

1. MACROPRUDENTIAL RISK ASSESSMENT

After rebounding in 2021 from the very low levels of activity in 2020 due to the pandemic, the global economic recovery continued, at a slower pace in 2022 as the positive effects of further re-opening of high-contact services sectors were to an extent thwarted by the impact of the outbreak of the war in Ukraine. The latter had far-reaching consequences, causing commodity prices to surge. This led to action by various authorities and governments to try to mitigate inflationary pressures. In this regard, the European Systemic Risk Board (ESRB) published its first ever General Warning in September 2022 to acknowledge increasing systemic risks that may threaten the smooth operation of the financial system and called for closer regulatory and supervisory scrutiny.¹

The Maltese economy was somewhat shielded from the direct consequences of the war, partly owing to the limited economic ties with both conflict countries, but also as a result of Government's intervention to keep energy prices stable. However, Malta was impacted through indirect effects, particularly in respect of inflation. At the same time, the MDB introduced schemes to mitigate liquidity issues and provided emergency support measures to economic sectors impacted by the war, including grain and fuel importers.²



Geopolitical developments dampened euro area economic growth and led to a surge in inflation, with the latter prompting a tightening of monetary policy.



Domestic mortgage lending continued to grow strongly, adding further concentration in the banks' loan books.



The domestic banking sector remained resilient backed by adequate capital and ample liquidity buffers. Profitability recovered, while asset quality continued to improve.



The domestic non-bank sector was adversely impacted by financial market developments, but continued to operate with strong capital and liquidity buffers.

¹ ESRB Warning on vulnerabilities in the Union financial system (September 2022). Source: https://www.esrb.europa.eu/pub/pdf/warnings/esrb.warning220929_on_vulnerabilities_union_financial_system~6ae5572939.en.pdf?b0d8a80266758fa897151ec70612330b.

² MDB support measures in response to the Ukraine crisis. Sources: <https://mdb.org.mt/en/news-and-media/Pages/MDB-response-to-Ukraine-crisis.aspx>; <https://mdb.org.mt/en/news-and-media/Pages/MDB-LSGS-A-and-B.aspx>

1.1 Vulnerabilities outside the financial system

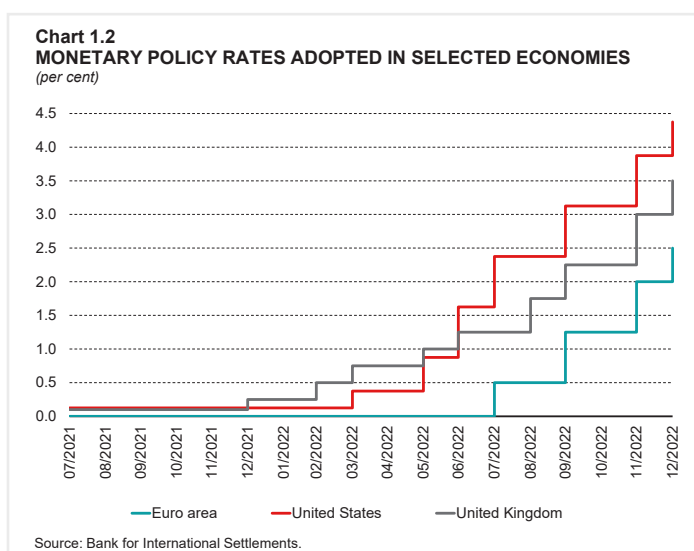
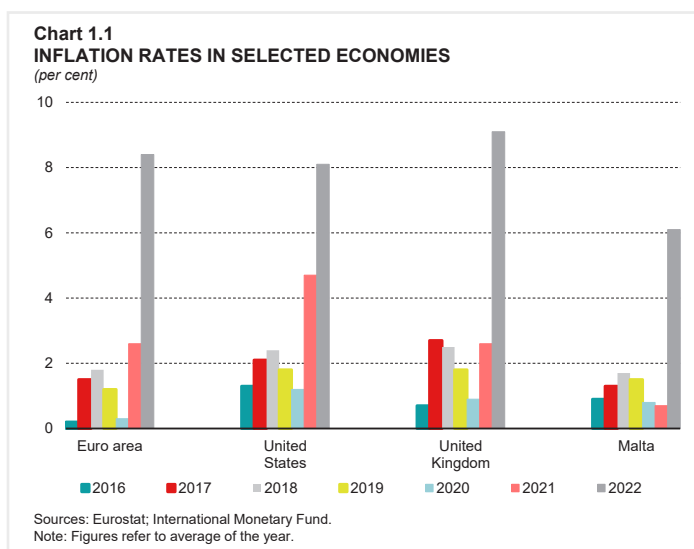
Soaring inflation became a major concern for policy makers ...

Headline inflation surged across major economies, with the euro area inflation rate standing at around 8.4% on average in 2022 (see Chart 1.1).³ In Malta, Harmonised Index of Consumer Prices (HICP) inflation also rose markedly, though it remained among the lowest in the euro area due to the Government's initiatives to maintain energy prices stable.

The significant inflationary pressures brought an end to central banks' monetary policy easing. The Bank of England and the Federal Reserve were among the first to raise their policy rates, while the ECB started by tapering off its asset purchase programme (APP), followed by raising key interest rates as from the second half of 2022 (see Chart 1.2). By the end of the year, the ECB's main refinancing rate had already increased by 250 basis points.⁴

Euro area inflation decelerated, and is expected to decelerate further to 5.3% by the end of 2023.⁵ Domestically, inflation is also foreseen to slow down to 5.3% in 2023, and to 2.9% by 2024.⁶ Nevertheless, since

inflation in the euro area is projected to remain significantly above the 2% target rate, monetary policy is expected to remain restrictive, including an end to the reinvestment of the ECB's holdings under the APP. This also in view of the possibility of second round effects on inflation going forward. In February, March, May and June 2023, the ECB raised its key interest rates by 150 basis points, bringing the main refinancing rate to 4.0%, the highest level seen since the 2008 financial crisis.⁷



³ Source: Eurostat.

⁴ ECB Monetary policy decisions dated July 2022 (50 basis points), September 2022 (75 basis points), October 2022 (75 basis points) and December 2022 (50 basis points).

⁵ ECB Eurosystem staff macroeconomic projections for the euro area (March 2023). Source: https://www.ecb.europa.eu/pub/projections/html/ecb.projections202303_ecbstaff-77c0227058.en.html.

⁶ Central Bank of Malta Outlook for the Maltese Economy 2023:2. Source: <https://www.centralbankmalta.org/site/Publications/Projections-2023-2.pdf>.

⁷ ECB Monetary policy decision dated February, March, May and June 2023 (50 basis points in February 2023, 50 basis points in March 2023, 25 basis points in May 2023 and 25 basis points in June 2023).

... with economic growth prospects adversely impacted

The confluence of all these shocks impacted the pace at which economies were expected to recover. Projections for world growth for 2022 became more pessimistic as the year progressed, with the International Monetary Fund's (IMF) estimates revised downwards by one percentage point to 3.4%, which is below historical average growth rates.^{8,9} Such downward revisions reflected China's lifting of its zero-COVID policy, which however led to a resurgence of cases, and the continued crisis within this country's real estate market, albeit this improved slightly in the first few months of 2023.

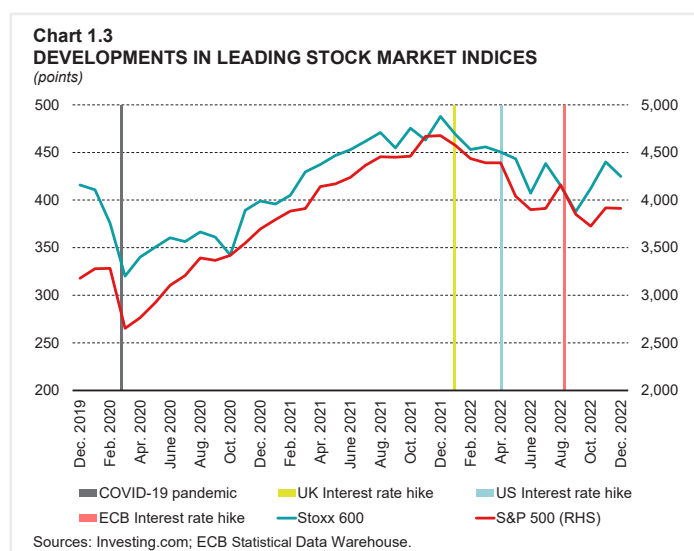
The United Kingdom's (UK) economy narrowly escaped a technical recession following the marginal contraction in the third quarter of 2022. Meanwhile, the United States' (US) economy contracted in the first half of the year but rebounded in the second half of 2022. The euro area, however, expanded by 3.5% in 2022.¹⁰ Notwithstanding, growth momentum is expected to weaken in 2023, as challenges are likely to persist, with gross domestic product (GDP) forecasted to grow at just 0.8% in the euro area, and by 2.8% globally.¹¹ Projections for 2024 are better, with growth forecasted to recover to 1.4% in the euro area, and 3.0% globally.

Malta managed to fare better amidst these global challenges, with the Bank's projections pointing to a moderate growth in economic activity for 2023 and 2024, at 4.0% and 3.8%, respectively, compared to the 6.9% in 2022.¹²

Stock market volatility heightened in 2022

The monetary policy tightening across major central banks led to a sharp rapid rise in bond yields, coupled with drops in equity prices, as economic prospects deteriorated. Market activity tapered as news emerged on the withdrawal or termination of pandemic-related measures, and the end of quantitative easing. In subsequent months, most equity and fixed-income markets declined, as stock markets grappled with the prospect of rises in interest rates and their dampening effect on economic activity. As a result, market gains registered in 2021 were completely lost by the pullback in 2022 (see Chart 1.3). In fact, the leading equity indices in Europe and the US, represented by the Stoxx 600 and the S&P500, shed around 13% and 16% of their value, respectively, by end 2022.

Heightened uncertainty triggered a reassessment of risk premia particularly for those assets whose valuations were stretched. This was also emphasised by the European Securities and Markets Authority (ESMA) which reported weakened market activity especially as confidence dipped.¹³ Similarly, the domestic equity



⁸ IMF World Economic Outlook Update: Inflation Peaking and Low Growth (January 2023). Source: <https://www.imf.org/-/media/Files/Publications/WEO/2023/Update/January/English/text.ashx>.

⁹ IMF World Economic Outlook Update: Rising Caseloads, A Disrupted Recovery, and Higher Inflation (January 2022). Source: <https://www.imf.org/en/Publications/WEO/Issues/2022/01/25/world-economic-outlook-update-january-2022>.

¹⁰ IMF World Economic Outlook Update: A Rocky Recovery (April 2023). Source: <https://www.imf.org/en/Publications/WEO/Issues/2023/04/11/world-economic-outlook-april-2023>.

¹¹ IMF World Economic Outlook Update: A Rocky Recovery (January 2023).

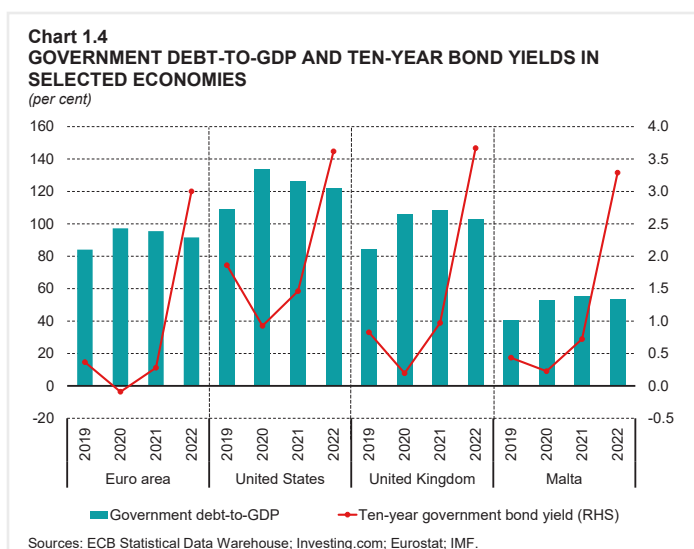
¹² Central Bank of Malta Outlook for the Maltese Economy 2023:2. Source: <https://www.centralbankmalta.org/site/Publications/Projections-2023-2.pdf>.

¹³ ESMA TRV Risk Monitor No.1 2023. Source: https://www.esma.europa.eu/sites/default/files/library/ESMA50-165-2438_trv_1-23_risk_monitor.pdf.

market lost some ground, dropping by around 10% throughout the year, with developments in the corporate bond market relatively more contained.¹⁴

Governments take on sizeable debt

The deterioration in investor sentiment has resulted in a widening of risk premia, as investors expected a higher compensation for any given risk. Concurrently, the climb in interest rates has led to a considerable rise in risk-free interest rates, with sovereign euro area bond yields increasing dramatically in the course of 2022 (see Chart 1.4). Rising interest rates coincided with governments' policies for additional fiscal support to mitigate the effects of the rise in energy and other commodity prices, adding to the already strong intervention undertaken during the pandemic. As a result, the increase in debt levels and yields put further pressure on governments' debt refinancing, more so for the highly-indebted countries, renewing concerns of fragmentation in the euro area sovereign debt market. Government debt as a share of GDP in the euro area, US and UK still exceeded pre-pandemic figures at 91.5%, 121.7%, and 102.6% of GDP, respectively in 2022, while in Malta it stood at 53.4%.



Real estate market in the euro area appears to be at a turning point

Vulnerabilities arising from both the strong mortgage growth rates and property prices, especially in the euro area, persisted in early 2022. However, more recent data indicates a turning point in the cycle, as the increase in interest rates added pressure on households' debt repayment capabilities and affordability, resulting in suppressed demand for residential real estate across the euro area. As a result, property price growth decelerated, from almost 10% in the first quarter of 2022, to just around 3% in the last quarter of the year.¹⁵ Similarly, forward-looking indicators point to a downturn in the euro area commercial real estate (CRE) market, as financial conditions for CRE investors deteriorated.

Domestically, house prices grew at a slower pace, with the annual growth rate decelerating to 5.9% in the last quarter of 2022, compared to the 2022 high of 7.6% in the second quarter. This was, however, stronger than the euro area average, as demand remained supportive reflecting fiscal support and incentives towards this sector. Although affordability metrics pointed towards some deterioration over the last decade, these have somewhat stabilised in recent years. At the same time, the Central Bank of Malta's house price misalignment indicator indicated that house prices are estimated to have remained below their fundamental levels, with the end of year readings being driven by relatively higher general as well as construction cost specific inflationary pressures. Going forward there are indications that house price inflation may cool down, reflecting in part the dissipating effects of the pandemic-related fiscal incentives, with sales of residential properties losing some momentum.¹⁶ However, new fiscal support measures aimed to aid affordability of first-time buyers is also expected to support demand for a specific segment of the market. Indeed, growth in resident mortgages, at 10.3%, remained strong in December 2022 compared to end 2021.

¹⁴ Source: Malta Stock Exchange.

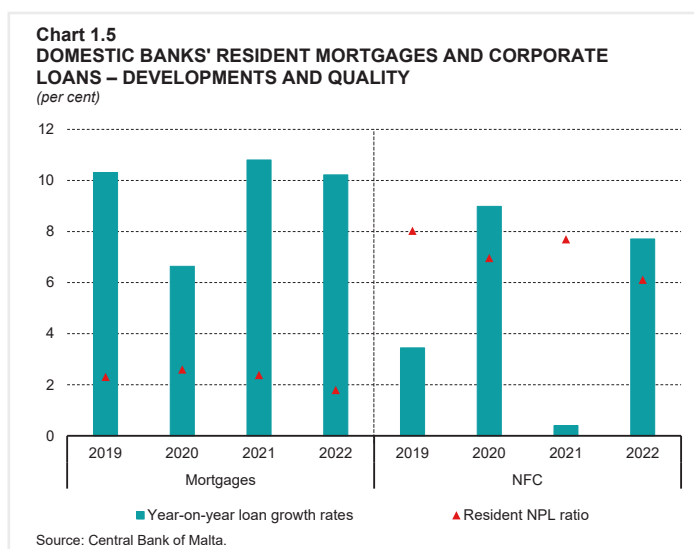
¹⁵ Source: Eurostat.

¹⁶ National Statistics Office News Release 006/2023 (January 2023). Source: <https://nso.gov.mt/residential-property-transactions-q4-2022/>.

1.2. Vulnerabilities within the financial system

Credit risk could increase on the back of weaker economic growth and further interest rate increases

Following the monetary policy tightening, euro area banks tightened their lending policies as risk perceptions increased (see Box 2). Despite this, overall credit to both households and corporates in the euro area remained positive, the latter largely reflecting financing for inventories and working capital needs, particularly those of energy companies.¹⁷



Resident mortgages continued to grow at robust rates in Malta, contributing further to the concentration in the banks' loan book (see Chart 1.5).¹⁸ Such sustained growth contributed to the rise in households' leverage, with their debt accounting for around 24% of financial wealth.¹⁹ Loans to Maltese firms picked up pace, up by 7.7% in 2022, mainly driven by lending towards real estate. Such lending partly reflected pent-up demand for the completion of investment projects which were disrupted by the pandemic and had subsequently come onstream in 2022. Notwithstanding, Maltese corporates were, on average, able to maintain stable leverage levels.²⁰

Despite the challenging macroeconomic environment, asset quality in Malta remained healthy. NPLs declined, mainly from lower corporate and household NPLs, driving the aggregate domestic NPL ratio to 2.5%, which is lower than the pre-pandemic ratio of 3.0%. This was also because both corporate and households' debt refinancing capabilities were not materially impacted, as domestic banks kept their base rates unchanged despite the ECB's hike in interest rates in the latter half of the year.²¹ Notwithstanding, both European and domestic banks, largely those classified as international banks, reported an increase in Stage 2 loans, suggesting a perceived increase in credit risk going forward.

To address cyclical risks arising from possible excessive credit growth, a number of European countries tightened capital-based measures, either through the countercyclical capital or sSyRBs.²² The Bank has recently supplemented its assessment of cyclical risk through the construction of a cSRI (see Box 1), which corroborates previously published analysis.²³ Such assessments have led the Central Bank of Malta to widen its macroprudential policy measures by introducing a sSyRB, as announced in March 2023 (see Box 5). This complements the borrower-based measures (BBMs) that were introduced in 2019.²⁴

¹⁷ European Banking Authority Risk Dashboard Q4 2022.

¹⁸ Mortgages represent around 53% of domestic banks' resident loan portfolio. More broadly, property related loans, which include loans towards construction, real estate, and mortgages, constitute a 67% share.

¹⁹ Based on December 2022 Central Bank of Malta data.

²⁰ Based on Central Bank of Malta and ECB Statistical Data Warehouse (SDW) data.

²¹ The increase in repayment costs was limited to some corporates whose loans are directly linked with market reference rates.

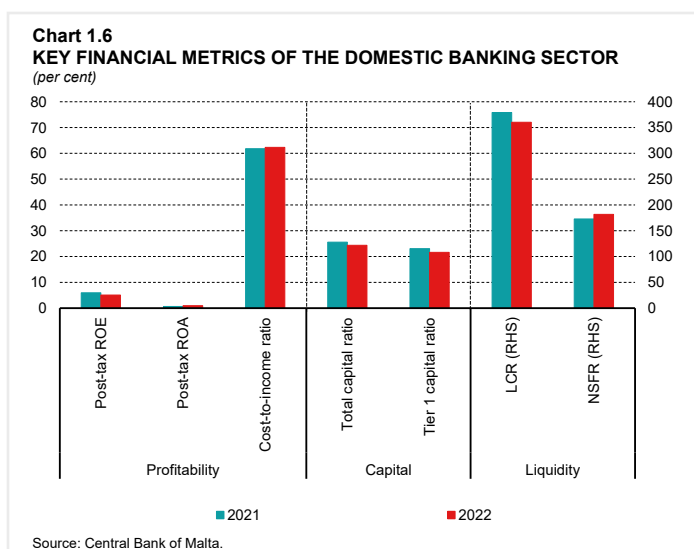
²² See ESRB National Policy. Source: https://www.esrb.europa.eu/national_policy/html/index.en.html.

²³ Central Bank of Malta Financial Stability Report 2021. Special Feature 1: Assessing Cyclical Risks in Malta <https://www.centralbank-malta.org/site/Publications/FSR-2021.pdf>.

²⁴ Central Bank of Malta Statement of Decision (March 2023). Source: <https://www.centralbankmalta.org/site/Financial-Stability/Statement-of-decision-2023.pdf>.

Despite some softening, domestic key financial metrics remain robust

European banks reported an improvement in profitability, driven by an increase in net interest income (NII).²⁵ From a domestic perspective, the overall increase in profits over 2021 was driven by branches of international banks and core domestic banks. This was due to developments occurring largely in the latter half of the year, as net and non-interest income rose, while a recovery of provisions was reported. The increase in NII reflected the hike in the ECB deposit facility rate, which now enabled banks to earn interest income on placements held with the Eurosystem. However, excluding the international branches, the post-tax Return on Equity (ROE) eased to 4.9% from 6.0%, a year earlier (see Chart 1.6).



Despite declining slightly from end 2021, European and domestic banks' capital and liquidity positions remained robust, with sufficient headroom above the minimum regulatory requirements. The total capital ratio of domestic banks stood at around 24%, largely backed by Tier 1 capital. Maltese banks continued to register higher capital ratios than their European counterparts, which on average stood at 19.4% for the euro area.²⁶ Strong liquidity levels were also reported domestically, with the Liquidity Coverage Ratio (LCR) and Net Stable Funding Ratio (NSFR) standing at around 360% and 182%, respectively.

Banks have continued to consider emerging risks present in their business model

According to replies submitted by euro area banks to the European Banking Authority's (EBA) risk assessment questionnaire, operational risk is expected to continue rising, mainly because of cyber risk and data security issues.²⁷ In this regard, Maltese banks continued to expand their awareness and strengthening appropriate mitigation measures against such risks. Cyber risk has particularly gained traction over the past few years following the rapid growth in digitalisation during the pandemic, with the rising geopolitical tensions increasingly playing out in the digital sphere, impacting cybersecurity. To this end, the ECB's Banking Supervision included cyber security as one of its supervisory priorities for the coming three years.²⁸ The increase in such risks is also becoming a more important driver in the higher share of the operational risks allocation in risk-weighted assets (RWAs).

In addition, the importance of further understanding the implications resulting from banks' exposure to both transition and physical risk from climate change remains of relevance, more so going forward, as more data and knowledge becomes widely diffused.

The non-bank sector faces headwinds

The non-bank financial institutions in the euro area were also impacted by the events of 2022. While euro area insurers maintained sufficiently robust profitability and solvency positions, concerns on their investment performance persisted, as heightened market volatility prevailed.²⁹ This especially as the surge in inflation

²⁵ European Banking Authority Risk Dashboard Q4 2022.

²⁶ See footnote 25.

²⁷ EBA Risk Assessment Questionnaire (Spring 2022). Source: https://www.eba.europa.eu/sites/default/documents/files/document_library/Risk%20Analysis%20and%20Data/Risk%20dashboard/q1%202022/1036532/RAQ%20Booklet%20Spring%202022_FINAL.pdf.

²⁸ ECB Supervisory priorities 2023-2025. Source: <https://www.bankingsupervision.europa.eu/banking/priorities/html/ssm.supervisory.priorities202212~3a1e609cf8.en.html>.

²⁹ ECB Financial Stability Review November 2022.

is a significant source of risk particularly for non-life insurers, which may have underestimated the technical provisions required for future claim payments due to higher price levels. Similarly, domestically-relevant insurances reported lower profitability, driven by lower investment income. Life insurers reported a decline in reserves for unearned premia and claims, which led to an improvement in their profitability. Non-life insurers meanwhile reported increased net claims paid and higher operational costs, partially reflecting rising inflation.

Euro area investment funds reported significant declines in their asset valuations. The mismatch between the liquidity of their assets and their redemption terms remained of concern given their generally low holdings of cash and liquid assets. Pockets of vulnerabilities continued to lie ahead as uncertainty on the pace of economic recovery persists. Similarly, the overall performance of domestically-relevant investment funds was marked by a significant decline in asset valuations. This was due to their significant exposure to bonds, though the adverse movements in equity markets also contributed to the overall decline. Despite these challenges, domestically-relevant investment funds remained highly liquid, while operating with low leverage levels.

1.3 Risk horizon

Developments going forward depend on several factors, particularly those related to geopolitical tensions and inflation, which in turn, have a bearing on the pace at which economies will grow in the coming years.

Notwithstanding a rather difficult external macroeconomic environment, the Maltese financial sector continued to remain sound, thanks in part to adequate capital and liquidity buffers, and risk management policies. The gradual normalisation of monetary policy is expected to continue favouring growth in NII, thereby contributing to a continued recovery in profitability. Nevertheless, the magnitude by which this occurs depends also on the pass-through of higher interest rates, which is somewhat slow domestically, as well as how sustained credit growth remains. Any increases in lending interest rates could also test the repayment capabilities of borrowers, thereby resulting in a possible deterioration in credit quality going forward. However, a recent study by the Central Bank of Malta shows that mortgages granted post the introduction of the BBMs in 2019 should be able to withstand hikes of up to 150 basis points, as this was already considered in their affordability test.^{30,31}

Developments in financial markets are also likely to impact securities portfolios of financial institutions, especially in the event of further asset price corrections. Furthermore, as also highlighted by the European Insurance and Occupational Pensions Authority (EIOPA), demand for insurance products could decrease as policyholders experience lower real disposable income.³² Life insurers on the other hand are likely to benefit from current interest rate hikes due to higher discount factors applicable for the longer-dated policyholder payments.















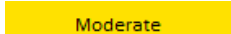
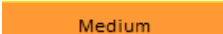




The Central Bank of Malta remains of the view that domestic banks should continue adopting prudent credit risk management and identify possible credit losses in a timely and conservative manner. Coupled with effective capital planning, this would enable the banking sector to be better placed in dealing with any losses materialising because of softening economic conditions. Deliberation on climate change and the implications this creates on the financial institutions' balance sheets is also of utmost relevance going forward.

Table 1.1 highlights the key vulnerabilities of the domestic financial sector and how they evolved in 2022.

³⁰ Central Bank of Malta Directive No.16 Regulation on Borrower-Based Measures. Source: <https://www.centralbankmalta.org/site/About-Us/Legislation/Directive-16-2021.pdf>.

³¹ Central Bank of Malta Interim Financial Stability Report 2022. Source: <https://www.centralbankmalta.org/site/Publications/Interim-FSR-2022.pdf>.

³² EIOPA Financial Stability Report December 2022. Source: https://www.eiopa.europa.eu/publications/financial-stability-report-december-2022_en.

Table 1.1 SUMMARY OF RISKS		
Main vulnerabilities and risks to financial stability	Description of risk	Risk assessment in 2022
Vulnerabilities outside the financial system		
Geopolitical uncertainties	The repercussions from the pandemic were compounded by the war in Ukraine, which triggered an energy crisis in Europe, and accelerated the increase in commodity prices. Although global energy and food commodity prices have come down significantly, geopolitical tensions and uncertainty continue to remain high.	
Inflationary pressures	Inflationary pressures led to monetary policy tightening which impacted financial markets. Borrowers' repayment capabilities and funding availability/costs could be impacted by further tightening.	
Reassessment in risk premia	The uncertain economic environment and worsening investment sentiment could trigger reassessment of risk premia.	
Economic conditions in the euro area and public debt sustainability	Concerns on euro area growth prospects escalated, with significant fiscal support being provided to dissipate a possible downturn.	
Domestic macroeconomic developments	Economic growth remained strong, though expected to moderate in the near-term.	
Real estate market developments	Demand for domestic properties remained strong though there are tentative signs of a slowdown.	
Vulnerabilities within the financial system		
Developments in mortgage lending	Domestic mortgage lending continued to grow strongly adding further concentration to the banks' loan book.	
Developments in NFC lending	Domestic corporate lending picked up pace after slowing down markedly during the COVID-19 pandemic.	
Concentration in sectoral lending	Domestic banks continued to focus their lending activity towards property-related sectors.	
Credit quality of the loan portfolio	Credit quality improved with domestic banks reporting declines in their NPLs. However, looking ahead, borrowers' repayment capabilities may be challenged due to persistent inflationary pressures and higher interest rates.	
Developments related to net income	Income grew at a faster pace than expenses, driven largely by intermediation activities, positive remuneration of Eurosystem placements, and lower provision charges.	
Operational risk	Credit institutions remain aware of possible operational risks, including cyber risks, accounting for the second largest contributor of total risk-weighted assets held.	
Domestically-relevant insurances	Insurers' investment returns were adversely impacted, with their capital and liquidity dropping, albeit still healthy. Life insurers' gross written premia declined, while non-life insurers reported higher claims.	
Domestically-relevant investment funds	Domestic investment funds registered strong declines in assets driven mainly by the general increase in interest rates. However, subfunds remained highly liquid while registering low leverage levels.	
Risk level:	  	
Risk direction:	Increased  Stable  Decreased 	

BOX 1: A CYCLICAL SYSTEMIC RISK INDICATOR FOR MALTA¹

The conduct of macroprudential policy includes the monitoring of both structural and cyclical systemic risk. Structural systemic risk is associated with the accumulation of vulnerabilities in the financial sector that can potentially intensify unfavourable economic shocks. Cyclical systemic risk is related to the build-up of macro-financial imbalances related to the dynamic developments of the financial cycle (Hodula et al., 2021).² Several studies provide evidence that cyclical risk builds up before a financial crisis (Minsky, 1982; Kindleberger, 1996; Schularick & Taylor, 2012; Mandler & Scharnagl, 2021).³ During a financial cycle upturn, growth in credit, and prices of financial and real estate assets surge, leading to higher collateral values and private sector debt via collateral channels (Hodula et al., 2021). The financial cycle reaches a peak when unsustainability concerns materialise via a drop in demand for these assets. This can drive fears of a correction, and impinges further on the value of collateral, potentially making debt underwater. A financial crisis ensues, leading to serious financial distress and economic dislocations (Borio, 2014).⁴

Macroprudential policy requires a time-dependent systemic risk framework to monitor the existence of risks, and quantify the likelihood of their eventual occurrence. The countercyclical capital buffer (CCyB) for Malta is guided *inter alia* by the deviation of the credit-to-GDP ratio from its long-term trend – known as the “Basel gap” – which proxies cyclical risk accumulation in the financial system. The Basel gap is a useful starting point to characterise the cyclical systemic risk present before a financial crisis. This measure is based on a trend extracted using a one-sided Hodrick-Prescott (HP) filter, and is argued to offer reliable early warning signals for a systemic banking crisis (Borio & Lowe, 2002; Borio & Drehmann, 2009; Detken et al., 2014).⁵ However, the Basel gap has several weaknesses, which primarily stem from the use of the HP filter (Hamilton, 2018; Lang et al., 2019).^{6,7} In light of these weaknesses, complementary cyclical systemic risk measures have been developed by central banks. In setting the CCyB for Malta, a spectrum of quantitative indicators (such as measures of property price overvaluation and household indebtedness) are monitored to assess the build-up of systemic risk and excessive credit growth.⁸

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² Hodula, M., et al. (2021). *Interaction of Cyclical and Structural Systemic Risks: Insights from Around and After the Global Financial Crisis*. Czech National Bank, Economic Research Division.

³ Minsky, H. P. (1982). The Financial Instability Hypothesis: Capitalist Processes and the Behavior of the Economy. In C. P. Kindleberger & J. P. Laffargue, *Financial Crises: Theory, History, and Policy* (pp. 13-39). Cambridge University Press.

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Mandler, M., & Scharnagl, M. (2022). Financial Cycles in Euro Area Economies: A Cross-Country Perspective Using Wavelet Analysis. *Oxford Bulletin of Economics and Statistics*, 84(3), 569-593.

⁴ Borio, C. E. (2014). The financial cycle and macroeconomics: What have we learnt?. *Journal of Banking & Finance*, 45, 182-198.

⁵ Borio, C. E., & Lowe, P. (2002). Assessing the risk of banking crises. *BIS Quarterly Review*, 7(1), 43-54.

Borio, C. E., & Drehmann, M. (2009). Assessing the risk of banking crises – revisited. *BIS Quarterly Review*, March 2009.

Detken, C., et al. (2014). Operationalising the countercyclical capital buffer: indicator selection, threshold identification and calibration options. *ESRB: Occasional Paper Series*, (2014/5).

⁶ Hamilton, J. D. (2018). Why you should never use the Hodrick-Prescott filter. *Review of Economics and Statistics*, 100(5), 831-843.

Lang, J. H., et al. (2019). *Anticipating the bust: a new cyclical systemic risk indicator to assess the likelihood and severity of financial crises*. ECB Occasional Paper, (219).

⁷ Three main weaknesses are highlighted by Lang et al. (2019). After a credit boom, the credit expansions spill into the trend, causing it to remain persistently high and the resulting gap to stay negative for a substantial period of time. Second, the gap is influenced by the length of the time series used, decreasing the measure's robustness for countries that have short credit time series. Third, concerns related to the ease of communicating results may emerge when the credit-to-GDP data and its trend are both increasing but the trend is increasing at a faster rate, causing the gap to narrow down.

⁸ See Central Bank of Malta. Source: <https://www.centralbankmalta.org/countercyclical-capital-buffer>.

Apart from the shortcomings of the Basel gap, practical evidence, and academic literature show that monitoring solely credit variations may not be sufficient to capture the cyclical risk present in a financial system (Tölö, 2020).⁹ It is also fundamental to condense and amalgamate a wide range of financial cycle information into one or a few measures, due to the vast number of indicators that can be used to monitor risks in practice. The synthetisation of data as a composite indicator aids macroprudential policymakers to monitor and analyse the dynamics of the financial cycle more easily.

A cSRI for euro area countries has been developed that has early warning features that can predict vulnerable periods before a systemic crisis (Constâncio et al., 2019).¹⁰ However, Constâncio et al. (2019) show that there is significant cross-country heterogeneity in the cSRI across the euro area and emphasize the importance of having country-specific macroprudential policies, together with a country-specific risk indicator. Moreover, the relevance of the cSRI as applied to Malta may be questioned as the methodology behind the cSRI presented in Constâncio et al. (2019) draws from past systemic crises experienced by other countries, whereas Malta did not experience crises in its recent macroeconomic history. Any periods that can be considered to have been characterised by notable systemic stress in Malta were significantly more short-lived and of limited impact on the macroeconomy.

This box focuses on the construction of a domestic cyclical systemic composite indicator for Malta, based on a subset of variables that are judged to be suitable early warning indicators. The main objective of this summary indicator is to convey further information about the accumulation of cyclical systemic risk over time. It also serves as a useful input in the policymaking process, whilst complementing other macroprudential tools in use.

A cyclical Systemic Risk Indicator for Malta

The variables that are included in the computation of the cSRI for Malta are based on an ECB early warning system that can predict financial crises (Lang et al., 2019). The cSRI is calculated based on four sub-indicators, drawn from a list of variables based on the ESRB Recommendation ESRB/2014/1.¹¹ These include the two-year real bank credit growth rate, the one-year change in the debt service-to-income (DSTI) ratio for the whole economy, the house price-to-income per capita ratio, and the two-year growth rate in real total debt (which includes both private and public sector debt). Hence, measures of credit developments, private sector debt burden, affordability of property prices, and overall imbalances are captured respectively. The four sub-indicators are combined into a composite indicator by employing weights using a statistical technique, and the signs of these weights are then assessed against expectations based on economic theory.

The country-specific weights for the cSRI are obtained using Principal Component Analysis (PCA), after the variables are standardised. This technique summarizes the co-movement among a potentially large set of variables in a few principal components, and is also behind other indicators used by the Bank, such as the Financial Conditions Index for the analysis of monetary conditions, and transmission of monetary policy.¹² The cSRI presented in this box is based on the first principal component, which captures 63% of the variation amongst the set of variables listed above.¹³ The weights for the sub-indicators that result from PCA analysis are displayed in Table 1. Real bank credit has the largest

⁹ Tölö, E. (2020). Predicting systemic financial crises with recurrent neural networks. *Journal of Financial Stability*, 49(3).

¹⁰ Constâncio, V., et al. (2019). *Macroprudential policy at the ECB: Institutional framework, strategy, analytical tools and policies*. ECB Occasional Paper, (227).

¹¹ ESRB (2014). Recommendation of the European Systemic Risk Board on guidance for setting countercyclical buffer rates. European Systemic Risk Board 2014/C 293/01.

¹² See Micallef, B. and Borg, I. (2017). Box 1: A Financial Conditions Index for the Maltese Economy, *Annual Report 2017*, 32-36. Central Bank of Malta.

¹³ During the research process, various principal components were extracted, which consisted of a broader set of macro-financial variables, different data transformations and various sample periods. Two important necessary conditions were considered during such exercise: the concordance of the index with judgement on the history of cyclical systemic risk in Malta; and the consistency of the sign of factor loadings with economic theory. More technical details can be found in a forthcoming working paper.

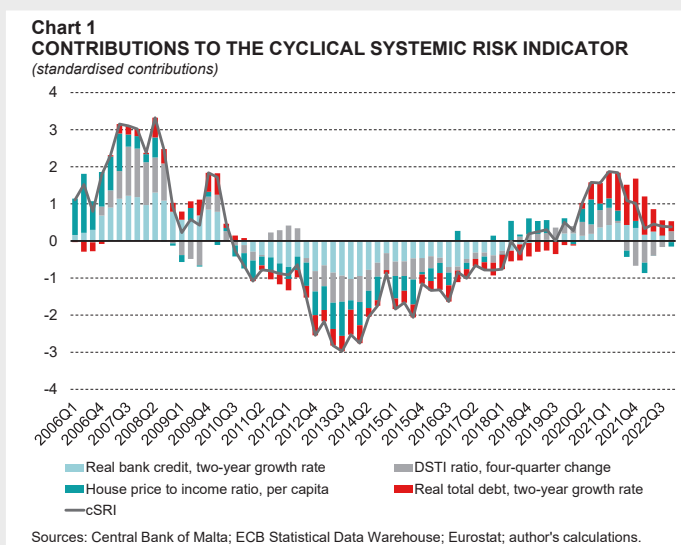
Table 1
CONTRIBUTIONS TO THE CYCLICAL SYSTEMIC RISK INDICATOR

Variables	Factor loadings	Weights %
Real bank credit, two-year growth rate	0.60	36.0
DSTI ratio, four-quarter change	0.48	23.4
House price to income ratio, per capita	0.48	22.9
Real total debt, two-year growth rate	0.42	17.7

Source: Author's calculations.

relative weight, reflecting the fundamental role that banks play in Malta's financial system. The other three sub-indicators have approximately equal weights, contributing positively to domestic cyclical systemic risk.

Chart 1 plots the cSRI and the contributions of the underlying sub-indicators from 2006Q1 to 2022Q4.¹⁴ Positive contributions of a variable indicate that it is higher than its historical average, and vice versa. Consequently, the cSRI indicates a build-up in cyclical systemic risk when it is above zero, and a winding-down of cyclical risk when it is below zero.



During the sample period considered, the cSRI reached its highest value during 2008Q2 and its lowest value during 2013Q3. This peak coincides with the onset of the Global Financial Crisis (GFC), and is characterised by rising house prices, followed by strong credit growth and rising debt burden. However, the Maltese economy proved to be resilient during the GFC due to a robust banking sector characterised by conservative lending practices. Most banks managed to retain healthy returns and liquidity, despite increasing regulations during such global turmoil. Almost all sub-indicators contributed positively to the cSRI up to 2010, except for the DSTI ratio, which fell in mid-2009 following the pass-through of the ECB's monetary policy loosening.

A period of low cyclical systemic risk was experienced for several years until 2019. As seen in Chart 1, over this period, real bank credit growth moderated substantially, the DSTI ratio declined, while the house price-to-income ratio declined until 2013, after which it resumed an upward trajectory. Findings from the BLS show tighter bank lending standards were in force between 2011 and 2013,

¹⁴ The cSRI starts from 2006Q1 onwards due to the lack of data availability prior to 2004Q1 for some of the sub-indicators. The two-year transformation for real bank credit and total real debt uses the first two years of data.

stabilising financing demands by NFC.¹⁵ The importance of bank credit as a financing source for NFCs also declined somewhat over time, as alternative sources of finance such as intragroup and wholesale funding were sought. Public debt grew, albeit at low levels for the first part of this period, with high economic growth eventually leading to favourable government finances, and to a reduction in the stock of outstanding public debt. Nevertheless, the strong economic growth contributed to keep cyclical systemic risks low for some time.

The cSRI peaked in 2021, at the height of the COVID-19 pandemic. A significant driver was the growth in total debt, attributed to the rise in public debt because of the fiscal support measures put in place at the time. However, house prices relative to income continued their upward trend, as did total bank credit, which exerted further upward pressure on the cSRI. This heightened cyclical systemic risk was phased downwards due to a strong economic recovery. COVID-19 related support measures, such as moratoria and the Wage Supplement Scheme, allowed the retention of employment in sectors severely hit by the pandemic, reducing the likelihood of default on bank loans and debt securities.

Financial stability risks remained contained as other support schemes were implemented, such as the MDB COVID Guarantee Scheme (CGS). The additional borrowing required to finance the shortfall in government revenue elevated the stock of general government debt drastically when compared to 2019.¹⁶ From early 2021 onwards, the cSRI was following a downward trend, signalling lower systemic risk as the consequences of the pandemic waned. Particularly, the DSTI contributed negatively to the cSRI due to a strong recovery in GDP, which is used as a measure of income. By 2022Q4, the cSRI indicates relatively low and stable cyclical risks, following an adjustment process to the pandemic shock.

Policy implications

The cSRI is equipped with macro-financial variables which are closely aligned with the movement of cyclical systemic risks in Malta. The early warning features of the cSRI can signal a systemic crisis ahead of time, providing policymakers with an opportunity to build resilience in the financial system, and counter the financial cycle by deploying the necessary macroprudential tools in a timely manner.

The cSRI is not meant to be used mechanically, and other complementary tools and expert judgement will be referred to for policy considerations. Having a suite of instruments as part of a cyclical risk analysis framework means that decisions are supported by a broad information set. In this context, the cSRI acts as another quantitative indicator that can be monitored and considered when assessing the appropriate CCyB level, as well as guiding Malta's macroprudential policy stance more generally.

¹⁵ See Zerafa, S. (2017). Access to finance for firms in Malta: Estimating the impact of reduced credit. *Policy Note*, July 2017, Central Bank of Malta.

¹⁶ See Attard, J. and Farrugia, J. (2022). Box 4: The Fiscal Response to the COVID-19 Pandemic, *Quarterly Review* 2022:2, 72-77. Central Bank of Malta.