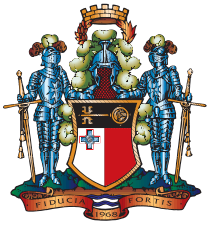


BANK ĊENTRALI TA' MALTA
EUROSISTEMA
CENTRAL BANK OF MALTA

FIFTEENTH FINANCIAL STABILITY REPORT

2022

Address
Pjazza Kastilja
Valletta VLT 1060
Malta

Telephone
(+356) 2550 0000

Fax
(+356) 2550 2500

Website
www.centralbankmalta.org

E-mail
info@centralbankmalta.org

Photo credits
Domenic Aquilina.

Unless otherwise indicated, the cut-off date for regulatory and prudential returns is 28 February 2023. The general risk assessment conducted in this edition of the Financial Stability Report focuses on developments occurring in 2022 but in some instances was updated to consider more recent developments. The source of data in tables and charts is the Central Bank of Malta unless otherwise indicated.

ISSN 2312-5918 (print)
ISSN 2074-2231 (online)

CONTENTS

ACKNOWLEDGEMENTS

The Financial Stability Committee

Profs. Edward Scicluna (Governor and Chairperson)
Oliver Bonello (Deputy Governor – Financial Stability)
Alexander Demarco (Deputy Governor – Monetary Policy)
Dr Aaron G. Grech (Chief Economist)
Alan Cassar (Chief Officer – Financial Stability & Statistics Division)
Maryanne Attard (Chief Officer – Financial Control & Risk Division)
Stephen Attard (Head – Policy, Crisis Management and Stress Testing)
Wendy Zammit (Head – Financial Stability Surveillance and Research, Secretary)

Financial Stability Surveillance and Research Department

Policy, Crisis Management and Stress Testing Department

Statistics Department

ABBREVIATIONS

AMC	amortised cost
APP	asset purchase programme
ARDL	Autoregressive Distributed Lag
ASF	available stable funding
AUM	Assets under Management
BBMs	borrower-based measures
BIA	Basic Indicator Approach
BIC	Bayesian Information Criterion
BLS	bank lending survey
BMA	Bayesian Model Averaging
BR	Banking Rule
BRRD	Bank Recovery and Resolution Directive
BTL	buy-to-let
CBC	counterbalancing capacity
CBM	Central Bank of Malta
CCR	Central Credit Register
CCyB	Countercyclical Capital Buffer
CGS	COVID-19 Guarantee Scheme
CIU	collective investment undertaking
COR	cost-of-risk
CRD	Capital Requirements Directive
CRE	commercial real estate
CRR	Capital Requirements Regulation
CSDB	Centralised Securities Data Base
cSRI	cyclical systemic risk indicator
DGS	deposit guarantee scheme
DORA	Digital Operational Resilience Act
DSTI	debt service-to-income
EAD	Exposure at Default
EBA	European Banking Authority
ECB	European Central Bank
ECL	Expected Credit Loss
EIOPA	European Insurance and Occupational Pensions Authority
ESAs	European Supervisory Authorities
ESMA	European Securities and Markets Authority
ESRB	European Systemic Risk Board
EU	European Union
FBE	forborne exposure
FINREP	financial information reporting
FM	Financial Margin
FV	fair value
FVOCI	fair value through other comprehensive income
FVTPL	fair value through profit and loss
GDP	gross domestic product
GFC	Global Financial Crisis
GHG	greenhouse gas
G-SII	global systemically important institutions
HFCS	Household Finance and Consumption Survey
HICP	Harmonised Index of Consumer Prices
HP	Hodrick-Prescott
HQLA	high-quality liquid assets
IFRS 9	International Financial Reporting Standard 9
IMF	International Monetary Fund
IRB	internal ratings-based
IRRBB	interest rate risk in the banking book
JFSB	Joint Financial Stability Board

LCR	liquidity coverage ratio
LGD	Loss-Given Default
LSI	less significant institutions
LTV	loan-to-value
MDB	Malta Development Bank
MFSA	Malta Financial Services Authority
MGS	Malta Government Stock
MiCA	markets in crypto-assets
MMF	money market funds
MRC	Minimum Required Capital
MREL	minimum requirement for own funds and eligible liabilities
MST	Macro Stress Testing
NACE	Nomenclature générale des Activités économiques dans les Communautés Européennes
NAV	net asset value
NCA	National Competent Authorities
NEAR	Normalised Exposure at Risk
NFC	non-financial corporations
NII	net interest income
NNII	net non-interest income
NPE	non-performing exposure
NPL	non-performing loan
NSFR	net stable funding ratio
NTI	Net Trading Income
OCR	Overall Capital Requirement
OFI	other financial intermediaries
O-SIIs	other systemically important institutions
P&L	Profit and Loss
PCA	Principal Component Analysis
PD	Probability of Default
PDW	persistent deposit withdrawals
PEAR	Potential Exposure at Risk
PIF	Professional Investor Fund
Repo	repurchase agreement
RHS	right-hand scale
RIAD	Register of Institutions and Affiliates Data
ROA	return on assets
ROE	return on equity
RS	risk scores
RSF	required stable funding
RWA	risk-weighted asset
SA	standardised approach
SCR	Solvency Capital Requirement
SDW	Statistical Data Warehouse
SHS	Securities Holdings Statistics
SHSS	Securities Holdings Statistics Sector
SI	significant institution
SPPI	Solely Payments of Principal and Interest
SRB	Single Resolution Board
sSyRB	sectoral systemic risk buffer
SyRB	systemic risk buffer
TLTRO	targeted longer-term refinancing operations
UCITS	Undertaking for the Collective Investment in Transferable Securities
UK	United Kingdom
US	United States of America
USD	United States dollar
WAIR	weighted average interest rate

THE DOMESTIC FINANCIAL SECTOR

Banks

Core Domestic Banks	**Non-core Domestic Banks**	**International Banks**
APS Bank plc	FCM Bank Limited	AgriBank plc
Bank of Valletta plc	FIMBank plc	Akbank T.A.S. (Branch)
BNF Bank plc	IIG Bank (Malta) Limited	Credit Europe Bank NV (Branch)
HSBC Bank Malta plc	Izola Bank plc	Credorax Bank Limited
Lombard Bank Malta plc	Merkanti Bank Limited	European Depositary Bank SA (Malta Branch)
MeDirect Bank (Malta) plc	Sparkasse Bank Malta plc	ECCM Bank plc
		Multitude Bank plc
		Novum Bank Limited
		Turkiye Garanti Bankasi A S (Branch)

Domestic Investment Funds

BOV Asset Management Limited	**Calamatta Cuschieri Investment Management Limited**	**Jesmond Mizzi Financial Advisor Limited**
BOV Balanced Portfolio Fund	Balanced Strategy Fund	Merill Global Equity Income Fund
BOV Conservative Portfolio Fund	Emerging Market Bond Fund	Merill High Income Fund
BOV Growth Portfolio Fund	Global Balanced Income Fund	Merill Total Return Income Fund
Vilhena Euro Income Fund	Global Opportunities Fund	
Vilhena Euro Liquidity Fund	Growth Strategy Fund	**Reaps Asset Management Limited**
Vilhena European Multi Manager Fund	High Income Bond Fund	APS Diversified Bond Fund
Vilhena Global Themed Fund	Income strategy Fund	APS Global Equity Fund
Vilhena High Yield Fund	Malta Government Bond Fund	APS Income Fund
Vilhena Malta Bond Fund	Malta High Income Fund	APS Regular Income Ethical Fund
Vilhena Malta Fund		
Vilhena Malta Government Bond Fund	**HSBC Global Asset Management (Malta) Limited**	**Self-managed**
Vilhena Maltese Equity Focus Fund	Equity Growth Fund	Amalgamated Growth and Income Fund
Vilhena Maltese Opportunities Fund	International Bond Fund	
Vilhena Sterling Income Fund	Malta Bond Fund	
Vilhena US Multi Manager Fund	Malta Government Bond Fund	
	Maltese Assets Fund	

Domestic Insurance Companies

Life Insurance Companies	**Non-life Insurance Companies**
HSBC Life Assurance (Malta) Limited	Atlas Insurance PCC Limited
IVALIFE Insurance Limited	Citadel Insurance plc
LifeStar Insurance plc	Elmo Insurance Limited
MAPFRE MSV Life plc	GasanMamo Insurance Limited
	MAPFRE Middlesea plc

This edition of the *Financial Stability Report* is based on the above categorisation of banks, domestically-relevant insurance companies and investment funds.

EXECUTIVE SUMMARY

The post-pandemic global economic recovery was somewhat hampered by the consequences of the war in Ukraine. Heightened inflationary pressures led major central banks to rapidly tighten monetary policy. Volatility in financial markets increased, with both equity and bond prices falling significantly, wiping away gains made in the previous year.

Policy measures shielded the Maltese economy from the direct repercussions of the war in Ukraine owing to the limited economic connections with the two conflict countries, though indirect effects still left their mark, particularly on inflation. The economy continued to grow, supported by Government's measures to mitigate the rise in energy prices, while the Malta Development Bank (MDB) introduced schemes to alleviate liquidity concerns and provided emergency support measures to firms in economic sectors impacted by the war. Against this backdrop, the Maltese banking sector remained resilient. Profitability improved, driven by both net and non-interest income, while a recovery of provisions was also reported. Banks continued to operate with ample liquidity, supported by continued deposit inflows and sufficient capital buffers. Asset quality also improved on the back of lower non-performing loans (NPLs). Stress tests confirm that Maltese banks overall remained adequately capitalised even under stressed conditions. However, going forward further inflationary pressures and interest rate hikes could affect borrowers' repayment capabilities and potentially could lead to asset quality deterioration. Unlike other euro area countries, the interest rate pass through is slower in Malta, given that the banks have ample liquidity. Banks also need to remain aware of possible consequences on their business models of emerging risks related to cyber and climate change. Indeed, this edition of the *Report* carries a box on experimental indicators on climate change for Malta, following the publication of harmonised euro area indicators by the European Central Bank (ECB) as part of its broader climate action plan.

Resident credit growth continued to be driven by higher resident mortgage lending, although a recovery in resident corporate credit also contributed. This recovery in corporate lending reflected pent-up demand following the pandemic, as some real estate projects came onstream. On the other hand, the growth in mortgage lending still reflected carry over effects of supportive fiscal measures targeting this sector, as also indicated in the boxed article on the Bank Lending Surveys (BLSs) conducted during the year. As a result, concentration in the banks' loan portfolios increased further. Owing to the continued build-up of cyclical and concentration risks, the Central Bank of Malta together with the Malta Financial Services Authority (MFSA) decided to phase in the introduction of a sectoral systemic risk buffer (sSyRB) on mortgages secured by residential real estate (RRE) over 2023 and 2024. Given the rising prominence of cyclical risk surveillance, this edition of the *Financial Stability Report* includes a boxed article on a newly constructed domestic cyclical systemic risk indicator (cSRI), as well as another box explaining the introduction of the sSyRB, which was announced in March 2023.

Domestically-relevant insurance companies and investment funds also remained resilient. These firms continued operating with strong capital and liquidity buffers. While still profitable, their performance was adversely impacted by the heightened volatility in financial markets. Going forward, further monetary policy tightening could adversely affect the profitability of domestically-relevant investment funds, given the high share of bond holdings. Non-life insurers could also be adversely impacted through higher costs owing to the strong rise in inflation. At the same time, demand for life cover could slow down, as inflation continues to erode policyholders' disposable incomes.

As part of the Bank's continued effort to strengthen its stress testing capabilities, the *Financial Stability Report* contains a boxed article on a new framework to quantify expected bank credit losses and another box detailing the accounting treatment of debt securities under International Financial Reporting Standard (IFRS) 9. The *Report* also includes a boxed article relating to the impact of inflation and interest rates on households quantified via the household stress testing framework.

The *Report* highlights the importance that the domestic financial sector remains aware of possible adverse developments impacting financial stability going forward, largely emanating from developments related to geopolitical tensions and policy responses to inflation. Domestic banks also need to continue adopting prudent credit risk management policies and identify possible credit losses at an early stage.

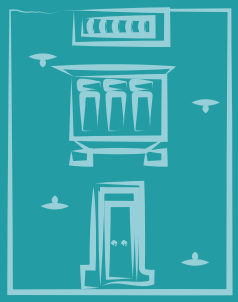
The *Report* is prepared by the Central Bank of Malta through the joint efforts of the Financial Stability Surveillance and Research Department, and the Policy, Crisis Management and Stress Testing Department of the Bank. This edition of the *Report* also benefitted from contributions by the Statistics Department. The *Report* is reviewed by the Bank's Financial Stability Committee, which is responsible to oversee and implement policies related to financial stability and the macroprudential framework.

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.

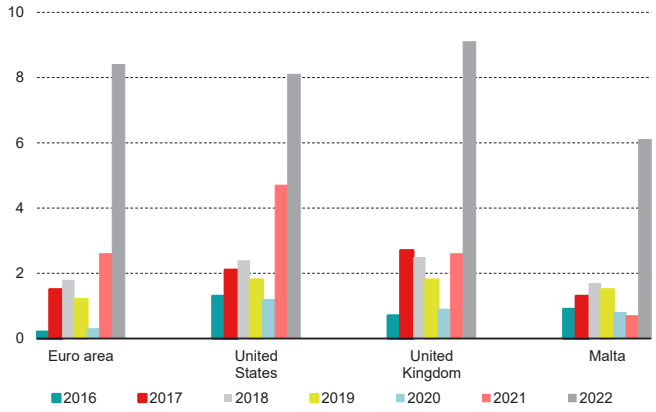
[2] MDB support measures in response to the Ukraine crisis. Sources: https://mdb.org.mt/en/news-and-media/Pages/MDB-response-to-Ukraine-crisis.aspx; https://mdb.org.mt/en/news-and-media/Pages/MDB-LSGS-A-and-B.aspx

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.

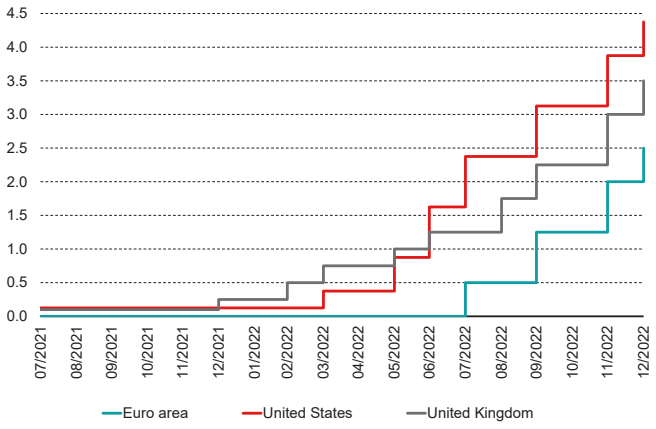
Chart 1.1
INFLATION RATES IN SELECTED ECONOMIES
(per cent)



Sources: Eurostat; International Monetary Fund.
Note: Figures refer to average of the year.

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]

Chart 1.2
MONETARY POLICY RATES ADOPTED IN SELECTED ECONOMIES
(per cent)



Source: Bank for International Settlements.

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.

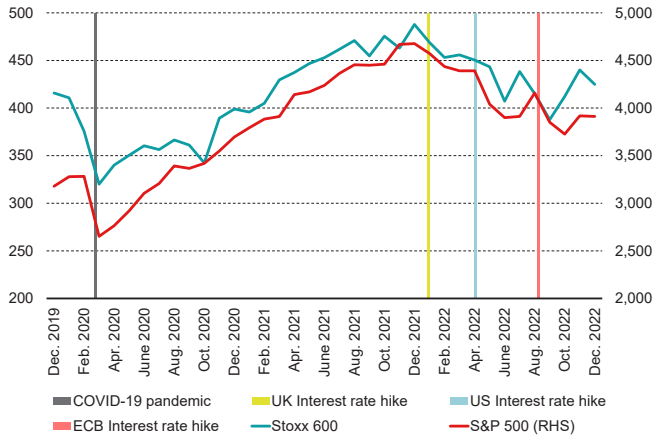
The United Kingdom's (UK) economy narrowly escaped a technical recession following the marginal contraction in the third quarter of 2022. Meanwhile, the United States' (US) economy contracted in the first half of the year but rebounded in the second half of 2022. The euro area, however, expanded by 3.5% 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.

Chart 1.3
DEVELOPMENTS IN LEADING STOCK MARKET INDICES
(points)



Sources: Investing.com; ECB Statistical Data Warehouse.

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.

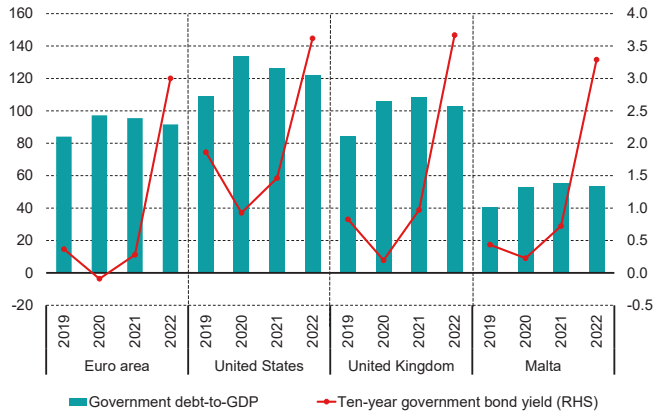
[11] IMF World Economic Outlook Update: A Rocky Recovery (January 2023).

[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]

Chart 1.4
GOVERNMENT DEBT-TO-GDP AND TEN-YEAR BOND YIELDS IN SELECTED ECONOMIES
(per cent)



Sources: ECB Statistical Data Warehouse; Investing.com; Eurostat; IMF.

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]

Chart 1.5
DOMESTIC BANKS' RESIDENT MORTGAGES AND CORPORATE LOANS – DEVELOPMENTS AND QUALITY
(per cent)

Source: Central Bank of Malta.

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.

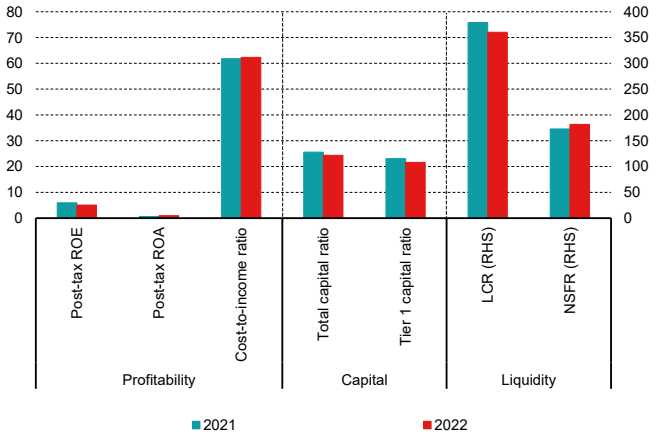
23 Central Bank of Malta Financial Stability Report 2021. Special Feature 1: Assessing Cyclical Risks in Malta https://www.centralbankmalta.org/site/Publications/FSR-2021.pdf.

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).

Chart 1.6
KEY FINANCIAL METRICS OF THE DOMESTIC BANKING SECTOR
(per cent)



Source: Central Bank of Malta.

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: Moderate | Medium | Elevated

Risk direction: Increased  Stable  Decreased 

BOX 1: A CYCLICAL SYSTEMIC RISK INDICATOR FOR MALTA[1]

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]

---

[1] Written by Sarah Vella, Research Economist within the Financial Stability Research Office of the Central Bank of Malta. The author would like to thank Dr William Gatt Fenech, Ms Wendy Zammit, Mr Alan Cassar, Deputy Governor Mr Oliver Bonello, Dr Aaron Grech and Deputy Governor Mr Alexander Demarco for their helpful comments and suggestions.

[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.
Kindleberger, C. P. (1996). Manias, Panics and Crashes: A History of Financial Crises. Wiley.
Schularick, M., & Taylor, A. M. (2012). Credit booms gone bust: monetary policy, leverage cycles, and financial crises, 1870–2008. American Economic Review, 102(2), 1029-1061.
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.

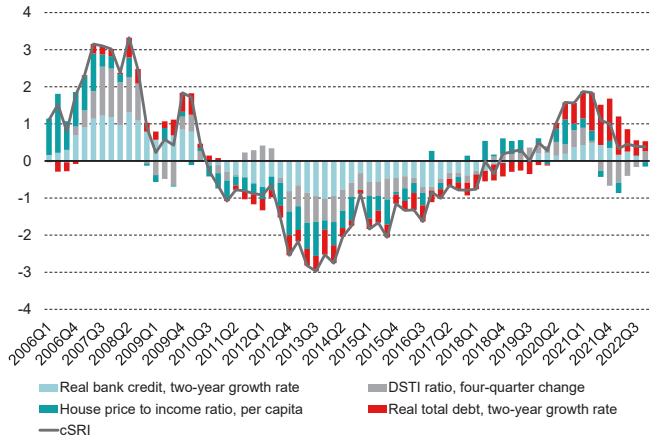
Table 1
CONTRIBUTIONS TO THE CYCLICAL SYSTEMIC RISK INDICATOR

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
CONTRIBUTIONS TO THE CYCLICAL SYSTEMIC RISK INDICATOR
(standardised contributions)



Sources: Central Bank of Malta; ECB Statistical Data Warehouse; Eurostat; author's calculations.

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.

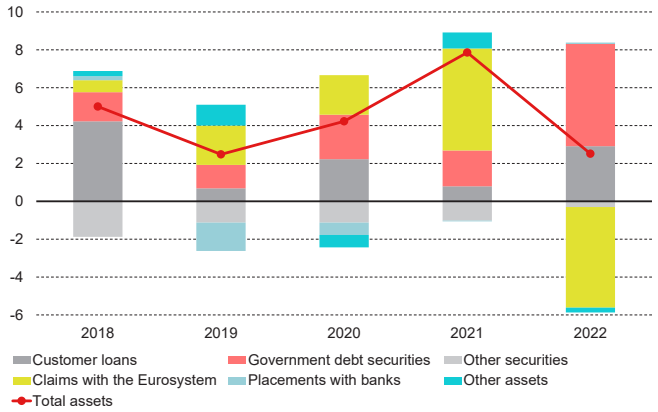
[16] See Attard, J. and Farrugia, J. (2022). Box 4: The Fiscal Response to the COVID-19 Pandemic, *Quarterly Review* 2022:2, 72-77. Central Bank of Malta.

2. DEVELOPMENTS IN THE BANKING SECTOR

2.1 Core domestic banks

The uncertain global macroeconomic environment was challenging for core domestic banks as they continued with their recovery from the pandemic. Their balance sheet expanded by 2.5%, the slowest growth in the last three years. As economic growth surpassed the expansion in banks' balance sheets, the size of the sector relative to GDP dropped by around 16 percentage points to 168.8%. With the early repayment of the targeted longer-term refinancing operations (TLTROs), following the end of the favourable conditions for such funding, an exceptional litigation charge, and opportunities to purchase fixed income instruments after the sharp fall in bond prices, the placements with the Eurosystem decreased by almost a quarter, after several years of sustained growth (see Chart 2.1). However, at 16.2% of assets, such placements still represented an important share of these banks' overall assets. Investment in sovereign bonds increased, given the higher yields owing to the rising interest rate environment. Such bonds are considered liquid, and thus the move from Eurosystem placements to sovereign bonds did not affect these banks' liquidity position (see section 2.1.4). At the same time, lending by the core domestic banks also increased by 6.4% over the previous year.

Chart 2.1
CONTRIBUTION TO BALANCE SHEET GROWTH – CORE DOMESTIC BANKS
(percentage points)

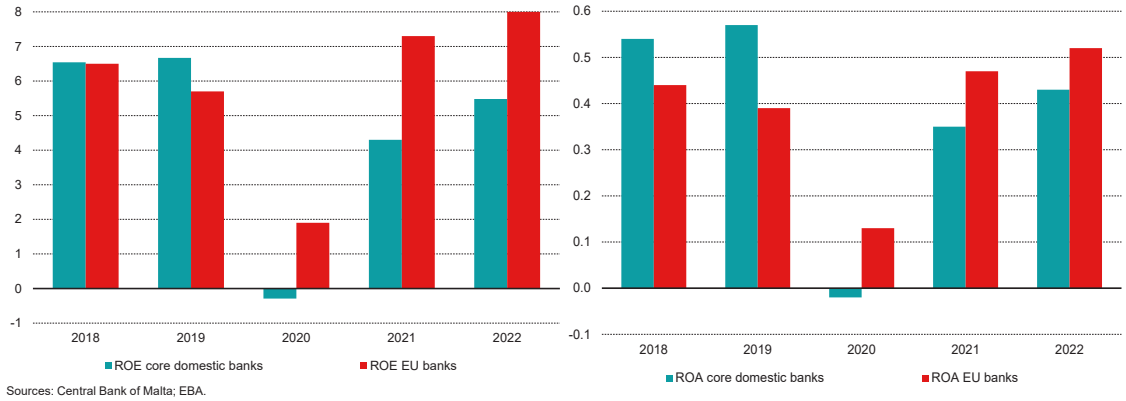


Source: Central Bank of Malta.

2.1.1 Profitability

The core domestic banks' profitability continued to recover, with pre-tax profits up by 27.8% compared to a year earlier. The recovery in overall profitability still lagged that of EU counterparts and pre-pandemic levels, however, this was mainly due to a one-off litigation charge which took place in the first half of the year. Should this be excluded, pre-tax profits would have doubled compared to 2021 figures. The post-tax ROE and Return on Assets (ROA) improved by 1.2 percentage points and 0.1 percentage point, respectively, to reach 5.5% and 0.4% (see Chart 2.2). Excluding the one-off litigation charge, the post-tax ROE and ROA would go up to around 8.5% and 0.7%, respectively, exceeding EU averages.[1]

Chart 2.2
PROFITABILITY RATIOS
(per cent)

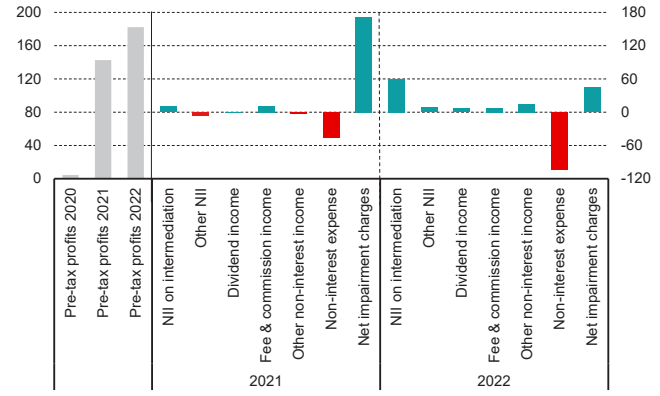


Sources: Central Bank of Malta; EBA.

[1] Source: EBA Risk Dashboard Q4 2022.

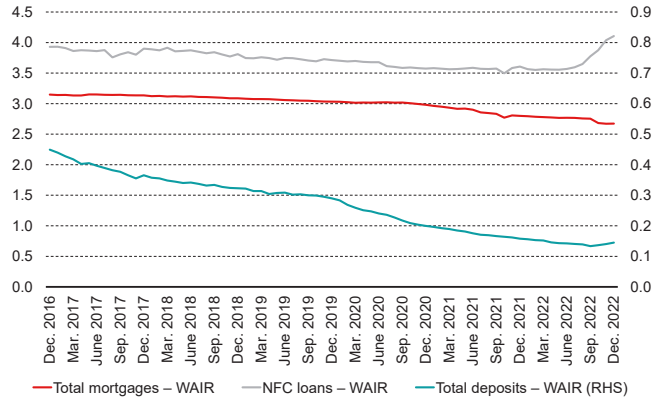
This group of banks reported reversals and recoveries of impairment losses which positively impacted profits. However, this was comparatively lower than in the previous year. The sustained economic recovery, and the increase in the ECB's deposit facility rate boosted NII by almost 18%, largely reflecting increased lending including a strong recovery in corporate lending (see Chart 2.3). At the same time, margins widened, as the weighted average interest rate (WAIR) on outstanding euro-denominated resident corporate loans rose from 3.6% in 2021, to 4.1% in 2022 (see Chart 2.4). While the WAIR on euro-denominated outstanding mortgages fell marginally by 0.1 percentage point to 2.7%, their interest income remained robust on the back of the strong mortgage growth. Funding costs remained contained, supported by the low WAIR on deposits, standing at less than 0.2% due to the on-demand nature of most deposits.

Chart 2.3
MAIN CONTRIBUTORS TO PROFITS – CORE DOMESTIC BANKS
(EUR millions)



Source: Central Bank of Malta.
Note: Grey bars indicate pre-tax profits in absolute amounts. Teal (positive) and red (negative) bars indicate yearly contributions to profits.

Chart 2.4
INTEREST RATE DEVELOPMENTS – CORE DOMESTIC BANKS
(per cent)



Source: Central Bank of Malta.
Note: Data refers to the annualised agreed WAIR on outstanding resident exposures by core domestic banks.

Non-interest income also rose, up by a fifth. This mainly reflected dividend income receivable, which almost doubled reflecting the pick-up in economic activity, and other non-interest income, particularly gains on financial assets. Furthermore, fees and commission income stood higher, up by 7.4%, to account for almost 70% of non-interest income.

On the downside, aggregated non-interest expenses climbed further, up by more than a quarter over the previous year, resulting in the cost-to-income ratio to advance by just over 5 percentage points, to 80.4%. This was however driven by a one-off litigation cost by one bank which took place in the first half of the year. Excluding this extraordinary cost, non-interest expenses would have remained generally stable, with the cost-to-income ratio improving by over 10 percentage points to 64.3%, though still above the EU banks' average of 60.6%.[2]

2.1.2 Credit dynamics

Core domestic banks' credit growth picked up momentum, up by 6.5% as at end 2022, compared to 2.2% a year earlier. The pick-up in pace was on account of a significant recovery in resident NFC lending, which grew by almost 6% in 2022, compared to a contraction of 0.4% a year earlier (see Chart 2.5). This was predominantly the result of higher lending towards the real estate sector, reflecting the pent-up demand following the pandemic, as projects which were postponed came on stream. This contributed to the share of lending to construction and real estate sectors to increase by almost 1 percentage point to 13.1% of the overall resident

[2] Source: EBA Risk Dashboard Q4 2022.

loan book (see Chart 2.6). This was followed by higher lending towards the wholesale and retail trade, as well as manufacturing. In contrast, loans to accommodation and food services, professional, scientific, and technical activities sectors dropped in 2022.

Despite a slight slowdown, resident mortgages continued to grow strongly. Just shy of a 10% annual growth rate, this segment remained the largest contributor to growth in the core domestic banks' loan book. Such growth remained sustained by the strong demand, as reported by the participants of the BLS (see Box 2). Whilst being a source of growth, this increasing activity is also manifesting itself into higher concentration risks, as banks are being increasingly exposed to the real estate sector.

At the same time, resident consumer credit continued to contract for the third consecutive year, though at a much less pronounced rate of 1%, compared to the 4.3% drop reported in the previous year. Non-resident loans, including interbank placements, declined further, to account for just 4.7% of the core domestic banks' overall loan book.

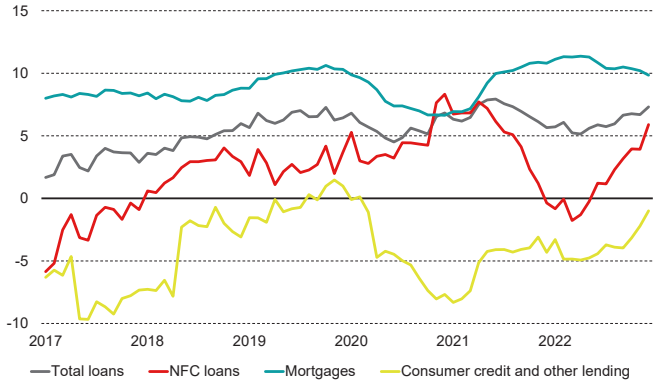
2.1.3 Asset quality

Non-performing loans

The overall NPL ratio improved to stand at 2.7% in 2022, down from 3.5% a year earlier (see Chart 2.7).[3] This was exclusively the result of a faster drop in the stock of NPLs, which fell by over a quarter, mainly reflecting recoveries as write-offs were more limited.

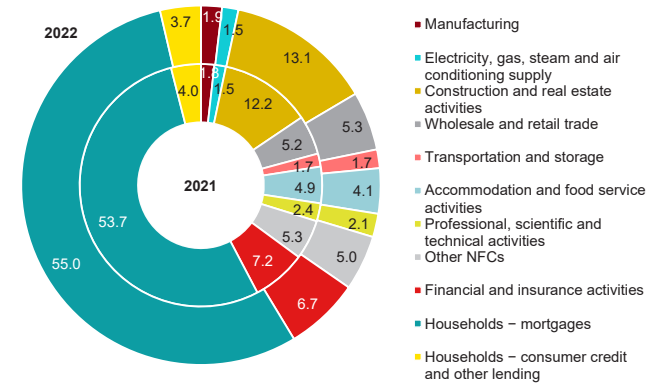
Lower NPLs stemmed mainly from resident NPLs which fell by 16.7%, largely reflecting firms in the construction sector and the

Chart 2.5
ANNUAL GROWTH RATE OF RESIDENT LOANS – CORE DOMESTIC BANKS
(per cent)



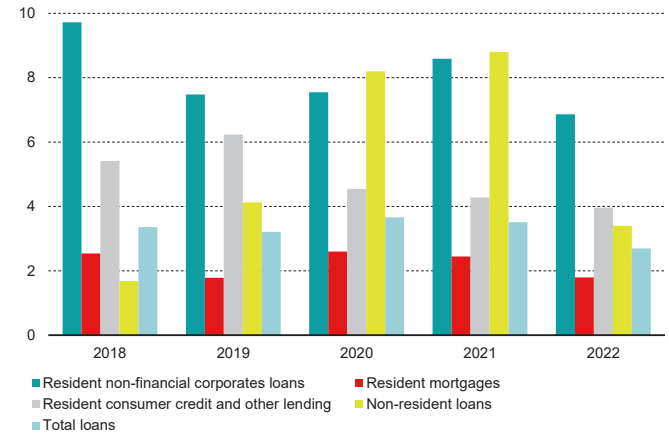
Source: Central Bank of Malta.
Note: A break in series was reported in May 2017 with regards to household consumer credit and other lending due to a reclassification exercise.

Chart 2.6
RESIDENT LOANS BY NACE – CORE DOMESTIC BANKS
(per cent)



Source: Central Bank of Malta.

Chart 2.7
NPL RATIOS – CORE DOMESTIC BANKS
(per cent)



Source: Central Bank of Malta.

[3] The NPL ratio stood above the EU banks' average NPL ratio of 1.8%. Source: EBA Risk Dashboard Q4 2022.

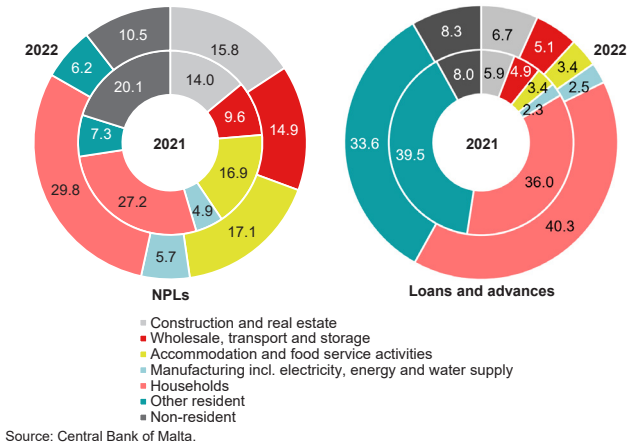
accommodation and food services. As a result, the resident NPL ratio declined by 0.4 percentage point to 2.6% in 2022, while the resident NFC NPL ratio fell by 1.7 percentage points to 6.9% by end-2022. In addition, resident households NPLs contracted by 18.4%, on account of improvements in both mortgages and consumer loans, with the resident household NPL ratio declining by 0.7 percentage point to 2.0%. Concurrently, non-resident NPLs dropped considerably mainly driven by NFCs and other financial intermediaries (OFIs), leading to the share of non-resident NPLs to drop by 9.6 percentage points to 10.5% of overall NPLs (see Chart 2.8). As a result, the non-resident NPL ratio improved by 5.4 percentage points to 3.4% in 2022.

Loans and provisions

Loans classified as Stage 2 and 3 declined by 5.4% and 22.2%, respectively, to account for 8.9% and 3.7% of the overall loan portfolio (see Chart 2.9). This was met with higher Stage 1 loans, to represent over 87% of outstanding loans, thus reflecting a better outlook for credit risk, with a lower share for both non-performing and underperforming loans. Such developments contributed to a drop in overall provisions of over 20%, driven by lower Stage 3 provisions, which however still accounted for around 70% of the total provisions.[4] Stage 1 provisions also dropped, down by over a quarter, to represent less than 15% of the overall provisions. While Stage 2 provisions fell by 13.4%, their share still rose to 15.6%.

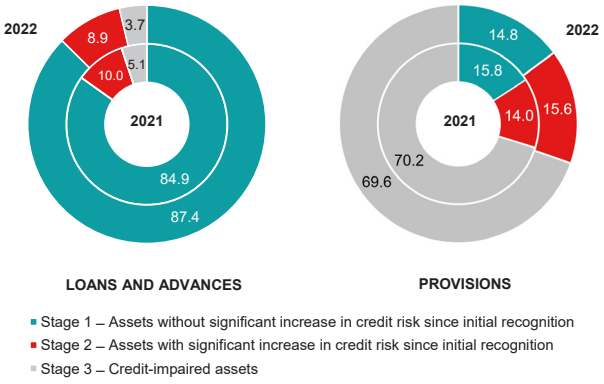
The overall coverage ratio increased to 50.3% in December 2022, from 47.0% a year earlier (see Chart 2.10). Such higher coverage was also supported by collateral backing NPLs, which stood at around 54%

Chart 2.8
SECTORAL ALLOCATION OF LOANS AND ADVANCES AND NPLs – CORE DOMESTIC BANKS
(per cent)



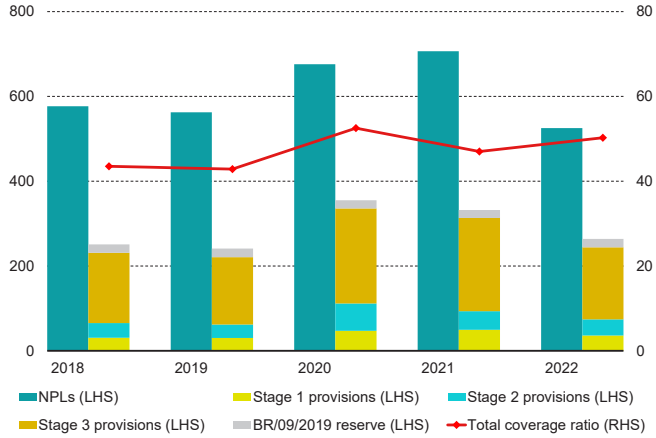
Source: Central Bank of Malta.

Chart 2.9
STAGE ALLOCATION OF LOANS AND ADVANCES AND PROVISIONS – CORE DOMESTIC BANKS
(per cent)



Source: Central Bank of Malta.

Chart 2.10
COVERAGE RATIO – CORE DOMESTIC BANKS
(EUR millions; per cent)

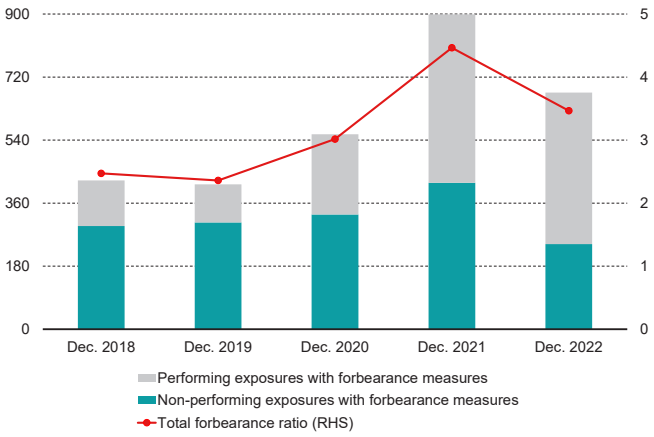


Source: Central Bank of Malta.

[4] Stage 1 provisions reflect provisions for loans without significant increase in credit risk, provisions for Stage 2 loans are those which have increased credit risk but not classified as non-performing, and provisions for Stage 3 loans represent NPLs.

of NPLs, resulting in full coverage of NPLs. The cost-of-risk (COR), defined as the change in allowances and provisions as a share of loans subject to impairments, narrowed to 0.2% in 2022 from 0.3% in 2021 and remained below the average of 0.5% for EU banks, implying lower costs for the core domestic banks to generate provisions.[5]

Chart 2.11
FORBORNE LOAN EXPOSURES – CORE DOMESTIC BANKS
(EUR millions; per cent)



Source: Central Bank of Malta.

Loan exposures with forbearance measures

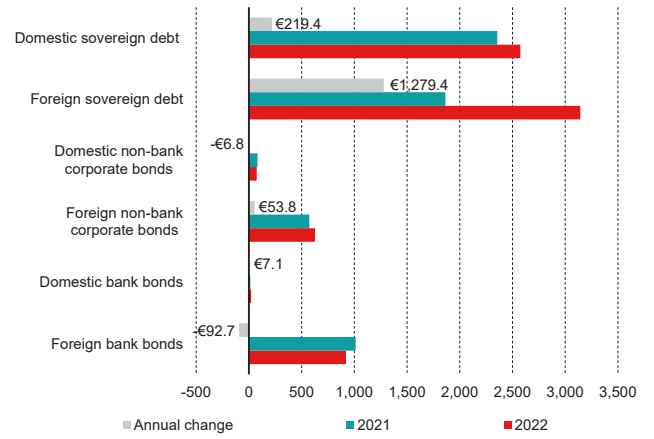
Forborne loan exposures fell by around a quarter, with the forbearance ratio dropping to 3.5%, from 4.5% a year earlier (see Chart 2.11). Such a drop stemmed largely from non-performing forborne loans, down by over two-fifths to account for just 36.0% of loans with forbearance measures. Performing forborne loans also decreased, but at a less pronounced rate of around 10%, and as a result their share rose to 64.0% of the overall forborne loans. While this shows enhanced asset quality, the ratio remained higher than in pre-pandemic times, owing to the conditions made to certain performing loans following the expiration of moratoria. In this regard, the core domestic banks need to continue with their rigorous monitoring of such forborne loans amid global adverse macroeconomic developments, which could potentially challenge borrowers' affordability.

The securities portfolios

The securities portfolios of these banks expanded by around 22% to reach €7.8 billion, or just over a quarter of total assets. Such growth was entirely driven by holdings of bonds, up by a quarter, as otherwise equity holdings fell to just 5.5% of the securities portfolio.

The increase in the banks' debt securities holdings was driven by higher sovereign bonds, which rose by over a third, taking advantage of the higher government bond yields, enabling them to diversify their income sources (see Chart 2.12). This was mainly driven by euro area sovereign bonds, which led to holdings of foreign government bonds to account for the larger share of the portfolios, while Malta Government Stocks (MGS) holdings accounted for just over a third. Holdings of corporate bonds remained largely unchanged. Despite the increased concentration in sovereign holdings, these banks mostly hold securities in countries rated A- or better, thus

Chart 2.12
BOND PORTFOLIO – CORE DOMESTIC BANKS
(EUR millions)



Source: Central Bank of Malta.

[5] Source: EBA Risk Dashboard Q4 2022.

contributing to the overall holdings of high and medium rated bonds to remain significant at around 91% of these banks' bond portfolios (see Chart 2.13).

2.1.4 Funding and liquidity

Eurosystem and wholesale funding

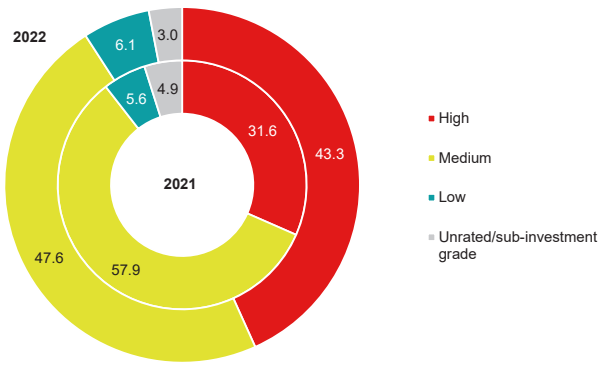
The monetary policy normalisation has tightened funding conditions, slowly ending cheap funding from the Eurosystem. The TLTROs were recalibrated, while market funding costs also increased due to the higher interest rates.[6] In line with these developments, Eurosystem funding by these banks dropped by €519 million by end 2022, to just €10 million, mainly reflecting the early repayment of TLTROs (see Chart 2.14). Similarly, interbank funding contracted by just over €200 million, accounting for less than 1% of total liabilities. During the year, these banks issued €365 million worth of debt securities largely to comply with the minimum requirements for own funds and eligible liabilities (MREL) requirements. This is expected to increase funding costs, albeit to a limited extent, as debt securities issued still accounted for just 2.2% of the overall balance sheet.

Customer deposits

The core domestic banks had to compete with the increasing sovereign and corporate yields to sustain their growth, reflected in marginal increases in interest rates on some retail term deposits. Indeed, following a gradual slowdown during the first three quarters of the year, customer deposits dropped slightly in the last quarter. Still on an annual basis, customer deposits grew by 4.8% (see Chart 2.15).

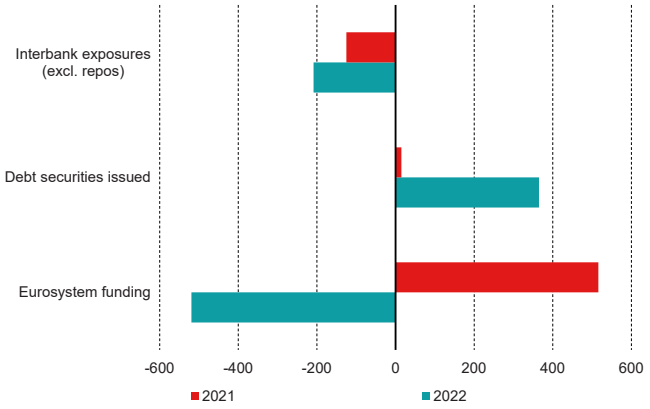
Despite the slowdown, overall customer deposits remained the primary funding source for these

Chart 2.13
BOND HOLDINGS BY RATING – CORE DOMESTIC BANKS
(per cent)



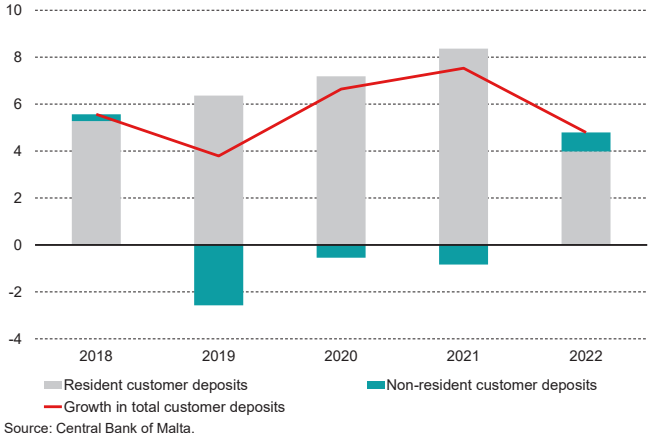
Source: Central Bank of Malta.
Note: Investment-grade bonds carrying a rating of AA- or above are regarded as 'high-rated bonds'. 'Medium-rated bonds' are those rated between A- and A+, whereas 'low-rated bonds' are those rated between BBB- and BBB+. Sub-investment grade bonds are rated lower than BBB-.

Chart 2.14
DEVELOPMENTS IN NON-RETAIL FUNDING – CORE DOMESTIC BANKS
(EUR millions; annual changes)



Source: Central Bank of Malta.

Chart 2.15
CONTRIBUTION TO GROWTH IN CUSTOMER DEPOSITS – CORE DOMESTIC BANKS
(percentage points; per cent)



Source: Central Bank of Malta.

[6] In October 2022, the ECB recalibrated the outstanding TLTROs so that their interest rate would be indexed to average applicable key ECB interest rates. Also, this is accompanied by three additional voluntary early repayment dates introduced for banks wishing to terminate or reduce borrowings before maturity.

banks, financing around 84% of total assets, up by 1.8 percentage points over the previous year, on account of the lower wholesale and Eurosystem funding (see Chart 2.16). These banks continued to source their deposits primarily from resident households, which in 2022 made up around two-thirds of deposits. At the same time, deposits from resident firms also increased, driven primarily by corporates operating in the wholesale and retail trade sector, to reach 14.2% of total deposits. Meanwhile, the contraction in non-resident customer deposits reported since 2019 was reversed, on the back of higher deposits by non-resident financial institutions, albeit non-resident customer deposits represented only about 7.5% of total retail funding.

Liquidity

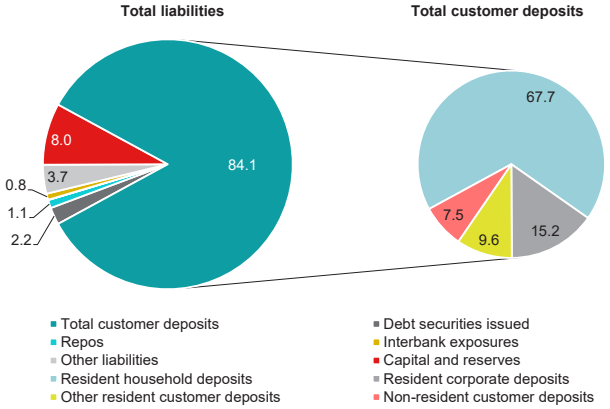
The liquidity position of this group of banks remained very healthy, as the lower reserves with the central bank were compensated for by higher central government assets, and other high-quality liquid assets (HQLA) such as exposures with multilateral development banks and international organisations' assets (see Chart 2.17). This, in conjunction with lower net liquidity outflows, led to the LCR to edge higher to 363% in 2022. The NSFR also strengthened by 12.8 percentage points, to 186.8%. Despite the tighter funding conditions, the customer loans-to-deposits ratio increased by 0.9 percentage point to 56.0%, which is markedly lower than the euro area banks' average of 108.1%.[7]

2.1.5 Capital and leverage

Total own funds decreased marginally by 0.1%, as the lower Tier 1 capital was almost entirely replaced by Tier 2 capital, reflecting higher intra-group subordinated loans (see Chart 2.18). As

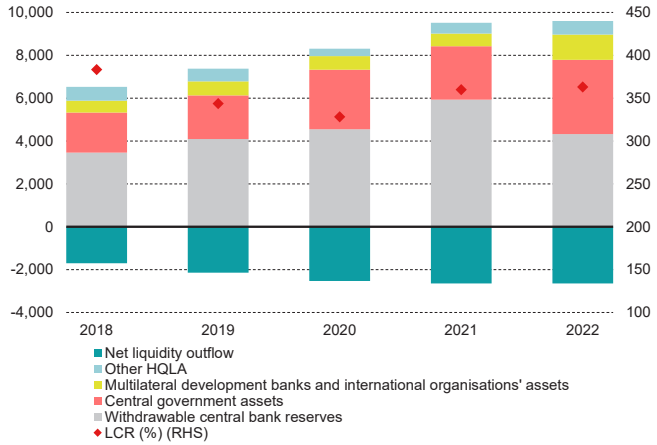
[7] Source: EBA risk dashboard 2022Q4.

Chart 2.16
BANKS' LIABILITIES COMPONENTS – CORE DOMESTIC BANKS (2022)
(per cent)



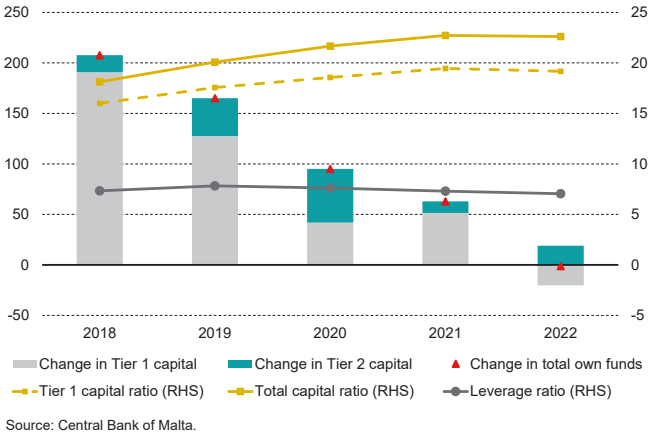
Source: Central Bank of Malta.
Note: Total customer deposits pie chart represents the 84.1% in the total liabilites pie chart. This adds up to 100%.

Chart 2.17
LIQUIDITY COVERAGE RATIO – CORE DOMESTIC BANKS
(EUR millions; per cent)



Source: Central Bank of Malta.

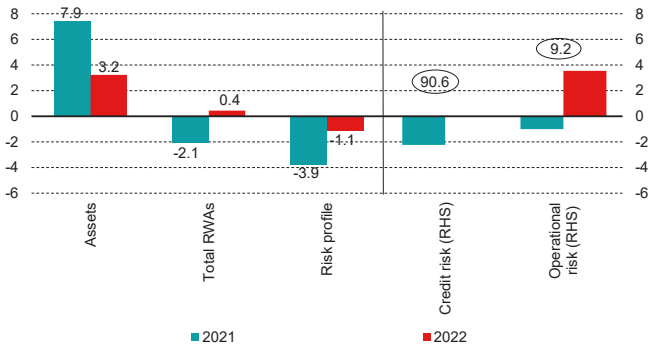
Chart 2.18
CHANGE IN TOTAL OWN FUNDS, CAPITAL AND LEVERAGE RATIOS – CORE DOMESTIC BANKS
(EUR millions; per cent)



Source: Central Bank of Malta.

total risk exposures rose by 0.4%, the total capital ratio declined marginally by 0.1 percentage point, to 22.6%. The primary increase in total risk exposures emanated from operational risk to account for 9.2% of total risk exposures, mainly reflecting the one-off litigation cost incurred during the first half of the year, as otherwise credit risk exposures remained broadly stable, and at just over 90% represented the largest share of total risk exposures (see Chart 2.19). The risk profile of these banks improved slightly, as the muted increase in total risk exposure was outpaced by a faster increase in their overall assets. Indeed, the ratio of total risk exposures in total assets reached 38.0%, the lowest point in recent years. Meanwhile, the leverage ratio declined by 0.3 percentage point to 7.0%, albeit remaining well-above the minimum regulatory threshold of 3%.

Chart 2.19
GROWTH IN ASSETS AND TOTAL RISK EXPOSURE – CORE DOMESTIC BANKS
(per cent)



Source: Central Bank of Malta.
Note: Asset growth figures within the chart are obtained from FINREP returns, differing slightly from the BR/06 Statutory Financial Information on which balance sheet developments is based. Percentages in circles represent the share of total risk exposure in 2022. Other percentages refer to the annual growth rate.

2.1.6 Risk outlook

Core domestic banks managed to weather the current uncertain global macroeconomic environment. They managed to register a recovery in their profitability, partly on the back of the rapid credit growth as mortgages kept growing strongly while lending to corporates recovered from the previous lows. However, the latter was mainly driven by the real estate sector, increasing the dominance of property-related loans in these banks' loan book. As a result, caution is warranted, to ensure that going forward credit growth remains healthy and diversified. In light of this, the introduction of an sSyRB on RRE domestic mortgages in 2023 aims to lock-in existing capital while complementing the existing BBMs, ensuring that banks adopt prudent lending practices when granting new loans, without taking undue risks that are not commensurate with their risk profile.

On the funding side, core domestic banks should expect higher funding costs due to the higher interest rate environment, which drove bonds yields higher. Nevertheless, their liquidity position is very healthy and remained buttressed by an ongoing inflow of customer deposits. Despite their strong capital position and benign asset quality, these banks should remain vigilant, given the uncertain macroeconomic environment and the likelihood of further interest rate increases going forward.

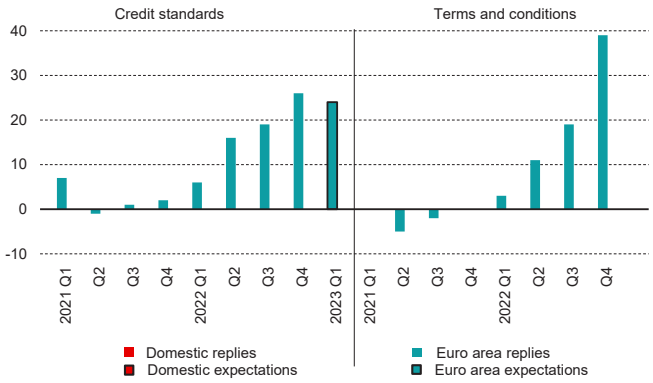
BOX 2: BANK LENDING SURVEY RESULTS[1]

The aim of this boxed article is to provide a summary of the replies to the BLS by the participating banks during the 2022 survey rounds. The BLS was distributed to a sample of around 150 banks across the euro area, including four banks in Malta which captured about 92% of the overall domestic bank credit.[2] The BLS is conducted on a quarterly basis to monitor developments in the lending policies and credit demand of enterprises and households, as well as their expectations.[3] The survey also contained a number of ad hoc questions related to funding conditions and the effect of monetary policy decisions, and new regulatory and supervisory actions on lending standards.

Loans to enterprises

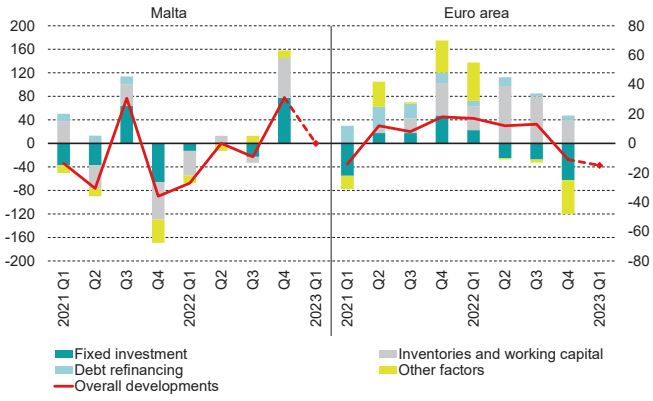
Over the past couple of years, on balance, domestic credit standards and terms and conditions for new loans to enterprises remained stable, but a few banks reported tighter loan-to-value (LTV) towards the CRE sector in the second half of 2022 (see Chart 1). Notwithstanding, net demand for domestic corporate loans improved somewhat in 2022. During the first three quarters of the year, demand declined owing to lower financing needs for inventories and working capital requirements, as well as for fixed investment in the CRE sector, services, and manufacturing, particularly in the energy-intensive firms. However, demand picked up momentum in the last quarter of the year, driven by the wholesale and retail trade sector (see Chart 2). In contrast, euro area banks reported stronger net tightening of corporate credit standards and terms and conditions across all main economic sectors. This was the result of higher risk perceptions and lower risk tolerance due to the weaker

Chart 1
CORPORATE CREDIT STANDARDS, AND TERMS AND CONDITIONS
(+ indicates net tightening/- indicates net easing)



Sources: ECB; Central Bank of Malta calculations.
Note: Given domestic replies indicate no change in lending standards, no domestic developments are visible in the chart.

Chart 2
CORPORATE CREDIT DEMAND
(+ indicates increase/ - indicates decrease)



Sources: ECB; Central Bank of Malta calculations.
Note: Domestic and euro area developments are plotted on the left and right axis, respectively. Stacked columns show the factors impacting corporate credit demand. Markers plotted on 2023Q1 refer to expectations.

[1] This Box was prepared by Christian Mamo, a Principal Economist, and Shaun Zaffarese, a Financial Analyst, within the Financial Stability Surveillance Office of the Central Bank of Malta.
[2] The BLS data for all euro area countries are published on the ECB's SDW.
[3] Lending policies include credit standards and terms and conditions. Credit standards refer to the bank's internal guidelines or loan approval criteria, established prior to the actual loan negotiation. These specify the required borrower characteristics such as income levels, age, and employment status which banks consider in their credit scoring methods. Credit terms and conditions refer to the conditions of a loan that a bank is willing to grant, namely the interest rate, loan size, fees, collateral requirements, maturity terms and other conditions.

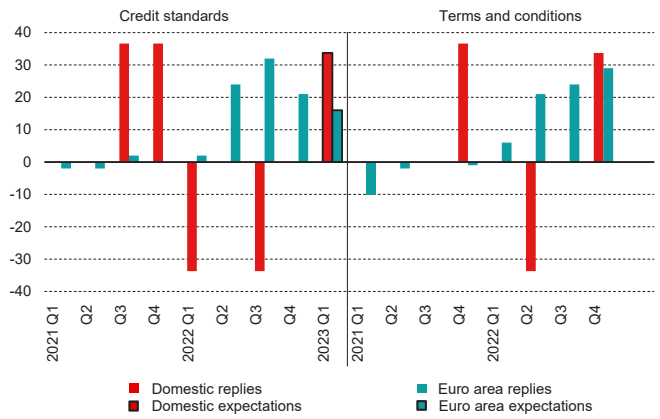
macroeconomic and financial conditions triggered by the war in Ukraine, coupled with industry and firm-specific factors. Consequently, margins on both average and riskier loans widened, while collateral requirements rose. Notwithstanding, euro area banks reported a marginal pick-up in demand for corporate loans in the first nine months of 2022, reflecting higher financing needs for inventories and working capital across all main economic sectors. As lending policies tightened further, demand fell, turning negative in the last quarter of the year, and was expected to decline further in the first quarter of 2023, as credit standards tighten further.

Loans to households for house purchase

Following the net tightening in 2021, sustained competitive pressures led domestic banks to ease their credit standards for mortgages in 2022, following the lifting of the remaining pandemic-related measures (see Chart 3). On balance, the terms and conditions on mortgages remained stable, as margins at first were narrowed due to increased competitive pressures but were later tightened as interest rates started to rise. According to survey respondents, net domestic demand for mortgages recovered in the first quarter of 2022 reflecting improved consumer confidence and remained stable for the rest of year. Surveyed banks expected mortgage demand to remain stable even in the first quarter of 2023 (see Chart 4).

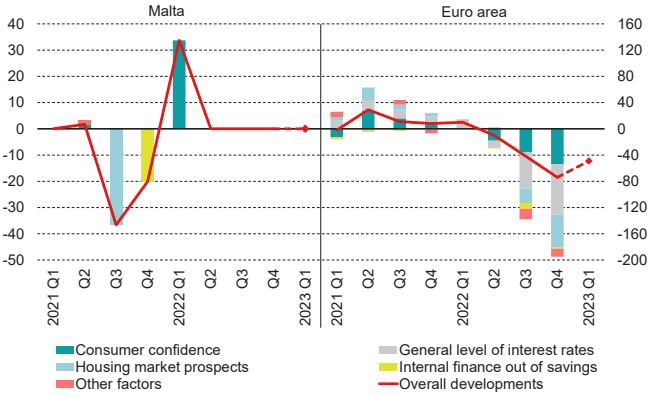
In the euro area, banks tightened mortgages' credit standards and terms and conditions, largely reflecting an adverse economic environment and deteriorating housing market prospects, higher risk perceptions, and rising funding costs. As a result, mortgage demand declined strongly, particularly in the second half of the year, with the drop in the last quarter being the largest ever reported in the BLS. This net tightening was expected to persist in the first quarter of 2023, amid further increases in key policy rates and a worsening in consumer confidence, with expectations that mortgage demand was going to fall further.

Chart 3
MORTGAGE CREDIT STANDARDS, AND TERMS AND CONDITIONS
(+ indicates net tightening/- indicates net easing)



Sources: ECB; Central Bank of Malta calculations.

Chart 4
MORTGAGE CREDIT DEMAND
(+ indicates increase/ - indicates decrease)

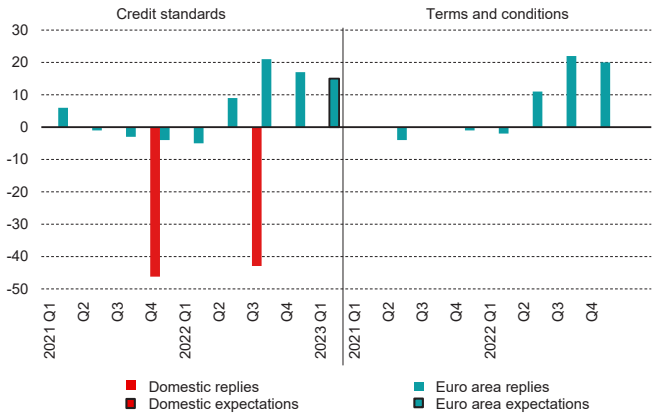


Sources: ECB; Central Bank of Malta calculations.
Note: Domestic and euro area developments are plotted on the left and right axis, respectively. Stacked columns show the factors impacting corporate credit demand. Markers plotted on 2023Q1 refer to expectations.

Consumer credit and other lending to households

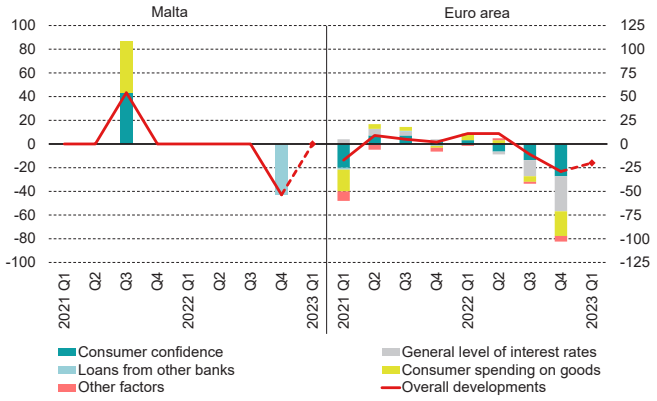
For the second consecutive year, domestic respondents eased credit standards for consumer lending as the remaining covid-related restrictions were lifted (see Chart 5). On the other hand, terms and conditions remained unchanged throughout the past couple of years. Yet, demand for consumer credit remained largely stable until the third quarter of 2022 but dropped in the last quarter reflecting higher competitive pressures from other banks (see Chart 6).

Chart 5
CONSUMER CREDIT STANDARDS, AND TERMS AND CONDITIONS
(+ indicates net tightening/- indicates net easing)



Sources: ECB; Central Bank of Malta calculations.

Chart 6
CONSUMER CREDIT DEMAND
(+ indicates increase/ - indicates decrease)



Sources: ECB; Central Bank of Malta calculations.
Note: Domestic and euro area developments are plotted on the left and right axis, respectively. Stacked columns show the factors impacting corporate credit demand. Markers plotted on 2023Q1 refer to expectations.

In contrast, euro area banks reported an overall net tightening in both credit standards and terms and conditions, reflecting the perceived deterioration in the general economic activity, worsened borrower creditworthiness, and increased cost of funds and risk perceptions. Up until the first half of 2022, demand for consumer credit rose marginally, mainly to satisfy the higher spending on durable consumer goods. However, as lending policies tightened, and interest rates started to rise, consumer confidence deteriorated, which affected consumer spending. This was expected to persist in the first quarter of 2023 as euro area banks anticipated continued net tightening of consumer credit standards.

Ad hoc questions

While during 2022 domestic BLS banks did not report any material changes in their wholesale funding, some minor developments were reported in terms of retail funding. One bank continued to strategically focus on short-term deposits, resulting in lower fixed-term deposits. Other respondents noted the more challenging environment in accessing retail funding particularly in the latter half of the year, on the back of the uncertain economic environment driven by the high level of inflation and the corresponding higher fixed-income yields. Consequently, following the ECB's interest rate hikes, some banks raised interest rates on term deposits in a bid to attract more retail funding. Going forward, such developments are expected to persist amidst the uncertain external macroeconomic environment and increasing interest

rates. Euro area banks also reported a similar deterioration in their access to money markets and retail funding.

During the first half of 2022, the ECB's APP continued to affect some domestic banks both on their overall assets, mainly through the lower holdings of sovereign bonds, and the consequent effect on their profitability levels through lower NII. However, once the APP was discontinued as from July 2022, domestic BLS banks found the opportunity to add to their holdings of sovereign bonds, and thus increase their NII from securities. Meanwhile, euro area banks reported that during the first half of the year the APP contributed to increased liquidity, access to market financing, and higher lending for house purchases and corporates. However, as the scaling down of monetary policy accommodation took place, their financial position deteriorated, having a major negative impact on their market financing conditions, liquidity position and slightly on their profitability. They also expected that the end of the APP would bring with it a limited tightening impact on their terms and conditions across all loan categories, which was expected to be translated into lower lending volumes for mortgages during the first half of 2023.

Until July 2022, the negative deposit facility rate adversely impacted the profitability of both the domestic and euro area participant banks owing to lower NII received, which was partly offset by the two-tier system for remunerating excess liquidity holdings.[4]

Domestic participant banks did not participate in TLTRO III operations during 2022, with outstanding amounts repaid early by end 2022, reflecting their abundant liquidity. Meanwhile, euro area banks made much lower use compared to previous operations. Given the discontinuation and early repayment options for TLTROs, euro area banks expected the overall financial and lending conditions to be less favourable, following the gradual monetary policy tightening.

While domestic respondents reported no material impact of the NPL ratio on banks' lending policy, euro area banks reported some small net tightening on credit standards for loans to corporates during the first half of the year, reflecting increased risk perceptions and capital-related funding costs.

Surveyed banks were also asked on the impact of new regulatory and supervisory actions on their total assets and capital position. As some domestic banks actively expanded their balance sheet, they increased their capital base to continue meeting their minimum capital requirements and maintain adequate management buffers, in order to be in a position to address non-performing exposures (NPEs) in line with the recent Banking Rule (BR) 09 update and the general increase in risk weighted assets in view of the upcoming CRR II regulation implementation. These developments are expected to continue in 2023. In addition, some other banks tightened credit margins following the implementation of higher regulatory capital buffers. In the euro area, banks reported an increase in their capital to reflect the new regulatory or supervisory requirements, with banks also tightening their credit standards across all loan categories.

Conclusion

The BLS replies for 2022 and the banks' expectations for early 2023, were very much dominated by the uncertain macroeconomic environment coupled with tighter financial conditions. Nevertheless, domestically, although overall lending standards for corporates were stable throughout 2022, the ad hoc questions highlighted some offsetting factors. Specifically, the availability of funds from previous TLTRO operations allowed banks to apply more flexible credit standards and terms and conditions across all the main economic sectors but tightened somewhat the terms and conditions for CRE loans in the second half of 2022. Notwithstanding the generally stable lending standards, demand for corporate loans

[4] The ECB's two-tier system for reserve remuneration exempts part of credit institutions' liquidity holdings in excess of minimum reserve requirements from negative remuneration at the annual rate of 0%.

declined in the first three quarters of 2022 mainly for CRE, the services sectors and manufacturing, particularly the energy-intensive firms, but recovered significantly during the last quarter of the year, especially in the wholesale and retail trade sector.

With regards to household lending, while on balance terms and conditions remained stable both for mortgages and consumer credit, credit standards for these two loan categories were eased as the pandemic-related tightening was lifted. This was corroborated with a higher demand for mortgages in the first quarter of 2022, while increased competition resulted in the demand for consumer credit to abate for some banks.

On the funding side, domestic banks did not report any significant changes in their usual sources of wholesale funding, albeit retail funding became more challenging and costlier owing to the tighter financial conditions which led some banks to increase, albeit marginally, interest rates on time deposits. Meanwhile, although domestic banks did not participate in the most recent TLTRO III, some still benefited from previous liquidity-providing operations that enabled them to improve their profitability.

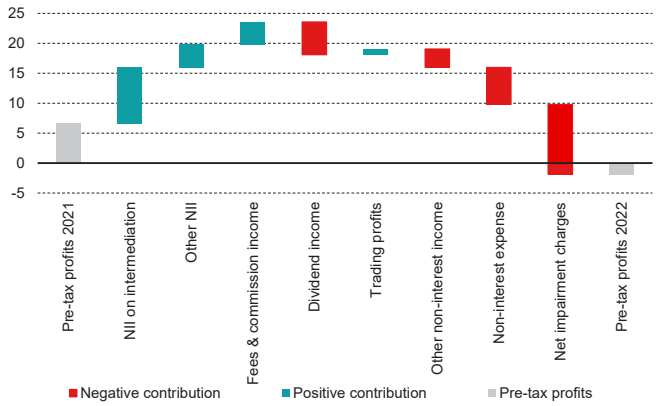
2.2 Non-core domestic banks

Despite the challenging external macroeconomic environment, the non-core domestic banks managed to sustain their growth strategies, albeit at a slower rate, as their balance sheet expanded by 1.3%, to account for around 20% of GDP. While their business activities remained predominately focused on non-residents, business with residents increased over the year, mainly driven by higher resident lending. At the same time, whilst accounting for more than 43% of resident assets, placements with the Central Bank of Malta declined by around 14%. These banks increasingly sought to expand further their business through factoring and forfaiting to increase revenue-generation streams. Their preferred funding source remained customer deposits, particularly from non-residents, though other funding sources also remained important.

2.2.1 Profitability

On aggregate, non-core domestic banks reported losses in 2022, with the post-tax ROE and ROA standing at -0.7% and -0.1%, respectively. Akin to the developments reported during the first year of the pandemic, the drop in profits was mostly due to higher impairment charges, which rose threefold in 2022 compared to 2021 (see Chart 2.20). This reflected lower recoveries and reversals, as otherwise write downs decreased at a much lower extent. Profits were also heavily impacted by an 11.6% increase in operational costs, largely owing to higher staff and administrative expenses. Such higher costs diluted the increase in NII, which rose by almost 51% over the year, to account for more than half of the gross income generated in 2022. This, in part, reflected higher earnings on placements held with the Central Bank of Malta, as the deposit facility rate turned positive and increased rapidly. In addition, higher interest income was generated from the loan portfolio, largely from corporate loans, as the market rates against which some of these loans were pegged, rose during the year. At the same time, these banks recorded higher interest generated from their securities portfolios. However, the ECB's hike in interest rates also placed a dent on these banks' funding costs since deposits became more expensive by the end of 2022.

Chart 2.20
MAIN CONTRIBUTORS TO PROFITS – NON-CORE DOMESTIC BANKS
(EUR millions)



Source: Central Bank of Malta.
Note: Grey bars indicate pre-tax profits in absolute amounts. Positive contributions to profit are marked in teal while negative contributions are marked in red.

Income generated from non-interest-bearing activities contracted by around 10%, mainly reflecting lower dividend income received from investments, which may be attributable to adverse financial market developments. While insufficient to overcome such drops, fees and commissions expanded by around 20% to represent almost two-thirds of non-interest income. Trading profits also rose during the period under review. Despite the overall increase in operating costs, and the drop in non-interest income, the increase in NII was enough to contribute to a slight improvement in the non-core domestic banks' cost-to-income ratio, which nonetheless remained elevated at 80.4%.

2.2.2 Credit dynamics

The overall loan book of these banks expanded by almost 15%, mostly reflecting loans to residents, which rose further by 36%. As a result, the share of resident lending on overall customer loans went up by 6.9 percentage points to almost 39%, primarily fuelled by higher corporate lending, which increased by around 41% over the year. This largely reflected companies operating in the real estate sector, which now represent almost 31% of the non-core domestic banks' overall resident loan book (see Chart 2.21). Credit to Maltese households also gained momentum, largely driven by the participation of one bank in the

domestic mortgage market, which however accounted for just 2.3% of the non-core domestic banks' overall resident customer loans.

Growth in loans to non-residents remained anaemic, up by just 0.4%. While lending to foreign financial and insurance companies rose by around 7% to account for more than half of overall non-resident customer lending, lower loans were granted to foreign NFC, especially those operating in the real estate sector (see Chart 2.22). Notwithstanding, non-resident NFC lending still accounted for more than 45% of outstanding non-resident customer loans. While loans to foreign households rose, these remained insignificant.

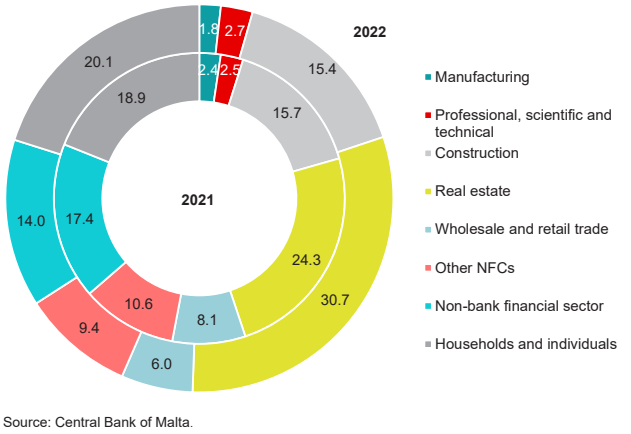
2.2.3 Asset quality

The loan portfolio

Despite the geopolitical and external macroeconomic uncertainties, the NPL ratio of the non-core domestic banks declined by 0.9 percentage point to 4.2% in December 2022, reflecting a shrinking of almost 18% in the stock of NPLs. Such a drop is largely owed to a write-off of debt of foreign companies operating in the wholesale and retail trade and, to a lower extent, the construction sector. Resident corporate NPLs also declined, though at a lower extent. These developments resulted in the overall NFC NPL ratio to drop by 4.0 percentage points to 12.4% by end 2022. Otherwise, despite increasing, household NPLs continue to represent an insignificant amount of overall NPLs.

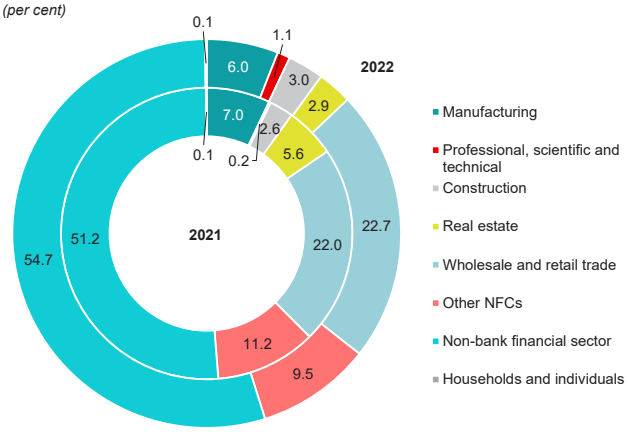
The loan portfolio of these banks registered a decline in distressed loans classified as Stages 2 and 3, which led to their share in the loan portfolio to shrink to 5.1% and 6.0%, respectively (see Chart 2.23). Furthermore, the non-core

Chart 2.21
RESIDENT CUSTOMER LOANS BY SECTOR – NON-CORE DOMESTIC BANKS
(per cent)



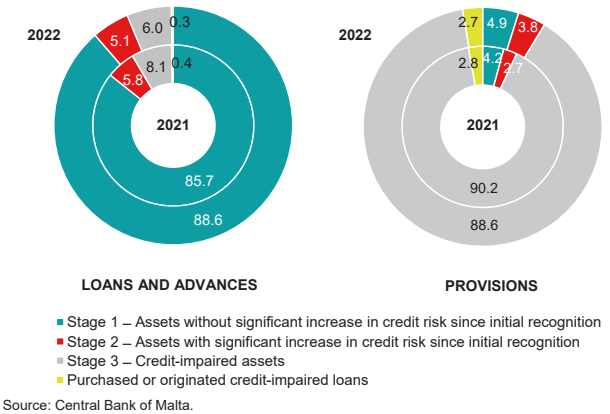
Source: Central Bank of Malta.

Chart 2.22
NON-RESIDENT CUSTOMER LOANS BY SECTOR – NON-CORE DOMESTIC BANKS
(per cent)



Source: Central Bank of Malta.

Chart 2.23
STAGE ALLOCATION OF LOANS AND ADVANCES AND PROVISIONS – NON-CORE DOMESTIC BANKS
(per cent)



Source: Central Bank of Malta.

domestic banks maintained a prudent approach to credit risk, with the coverage ratio improving to 73.1%, after having increased their provisioning levels for both Stage 1 and Stage 2 loans, which were partly offset by a decline in Stage 3 provisions. As a result, their overall provisions rose by just 0.3%.

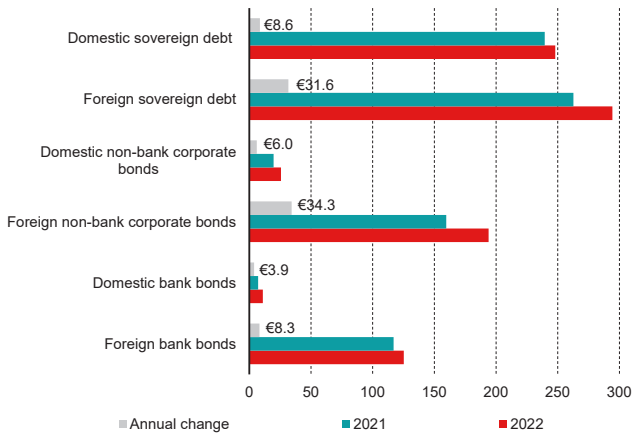
To further complement these banks' sound credit quality, lower forborne loans, both non-performing and performing, were reported throughout the year, which led to the overall forbearance ratio to slightly improve to 0.6%.

The securities portfolio

Amidst the volatile financial market environment, the equity portfolio of these banks decreased by nearly 7%, to represent almost one fifth of total securities. This was primarily attributable to equities of foreign companies, although those of domestic firms also fell to negligible amounts. This was instead partly substituted with increased investments in debt securities, due to their increased attractiveness following the rise in interest rates by major central banks. Non-core domestic banks expanded their bond holdings largely of foreign companies, OFIs, and sovereigns particularly located in Germany, though holdings of MGS also rose to account for 45.7% of all sovereign debt holdings (see Chart 2.24).

The bond portfolio continued to consist primarily of high and medium-rated fixed income securities, despite declining by 4.6% and 7.1%, respectively throughout the year to account for around 26% and 40% of the overall bond portfolio. Otherwise, both low and speculative or unrated bond holdings rose to account for another 9% and 22% of the bond portfolio, up by 5.2 and 6.4 percentage points, respectively. Despite these banks' recourse to riskier investments, the quality of the securities portfolio remained sound, as they did not report any non-performing securities by end 2022.

Chart 2.24
BOND PORTFOLIO – NON-CORE DOMESTIC BANKS
(EUR millions)

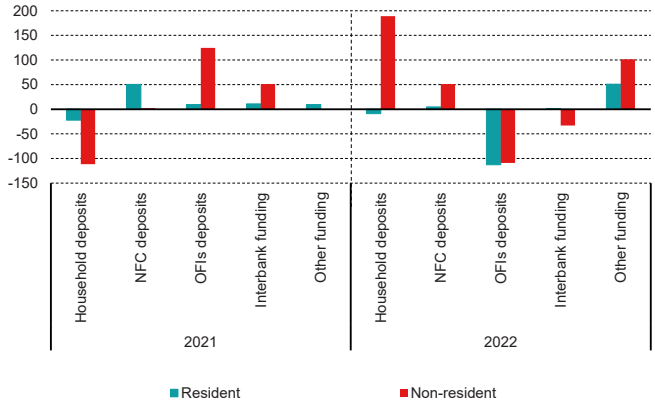


Source: Central Bank of Malta.

2.2.4 Funding and liquidity

These banks' business model continued to rely mostly on funding from customer deposits, which financed around 70% of assets in 2022. Overall customer deposits rose by 7.5%, on the back of higher non-resident deposits which grew by almost 14% (see Chart 2.25). The bulk originated from German households, adding some concentration towards this jurisdiction, largely in term deposits maturing between two and three years. Otherwise, resident customer deposits, mostly from OFIs, contracted by 12% to account for nearly 20% of

Chart 2.25
GROWTH IN SELECTED SOURCES OF FUNDING – NON-CORE DOMESTIC BANKS
(EUR millions)



Source: Central Bank of Malta.

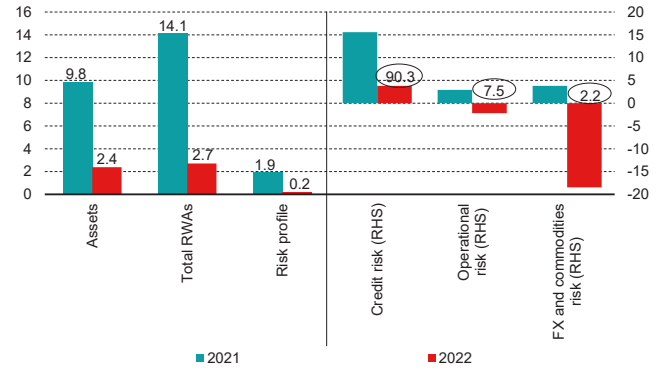
total customer deposits. This influenced the share of term deposits, which ended up accounting for more than half the deposits by the end of 2022, compared to 48.0% a year earlier, thus further reducing roll over risk.

Non-core domestic banks' funding through debt securities remained negligible. At the same time, owing to the tighter financial conditions, interbank funding activity, especially from related credit institutions, retracted by around one fifth in 2022. This was mostly replaced with Eurosystem funding, largely reflecting funding through USD operations, although other liquidity providing operations were also tapped, which by the end of the year funded almost 7% of their assets. In case of immediate liquidity needs, the non-core domestic banks could rely on additional Eurosystem funding given that around two-thirds of their Eurosystem eligible securities, representing 10.9% of their assets, remained unutilised. Lower withdrawable central bank reserves contributed to a 6.0% drop in liquid assets. Concurrently, these banks reported higher net liquidity outflows associated with non-operational deposits. Despite the resulting drop in the LCR, it remained at a robust 325.6%. The NSFR also sufficiently exceeded regulatory minima, at 179.6%.

2.2.5 Capital and leverage

The capital position remained healthy, as the total capital ratio increased by a marginal 0.2 percentage point to 20.5% as at end 2022. Total own funds increased, driven by the bond issuance of one bank, as otherwise Tier 1 capital declined marginally. This led to the Tier 1 capital ratio to narrow by 0.6 percentage point to 19.5%. RWAs also increased, mirroring the expansion reported in these banks' credit portfolio. As a result, despite growing at a slower pace compared to 2021, RWAs from credit risk exposures grew by 3.8%, to continue to constitute by far the largest part of overall RWAs, accounting for 90.3% (see Chart 2.26). RWAs from operational risk followed, with a 7.5% share in the overall RWAs, despite contracting marginally. Meanwhile, the leverage ratio declined by 0.3 percentage point to 9.7%, still significantly exceeding the 3% minima required, reflecting increases in corresponding assets.

Chart 2.26
GROWTH IN ASSETS AND TOTAL RISK EXPOSURE – NON-CORE DOMESTIC BANKS
(per cent)



Source: Central Bank of Malta.
Note: Asset growth figures are obtained from FINREP returns, differing slightly from the BR/06 Statutory Financial Information on which balance sheet developments is based. Percentages in circles represent the share of total risk exposure in 2022. Other percentages refer to the annual growth rate.

2.2.6 Risk outlook

The challenges experienced throughout the year by the non-core domestic banks are expected to linger. As a result, it is vital for these banks to continue adapting their risk appetite and addressing underlying structural issues present in their balance sheets. These are particularly crucial for them to mitigate the amplification of adverse financial positions with the expectation of also being better positioned to face potential downside scenarios. The ample liquidity and strong capital ratios, however, continue to provide resilience for them to deal with adverse developments, though a high degree of prudence should be exercised in these banks' provisioning, credit risk management and capital planning policies. Cost pressures, especially arising from the tighter funding conditions, should also continue to be closely monitored to improve profitability in the near-term.

2.3 International banks

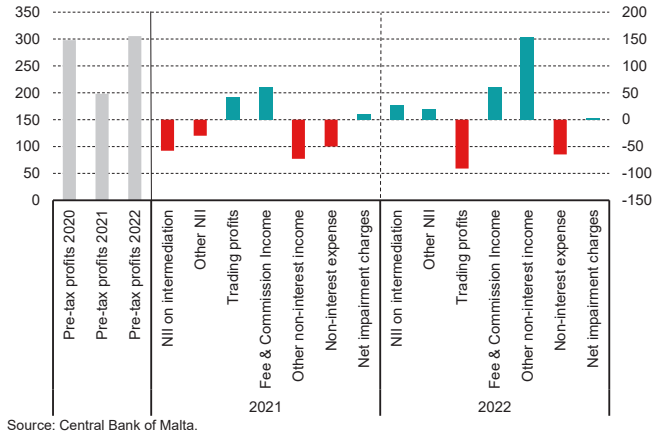
During 2022 a subsidiary of a foreign bank voluntarily surrendered its license bringing the total number of international banks down to nine, of which, five are subsidiaries and stand-alone banks, while the remaining are branches of foreign banks. On aggregate, the balance sheet of international banks contracted by 11.7%

to account for 59.8% of GDP, reflecting the 13.3% decline in the overall assets of the branches of foreign banks, as they continued with the consolidation process embarked in the last few years. Assets of subsidiaries and stand-alone banks also fell, although by a more modest rate of 5.9% over 2021. However, this was exclusively driven by the voluntary closure of the above-mentioned subsidiary, as otherwise the balance sheet of the remaining banks would have expanded by about 11%. The business model of the international banks remained relatively unchanged and oriented towards foreign entities, with the share of resident assets in overall assets decreasing by 2.6 percentage points to 7.3%.

2.3.1 Profitability

The overall profitability of international banks improved substantially in 2022, with pre-tax profits increasing by 54.1%, exclusively due to the positive performance of the branches (see Chart 2.27). As a result, their post-tax ROA rose by almost 2 percentage points to 2.7%. In contrast to the higher profits by branches, net profits before tax earned by the subsidiaries and stand-alone banks fell by more than half, translating into a drop in post-tax ROE and ROA of 5.5 and 2.1 percentage points to 6.1% and 1.8%, respectively.

Chart 2.27
MAIN CONTIBUTORS TO PROFITS – INTERNATIONAL BANKS
(EUR millions)



Source: Central Bank of Malta.
Note: Grey bars indicate pre-tax profits in absolute amounts. Teal (positive) and red (negative) bars indicate yearly contribution to the change in profits.

The overall improvement in profits stemmed from higher operating income, which rose by 28.8%. At the same time, non-interest income increased by 48.0%, resulting in its share in overall gross income to go up to just over a half in 2022. This mainly reflected the gains on foreign exchange dealings by one branch, as the other branches reported lower trading income and fees. In contrast, subsidiaries and stand-alone banks reported a drop in income earned from non-interest-bearing activities predominantly due to trading losses. However, driven by the non-branches, overall fees and commission income rose by more than a quarter, accounting for more than three quarters of the overall non-interest income of international banks.

International banks' NII also rose by 13.8%, mainly owing to higher interest income earned on consumer loans. Income from the securities portfolios also rose by more than one fifth. Non-interest expenses grew by 23.4%, exclusively from the subsidiaries and stand-alone banks, as otherwise operating expenses of branches fell by 15.3% reflecting lower administrative costs. Net impairment charges dropped by 3.1% over a year ago.

The cost-efficiency of the international banks improved, with the cost-to-income ratio dropping by 2 percentage points to 45.2%.

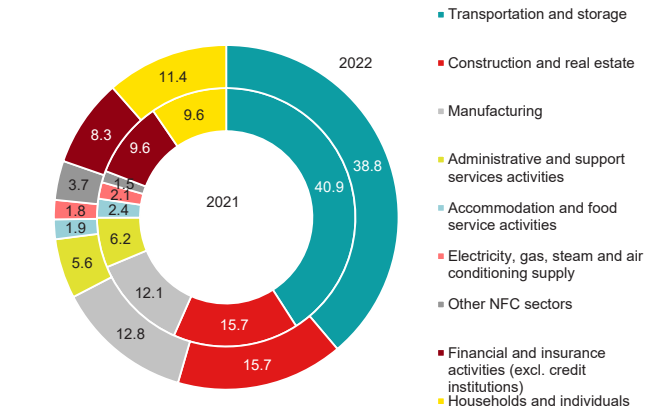
2.3.2 Credit dynamics

The customer loan portfolio of international banks rose marginally, but their share in overall assets rose by 4.9 percentage points to 41.8%. While customer loans issued by the subsidiaries and stand-alone banks rose by 3.9%, mainly due to higher lending towards households and OFIs, the customer loan portfolio of the branches declined by 1.6%, due to lower loans to OFIs. Owing to the latter, the overall share of OFI lending dropped to 8.3% of customer loans (see Chart 2.28). Overall NFC lending continued to represent around four-fifths of the international banks' customer loan books, despite falling marginally by 0.6%, mainly driven by the transportation and storage sector and to a lower extent the real estate sector. In contrast, lending towards the construction and public administration and defence sectors rose. Household loans, largely

consisting of consumer credit, rose by almost 20%, with the share in the overall customer loan portfolio rising by 1.9 percentage points to 11.4%. Resident customer loans declined by 1.6% to account for just 0.3% of the international banks' loan portfolio.

Meanwhile, interbank placements fell by just over a half over 2021, driven predominantly by the branches' balances with unrelated credit institutions. Subsidiaries and stand-alone banks also reported lower placements with related credit institutions, although to a much lower extent. Concurrently, Eurosystem deposits fell by 35.8%, predominantly by the branches of foreign banks.

Chart 2.28
CUSTOMER LOANS BY SECTOR – INTERNATIONAL BANKS
(per cent)



Source: Central Bank of Malta.

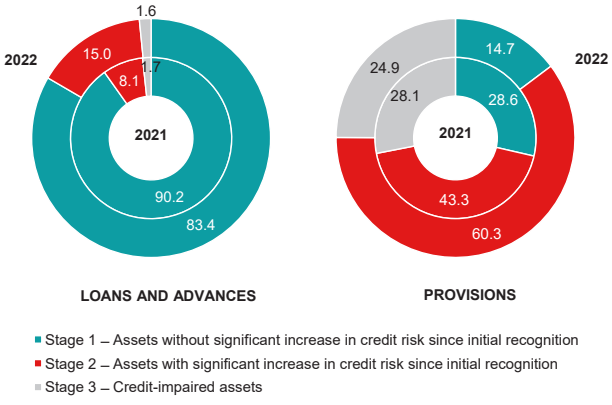
2.3.3 Asset quality

Loan portfolio

During 2022 the outstanding stock of NPLs held by international banks dropped by almost a quarter, predominantly from foreign households, and to a lower extent foreign firms operating in the transportation and storage sector and foreign OFIs. Concurrently, international banks also reported lower forborne loans, as both performing and NPLs with forbearance measures fell by 14.8% and 69.4%, respectively. However, as loans and advances fell, driven by lower placements, the NPL ratio narrowed only marginally to 1.3%, whilst the forborne loans ratio rose to 7.5%.

Reflecting the lower interbank placements, Stage 1 loans fell by almost a fifth but at about 83%, these loans still represented the largest share on the banks' portfolio (see Chart 2.29). Similarly, Stage 3 loans declined to account for just 1.6% of total loans. On the other hand, loans classified as Stage 2 rose by more than 60%, driving up their share to 15% of total loans in 2022 from 8.1% a year earlier. Such increase was however driven largely by third country branches. This led to Stage 2 provisions to increase by more than a third, with their share in total provisions reaching 60.3%. Nevertheless, overall provisions still fell by 3.5% over 2021, driven mainly by lower Stage 1, and to a lower extent Stage 3 provisions. The overall coverage ratio also rose from 147.5% to 187.3% in 2022, as the drop in NPLs outpaced the drop in provisions.

Chart 2.29
STAGE ALLOCATION OF LOANS AND ADVANCES AND PROVISIONS – INTERNATIONAL BANKS
(per cent)

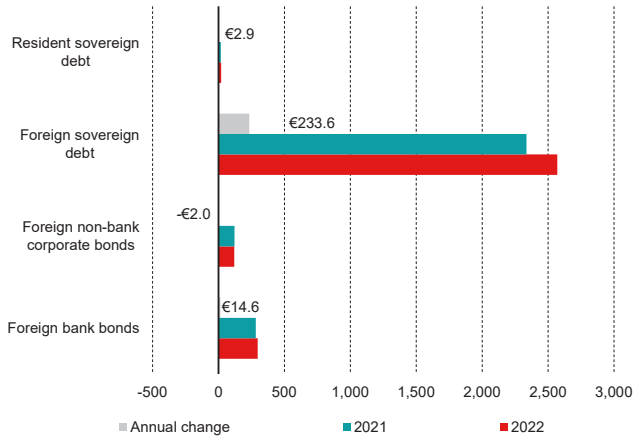


Source: Central Bank of Malta.

Securities portfolio

The securities portfolio of the international banks expanded by 7.6% to 30.8% of these banks' overall assets. The increase was driven by higher bond holdings which rose by 9.0%, driven predominantly by foreign sovereign bonds, largely of the Turkish Government, to account for 85.5% of the overall bond portfolio (see Chart 2.30). Consequently, such bond portfolios were mainly invested in speculative/unrated bonds, with just less than 1% invested in high and medium-rated bonds.

Chart 2.30
BOND PORTFOLIO – INTERNATIONAL BANKS
(EUR millions)



Source: Central Bank of Malta.

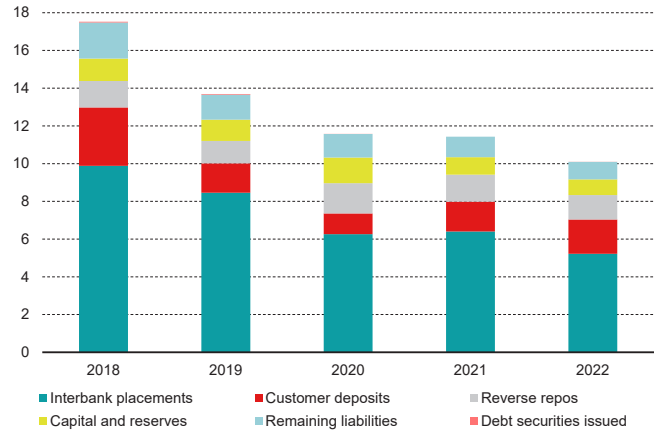
The overall expansion in the bond portfolio stemmed exclusively from the branches, with their overall securities portfolio, which is solely composed of foreign bonds, expanding by 11.8% over 2021. On the other hand, subsidiaries and stand-alone banks reported lower investment bonds, down by 72.5%, as well as less equities which dropped by 23.4%.

2.3.4 Funding and liquidity

The overall funding base of the international banks declined due to lower interbank funding, which fell by 18.5% to account for 51.7% of total liabilities in 2022 (see Chart 2.31). This was attributed predominantly to the branches of foreign banks, largely due to lower placements obtained from their head offices and other related companies. Nonetheless, interbank placements continued to be the main source of funding for such branches, financing 68.2% of their assets. In contrast, subsidiaries and stand-alone banks did not resort to the wholesale market and focused their funding strategy on customer deposits.

Overall, customer deposits held by the international banks rose by 15.0% to finance 18.0% of their assets, up from 13.8% in 2021. Both the branches as well as the subsidiaries and stand-alone banks reported higher inflows. Nonetheless, the increase for branches stemmed from a relatively low base, to finance just 4.4% of their assets, and accounting for only 18.3% of the overall customer deposits held by international banks. In contrast, customer deposits of subsidiaries and stand-alone banks financed more than three fifths of their assets. The overall increase in customer deposits stemmed predominantly from foreign OFIs, accounting for 52.1% of total customer deposits in 2022, up by 21.6 percentage points over 2021. Foreign NFC deposits fell by more than a third, largely driven by deposits from the manufacturing sector held with subsidiaries and stand-alone banks. Non-resident household deposits, mainly from Germany, also declined to account

Chart 2.31
DISTRIBUTION OF LIABILITIES – INTERNATIONAL BANKS
(EUR billions)



Source: Central Bank of Malta.

for 28.7% of the overall customer deposits in 2022. Resident customer deposits remained negligible, financing just 0.9% of these banks' total assets.

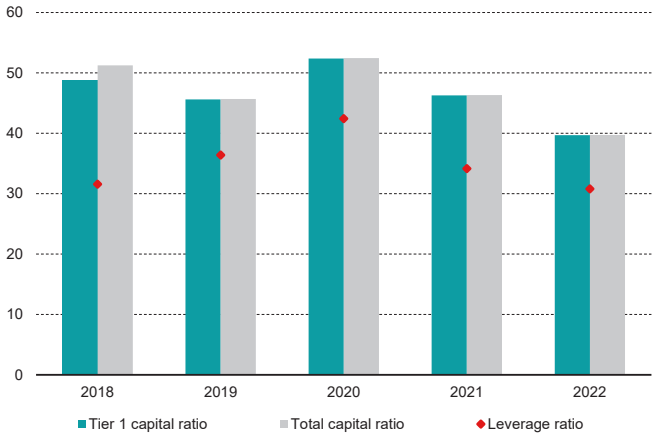
International banks continued to attract long-term retail funding to finance their business activities, which grew by around 20% to represent over half of customer deposits as at end 2022. Such rise in deposits was exclusively driven by the branches of foreign banks. Deposits with maturity exceeding five years rose by 83.0%, while demand deposits grew by 9.2%, driven mainly by the non-branches and to a lower extent the branches of foreign banks.

Despite decreasing, the liquidity position of subsidiaries and stand-alone banks remained strong during 2022, with an LCR of 378.8%, still comfortably above the minimum regulatory requirement. Compared to a year ago, these banks reported higher net outflows, largely from non-operational deposits not covered by the deposit guarantee scheme (DGS). Liquid assets fell by 6.7%, driven by lower withdrawable central bank reserves and to a lower extent government assets. Similarly, the NSFR dropped by 23.6 percentage points over 2021 to 131.6% in 2022.

2.3.5 Capital and leverage

Although the capital position of the subsidiaries and stand-alone banks declined, at 39.7% the total capital ratio and Tier 1 Capital ratio remained comfortably above the minimum regulatory requirements (see Chart 2.32). Total own funds fell by 24.3%, driven by lower Tier 1 capital, also reflecting the voluntary closure of one subsidiary of a foreign bank. RWA also fell, yet by a more modest rate of 11.7%. This reflected lower risk-weighted exposures for credit risk, which despite decreasing by 17.4%, still accounted for the largest share of the overall RWA. Foreign exchange and operational risk exposures rose by 10.2% and 0.9%, respectively, pushing their share in the overall RWA from 2.9% and 36.8% in 2021, to 3.6% and 44.9% a year later. Similarly, the leverage ratio dropped by 3.4 percentage points to 30.8% in 2022.

Chart 2.32
CAPITAL AND LEVERAGE RATIOS – INTERNATIONAL BANKS
(per cent)



Source: Central Bank of Malta.

2.3.6 Risk outlook

Given the significant focus on non-resident activity, international banks remained sensitive to global macroeconomic developments, with diverse business models bound to be impacted differently. Banks that relied mostly on interbank funding, particularly the branches of foreign banks, experienced withdrawals and reduced availability of such funding. Funding pressures going forward could intensify, especially if market funding dries up. This led to a shift towards term deposits by retail customers, which are a more stable funding source, albeit costs to maintain such deposits might continue to increase, going forward. On the asset side, banks which focus on non-resident consumer credit are more likely to be adversely impacted by subdued household consumption due to the rise in inflation. However, these banks' interest income improved, with the outlook expected to remain positive, especially if these international banks manage to keep healthy margins. International banks continued to operate with significant management capital buffers and ample liquidity, which are key for financial resilience in an uncertain macroenvironment.

3. STRESS TESTS

The macro stress test demonstrates that banks are well-prepared to handle the emergence of additional impairments over the horizon, resulting from the scenario-based transition probabilities.

Increases in interest rates improve banks profitability and capital position, since interest income earned compensates for both the interest expense paid and revaluations of bond holdings.

Strong and robust liquidity buffers within the banking system can withstand extreme stress scenarios, including bank-run type events.

Banks on aggregate exhibit resilience by surpassing minimum capital requirements even under adverse scenarios, demonstrating a strong capital position and ability to withstand potential future shocks.

3.1 Scenario-based solvency stress tests

3.1.1 Macro stress testing framework

Stress testing of the banking sector is a crucial element to the Bank's financial stability framework. It involves assessing the resilience of individual banks and the overall system to adverse macroeconomic scenarios and changing regulation.

In particular, the Macro Stress Testing (MST) framework now adopts a new approach to the credit risk module that quantifies credit risk in line with IFRS 9 loan classification by stages, and factors in the minimum provision coverage of legacy NPLs as laid down by the revamped BR09. Moreover, the recent financial market turmoil surrounding distressed US banks, has garnered renewed investor focus on banks' liquidity and solvency positions.

Contrary to other jurisdictions, the EU banking sector is subject to strict consistent prudential standards for both solvency and liquidity requirements regardless of the size of supervised institutions. These aspects are featured routinely in the Bank's stress tests. In fact, severe deposit outflows and the sale of bonds to meet these liquidity needs, are incorporated under the liquidity frameworks, while sensitivity analyses testing credit quality deterioration and interest rate risk in the banking book (IRRBB), capture the solvency impact of bond holdings arising from market price changes and issuer default.

The results of the Bank's frameworks point to overall resilience in the domestic banking sector, with robust liquidity buffers against severe outflows and adequate loss absorption capacity from improved profitability and capital position under scenarios featuring increases in interest rates. Specific findings are reported in the respective subsections in Chapter 3. In addition, the MST also highlights the resilience of the banking sector under a baseline and adverse scenario inspired by heightened geopolitical risks that lead to higher inflationary pressures. The trajectories for the scenarios are sourced from the EBA 2023 EU-wide stress test.

BOX 3: EXPECTED CREDIT LOSS MODEL[1]

One critical aspect of stress testing is the consideration of NPLs. At the most general level, it relates to a loan where the borrower is not making repayments as per contractual obligations – usually for a period exceeding 90 days. NPLs can pose significant risks to financial institutions and the overall financial system, resulting in bank losses and an adverse impact on profitability, reducing credit availability, and eroding investor confidence. Thus, the potential impact of NPLs on financial institutions' balance sheets and their ability to absorb losses are a crucial element in banks' stress testing and risk quantification exercises.

The quantification of provisions for credit losses has undergone a significant shift with the implementation of the IFRS 9 for financial instruments, effective from 1 January 2018. IFRS 9 replaces the incurred loss models under IAS 39 with an expected credit loss (ECL) model that looks ahead and factors in potential future losses. IFRS 9 was prompted by the fact that banks worldwide did not adequately set aside provisions in a timely manner during the GFC in 2008. Under the incurred loss model, charges for potential credit losses were kept low until an actual credit loss event occurred. Once loan delinquencies start to rise, the charges sharply increased, thereby further threatening financial system stability.

The implementation of IFRS 9 brings several advantages, including a more gradual adjustment of loss provisions throughout the economic cycle. Under IFRS 9, the ECL recognition follows a three-stage impairment approach, which involves calculating provisions based on the credit quality of financial instruments. Stage 1 (performing) provisions account for expected defaults within the next 12 months for loans with low credit risk. Stage 2 (performing loans that experienced a *significant increase in credit risk*) and Stage 3 (NPLs) provisions are based on the lifetime ECL for loans that have significantly deteriorated or are expected to adversely affect future cash flows.

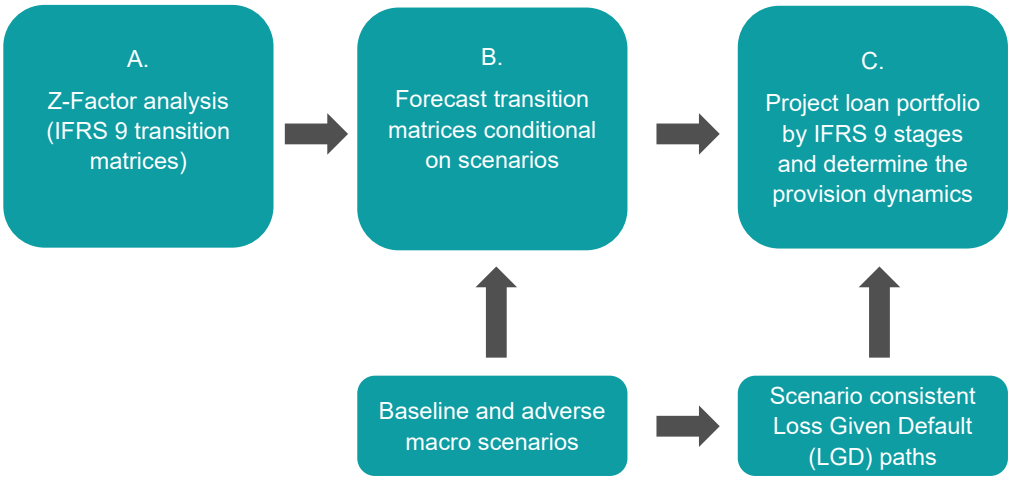
IFRS 9 allows for the early recognition of low provisions from the loan's origination date, and higher provisions are made as the credit quality of the loan deteriorates. Provisioning may increase substantially as the credit risk worsens, but if the credit quality improves, it can revert to a 12-month ECL level. The following Box provides details on the top-down approach used to estimate banks' ECL provisions and, consequently, determine accurate bank capital projections driven by the extent of credit risk.

Overview

IFRS 9 provisioning requirements are informed by the ECL module of the Bank's loan loss forecasting model. The box is structured as follows. Part A provides an explanation of how the Z-Factor is calculated and showcases the historical time series of the Z-Factor, which is based on aggregated loan portfolios from core domestic banks. Part B outlines the process of connecting the Z-Factor to macro-financial conditions and presents the projected Z-Factor for the time horizon of 2023-2025. Lastly, Part C outlines the specific measures taken to convert the projected transition matrices into loan loss provisions flow amounts. The model flow is depicted graphically in Figure 1. The framework follows ECL methodologies proposed by the IMF in Gross et al. (2020) and model averaging techniques described by Gross and Población (2019). Integral to the ECL stress test framework is the concept of transition matrices that captures the transitions across loan stages. In the first stage of the analysis, the probability of loans progressing among the IFRS 9 stages 1, 2 and 3 will be estimated using the Z-Factor methodology.

[1] Prepared by Dr Ashleigh Neill Senior Economist and Mr David Stephen Law Principal Quantitative Analyst both within the Policy Crisis Management and Stress Testing Department. The authors would like to thank Ms Christine Balzan Manager Policy Crisis Management and Stress Testing Department and Mr Alan Cassar Chief Officer Financial Stability and Statistics Division for their valuable suggestions.

Figure 1
OUTLINE OF THE THREE PARTS OF THE EXPECTED CREDIT RISK MODULE



Source: Central Bank of Malta.

The Z-Factor methodology provides a way of summarising the nine transition values into one. The second stage of the analysis involves linking the Z-Factor to macroeconomic variables and then forecasting the loan transitions conditional on EBA scenario forecasts under both baseline and adverse scenarios. The Bayesian Model Averaging (BMA) techniques are utilised when establishing a link between macroeconomic variables and the Z-Factor. BMA accounts for model uncertainty explicitly by using several highly probable models to estimate the forecasts rather than relying on a singular model and variable specification. The third stage of the analysis assesses the impact of the Z-Factor forecasts (that would have been transformed back to IFRS 9 transition matrices) on the provisioning requirements of banks to quantify the extent of provisions required by them under the baseline and adverse scenarios for the three loan stages.

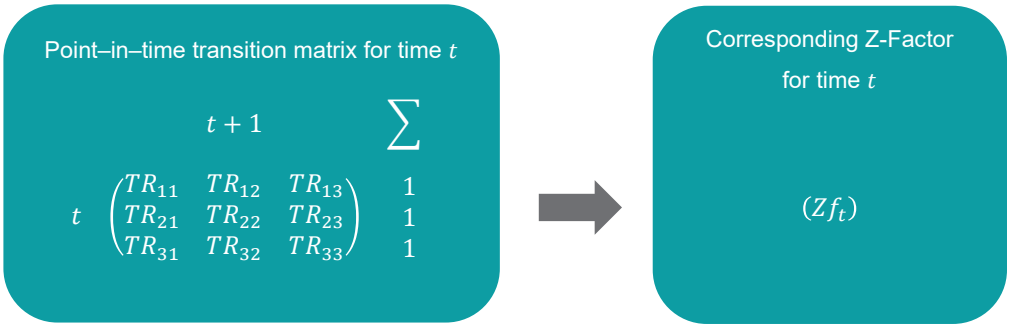
Data requirements

The data involved in the ECL modelling exercise includes i) granular loan data for core and non-core banks, ii) historical macroeconomic data and iii) macroeconomic projections. The first category of input data is needed to calculate the Z-Factor, with loan volumes sourced from FINREP and loan portfolio characteristics sourced from the Central Credit Register (CCR). Specifically, quarterly reports were generated from the CCR to track the share of loans to households and non-financial corporations (NFCs) experiencing changes in their performance status over the tested period. In addition, balance sheet data was required to calculate credit risk parameters, including loan loss provisions and risk exposure amounts at their respective starting points as of 2022 (more information on the risk parameters is provided later in part C of this box). The second type of data pertains to historical time series of macro-financial variables between 2016 and 2022, sourced from the National Statistics Office and ECB SDW (detailed in Table 1 of part B). And finally, baseline and adverse scenario macro forecasts were sourced from the EBA's 2023 EU-wide stress test.

Part A: Z-Factor and transition matrices

The analysis employs a one-parameter representation of credit rating transition matrices in line with the work of Gross et al. (2020) and Belkin et al. (1998a). The Z-Factor provides a way of summarising the 9 transition values into a single value as shown in Figure 2. IFRS 9 came into effect in 2018; however, the analysis is extended back to 2016 to improve the accuracy of the forecasts.

Figure 2
POINT-IN-TIME TRANSITION MATRIX CONVERTED TO A SINGLE Z-FACTOR



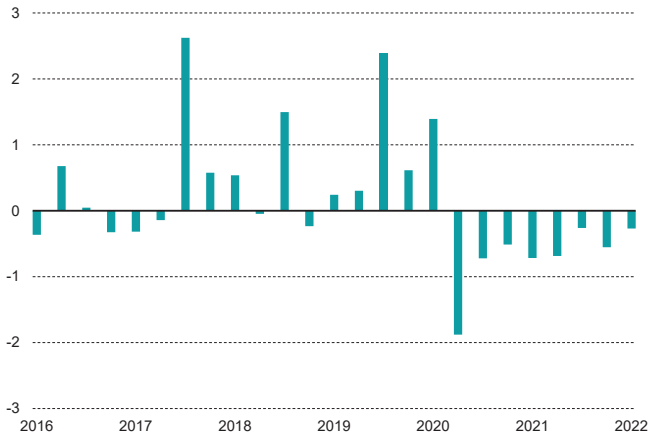
Source: Central Bank of Malta.

The loan stages are applied retrospectively whereby banks' loans are classified according to the following: Stage 1 – performing with a stable risk profile (those without or up to 30 days past due), Stage 2 – exposures with a significant increase in credit risk (forborne performing or performing with days past due between 30 and 90 days), and Stage 3 (all NPEs with days past due exceeding 90 days).

Chart 1 provides a visual representation of the calculated historical Z-Factor. The Z-Factor is negative during economic downturns due to downgrades between Stages 1 and 2 or defaults into Stage 3. Conversely, the Z-Factor is positive during economic upturns when the transition probabilities referring to the downward movement of loans stand below their long-term average, corresponding to loans reverting to previous stages. The Z-Factor can be interpreted as representing one standard deviation of stage transitions from the historical average of stage transitions. The occurrence of the negative Z-Factor period in Chart 1 follows the COVID-19 period. Several European governments, including that of Malta, implemented a range of fiscal and macroprudential policies, such as moratoria, to alleviate the economic repercussions of the pandemic on households and businesses. These measures introduced during the initial phase of the pandemic might partly account for the delayed response observed in the Z-Factor series.

The process of converting the stage transitions shown in Figure 2 to the Z-Factor series in Chart 1 is done by assuming that the probability density of loan transitions *X* depends on two independent normal random variables: an idiosyncratic driver *Y* and a systematic economy-wide driver *Zf*. The correlation between *Zf* and *X* is captured by the parameter ρ, with *Zf* explaining a fraction of the variance of *X* noted in equation 1.

Chart 1
HISTORICAL Z-FACTOR SERIES
(standard deviations)



Source: Central Bank of Malta calculations.

$$X_t = \sqrt{1-\rho}Y_t + \sqrt{\rho}Zf_t \quad (1)$$

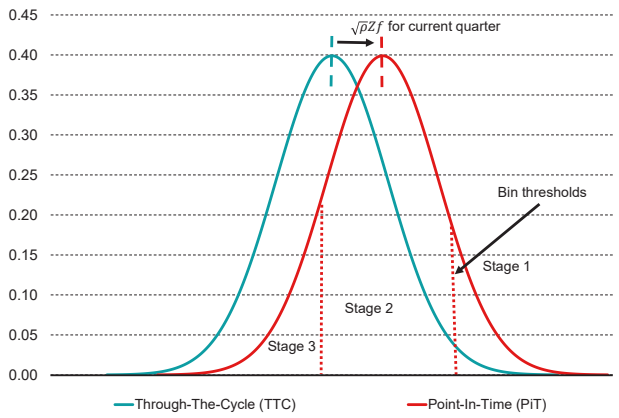
Since the portfolio consists of many obligors, the idiosyncratic component *Y* can be assumed to be eliminated through diversification as in Belkin et al. (1998b). The method calculates fitted transition probabilities based on bin boundaries and a long-term average transition matrix as depicted in Chart 2.

The fitted transition probabilities, Δ_t can be expressed mathematically as follows:

$$\Delta_t\left(X_{g+1}^G, X_g^G, Zf_t, \rho\right) = \Phi\left(\frac{X_{g+1}^G - \sqrt{\rho}Zf_t}{\sqrt{1-\rho}}\right) - \Phi\left(\frac{X_g^G - \sqrt{\rho}Zf_t}{\sqrt{1-\rho}}\right) \quad (2)$$

The function Φ represents a cumulative distribution of a standard normal variable. The term X_g^G are the "bin boundaries" (represented by the vertical lines in Chart 2), which are calculated using the inverse of the standard normal cumulative distribution function, referencing a long-term average transition matrix. The historical deviation between observed and fitted transition matrices can be computed using a minimisation function for each point in time that minimises the expression in equation 3.

Chart 2
PROBABILITY DENSITY FUNCTIONS FOR IFRS 9 STAGES
(per cent)



Source: Central Bank of Malta
Adapted from: Belkin et al. (1998a); Gross et al. (2019).

$$min_{Zf_t} \sum_G \sum_g w_{tg} \left(P\left(G,g\right) - \Delta\left(X_{g+1}^G, X_g^G, Zf_t, \rho\right)\right)^2 \quad (3)$$

Assuming ρ and the bin boundaries from the long-term average transition matrix, a Z-Factor was computed for each point in time that minimises equation 3. However, since ρ and *Zf* are unknown, a double-loop approach as suggested by Belkin et al. (1998a) was adopted by searching for both ρ and the time series Z-Factor while ensuring that the resulting variance of Z-Factor is equal to one.

B. Linking the Z-Factor to macroeconomic conditions and projecting scenario conditional paths

Selecting a single equation to connect risk metrics such as the Z-Factor to macroeconomic variables can notably affect a bank's requirements for loan loss provisioning and anticipated capital standing. Even rational equations from an economic and statistical standpoint can produce a broad spectrum of results based on scenario analyses. To mitigate this problem, a BMA methodology is employed akin to that of Gross et al. (2019), that explicitly attempts to address model uncertainty. This approach assumes that every model is only partially accurate, and thus it operates with a set of models. These models are assigned weights in the form of probabilities that reflect their relative predictive performance. The

individual models are then combined to form a posterior model that relates the Z-Factor to contemporaneous and lagged macroeconomic variables. This posterior model acts as an econometric bridge equation and is created using the assigned probability weights.

To limit the number of models used in the BMA approach, the maximum number of predictors are restricted to three out of *K* possible predictors. The equations used in the model structure follow the Autoregressive Distributed Lag (ARDL) model format, as shown in equation 4. The Z-Factor, denoted by Y_t, is the dependent variable, while the macroeconomic variables in Table 1 are the *K* predictors. The model space is formed by examining all potential combinations of predictors from the pool of *K* variables. Due to the limited time series data from Q4 2016 to Q4 2022 at a quarterly frequency, the lag structure for the exogenous predictors is "closed" without any gaps, and the lag length is fixed at one. The Bayesian Information Criterion (BIC) showed that all models required a single autoregressive lag, a common feature among all the equations in the model space, before considering various predictor combinations to define the model spaces.

$$Y_t = \alpha + \rho_1 Y_{t-1} + \cdots + \rho_1 Y_{t-p} + \sum_{k=1}^{k_i} (\beta_0^k X_t^k + \cdots + \beta_{q^k}^k X_{t-q^k}^k) + \varepsilon_t \quad (4)$$

The posterior coefficient means $E(\beta|D)$ are a weighted average of the individual equations' coefficients, with the weights $P(M_i|D)$ being implied by BIC performance measure based on data D, as in Raftery (1995). See equations 5 and 6, respectively.

$$E(\beta|D) = \sum_{i=1}^{I} P(M_i|D)\check{\beta}_i \quad (5)$$

$$P(M_i|D) \approx \exp(-1/2\, BIC_i) / \sum_{l-1}^{I} \exp(-1/2\, BIC_l) \quad (6)$$

Sign constraints are imposed to ensure that the signs of the predictors have the desired effect on the Z-Factors in the macroeconomic stress scenario. The predefined sign criteria are detailed in Table 1. The BMA estimation and sign constraint findings indicate that house prices, inflation, and interest rate play a significant role in driving the Z-Factor. Furthermore, all equations in the final model space exhibit well-behaved residuals with Durbin Watson values near 2.

The subsequent step involves using the posterior model to predict scenario-dependent paths for Z-Factors over the three-year stress test horizon (12 quarters). The EBA's 2023 stress test scenarios

Table 1
TRANSFORMATIONS AND SIGN CONSTRAINTS FOR MACROECONOMIC VARIABLES

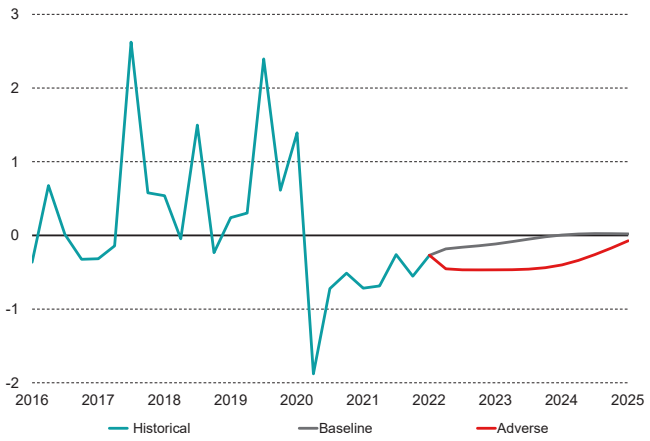
Variable	MT GDP	MT Unemployment	MT Sovereign spread	MT House prices	MT Inflation	Risk free rate (Ten-year Bund rate)
Transformation	YoY	Level	Level	YoY	YoY	Level
Sign constraint	1	-1	-1	1	-1	-1
EBA Baseline 2025	+ 11.2%	+ 0.3 pp	+ 0.2 pp	+ 11.3%	+ 9.0%[1]	- 0.1 pp
EBA Adverse 2025	- 5.5%	+ 7.8 pp	+ 0.6 pp	- 9.7%	+ 9.0%	+1.5 pp

Source: Central Bank of Malta and EBA 2023 EU-wide stress macro financial scenario.

[1] Although the three-year cumulative impact for HICP is the same, the increases are frontloaded in the case of the adverse scenario.

for the baseline and adverse figures are integrated with the path created with the posterior model. The EBA's annual figures are integrated were temporally disaggregated into quarterly frequency for the analysis. The predicted conditional paths for Z-Factors are presented in Chart 3, displaying both the posterior baseline and adverse paths. The Chart shows a smooth recovery under the baseline scenario to the historic average loan transition rate, with an even slower recovery under the adverse scenario.

Chart 3
HISTORICAL SERIES AND SCENARIO PROJECTIONS FOR Z-FACTOR
(standard deviations)



Source: Central Bank of Malta calculations.

A transition matrix forecast can be derived from the conditional Z-Factor projections in the same way as the historical fit is produced at the estimation stage, using the formulae given by equation 3 above. The parameter ρ and the bin boundaries previously estimated are used; only *Zf* as an input variable varies conditional on the outcome of the baseline or adverse scenario forecasts.

C. Loan loss provisions

With the transition matrices obtained, the next step concerns the derivation of the implied S1, S2 and S3 loan stocks and the corresponding provisions. In line with the static balance sheet assumption, there is no explicit control over maturity, new business flows and write-offs. The stock-flow dynamics for the loans are presented in the set of Equations 7:

$$S1_t = S1_{t-1} + \underbrace{(TR_t^{21}S2_{t-1} + TR_t^{31}S3_{t-1})}_{(inflows\ to\ S1)} - \underbrace{(TR_t^{12}S1_{t-1} + TR_t^{13}S1_{t-1})}_{(outflows\ from\ S1)} \quad (7)$$

$$S2_t = S2_{t-1} + \underbrace{(TR_t^{12}S1_{t-1} + TR_t^{32}S3_{t-1})}_{(inflows\ to\ S2)} - \underbrace{(TR_t^{21}S2_{t-1} + TR_t^{23}S2_{t-1})}_{(outflows\ from\ S2)}$$

$$S3_t = S3_{t-1} + \underbrace{(TR_t^{13}S1_{t-1} + TR_t^{23}S2_{t-1})}_{(inflows\ to\ S3)} - \underbrace{(TR_t^{31}S3_{t-1} + TR_t^{32}S3_{t-1})}_{(outflows\ from\ S3)}$$

Loan loss provisions must be assigned to exposures in all three stages, which vary over time due to various risk factors under the ECL approach. These risk factors include the probability of default (PD) (12-month and implied lifetime), a discount factor, and LGD. Specifically for real estate collateralised portfolios, which represent the majority share of the loan book, the LGD component is estimated for each bank in a separate module. The LGD is connected to the EBA house price trajectories for both the baseline and adverse scenarios via equation 8.

$$LGD_t = 1 - \left(\frac{HP_t}{HP_0} \times RE_{Collateral}\right) - Other_{Collateral} \quad (8)$$

$RE_{Collateral}$ refers to real estate collateral. Therefore, HP, representing house prices, are an influential factor both for projecting loan migrations and determining the value of collateral.

For S1 exposures under IFRS 9, the provisions stocks are equal to the 12-month ECL, given by:

$$Prov_{t,S1} = ECL_{t,S1} = TR^{13}_{t+1|t} \times LGD_{t+H|t} \times S_1 \quad (9)$$

Equation 9 follows the familiar *PD x LGD x EAD* structure for ECL. The term $TR^{13}_{t+1|t}$ is the expected default rate for S1 exposures conditional on end of period t. The $LGD_{t+H|t}$ term has a t+H|t to denote the fact that the LGD is forward looking.

For S2 exposures, the lifetime ECL is:

$$Prov_{t,S2} = ECL^{LT}_{t,S2} = \sum_{s=t+1}^{M} \frac{TR^{23*}_s \times LGD_{s+H|s} \times S2_{s-1}}{(1-r)^s} \quad (10)$$

With *M* denoting the average residual term to maturity of each bank's households and NFC portfolio. The denominator of the formulae involves a bank specific average interest rate for both their households and NFC portfolios, that is used for discounting the ECL along the residual maturity.

The term TR^{23}_s is the unconditional transition probability for S2 stocks, which links to the outcome of the transition matrix forecast path in part B. While this unconditional PD TR^{23}_s moves over the lifetime of a loan portfolio in an "unrestricted" manner, and in relation to macro-financial conditions, the incremental PD TR^{23*}_s measures the PD in period *s* conditional on not having defaulted up to period *s-1* and approaches zero over time. The lifetime horizon as measured by *M* is considerably longer than the stress test horizon. To reconcile this, the framework follows the methodological assumptions employed by the EBA, which require the credit risk parameters to remain constant for the baseline scenario after 2025 (including stage transition probabilities and corresponding loss rates). Conversely, those under the adverse scenario revert to the 2025 baseline parameters, following a linear path over a period of six years. This means that each credit risk parameter for the adverse scenario beyond 2031 is equal to the 2025 baseline parameters.

For S3 exposures, the lifetime ECL is computed taking into consideration the probability of remaining in S3:

$$Prov_{t,S3} = ECL^{LT}_{t,S3} = \sum_{s=t+1}^{M} \frac{TR^{33*}_s \times LGD_{s|t} \times S3_{s-1}}{(1-r)^s} \quad (11)$$

The total provisions stock equals the sum of the stage-specific provisions:

$$Prov_t = Prov_{t,S1} + Prov_{t,S2} + Prov_{t,S3} \quad (12)$$

The new provisions which would need to be set aside correspond to the loan loss provisions flow given by:

$$Prov\_Flow_t = Prov_t - Prov_{t-1} \quad (13)$$

Supervisory minimum coverage expectations

Another aspect of relevance to the calculation of provisions is the supervisory minimum coverage expectations for NPEs. These are set out by the respective supervisor, with a communication issued by ECB banking supervision, applicable to the three domestic Significant Institutions (SIs), and BR 09 applicable to the banks supervised by the MFSA (refer to Chapter 5). These expectations set up minimum coverage expectations for "legacy" and "new" NPLs, with a dedicated approach to deal with existing (stocks) of legacy NPLs, issued and classified as such prior to a cut-off date (April 2018 for SIs and April 2019 for other banks), as well as new NPLs for those issued after the respective date. These coverage expectations vary by the vintage count (i.e. number of years the loan has been classified as NPL) and the collateral underlying the loan. This means that the applicable coverage expectations are staggered and will go beyond the three-year stress test horizon. Indeed, a legacy ratio was defined for the share of S3 loans for which minimum coverage expectations apply from 2026. On average, this amounts to 36.5% of the stock of S3 loans reported in December 2022 by the twelve banks in scope of the MST.

To complement the findings of the IFRS 9 credit risk module, the incremental coverage expectations under the supervisory approach for the years 2023, 2024 and 2025 are calculated for each bank. This is done by determining which loans were classified as NPLs in December 2022 and with their loan identifier (provided in the CCR), trace back the first instance when these loans are first reported in the CCR as NPLs. This provides an estimate as to how long these loans have been classified as NPLs and ultimately determine the respective minimum coverage expectations. These requirements for existing NPLs are included in both the baseline and adverse scenarios. In addition, 2023 projections of new NPLs are in scope for incremental provisions given that by 2025 these would have been classified as such for a minimum of two years. In this respect, incremental provisions are added on to the provision requirements of 2025, calculated on the basis of the share of unsecured Stage 3 loans projected for 2023 under the respective scenario.

References

Belkin, B., Suchower, S., and Forest, L. R. (1998a). A one-parameter representation of credit risk and transition matrices. *CreditMetrics monitor*, 1(3), pp. 46-56.

Belkin, B., Suchower, S., and Forest, L. R. (1998b). The effect of systematic credit risk on loan portfolio value-at-risk and loan pricing. *CreditMetrics Monitor*, pp. 17-28.

Gross, M. M., Laliotis, D., Leika, M., and Lukyantsau, P. (2020). Expected credit loss modelling from a top-down stress testing perspective. *International Monetary Fund*.

Gross, M., and Población, J. (2019). Implications of model uncertainty for bank stress testing. *Journal of Financial Services Research*, *55*, pp. 31-58.

Raftery, A. E. (1995). Bayesian model selection in social research. *Sociological methodology*, pp. 111-163.

Integrating IFRS 9 projections into the MST framework

The MST framework employs a three-year horizon and assesses the impact of macro-economic shocks on the balance sheets of core and non-core domestic banks. The methodological changes outlined in Box 3 relating to the credit risk module, project banks' household and NFC loan portfolios in reaction to the macroeconomic environment described in the baseline and adverse scenario of the EBA 2023 EU-wide stress test. Although under a static balance sheet it is assumed that no new loans are issued and that maturing loans are rolled over with similar characteristics, these projections reflect transitions of the existing loans across the three IFRS 9 loan stages leading to three distinct impacts on banks.[1] The first is the calculation of provisions, quantified under the applicable ECL approach for the respective stage, explained in detail in Box 3, which has a direct impact on banks' profitability. The second and third impacts are linked to the volume of Stage 1 and Stage 2 loans being downgraded to Stage 3, representing those borrowers that have experienced a default event and no longer repay their loan obligations. Consequently, the second impact also affects banks' profitability owing to a reduction in their stream of income due to the missed repayments from Stage 3 loans. The third impact is associated with the higher risk-weights associated with Stage 3 loans relative to both Stage 1 and Stage 2, resulting in a lower capital ratio.

For the remaining elements of the banks' balance sheets, the methodology adopted is the same as previous runs of the MST. In addition to the credit risk module, the framework makes use of four other modules to quantify the impacts for: NII and net non-interest income (NNII); market risk; net trading income (NTI) and operational risk. The NII and NNII module tests for changes in interest income and interest expense generated directly from the assets and liabilities available at the reference date but factors in any deductions arising from the missed loan repayments from Stage 3 loans and defaulted bonds arising under the respective scenario. The market risk module assesses the revaluation of bonds held at fair value (FV) following a widening of credit spreads.[2] The NTI module quantifies market risk on derivatives and economic hedges and is based on the simplified approach of the market risk methodology adopted in the 2016 EBA EU-Wide Stress Test (described in Section 3.6 of the 2016 methodological note). Finally, the operational risk module assumes a materialisation of risk equal to a share of the capital requirements set aside for operational risk. These capital requirements are calculated according to the Capital Requirements Directive (CRD) Basic Indicator Approach (BIA) and the loss events are assumed at 40% of the requirement under the baseline and 100% under the adverse scenario.

The impact arising from NII & NNII, NTI and operational risk are charged directly to the P&L, reflected in retained earnings and ultimately in capital.

2023-2025 scenarios

The analysis is conducted on the EBA 2023 EU-wide Stress Scenarios. The EBA baseline scenario is based on the December 2022 projections from the respective EU national central banks. The EBA adverse scenario is a hypothetical scenario which explores an environment characterized by heightened geopolitical tensions, accompanied by escalating commodity prices and a resurgence of COVID-19, as well as concerns surrounding sovereign debt sustainability. It highlights the main risks that pose a threat to the stability of the EU financial sector, as identified by the ESRB.

The narrative unfolds with high inflation, leading to adverse effects on private consumption and investment, ultimately resulting in a global economic contraction given by a deterioration in the economic outlook. Geopolitical tensions, exemplified by the war in Ukraine, lead to a phenomenon known as stagflation which is characterized by a combination of stagnant economic growth, high unemployment rates, and high inflation. This disruption causes global production chains to falter, resulting in significant price increases for commodities.

[1] The static balance sheet assumption requires banks to retain the same composition of assets and liabilities throughout the test horizon by replacing instruments which mature between 2023 and 2025 with similar instruments in terms of type, credit quality and residual maturity as observed in December 2022. This allows for ease of comparison across the results of banks in scope.

[2] The methodology and findings on bond holdings (both for credit default risk and revaluation of FV bonds) is provided in section 3.1.2.

Key macroeconomic variables such as long-term interest rates, GDP and unemployment are subjected to substantial shocks, with the EU's real GDP projected to decline by 6% cumulatively over the three-year period, while the unemployment rate is expected to increase by 6.1 percentage points relative to the initial starting point. Moreover, inflation is assumed to exceed baseline levels throughout the entire scenario horizon, with a 3 percentage point increase in 2023 and a 1.5 percentage point increase in 2025. The vulnerabilities in the real estate sector are also emphasized given by adverse shocks to both commercial and real estate prices. The MT specific shocks are reported in Table 1 of Box 3.

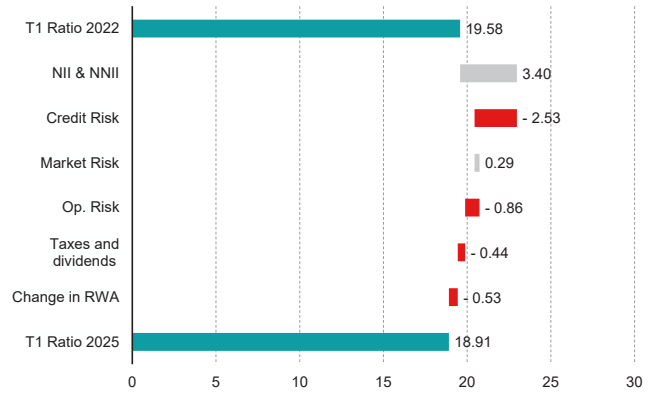
It is important to note that the EBA scenario assumes a policy environment without any changes, aligning with market expectations related to monetary and fiscal policies.

Results

Charts 3.1 and 3.2 present the three-year cumulative contributions of the various risk modules on the Tier 1 capital ratio for core and non-core domestic banks under the baseline scenario.

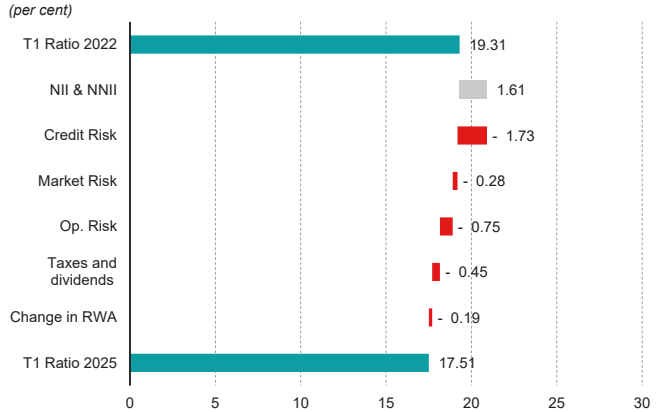
On the one hand, NII & NNII have a positive contribution to the Tier 1 capital ratio. This contribution is estimated on banks' potential to generate income and incur expenses based on the composition of assets and liabilities as at the reference date, while the scenario-specific estimates for missed repayments on newly classified Stage 3 loans and the associated increase in provisions are deducted from profitability. On the other hand, the other modules result in losses exceeding the positive contribution of NII & NNII. This is particularly the case for credit risk which accounts for IFRS 9 loan provisions and incremental coverage requirements under BR09 as well as, to a lower extent, default risk for bonds accounted for at AMC. The overall losses lead to a release of capital reserves with the Tier 1 capital ratio of core domestic banks decreasing by 0.67 percentage point from 19.58% to 18.91%, while that of non-core domestic banks decreasing by 1.80 percentage points from 19.31% to 17.51%. At an individual bank level, all banks surpass their overall capital requirement (OCR) which consists of a common 6% Pillar 1 requirement, an institution-specific Pillar 2 requirement and the combined buffers, including the phased-in sSyRB.

Chart 3.1
STRESS TEST RESULTS – MACRO STRESS TEST BASELINE SCENARIO – RELATIVE CONTRIBUTION OF THE IMPACT ON CORE DOMESTIC BANKS' TIER 1 CAPITAL RATIO
(per cent)



Source: Central Bank of Malta calculations.

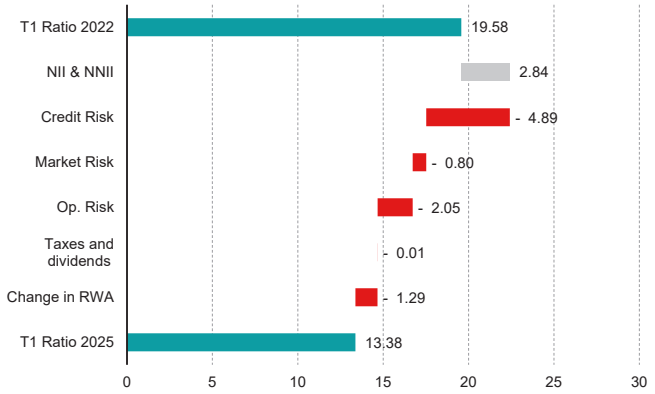
Chart 3.2
STRESS TEST RESULTS – MACRO STRESS TEST BASELINE SCENARIO – RELATIVE CONTRIBUTION OF THE IMPACT ON NON-CORE DOMESTIC BANKS' TIER 1 CAPITAL RATIO
(per cent)



Source: Central Bank of Malta calculations.

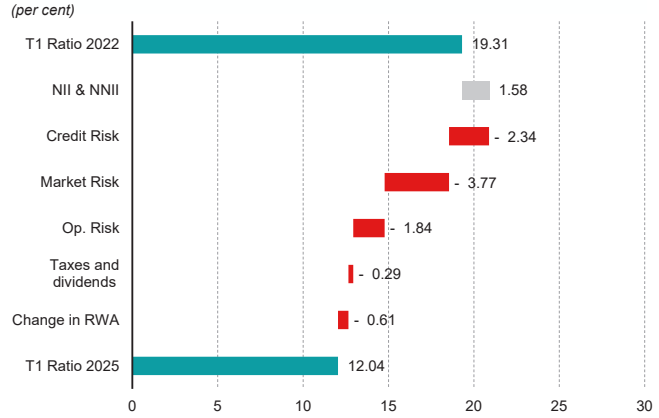
Charts 3.3 and 3.4 show the resulting relative contribution to the Tier 1 capital ratio under the EBA 2023 EU-wide adverse scenario. Elevated inflation and low economic growth contemplated in the scenario, are assumed to give rise to higher insolvencies across households and NFCs. This is the main driver behind the relative increase in credit risk when compared to the baseline scenario. In particular, the economic projections under this scenario result in higher volumes of loan transitions to both Stage 2 and Stage 3 which, paired to the drop in valuation of real-estate related collateral, result in substantially higher provisions. In the case of non-core domestic banks, losses mainly originate from market risk, particularly the assumed adverse shock of 24% on the valuation of equity holdings given the significant equity holdings for this category of banks. The Tier 1 capital ratio for core domestic banks falls by 6.20 percentage points to reach 13.38% while that of non-core domestic banks falls by 7.27 percentage points to reach 12.04%.

Chart 3.3
STRESS TEST RESULTS – MACRO STRESS TEST ADVERSE SCENARIO – RELATIVE CONTRIBUTION OF THE IMPACT ON CORE DOMESTIC BANKS' TIER 1 CAPITAL RATIO
(per cent)



Source: Central Bank of Malta calculations.

Chart 3.4
STRESS TEST RESULTS – MACRO STRESS TEST ADVERSE SCENARIO – RELATIVE CONTRIBUTION OF THE IMPACT ON NON-CORE DOMESTIC BANKS' TIER 1 CAPITAL RATIO
(per cent)



Source: Central Bank of Malta calculations.

At an individual bank level, vulnerabilities are detected for two non-core domestic banks, mainly due to their business model and a weaker starting position following losses recorded in 2022. The core domestic and the remaining four non-core domestic banks would instead be able to absorb the losses under this scenario via a release of capital. Nevertheless, the resulting capital ratios for these banks remain above their respective capital requirements.

3.1.2 Credit quality deterioration

This sensitivity test assesses the debt securities portfolios of core domestic, non-core domestic and international banks against a potential deterioration in their credit quality. Banks that do not hold bonds are naturally excluded from the test.

BOX 4: IFRS 9 CLASSIFICATION OF BONDS[1]

The aim of this boxed article is to provide a concise overview of the classification and measurement of bonds under IFRS 9, including familiarisation with accounting concepts and terminology. This, particularly in the context of the methodology and assumptions of the stress test exercises conducted by the Bank that reflect any gains or losses arising from holding respective instruments, amongst others.

By investing in bonds, banks can generate income by either retaining them to collect the principal upon maturity and any coupon payments in the interim, or else by selling them, ideally under favourable market price conditions. Linked to these intentions, IFRS 9 identifies three types of business models, namely: *hold to collect*, *hold to collect and sell*, and *other*. These business models reflect the objective and the approach that banks adopt to generate cashflows from the management of their bond holdings. Business models do not depend on management's intentions for an individual instrument but are determined on a higher level of aggregation. Indeed, banks may have more than one business model for managing their bond holdings. Moreover, although expected to be very infrequent, it is possible for banks to re-classify bonds when business model changes, as long as the necessary conditions are met.

Under the *hold to collect* business model, the objective is to hold assets to collect contractual cashflows over the life of the instrument. However, the entity need not hold all of those instruments until maturity and some sales out of the *hold to collect* business model are expected to occur as long as they are consistent with business model's objective.

Under the *hold to collect and sell* business model, the objective is achieved by both collecting contractual cash flows and selling financial assets. In contrast to the *hold to collect* business model, sales are integral rather than incidental, and consequently, this business model typically involves a greater frequency and value of sales.

Any residual objectives that differ from those applicable to the *hold to collect* and *hold to collect and sell* would instead be classified under the *others* business model category. These are typically associated, but not limited to, the realisation of cash flows through the sale of bonds. The collection of contractual cash flows is not integral to achieving the business model's objective but instead is incidental to it.

The measurement category of each bond holding depends on the business model within which it is held, and whether its contractual terms give rise to cash flows that qualify as Solely Payments of Principal and Interest (the SPPI test). Bonds that satisfy the SPPI test and are in the *hold to collect* business model would be measured at amortised cost (AMC). Those bonds that satisfy the SPPI test and are in the *hold to collect and sell* business model would be measured at fair value through other comprehensive income (FVOCI). The remaining bonds that are not measured at AMC or at FVOCI are to be measured at fair value through profit and loss (FVTPL).

Figure 1 summarises the measurement categories of bonds.

Bonds are measured at AMC using the effective interest method for amortisation, considering any difference between the initial amount and the maturity amount adjusted for any loss allowance. Consequently,

[1] Prepared by Mr David Stephen Law Principal Quantitative Analyst and Ms Christine Balzan Manager, both within the Policy Crisis Management and Stress Testing Department. The authors would like to thank Ms Amy Camilleri Principal Expert within the Financial Control Department for her valuable insights and suggestions.

Figure 1
SUMMARY OF MEASUREMENT CATEGORIES FOR BONDS

Measurement category	*AMC*	*FVOCI*	*FVTPL*
Valuation method	Amortisation based on original value at purchase and redemption value upon maturity	At FV, reflecting the current market price	At FV, reflecting the current market price
Recognition of changes in market price	Not applicable (Does not impact the valuation)	Unrealised gains or losses from price changes charged directly to capital	Unrealised gains or losses from price changes charged to the Statement for Profit and Loss
Recognition of credit risk	ECL model for provisions	ECL model for provisions	Not applicable (Provisions are not required)

Source: Central Bank of Malta.

while market price changes are not recognised for bonds measured at AMC, banks must apply the impairment requirements and recognise a loss allowance for ECLs.

In the case of bonds valued at FVOCI, which belong to the *hold to collect and sell* business model, changes in FV result in *unrealised gains* or *unrealised losses*, which directly impact capital (recognised as part of Other Comprehensive Income). Bonds measured under the FVOCI category are also subject to impairment requirements for the recognition and measurement of a loss allowance for ECL.

For the remaining bonds measured at FVTPL, where income generation is linked to sales, changes in FV whilst holding these bonds, result in *unrealised gains* or *unrealised losses* which are recognised in the Statement for Profit and Loss (P&L). Moreover, unlike the former two measurement categories, bonds measured at FVTPL are not subject to impairment requirements.

Domestic banks hold AMC and FVOCI instruments in the main, although recently, the share of bonds measured at AMC has increased. While subject to impairment loss assessments, the valuation of AMC bonds is insulated from "unrealised losses" linked to increasing yields. However, should banks be required to sell these bonds, say for liquidity purposes, banks might incur realised losses depending on the discrepancy between the book value and the market value of the instrument at the time of sale; thereby having implications on banks' profitability and ultimately their capital position. Nonetheless, given that domestic banks have been operating with ample liquidity for the past years, and given that the majority of bonds held by banks are eligible for ECB funding under normal monetary policy operations, the need for selling bonds measured at AMC for liquidity purposes is rather low.

As of December 2022, banks continued to invest in high rated bonds, with 94% of the non-core domestic banks' and 100% of core domestic and international banks' bond portfolios rated at investment grade (rated BBB- or better). Under this framework, bonds accounted at FV are repriced following a widening of credit spreads for non-sovereigns or on the basis of haircuts applicable to sovereigns. However, this approach applies to only a small share of the total bond holdings. Instead, core domestic, non-core domestic and international banks hold 78%, 93% and 48% of the respective debt securities at AMC. This high share could be attributed to banks' preference to acquire bonds with the intention of retaining them until maturity, whilst also benefitting from a preferential valuation approach which is not affected by market movements. Nevertheless, such bonds measured at AMC are still subject to impairment loss assessments. Under this framework, the impairment losses are quantified through the application of higher probabilities of default associated with a three-notch downgrade in their official rating. The calculation of losses for bonds valued at AMC also factors in the realised gains or losses associated with the default event as the difference between the nominal and book-value of bonds. In the case that the book-value is higher than the nominal, this upward amortisation is recognised as part of the losses from the default event. Conversely, when the book-value is lower than the nominal amount, the downward amortisation has already been accounted for and thus acts as a buffer to absorb, at least in part, the default event.

The quantification of the impact of the credit quality deterioration to AMC and FV debt securities would result in a drop in the Tier 1 capital ratio of 0.47, 0.32 and 0.01 percentage points to reach 18.70%, 19.15% and 39.67% for core domestic, non-core domestic and international banks, respectively. Compared to December 2021, banks have increased the share of bonds being accounted for at AMC which attract low PDs (even after a three-notch downgrade) given their high investment grade ratings. Indeed, in addition to the 22% increase in the volume of bonds held by banks from €6.7 billion in December 2021 to €8.2 billion as at the reference date, the share of bonds held at AMC has also increased significantly from 62% to 74% (i.e. from €4.1 billion to €6.0 billion a year later), overall. Consequently, only 26% of bond holdings are exposed to market price movements. Moreover, the impact is very low compared to previous editions of the FSR due to the gap between book-value and nominal amounts having substantially narrowed, resulting in lower additional losses on the assumed defaulting AMC bonds with a book value above nominal. The materialisation of the assumed shocks would leave all three bank categories in a comfortable position to absorb potential losses when compared to the respective minimum capital requirements including the total SREP capital requirement.

3.2 Liquidity stress testing frameworks

Liquidity is fundamental to the banking system as it enables banks to meet their financial obligations, manage cash flows, respond to market shocks, and comply with regulatory requirements. By prioritizing liquidity, banks can enhance their resilience, and ability to navigate challenging economic and financial conditions. To assess the liquidity position of domestic banks, the Bank employs three complementary frameworks as part of its stress testing toolkit.

The first framework, known as the persistent deposit withdrawals (PDW) framework, evaluates banks' ability to meet their financial obligations when faced with a bank-run type scenario over a survival period of four weeks. By analysing how effectively banks manage PDW and ensure the availability of sufficient cash or other liquid assets, valuable insights into their liquidity position are gained.

The second framework is the LCR, which assesses banks' ability to withstand adverse scenarios involving high outflows over a 30-day horizon. This framework plays a critical role in evaluating banks' capacity to maintain an adequate level of liquidity during periods of significant stress.

The third framework, the NSFR, focuses on longer-term liquidity. It evaluates banks' ability to withstand liquidity pressures over an extended period by assessing their funding structure and availability of stable funding sources.

These frameworks test the domestic banking system's resilience to navigate through potentially challenging liquidity scenarios.

3.2.1 Persistent deposit withdrawals

The PDW framework tests whether banks' liquidity buffers of the highest quality are sufficient to meet the assumed liquidity outflows in a bank-run type scenario. The framework considers extreme shocks, over a period of five days and the subsequent three weeks, to assess the banks' counterbalancing capacity (CBC) in meeting the assumed deposit outflows. The banks' CBC is defined as the quantity of funds at the banks' disposal to meet liquidity requirements, and is made up of, inter alia: cash, excess on the banks' reserve requirements with the Central Bank of Malta and funds raised from the sale of marketable securities. Banks are assumed to become illiquid if their stressed CBC drops below zero, i.e. is insufficient to meet the assumed withdrawals.

The framework features three adverse scenarios to describe bank reactions to access funding against a common set of extreme outflow rates on deposits. The extent of outflows assumed in the scenarios consider their term-to-maturity and differ across the retail, corporate and other customer categories. Under all adverse scenarios presented, it is assumed that the intragroup and interbank funding would be suspended and withdrawn for the duration of the stress period as part of the outflows experienced in Day 1. While the scenarios adopt the same outflow rates, they differ in the approach banks are assumed to adopt in relation to the liquidation of bond holdings, by taking into account their eligibility for use as collateral in standard monetary policy operations.[3]

Under Scenario 1, banks can obtain funding from standard Eurosystem monetary policy operations only against ECB eligible debt securities that were already pledged with the Bank as at December 2022.[4] Additional funding can be sourced from the fire sale of bonds measured at FV.[5] Conversely, bonds valued at AMC are assumed to be retained by banks given that these are purchased with the intention of redeeming the final principal upon maturity and earning a regular stream of coupon payments.

Under Scenario 2, banks are allowed to obtain additional funding from standard Eurosystem monetary policy operations by pledging any other unencumbered and eligible debt securities. Given that the haircuts assumed for fire sale prices are higher than the valuation haircuts which would be applied by the ECB, in this scenario banks have a higher CBC compared to the first scenario.[6] In addition, given the ECB's ongoing commitment to provide liquidity assistance, this scenario is deemed more plausible. Similar to scenario 1, it is assumed that banks do not to sell their bonds held at AMC.[7]

Under Scenario 3, banks are assumed to meet the necessary requirements to generate additional CBC by also liquidating their unencumbered non-eligible AMC bonds at fire-sale prices in addition to pledging any unencumbered and eligible debt securities for monetary policy operations and selling FV bonds. Sale of these bonds can only occur if the sale qualifies as incidental (in line with the *hold to collect* business model) or if the bank is able to switch business model to *hold to collect and sell* or *other*. Should a switch in business model occur, banks would be required to change the valuation approach from AMC to market-based repricing of bonds, charging the valuation changes as unrealised gains or losses either directly to capital through other comprehensive income (only if converted to *hold to collect and sell* and passes

[3] Securities pledged with the ECB are subject to liquidity haircuts which are regularly updated in line with revisions to the ECB framework. Only banks that are a signatory to the Central Bank of Malta Directive No. 8 can make use of these operations.

[4] Eligible debt securities refer to any marketable assets held by banks which, as at the reference date, are included in the database of eligible assets for Eurosystem monetary operations.

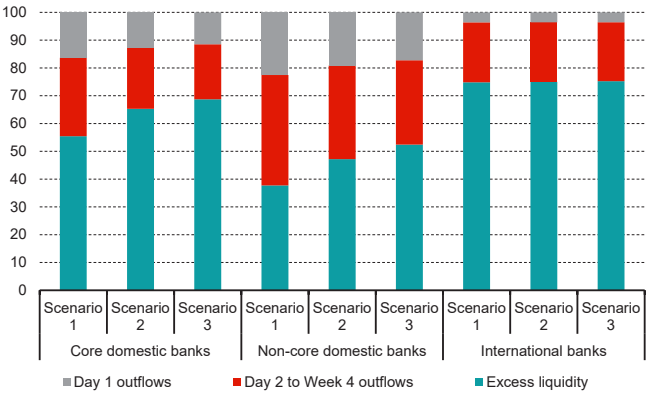
[5] Fire sale prices have been calibrated on the basis of the market prices observed during the 2008 financial crisis and assessed for severity against those applied by the SSM in the 2019 Liquidity Stress Test (LiST).

[6] See Box 2 in the *Financial Stability Report* 2015 for further detail on the methodology and haircuts applied in the PDW stress test. The haircuts for ECB eligible securities have since been updated in line with the current guidelines issued by the ECB in Guidance (EU) 2019/1033.

[7] Under adverse scenario 2, banks are allowed to pledge AMC bonds as collateral for ESCB monetary policy operations with the liquidity granted estimated at a haircut over the current market price of these bonds. Although the market value may be substantially different from the book value and this would affect the volume of liquidity obtained, banks do not experience any valuation losses on the bonds themselves since assets are only pledged not transferred.

the SPPI test) or through the P&L account. Thus, the additional liquidity obtained under this scenario might come at a much higher cost in recognising the differences between the amortised book value and the current market prices and would have implications on profitability and ultimately capital once the switch in accounting treatment occurs. To note that while scenario 2 is deemed more plausible, scenario 3 can only be deemed as a viable option for banks if the proceeds of liquidating the AMC portfolio, surpass the cost of the revaluation upon conversion and the risks associated with daily price movements.

Chart 3.5
STRESS TEST RESULTS – PDW – IMPACT OF OUTFLOWS AND EXCESS AVAILABLE AFTER FOUR-WEEK HORIZON AS SHARE OF ORIGINAL CBC
(per cent)



Source: Central Bank of Malta calculations.

Chart 3.5 shows the reduction in CBC from the assumed outflows in the first day (grey bar) and the subsequent time periods in the four-week test horizon (red bars).

Under Scenario 1, all three bank categories would be able to withstand these assumed outflows without depleting the available liquidity buffer (i.e. the CBC does not drop below zero). Indeed, banks retain robust excess liquidity buffers of 55%, 38% and 75%, respectively compared to the initial CBC.

Under Scenario 2, although the volume of outflows is the same under both scenarios, these represent a smaller share of the original CBC under adverse scenario two for core and non-core domestic banks. This is because around 57% and 37% of their respective bond holdings are unencumbered and ECB eligible, boosting their CBC by 34% and 23%, respectively. In the case of international banks, while around 68% of their bonds are unencumbered and ECB eligible, the volume of these holdings is negligible and improves the CBC by only 0.8% which is mainly composed of placements with central banks, deemed as highly liquid. At the end of the test horizon, the excess liquidity buffers stand at 65%, 47% and 75%, respectively. With such high shares of excess liquidity, banks would be able to withstand further weeks of extreme withdrawals under both scenarios.

Under Scenario 3, banks would be able to generate extra liquidity from the fire sale of unencumbered and non-eligible which represent only 28%, 25%, 41% of the three bank categories' respective AMC portfolio. The original CBC improves by 13%, 12% and 0.9% for the respective bank category, leading to excess liquidity buffers at the end of the test horizon of 69%, 52% and 75%, respectively. Compared to scenario 2, there is limited improvement over the excess CBC – at around 5 percentage points higher for core and non-core domestic banks, and no improvement for international banks; although this would arise at the back of an adverse impact on capital via unrealised losses upon conversion and further losses if sold at fire sale prices. Moreover, considering that non-eligible bonds represent a small share of AMC holdings, particularly for core and non-core domestic banks, the extra liquidity generated can be deemed as an insufficient incentive for banks to consider converting the portfolio and switching the valuation approach from AMC to FV.

The majority of banks in all three categories would be able to withstand the assumed outflows with robust excess CBC already under Scenario 1 assuming no sale of the portfolio measured at AMC and no reliance on standard monetary policy operations. While Scenario 2 is deemed more plausible due to the ECB's

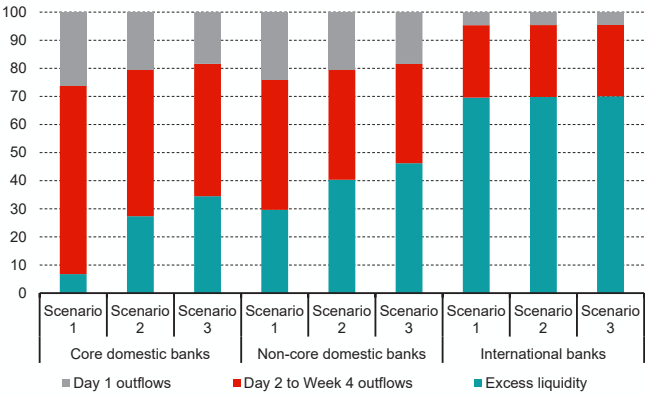
ongoing commitment to provide liquidity, the already high levels of CBC in Scenario 1 reduces further the likelihood of Scenario 3 materialising.

Vulnerabilities are detected for two non-core domestic banks. One of these banks marginally runs out of liquidity before the end of week 4 under Scenario 1 but through standard monetary policy operations would be able to survive the entire test horizon under Scenarios 2 and 3. The other non-core bank would run out of CBC by the end of the first week in all three scenarios due to limited access to liquidity as only 29% of its bonds are unencumbered. All other banks would manage to survive the entire four-week stress test horizon under all scenarios.

Persistent deposit withdrawals with heightened outflow rates

Although the outflow rates adopted in the framework have been calibrated to past liquidity crises and assessed against the ECB's 2019 liquidity stress test, the framework was re-run using the outflow rates that mimic the recent US financial market turmoil. While it is highlighted that such scenario is deemed extremely severe given the idiosyncrasies of these specific cases and that the domestic Depositor Compensation Scheme provides coverage for eligible deposits thereby reassuring the average depositors, excessive deposit outflows could arise from the few large depositors that may be wary of their uncovered deposits (any amounts in excess of €100,000) and would intervene by withdrawing these deposits at the first signs of distress. To this end, the outflow rates in the first week were modified to reach up to 25% of sight deposits, with further withdrawals to surpass the share of uncovered deposits by the end of the test horizon. Chart 3.6 shows the impact on the CBC from the heightened outflow rates assumed.

Chart 3.6
STRESS TEST RESULTS – PDW – IMPACT OF HEIGHTENED OUTFLOWS AND EXCESS AVAILABLE AFTER FOUR-WEEK HORIZON AS SHARE OF ORIGINAL CBC
(per cent)



Source: Central Bank of Malta calculations.

The increase in outflows is particularly visible for core and non-core domestic banks with virtually no impact on international banks. Under Scenario 1, the core domestic banks would survive the four-week period with an excess CBC of 7%, 30% and 70%, respectively. However, through pledging the unencumbered eligible bonds, banks improve their CBC in Scenario 2, with core and non-core domestic banks having an excess CBC of 27% and 40%, respectively. Under Scenario 3, there is only a mild improvement in the CBC compared to Scenario 2 confirming that banks' high share of eligible instruments makes the conversion of the bond portfolio unlikely since the CBC available under Scenarios 1 or 2 are already sufficient to satisfy the liquidity requirements even under the heightened outflow rates.

3.2.2 LCR-based liquidity stress test

The LCR framework assesses the ability of banks to survive a period of liquidity stress lasting 30 calendar days through their HQLA. The LCR is calculated as the ratio of HQLA to net liquidity outflows (outflows less inflows over a 30-day period) and is to exceed 100%. The European Commission (EC) Delegated Regulation (EU) 2015/61 (hereafter, LCR Delegated Regulation) prescribes haircuts for the valuation of HQLA as well as inflow/outflow rates to quantify the net liquidity outflows. The LCR stress test benchmarks the results against the minimum regulatory requirement of 100%.

The framework is run on a baseline and three adverse scenarios as shown in Table 3.1.

Table 3.1
DESCRIPTION OF LCR FRAMEWORK'S BASELINE AND ADVERSE SCENARIOS

Scenario	Description
Baseline	Haircuts and outflow/inflow rates as prescribed by the LCR Delegated Regulation
Adverse:	
Scenario 1	Higher outflows compared to the LCR Delegated Regulation
Scenario 2	Adverse Scenario 1 with additional withdrawals from both resident and non-resident time deposits
Scenario 3	Baseline scenario with full withdrawal of committed facilities to NFCs and households

Source: Central Bank of Malta.

The baseline scenario applies the benchmark haircuts and inflow/outflow rates as prescribed by the LCR Delegated Regulation and acts as a monitoring tool for the LCR as reported by banks.[8]

Adverse Scenario 1 assumes higher outflow rates than those applied in the baseline scenario (approximately 1.5 times higher, unless the LCR Delegated Regulation already applies a 100% outflow rate and hence cannot be increased further).

Adverse Scenario 2 combines the higher outflows in the first scenario with additional withdrawals of fixed term deposits which have a contractual maturity exceeding the 30-day period covered by the LCR Delegated Regulation. This scenario assumes that customers are willing to forfeit any accrued interest to access their funds and is able to distinguish the impact arising from the withdrawals of resident and non-resident depositors.[9]

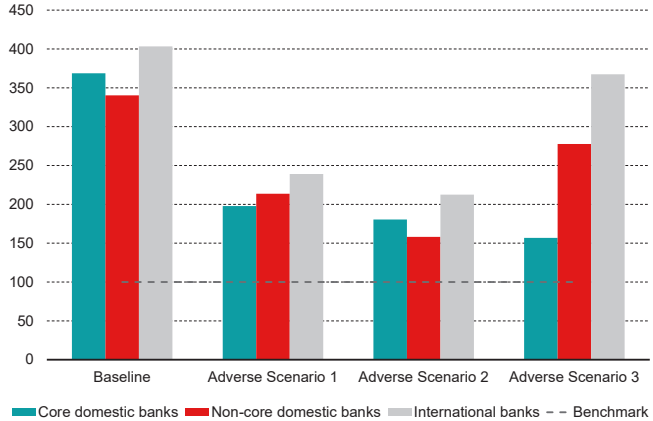
Adverse Scenario 3 is a separate scenario which assumes a full withdrawal by NFCs and households on their approved but unutilized credit, be it on existing loans, overdrafts, or credit cards. This scenario could materialise in the context of rising costs due to the current inflationary pressures or to mimic the recent market turmoil experience in the US in which NFCs would have restricted or limited access to capital funding, in which struggling NFCs and households would use these commitments instead of requesting new loans.

Chart 3.7 shows the results for the three bank categories under the Baseline and the three adverse scenarios.

In December 2022, the LCR under the Baseline scenario stood at 369% for core domestic banks, 340% for non-core domestic banks and 403% for international banks.

Under Adverse Scenario 1, the LCR drops by 171, 127 and 164 percentage points, for core domestic, non-core domestic and international banks, respectively. The shocks under this scenario correspond to a substantial drop which highlights a general tendency for

Chart 3.7
STRESS TEST RESULTS – LCR RESULTS FOR ALL BANKS
(per cent)



Source: Central Bank of Malta calculations.

[8] The baseline scenario is based on the LCR Delegated Regulation and applies a minimum level of severity which is common across all banks whenever the regulation allows ranges. This also serves as a cross-check against information reported by banks, while also serving as a common reference point for the adverse scenarios.

[9] See Box 4 in the *Financial Stability Report* 2018 for further detail on the methodology and haircuts applied in the first four adverse scenarios of the LCR stress test.

all banks to rely on short-term funding. Indeed, current, savings and time deposits with a term of up to 30 days make up 88%, 66% and 64% of core domestic, non-core domestic and international banks' total deposits, respectively.

Under Adverse Scenario 2, which builds on adverse scenario 1 and includes additional outflows from both resident and non-resident time deposits exceeding 30 days, the LCR falls by a further 17, 55 and 27 percentage points to reach 180%, 158% and 212% for the respective bank category. The results also indicate a partial reliance on resident fixed term deposits (10% of total deposits) for core domestic banks and a stronger reliance on non-resident fixed term deposits for non-core domestic and international banks.

Under Adverse Scenario 3, the LCR falls by 212, 63 and 36 percentage points to reach 157%, 278% and 367% for core domestic, non-core domestic and international banks, respectively. This scenario tends to be very conservative as it is not possible to determine the extent of commitments which could be revoked by the banks or those which belong to prospective clients that have received a sanction letter from multiple banks to seek the best rates and loan conditions prior to committing with one bank. Notwithstanding these two data caveats, the adverse scenarios assumes that all committed funds are available for withdrawal and highlights a higher share of loan commitments by core domestic banks as the main providers of credit, especially mortgages. Nevertheless, the ratios remain well above the 100% regulatory requirement.

At an individual bank level weaknesses can be observed across the three adverse scenarios, with some banks experiencing an LCR below the 100% requirement by design of the adverse scenarios and the severity of the shocks applied which aim to test systemic risks. In general, although the starting LCR is slightly lower than the ratio reported for June 2022, the scenario impacts remain comparable to previous runs of the LCR framework and, should such adverse scenarios materialise, banks would be allowed to temporarily operate below this requirement since the regulation allows for a flexible approach in restoring liquidity buffers to the required levels.

3.2.3 Net Stable Funding Ratio stress test

The NSFR framework assesses the liquidity position of banks over a longer time-horizon to determine potential structural long-term liquidity risks by targeting any potential mismatches between long-term assets and short-term sources of finance on the liabilities side. The framework, which was introduced in the FSR 2021 in a dedicated Special Feature, is based on a baseline and three adverse scenarios. The NSFR is calculated as the ratio of the available stable funding (ASF) to required stable funding (RSF) and is to exceed 100%. The Regulation (EU) 2019/876 prescribe factors to be applied to capital and liabilities to compose the ASF as the funding instruments remaining with the institutions for more than one year. It also prescribes factors to be applied to assets and off-balance sheet commitments to determine the RSF as long-term liquidity requirements. Similar to the LCR, the ASF and RSF factors applied in the Baseline scenario are as prescribed in the regulation and act as a monitoring tool for the NSFR as reported by banks. The three adverse scenarios target different components of the banks' ASF and RSF that are deemed most relevant to their business models. Moreover, a fourth scenario is introduced to link Adverse Scenario 3 of the LCR framework with a full withdrawal of commitments under the NSFR framework. Table 3.2 provides a summary of all the scenarios considered in the NSFR framework.

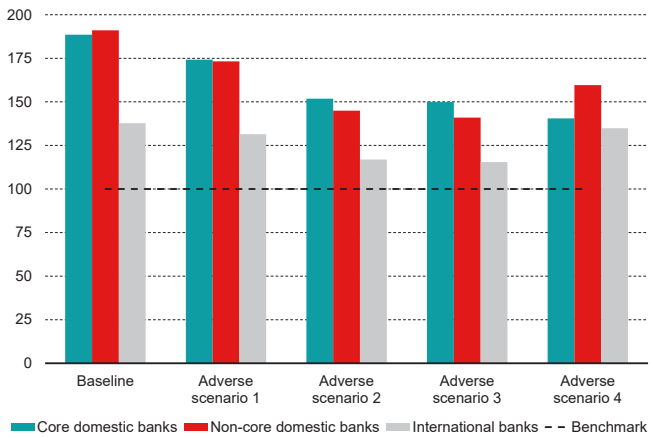
Table 3.2
DESCRIPTION OF NSFR FRAMEWORK'S BASELINE AND ADVERSE SCENARIOS

Scenario	Description
Baseline	ASF and RSF factors as prescribed by the CRR2 Regulation
Adverse:	
Scenario 1	A higher run-off for retail and wholesale deposits impacting the availability of stable funding
Scenario 2	Adverse scenario 1 with some loans become non-performing requiring more stable funding to support them impacting the RSF
Scenario 3	Adverse scenario 2 with pressure in the market reducing the value of bonds and equities (Level 1, 2A and 2B HQLA and other securities) implying the need for further stable funding
Scenario 4	Baseline with full withdrawal of committed facilities to NFCs and households (Similar to LCR adverse scenario 3).

Source: Central Bank of Malta.

Chart 3.8 presents the resulting NSFR in December 2022 for the three bank categories, under the baseline and three adverse scenarios. Compared to December 2021, the NSFR of core domestic banks increased from 175% to 187%, while the NSFR of non-core domestic and international banks declined from 185% to 180%, and from 175% to 133%, respectively. Like December 2021, the largest impact stems from Adverse Scenario 2, which considers an increase in NPLs due to the large concentration of loans for banks in their asset portfolio. Under Adverse Scenario 3, which combines all the shocks, the NSFR of the three respective bank categories falls to 152%, 145% and 117%, respectively, remaining above the 100% minimum requirement. Under Adverse Scenario 4, the longer-term impact of a withdrawal of commitments results in a reduction of the NSFR for core and non-core domestic banks, yet remaining well above the 100% minimum requirement.

Chart 3.8
STRESS TEST RESULTS – NSFR RESULTS FOR ALL BANKS
(per cent)



Source: Central Bank of Malta calculations.

At an individual bank level, with the exception of one, all banks are operating with ample liquidity and manage to maintain a NSFR above the 100% minimum requirement even in the most adverse scenario. The only exception has a low initial NSFR which although being above the minimum requirement, provides limited room to withstand any shocks to the ASF or RSF without resulting in an NSFR remaining above 100%. Unlike the LCR which allows temporary dips below the requirement, if at any time the NSFR of an institution falls below this requirement, or is expected to fall below it, the institution shall immediately notify the National Competent Authority (NCA) and submit without undue delay a timely restoration plan of the NSFR. NCAs are expected to assess the reasons for the institution's failure to maintain the minimum level before taking any supervisory measures.

In conclusion, all three liquidity frameworks highlight the robustness of the Maltese banking system, despite the presence of limited exceptions identified in the various tests and scenarios. The results demonstrate several strong points, including high liquidity buffers, significant placements with central banks that are liquid and eligible as collateral, and a limited likelihood of banks resorting to offloading the AMC portfolio even in extreme liquidity situations.

Compared to the *FSR* 2021 results, it can be observed that the current outcomes indicate a continued strength and resilience in the banking sector. This reaffirms the positive trajectory and effectiveness of measures implemented to enhance liquidity and maintain stability within the banking system.

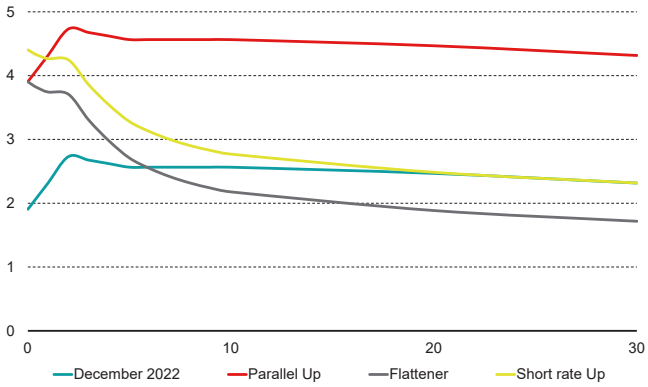
3.3 Interest rate risk in the banking book

The IRRBB framework analyses the impact stemming from changes in the yield curve on the banks' business model. Amid the current persistent rising interest rates internationally and changes in bond yields, scenarios assuming increases in the short end of the yield curve have become more relevant. The framework assesses the immediate impact of increases in interest rates to profitability via the NII and the revaluation of bonds held by banks measured at FV, from three different shocks to the yield curve.

The scenarios considered feature increases in short term interest rates and are as prescribed in Annex 2 of the 2016 Basel Committee on Banking Supervision standards. The parallel up scenario is a direct shift

upwards of the current yield curve, the flattener is a pivot upwards of the short-end of the current yield curve, leaving the long-end constant while the short rate up is a composite shift in both the short and long ends of the curve, resulting in higher short-term rates and lower longer-term rates.

Chart 3.9
STRESS TEST SCENARIOS – CHANGE IN THE EUR TERM STRUCTURE OF INTEREST RATES UNDER THE THREE BCBS SCENARIOS FEATURING INCREASES IN SHORT TERM RATES
(per cent; years)



Sources: Central Bank of Malta calculations; BCBS.

The extent of the impact is influenced by, inter alia; the interest rate type (fixed, variable or a combination of both); the currency denomination, and the reset date of interest-bearing assets and liabilities. Chart 3.9 shows the term structure of interest rates under the three BCBS scenarios against the current yields for Euro denominated instruments for December 2022.

By design, the test assesses the impact of interest rate risk over a one-year horizon. Thus, a static balance sheet approach is adopted whereby maturing instruments are rolled over and there is no impact from interest rates on loan demand or additional NPLs arising from higher debt servicing costs.

Table 3.3 presents the impact on the three bank categories' Tier 1 capital ratios from changes in NII and bond revaluations under the three scenarios, with an applied corporate tax rate of 35% on banks' profits.[10]

Based on the balance sheet composition in December 2022, interest income earned grows more than interest expenses paid, contributing at least +1.53 percentage points to the Tier 1 capital ratio. Conversely, banks would experience revaluation losses due to the inverse relationship between bond prices and yields

Table 3.3
STRESS TEST RESULTS – IRRBB FRAMEWORK – RELATIVE IMPACT OF CHANGES IN INTEREST RATES ON THE TIER 1 CAPITAL RATIO
(per cent)

		Core domestic banks	Non-core domestic banks	International banks
	Initial Tier 1 capital ratio	19.17	19.47	39.68
Parallel up	*NII*	*+2.65*	*+1.77*	*+2.04*
	Revaluations	*-0.92*	*-0.30*	*-0.09*
	Post-shock Tier 1 capital ratio	20.90	20.94	41.64
Flattener	*NII*	*+2.46*	*+1.53*	*+1.61*
	Revaluations	*-0.15*	*+0.04*	*-0.01*
	Post-shock Tier 1 capital ratio	21.48	21.04	41.27
Short rate up	*NII*	*+3.09*	*+1.93*	*+2.02*
	Revaluations	*-0.42*	*-0.07*	*-0.04*
	Post-shock Tier 1 capital ratio	21.85	21.33	41.66

Source: Central Bank of Malta calculations.

[10] Banks may apply a lower tax rate if in previous years they have accumulated deferred tax assets; however, for the scope of this stress test, deferred tax assets are not being considered.

along all scenarios and for most tenures, with drops in the capital ratio ranging between -0.92 to -0.01 percentage points. The only exception is for bonds held over the medium to long-term under the flattener scenario (beyond six years in the case of the EUR yield curve) since their valuation increases as the yields drop beyond the values for December 2022. Consequently, bond values would appreciate, as is the case for non-core domestic banks, registering an increase in the capital ratio of 0.04 percentage point under the flattener scenario. The impact from revaluation is not as significant given that banks hold a larger share of their instruments at AMC, which by their nature, are excluded from this assessment. As per Table 3.3, the impact of revaluation losses is highest for all three bank categories under the parallel up scenario in which interest rates increase also for the long-term end of the yield curve. Under this scenario, revaluation losses would also be reported on long-dated bonds held at FV. Nevertheless, the overall impact of short-term increases in interest rates on profitability is positive for all three bank categories, yielding improvements in the Tier 1 capital ratio under all three scenarios.

In line with Basel standards, the framework tests for interest rate risk in accordance with the prescribed standards. However, additional scenarios can be tested and in the context of increases observed in the first half of 2023, the parallel up scenario was rerun using a further 100 basis points increase over the shock applicable to the respective currency (to reach 300 basis points for the EUR yield curve). The results obtained present the same picture – but with stronger impacts – characterised by a higher increase in interest income which compensates for the increase in interest expense and revaluations.

BOX 5: ASSESSING THE VULNERABILITY OF MALTESE INDEBTED HOUSEHOLDS TO INFLATION AND INTEREST RATE SHOCKS BASED ON THE HOUSEHOLD STRESS TESTING FRAMEWORK[1]

This box presents the results from the second iteration of the Household Stress Testing Framework (Abela & Georgakopoulus, 2022) and makes use of micro data from the fourth wave of the Maltese Household Finance and Consumption Survey (HFCS).

The framework simulates interest rates hikes and high inflation scenarios to gauge their effect on households' financial vulnerabilities and how prone Maltese indebted households are to these factors. Other factors are considered, such as an increase in the unemployment rate and potential drop in property prices. In addition, shocks are also quantified in terms of their impact on banks.

This study complements a similar in-depth analysis published as a Special feature in the 2022 *Interim FSR*, considering granular loan data available in the recently updated Bank's Real Estate Data Template. The study finds that overall, households are resilient to increases in interest rates of up to 250 basis points but identifies pockets of vulnerabilities depending on the level of income and other household characteristics including stretched borrower metrics on new loans.

Data and methodology

Micro-data from the fourth wave of the HFCS survey was collected for 2020 from a sample of Maltese households. To note that data collection coincided with the inception of COVID-19 pandemic and the implementation of COVID-19 lockdown measures, which impacted household consumption, saving patterns and wages, albeit more limited, due to the wage supplement. The data contain household specific balance sheet data for Maltese households as well as detailed households' characteristics, on which the stress test scenarios are applied. As in the previous iteration, this box is based on the financial margin (FM) approach given by the below equation, where each household's PD is based on the difference between the household's income and expenditure and considers the extent of its holdings of liquid assets.

$$FM_i = DI_i - DS_i - R_i - PT_i - BLC_i$$

where DI_i captures the household's disposable income after considering taxation and social security contribution.[2] DS_i represents the monthly debt-servicing costs, including both mortgage and non-mortgage debt. R_i includes the household's rental payment (if any), PT_i relates to monthly private transfers (such as child support and maintenance and other regular payments), while BLC_i measures the basic living cost for a specific household.

Weights are assigned to each individual household to ensure that these households are representative of the whole population. As the objective is to analyse the vulnerability of indebted households, the study eliminates all households without any form of debt. From a total of 206,868 (weighted) households in the HFCS survey, the study considers 67,626 (weighted) households.[3]

The exposure at default (EAD) and LGD are in turn given by:[4]

[1] Prepared by Mr Ian Debattista, Senior Economist and Ms Christine Balzan, Manager within the Policy, Crisis Management and Stress Testing Department. The authors would like to thank Mr David Stephen Law, Principal Quantitative Analyst within the Policy, Crisis Management and Stress Testing Department and Mr Alan Cassar, Chief Officer Financial Stability and Statistics Division, for their valuable suggestions.

[2] To note that the tax brackets and social security rates have been updated to the year 2020, as these coincide with the year of data collection.

[3] This corresponds to 276 households considered in this analysis, out of the 1,018 households interviewed.

[4] Where D_i is the total outstanding debt and A_i is the value of real estate assets that banks can recover in case of default.

$$EAD = \frac{\sum_i PD_i * D_i}{\sum_i D_i};$$

$$LGD = \frac{\sum_i PD_i * (D_i - A_i)}{\sum_i D_i}$$

Preliminary data analysis for Maltese indebted households

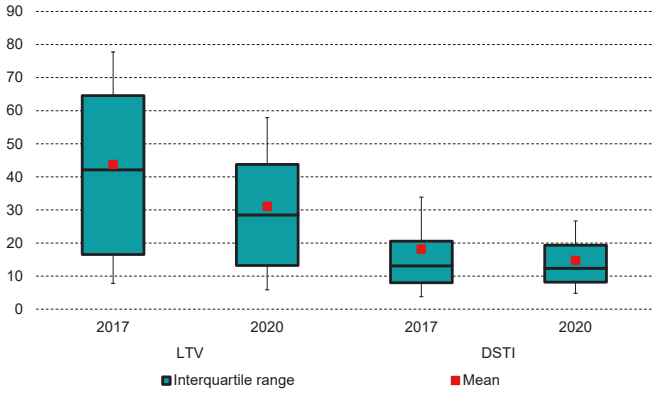
Households with a negative FM are not assumed to automatically default if they have sufficient liquid assets to resort to. The specific number of months (M), by which households can survive a negative FM is calibrated such that the EAD would be equal to mortgage NPL. The average amount of liquid assets for each household stood at €30,343, whilst that of households with an initial negative FM margin stood at €10,933. The latter reflects the constraints faced by the more vulnerable households to fund their financial shortfalls. Nonetheless, despite the level of liquid assets has deteriorated between the 2020 and 2017 iterations, the number of households having a negative FM and who are thus dissaving is still relatively lower. This indicates an improved income to expenditure ratio, mainly driven by higher income levels.

The more stringent the survival criterion (i.e., the number of months a household must be able to sustain its dissaving), the bigger the share of households with insufficient liquid assets. Additionally, the average EAD ratio closest to the resident mortgage NPL ratio of 2.2% (as of 2020) is obtained when $M = 30$.[5] In comparison to the previous iteration, although the resident mortgage NPL ratio has marginally decreased, the calibrated number for M has decreased from 36 to 30. This is partially driven by the reduction in liquid assets between iterations for households with a negative FM. Despite this, in comparison to other countries, the level of liquid assets for indebted households remains elevated.

Chart 1 presents the LTV and DSTI distributions of Maltese indebted households using the third (2017) and fourth (2020) wave of the HFCS data for ease of comparison between the iterations.[6]

As can be seen, there has been a prominent downward shift in both the LTV and DSTI distributions between the third and fourth waves, more pronounced for the LTV. The reasons behind this shift can be numerous and it is quite challenging

Chart 1
BOX PLOT OF THE LOAN-TO-VALUE AND DEBT SERVICE-TO-INCOME RATIOS
(per cent)



Source: HFCS, Central Bank of Malta. Data are multiply imputed and weighted.
Notes: The majority of the sample consists of mortgage indebted households.

[5] The calibration of *M* based on NPLs follows Merikull and Room (2017), Ampudia et al. (2016) and Giordana and Ziehelmeyer (2018).

[6] It is important to distinguish between the calculated LTV and DSTI ratios and the DSTI-O and LTV-O ratios as stipulated in the Central Bank of Malta's Directive No. 16. The calculated ratios represent the current LTV and DSTI limits and not at loan origination, thereby clarifying the significantly lower rates when compared to the rates at loan origination.

to narrow down. This is because a lot of factors are at play including the fact that the information relates to a stock position and represents a subjective interpretation of the property value reported by the respondent, and limited information on the borrower and loan characteristics. Nonetheless, hard data gathered from the ESRB data template show that LTVs for newly granted loans have marginally decreased for RRE first time buyers between 2017 and 2020 and even further for residential buy-to-let (BTL) loans.

Simulated shocks

This analysis is based on the four different shocks presented in the first iteration of this framework and is run on the same methodological framework. The shocks simulate a rise in interest rates, an increase in the unemployment rate, a decline in the valuation of real estate and a fall in the value of liquid assets. This vintage introduces two additional shocks, namely a simulated increase in rental payments, as well as an increase in the basic living cost, with the latter being influenced by rising inflationary pressures. Apart from the impact on households, the shocks will also be assessed in terms of their impact on banks' EAD and LGD.

The simulated shocks will initially be applied individually and subsequently combined under three different intensity scales – low, medium, and high. Table 1 presents the assumed magnitude of the shocks in each intensity scale for each individual shock. The combined shock, example the "low-scale" shock applies the individual shocks (listed in the first column) simultaneously. Results focus on the individual highest magnitude shocks, the baseline and high-scale combined shocks.

An increase in interest rates would directly impinge negatively on households' debt servicing costs, thereby impacting the FM for each household. In such scenario, it is assumed that the increase in interest is fully reflected in the monthly repayments and does not lead to further extensions in the maturity of the loan.[7]

The shock to the unemployment rate is determined by the probability of the reference person becoming unemployed based on their gender, age, highest educational attainment, and gross income. A random real number is generated from a uniform distribution for each household, whereby if this is lower than the probability of unemployment of the reference person, then the income of one working adult is deducted and replaced by the unemployment benefit.

Table 1
STRESS TEST SCENARIOS

Individual shocks			
Interest rate	+2 pps	+3 pps	+4 pps
Unemployment rate	+1 pps	+2 pps	+3 pps
Real estate prices	-10%	-20%	-30%
Rental payment	+12 pps	+14 pps	+16 pps
Basic living cost	+12 pps	+16 pps	+20 pps
Value of liquid assets (Stocks, bonds, and less liquid assets, respectively)	-10%, -10%, -20%	-20%, -20%, -40%	-30%, -30%, -60%
Combined shocks	Low-scale	Medium-scale	High-scale

Source: Central Bank of Malta.

[7] Based on data from the Bank's CCR, borrowers on average have around two years gap between maturity of loans and their retirement age. Thus, on average, there isn't enough flexibility for banks to grant an extension in the term to maturity of a loan.

Upon simulating a decline in the valuation of real estate, this reduction is assumed to be identical across different types of real estate assets (houses, apartments, non-residential property) and across different regions. The magnitude of the shock is applied on the value of property reported by the respondents as at the reference date, i.e., end 2020. Thus, the shocks disregard any possible increases in valuation to date since 2020, which effectively increases the overall magnitude and severity of the simulated decline. By negatively impinging on the value of collateral held by banks in the eventuality of a default, this shock affects the LGD.

An increase in the rental payments and basic living costs, similar to the interest rate shock, would increase the expenditure aspect of the FM for each household, and subsequently affect the banks' PD, EAD and LGD. These shocks do not incorporate the feedback of increases in income associated with higher inflation through the COLA mechanism. Therefore, the results for these shocks are more conservative, especially for lower income households as COLA is a partial wage indexation mechanism that is relatively more beneficial to the lower income households. The shock to rental payments affects a very small portion of households, as only approximately 5% of the sampled indebted households have any form of rental payment. Moreover, the magnitude of the shock on basic living costs considers the inflationary pressures that had in actual fact been experienced by households between March 2021 and December 2022.[8] During this period, the HICP index for Malta grew by 9.96%. Thereby, these shocks were designed to capture the household's vulnerabilities against a further increase of 2 percentage points, 6 percentage points and 10 percentage points, respectively, over and above the increase already experienced from data collection till end of 2022.

Finally, a shock to the value of liquid assets would directly affect the estimation of PD, as previously referenced. The value of stocks and bonds are assumed to decline by 10%, 20% and 30% whilst the value of less liquid assets is assumed to decline at a higher rate of 20%, 40% and 60%. This shock does not consider a case of bank failures and thereby the value of deposits are not affected.

Results

This section presents the effect of the hypothetical sensitivity shocks through their impact on household vulnerability as well as the impact on banks via the PD, EAD and LGD.

Consistent with the findings of the previous vintage, the results demonstrate that household vulnerabilities are most sensitive to simulated increases in interest rates and basic living cost. Nonetheless, when compared to the preceding iteration, both the average households' PD and the number of households with negative FM improved in the current version of results following the shock to interest rates. In this case, the simulated increase in rental payments does not lead to a significant impact given that this shock only affects a small fraction of the indebted households.

Table 2 presents the impact of the simulated shocks through the mean PD, EAD and LGD, with the latter two risk factors expressed as a ratio of total debt. This table shows the baseline results obtained prior to applying any shock, and the results for each individual shock, as well as the combined shocks thereafter. The low LGD ratio in the baseline already shows that most households are well collateralised, especially for households with mortgage related indebtedness.[9]

Similar to the results expressed in terms of FM, the simulated increase in interest rates and inflationary pressures have a higher impact also in terms of PD and EAD. Through an overall increase of 4 percentage points in interest rates, the average PD and EAD ratios as a percentage of debt increases

[8] Data collection for the 2020 HFCS wave was conducted between November 2020 and February 2021. (Antonaroli V., Deguara W. & Muscat A., 2022).

[9] A similar analysis was conducted by employing only the subsample of households who have outstanding mortgage debts. In such case, the LGD would become positive only following a hypothetical 30% decrease in the valuation of real estate and in the combined scenarios.

Table 2
STRESS TEST RESULTS

Shock	Magnitude of shock	Mean PD	EAD in % of debt	LGD in % of debt	Growth of LGD relative to baseline
Baseline		**4.19**	**2.26**	**0.08**	
Interest rate	+2 pps	4.68	2.85	0.08	1.00
	+3 pps	4.80	2.99	0.08	1.00
	+4 pps	4.95	3.13	0.08	1.00
Basic living cost	+12 pps	5.93	4.19	0.08	1.10
	+16 pps	6.21	4.52	0.09	1.12
	+20 pps	6.43	4.78	0.09	1.14
Combined shocks	Low-scale	6.36	4.70	0.09	1.22
	Medium-scale	6.90	5.40	0.11	1.50
	High-scale	8.33	6.45	0.32	4.16

Source: HFCS, Central Bank of Malta calculations. Data are multiply imputed and weighted.

by around 18% and 39% respectively in comparison to the baseline results. Notwithstanding, despite such increases in PD and EAD, the interest rate shock has not resulted in an increase in the LGD given that the LGD factor is affected by shocks that directly hit the risk mitigation factors of banks; i.e., house price shock on collateral value.

Similarly, simulating inflationary pressures on households through an increase in the basic living cost, has led to the largest increase in households with negative FM, as well as the largest increase in the average PD and EAD as a percentage of total debt, amongst all individual shocks. In fact, the mean PD and EAD ratio increased by 53% and 112% respectively under the most adverse magnitude of a 20 percentage points increase in basic living costs. The effect on the LGD ratio is again much more conservative in relative terms, increasing by 14% via heightened household vulnerability and higher PDs and EAD. Indebted households are also rather resilient to the simulated unemployment shock, with contained increases in the average PD, EAD and LGD ratios. In the most adverse scenario of a 3 percentage point increase in the unemployment rate, the PD, EAD and LGD increase by 14%, 32% and 5%, respectively, compared to the baseline scenario. The impact of the simulated decline in the value of real estate affects only the LGD ratio as it directly effects the value of collateral held by banks. The impact of this shock is only visible under the most adverse magnitude where the LGD ratio increases to 0.17%.

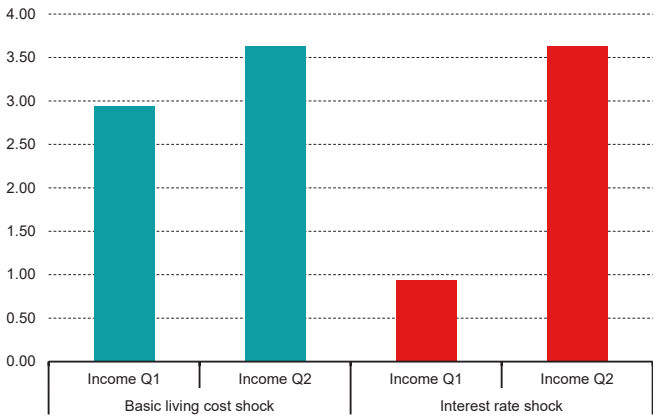
Following a hypothetical decline in the value of liquid assets, results show a rather conservative increase in the PD and EAD, and no effect on the LGD ratio. The results may be driven by the fact that deposits, which constitute 62% of all liquid assets, are assumed to remain unaffected by this shock.

As one would expect, the three combined scenarios show a more pronounced impact and more visible increases in the mean PD and EAD ratio. With respect to the LGD, increases are rather contained for the low-scale and medium-scale scenarios, but the effect is considerable in the high-scale scenario, mainly driven by the assumed 30% drop in the valuation of real estate property. The LGD ratio in the most adverse scenario is 0.32% of all total debt and therefore indicates that even in the aftermath of a strong negative economic shock targeted on the household sector, bank losses appear to remain contained.

The results are analysed further by looking into the profile of households, to identify those which are more vulnerable and more susceptible to the shocks applied. In this regard, the analysis focuses on those households which register a positive PD following the application of individual shocks, i.e., those households which had a 0% PD prior to the application of shocks given by ample liquid assets to sustain their dissaving, but which became positive post-shocks. These pertain to 1.74% and 1.21% of total indebted households for the shock to basic living cost and interest rates respectively. Indeed, these households are examined further and compared with the entire sample group by delving deeper into their FM including its composition of income and expenditure, as well as their average DSTI and LTV ratios before the occurrence of these shocks. The aim of this analysis is to shed light on the underlying factors that make such households more susceptible to these individual shocks.

Chart 2 depicts the share of households having registered a positive PD by their income distribution as a result of the increase to the basic living cost and interest rate. These impacted households pertain exclusively to the lower two income quartiles with income levels given by €23,500 at the 25th percentile (first quartile) and up to €33,300 at the 50th percentile (2nd quartile).[10]

Chart 2
SHARE OF IMPACTED HOUSEHOLDS BY INCOME QUARTILE
(per cent)



Source: HFCS, Central Bank of Malta. Data are multiply imputed and weighted.
Note: No households within the third and fourth quartile were impacted by either shock.

The shock to the basic living cost via inflation led to an increase in the share of households with positive PD to 2.94% within the lower income quartile, in comparison to the pre-shock condition. The increase in interest rates had a more limited effect on households within the same quartile which led to an increase in this share of households by 0.94%. Furthermore, these shocks also led to an increase in such share of impacted households to 3.63% within the second income quartile. This is driven by the fact that while in level terms, the number of vulnerable households in the lower quartile was higher prior to the application of such shocks, the share of households (weighted and thus upscaled to population) impacted by the shocks, increased by a higher magnitude in the 2nd quartile. In other words, 21% of households impacted by the interest rate shock are in the lower income quartile, whilst the remaining 79% are in the second quartile. On the other hand, 45% of vulnerable households to the basic living shock are in the lower income quartile, and the remaining 55% in the second income quartile.

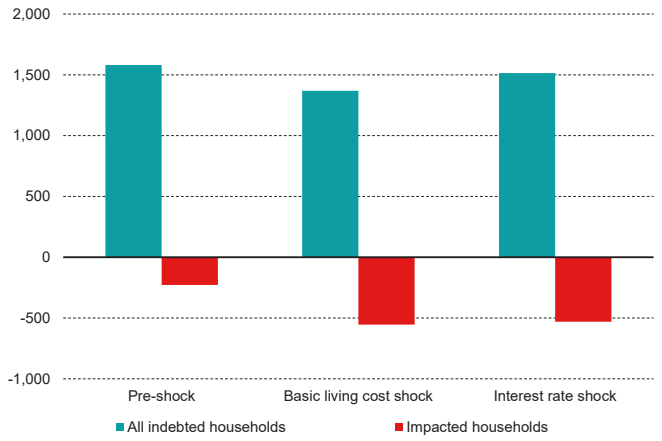
Charts 3 and 4 delve deeper into the FM and its components for all indebted households as well as those which are more impacted by the shocks (i.e., those registering a positive PD post shocks) to better comprehend the financial position of these households both pre – (baseline) and post- interest and basic living cost shocks.

This chart indicates that even before applying any shock, these households were already experiencing a negative FM, and therefore were dissaving. In the baseline, the average monthly household

[10] As previously referenced, the effects of these shocks are more pronounced towards the lower income households as fiscal incentives that increases income to counter inflationary pressures, such as COLA, are not considered within the framework.

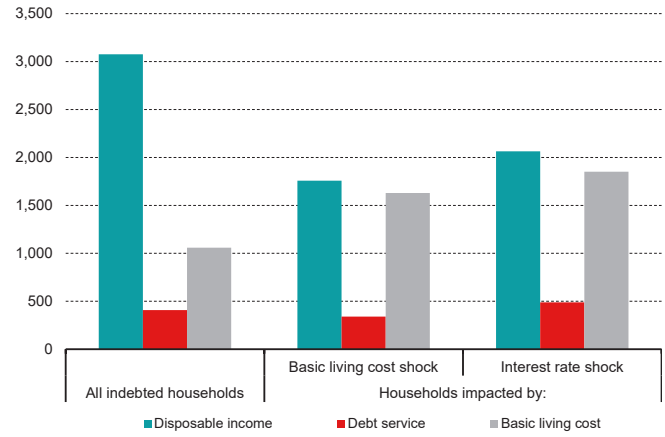
FM for all indebted households stood at €1,580 whilst for the subset of impacted households, this stood at a negative €228. Each of the shocks has exacerbated this difference, with the average FM decreasing to negative €554 and negative €530 post the shock to basic living cost and interest rate respectively. These shocks increase the household's dissaving rate such that this exceeds the amount of dissaving such households could finance through their liquid assets for a duration of 30 months, thereby registering an increase in their PD rate.

Chart 3
AVERAGE FINANCIAL MARGIN
(EUR)



Source: HFCS, Central Bank of Malta. Data are multiply imputed and weighted.

Chart 4
MAIN COMPONENTS OF FINANCIAL MARGIN
(EUR)



Source: HFCS, Central Bank of Malta. Data are multiply imputed and weighted.

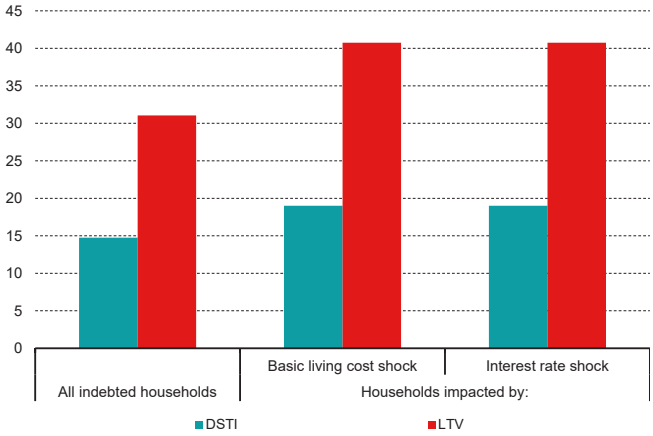
Chart 4 compares the three main components in the FM, namely the disposable income, debt service and basic living cost, for the impacted households, against all indebted households, before the application of any shock. Overall, households impacted by either of the shocks had lower monthly disposable income compared to the average of all indebted households. The average disposable income for the impacted households is 42.8% (impacted by shock to basic living cost) and 32.9% (impacted by shock to Interest rate) lower than the average disposable income of all indebted households, respectively.

Average monthly debt service is 16.6% lower for households impacted by the shock to the basic living cost compared to all indebted households. On the other hand, the average monthly debt service is 20% higher for households impacted by the interest rate shock, in comparison to all indebted households.

Chart 4 also illustrates that impacted households had higher consumption patterns (in absolute terms; as indicated by the basic living cost) compared to the average of all indebted households. The average basic living costs for the impacted households following the application of basic living costs and interest rate shocks respectively, were 53.8% and 74.8% higher than of all indebted households. All in all, impacted households had both higher levels of consumption and as well as lower disposable income, making them more susceptible to dissave.

Chart 5 shows that households impacted by the shock to basic living costs and interest rates also have a higher DSTI and LTV ratio prior to the application of any shock, compared to the average ratios for all indebted households. The average DSTI ratio for all indebted households stood at 14.74%, whilst households vulnerable to the interest rate and basic living cost shock had an average DSTI ratio of 19%.[11] The average LTV ratio of the impacted households is also higher at 40.74%, compared to the LTV ratio for all indebted households, which stood at 31.06%. In this regard, households which have relatively higher DSTI and LTV ratios are more susceptible to interest rate shocks and inflationary pressures.

Chart 5
AVERAGE DSTI AND LTV OF IMPACTED HOUSEHOLDS
(per cent)



Source: HFCS, Central Bank of Malta. Data are multiply imputed and weighted.

Conclusions

The objective of the stress testing framework is to assess the resilience of the Maltese household sector to a series of shocks that target specific risks, thereby detecting any possible vulnerabilities. The framework also includes reference to the potential losses that banks may incur in the event of defaults under unfavourable macro financial conditions. The shocks considered relate to hypothetical increases in interest rates, basic living costs, unemployment rates, rental payments, and decreases in the value of real estate property and liquid assets; with the former two receiving more attention given the prevailing environment.

The simulation results show that shocks to basic living costs, and to a lesser extent, interest rates, have the most significant impact on the household's FM and PD, as well as on the EAD. Households having a negative FM, representing 9.8% of the population, are more susceptible to adverse shocks given that their income falls short of their overall consumption, even before any of the shocks are applied. In addition, compared to the previous iteration, households have a much lower share of reported liquid assets, although still high, leading to a higher extent of vulnerable households.

A further deep dive into households whose PD became positive (i.e., from a 0% PD to a positive rate) following shocks to basic living costs and interest rates, revealed that before the application of any shock, these households had a lower and thus more stretched FM, compared to the sample of indebted households. Their vulnerability, given by their dissaving pattern is predominantly the result of a combination of lower disposable income and higher consumption expenditure. Furthermore, the analysis also indicates that both the average DSTI and LTV ratios were elevated, in comparison to the sample of indebted households. These weaknesses were further exacerbated by the two aforementioned shocks applied.

[11] The DSTI is based on reported values of debt servicing and income and is not indicative of the DSTI at loan origination. Furthermore, this estimate pertains only to those households with a positive PD (i.e., the number of households whose PD increased from 0% to a positive value) following a shock to interest rates and basic living costs.

In terms of banks, the most substantial impact arises from the LGD linked to the reduction in collateral values held by banks, associated with the highest shock to the value of real estate property. The second largest impact arises from the shock in the value of liquid assets which has only a marginal effect on bank losses, as deposits represent a substantial portion of liquid assets that remain unaffected by the shock. The combined shocks lead to the strongest increases in defaults and bank losses, although their impacts remain contained.

The analysis corroborates findings from other analyses in that pockets of vulnerabilities exist especially for households at the lower end of the income distribution and stretched borrower metrics. However, after introducing the liquidity dimension, through the FM, the overall analysis indicates that the Maltese household sector appears to be more resilient to adverse economic shocks, primarily due to its general ability to tap into its ample liquidity buffers.

References

Abela, K., and Georgakopoulus, I. (2022). *A Stress Testing Framework for the Maltese Household Sector.* Available from: https://www.centralbankmalta.org/site/Reports-Articles/2022/WP-04-2022.pdf.

Ampudia, M., van Vlokhoven, H., and Zochowski, D. (2016). *Financial fragility of euro area households*, Journal of Financial Stability, 27, pp. 250-262.

Antonaroli V., Deguara W., and Muscat, A. (2022). *Household Finance and Consumption Survey: Main findings from the 2020 wave*. Central Bank of Malta *Research Bulletin* 2022, pp. 7-13. Available from: https://www.centralbankmalta.org/site/Economics/Research-Bulletin-22-HFCS.pdf.

Giordana, G., and Ziegelmeyer, M. (2018). *Stress testing households balance sheets in Luxembourg*, Banque Centrale du Luxembourg Working Paper 121.

Merikull, J., and Room, T. (2017). T*he financial fragility of Estonian households: Evidence from stress tests on the HFCS microdata*, Eesti Pank Working Paper Series 4/2017.

4. INSURANCE COMPANIES AND INVESTMENT FUNDS

4.1 Domestically-relevant insurance companies

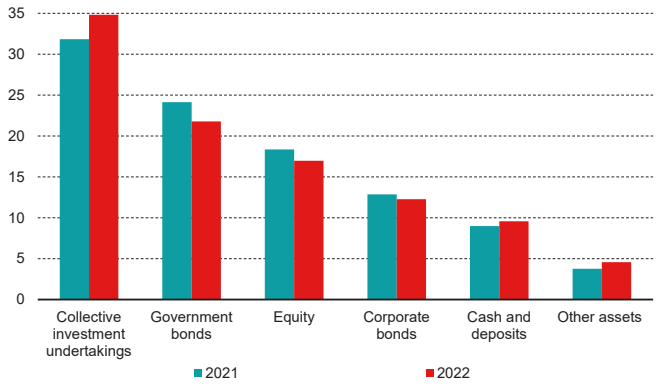
During 2022 four insurers surrendered their licence while a new company was formed bringing the number of licensed insurance companies in Malta to 68. While the domestically-relevant insurance companies remained unchanged at nine, their assets decreased by 10.9% to €3.6 billion, equivalent to 21.5% of GDP. The drop was driven by the four life insurance companies, as otherwise the other five insurance companies which specialise in non-life insurance reported higher assets in aggregate.[1]

Domestically-relevant insurance companies re-insured a median of 17.7% of their premia with foreign reinsurance companies, marginally lower than the 19.4% in the previous year. Although reinsurance is meant to mitigate risks on their books, based on the duration and nature of their liabilities, as well as their risk appetite, it also increases their connectedness with foreign counterparties.[2]

4.1.1 Domestically-relevant life insurance companies

The volatility in financial markets in 2022 affected the valuation of life insurers' investment portfolios, primarily reflecting losses in fixed-income securities due to the market price changes following monetary policy tightening. This resulted in these companies' overall assets to drop by 13.0% to €3.1 billion. As a result, the composition of the life insurers' investment portfolios has changed, with the share of collective investment undertakings (CIUs) increasing to roughly 35%, while the share of bond and equity holdings decreased (see Chart 4.1).

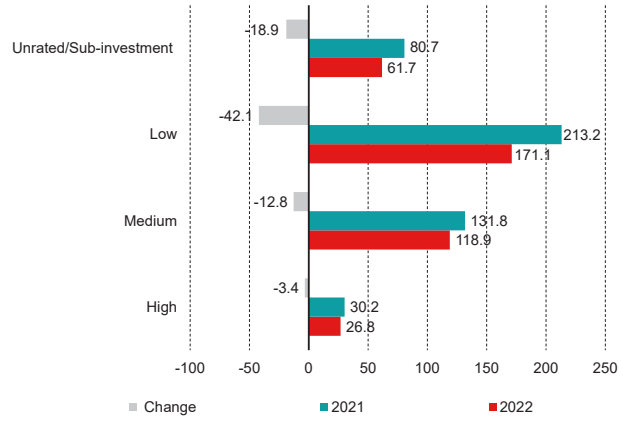
Chart 4.1
COMPOSITION OF ASSETS HELD BY THE DOMESTIC LIFE INSURANCE SECTOR
(per cent of total assets)



Source: Central Bank of Malta.
Note: Other assets mainly include deferred tax, property, recoverables and receivables, collateralised securities, structured notes, mortgages and loans.

The value of sovereign bond holdings declined by 21.5%, while corporate bond holdings fell by 17%. Notwithstanding, insurers' fixed-income investments continued to be skewed towards sovereign bonds, which accounted for around 64% of the bond portfolios as at end 2022. The majority of the sovereign bond holdings comprised of high and medium-rated euro area paper, with Maltese sovereign bonds limited to just above a fifth of the overall sovereign bonds held.

Chart 4.2
CORPORATE BOND PORTFOLIOS – INVESTMENT RATINGS – LIFE INSURANCE SECTOR
(EUR millions)



Source: Central Bank of Malta.

The rating of the corporate bond portfolios improved somewhat in 2022, with high and medium-rated bonds accounting for 38.5% of the bond portfolios, up from 35.5% the previous year, despite declining in absolute terms (see Chart 4.2).

[1] Two of these non-life insurance companies are also licensed to sell life insurance, however the life business only accounts for 5.3% of their total gross written premia.
[2] Non-life insurers tend to reinsure a greater share of their written premia. The median reinsurance part of premia was 8.3% for the life insurance sector and 35.0% for the non-life insurance sector.

Nonetheless, at 61.5%, unrated and sub-investment grade corporate bonds maintained a dominant share in the corporate bond portfolios, despite decreasing in both absolute terms and as a share of overall bonds. This resulted in a sustained concentration risk towards corporate exposures with relatively higher credit risk. Corporate bond holdings remained concentrated towards the euro area, with the exposure to Maltese companies accounting for only 7.2% of the corporate bond portfolios.

In 2022, equity markets experienced increased uncertainty, which drove the overall value of equity holdings down by 19.5%, even though life insurers took the opportunity of investing in equities at lower prices. Equity holdings remained primarily concentrated in NFCs based in the US and the euro area, with domestic entities accounting for just 17.3% of the total equity portfolios, primarily in firms operating in the real estate and the financial and insurance sectors.

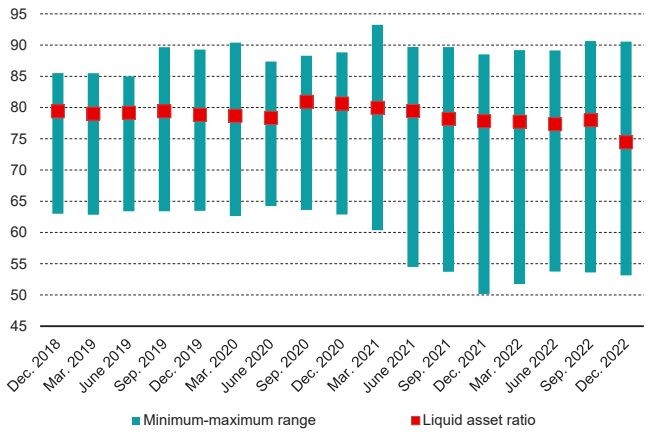
Participation in CIUs also declined, but by a more contained rate of 4.8%. As a result, their share in overall assets rose to more than a third. Drops were recorded across participations in euro area equity and debt funds, but investments in euro area money market funds (MMF) and intragroup infrastructure funds rose.

Domestic life insurance companies continued to maintain almost a tenth of their balance sheet in cash and deposits, though over the year these contracted by 7.3%. The deposits were held almost entirely with domestic banks. Other assets include property, which is primarily held for investment purposes and accounted for 4.2% of their balance sheet. Mortgages and loans increased marginally but remained limited to 0.8% of the aggregate balance sheet, reflecting domestic life insurers' limited involvement in non-traditional operations.

The liquid assets ratio fell by 3.4 percentage points to 74.5% in 2022, largely because of lower holdings of sovereign bonds and equities (see Chart 4.3). Heterogeneity among life insurers remained noticeable, albeit declining slightly compared to a year ago.

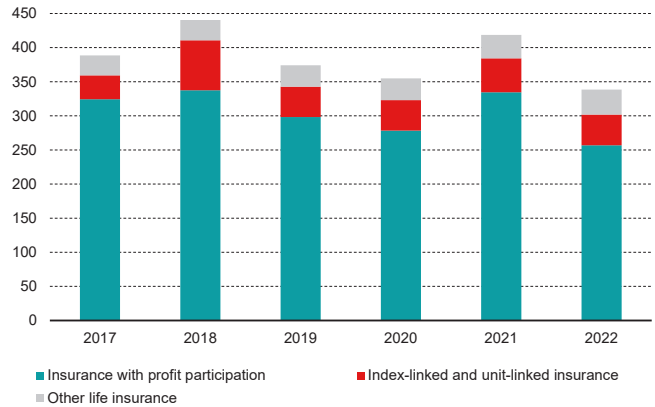
Gross written premia decreased by 19.3% in 2022, with the fall mainly reported in the second half of the year (see Chart 4.4). This also reflected the volatility experienced in financial markets, with the largest contraction observed in products offering 'insurances with profit participation,' where premia fell by 23.2% compared to 2021 as clients shied away from such investments. As a result, their share of overall

Chart 4.3
LIQUID ASSET RATIO OF THE DOMESTIC LIFE INSURANCE SECTOR
(per cent)



Source: Central Bank of Malta.

Chart 4.4
GROSS WRITTEN PREMIUM OF THE DOMESTIC LIFE INSURANCE SECTOR BY LINE OF BUSINESS
(EUR millions)



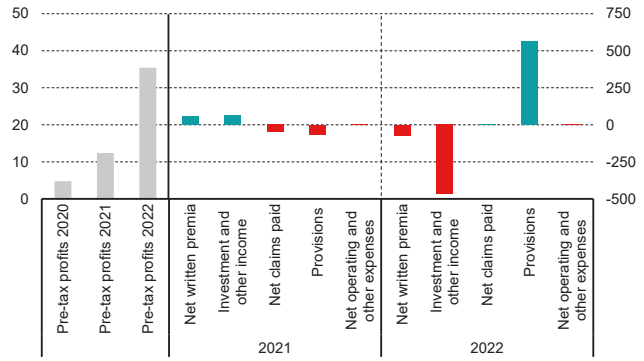
Source: Central Bank of Malta.

premia fell by 4.0 percentage points, but at 75.9%, these products still accounted for the bulk of premia. While 'index and unit-linked policies' also declined, in line with market volatility, their share of gross written premia climbed to 13.3%. This shows an overall decline in demand for such policies. Otherwise, the gross written premia of 'other life insurance products,' which includes mortgage life insurance, increased by 6.6%, to reach about 11% of gross written premia, in line with the continued strong interest in the property market.

Against the backdrop of adverse financial market developments, the life insurance sector registered a loss on investments, with a decrease of €467.6 million compared to the previous year's gains (see Chart 4.5). Furthermore, net written premia also decreased by 18.9%, while operational expenses increased by 2.4%, both negatively impacting life insurers' profitability. Nevertheless, life insurance companies were able to increase their profitability, with a profit before tax of €35.4 million in December 2022, an increase of 186.0% over the previous year. This increase in profits can be attributed to two factors, a reduction of €561 million in provisions for unearned premia and claims, coupled with a small decline in net claims of 1.3%. This resulted in 7.3 and 0.8 percentage points increases in the ROE and ROA, respectively, to 11.2% and 1.1% by December 2022. The expense ratio, which compares net premia after reinsurance to the costs incurred to obtain and maintain policies, rose by 2.6 percentage points to 13.0%.

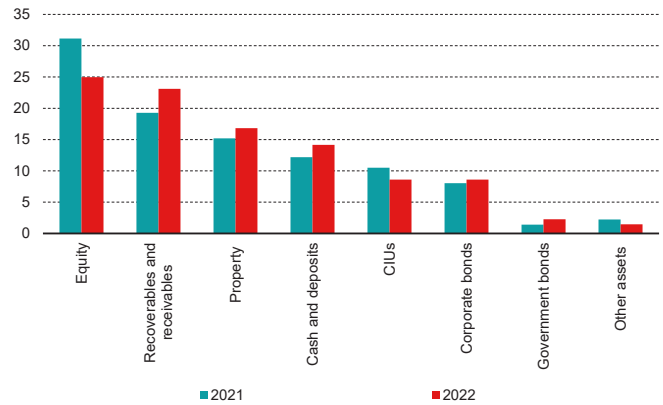
The capitalisation of life insurance firms has been somewhat negatively impacted by the inflationary pressures and interest rates hikes, resulting in higher capital requirements while overall eligible own funds fell. As a result, the overall Solvency Capital Requirement (SCR) coverage ratio fell by 47.5 percentage points to 170.5%. Nevertheless, such ratio remained well above regulatory requirements and the quality of eligible own funds has remained strong, with nearly all held in the highest quality category composed of Tier 1 capital.[3]

Chart 4.5
MAIN CONTRIBUTORS TO PROFITS – DOMESTIC LIFE INSURANCE SECTOR
(EUR millions)



Source: Central Bank of Malta.
Note: Grey bars indicate pre-tax profits in absolute amounts. Teal (positive) and red (negative) bars indicate yearly contribution to profits. These figures are based on management accounts.

Chart 4.6
COMPOSITION OF ASSETS HELD BY THE DOMESTIC NON-LIFE INSURANCE SECTOR
(per cent of total assets)



Source: Central Bank of Malta.
Note: Other assets mainly include mortgages and loans.

4.1.2 Domestically-relevant non-life insurance companies

The balance sheet of domestic non-life insurers expanded by 2.9% to around €539 million in December 2022, or 3.2% of GDP. The most significant increase was in recoverable and receivables, which occurred primarily in the first half of the year, to represent about 23% of their assets (see Chart 4.6). Otherwise, the investment portfolios of non-life insurers fell, driven by equity holdings, which decreased by 4.8% to around 56% of the

[3] The Solvency II Directive mandates that insurance companies to hold own funds that are at least equal to the SCR, which translates into a SCR coverage ratio of 100%.

investment portfolios, or around 25% of assets. The share of CIUs also declined slightly to 19.4% of investment holdings. In contrast, bond holdings increased by 6 percentage points to 24.0%.

Non-life insurers' bond portfolioss grew by 18.6%, largely in the second half of the year, as they took the opportunity to buy high-quality bonds at discounted prices as bond yields rose. Growth was driven mostly by sovereign bonds, although corporate bond holdings also increased. As a result, non-life insurers' holdings of high-quality bonds more than doubled but remained limited to 8.2% of the bond portfolios. Holdings of medium-rated bonds climbed by more than a quarter to 23.6% of the overall portfolios, while the share of corporate bonds rated in the lowest investment-grade category or unrated/sub-investment declined but continued to represent a significant share of the overall portfolios at 35.3% and 41.7%, respectively.

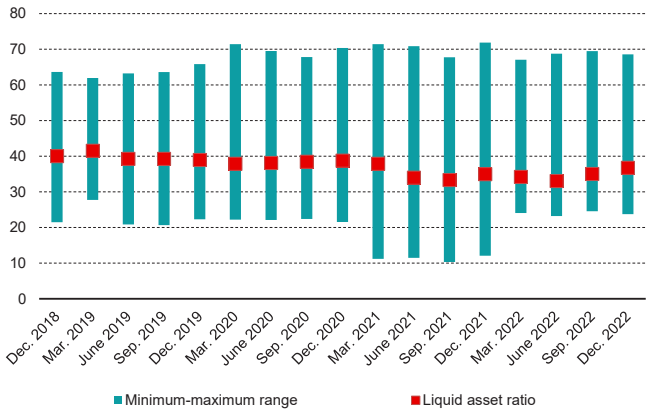
In contrast, the value of equity holdings fell by 17.5%, owing predominantly to the drop in financial markets, as otherwise non-life insurers sought to increase their holdings by taking advantage of the bear market. The proportion of equity holdings to total assets fell by 6.6 percentage points to 25.0%. Similarly, participation in CIUs declined to 8.6% of overall assets.

Cash and cash equivalents increased by 19.5% to 14.2% of total assets. Additionally, non-life insurers' exposure to the domestic real estate market increased slightly to 16.8% of total assets, while other assets declined to account for only 1.5% of these firms' total balance sheet holdings.

The liquid assets ratio in the non-life sector climbed by 1.7 percentage points to 36.7% in December 2022, owing mostly to the increase in cash and bond holdings (see Chart 4.7). Furthermore, compared to December 2021, the disparity between non-life insurers narrowed, indicating a considerable improvement in the least liquid non-life insurance companies.

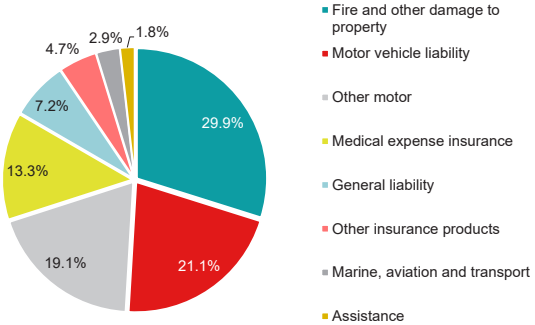
Gross written premia increased by 10.2% in 2022, to nearly €288 million. This reflected increases of varying extent in most lines of business except for income protection insurance and workers' compensation insurance, both of which fell slightly. Property damage and general liability insurance registered the largest growth in written premia, at 12.2% and 25.2%, respectively. As a result, property damage insurance accounted for almost 30% of total gross written premia, reflecting the continued high interest in the property market (see Chart 4.8). The motor-related category climbed

Chart 4.7
LIQUID ASSET RATIO OF THE DOMESTIC NON-LIFE INSURANCE SECTOR
(per cent)



Source: Central Bank of Malta.

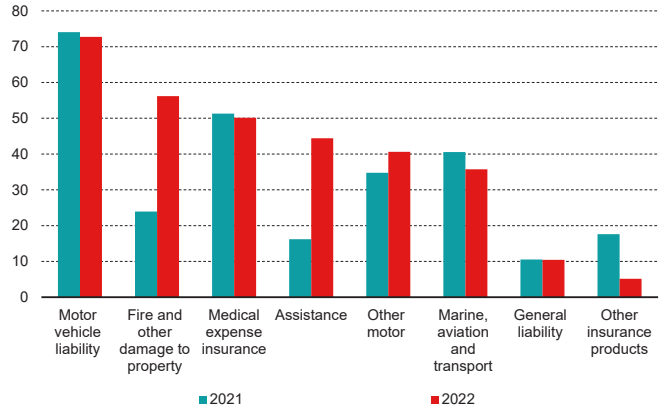
Chart 4.8
GROSS WRITTEN PREMIUM OF THE DOMESTIC NON-LIFE INSURANCE SECTOR BY LINE OF BUSINESS
(per cent)



Source: Central Bank of Malta.
Note: Solvency II Reporting. Other insurance products include workers' compensation, income protection, miscellanous financial loss, other life insurance and profit participation, index-linked and unit-linked insurance.

by 6.7% and continued to be the most important non-life business segment, accounting for 40.2% of overall written premia. The increase in gross premia was offset by higher gross claims, resulting in the pay-out ratio to increase from 40.6% in 2021 to 50.3% in 2022.[4] The highest pay-out continues to be reported in the motor vehicle liability, where around 73% of the premia was paid out as claims (see Chart 4.9). Property damage follows, albeit at a lower rate of about 56%. The marine, aviation and transport, medical insurance, and other smaller business classified as 'other' have meanwhile recorded a drop in their pay-out ratio.

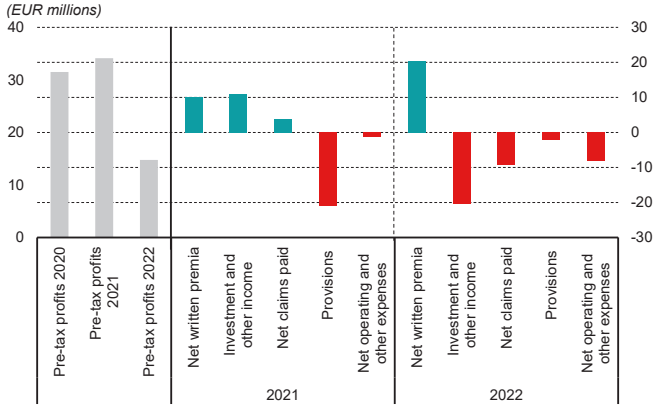
Chart 4.9
GROSS PAYOUT RATIO BY LINE OF BUSINESS
(per cent)



Source: Central Bank of Malta.
Note: Solvency II reporting. Other insurance products include income protection, miscellaneous financial loss and workers' compensation insurance.

The non-life sector reported an aggregate profit before tax of €14.8 million in December 2022, a decrease of 56.8% compared to the previous year, pushing the pre-tax ROE and ROA down by 8.9 and 3.8 percentage points, to 7.0% and 2.8%, respectively in December 2022. This was driven by lower investment income which fell by €20.5 million, in view of unfavourable market dynamics (see Chart 4.10). Furthermore, increases in net claims paid and operating expenses increased by €9.1 million and €8.1 million, or 12.7% and 13.2%, respectively in part reflecting the consequences of increased inflation. High inflation also contributed to the technical provisions to increase by €2.0 million, or 14.2%, reflecting the expectation of further increases in the costs of forecasted claims and operational expenditures. On the other hand, the decrease in profitability was alleviated by an increase in net written premia of €20.5 million, or 12.0%. As operational developments almost offset each other, the combined ratio increased marginally by 0.8 percentage points to 77.2%, staying below 100%, indicating that non-life insurers were still able to generate positive underwriting results.

Chart 4.10
MAIN CONTRIBUTORS TO PROFITS – DOMESTIC NON-LIFE INSURANCE SECTOR
(EUR millions)



Source: Central Bank of Malta.
Note: Grey bars indicate pre-tax profits in absolute amounts. Teal (positive) and red (negative) bars indicate yearly contribution to profits. These figures are based on management accounts.

The solvency position of non-life insurers remained strong, with the overall SCR coverage ratio standing at 239.1% as at end 2022, a 6.3 percentage-point decrease from the previous year. This however remained significantly higher than regulatory capital requirements, with the quality of eligible own funds robust, nearly all held in Tier 1 capital.

4.1.3 Risk outlook

Global concerns in 2022 shifted away from the pandemic toward heightened geopolitical risks, rising inflationary pressures, and the ensuing financial tightening. As a result, financial markets were adversely impacted,

[4] When the reinsurance part is included, a net pay-out ratio of 48.1% in 2021 would be reported, rising to 48.6% in 2022.

translating into substantial losses in investment income and significant changes in the composition of balance sheets. Heightened uncertainty remains, and the outlook for the global economy is still overshadowed by the war in Ukraine, inflation, as well as concerns on financial vulnerabilities. Such developments could continue to exert pressure on the domestic insurance sector, particularly for non-life insurers, which are more vulnerable to rising claims costs. In contrast, most pay-outs for life insurance policies and annuities are fixed in monetary terms and do not increase in line with inflation. However, due to its negative impact on policyholders' disposable incomes, inflation presents underwriting risks for the insurance sector in general, as it may result in a drop in demand for insurance products. This has already started to manifest itself in lower demand for life insurance products. Yet, the fact that insurers continue to be well capitalised means that the sector is well positioned to absorb shocks.

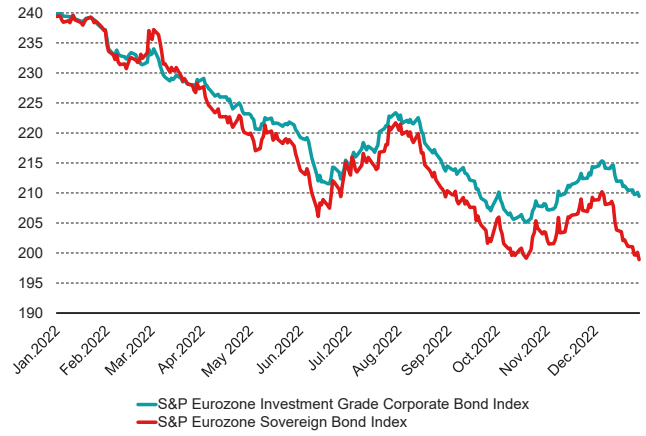
4.2 Domestically-relevant investment funds

By the end of December 2022, 37 sub-funds were classified as domestically-relevant.[5] All but one remained licensed as retail Undertakings for the Collective Investment in Transferable Securities (UCITS), with the remaining sub-fund licensed as a Professional Investor Fund (PIF).

The overall assets of these sub-funds decreased by 18.7% to €1.5 billion, representing about 9% of GDP. This reflected market changes, partly driven by tighter monetary policies by major central banks to fight inflation. Both equity and bond prices plunged, even though portfolios managers generally use bonds as portfolios stabilizers and a diversifier to stocks. Indeed, the major European corporate and sovereign bond indices registered significant declines throughout the period (see Chart 4.11). Furthermore, after recovering from the effects of the pandemic, the equity market once again experienced strong declines, driven by tightening financing conditions, increased uncertainty, and geopolitical developments. In fact, both the Euro Stoxx 600 and the S&P 500 registered significant losses, especially in the third quarter of 2022, strongly impacting the results of funds exposed to them.[6]

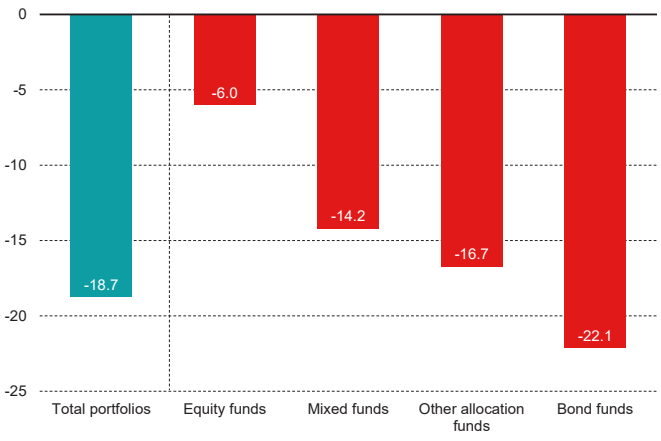
Bond funds contracted by 22.1% during 2022, with 15 sub-funds accounting for 67.8% of the overall assets, a slightly lower share when compared to the previous year (see Charts 4.12 and 4.13). The decline in equity funds was more contained, representing 13.0% of overall assets. The remaining sub-funds,

Chart 4.11
PERFORMANCE EUROZONE BONDS INDICES
(index)



Sources: S&P; Central Bank of Malta.

Chart 4.12
CHANGES IN OVERALL ASSETS BY MAIN STRATEGY
(per cent)



Source: Central Bank of Malta.

[5] Three sub-funds were excluded by end 2022 as they either surrendered their licenses or were redeemed while two new sub-funds were included as domestic relevant. For analysis purposes, the domestically-relevant sub-funds active in the respective period are considered within the respective periods.

[6] This for example reflected the uncertainties originated from the turmoil in the UK government bond market last autumn that spread into other markets.

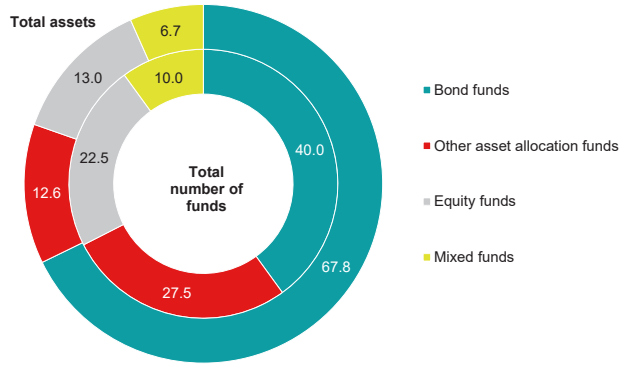
being other allocation funds and mixed funds, also reported drops in their asset values, standing at 12.6%, and 6.7% of the overall assets, respectively.

4.2.1 Asset composition and investment strategies

Fixed-income securities remained the main instrument of choice for domestically-relevant investment funds, accounting for around two-thirds of the domestic sub-funds' overall portfolios (see Chart 4.14). However, these declined by almost 20% to their lowest share in the last five years. The sharp increase in interest rates significantly impacted market prices, prompting fund managers to shift towards a more equity-oriented exposure, in search for higher returns to balance the losses registered in the bond market. Although equity holdings fell by 10.3%, this was driven by price developments as otherwise funds sought to increase their holdings. As a result, the share of equity holdings on overall assets rose by 2.7 percentage points, representing the highest share in the same period under review. Meanwhile, cash and deposits continued to decline, dropping by 2.0 percentage points to 4.9% of overall assets. Nonetheless, liquidity concerns for domestically-relevant investment funds remained contained (see section 4.2.3).

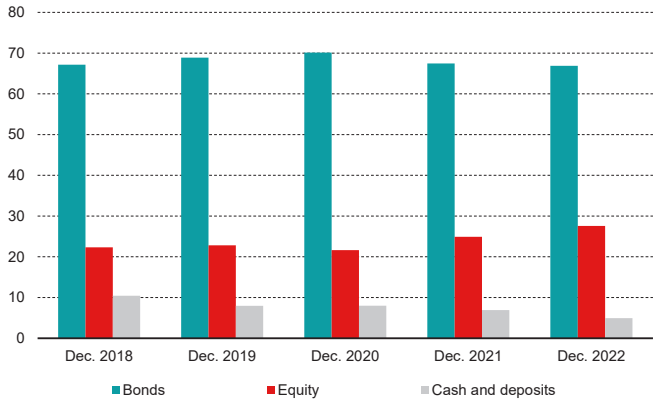
A significant share of the bond holdings remained invested in sovereign bonds, even though these registered strong declines of around 27%. As a result, their share declined by 4.7 percentage points to 46.3% of the overall bond portfolios (see Chart 4.15). The drop was mainly driven by holdings of MGS, which fell by 29.1%, although they continued to represent the bulk of sovereign bonds, accounting for 85.9% of the overall share of sovereign bonds. In contrast, holdings

Chart 4.13
DOMESTIC INVESTMENT FUNDS BY MAIN STRATEGY AS AT DECEMBER 2022
(per cent)



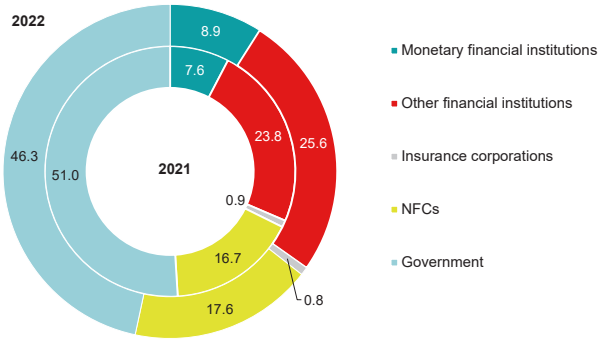
Source: Central Bank of Malta.

Chart 4.14
ASSETS COMPOSITION OF THE DOMESTICALLY-RELEVANT INVESTMENT FUNDS
(per cent)



Source: Central Bank of Malta.

Chart 4.15
BOND HOLDINGS COMPOSITION OF DOMESTICALLY-RELEVANT INVESTMENT FUNDS
(per cent)



Source: Central Bank of Malta.
Note: Other financial institutions includes OFIs, financial auxiliaries and captive financial institutions and money lenders.

of euro area and US sovereign bonds rose to represent 4.9% and 4.1%, respectively of the overall bond portfolios.

Corporate bonds declined by 14.7%, but their share in the overall bond portfolios rose by 0.9 percentage point to 17.6%. Exposure to Maltese firms remained limited to almost a third of NFC bonds, with the rest primarily consisting of companies located in other euro-area countries and the United States.

The share of financial corporate bonds also rose, up by around 3 percentage points to 35.3%, largely driven by bonds of institutions classified as other financial Institutions. Although the value of such holdings declined by 11.8%, their share in the overall bond portfolios rose by 1.8 percentage points to just above a fourth of all bonds. While bonds issued by monetary financial institutions also fell by 5.7%, their share increased by 1.3 percentage points to 8.9% of the overall bond holdings. At 47.2%, domestic bank bonds continued to represent an important share of such holdings. Bonds of insurance firms remained limited to less than 1% of the bond portfolios, with the majority of such holdings related to insurance firms located in other euro area countries, with no exposure to domestic insurances.

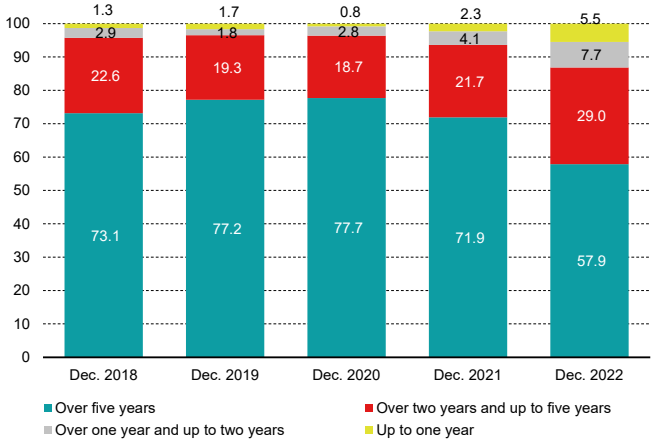
The overall bond portfolios continued to present a strong domestic bias, as around 63% of the debt paper was issued by Maltese entities, largely reflecting sovereign exposure. Meanwhile, around 17% reflected bonds issued by euro area countries, with the remaining share representing bonds issued by entities based in other countries, largely dominated by US bonds.

Adverse macroeconomic developments and the monetary policy tightening prompted fund managers to alter their investment strategies, adopting a bond laddering approach focused on reducing the exposure to interest rate volatility. As a result, the maturity structure of the bond portfolios changed, with the share of long-term bonds with an outstanding maturity of over 5 years declining significantly (see Chart 4.16). After reaching almost 78% of the overall portfolios at the end of 2020, the share of such bonds decreased somewhat in 2021, and more significantly in 2022, to 57.9% of the overall bond holdings. Meanwhile, the portfolios were balanced by an increase in short- and medium-term bond holdings, with the largest growth registered in bonds with an outstanding maturity of between two and five years, which rose by 7.3 percentage points, reaching 29.0% of the overall bond holdings.

As a result, the duration of the portfolios also declined. Estimates for the modified duration, which is a financial indicator[7] that expresses the percentage change in the bonds portfolios value given a 1% change in the interest rate, dropped to 5.4% by end 2022, from the 7.0% registered twelve months earlier (see Chart 4.17).

By the end of 2022, equity holdings declined by 10.3%, mainly due to price effects as the result of the market turbulence during the period under review. They remained largely allocated towards non-MMF investment funds, accounting for 47.2% of the overall holdings,

Chart 4.16
OUTSTANDING MATURITY STRUCTURE
(per cent of NAV)



Source: Central Bank of Malta.

[7] The modified duration is a financial metric to measure the bond's price sensitivity to a 1% change in interest rates. Meaning, that a given 100 basis-point movement in yield, a security with a Modified Duration of 5.4, would inversely move in price-by-price by 5.4%.

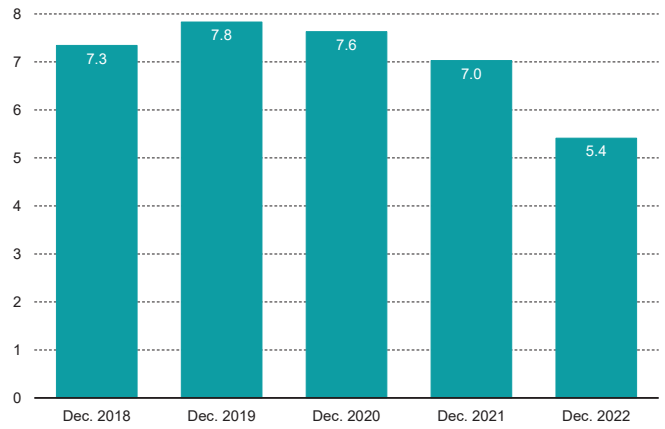
representing a decrease of 1.5 percentage points compared to end 2021 (see Chart 4.18). Meanwhile, corporate stock continued to represent the second largest share of the equity portfolios, registering a slight decrease of 0.8 percentage point, standing at 29.0% of equity holdings. Such decline was balanced by an expansion of 2.5 percentage points in bank stocks, rising just above 13% of the overall equity holdings. Holdings of stocks of OFIs remained relatively stable, while stocks of insurance corporations declined by 0.6 percentage point, with their share in the equity portfolios becoming even more limited.

In terms of geographic exposure, at 47% the equities portfolios remained largely European-oriented, notwithstanding recording the largest drop in terms of share. The decline was counterweighed by a larger participation in domestic equities, which increased by 2.6 percentage points to 40.4% of the overall equity holdings. Standing at 6.3%, exposure to US-based entities remained relatively stable, while the exposure to other countries continued to represent a small share of about 5.9%.

4.2.2 Investors

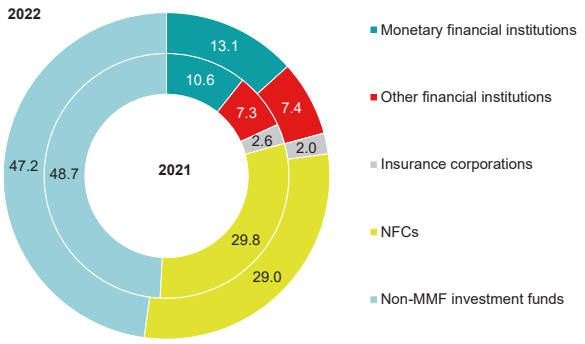
Despite declining by 2.4 percentage points by the end of 2022, Maltese households remained the principal investors in domestically-relevant sub-funds, accounting for 55.6% of the total net asset value (NAV), the lowest share recorded in the past five years (see Chart 4.19). The drop in NAV also reflected investments by domestic banks, whose share fell by 1.1 percentage points to just 3.0%, reflecting redemptions incurred by one sub fund. Although holdings by domestic OFIs, insurance firms and NFCs declined, their share in overall NAV rose, standing

Chart 4.17
MODIFIED DURATION OF THE PORTFOLIOS
(per cent)



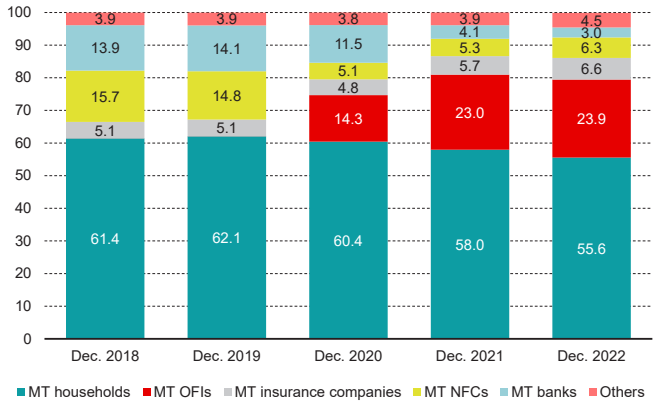
Source: Central Bank of Malta.

Chart 4.18
EQUITY HOLDINGS COMPOSITION OF DOMESTICALLY-RELEVANT INVESTMENT FUNDS
(per cent)



Source: Central Bank of Malta
Note: Other financial institutions includes OFIs, financial auxiliaries and captive financial institutions and money lenders.

Chart 4.19
DOMESTIC INVESTMENT FUND'S NAV BY COUNTERPARTY
(per cent)



Source: Central Bank of Malta
Note: Others include investment from domestic investment funds, and all investments from the euro area and rest of the world.

at 23.9%, 6.6% and 6.3% of overall NAV, respectively. Consequently, Maltese OFIs, such as financial auxiliaries and captive financial institutions, remained the second largest segment of investors, in line with the trends observed since 2020. Investments by non-residents remained limited to 4.4% of the total NAV, reflecting the domestic focus of these sub-funds.

4.2.3 Liquidity and leverage

Throughout 2022, domestically-relevant investment funds registered high liquidity levels along with low leverage rates. Overall, the healthy liquidity position is due to the strong holdings of liquid assets in their portfolioss, such as highly rated sovereign debt and equities. Nonetheless, the liquidity ratio decreased by 1.7 percentage points to 69.7%, mostly reflecting the fast pace of decline in the holdings of sovereign bonds.

Meanwhile, leverage of domestically-relevant sub-funds remained limited, partly because most of them are licensed and regulated under the UCITS Directive.[1] Despite the high volatility in financial markets and significant losses throughout the year, the leverage of domestically-relevant investment funds, calculated as AUM-to-NAV ratio, stood at 100.3% at the end of 2022, marginally lower than the 100.6% registered twelve months earlier.

4.2.4 Risk outlook

The nature of the geopolitical and market events experienced in 2022, including the monetary policy tightening by major central banks, which impacted significantly the bond markets. European equity markets also suffered losses, largely driven by the stress in the UK government bond market, impacting the overall market performance. Nonetheless, concerns on domestically-relevant investment funds are somehow limited. This is not only due to their low leverage but also because of the high liquidity rates they operate with, where liquid assets represent around 70% of overall assets on average. However, in case of severe market distress, several liquidity management tools such as redemption gates and redemption fees are available for most of the funds.

Despite reducing their exposure to interest rate volatility, as observed in the decrease in the modified duration and the smaller share of fixed-income securities with longer term maturities, further interest rates increases are likely to negatively affect the performance of domestically-relevant investment funds. This may prompt asset managers to pursue a yield-oriented strategy, increasing the exposure towards equities, and continue in their bond laddering investment approach, to deliver stable returns to their investors.

Domestically-oriented sub-funds are structurally connected with the core domestic banks. Not only by the fact that most of these sub-funds are managed by asset management companies owned by these banks, but also through holdings of securities issued by them. Although the share of domestic banks as investors have been declining over the past four years, to just around 3.0% of NAV by end 2022 (see Chart 4.19), any negative performance of these funds could have repercussions on banking group's profitability. Nonetheless, such companies are set up as separate legal entities, subject to the provisions of the Maltese Companies Act and the Investment Services Act.

[1] UCITS Directive Article 83 restricts borrowing for retail to up to 10% of their assets and on a temporary basis (as found in https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:302:0032:0096:en:PDF).

BOX 6: EXPERIMENTAL AND ANALYTICAL CLIMATE CHANGE-RELATED INDICATORS FOR THE FINANCIAL SECTOR IN MALTA[1]

Introduction

On 27 January 2023, the ECB published its first harmonised climate change-related indicators for the euro area, as part of an action plan to include climate change considerations in the ECB's policy strategies.[2] These indicators are the first of their kind in the euro area and aim to reflect climate risks that can affect not only the financial system, but also monetary policy and price stability. Three types of indicators are included in the ECB's publication, namely: (1) experimental indicators on sustainable finance, (2) analytical indicators on carbon emissions in the financial sector's loan and securities portfolioss, and (3) analytical indicators on physical risks associated in the loans and securities portfolioss of the financial sector.[3] These indicators were presented at a country level on the ECB's website,[4] alongside a detailed report documenting their methodology, data sources, caveats, and a technical annex. The caveats listed therein are noteworthy and caution is therefore suggested in the use of such indicators.

This box focuses on the indicators compiled for Malta, which were in turn, updated by the Central Bank of Malta with the latest available data. The aim is not to conduct an exhaustive analysis of the indicators, but rather to raise awareness of their existence and encourage researchers to use them in related fields as these indicators mature over time.

The time series of these indicators includes quarterly data spanning from 2021 Q1 until 2022 Q4 for sustainable finance indicators, annual data from 2018 to 2020 for carbon emissions indicators, and annual data for 2020 for physical risks indicators.

1. Experimental indicators on sustainable finance

Experimental indicators on sustainable finance comprise mainly indicators on issuances and holdings of green, social, or sustainable securities.[5] These indicators are compiled exclusively using official European System of Central Bank (ESCB) data sources, namely granular information from the Centralised Securities Database (CSDB) and the Securities Holdings Statistics (SHS) dataset.

The sustainability classifications comprise four groups:

1. **Green** – debt securities where proceeds are used to finance green projects
2. **Social** – debt securities where proceeds are used to finance social projects
3. **Sustainability** – debt securities where proceeds are used to finance a combination of both green and social projects
4. **Sustainability-linked** – debt securities where issuers are committed to future improvements in sustainability outcome(s) with no restrictions on how the proceeds can be used.

While the reference jurisdiction of the issuances of sustainable debt securities is the issuer country, data on the holdings of such securities refer to the counterparty's jurisdiction. The latter includes the euro area, the rest of the European Union and the rest of the world.

Chart 1 shows the nominal value of the holdings of securities by resident deposit-taking corporations except central banks, non-money market investment funds, and insurance corporations, broken

---

[1] Written by Gabriele Lentini, Economist Statistician and Dr Krisztina Dekany, Senior Statistical Information Management Officer within the Statistics Department of the Central Bank of Malta. The author would like to thank Mr Jesmond Pule', Mr Alan Cassar, Deputy Governor Mr Oliver Bonello for their helpful comments and suggestions.

[2] See https://www.ecb.europa.eu/press/pr/date/2021/html/ecb.pr210708_1~f104919225.en.html.

[3] Experimental and analytical indicators are not considered as official statistics and are thus to be treated with caution.

[4] See https://www.ecb.europa.eu/stats/ecb_statistics/sustainability-indicators/html/index.en.html.

[5] Securities comprise debt securities, such as bonds, and other securities such as equity.

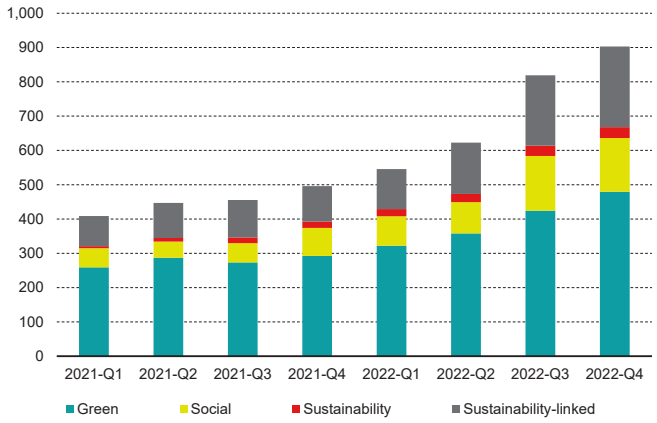
down by sustainability classifications.

It can be noticed that between 2021 to 2022 holdings of such securities were on the increase, with the highest nominal value of holdings being the green securities, whilst sustainability securities accounted for the lowest share.

Chart 2 shows the holdings of securities broken down by sector.

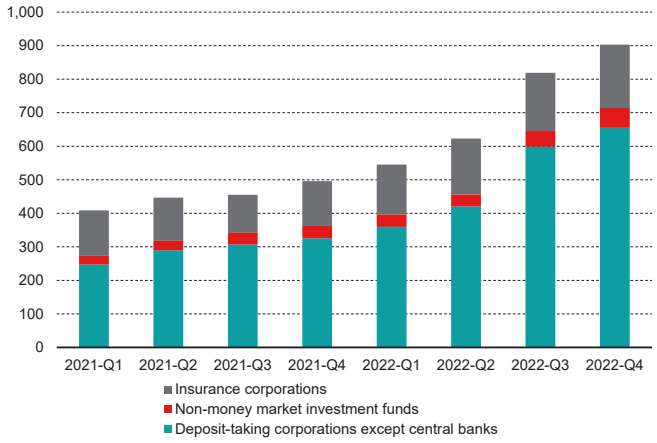
Chart 2 shows that, over these two years, Deposit-taking corporations except central banks reported the strongest increase in the holdings of such securities.

Chart 1
HOLDINGS FOR MALTA BROKEN DOWN BY SUSTAINABILITY CLASSIFICATION
(EUR millions)



Source: SHSS.

Chart 2
HOLDINGS FOR MALTA BROKEN DOWN BY SECTOR
(EUR millions)



Source: SHSS.

2. Analytical indicators on carbon footprint

The ECB released four indicators on carbon intensity,[6] namely:

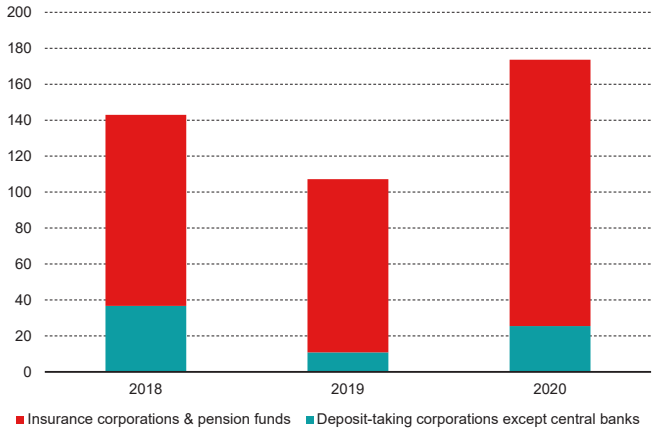
1. **Financed emissions**, which is the total greenhouse gas (GHG) emissions weighted by the share of investment over these activities, in proportion to the total company value.
2. **Carbon Intensity**, represented by financed emissions in proportion to the company production value of a firm, weighted by the share of investment over these activities over the total company value.
3. **Weighted average carbon intensity**, which is the total GHG emissions standardised using a measure of company production value and weighted by the share of the investment in its total investment portfolios.
4. **Carbon Footprint**, measured as financed emissions in proportion to the total investment portfolios value.

The first two indicators are known as indicators on 'financing the transition to a net-zero economy', whilst the last two indicators are described as 'indicators on transition'. The data for Malta consists

[6] Further explanations of the four indicators can be found in Towards climate-related statistical indicators – Technical Annex, European Central Bank, Frankfurt, p. 9.

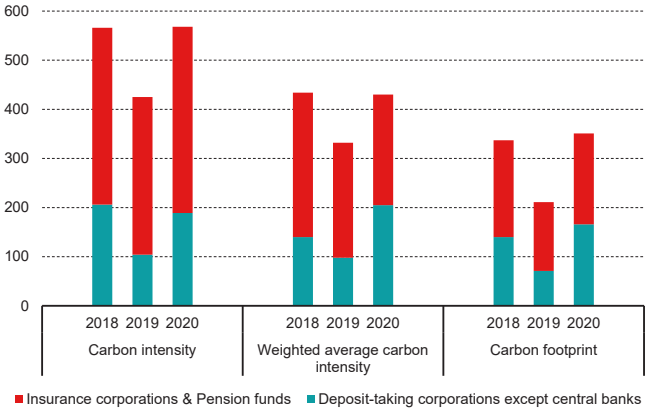
of group level data for two sectors, namely the deposit-taking corporations except central banks and insurance corporations and pension funds. Group level data are obtained from the parent company's reported financial and emissions' data, sourced from private commercial data sources. Furthermore, the data considered for Malta consists solely of direct emissions, which are emissions from the sources owned by the reporting entity. The indicators for Malta are reproduced in Charts 3 and 4.

Chart 3
FINANCED EMISSIONS FOR MALTA BROKEN DOWN BY SECTOR
(thousands; tons)



Source: European Central Bank calculations.

Chart 4
CARBON INTENSITY, WEIGHTED AVERAGE CARBON INTENSITY AND CARBON FOOTPRINT FOR MALTA BROKEN DOWN BY SECTOR
(tons/EUR millions)



Source: European Central Bank calculations.

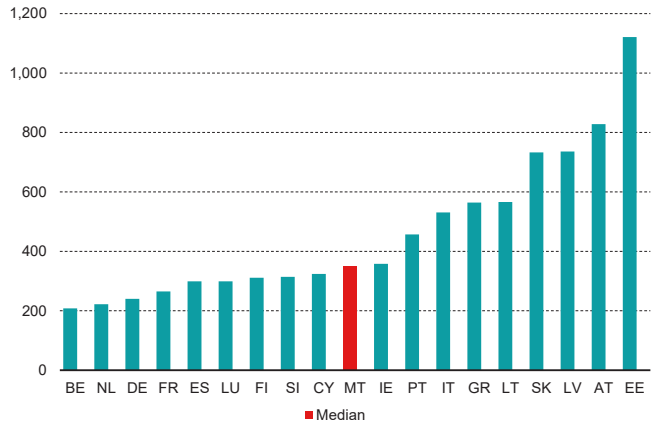
As can be seen in Chart 3, insurance corporations and pension funds held securities of high-emission companies compared to those held by deposit-taking corporations. This characteristic is not unique to Malta, as it could be observed across most euro area countries. Similarly, Chart 4 shows that carbon intensity, weighted average carbon intensity and carbon footprints are all higher for insurance corporations and pension funds when compared to deposit-taking corporations. Similar traits are also observed for roughly half of the Euro Area countries. These observations could however be the result of a disparity in the coverage of the underlying data, that is the share of securities holdings about which emissions information exists. For the Maltese data, the coverage for the securities held by insurance corporation and pension funds is significantly larger than that of deposit-taking corporations. Furthermore, the coverage for deposit-taking corporations drops by almost a half in 2019 and 2020 when compared to 2018.

Charts 3 and 4 show a drop in the indicators for 2019. Although this reflects lower overall reported GHG Scope 1 emissions, it could be heavily influenced by the coverage issues mentioned earlier, and therefore such results should be treated with caution.

Chart 5 compares the 2020 carbon footprint across the euro area countries.

As can be seen in Chart 5, Malta's score is in line with the median value across the countries with respect to the carbon footprint indicator. Similarly, Malta's figures hover around the median for both carbon intensity as well as the weighted average carbon intensity.

Chart 5
CARBON FOOTPRINT BY COUNTRY IN THE EURO AREA
(tons/EUR millions)



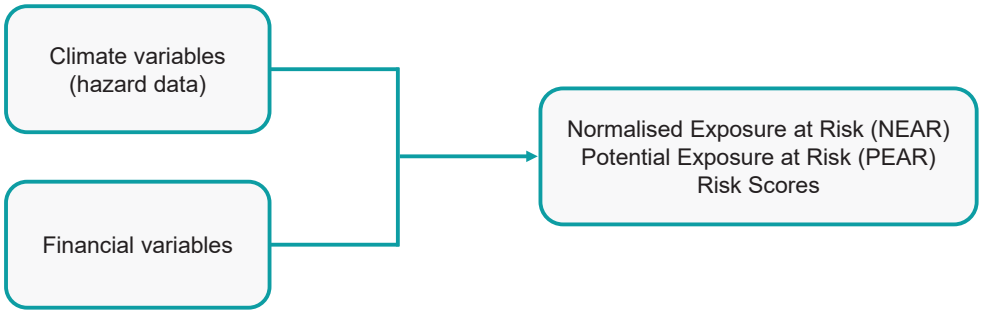
Source: European Central Bank calculations.

3. Analytical indicators on Physical Risks

The Physical risks indicators consider risks emanating from climate change-induced natural hazards, like floods, storms or wildfires, which in turn, could affect the market value of loans, bonds and equities.

The ECB considers seven natural hazards for which physical risk indicators were constructed, namely: (1) coastal flooding, (2) river flooding, (3) windstorms, (4) landslides, (5) subsidence, (6) water stress, and (7) wildfires. For the first five of these hazards, only current hazard profiles are available, however, for water stress and wildfires, projected data[7] are available for 2030 and 2030-2050, respectively. For each of the physical hazards, climate and financial variables were combined to calculate three different sets of indicators, namely Normalised Exposure at Risk (NEAR), Potential Exposure at Risk (PEAR) and Risk Scores (RS).[8]

Figure 1
PHYSICAL RISK INDICATORS



Source: Central Bank of Malta.

[7] Regarding the projected data, both wildfire and water stress indicators were calculated on the 'worst-case scenario' of global warming, also called RCP 8.5. This high-emissions scenario is frequently referred to as "business as usual", suggesting that this is a likely outcome if society does not make concerted efforts to cut GHG emissions, representing the 90th percentile of no-policy baseline scenarios available at the time, https://www.carbonbrief.org/explainer-the-high-emissions-rcp8-5-global-warming-scenario/.

[8] For more details of the computation functions and the data sources, check the following documents: Statistics Committee of the European System of Central Banks (2023): Towards climate-related statistical indicators, European Central Bank, Frankfurt, pp. 14-16. Statistics Committee of the European System of Central Banks (2023): Towards climate-related statistical indicators – Technical Annex, European Central Bank, Frankfurt, pp. 15-24.

Three sets of indicators have been computed using harmonised methodologies across euro area countries.[9]

The indicators are calculated from the point of view of the creditor or the holder. Thus, for instance, it is possible for a financial institution in Malta to face a river flooding risk if it has invested in a company located in a fluvial flood risk area in a third country. The location information of firms is based on the ESCB's Register of Institutions and Affiliates Data (RIAD) and contains information at the level of the legal entity. Given that the NEAR is still under development and more data is needed for its robust application to Malta, this box article focuses on the PEAR indicators.

Potential Exposure at Risk indicators

The PEAR indicator captures the maximum share of the portfolios that is potentially exposed to physical hazards, based on the total financial exposure entity by entity that have a risk score above zero.

PEAR indicators were calculated for all the seven different hazards:

1. Coastal flooding is the inundation of normally dry land areas along the coast with seawater. Coastal flooding is typically a result of a combination of sea tidal surges, high winds, and barometric pressure.
2. Landslide is defined as the gravitational movement of a mass of rock, earth, or debris down a slope. It can be triggered by heavy or prolonged rainfall, earthquakes, volcanic eruptions, rapid snow melt, slope undercutting by rivers or sea waves, permafrost thawing, land use changes (for example deforestation), rapid reservoir drawdown, irrigation, blasting vibrations or water leakage from utilities.
3. River flooding occurs when water levels rise over the top of riverbanks. River flooding typically happens for four reasons: excessive rain making landfall, persistent thunderstorms over the same area for extended periods, combined rainfall and snowmelt, and ice jam.
4. Subsidence refers to (i) a sinking down of a part of the earth's crust, generally due to underground excavations, or (ii) the sudden sinking or gradual downward settling of the Earth's surface with little or no horizontal motion.
5. Wildfire is an unplanned fire which burns in a natural area such as a forest, grassland, or prairie. Wildfires are often caused by human activity or a natural phenomenon such as lightning or droughts and can happen at any time and anywhere.
6. Windstorms are defined as an extreme weather condition with very strong wind, heavy rain, and often thunder and lightning.
7. Water stress is the ratio between total water withdrawals and available renewable surface water. It measures the level of competition for available water and estimates the degree to which freshwater availability is an ongoing concern.

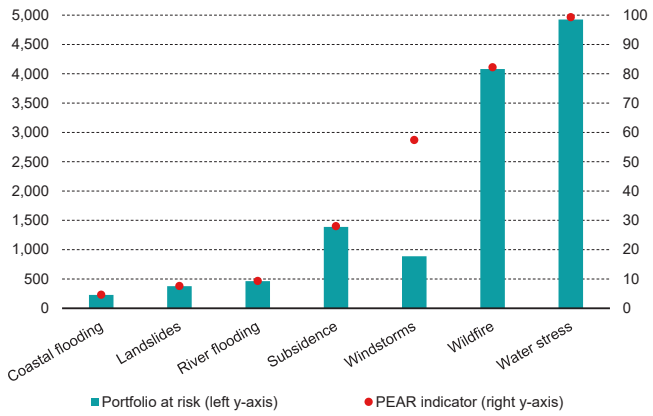
Chart 6 shows the PEAR indicator in percentage terms (right y-axis) with dots, while the bars represent the portfolios in euro millions (left y-axis) at potential risk from each of the seven hazards.

For example, in the case of coastal flooding, the bars show the portfolios value which is hypothetically exposed to coastal flooding; in the case of Malta, in 2020, about €228 million worth of loans, bonds and securities were estimated to be potentially exposed to this type of hazard at non-zero risk. Staying with the same example of hazard, the respective PEAR indicator, marked with a red dot, shows that the maximum share of the portfolios (of loans, bonds, and securities) that is potentially exposed to coastal flooding is roughly 4.6%.

[9] Statistics Committee of the European System of Central Banks (2023): Towards climate-related statistical indicators, European Central Bank, Frankfurt, p. 13.

Having a closer look at the cross-country comparisons of the separate types of hazards, Table 1 shows the PEAR indicators (%) for all the euro area countries including Malta and the euro area average.

Chart 6
PEAR INDICATORS OF MALTA REGARDING THE PHYSICAL HAZARDS (2020)
(EUR millions; per cent)



Source: European Central Bank calculations.

Focusing on the PEAR indicators for Malta, only the wildfire and water stress indicators are higher than the euro area average. A number of caveats are noteworthy. Firstly, the climate variables underlying these two types of hazards were projected into the future (2030-2050 and up to 2030, respectively), based on a worst-case scenario for global warming. Also, the high readings for Malta reflect the structural characteristic of the indicators themselves, which was referred to earlier, mainly that these are based on the holder/issuer side. Thus, if for example a financial institution domiciled in Malta invested in a security of a firm located in another country at

Table 1
PEAR INDICATOR OF THE SEVEN HAZARDS BY COUNTRY IN THE EURO AREA
(per cent)

	Coastal flooding	Landslides	River flooding	Subsidence	Wildfire	Windstorms	Water stress
Austria (AT)	6.6	29.4	32.6	96.3	84.8	28.0	100.0
Belgium (BE)	11.7	11.9	19.0	80.4	84.4	28.3	99.7
Cyprus (CY)	1.7	5.1	1.3	15.8	75.1	86.3	96.3
Estonia (EE)	1.1	1.1	9.2	37.4	87.0	84.1	98.3
Finland (FI)	5.1	4.3	25.5	94.5	77.8	81.5	96.9
France (FR)	11.2	25.4	26.7	74.5	79.2	47.7	99.4
Germany (DE)	11.9	18.7	29.8	75.4	86.4	57.5	99.8
Greece (EL)	0.7	38.5	1.7	91.7	71.2	29.7	94.5
Ireland (IE)	20.1	27.3	33.9	81.1	81.2	63.2	99.7
Italy (IT)	8.4	39.5	20.9	86.5	80.7	67.1	98.9
Latvia (LV)	1.0	0.8	26.5	30.0	62.0	98.5	99.3
Lithuania (LT)	0.9	2.2	11.4	96.8	97.8	99.6	99.6
Luxembourg (LU)	19.6	27.9	35.2	86.3	89.4	62.2	99.9
Malta (MT)	4.6	7.6	9.3	28.0	82.2	57.4	99.3
Netherlands (NL)	29.8	10.4	28.1	77.2	80.3	68.0	99.5
Portugal (PT)	3.9	19.1	4.1	73.6	72.6	46.5	96.8
Slovakia (SK)	1.4	12.3	24.8	99.1	88.3	94.7	100.0
Slovenia (SI)	4.0	51.2	35.4	83.8	99.2	14.0	99.5
Spain (ES)	5.5	21.3	12.5	78.3	73.9	59.6	97.8
Euro area (EA)	7.9	18.6	20.4	73.0	81.8	61.8	98.7

Source: European Central Bank calculations.

risk of forest fires, although the indictor would capture that risk on the resident financial institution, it does not mean that the underlying risk would lie within the Maltese physical territory. This is also more relevant in the context of the Maltese financial sector, which exhibits a significant portion of its activity being oriented towards the international sphere and hence exhibiting limited or no links with assets located in Malta. Furthermore, considering that large areas of Europe, including Malta, are projected to suffer higher water stress in future, the relatively high PEAR reading of 99.3% reflects not only the international exposures held by resident institutions, but also those located within the Maltese territory.

Way forward

The next publication and refinements of these experimental indicators by the ECB is planned towards the end of 2023 and may include breakdowns for the physical risk indicators by (a) sectors of the economy such as deposit-taking corporations except central banks, non-MMF investment funds and Insurance corporations and by (b) instruments such as loans, bonds, equities for both carbon footprint and physical risk indicators.

The Central Bank of Malta will focus more on individual natural hazard types which could potentially have the most significant affects in Malta, such as coastal flooding and windstorms. However, one should keep in mind that through transactions with foreign counterparties, resident banks may also have significant risks from other hazard types occurring in other jurisdictions.

Furthermore, the Central Bank of Malta will continue to liaise with the ECB and other national central banks to improve the data coverage to improve its reliability and enable further research and analysis.

5. MACROPRUDENTIAL POLICY RESPONSE

This chapter highlights the main policy measures implemented by the Bank during 2022. It also provides an overview of the regulatory actions and developments taken by other authorities in this regard, both at a Domestic and European level.

5.1 Central Bank of Malta measures

Sectoral Systemic Risk Buffer

During 2022, risk assessments carried out by the Bank indicated vulnerabilities in the domestic RRE sector, particularly those emanating from a significant increase in the share of mortgage loans in banks' loan portfolios, thus amplifying concentration risk. In view of these observed vulnerabilities, the Central Bank of Malta together with the MFSA decided to implement in 2023 a sSyRB on domestic RRE mortgages secured by domestic RRE collateral. For further details on the scope, design and calibration of the buffer please refer to Box 7.

Countercyclical capital buffer

As per the CCyB rate decision notification, applicable for the first quarter of 2023, a CCyB rate at 0% remains appropriate for the domestic financial system.[1] The relevant credit-to-GDP ratio was recorded at 73.9%, and its deviation from the long-term trend stood at -6.2 percentage points. The analysis is also supplemented by other relevant indicators of credit developments and expert judgement confirming that, at the current juncture, the CCyB rate for Malta should continue to be set at zero.[2]

Voluntary reciprocation of macroprudential measures

In line with the ESRB Recommendation, on voluntary reciprocity for macroprudential measures, the Bank annually reviews newly implemented measures recommended for reciprocation by other EU Member States.[3] During 2022, the Bank decided not to reciprocate the Lithuanian, Dutch, Belgian, and German measures, on the basis of a lack of applicability to the Maltese banking sector. Moreover, the Bank maintained its non-reciprocity stance unchanged in relation to the previous measures recommended for reciprocation by other Member States in past years; namely Finland, Belgium, France, Sweden, Luxembourg, and Norway.[4,5]

Material third countries

The Bank carries out an annual exercise for the identification of those third countries which are deemed to be material to the Maltese banking sector.[6,7] The extent of materiality is based on three exposure metrics; namely, original exposures, RWAs, and defaulted exposures for the Maltese banking sector in relation to third countries.[8] In line with the methodology stipulated in Article 4 of the ESRB Decision 2015/3, the material third countries for the domestic banking sector during the period Q2 2023 until Q2 2024 remain unchanged from those identified last year namely, the United States, the United Kingdom and the United Arab Emirates.

---

1 Refer to https://www.centralbankmalta.org/site/Financial-Stability/CCyB/CCyB-assessment-2023-Q2.pdf.

2 The other relevant indicators of credit developments that further supplemented this analysis include credit growth, household and corporate debt to GDP ratio, median property price to income ratio and ratio of current account to GDP.

3 ESRB/2020/9: Recommendation of the ESRB of 2 June 2020 amending Recommendation ESRB/2015/2 on the assessment of cross border effects of and voluntary reciprocity for macroprudential policy measures.

4 For further information on these measures refer to the reciprocity on the Central Bank of Malta website. Link: https://www.centralbankmalta.org/reciprocity.

5 For further information on reciprocity adopted in the first half of 2022, kindly refer to the *Interim Financial Stability Report* 2022.

6 ESRB/2015/3: Decision of the ESRB of 11 December 2015 on the assessment of materiality of third countries for the Union's banking system in relation to the recognition and setting of countercyclical buffer rates. Source: https://www.esrb.europa.eu/pub/pdf/other/Decision_ESRB_2015_3.pdf.

7 ESRB 2015/1: Recommendation of the ESRB of 11 December 2015 on recognising and setting countercyclical buffer rates for exposures to third countries. Source: https://www.esrb.europa.eu/pub/pdf/recommendations/ESRB_2015_1.en.pdf.

8 A third country is identified as material, when exposures of the Maltese banking system to that third country are at least 1% for at least one of the above three metrics for a set period of time, and for both steps, as prescribed by the ESRB Decision 2015/3.

Borrower-Based Measures

The Directive on BBMs has entered into its fourth year of implementation since July 2019. The policy stance on BBMs had remained unchanged during 2022, as it continues to be effective in safeguarding the financial resilience of both obligors and lenders in the current scenario.

During 2022, the banks submitted external audit reports requested by the Bank in line with Paragraph 19 of the Directive, relating to a detailed assessment of the banks' compliance with such Directive. In preparation for the internal audit reports expected to be received during 2023, a set of guidelines has been communicated to each credit institution. The aim of the guidelines is to ensure consistency among the checks applied by the respective banks' auditors in their internal assessments, and to standardise the processes across the reporting banks.

Identification of other systemically important institutions

The same four credit institutions identified as O-SIIs during the 2021 exercise have been re-confirmed in the 2022 O-SII iteration.[9] Consequently, the Bank in conjunction with the MFSA, (hereinafter referred to as 'the Authorities'), confirmed APS Bank plc, MDB Group Limited, HSBC Bank Malta p.l.c. and Bank of Valletta plc as O-SIIs, with an O-SII buffer rate ranging from 0.50% to 2.00%.[10]

In the latest O-SII statement of decision, the Authorities announced changes in the O-SII buffer rates for two designated O-SIIs. APS Bank plc registered a higher O-SII score, leading to an increase in its O-SII buffer rate from 0.25% to 0.50%. This increase is to be phased-in over a four-year period. In the course of 2022, HSBC Bank Malta p.l.c. was subject to a corporate restructuring process. This restructuring made HSBC Bank Malta p.l.c. eligible for the O-SII buffer cap foreseen in Article 131(8) of the Capital Requirements Directive, which caps the bank's 1.50% O-SII buffer rate to 1.25%.[11] The O-SII buffer requirement for each identified bank and the applicable transitory provisions are outlined in the Authorities' statement of decision and are applicable from the date of publication of this decision.[12]

5.2 Other domestic regulatory developments

Update on the implementation of revised MFSA BR/09

During the course of 2022, the MFSA consulted the Bank on a number of updates to the MFSA's BR 09.[13] These updates to the Rule reflect a number of EU regulatory developments, including the:

- *Implementation of EBA Guidelines related to the field of NPEs;* namely the EBA Guidelines on the management of NPEs and Forborne Exposures (FBEs) (EBA/GL/2018/06) which amends the threshold for a high NPE bank from 6% to 5%;[14]
- *Removal of 'General Reserve for banking risk'* and 'Excessive NPLs reserve' and replaced by a *revised 'Regulatory Allocation*.[15] The new Regulatory Allocation sets out quantitative requirements for minimum amount of coverage expectations against both the flow and stock levels of NPEs.

---

[9] CBM-MFSA Policy document on the revised methodology for the identification of other systemically important institutions (O-SIIs) and the related capital buffer calibration: https://www.centralbankmalta.org/site/Financial-Stability/O-SII/o-sii-policy-document.pdf.

[10] MeDirect Bank Malta is the parent of MeDirect Bank Belgium, which collectively make up MDB Group Limited, i.e., the consolidated entity that is subject to the O-SII exercise.

[11] Directive 2013/36/EU of the European Parliament and of the Council, as amended by Directive (EU) 2019/878 of the European Parliament and of the Council (CRD V).

[12] The CBM-MFSA O-SII Statement of Decision was published on 16 January 2023 and is accessible from the following link: https://www.centralbankmalta.org/site/Financial-Stability/O-SII/2023-O-SII-Statement-of-Decision.pdf.

[13] MFSA BR No. 9 – Measures addressing credit risks arising from the assessment of the quality of asset portfolios of credit institutions authorised under the Banking Act 1994.

[14] The revised Rule also reflects the EBA Guidelines on the definition of default (EBA/GL/2017/07), the EBA Guidelines on credit risk management practices and accounting for expected credit losses (EBA/GL/2017/06) and the EBA Guidelines on disclosures of NPEs and FBEs (EBA/GL/2018/10).

[15] Two types of reserves were embedded in the previous BR/09: (i) Allocation of a 'general banking risk reserve' which comprised of a capital buffer in the form of a Pillar II measure allocated from the profits for the year (CET1 deductions) and (ii) Allocation of a 'Reserve for excessive NPLs' which was applied to banks deviating from NPL Reduction Plans.

These amendments ensure a more level playing field between the NPE supervisory expectations applied to SIs and less significant institutions (LSIs). By reflecting a fairer economic cost of NPEs, the amendments foster greater bank balance sheet transparency. A final version of the revised BR/09 that reflects the above considerations was published on 19 January 2023.[16]

5.3 European regulatory developments

Introduction of the Daisy Chain Regulation

On 14 November 2022, Regulation (EU) 2022/2036 of the European Parliament and of the Council came into force (the Daisy Chain Regulation). The Regulation amended the Capital Requirements Regulation (EU) No 575/2013 (CRR) and the Bank Recovery and Resolution Directive (2014/59/EU) (BRRD). The aim of the Daisy Chain Regulation is to introduce targeted adjustments to improve the resolvability of banks in a way that banks remain resilient and capable of withstanding shocks. In this regard, revisions are made to the MREL regime, and to align the resolution treatment of global systemically important institutions (G-SII) in the prudential regulatory framework. Such amendments were necessary to implement in the European Union the international 'Total Loss-absorbing Capacity (TLAC) Term Sheet' for G-SII groups as published by the Financial Stability Board on 9 November 2015, as well as to enhance the application of the MREL for all banks.

Single Resolution Board (SRB) publishes updated 2022 MREL policy

On 8 June 2022, the SRB published the updated approach to setting MREL. The approach results from the experience gained during past resolution planning cycles, feedback received from stakeholders, as well as the consideration of new regulatory developments arising from the revised Banking Package. MREL is a crucial tool in ensuring that banks have sufficient eligible instruments to support the implementation of the institutions' preferred resolution strategy. Additionally, MREL internalizes the cost of failure of the respective bank and thus ensures that the shareholders and the creditors are the ones that contribute to the absorption of losses and subsequent recapitalisation, thereby preventing the provision of public financial support. The developments considered in the new updated policy include the end of the supervisory leverage relief measures of the ECB, the changes to the CRR on the indirect holding of internal MREL (iMREL), and the MREL calibration for banks with a multiple point-of-entry resolution strategy.

Digital Operational Resilience Act (DORA)

On 27 December 2022, Regulation (EU) 2022/2554 on Digital Operational Resilience for the Financial Sector was published in the EU Official Journal, and entered into force on 16 January 2023. DORA entered into force with a two-year implementation period, with financial entities being expected to be compliant by January 2025. The aim of this new regulation is to create a framework that strengthens the financial sector's resilience towards ICT related incidents and threats.

Markets in crypto-assets (MiCA) Regulation

In June 2022, the European Parliament and the Council reached a provisional agreement on the MiCA regulation, which is part of a wider digital finance package that is intended to stimulate technological growth, while ensuring financial stability and consumer protection. The Regulation is expected to enter into force in 2023, with a transitional period for its application. The aim of the regulation is to create provisions on the prevention of market abuse within the crypto-asset market and regulate specific areas such as client information, fund protection and outsourcing. Following the publication of MiCA, the European Supervisory Authorities (ESAs) will develop regulatory technical standards for the content and methodologies included in the regulation.

ESRB Recommendation on the vulnerabilities in the Commercial Real Estate Sector

On 25 January 2023, the ESRB published a recommendation on vulnerabilities in the CRE sector in the European Economic Area. The aim of the recommendation is to urge the European Union and national authorities to

[16] The final amended BR/09 text may be accessible from the following link: https://www.mfsa.mt/wp-content/uploads/2023/01/BR-09-Measures-Addressing-Non-Performing-Exposures-and-Forborne-Exposures.pdf.

enhance the monitoring of systemic risks emanating from the CRE sector, whilst ensuring that financial institutions participating in CRE lending are resilient and engage in sound and prudent risk management practices.

The EBA publishes its Report on the first mandatory exercise on Basel III full implementation impact

On 30 September 2022, the EBA published a report on the first mandatory exercise on the impact of the full implementation of Basel III in 2028.[17] This project was launched at the end of January 2022, with the sample of EU banks participating in this exercise determined by the relevant NCAs in line with Articles 4 and 8 of the EBA Decision on the mandatory Basel III monitoring exercise. The data submitted in scope for this exercise has a reference date as of December 2021, and covers a total of 163 banks from all EU countries with the four MT O-SIIs also forming part of the sample.[18] The results of this exercise revealed that the full Basel III implementation would result in an average increase of 15.0% of the current Tier 1 minimum required capital (T1 MRC) of EU banks, with the main drivers of this impact being the 'Output floor' (6.3%) and 'credit risk' (4.4%).[19]

[17] The Basel III monitoring exercise aims to assess the impact of the latest regulatory developments at BCBS level with regard to: i) the global regulatory framework to enhance resilience for banks and banking systems; ii) leverage ratios; iii) liquidity ratios; iv) the NSFR; v) the post-crisis reforms.

[18] Namely APS Bank plc, MDB Group Limited, HSBC Bank Malta p.l.c. and Bank of Valletta plc.

[19] The output floor aims at reducing inconsistencies in the calculation of RWAs between banks using the Standardised Approach (SA) and those using the Internal-Rating Based (IRB) approach to calculate their capital requirements. IRB-based banks are to hold RWAs equivalent to at least 72.5% of the RWA that would have had to be held under the SA approach.

BOX 7: IMPLEMENTATION OF A SECTORAL SYSTEMIC RISK BUFFER FOR MALTA[1]

Introduction

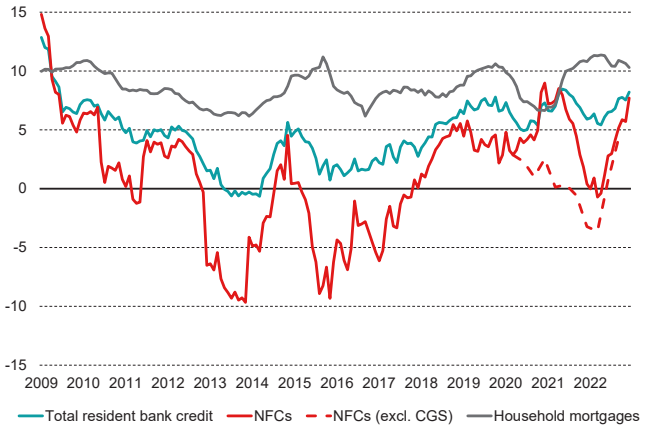
As outlined in 'Special Feature 1: Assessing Cyclical Risks in Malta,' risk assessments indicate that cyclical risk has been rising, driven by the household and property stretches.[2] More recent assessments indicate that, vulnerabilities persisted within the RRE sector, stemming from heightened mortgage loan activity. While growth in mortgages decelerated slightly in 2022, this remains at significantly strong levels, close to 10% (see Chart 1).

Vulnerabilities within the RRE sector have to be seen in the context of higher household leverage which, given the prevailing increasing interest rate environment, could lead to a strain on debt repayments, particularly for the more indebted borrowers.

From the banks' perspective, persistently high mortgage growth continued to manifest itself in increasing concentration risk. As can be seen in Chart 2, the share of resident mortgage lending rose significantly, from just 26% in 2004, to around 53% in 2022. Given the vast majority of the banks' collateral is immovable property related, the performance of the immovable property sector may also expose the banking sector to indirect vulnerabilities. Also, in the event of a sharp correction in residential property prices, banks' asset quality may be weakened via the wealth effect channel.

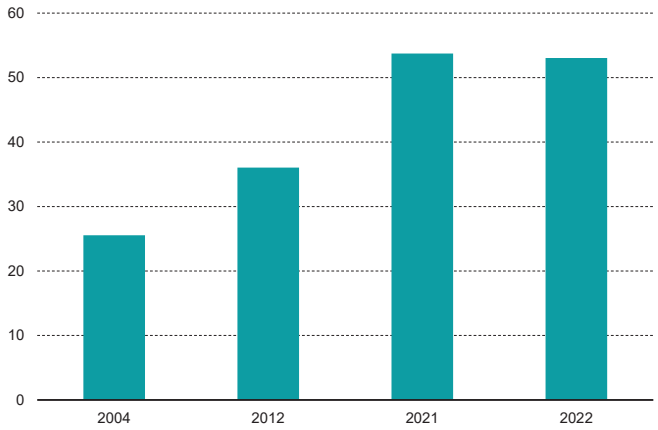
Regarding the corporate sector, the above-mentioned special feature highlights

Chart 1
ANNUAL CREDIT GROWTH RATE
(per cent)



Source: Central Bank of Malta calculations.

Chart 2
MORTGAGE LENDING AS A SHARE OF TOTAL LENDING
(per cent)



Source: Central Bank of Malta calculations.

[1] Prepared by Ms Dominique Tanti Executive within the Policy, Crisis Management and Stress Testing Department. The author would like to thank Ms Christine Balzan, Manager and Mr Stephen Attard Head of Department within the Policy, Crisis Management and Stress Testing Department for their valuable suggestions.

[2] Refer to https://www.centralbankmalta.org/site/Financial-Stability/WP-Other-Studies/special-feature1-fsr-2021.pdf.

that the NFC stretch was in negative territory, indicating that risks from within the sector were contained. Chart 1 shows that the growth rate of resident NFC loans generally exhibited a strong downward trend in 2021, following the temporary pick-up reported during the COVID-19 pandemic, on the back of the MDB CGS, introduced in April 2020, to meet new working capital requirements. A strong pick-up in growth rate was again observed throughout 2022, owing to pent-up demand following the pandemic, as projects were coming onstream. Furthermore, such growth was almost entirely driven by lending towards real estate, rather than from a broad-based pick-up in bank lending to NFCs.

Against this backdrop, Maltese authorities assessed which macroprudential tools could be implemented that could best safeguard the financial system against the above-mentioned risks. In this regard, the Central Bank of Malta, in collaboration with the MFSA, and under the auspices of the Joint Financial Stability Board (JFSB), agreed to implement a sSyRB. This is in view of its targeted nature, which makes it the most effective tool for Malta to address the prevailing risks stemming from the RRE sector, particularly with respect to domestic mortgage exposures to natural persons. In contrast to a CCyB, which adopts a more blanket approach, the systemic risk buffer (SyRB) targets existing or emerging vulnerabilities in specific sectors and credit institutions.

Scope and characteristics of the sSyRB for Malta

As per Article 133 of the CRD, the SyRB can address risks which are not covered by other tools, such as the CCyB and O-SII/G-SI buffer. This makes the SyRB a very flexible tool to address risks of both cyclical and structural nature. Furthermore, the SyRB can also be applied on a sectoral basis, as well as to a subset of institutions only. These characteristics enhance the effectiveness of the tool, particularly when the tool is intended to target risk stemming from a particular sector. Such risk targeting also leads to a price signalling effect, by incentivising banks to diversify their loan portfolio, thereby reducing concentration risk to the sector. Indeed, the sSyRB is designed to operate in a proportionate manner, whereby those institutions with a higher share of the targeted exposures (i.e. domestic mortgage exposures) to total exposures, are impacted more. In other words, banks could control the impact of this measure according to their targeted level of exposure to the real estate sector. In this regard, the SyRB differs from the aim and features pertaining to the CCyB, which is designed to target overall credit dynamics, as opposed to specific sources thereof.

Calibration of the sSyRB

The calibration of the sSyRB rate was based on house price sensitivity tests. The standard house price sensitivity test applies exogenous shocks to house prices and assesses the corresponding impact on the core domestic banks' balance sheet, which are the main mortgage providers in Malta, via collateral values. The assumed magnitude of shocks to house prices is based on the historical standard deviations of the annual rate of change in the house price index and relates to the magnitude of shocks applied in similar stress test exercises. The calibration method employed assumes that a drop in house prices fully translates into a drop in property related collateral values, which corresponds to the main type of collateral backing loans for core domestic banks.

Shocks to house prices lead to increases in loan loss provisions; given that, as collateral values decline, loan loss provisions would have to increase accordingly to fulfil the requirement of full NPL coverage by either provisions or collateral. The hypothetical increase in provisions is charged to capital, which feeds into changes in the Tier 1 capital ratio held by banks. The changes in Tier 1 capital arising from diverse shocks to house prices are then assessed against the loss absorption capacity of banks, based on different sSyRB rates.

Drawing from the results of these sensitivity tests, and the banks' capacity to absorb the increase in capital via management buffers, the Central Bank of Malta's policy decision was to set the sSyRB rate at 1.5% to be implemented in a phased-in approach.

Applicability and review of the measure

The sSyRB is effective from 28 March 2023, with its first phase of implementation taking place in end-September 2023, with a sSyRB of 1%, and fully phased-in at 1.5% as of end-March 2024.

The 1.5% sSyRB is applicable on the amount of RWAs held against domestic mortgage exposures to natural persons, secured by RRE. Exposures also include BTL loans (for residential purposes) secured by RRE, granted to natural persons. Furthermore, the 1.5% sSyRB is applicable to credit institutions, at the highest level of consolidation in Malta.

Moreover, the review of the measure, including its scope and applicability, will take place at least every two years, in accordance with the provisions of CRDV, and as transposed in CBM Directive No. 11. The Bank plans to conduct regular reviews of the underlying risks being addressed by the sSyRB to assess the adequacy of the buffer, also in the context of the evolving market developments and risk landscape.

APPENDICES

Appendix A
IMPLEMENTED POLICY MEASURES (UP TO 2023 Q1)

Capital Buffer for Other Systemically Important Institutions (O-SII)	2020	2021	2022	2023	Implementation date
MDB Group Limited*	0.500%	0.500%	0.625%	0.750%	1 Jan. 2016, revised 1 Jan. 2020
HSBC Bank Malta p.l.c**	1.500%	1.500%	1.500%	1.250%	
Bank of Valletta plc	2.000%	2.000%	2.000%	2.000%	
APS Bank plc***	0.0625%	0.0625%	0.125%	0.250%	

* MDB Group Limited's O-SII buffer rate is subject to the following transitory period for the build-up of its fully-loaded O-SII buffer rate: 0.625% (2022); 0.75% (2023); 0.875% (2024); 1.000% (2025).

** HSBC Bank Malta p.l.c qualifies for the provisions of Article 131(8) of CRD, which results in the capping of its O-SII buffer rate to 1.25%.

*** The 0.25% increase in APS Bank plc's O-SII buffer rate is subject to the following transitory period for the build-up of its fully-loaded O-SII buffer rate: 0.125% (2022); 0.25% (2023); 0.375% (2024); 0.4375% (2025); 0.50% (2026).

Sectoral Systemic Risk Buffer* (sSyRB)	2023	2024	Implementation date
All credit institutions involved in mortgage lending	1.000%	1.500%	1.000% as from end Sep. 2023 1.500% as from end Mar. 2024

* Effective as from 28 March 2023.

Countercyclical Capital Buffer (CCyB)	2020				2021				2022				2023			Implementation date
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	
All credit institutions	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1 Jan. 2016

	2020	2021	2022	2023	Implementation date
Macro-prudential policy					
Identification of Material Third Countries	United States of America, Republic of Turkey, United Arab Emirates	United States of America, United Kingdom, United Arab Emirates	United States of America, United Kingdom, United Arab Emirates	United States of America, United Kingdom, United Arab Emirates	June 2016
Measures Addressing Credit Risk					
Borrower-based measures	Issuance of Notice to amend Directive no.16 in response to the COVID-19 pandemic	Issuance of amended Directive no.16	No changes occurred	No changes occurred	1 July 2019, amended 29 Nov. 2021
All credit institutions (BR/09/2023)	Implementation of NPL Reduction Plan for banks which exceed the 6% NPL ratio threshold	Implementation of NPL Reduction Plan for banks which exceed the 6% NPL ratio threshold	Implementation of NPL Reduction Plan for banks which exceed the 6% NPL ratio threshold	New regulatory allocation and implementation of EBA guidelines (reduction strategies for banks with NPL ratio > 5%)	2 Jan. 2007, revised in 2019. A revamped version of the Rule became effective on 1 Jan. 2023
Moratoria on Credit Facilities in Exceptional Circumstances	Publication of Directive no.18 in response to the COVID-19 pandemic	Re-activation of Directive No.18 in response to the protracted impact of the COVID-19 pandemic	Expired	Expired	13 April 2020, amended 23 April and 30 June 2020; Directive No. 18 re-activated 14 Jan. 2021 with final application deadline 31 March 2021

Appendix B
FINANCIAL SOUNDNESS INDICATORS

	Core Domestic Banks					Non-Core Domestic Banks					International Banks[1]					Total Banks[1]				
	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022	2018	2019	2020	2021	2022
Capital[2]																				
Regulatory capital to RWAs	18.1	20.1	21.7	22.7	22.6	17.9	19.2	20.2	20.3	20.5	51.2	45.7	52.5	46.3	39.7	22.6	23.6	25.8	25.6	24.4
Regulatory Tier 1 capital to RWAs	16.0	17.6	18.6	19.5	19.2	17.6	18.9	19.9	20.0	19.5	48.7	45.6	52.4	46.3	39.7	20.7	21.7	23.4	23.1	21.6
Leverage ratio	7.3	7.8	7.6	7.3	7.0	10.8	11.0	9.5	10.0	9.7	31.6	36.4	42.4	34.2	30.8	10.2	10.6	10.5	9.6	8.8
Large exposures to total own funds	84.6	76.3	69.6	66.6	84.2	200.6	140.7	175.8	173.4	177.4	85.3	88.5	83.3	67.9	79.2	94.8	85.7	81.8	76.8	92.7
RWAs to total assets	48.5	46.2	42.9	39.1	38.0	58.9	61.1	49.0	50.9	51.1	72.4	84.5	82.8	74.9	69.9	51.8	50.9	46.6	43.0	41.5
Profitability																				
ROA[3]	0.5	0.6	0.0	0.4	0.4	0.2	1.3	-1.5	0.2	-0.1	1.4	1.1	2.2	1.5	2.6	0.9	0.8	0.6	0.7	0.9
ROE[2,3]	6.5	6.7	-0.3	4.3	5.5	1.7	11.0	-12.7	2.4	-0.7	5.2	5.8	6.2	11.6	6.1	5.7	6.8	0.4	6.0	4.9
Operational cost-to-income ratio	62.8	66.3	68.0	75.2	80.4	62.2	47.0	95.8	82.2	80.4	29.9	39.9	35.1	47.2	45.2	47.4	53.9	51.7	61.8	62.3
Interest margin to gross income	62.3	63.7	73.2	72.1	71.8	36.6	31.4	48.9	40.9	53.8	79.9	56.1	64.6	55.9	49.9	69.3	58.1	67.7	62.4	59.6
Non-interest expense to gross income	64.3	67.8	70.0	77.0	81.4	62.6	47.1	97.5	83.4	81.2	29.9	39.9	35.2	47.3	45.3	48.1	54.7	52.7	62.7	62.8
Personnel expenses to non-interest expenses	37.8	43.8	45.8	41.2	37.2	50.4	50.2	48.3	48.5	46.7	14.2	13.5	12.7	10.8	10.1	31.4	34.6	34.2	30.3	27.7
Non-interest income to gross income	37.7	36.3	26.8	27.9	28.2	63.4	68.6	51.1	59.1	46.2	20.5	44.2	35.4	44.8	50.3	31.0	42.1	32.4	37.9	40.5
Net impairment charges to gross income	9.0	0.1	29.2	-3.4	-10.0	29.0	12.8	79.5	6.3	21.4	21.7	24.2	18.7	18.9	14.3	16.0	11.0	25.6	8.1	4.1
Asset Quality																				
NPLs to total own funds[2]	27.8	25.1	28.9	29.4	21.9	36.2	34.8	53.1	34.2	27.0	13.2	8.1	9.7	10.1	11.2	24.0	21.3	25.4	24.8	20.4
NPLs to total gross loans	3.4	3.2	3.7	3.5	2.7	5.8	5.4	7.1	5.1	4.2	2.4	1.8	1.9	1.4	1.3	3.2	3.0	3.5	3.1	2.5
NPEs to total gross exposures	2.6	2.5	2.8	2.7	2.0	4.7	4.6	5.6	3.8	3.0	1.6	1.3	1.3	1.0	0.9	2.3	2.2	2.6	2.4	1.8
Total coverage ratio[4]	43.5	42.9	52.5	47.0	50.3	60.5	41.0	47.6	59.8	73.1	61.9	78.4	91.4	147.5	187.3	50.3	49.2	57.2	59.9	68.8
Unsecured loans to total lending	28.6	25.1	23.2	20.1	18.7	73.5	77.6	80.8	71.9	69.6	68.3	82.7	72.3	77.6	78.9	26.8	27.1	25.6	23.8	23.5
Share of Stage 3 provisions to total provisions	71.7	71.9	66.7	70.2	69.6	89.7	91.4	93.0	90.2	88.6	59.5	48.7	44.6	27.9	24.9	70.1	67.1	65.1	60.5	58.0
Forborne loans to gross loans	2.5	2.4	3.0	4.5	3.5	1.9	0.9	0.5	0.8	0.6	2.0	3.7	3.3	7.4	7.5	2.3	2.7	2.9	4.9	4.1
Liquidity																				
LCR[2]	383.3	343.7	328.2	359.9	363.0	418.0	374.7	325.4	356.8	325.6	316.7	303.0	686.6	2469.6	378.8	382.2	345.4	332.7	379.0	360.3
Liquid assets to total assets[2,5]	28.2	31.0	33.3	35.6	34.6	29.4	36.2	40.3	33.2	30.6	15.7	12.7	11.8	27.3	26.9	27.1	29.9	32.3	34.7	33.7
Customer loans to customer deposits	60.9	59.5	58.4	55.2	56.0	50.5	46.6	46.5	52.2	54.3	208.4	376.6	462.3	267.0	232.3	79.0	79.3	75.4	67.5	67.3
CBC on net cash outflows	170.5	139.0	169.9	189.3	234.0	237.5	245.4	238.1	300.8	248.1	74.0	116.1	326.3	601.9	56.9	170.4	149.5	180.2	204.0	225.9
NSFR[2]				174.0	186.8				178.4	179.6				155.3	131.6				172.8	181.8
Balance Sheet																				
Assets-to-GDP	186.1	174.2	195.5	185.1	168.8	20.9	20.7	23.1	22.6	20.3	132.5	95.3	87.9	76.2	59.8	339.5	290.1	306.4	283.9	248.9
Domestic debt securities to total assets	6.5	6.4	8.3	8.8	9.4	2.1	2.9	7.2	7.9	8.3	0.1	0.0	0.1	0.2	0.2	3.7	4.1	5.9	6.4	7.1
Foreign debt securities to total assets	15.8	15.4	13.8	12.4	16.5	14.0	10.7	12.2	15.9	17.9	29.5	26.4	25.2	24.0	29.6	21.1	18.7	16.9	15.8	19.7
Customer loans to total assets	48.5	48.0	48.2	45.4	47.1	34.8	33.1	33.2	34.5	38.0	37.6	43.4	43.9	36.9	41.9	43.4	45.4	45.8	42.3	45.1
Interbank exposures to total assets	7.8	6.2	5.3	4.9	4.8	21.6	14.7	9.7	9.4	7.3	13.0	13.5	12.3	17.8	10.0	10.7	9.2	7.6	8.7	6.3

[1] Satabank plc is excluded from 2018 figures onwards following the MFSA's decision to appoint a competent person in October 2018 in terms of Article 29(1)(c) and (d) of the Banking Act. Its licence was withdrawn on 30 June 2020.

[2] Data for international banks excludes the branches of foreign banks.

[3] Based on profits after tax.

[4] For the core domestic banks the ratio includes 'Reserve for General Banking Risks' as per the BR 09/2019.

[5] Liquid assets are defined in line with the EBA's methodology for the LCR.