## 1. MACROPRUDENTIAL RISK ASSESSEMENT

Financial stability challenges rose in 2023, amid the confluence of events that hit the global economy. Following market disruptions in the fourth quarter of 2022, markets were hit again by the banking turmoil which erupted in the United States (US) and Switzerland in the first quarter of 2023. However, the prompt and decisive actions by respective authorities helped restore market confidence and stem the high risk of contagion. Such events are however forcing a re-evaluation of banking regulation and resolution processes, especially in the US. Nonetheless, the euro area banking system remained resilient, buttressed by strong capital and liquidity buffers coupled with increased profitability.[1] The cost of financing continued to trend upwards on the back of the tighter monetary policies. Against such a backdrop, the possibility of a deterioration in credit quality going forward is plausible. Despite the rising credit risks, leverage, and low liquidity buffers, the euro area's non-bank financial sector demonstrated resilience, whilst remaining highly engaged in primary debt markets.[2] Although financial markets have been somewhat volatile throughout the year, equity prices surged

The global macroeconomic environment remained fragile, amidst heightened geopolitical tensions, elevated inflation, weaker economic growth and tighter financial conditions.

Financial markets performed well; however, prices of some asset classes remained overstretched, and hence vulnerable to abrupt corrections, especially if inflation remains above the ECB's medium-term target.

Domestically, cyclical developments remained robust, driven by strong credit towards property-related loans which adds to concentration risks on banks' loan books.

The domestic financial sector remained resilient backed by strong capital and ample liquidity buffers. Profitability recovered notably, while asset quality improved further.

[1] Source: ECB: Financial Stability Review – May 2024.

[2] See Footnote 1.

higher whilst bond yields retreated slightly, especially in the last quarter of the year. Meanwhile, the geopolitical tensions in the Middle East escalated further towards the end of the year, which may have adverse effects on the global economy and energy prices, hence inflationary pressures could resurface.

In the face of these events, the Maltese financial system remained resilient. Domestic banks continued to operate with ample liquidity and strong capital buffers, enabling them to withstand possible adverse shocks. They also managed to reap the benefits of the tighter monetary policy stance, improving their net interest income (NII) from placements with the Eurosystem as well as from intermediation activities. Going forward, downside risks to profitability remain driven by the possible adverse impact of the current uncertain macroeconomic environment on the credit growth path and funding costs. Furthermore, markets are pricing in rate cuts in the near term which could affect banks' interest income, especially on their large balances with the Eurosystem.

## 1.1 Vulnerabilities outside the financial system

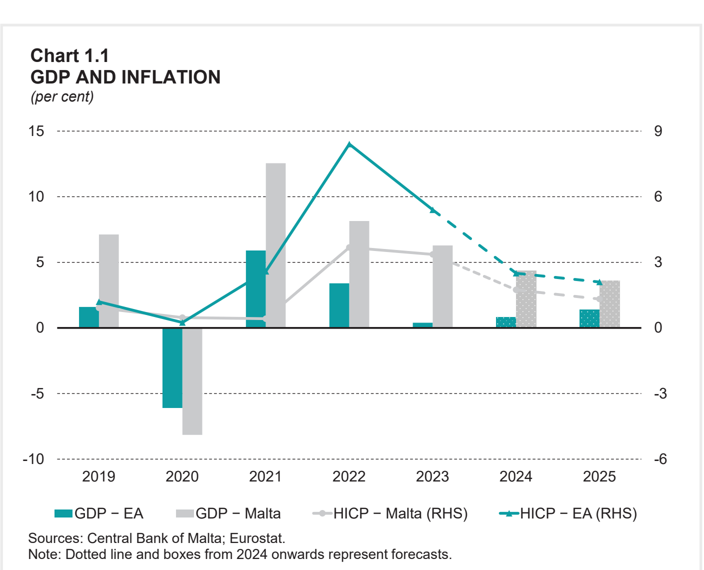
During the year, euro area inflation declined but remained above the ECB's medium-term target of 2%, such that the ECB continued with its contractionary monetary policy. It raised its key interest rates six times in 2023, so that the main refinancing operation (MRO) reached 4.50%. Despite also slowing down domestically, inflation in Malta stood at 5.6%, slightly higher than the 5.4% for the euro area. This was largely driven by higher food prices and services (see Chart 1.1). Inflation in both the euro area and Malta is expected to return close the ECB's target by 2025.

Against this environment, euro area real economic growth slowed down to just 0.4% in 2023, compared to the 3.4% reported in the previous year. This moderation was also attributed to the absence of a strong growth catalyst, primarily seen in weak private consumption, with nominal wage growth trailing behind inflation. Growth was also affected on the external front as exports dwindled in part due to the slowdown in the Chinese economy. Going forward, at 0.8%, growth in real gross domestic product (GDP) is expected to remain subdued in 2024, before recovering to 1.4% in the following year.

Economic activity in Malta also moderated, down by 1.9 percentage points to 6.3% in 2023. Notwithstanding, such growth remained one of the highest in the euro area, spearheaded by the strong recovery in the tourism sector coupled with the robust domestic demand. Looking ahead, economic growth is expected to abate further in the next three years, but it is still projected to remain well above the euro area average. Domestic demand is projected to be the main engine of growth, with private consumption leading the charge followed by export services.

Interest rates have already peaked as the ECB lowered its key interest rates in June 2024. However, their future path is data-dependent and interest rates may be held at elevated levels for a longer period if inflation does not converge to the target level. Such a scenario may have negative repercussions on the growth outlook, compounded by enduring geopolitical tensions, especially due to the ongoing conflict in the Middle East. These continue to exert some upward pressures in commodity prices also compounded by the higher freight costs due to the unsecure trade route channels. In addition, the

**Chart 1.1**
**GDP AND INFLATION**
*(per cent)*




Sources: Central Bank of Malta; Eurostat.
Note: Dotted line and boxes from 2024 onwards represent forecasts.

economic slowdown in China may have significant adverse spillover effects on the rest of the world, although the strong rebound in the first quarter of 2024 helped lift its near-term economic outlook.

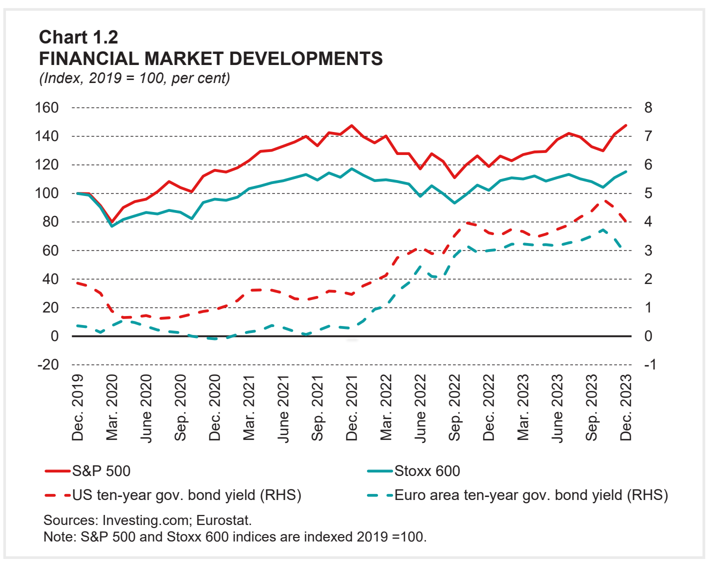


**Chart 1.2**
**FINANCIAL MARKET DEVELOPMENTS**
*(Index, 2019 = 100, per cent)*

Sources: Investing.com; Eurostat.
Note: S&P 500 and Stoxx 600 indices are indexed 2019 =100.

Despite the financial stability risks mentioned above, financial markets performed well but are still vulnerable to any potential macroeconomic surprises. After retreating in most of 2022, equity prices recovered strongly in the latter part of 2022 and most of 2023. This resulted in the Stoxx 600 index to increase by 12.7% during the year, with an even more pronounced growth in the US, where the Standard & Poor's (S&P) 500 rose by 24.2% (see Chart 1.2). However, such growth was mostly focused on the technology and communication sectors, aided by the increased interest in Artificial Intelligence (AI) technologies. The US ten-year government bond yield peaked at 4.8% in October 2023, before retreating to 4.0% by year end, which is still above the level in 2022. The euro-area ten-year government bond yield followed the same pattern but fell at a faster rate after peaking at 3.7% in October 2023 to reach 2.9% in December 2023, marginally below the 2022 level. Going forward, prices of some asset classes, especially in some specific sectors, may look overstretched and hence are vulnerable to sudden price corrections if risk sentiment deteriorates, economic growth falters, or inflation pick up momentum amidst the heightened geopolitical tensions.

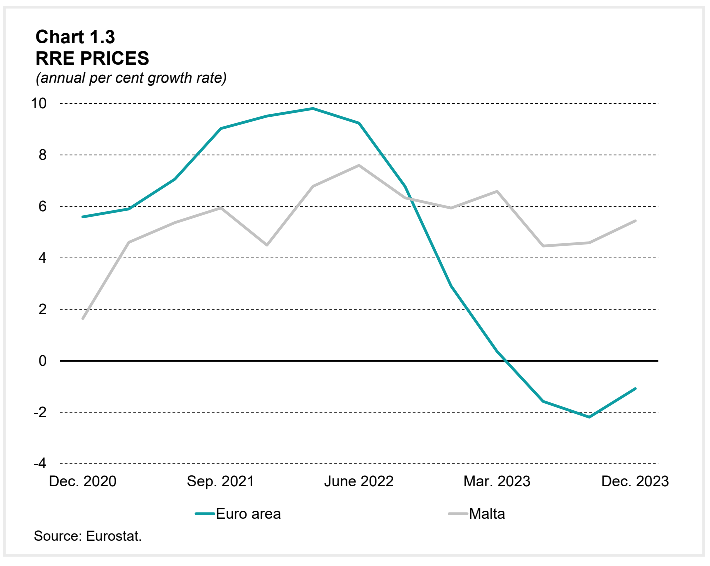
The phasing-out of government support measures in some euro area countries in response to the previous energy price shock coupled with high inflation prompted some fiscal tightening. However, a deterioration in economic activity in addition to a re-emergence of energy price shocks could give rise to new fiscal measures which may lead to a rise in sovereign debt sustainability risks. In addition, the higher interest rate environment is exposing some possible vulnerabilities in the sovereign debt market, especially for highly-indebted governments. This as new debt issuances and the roll-over of existing debt became costlier impinging on governments' debt servicing capabilities. Nonetheless, on aggregate, the euro area government debt-to-GDP ratio dropped by 2.2 percentage points to 88.6% as at the end of 2023.[3] In Malta, despite the higher re-financing costs, government debt as a share of GDP dropped from 51.6% as at end 2022 to 50.4% in December 2023.[4]

Euro area corporates entered the interest rate cycle on the back of strong metrics, on account of the robust recovery post-pandemic. Nonetheless, they are also feeling the pinch of the increased funding costs and remain vulnerable to the tighter financial conditions especially should inflation stay higher than currently projected, compounded by the expected slowdown in the economy. Some domestic firms were also feeling the effect of a rising interest rate environment, especially those which issued new bonds, or which have bank facilities linked to international benchmark rates. Yet, consolidated corporate debt as a share of GDP trended further downwards due to the faster increase in GDP than debt, standing at 67.8%, in line with the euro area average.[5]

The financial position of the euro area households remained resilient, buttressed by a buoyant labour market, mitigating somewhat the rise in credit risk on banks' balance sheets. However, borrowers with high levels of debt at variable rates are being challenged by the rising financing costs. This also had an adverse effect on

[3] Source: Eurostat.
[4] Source: National Statistics Office (NSO).
[5] Source: ECB Data Portal.

the demand for mortgages, which grew by a mere 0.1% in 2023, down from 3.8% in the previous year. The tighter financing conditions also translated into downward pressures on RRE prices, down by just over 1% (see Chart 1.3). In contrast, the real estate cycle in Malta remained more buoyant albeit at a slower pace than in previous quarters, with house prices rising by 5.4%. In part this reflected the fact that although most mortgages are priced at variable rates, these are linked with the banks' base rates, which remained unchanged throughout the year, resulting in a limited pass-through of interest rates. Mortgage growth did however slow down, as reflected by a drop in the number of signed final deeds of sale, which fell by almost 15% over a year ago. However, promise of sale agreements rose by 8.5%, which is indicative that mortgage demand is likely to remain relatively strong.[6] Housing affordability, measured through the median advertised property price-to-per-capita income ratio stood slightly above the long-term average. At the same time, as per the house price misalignment index, house prices still point towards a slight undervaluation. In addition, the introduction of the sSyRB applicable on RWAs related to resident mortgages is expected to mitigate any repercussions resulting from a possible correction in the real estate market.




## 1.2 Vulnerabilities within the financial system

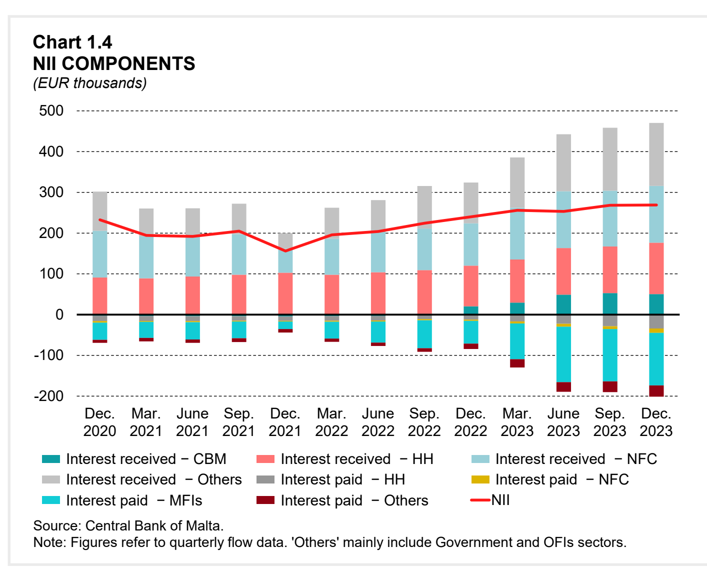
Although financial stability challenges intensified, euro area banks remained resilient and continued to operate with healthy capital and liquidity buffers. The aggregate capital ratio of euro area banks reached 19.9% in Q4 2023, returning to historical highs.[7] Despite easing slightly following targeted longer-term refinancing operations (TLTRO) repayments, liquidity remained ample with the average liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR) standing at 167.1% and 126.8%, respectively. Lending to households and corporates remained fragile on the back of the tighter lending standards and weak credit demand. Although asset quality so far remained healthy, with a non-performing loan (NPL) ratio stable at 1.9%, weak economic growth, tight financing conditions, and geopolitical tensions are likely to further heighten uncertainty going forward. This could potentially adversely affect asset quality and lending growth. In terms of profitability, these banks have until now benefitted from the higher interest rate margins, mostly stemming from variable-rate exposures. Indeed, net interest margins widened by 0.3 percentage point to 1.7%, the highest recorded in these last years, with the return on equity (ROE) and return on assets (ROA) peaking at 10.3% and 0.7%, respectively in 2023.

Domestic banks also managed to reap the benefits of the rising interest rate environment, as NII went up by just over a fifth, driven largely by net income earned on placements with the Eurosystem. As a result, ROA improved by 0.4 percentage point to 1.3% in 2023 (see Chart 1.4). Interest income from intermediation also grew on the back of the strong growth in lending volumes, as base rates were kept largely unchanged. From a sectoral perspective, interest income from non-financial corporate (NFC) loans outgrew the interest earned from household loans, up by over a third and just over 12%, respectively.

[6] Number of final deeds and promise of sale agreements sourced from NSO.
[7] Source: European Banking Authority (EBA) risk dashboard.

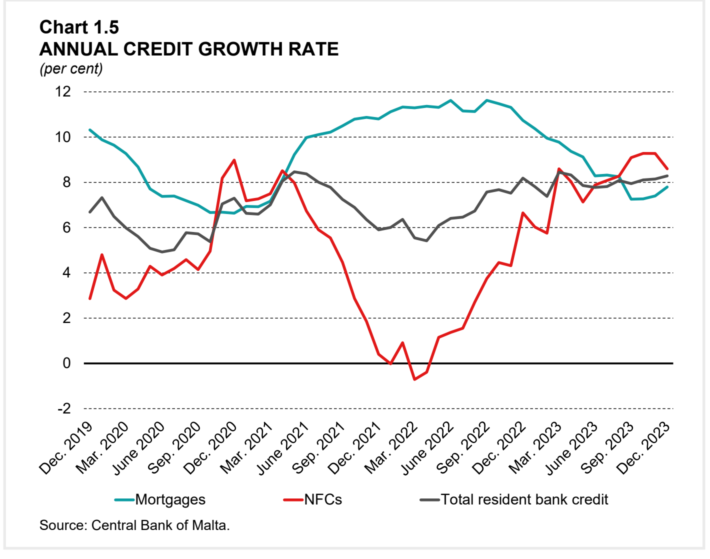
The higher interest rate environment prompted some of the banks to increase their interest rates on their deposits in a bid to compete with the rising bond yields and attract new deposit inflows. However, such developments were mainly focused on term deposits, which despite increasing, still accounted for a minor share of the overall deposits, thereby limiting the increase in banks' interest expenses. Downside risks on profitability remained driven by possible impact on lending volumes and funding costs, albeit profitability could decrease going forward due to the anticipated ECB key interest rate cuts which started in June 2024. Domestic banks continued to operate with ample liquidity buffers as evidenced by the elevated LCR of 373.1% and NSFR of 173.2%. Similarly, domestic banks remained well-capitalised with a total capital ratio of 25.4%, with some banks also issuing subordinated debt to meet the minimum requirement for own funds and eligible liabilities (MREL) requirements, possibly raising some of their funding costs.

**Chart 1.4**
**NII COMPONENTS**
*(EUR thousands)*




Source: Central Bank of Malta.
Note: Figures refer to quarterly flow data. 'Others' mainly include Government and OFIs sectors.

**Chart 1.5**
**ANNUAL CREDIT GROWTH RATE**
*(per cent)*




Source: Central Bank of Malta.

Resident credit kept the strong momentum post-pandemic, increasing steadily by 8.3%. Although growth in mortgages moderated somewhat, credit to NFCs picked up pace (see Chart 1.5). More recent data suggest some softening in lending to private firms. This is also corroborated with the BLS results (see Box 2 in Chapter 2), where participating banks noted that some corporates are starting to feel the pressure of higher financing costs. To date, asset quality remained benign as depicted by the low NPL ratio of 2.1%, down from 2.5% a year earlier. The improvement in the NPL ratio emanated from a faster decrease in NPLs than loans. Such progress in managing credit risk is also confirmed by the low forbearance ratio of 2.2%. Looking ahead, credit risk is expected to remain in check as evidenced by the decline in Stage 2 loans, though if interest rates remain higher than expected, it may push banks to raise their base rates, which may add further pressure on corporates and households to meet their obligations.

The domestic life insurance sector saw a modest recovery in its balance sheet, driven by index and unit-linked contracts, as premia from other contracts decreased reflecting in part higher-yielding investment opportunities. Nonetheless, life insurers maintained strong capital positions. In contrast, non-life insurers reported a slight decline in their assets despite an expansion in their investment portfolios and written premia. The non-life insurers also reported improved liquidity and capital positions. Such developments are

aligned with trends reported within the broader European insurance sector which have also remained resilient with improved capital positions. Still, underwriting challenges persisted, particularly for life insurers due to changing consumer behaviours, which also became evident in Malta. Looking ahead, global capital markets present mixed prospects, especially given ongoing challenges from inflationary pressures and geopolitical uncertainties. Accurate pricing remains crucial for general business products, while the life sector must adapt to evolving customer needs and seize growth opportunities, such as in addressing the climate protection gap.

Meanwhile, domestically-relevant investment sub-funds registered the first growth in two years, in line with the results observed across the sector in the euro area. The outcome was prompted mainly by the significant gains in the equity markets, along with the recovery in bond prices in the last quarter of the year. Euro area investment funds remained vulnerable to liquidity risks, even though the sector continued to shift its bond portfolios towards higher-rated debt instruments. Domestically, risks regarding liquidity and redemptions remained limited. Throughout 2023, redemptions requests decreased to the levels registered before the beginning of the tighter monetary policy environment. Furthermore, domestically-relevant sub-funds operated on the back of an elevated ratio of high-quality liquid assets (HQLA) and low leverage rates.

## 1.3 Risk horizon

Inflation has eased in recent months, with the ECB announcing a rate cut of 25 basis points in June 2024, but the outlook on inflation is still uncertain. However, the macroeconomic environment remains fragile, especially should inflation remain sticky at elevated levels or surprise on the upside. These risks are exacerbated should the ongoing geopolitical tensions in the Middle East escalate further, which would most likely add further pressures on commodity prices. Such risk has the potential to test financial stability, especially against a backdrop of the existing vulnerabilities in China. Despite the first interest rate cut in almost two years, interest rates remained high, which together with slower economic growth and more restrictive financial conditions has the potential to unravel pre-existing financial vulnerabilities. Adverse surprises from inflation may also trigger an abrupt sell-off in financial markets, especially for those assets for which their price is already overstretched. In addition, the real estate cycle in the euro area is in a downturn, with a possible sustained decline in RRE prices potentially having negative repercussions on banks' collateral values.

Taking a local perspective, the Maltese financial sector remained resilient, supported by strong capital buffers and ample liquidity space. Although the pass-through of interest rates on loans has been limited, this was compensated for by strong credit volumes. Going forward, the domestic financial system remains susceptible to sudden adverse shocks, mostly originating from the vulnerable external environment. The anticipated decrease in interest rates may reduce domestic banks' profitability, particularly for those banks which have significant levels of placements with the Eurosystem. In addition, banks remained highly exposed to the RRE market and a more-than-expected slowdown in this sector may pose adverse effects on their asset quality. Financial institutions should remain vigilant for ongoing risks and vulnerabilities as economic and financial conditions may deteriorate abruptly and in a disorderly manner. The sector should also give due consideration to rising climate-related risks and cyber risks which have exacerbated as the drive for digitalisation intensified. Against this backdrop, the Central Bank of Malta remains committed to ensure that financial stability is preserved through the timely implementation of macroprudential policy tools as deemed necessary. Banks should ensure that they have effective credit risk management frameworks and that their funding plans also incorporate elements of diversification in their funding sources.

**Table 1.1**
**SUMMARY OF RISKS**

| Main vulnerabilities and risks to financial stability | Description of risk | Risk assessment |
|---|---|---|
| **Vulnerabilities outside the financial system** | | |
| **Geopolitical uncertainties** | Geopolitical risks continued to increase as the war in Ukraine continued to rage on, coupled with the unrest in the Middle East and the ongoing military tensions between China and Taiwan. All this is happening on the back of increased economic uncertainty influencing voting in national elections across the globe. | |
| **Inflationary pressures** | Inflation is on a downward path, with the ECB already lowered the interest rates by 25 basis points in June 2024. This is expected to be accompanied with an increase in disposable income which should help mitigate pressures on borrowers' repayment capabilities. However, the risk of still stubborn inflation could keep interest rates higher-for-longer. | |
| **Reassessment in risk premia** | The potential for a reassessment of risk premia remains high amid stretched asset valuations and tighter liquidity conditions. Such risk is particularly present in certain sectors like technology companies including AI, and cloud computing. | |
| **Economic conditions in the euro area and public debt sustainability** | Weaker-than-expected economic growth prospects could increase pressure on public debt sustainability. However, such concerns are expected to be somewhat mitigated by the projected lower funding costs on new and rolled-over debt when the ECB continue with its rate cuts. | |
| **Domestic macroeconomic developments** | The Maltese economy is expected to continue growing, though at a more moderate pace, with private consumption expected to be the main contributor. | |
| **Real estate market developments** | Although residential property sales decreased somewhat, the number of promises of sale agreements rebounded indicating sustained demand. At the same time, property price growth remained strong albeit decelerating. There appears to be some excess supply in some segments of the commercial real estate market, albeit the impact on the financial system is not expected to be systemic. | |
| **Vulnerabilities within the financial system** | | |
| **Developments in mortgage lending** | Resident mortgage lending remained buoyant albeit this slowed down and is expected to grow at more moderate pace. Risks are somewhat mitigated by the conservative lending practices and the introduction of the sSyRB. | |
| **Developments in NFC lending** | Growth in resident corporate lending persisted, largely driven by lending to property-related sectors, although other sectors also contributed to such growth. | |
| **Concentration in sectoral lending** | Resident lending continued to be largely concentrated in property-related sectors, albeit such share remained largely stable throughout the year. | |
| **Credit quality of the loan portfolio** | The overall credit quality of banks' loan books improved, though asset quality concerns could arise, should economic growth slows down, and there are negative surprises in inflation, resulting in a delay in monetary easing. | |
| **Developments related to net income** | The higher interest rate environment had a positive effect on domestic banks' income from intermediation as well as from their placements with the Eurosystem. This was also possible as the increase in funding costs was limited so far. However, net income could decrease going forward as a result of the rate cuts by the ECB. | |
| **Liquidity developments** | Banks' liquidity remained ample reflecting the significant level of customer deposits and highly liquid assets, limiting concerns of a materialisation of liquidity risks. However, in a rising interest rate environment with higher-yielding investment products, customer deposits growth slowed down, as a result of higher yielding alternative investments opportunities. | |
| **Operational risk** | As banks continued with their digitalisation journey, they are becoming more susceptible to higher operational risks, particularly due to increasing cyber threats. | |
| **Domestically-relevant insurances** | The life insurance sector recorded an increase in its balance sheet size, with robust capital and liquidity levels. Nevertheless, a declining trend in premia continues to pose challenges, indicating shifting customer behaviour amidst rising interest rates. Meanwhile, non-life insurers saw growth in investment portfolios alongside increased premia and decreased claims. | |
| **Domestically-relevant investment funds** | Domestic investment funds registered their first growth in assets after a period of declines, largely driven by the rebound in the equity market. Investments remained concentrated in liquid assets, albeit the levels of cash and deposits fell further. Nonetheless, redemptions decreased closer to historical average levels. Parallel to that, leverage remained low and stable. Risks going forward remain present given the potential of higher reassessment of risk premia given the challenging macroeconomic backdrops and headwinds. | |

**Risk level:** Limited Moderate Elevated

**Risk direction:** Increased Stable Decreased

## BOX 1: MEASURING THE CREDIT GAP FOR MALTESE PRIVATE CORPORATIONS USING THE HAMILTON FILTER[1]

In the aftermath of the great financial crisis, credit to the private sector in Malta ramped up, but underneath the headline figures, at a sectoral level, there was an interplay of differing dynamics. While the corporate sector underwent a deleveraging process, lending to households remained strong, prompting the Central Bank of Malta to implement BBMs in 2019 and later, in 2023, a targeted sectoral sSyRB.[2,3] These measures targeted the mortgage market since this underpinned the primary source of credit growth. Following the onset of the COVID-19 pandemic, lending to corporates picked up momentum, growing by more than 9% by the end of 2020, supported by loan guarantee schemes. As the need for such support measures subsided, growth slowed down to nearly 2% by June 2022, to pick up momentum thereafter. By the end of 2023, credit to resident firms grew by about 7%, necessitating the need to investigate such segment further.

Since it is well established that unsustainable excessive credit growth and leverage can be a source of financial instability, macroprudential authorities carry out exhaustive assessments to unearth budding risks and to try to balance the risk of crises with the cost of policy interventions. The Central Bank of Malta has more recently augmented its assessment of cyclical risk through the construction of the cyclical Systemic Risk Indicator (cSRI), and the multivariate filter credit gap, published in the Bank's 2022 *Financial Stability Report* (FSR) and the 2023 *Interim FSR*, respectively.[4,5] However, the cSRI is an aggregate measure of cyclical risk, and while the multivariate filter credit gap analyses risk within the household and corporate sectors, it is not designed to shed light on different corporate sectors at a disaggregated level. To this end, it was deemed important to enhance such analyses by monitoring the cyclicality in credit to Maltese firms by sector to identify whether the buildup in credit is being driven by sector-specific developments.

This box uses the approach proposed in Hamilton (2018) as it facilitates the construction of credit gaps by sectors of economic activity (NACE).[6] Such application contributes to existing studies by international organisations including the International Monetary Fund (IMF), and other national central banks, which have adopted the Hamilton Regression Filter (HRF) for detrending purposes.[7,8]

The HRF was originally developed by James D. Hamilton as an alternative method to the traditional Hodrick-Prescott (HP) filter. The HP filter has been cited to suffer from a number of limitations, including its susceptibility to generate spurious cycles and its tendency to 'over-shoot' results when data exhibits turning points.[9,10] Rather than applying a smoothing parameter to construct a gap, Hamilton proposes using a variable's own lags to construct a measure of the underlying trend. This is represented by the following regression:

$$Y_t = \beta_0 + \beta_1 Y_{t-h} + \beta_2 Y_{t-h-1} + \cdots + \beta_j Y_{t-h-p} + v_t \quad (1)$$

where $Y_t$ is the observed variable, which for the purpose of this study represents credit in logarithmic form at time $t$. The value of $h$ reflects beliefs about the duration of the cycle inherent in the variable,

[1] Written by Ms Joanne Ciantar, Senior Expert within the Financial Stability Surveillance Office of the Central Bank of Malta. The author would like to thank Dr William Gatt Fenech, Mr Andrew Spiteri, Ms Wendy Zammit and Mr Alan Cassar for their helpful comments and suggestions.

[2] See Central Bank of Malta Directive No.16 'Regulation on Borrower-Based Measures'.

[3] See Central Bank of Malta (2023) 'Statement of Decision on the implementation of a sectoral Systemic Risk Buffer on RRE domestic Mortgages in Malta'.

[4] See Vella, S (2023). Box 1: A cyclical Systemic Risk Indicator for Malta, in *Financial Stability Report* 2022, Central Bank of Malta.

[5] See Gatt Fenech, W (2023). Special Feature: A measure of the credit gap for Malta, in *Interim Financial Stability Report* 2023.

[6] See Hamilton, J (2018): 'Why you Should Never Use the Hodrick-Prescott Filter'.

[7] See Baba, et. al (2020): 'How Should Credit Gaps Be Measured? An Application to European Countries'. In *IMF Working Paper*.

[8] See Schüler, Y (2018): 'On the cyclical properties of Hamilton's regression filter'. In *Deutsche Bundesbank Discussion Paper*.

[9] See Hamilton, J (2018) and Baba, C, et. al (2020).

[10] See Lang, J. H. and Welz, P. (2017): 'Measuring credit gaps for macroprudential policy'. In European Central Bank *Financial Stability Review* 2017.

with higher values translating into longer cycles. In this regard, Hamilton (2018) recommends a value of five years ($h$ = 20 quarters) for the detrending of the credit variable, reflecting the property that financial cycles are long. Three lags of the variable are also included ($p$ = 3), which were found to be sufficient for the applications below. The model in equation (1) is typically estimated using Ordinary Least Squares, and the residuals $v_t$ constitute the cycle.

The model is estimated using quarterly credit data for the period 1993-2023 for overall resident private firms and for several sectors.[11] As can be observed in Table 1, the availability of sectoral credit

**Table 1**
**CREDIT DATA REPORTING BY SECTOR OF ECONOMIC ACTIVITY**

| **March 1993-September 2003** | **September 2003-May 2010** | **June 2010-to date** |
|---|---|---|
| Transport, storage and communication | Transport, storage and communication | Transportation and storage |
| | | Information and communication |
| Manufacturing | Manufacturing | Manufacturing |
| Building and construction | Construction | Construction |
| | Real estate, renting and business activities | Real estate activities |
| Hotel, restaurant and tourist trades | Hotels and Restaurants, excluding related construction activities | Accommodation and food service activities |
| Wholesale and retail trades | Wholesale and retail trade, repairs | Wholesale and retail trade; repair of motor vehicles and motorcycles |
| Energy and water | Electricity, gas and water supply | Electricity, gas, steam and air conditioning supply |
| | | Water supply; sewerage waste management and remediation activities |
| Other[(1)] | Agriculture | Agriculture and forestry |
| | Community, recreational and personal service activities | Arts, entertainment and recreation |
| | Education | Education |
| | Extraterritorial organisations and bodies | Activities of extraterritorial organisations and bodies |
| | Financial intermediation | Financial and insurance activities |
| | Fishing | Fishing and aquaculture |
| | Health and social work | Human health and social work activities |
| | Mining and quarrying | Mining and quarrying |
| | Public administration | Public administration and defence; compulsory social security |
| | | Administrative and support service activities |
| | | Professional, scientific, and technical activities |
| | | Other service activities |

Sources: Eurostat; Central Bank of Malta.

[(1)] Includes loans to agriculture and fishing, mining and quarrying, public administration, education, health and social work, financial and insurance activities (including interbank loans), professional, scientific and technical activities, administrative and support service activities, arts, entertainment and recreation, other services activities, and extraterritorial bodies and organisations.

[11] Since only the private sector is being considered, loans to the general government and public corporations were excluded both on a sectoral basis as well as from the overall figure.

data varied throughout the period observed, with historical data available at a less granular form.[12] As a result, the oldest sectoral composition was used to benefit from the entire time-series available.[13] This resulted in the development of seven credit gaps, including one for overall credit to private firms, as well as for the below sectors:

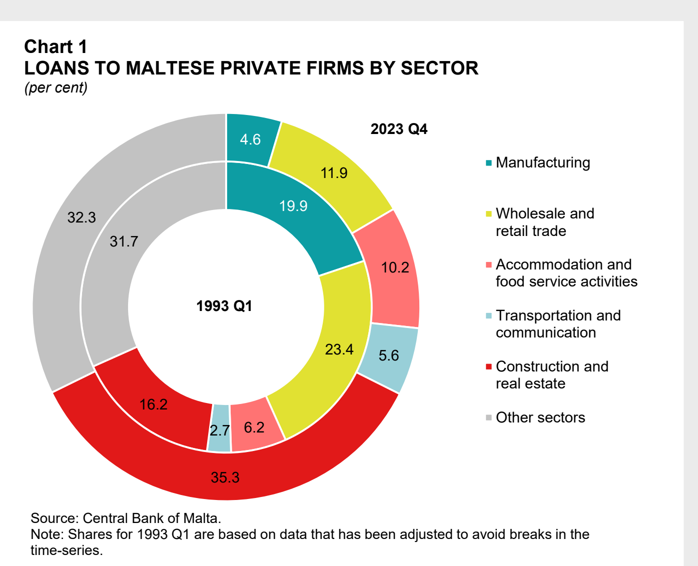
1. Manufacturing sector (NACE C)
2. Wholesale and retail trade sector (NACE G)
3. Accommodation and food service activities sector (NACE I)
4. Transportation and communication sectors (NACE H and NACE J)
5. Construction and real estate sectors (NACE F and NACE L)
6. Other sectors[14,15]

## 1. Sectoral and overall private firms' credit gaps for Malta

The construction and real estate sectors are key drivers of credit to the Maltese private corporations, as reflected in the sizeable share of loans granted by the domestic banks (see Chart 1). However, this was not always the case, with the share of 16.2% growing significantly over the last 30 years to reach over 35%. The second most prominent sector as at the end of 2023 is the 'other sectors' category, which is composed of several sectors, including the financial sector. This cannot be disaggregated further due to historical statistical methodologies.

The application of the HRF on overall Maltese private firms' credit evidences a long credit cycle ranging between ten to 15 years (see Chart 2). This is in line with existing literature that financial cycles are typically of a longer duration compared to business cycles.[16] Three periods of possible excessive credit are identified; the first captured at its final stages in the late 1990s likely reflecting the impact of the financial liberalisation introduced at the time, the second during the

**Chart 1**
**LOANS TO MALTESE PRIVATE FIRMS BY SECTOR**
*(per cent)*




Source: Central Bank of Malta.
Note: Shares for 1993 Q1 are based on data that has been adjusted to avoid breaks in the time-series.

[12] The NACE classifications reflect the main economic activity as reported in Central Bank of Malta data.

[13] Due to the minor representativeness of credit facilities to the Energy and Water sectors within overall credit to resident private firms, these have been considered within Other Sectors for the purpose of this study.

[14] Based on Eurostat NACE Rev. 2 terminology, this incorporates the following sectors: Agriculture, forestry and fishing (NACE A), Mining and quarrying (NACE B), Electricity, gas, steam and air conditioning supply (NACE D), Water supply; sewerage, waste management and remediation activities (NACE E), Financial and insurance activities (NACE K), Professional, scientific and technical activities (NACE M), Administrative and support service activities (NACE N), Public administration and defence; compulsory social security (NACE O), Education (NACE P), Human health and social work activities (NACE Q), Arts, entertainment and recreation (NACE R), Other service activities (NACE S), and Activities of extraterritorial organisations and bodies (NACE U).

[15] In December 2023, data for Other Sectors is composed as follows: 50.5% pertain to the Financial sector (NACE K), 0.7% to Agriculture (NACE A1 and A2), 5.1% to Fishing (NACE A3), 20.1% to Professional services (NACE M), 11.9% to the Administrative sector (NACE N), 2.9% to the Education sector (NACE P), 4.9% to Human health activities (NACE Q), 2.2% to the Arts and entertainment sector (NACE R), and 1.5% to Other Services (NACE S). The Mining and quarrying (NACE B), Public administration (NACE O) and Extra-territorial activities (NACE U) represented a negligible amount.

[16] See Drehmann and Yetman (2020): 'Which credit gap is better at predicting financial crises? A comparison of univariate filters'. In Bank for International Settlements Working Papers.

global financial crisis, which persisted until the first quarter of 2013, and the third starting in 2019 Q2. The latter positive credit gap persisted to reach 24.4% in the last quarter of 2023, the highest throughout the 30-year period being analysed.[17] Since the period assessed was characterised by exceptional events, namely the COVID-19 pandemic, the credit gap was re-generated to adjust for its impact on credit growth. When considering two different approaches, namely when excluding loans granted through the Malta Development Bank (MDB) COVID-19 Guarantee Scheme (CGS) and when introducing a dummy variable, results for December 2023 would remain unchanged (see Chart 3).[18]

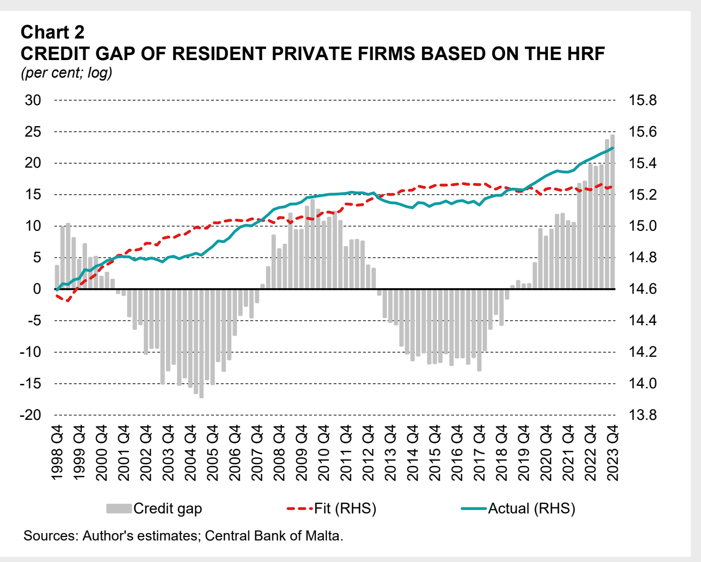



**Chart 2**
**CREDIT GAP OF RESIDENT PRIVATE FIRMS BASED ON THE HRF**
*(per cent; log)*

Sources: Author's estimates; Central Bank of Malta.

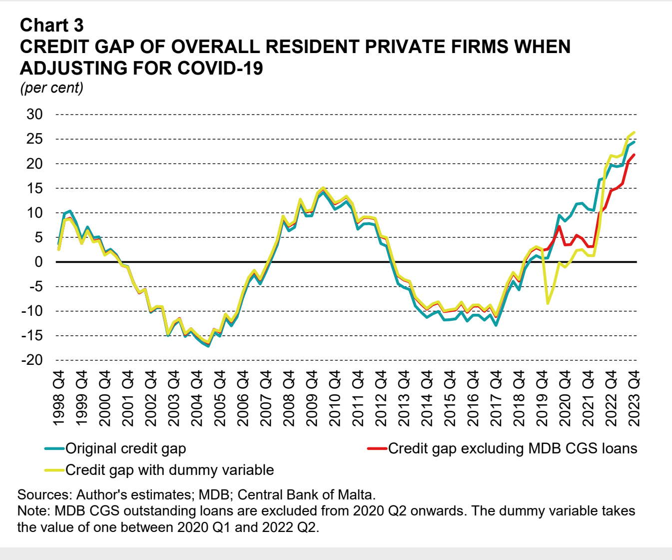



**Chart 3**
**CREDIT GAP OF OVERALL RESIDENT PRIVATE FIRMS WHEN ADJUSTING FOR COVID-19**
*(per cent)*

Sources: Author's estimates; MDB; Central Bank of Malta.
Note: MDB CGS outstanding loans are excluded from 2020 Q2 onwards. The dummy variable takes the value of one between 2020 Q1 and 2022 Q2.

As outlined earlier, one of the main advantages of this study is the ability to estimate credit gaps for each of the sectors specified above. The sectoral credit gaps could then be combined to better identify the importance of each sector in driving credit to resident private firms, resulting in a second measure of the overall credit gap to be produced (see Chart 4).[19] At 21.9% in December 2023, it stood very close to that estimated for overall credit.

The credit cycle of the construction and real estate sectors mirrors very closely that observed for resident private firms (see Chart 5). These two sectors were the primary contributors in the early stages of the positive credit gap during the global financial crisis as the gap for these sectors peaked and exceeded 50%. Activity in these sectors started to exceed the estimated levels again in the 2020s, with data for the last quarter of 2023 suggesting that the credit gap stood at 33.8%. While this is significant, it is still

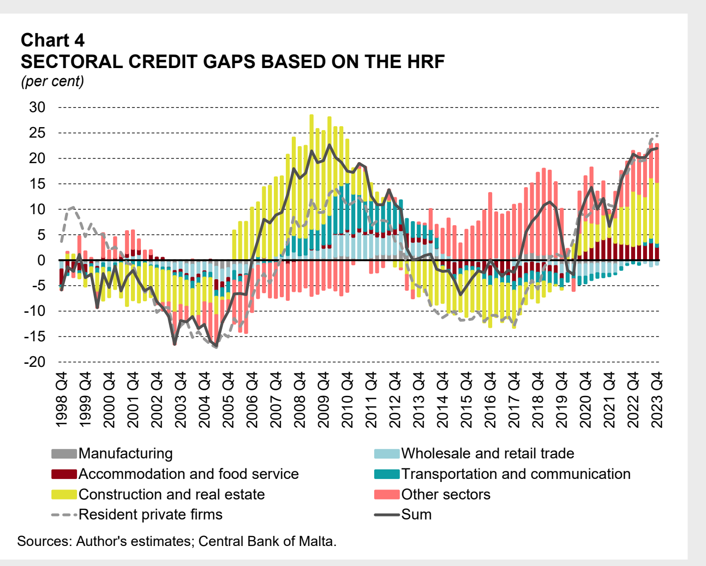
[17] These results remain unchanged when considering varying values of $h$ and $p$ in the HRF application.

[18] MDB CGS loans granted between 2020 Q2 and 2023 Q4 were excluded, while the dummy variable took the value of one between 2020 Q1 and 2022 Q2 and zero for all remaining periods.

[19] This was done by weighting the credit gaps of each sector according to their share within overall credit to resident private firms. These weights reflect the changing compositions of each sector over time. The sum of the contributions of the sectoral gaps does not necessarily equate to the credit gap estimated over the aggregate time series.

below the peak observed in the past property boom of 2007-2008. Representing 11.9 percentage points of the accumulation of weighted positive gaps as at December 2023, these two sectors were the primary driver behind recent developments within the credit to Maltese private firms, as also shown in Gatt Fenech (2023).

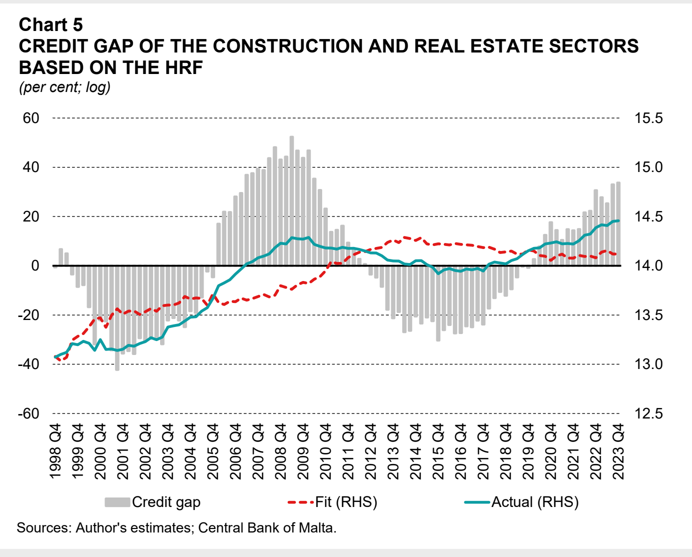
Chart 4
SECTORAL CREDIT GAPS BASED ON THE HRF
*(per cent)*



Sources: Author's estimates; Central Bank of Malta.

However, other sectors also played a role in the recent positive credit gap. One such sector is the accommodation and food service activities sector. Recent results of the HRF show that the credit gap of this sector is at its highest level over the 30-year period examined. Nevertheless, as it constitutes a lower share in overall credit, its contribution to the combined gap is much more contained at 2.6 percentage points as at the end of 2023. Similarly, despite ending 2023 with a positive credit gap, the transportation and communication sectors contributed just 0.8 percentage point, suggesting minimum impact on overall credit to Maltese firms. Meanwhile, the manufacturing and wholesale and retail trade sectors ended 2023 with negative credit gaps and are thus not considered to be contributing to the most recent developments observed within the overall private firm credit. The remaining share of the gap is in fact largely attributable to the other sectors, primarily reflecting loans to the financial sector. Should these be excluded, the credit gap for Maltese private NFCs corresponds to 21.0% in December 2023.[20] In contrast, when excluding the financial sector, the credit gap of the other remaining sectors would turn negative to -1.7% during the same period.

Chart 5
CREDIT GAP OF THE CONSTRUCTION AND REAL ESTATE SECTORS BASED ON THE HRF
*(per cent; log)*



Sources: Author's estimates; Central Bank of Malta.

## 2. HRF results compared with other gap extraction methods

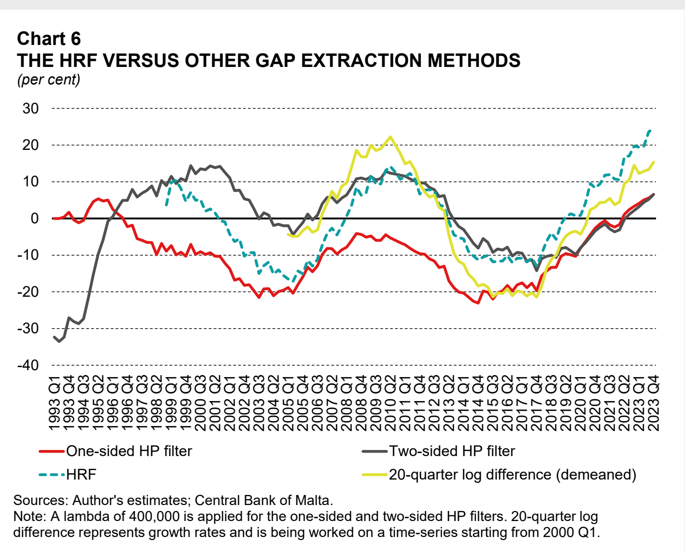
To assess the performance of the HRF as a robust mechanism for signalling excessive credit growth within the private firms' sector in Malta, its results are being compared with alternative metrics. One

[20] The separate credit gaps generated for Maltese private NFCs and other non-financial sectors were generated from 2003 Q1, reflecting data availability on financial loans.

of this, used by Drehmann and Yetman (2018) and Hamilton and Leff (2020), is the five-year (or 20-quarter) log differences.[21,22,23] The other metric is the HP filter, including both a one-sided application for detrending as proposed by Borio and Lowe (2002) and as used in the assessment of the countercyclical capital buffer (CCyB), as well as its two-sided application. The former considers only past observations to estimate the trend, while the latter considers both past and future observations.[24] As guided by literature, a smoothing parameter of 400,000 was used in both applications.

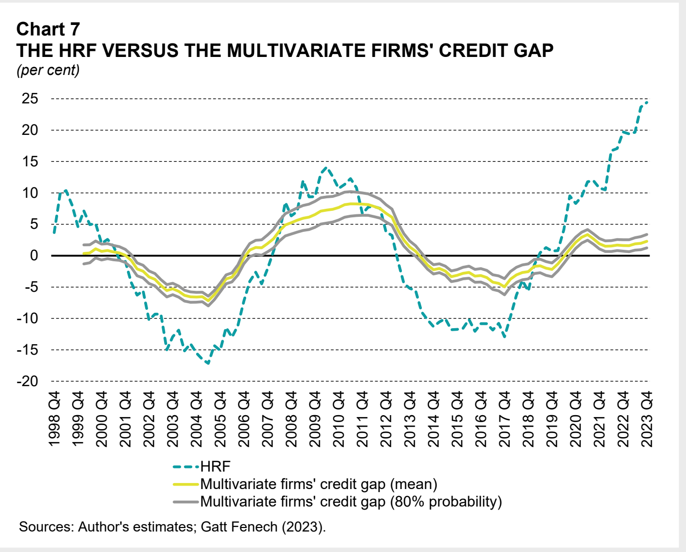
Chart 6 illustrates the results for credit to Maltese private firms extracted using the above three methods, compared to those derived using the HRF. All gap extraction methods, except for the one-sided HP filter, are largely consistent in their estimates of the cycle and its turning points, with some having more pronounced peaks and troughs than others throughout the period analysed. In fact, all metrics, bar the one-sided HP filter, indicate that credit was above historical levels during the global financial crisis. Importantly, all gap extraction methods signal a positive credit gap for resident private firms by the end of 2023, with the one formulated by the HRF opening at a faster pace. Such consistency in results was also observed from a sectoral perspective.[25]

**Chart 6**
**THE HRF VERSUS OTHER GAP EXTRACTION METHODS**
*(per cent)*




Sources: Author's estimates; Central Bank of Malta.
Note: A lambda of 400,000 is applied for the one-sided and two-sided HP filters. 20-quarter log difference represents growth rates and is being worked on a time-series starting from 2000 Q1.

**Chart 7**
**THE HRF VERSUS THE MULTIVARIATE FIRMS' CREDIT GAP**
*(per cent)*




Sources: Author's estimates; Gatt Fenech (2023).

The HRF results for the credit gap extracted for resident private firms are also assessed against the findings of the firms' credit gap derived using the multivariate filter (see Chart 7).[26] As

[21] See Drehmann and Yetman (2018): 'Why you should use the Hodrick-Prescott filter – at least to generate credit gap'. In Bank for International Settlements Working Papers.
[22] See Hamilton and Leff (2020): 'Measuring the Credit Gap'.
[23] The 20-quarter log differences have been demeaned and extracted based on data starting from 2000 Q1 to adjust for the impact of the financial liberalisation programme in Malta in the 1990s.
[24] See Borio and Lowe (2002): 'Asset prices, financial and monetary stability: exploring the nexus'.
[25] More details will be published in Ciantar, J. (forthcoming), Analysing the Credit Gap in Maltese Private Firms: Insights from the Hamilton Filter methodology, *Central Bank of Malta Working Paper*.
[26] See Gatt Fenech, W. (2023).

can be deduced from Chart 7, both credit gaps are positive with the duration and the turning points of the credit cycle also consistent across both methods.[27]

### 3. Conclusion

The need for a sectoral credit gap measure for Maltese private firms has been mainly motivated by strong growth rates observed in recent years and the need to ascertain any potential sources of risks at a sectoral level.

This box proposed a univariate statistical filter as recommended in Hamilton (2018) to facilitate the extraction of seven separate credit gaps. Results for the last quarter of 2023 show a positive credit gap for resident private firms of 24.4%, with similar conclusions when adjusting for the COVID-19 pandemic period and excluding credit to financial entities.

When benchmarked with other gap measurement techniques, the results produced by the HRF are largely consistent. Credit developments within the construction and real estate industry and, to a lesser extent, the accommodation and food service activities sector have particularly contributed to the conclusions observed within the overall credit gap. Although at 33.8%, the HRF credit gap for the construction and real estate sectors is positive, it is still lower than peaks observed during the global financial crisis. Results for the accommodation and food service activities sector reflect the significant expansion of the industry over a prolonged period, which has become more pronounced following the substantial aid received during the COVID-19 pandemic. Nonetheless, its impact on the overall credit gap was more limited given the relatively small share of credit granted to this sector.

The robustness checks performed have all produced identical outcomes, especially for overall credit. As a result, this analysis can enhance the Bank’s current toolkit in assessing cyclical risk, by shedding light on sector-specific developments. Such insights are useful in calibrating the appropriate macroprudential policy stance and tools in Malta.

[27] The observable difference in magnitude is due to differing methodologies.