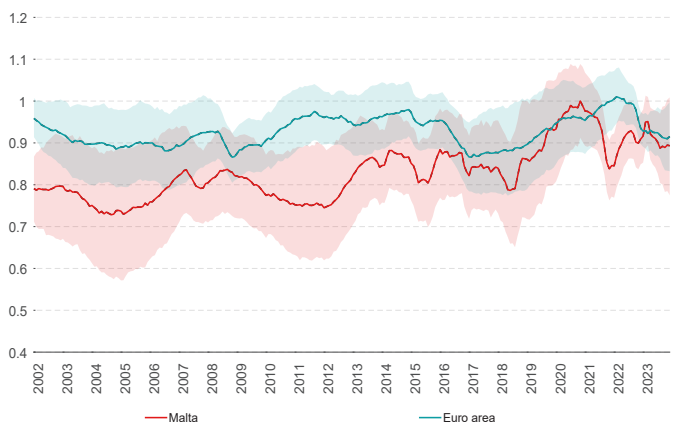
Persistence in energy inflation has been comparatively stable and high over the period under consideration, which might reflect the fact that this subcomponent is administered by the Maltese Government. In view of the Government's decision to keep energy prices unchanged throughout the period characterised by sharp increases in international energy commodity prices, energy inflation persistence remained stable unlike that in the other subcomponents.

Finally, persistence in services inflation was comparatively lower than other subcomponents across the sample under consideration. But, similarly to others subcomponent measures, as services inflation stabilised over the 2013-2021 period, the estimated persistence rose rapidly. Despite falling somewhat, persistence remained relatively elevated from a historical point of view during the high inflation period which started in 2022.

How has inflation persistence evolved in Malta vis-à-vis in the euro area

Chart 3 shows that Malta's inflation persistence has been consistently lower than that of the euro area up until 2019.

Chart 3
TIME-VARYING PERSISTENCE ESTIMATES OF MALTA AND THE EURO AREA



Source: Author's estimates.
Note: Chart shows the estimated time-varying persistence parameters for overall inflation in Malta and the euro area.

[3] The food price shock was a period which featured a dramatic increase in the price of international food commodities such as rice, corn, and wheat. It was driven by a confluence of factors such as higher oil prices, the depreciation of the U.S. dollar, weather shocks, etc. (see Heady and Fan, 2008). There could be other factors explaining the food price shock that occurred in 2007-2008 but there is no full consensus in the literature.

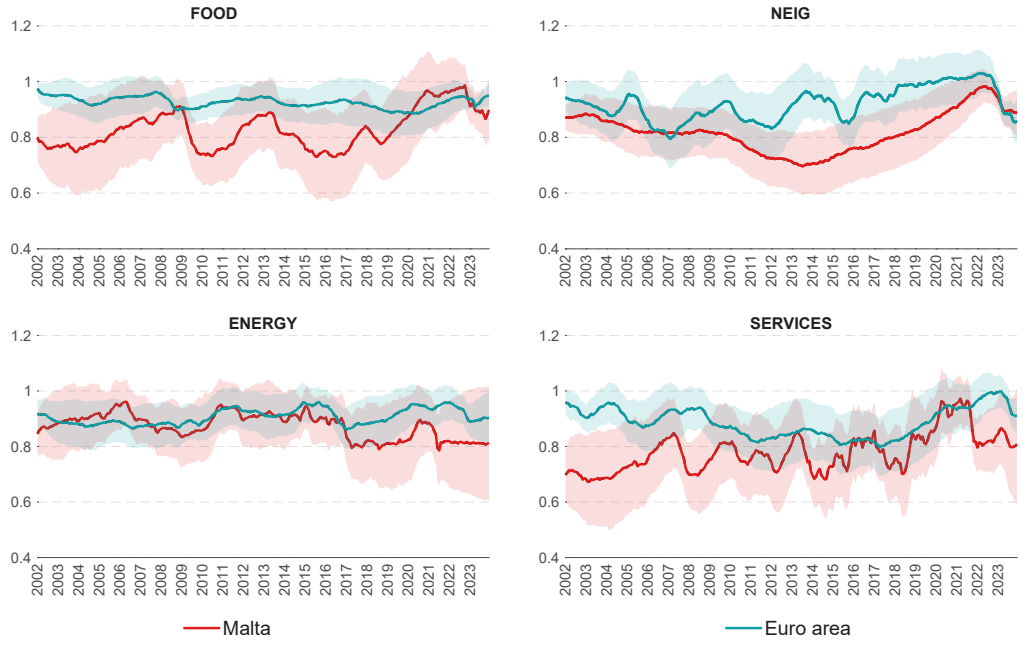
The dynamic nature of the time-varying estimation shows a gradual convergence towards euro area inflation persistence. A brief alignment with euro area persistence was observed in Malta during 2020 and 2021. Conversely, a spike in headline inflation in 2022 prompted a slight drop in Maltese inflation persistence, followed by a subsequent rise into 2023. Concurrently, the euro area experienced a peak in inflation persistence around mid-2022, tapering off gradually throughout 2023, resulting in a convergence with Malta's persistence by mid-2023.

Delving into subcomponents in Chart 4, a comparison shows some divergences in the drivers of headline inflation persistence dynamics.

Maltese food inflation's persistence was consistently lower than the euro area's between 2013 and 2017 but, subsequently, the two began to converge. The convergence during the recent inflationary period reflects the synchronization of the upward swing in food inflation dynamics between the euro area and Malta. This convergence could also reflect the fact that common international supply side shocks were the main drivers of inflation dynamics in both euro area and Malta during this period and by the fact that Malta's goods consumption basket has a large import content.

Estimates of energy inflation persistence for Malta reflect a significant influence from governmental price administration, contrasting with the euro area's more dynamic energy pricing. Pre-2017, energy inflation persistence of Malta and the euro area remained

Chart 4
TIME-VARYING PERSISTENCE ESTIMATES OF SUBCOMPONENTS – MALTA VS EURO AREA



Source: Author's estimates.
Note: Chart shows the estimated time-varying persistence parameters for subcomponent inflation in Malta and the euro area.

comparable, yet post-2017, Malta's estimates were consistently lower, driven mainly by the Maltese Government price stabilisation policies. This divergence intensified amid large shocks to euro area energy inflation versus Malta's zero-energy inflation.

Services inflation in Malta exhibits lower persistence compared to the euro area. This is true throughout most of the period under consideration with the exception of the period between 2015 and 2022 where the Malta's services inflation persistence has mirrored that of the euro area.

Factors that might explain the recent developments in inflation persistence

We seek tentative evidence of factors that might explain the recent developments in inflation persistence by extending the inflation persistence estimates to each of the 20 euro-area countries. Subsequently, by utilising a panel regression framework, we regress the estimated country-specific series of time-varying headline HICP inflation persistence on a set of common determinants.[4] The main results are shown in Table 1.[5]

Inflation expectations do play a role in explaining the evolution of inflation persistence, though there are variations across periods considered. Sellers' expectations in industry contributed negatively to overall inflation persistence until February 2021. Neri (2023) showed that long-term inflation expectations were generally well-anchored and had reached very low levels by 2019, which might explain the low impact of sellers' expectations on inflation persistence.

Table 1
SOURCES OF INFLATION PERSISTENCE

Prices expectations industry (till 2021M02)	-0.042	*
Prices expectations industry (since 2021M03)	0.131	***
Prices expectations consumers (till 2021M02)	-0.001	
Prices expectations consumers (since 2021M03)	-0.074	***
Equipment limiting production (till 2021M02)	0.170	***
Equipment limiting production (since 2021M03)	0.089	***
Unemployment cycle abs (till 2021M02)	1.393	***
Unemployment cycle abs (since 2021M03)	1.014	*
Trade openness	2.106	**
Dummy EA	-2.829	***
Dummy 2021M03 onwards	2.001	**
ECB shadow rate	-0.697	***
Cons	86.772	***
Observations	4895	
Within R-squared	0.251	

Source: Author's estimates.

[4] For more details on the model please refer to Ruisi and Borg (2024) "Inflation persistence over time: Developments and contributing factors", Central Bank of Malta *Policy Note*.

[5] Throughout this section, the dependent variable, i.e., inflation persistence, has been multiplied by one hundred for easier readability of the slope parameters of interest.

Conversely, since March 2021, sellers' price expectations contributed positively to inflation persistence. During this period, sellers' price expectations rose significantly, mainly due to sharp increases in input and financing costs as well as to pent-up demand from the pandemic.

Consumer price expectations do not seem to have been a factor driving inflation persistence prior to February 2021. To the contrary, they are found to be negatively related to inflation persistence post March 2021. Evidence from the ECB's Consumer Expectations Survey (CES) shows that consumers have primarily adjusted downwards their consumption (and increased savings) to cope with higher inflation (Bobasu et al., 2023). Hence, higher consumer expectations might have brought about a stronger downward adjustment in consumption, which in turn reduced inflationary pressures, thus reducing its persistence.

The coefficients on equipment shortages and labour market tightness, the latter captured by the absolute value of the unemployment cycle, are positive and statistically significant, both for the period prior and post 2021. Bernanke and Blanchard (2023) found that the two are major drivers for the increase in inflation occurring in the post-COVID period. From our results, we find that they are also positively correlated with inflation persistence.

Finally, the parameters associated with trade openness and the dummy are positive and statistically significant. Additionally, a country's entry into the euro area has generally been associated with a reduced overall inflation persistence as highlighted by the significant slope relative to the and to the ECB's policies as proxied by the shadow rate.

Conclusions

This box shows estimates of the persistence of inflation in Malta and compares their evolution over time and across various subcomponents with that of the euro area. Inflation persistence in Malta has trended upwards since 2012, generally reflecting a period of persistently low inflation and has then increased sharply since 2021. Overall, Maltese inflation persistence was lower than in the euro area until 2019 but has recently converged, both for headline and for its main subcomponents. The analysis also identifies key major factors that might have positively contributed to persistence, especially after March 2021 with supply shocks, sellers' and consumers' inflation expectations, and labour market tightness found to be correlated with inflation persistence measures.