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PORTUGAL

FINANCIAL SECTOR ASSESSMENT PROGRAM

TECHNICAL NOTE ON SYSTEMIC RISK ANALYSIS

July 2026

This Technical Note on Systemic Risk Analysis for the Portugal Financial Sector Assessment Program was prepared by a staff team of the International Monetary Fund as background documentation for the periodic consultation with the member country. It is based on the information available at the time it was completed on July 8, 2026.

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SYSTEMIC RISK ANALYSIS

Prepared By
Monetary and Capital Markets Department

This Technical Note was prepared by IMF staff in the context of the Financial Sector Assessment Program in Portugal. It contains technical analysis and detailed information underpinning the FSAP's findings and recommendations. Further information on the FSAP can be found at http://www.imf.org/external/np/fsap/fssa.aspx

CONTENTS

FIGURES

TABLES

APPENDICES

Glossary

AC	Amortized Cost
AE	Asset Encumbrance
CAR	Capital Adequacy Ratio
CB	Central Bank
CBC	Counterbalancing Capacity
CBR	Combined Buffer Requirement
CCoB	Capital Conservation Buffer
CCR	Counterparty Credit Risk
CCyB	Countercyclical Capital Buffer
CET1	Common Equity Tier 1
COREP	Common Reporting (Framework)
CQS	Credit Quality Steps
DT	Downturn
EA	Euro Area
EAD	Exposure at Default
EBA	European Banking Authority
ECB	European Central Bank
FINREP	Financial Reporting
FSAP	Financial Sector Assessment Program
FVOCI	Fair Value through Other Comprehensive Income
FVPL	Fair Value through Profit and Loss
GDP	Gross Domestic Product
GFC	Global Financial Crisis
G-SII	Global Systemically Important Institution
HFCS	Household Financial and Consumption Survey
HH	Households
HQLA	High Quality Liquid Assets
IC	Insurance Corporations
IF	Investment Funds
IFRS	International Financial Reporting Standards
IRB	Internal Ratings-based (approach of Basel III)
ITS	Implementing Technical Standards
LCR	Liquidity Coverage Ratio
LE	Large Exposures
LGD	Loss Given Default
LSI	Less Significant Institutions
MFI	Monetary Financial Institution
MIR	MFI Interest Rates (dataset of the ECB)
NBFI	Nonbank Financial Institutions
NFC	Nonfinancial Corporates
NFCI	Net Fee and Commission Income
NII	Net Interest Income

NIM	Net Interest Margin
NLP	Net Liquidity Position
NPE	Non-Performing Exposure
NPL	Non-Performing Loan
NSFR	Net Stable Funding Ratio
NTI	Net Trading Income
OCI	Other Comprehensive Income
OFI	Other Financial Institutions
O-SII	Other Systemically Important Institution
P&L	Profit and Loss
PBT	Profit Before Tax
PD	Probability of Default
PF	Pension Fund
PiT	Point-in-Time
ROW	Rest of the World
RWA	Risk-Weighted Asset
SHSG	Securities Holdings Statistics Group
SI	Significant Institution
SREP	Supervisory Review and Evaluation Process
STA	Standardized Approach (of Basel III)
SyRB	Systemic Risk Buffer
TCI	Total Comprehensive Income
TM	Transition Matrix
TTC	Through-The-Cycle
WEO	World Economic Outlook

EXECUTIVE SUMMARY

The Financial Sector Assessment Program (FSAP) for Portugal conducted a comprehensive systemic risk analysis and assessment of the resilience of the banking sector. This included a full-fledged top-down solvency stress test to evaluate banks' capital adequacy under two severe adverse macrofinancial scenarios. Alongside this, targeted sensitivity analyses were conducted to examine risks not fully captured in the solvency tests, including debt revaluations at amortized cost, potential losses from common large exposures, and quasi-reverse stress tests. Cash flow-based liquidity stress tests assessed banks' resilience to general risk aversion, sovereign market distress, and idiosyncratic shocks to their funding base. A targeted assessment analyzed vulnerabilities across the household, corporate, and real estate sectors, and interconnectedness analysis examined the structural evolution of cross-sectoral linkages in the financial sector.

The FSAP evaluated the sources of systemic risks and their potential effects on the banking sector. The assessment occurred against a backdrop of supportive macroeconomic conditions—marked by strong growth, a resilient labor market, and improving fiscal balances. However, elevated housing prices, which have surged by 180 percent since 2015, pose a key risk. Banks' substantial exposure to residential mortgages amplifies the potential impact of a housing market correction. External shocks, such as a slowdown in euro area growth, trade war, tighter global financial conditions, or rising interest rates could impair credit quality and trigger debt securities revaluation. Although present risks are mitigated by robust fundamentals and macroprudential measures, the high sensitivity of household debt repayment capacity to interest rate fluctuations underscores the need for continued vigilance and prudent risk management.

The results of the FSAP solvency stress tests show that the banking system remains stable in the adverse scenarios. Banks enter the stress test scenarios from a position of strength, supported by high profitability, low level of non-performing assets, and ample capital buffers after the banking sector's thorough balance sheet clean-up and risk-off stance over the preceding decade. The banks' operating costs are also among the lowest in the EA. A combined materialization of credit, market, and interest rate risks under extreme stress does not lead to depletion of banks' capital buffers. No bank's capital position falls below the regulatory requirement. Banks, in aggregate, display strong profitability and limited credit and market risk losses even under the assumed extreme shocks, with some heterogeneity across banks. They remain resilient even after applying the banking sector's maximum past probability of default over the past two decades (a quasi-reverse stress test). Sensitivity analyses show that the potential impact of the ongoing conflict in the Middle East does not change these conclusions.

Liquidity risk analysis shows that the banks can withstand liquidity outflows under severe stress scenarios, with a few banks facing limited liquidity shortfalls in extreme stress. The analysis shows that the aggregate LCR of all banks continues to comfortably exceed minimum regulatory requirements, while the NSFR indicates a strengthening of structural funding resilience since 2021. The cash flow-based liquidity stress test of nine sample banks reveals that their net liquidity positions remain resilient across horizons under the general risk aversion and market

sovereign distress scenarios. A few banks, however, would face marginal liquidity shortfalls under the extreme idiosyncratic funding shock, ranging from 0.1 percent to 3.5 percent of total assets. Liquidity drain under this extreme scenario is driven mainly by severe deposit outflows.

Significant deleveraging over the past decade has reduced household and corporate vulnerabilities, but housing market risks have exacerbated and should be closely monitored. Corporate and household debt levels are now below euro area averages. However, low-income households remain vulnerable to rising living costs and interest rates due to the prevalence of adjustable-rate mortgages. Risk analysis shows that adverse conditions could sharply increase household "debt at risk" and impact lower-income groups the most. But the very low share of mortgage credit allocated to lower-income groups should mitigate systemic risk. Corporate resilience has strengthened through deleveraging and improved profitability. The FSAP analysis shows that macrofinancial shocks of severity similar to the European debt crisis would result in markedly lower default rates, but certain sectors, including construction and real estate, are more vulnerable. Limited housing supply has kept house prices above levels implied by income and demographic trends, stressing the need for policy action to address supply bottlenecks.

Financial exposures among key sectors are limited and have moderated compared to a decade ago. Interconnectedness analysis shows minimal direct contagion risks within the financial sector. Bilateral links between banks and nonbanks have significantly declined on both the asset and liability sides, largely due to a sharp contraction in exposures to OFIs, the largest sub-sector within the nonbank sector. The domestic sovereign-bank nexus has also weakened in line with banks' lower direct exposure to Portuguese public debt. Cross-border banking operations are modest but warrant closer monitoring given the Spanish banks notable presence and possible contagion.

The recommendations emphasize the need for ongoing monitoring of risks and the continuous enhancement of modelling capabilities. Close attention should be paid to risks from real estate exposures, sovereign debt holdings, and the predominance of demandable deposits as a source of funding. Banks have considerable exposure to residential real estate. Exposures to EA sovereign debt are significant and diversification is limited, warranting close and ongoing monitoring. Liquidity monitoring should prioritize demandable deposit outflows and risks from unexpected withdrawals, which could be triggered by new bank or non-bank competitors and/or new products entering the market. Advancing tools for analyzing net interest income dynamics, macrofinancial feedbacks, and reverse stress testing are recommended.

Table 1. Portugal: Main Recommendations on Stress Testing	
Recommendations	**Timing***
Solvency Stress Testing	
Continue to monitor risks related to real estate exposures and sovereign debt portfolios, in particular potential unrealized losses in the securities held at amortized cost.	ST
Invest resources to further develop tools to monitor the banking sector, including refining models for net interest income to better capture changes in passthrough dynamics from the rise in mixed rate mortgages, and developing reverse stress test capabilities.	MT
Expand stress-testing models to account for macrofinancial feedback loops and enable assessment of policy intervention impacts.	MT
Liquidity Stress Testing	
Continue to monitor demandable deposit outflows and potential risks associated with unexpected deposits withdrawals.	ST
* I: Immediate = less than one year; ST: short term = 1-2 years; MT: medium term = 3–5 years.	

INTRODUCTION[1]

A. Macrofinancial Context

1. Portugal's economic growth has been resilient, with growth exceeding the EA average in recent years. This strong performance was supported by robust tourism inflows, EU Resilience and Recovery Facility (RRF) funding, and the payoff of past reforms. Real GDP grew at 1.9 percent in 2025, mainly driven by private consumption, supported by strong labor markets and supportive fiscal policies boosting real disposable income, while investment remained strong, supported by RRF funding. The external current account weakened but remained in surplus. The labor market has remained strong, with working-age population growing since 2023 reflecting immigration flows, while labor force participation also continued to increase, and the unemployment rate remained at historically-low levels. With the tight labor market, real wage grew by 6.0 percent in 2025 (after 7.4 percent in 2024), outpacing productivity and weakening competitiveness. Both headline and core inflation continued to decline to 2.2 and 2.1 percent respectively in 2025. The fiscal position remained strong, recording a surplus for a third consecutive year in 2025, and public debt continued its impressive reduction to below 90 percent of GDP, down 44 ppts from 2020.

2. Activity is expected to slow in 2026 and 2027. Growth is projected at 1.7 percent in 2026, as negative spillovers from the conflict in the Middle East on external and domestic demand are expected to offset the impact of higher EU funds. Severe storms dampened growth early in the year, but reconstructions and repairs are expected to subsequently boost activity, so their annual impact will be minimal. The expected slowdown in 2027 mostly reflects the end of RFF-financed investment. Inflation is expected to increase to 3.4 percent in 2026, driven by commodity price increases and, to a lesser extent, wage pressures. There are significant risks to the outlook that could, alone or in combination, push growth down and inflation up (Appendix 1). As a small open economy, Portugal is vulnerable to increased trade disruptions due to geopolitical tensions, conflicts, protectionism, and policy uncertainty, although the importance of tourism in exports and EU/EA membership are mitigants. Commodity price volatility could increase inflation, discourage investment, and dampen growth.

3. Bank lending has accelerated after contracting in the 2010s, but loans continued to decline relative to GDP until a marginal increase in mid-2025—a sign of a possible shift in the credit cycle. Credit to domestic activities accelerated in 2025, growing by 6.8 percent in end-2025 (1.9 percent in December 2024) and, after a 1.6 percent drop in 2023, is back on the recovery path started in 2020 after a decade of negative growth.[2] It has nonetheless continued to decline relative to GDP, down to 90 percent of GDP at end-September 2025 from 191 percent at end-2010. Growth in domestic mortgage and other household lending is particularly brisk (up 8.9 percent at end-2025), supported by stronger demand, government housing support, and lower policy rates. Corporate

[1] This Technical Note was prepared by Jean Christine A. Armas, Guillaume Arnould, Gohar Minasyan, and Laura Valderrama. The analysis has benefited from insightful discussions with Banco de Portugal, the ECB/SSM, and the Portugal FSAP team.

[2] Credit contracted on average by 2.9 percent a year in the 2010s.

credit has been accelerating (up 2.8 percent at end-2025), after declining from June 2023 until September 2024.[3]

4. Private sector deleveraging has been underway since 2013, except for a brief interruption after the onset of the 2020 pandemic. The debt of non-financial corporates (NFCs) has declined to 103 percent of GDP at end-2025, from 176 percent at end-2012. NFCs are increasingly funded by internal equity (45.7 percent of NFCs' funding at end-September 2025, up from 31 percent at end-June 2009), supported by strong profitability. NFCs' EBITDA at end-September 2025 was at 9.2 percent of total assets, as compared to the average of 7.3 over the past 20 years. Household indebtedness has also declined from a peak of 94 percent of GDP at end-2009 to 55 percent at end-2024, before edging up to 57 percent at end-2025. Household indebtedness contracted also in terms of disposable income since the European debt crisis, supported by lower unemployment and rising disposable income. The rise in the household savings rate (12.1 percent in 2025 as compared to an average of 7.7 over 2013-15) provides a buffer against potential shocks.

B. Financial Sector Structure and Vulnerabilities

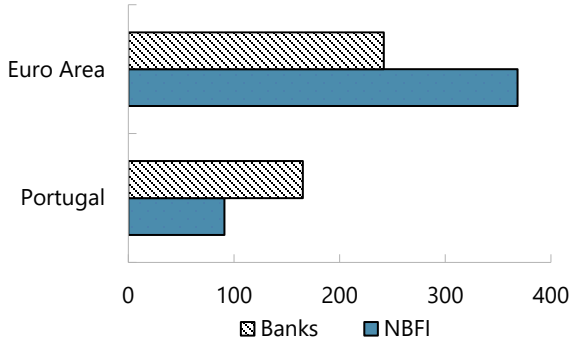
5. Portugal's financial system is bank-centric, and the nonbank financial sector is smaller than euro area average. The banking sector holds 165 percent of GDP in total assets at end-September 2025, accounting for 65 percent of assets in the financial sector (Figure 1). The imprint of the nonbank financial institutions (NBFI) sector remains small, with total assets accounting for 91 percent of GDP in Q3 2025, compared to 368 percent in the EA. Captive financial institutions and money lenders, including financial and non-financial holding companies, are the most important players in the market (with assets equivalent to 32 percent of GDP) and provide funding to domestic corporates.[4] Insurance companies play a less important role, with assets at 20 percent of GDP. Investment funds and pension funds are of considerably more limited relevance compared to most other EA countries, with assets jointly at 27 percent of GDP.

[3] A large portion of corporate debt (41 percent) goes to the services sector, including trade, accommodation, and food services; -12 percent goes to industry.

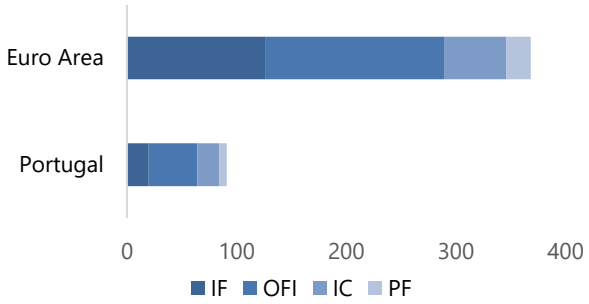
[4] Captive financial institutions and money lenders include financial and non-financial holdings and trusts; money lenders (which grant credit secured by assets); and special purpose entities (which secure market funding for group entities). Captive financial institutions and money lenders are mostly funded via equity instruments and to a lesser extent loans.

Figure 1. Portugal: Financial Sector Developments in Portugal and the Euro Area

Composition of Financial Sector, EA vs. PT
(Financial assets, in percent of GDP, Q3 2025)



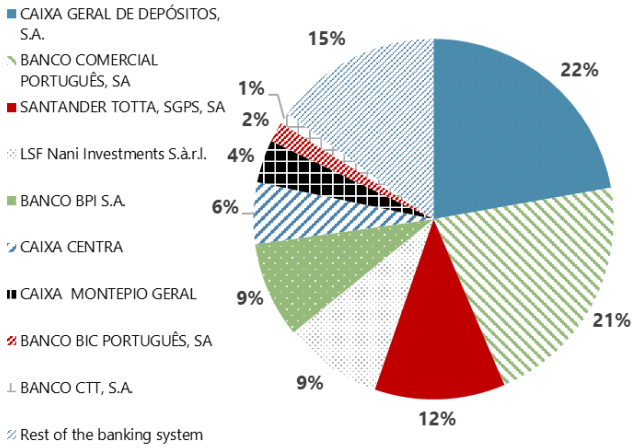
Composition of the NBFIs, EA vs. PT
(Financial assets, percent of GDP, Q3 2025)



Source: Banco de Portugal, ECB Data Portal, and IMF Staff calculations.
Notes: Euro Area 20 (fixed composition) as of January 2023. MFIs = monetary financial institutions (banks); NBFIs = nonbank financial institutions; IF = Investment Funds; OFI = Other Financial Institutions (captive financial institutions and money lenders, financial auxiliaries, and other financial intermediaries); IC= Insurance Corporations; and PF = Pension Funds.

6. The Portuguese banking system is dominated by a few large banks, with a large share composed of foreign-owned subsidiaries. Three significant institutions (SIs) account for 54 percent of banking system assets, while foreign-owned subsidiaries account for another 24 percent (Figure 2).[5] Less significant institutions (LSIs) account for 14 percent of total assets and foreign-owned branches account for 9 percent.[6]

Figure 2. Portugal: Banking Sector Structure
(In percent of total banking sector assets, end-June 2025)



Sources: Banco de Portugal and IMF Staff calculations.

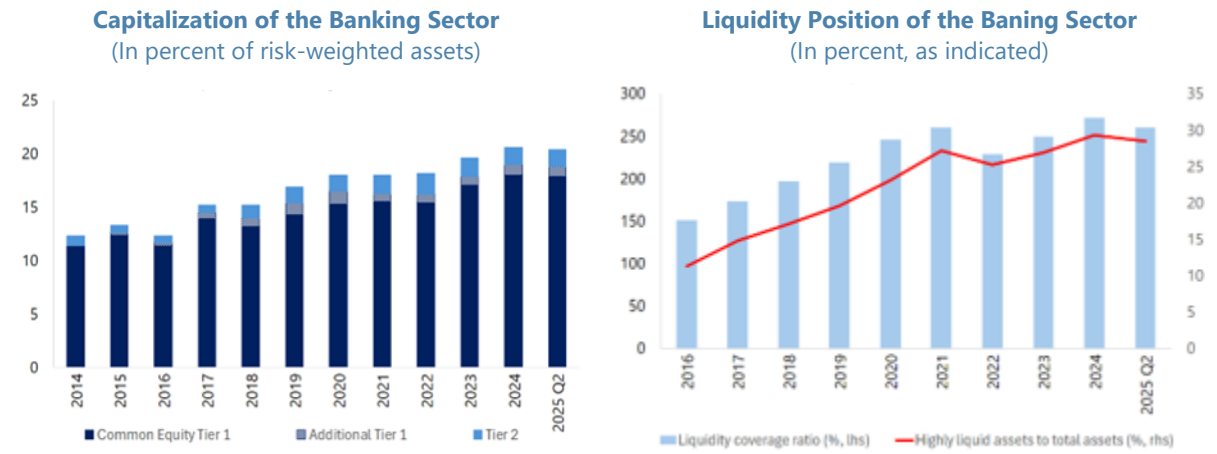
7. Banks' capital positions have improved markedly, and liquid asset buffers are high. The banking sector's Common Equity Tier 1 (CET1) ratio was at 17.9 percent at end-June 2025, rising

[5] Foreign subsidiaries are predominantly owned by Spanish parent institutions, although Novo Banco is currently subject to an acquisition by the French group BPCE.

[6] Significant (credit) Institutions (SI) are under the ECB's direct supervision while LSIs are supervised by national competent authorities under the oversight of the ECB.

steadily over the preceding decade (Figure 3). Both the liquidity coverage ratio (LCR) and the net stable funding ratio (NSFR) are considerably above regulatory minima. The LCR is one of the highest in the EA (260 percent at end-June 2025), compared to the EA median of 183 percent.

Figure 3. Portugal: Banking Sector Capitalization and Liquidity Buffers



Sources: Banco de Portugal and IMF Staff calculations.

8. Banks' funding structure is retail based, reflecting a stable and traditional model. Banks are predominantly funded by deposits representing 81 percent of total liabilities in Q2 2025, with market funding (i.e., covered bonds, repos, and other debt securities) playing only a limited role (Figure 4). Within deposits, households form the dominant and stable base accounting for 56 percent of total liabilities, while corporate deposits provide 19 percent of total liabilities. Interbank and other deposits remain small. Term deposits represent the majority of deposits for households.

9. Banks' assets are centered around loans with variable interest rates, while the share of new mixed rate loans is growing. Loans represent 56 percent of total assets, with most loans (27 percent of total assets) being mortgages, closely followed by corporate loans (18 percent of total assets; Figure 4). A defining feature of the Portuguese banking system is the dominance of loans with a variable interest rate. About 75 percent of outstanding mortgages and almost all corporate loans have a variable rate or short maturity. Mixed-rate mortgages (6 percent of total assets) have a fixed rate for a limited period and then shift to a pre-defined variable rate at the end of the fixed period. They became more relevant after the rise in interest rates in 2023, which created an impetus to temporarily lock rates and curb interest rate-related credit risk. Repricing periods have, as a result, lengthened: 73 percent of existing mortgages now reprice within a year, compared to 95 percent at end-2022. The recent interest rate cuts by the European Central Bank (ECB) (200bps since June 2024) could weigh on bank profitability, as the high share of variable-rate or short maturity loans may compress net interest margins (NIMs). The rising share of mixed-rate mortgages should be monitored since it may change the policy rate passthrough and affect NIM dynamic.

10. Banks' high domestic real estate exposures pose a vulnerability. These exposures—which include mortgages, other loans collateralized against real estate, real estate holdings, and real estate funds—amount to a third of the banking system's total assets. Residential mortgage lending in 2025 has been growing the fastest since 2010 (10 percent y-o-y in 2026Q1). Residential property prices

have also been rising rapidly, up 16.4 percent in real terms y-o-y in 2025Q4 (the fastest y-o-y growth since 1989), outpacing household income. Supply constraints and non-resident and tourism demand have been key driving factors.[7] The declining share of loans with high LTV and DSTI ratios, the systemic risk buffer for residential real estate exposures (introduced in October 2024), the countercyclical capital buffer (raised to 0.75 percent in January 2026), and the rising household disposable income and savings rate are risk mitigants for the banks.[8]

11. Banks hold a large share of their total assets in government debt securities, with a concentration in euro area countries; however, exposure to Portugal has been declining. Debt securities holdings amount to 29 percent of total assets, compared to an EA average of 14 percent (Figure 4). These are mostly composed of government debt securities at amortized cost (72 percent). The debt securities portfolio is fairly concentrated, with the exposure to the top three sovereigns representing 48 percent of the total debt securities portfolio. A smaller share of debt holdings has been allocated to the domestic sovereign since the European debt crisis (22 percent, down from 73 percent in 2015), with an increasing allocation into other euro area debt (e.g. Spain, Italy and France).

12. Banks have benefited from higher interest rates, and profitability has been at a record high in recent years. The banking sector's ROA reached a high of 1.4 percent at end-June 2025, before declining slightly to 1.3 percent at end-December 2025. This increase is mainly driven by high interest income but also a reduced level of provisioning, stable fee income, and low operational costs (Figure 5). Loans are mostly variable rate (80 percent of total loans), enabling banks to benefit from the recent interest rate rise, while the pass-through to deposit rates have been lower. As a result, Portuguese banks currently enjoy a large spread between their interest earning assets and cost of funding.[9] Banks in Portugal are also some of the most efficient in the EA, with low cost-to-income ratios, which further bolsters their profitability.[10]

[7] Non-resident buyers have played an important role in Portugal's retail housing market, accounting for 10 percent of total transaction value in 2024. Their participation has been supported by policy measures, notably the Golden Visa program (2013-23) which granted residence to foreign buyers of properties valued over EUR500,000.

[8] Two-thirds of house loans were associated with LTVs of less than 80 percent and virtually all with LTVs of less than 90 percent at end-2024 (55 percent and 79.5 percent, respectively, at end-September 2018); 92 percent of loans were associated with DSTI of less than 50 percent at end-2024 (80 percent at end-September 2018).

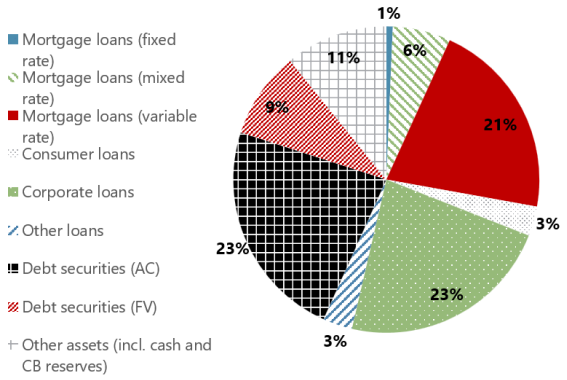
[9] Interest rates on mortgage loans were at 3.4 percent, while those for non-financial corporates (NFC) were at 4 percent and interest rates for consumer loans were at 7.3 percent in mid-2025. In addition, interest rates paid on deposits are low, close to zero for sight deposits, while term deposits are at 1.3 percent, below the ECB policy rate.

[10] Post-European debt crisis consolidation and branch rationalization have enabled Portuguese banks to achieve larger cost reductions than most euro area peers.

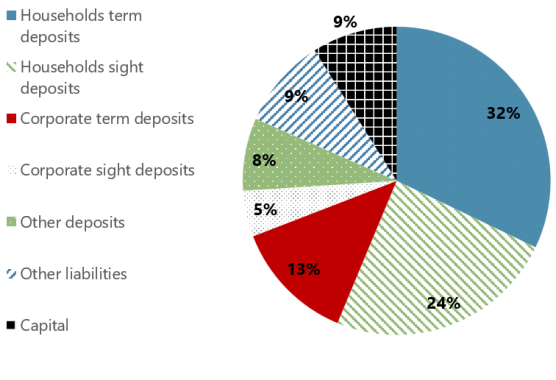
Figure 4. Portugal: Banking Sector Assets and Liabilities

(In percent of consolidated balance sheet; Bank stress test sample, end-June 2025)

Banking Sector Assets

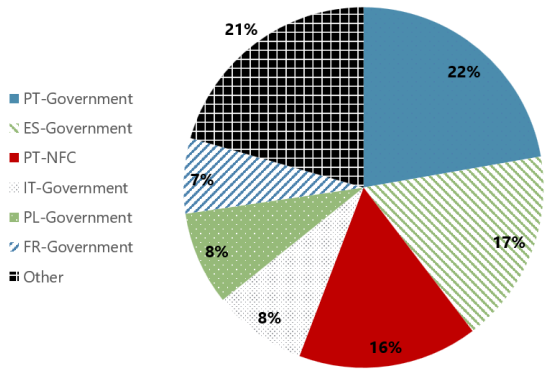


Banking Sector Liabilities

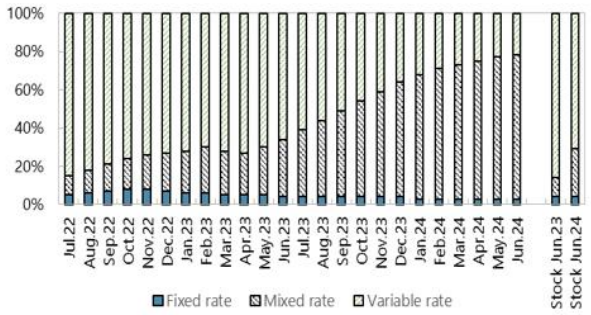


Notes: Other loans are composed of loans to financial institutions and government.

Debt Securities Distribution



Monthly Flow of New Loans and Stock of Housing Loans by Type of Interest rate

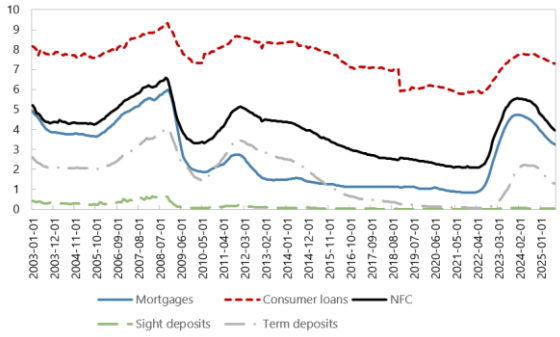


Sources: Banco de Portugal and IMF Staff calculations

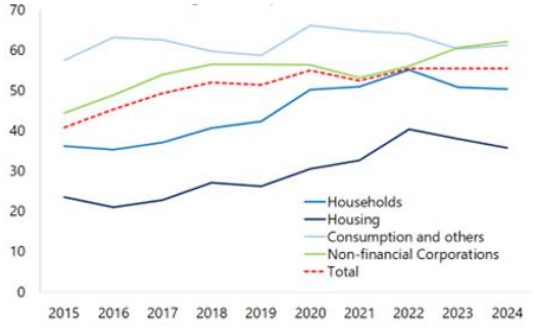
Notes: Other is composed of all other exposures that fall below a 5 percent threshold.

Figure 5. Portugal: Banking Sector Profitability

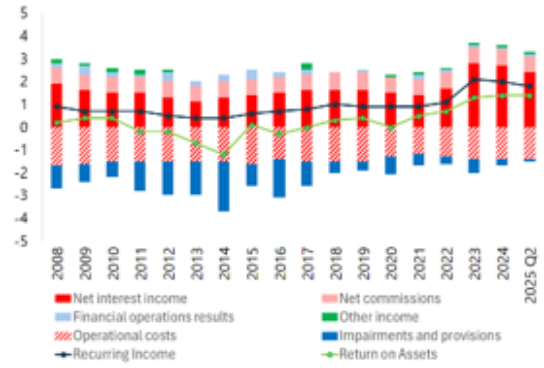
Interest Rate of Outstanding Loans and Deposits
(In percent)



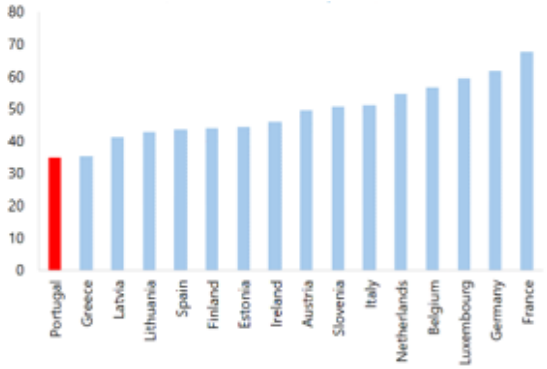
NPL Provisioning
(Coverage ratio, in percent of NPLs)



Return on Assets of the Banking Sector
(In percent of Average Assets)



Euro Area: Banking Sector Efficiency
(Cost-to-income ratio; in percent)



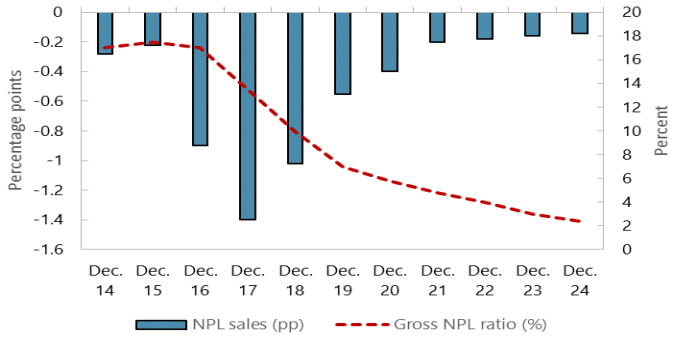
Sources: Banco de Portugal and IMF Staff calculations.

13. The banking system has deleveraged considerably since the European debt crisis. The banking sector's assets declined to 165 percent at end-September 2025 from a peak of 293 percent of GDP at end-2012. Customer loans have declined to 56 percent of total assets in end-September 2025 from 70 percent in 2008. Banks' debt securities holdings have in contrast risen to 29 percent of total assets in end-September 2025, from 11 percent in 2008. This reflects primarily the deleveraging of household and nonfinancial corporate balance sheets after the European debt crisis, as well as the effort by the banks to address problem assets by disposing of NPLs to enable balance sheet clean-up and meet higher capital requirements. At the height of the European debt crisis Portuguese banks temporarily lost access to international wholesale funding markets. This meant additional pressure, which led banks to deleverage.

14. Banks' credit quality has improved significantly in the past decade. NPLs have declined to 2.1 percent at end 2025 from 17.9 percent peak in early-2016, as the banks addressed asset quality issues after the European debt crisis (Figure 6). Today, NPLs are low across bank portfolios, ranging from 1 percent of housing loans to 6.1 percent for consumption loans at end-September 2025. To restore balance sheet health and meet supervisory targets, banks pursued aggressive NPL reduction strategies, including large-scale portfolio sales to specialized international investors and asset management companies, as early as 2014. These transactions, often at steep discounts, helped banks free up capital, reduce provisioning needs, and improve asset quality metrics.

Figure 6. Portugal: Evolution of NPLs

NPL Ratio (percent of gross loans) and NPL Sales



Sources: Banco de Portugal and IMF Staff calculations.

15. Banks have drastically reduced their reliance on wholesale and external debt and shifted towards domestic deposits. After the European debt crisis, Portuguese banks faced severe funding pressures as their access to international wholesale markets virtually collapsed. Rising sovereign risk premiums and downgrades of Portugal's credit rating made external borrowing prohibitively expensive, while investor confidence in the banking sector eroded. This forced banks to rely heavily on ECB liquidity facilities and domestic deposits. Today, banks funding is dominated by deposits (81 percent of total liabilities), with a large share protected by the deposit guarantee scheme and market-based funding playing only a limited role. While the predominance of retail deposits (both sight and term) has historically supported stability and profitability, new competitors (including non-banks) and/or new products (such as stablecoins) entering the market could amplify deposit outflows in stress scenarios and warrants continuous monitoring.

16. Domestic interlinkages appear limited, but cross-border interconnectedness can play a role. Institutional interconnectedness has declined over the past decade. Bilateral links between banks and nonbanks have significantly declined on both the asset and liability side, largely due to a sharp contraction in exposures to OFIs—the largest NBFI sub-sector. The sovereign-bank nexus has also weakened in line with banks' lower direct exposure to domestic public debt. Cross-border banking operations are modest relative to their balance sheets, but Spanish banks have notable presence in Portugal.

C. FSAP Stress Testing Strategy

17. The resilience of the Portuguese banking system was assessed using a range of stress tests:

- A fully-fledged top-down solvency stress test to assess banks' capital adequacy against two severe, adverse macrofinancial scenarios.
- Selected sensitivity analyses to explore risks not directly captured in the solvency stress test, such as revaluation of debt securities held at amortized cost, a quasi-reverse solvency stress test, and an analysis of large exposures.

- A wide range of liquidity stress tests to estimate bank resilience to market-wide and idiosyncratic liquidity risks.

- An assessment of private-sector balance sheet vulnerabilities of households, NFCs, and the housing market, with estimation of household and NFC probabilities of default (PDs) and their application in the bank solvency stress test.

18. An interconnectedness analysis that provides a structural assessment of the extent of cross-sectoral interconnectedness in Portugal.

19. The stress test closely follows the EA FSAP stress test but also integrates Portugal-specific features. To ensure consistency across FSAP stress test approaches and assessments, the stress test employs approaches similar to those used in the EA FSAP for most of the satellite models

and assumptions (see IMF, 2025). By leveraging on available granular data, BdP shared detailed breakdowns that capture important specificities of the Portuguese banking system, allowing the development of new satellite models to estimate credit risk, NII, and market risk.

20. The banking stress test was conducted using mid-2025 data for the nine largest banks in the Portuguese banking system. The stress test covered 85 percent of the banking system's total assets. The stress test was performed using bank-level supervisory data, including from the European Banking Authority's (EBA's) Financial Reporting (FINREP) and Common Reporting (COREP) templates, the ECB short-term exercise (STE) templates, the Portuguese credit register, and the Securities Holdings Statistics Group (SHSG) database.[11]

21. Stress testing results for the banking system are presented as an aggregation for the full sample of nine banks. For analytical purposes, banks are grouped into three main categories based on their size and characteristics (Table 2): (i) SIs (3 banks), which are the largest banks directly supervised by the ECB; (ii) LSIs (3 banks), which comprise high-impact LSIs per ECB classification and correspond to the largest LSIs in Portugal directly supervised by BdP; and (iii) foreign subsidiaries (3 banks), which comprises banks that are a subsidiary of a foreign-owned bank, also under supervision by the ECB.[12]

[11] The SHSG data is compiled by the BdP and also provided to the ECB according to the ECB guidance notes on SHS regulation.

[12] Banco BIC was bought by the Spanish bank Abanca in 2024 which aims to combine it with its existing branch by end-2025, which will increase the size of the entity by about 50 percent. At the cutoff date for the stress test (Q2 2025), the merger had not been completed yet. The FSAP team engaged with the ECB's Joint Supervisory Team to conduct a high-level assessment of the portfolio of the new group using pro-forma balance sheet.

Table 2. Portugal: List of Institutions Covered in the Stress Tests

Name of Institution	Groups
Caixa Geral De Depósitos, S.A.	SI
Banco Comercial Português, SA	SI
Santander Totta, SGPS, SA	Foreign Subsidiary
Novo Banco S.A.	SI
Banco BPI S.A.	Foreign Subsidiary
Caixa Central - Caixa Central De Crédito Agrícola Mútuo, CRL	LSI
Caixa Económica Montepio Geral, Caixa Económica Bancária, SA	LSI
Banco BIC Português, SA	Foreign Subsidiary
Banco CTT, S.A.	LSI

Sources: Banco de Portugal and IMF Staff calculations.

BANK SOLVENCY STRESS TEST

A. Overarching Assumptions

22. Bank resilience was assessed against three criteria ("hurdle rates"):

- The "minimum capital ratio" or Supervisory Review and Evaluation Process (SREP) requirement: consisting of a Basel III regulatory minimum (CET1 ratio of 4.5 percent) plus Pillar 2 requirements (P2R).
- The "minimum capital ratio" plus the "combined buffer requirement (CBR)" consisting of two additional elements: a Capital Conservation Buffer (CCoB), and the Other Systemically Important Institution (O-SII) buffer.
- The leverage ratio was assessed against the 3 percent Basel III minimum requirement.

23. A static balance sheet approach was adopted for the stress tests. The stress tests were conducted under the assumption that exposures and liabilities remain constant and maintain the cut-off date level throughout the stress testing horizon. For instance, maturing loans are replaced by new performing loans, and the maturity structure is kept constant over the horizon of the scenarios. Banks can build capital through retained earnings, but there are no capital injections.

B. Scenarios

Macrofinancial Scenarios

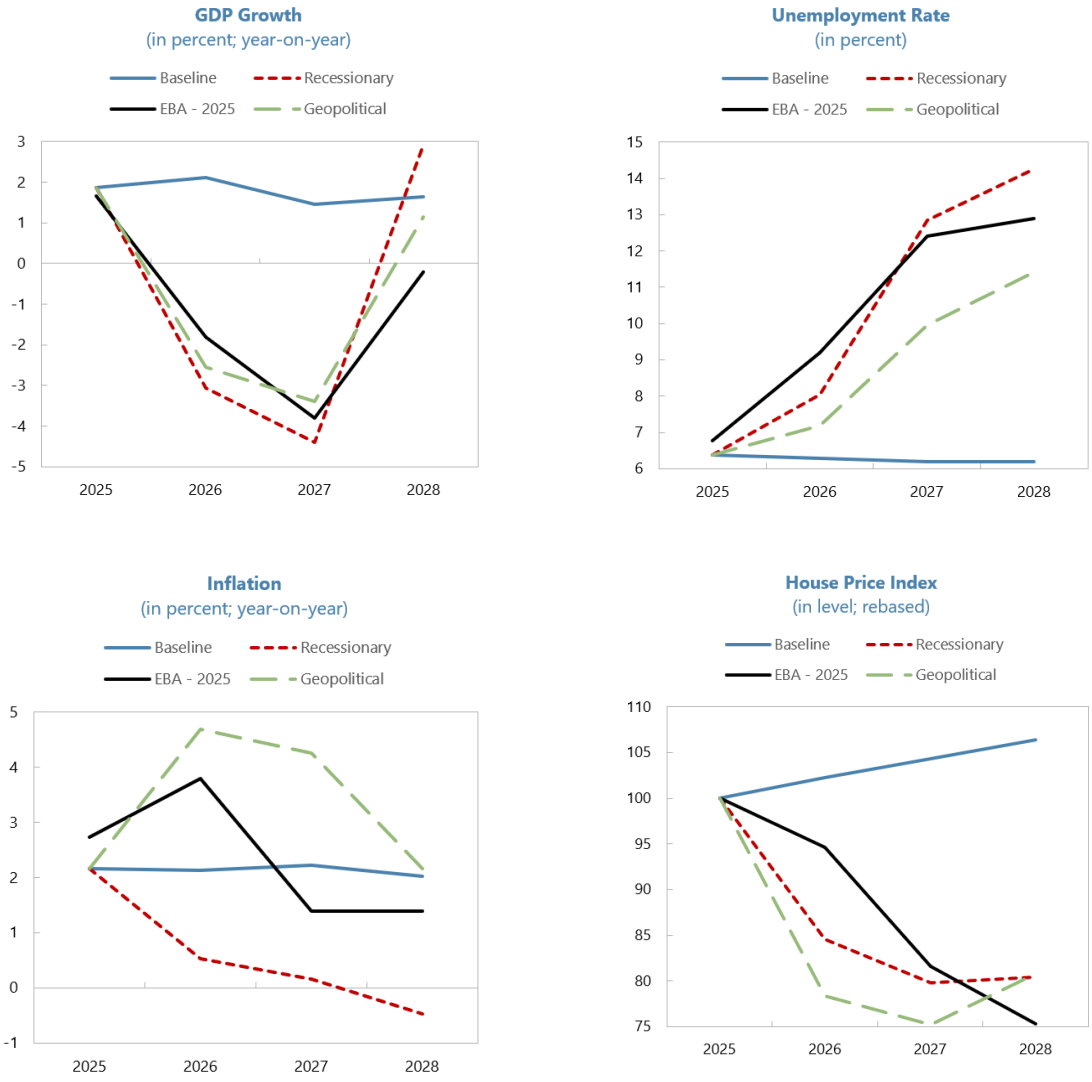
24. Banks' resilience was assessed against two severe adverse macrofinancial scenarios.[13,14] The design of both scenarios was aligned with the risks identified in the Risk Assessment Matrix (RAM) (Appendix I) and the EA FSAP adverse scenarios (IMF, 2025). The first, "recessionary scenario" showed a synchronized global slowdown, amplified by sovereign debt distress in the EA, widening of credit spreads, term-premium decompression, and confidence losses softening aggregate demand. An accommodative monetary policy reaction was assumed, which mitigates the adverse impact on aggregate demand. The second, "geopolitical scenario" featured further escalation of geopolitical conflicts, heightened commodity price volatility and disrupted global production chains, with large adverse trade, price, and tariff shocks ("trade wars"), slowing growth. Countries with adequate fiscal space were assumed to use fiscal policy to partly offset the demand shock and support consumption. The rise in inflation due to production chain disruptions was assumed to prompt monetary policy tightening.

25. Both scenarios also featured a house price shock to assess risks from the banks' large exposures to the real estate sector. House prices have grown rapidly in recent years, increasing by 180 percent since 2015, compared to an EA average of 56 percent as of 2025Q4. To estimate the magnitude of potential shock on house price in an adverse scenario, the FSAP team reviewed a range of metrics, such as the price-to-income and price-to-rent ratios, which are 30 percent and 38 percent above the estimated fundamental value, respectively, while the ECB estimates the overvaluation gap in Portugal at around 20 percent as of end-2024 (Cousin et al., 2025). The shocks' magnitude was then calibrated to be in line with these recent estimates of overvaluation and was set at 20 percent in the recessionary scenario and 25 percent in the geopolitical scenario. The shocks were then fed through the structural model which estimated interactions with other macro variables to derive scenario-consistent paths for all risk factors modelled (Figure 7).

[13] Scenarios are not a forecast of macroeconomic, financial conditions or monetary policy reactions. Rather, they are intended to be a coherent 'tail risk' scenario designed to assess the resilience of Portuguese banks.

[14] The adverse scenarios were simulated using a global macrofinancial model, a structural macroeconometric model covering forty economies based on Vitek (2015).

Figure 7. Portugal: Projected Core Variables in the Scenarios



Note: Baseline projections for GDP growth, unemployment and inflation are based on October 2025 WEO. EBA – 2025 is the scenario used by the EBA for its 2025 stress test., whose starting point in 2024 has been shifted.
Sources: EBA, IMF, and IMF Staff calculations. The figure shows the path of key variables under the FSAP stress test scenarios.

26. The baseline scenario reflected World Economic Outlook (WEO) projections of the global economy and financial conditions. The baseline scenario is in line with the October 2025 WEO. The scenarios project the dynamics of GDP growth, unemployment, headline inflation, and housing prices (Figure 7), as well as labor costs and oil price, all of which affect bank profitability and risk-weighted assets (RWA) through various channels.

27. The adverse scenarios are calibrated to be severe. They feature a pronounced macroeconomic downturn, that is, on balance, slightly more adverse than the scenario underpinning the 2025 EBA stress test, but within the range of historical episodes of stress. GDP growth drops to -4.4 percent and -3.4 in the recessionary and geopolitical scenarios, respectively (Figure 7). These paths follow a sharp contraction in economic activity, comparable to yearly historical episodes of significant stress, such as 2012, when GDP growth reached -4.1 percent (see Appendix III). The GDP

path corresponds to a severity of respectively -1.9 and -1.5 standard deviation.[15] The FSAP adverse scenarios are slightly more severe than the EBA adverse scenario regarding GDP growth and unemployment (ESRB, 2025). The EBA adverse scenario most closely resembles the geopolitical scenario particularly when it comes to the path of inflation.

Market Risk Scenario

28. Market risk analysis was conducted against two short-term market stress scenarios, similar to those in the EA FSAP (IMF, 2025). These were calibrated to capture high-frequency market price and volatility movements in the period between January 2008 and October 2024, based on the expected shortfall at 0.1 percent of market factors' marginal distributions (Appendix III). The geopolitical market scenario featured an increase in interest rates (particularly at the short end of the EUR yield curve), commodity prices, and credit spreads, as well as a sharp contraction in equity prices. The recessionary market scenario featured a drop in commodity and equity prices, and a larger increase in the credit spread of mid- and high-risk EA sovereigns, while the short end of the EUR yield curve remained muted.

C. Credit Risk

29. Credit risk is a key component of solvency stress testing. It is associated with potential losses from (domestic and cross-border) loans and advances granted to households, corporates, governments, credit institutions, other financial institutions, as well as default probability of debt securities issued by corporates, governments, credit institutions, and other financial institutions. Under international financial reporting standards (IFRS), debt securities in the banking book (non-trading assets) can be measured at amortized cost (AC), fair value through profit and loss (FVPL), and fair value through other comprehensive income (FVOCI).

30. The credit risk modeling approach is differentiated across AC, FVPL, and FVOCI debt securities holdings. Credit impairments for AC securities are estimated in the same way as for loans and advances. The credit risk of FVPL securities is embedded in the market risk methodology, where the change in a security's price reflects changes due to risk-free rate movements or a widening in credit risk spreads. Finally, the credit risk of debt securities measured at FVOCI are estimated through both the market risk methodology and through banking book credit impairment estimation.

Probability of Default Estimations

31. The impact of the macrofinancial scenarios on probabilities of default (PDs) was assessed by country and sector. For household loans, the PDs were calibrated based on the latest Household Financial and Consumption Survey (HFCS), completed in 2021.[16] For exposures of countries not included in the HFCS, such as Poland, the PDs were mapped to comparable EA

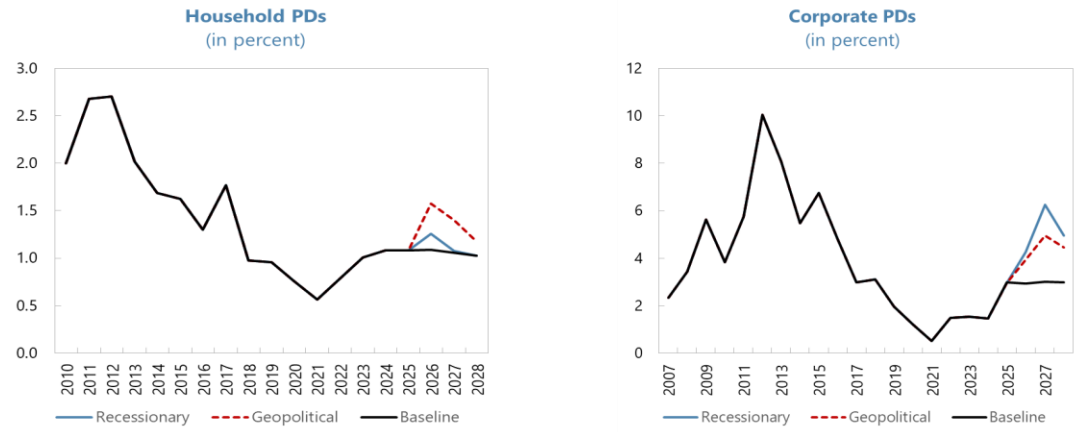
[15] Severity compares the two-years cumulated growth of the scenarios with the standard deviation of the two-years cumulative growth over the period 2000-2024, excluding the years 2020 and 2021.

[16] The survey includes 83,000 households and 200,000 personal files across 22 countries (20 EA countries, Czech Republic, and Hungary). The final survey dataset contains 6,107 households and 15,077 personal files for Portugal. See Appendix VII for more details.

countries based on household balance sheet leverage. For corporate loans and bonds in AC and FVOCI, the respective PDs were derived from the corporate PD projection model of Tressel and Ding (2021) for the same set of countries. PDs for sovereigns and financial institutions (both loans and debt securities subject to provisioning) were estimated using a Merton approach applied to the credit spreads projected in the scenario, defined as the difference between bond yields and the risk-free rate, approximated by Germany's 10-year government bond yield under the macrofinancial scenarios, assuming a fixed loss given default (LGD) of 35 percent.[17]

32. The household and corporate PDs are derived from the private-sector balance sheet vulnerability analyses detailed later in the document. The projected aggregate corporate PD in the adverse scenarios was determined to be more severe than the household PD. The corporate PD rises to 6.3 percent in 2027 in the recessionary scenario and 5 percent in the geopolitical scenario—a large increase from the starting point (Figure 8).[18] At 6.3 percent, the peak corporate PD is below the peak reached during the 2012 European debt crisis. The recessionary scenario is associated with more severe PDs due to the larger shock on unemployment, which impairs consumption, despite the significant relief from lower interest rates given that almost all corporate loans are repriced over the short term. The rise in the household PD is more limited and only reaches 1.6 percent in the geopolitical scenario; the increase is even more muted in the recessionary scenario, up at 1.3 percent from the starting point of 1.1 percent. In the latter case, the prevalence of variable rate mortgages lowers significantly households' interest payments while unemployment benefits soften the short-term negative impact of the rise in unemployment. In the geopolitical scenario, the interest rate increase, combined with a significant unemployment shock, leads to a 50 percent increase of PDs, but PD levels stay well below the historical peak of 2.7 percent during the European debt crisis.

Figure 8. Portugal: PDs Projections



Sources: Banco de Portugal, and IMF Staff calculations.

[17] Consequently, the PD of banks' sovereign exposures to Germany, Austria and Netherland is 0.

[18] Note that bank-loan weighted PDs are used in this exercise; debt-weighted PDs are used for analyzing corporate vulnerabilities.

33. For each bank and each lending segment, a PD path was generated over the course of each scenario. This path represents a weighted average of the aggregate, country-specific PDs, based on the distribution of the bank's lending exposures across countries, as reported in COREP (C09.02). The resulting PD path is then adjusted to reflect the bank- and segment-specific starting point-in-time (PiT) PD, calculated as the weighted average of observed transition probabilities from stage 1 to stage 3, and stage 2 to stage 3, weighted by total balances at each stage. This adjustment is performed using the distance-to-default formula (Equation 1):

$$PD_{i,t} = N\left(G\left(PD_{i,0}\right) + G(aPD_t) - G(aPD_0)\right) \quad (1)$$

where, $PD_{i,t}$ is the bank-specific probability of default and aPD_t is the aggregate probability of default at time t, G is inverse of cumulative distribution function of standard normal distribution and N is cumulative distribution function of standard normal distribution. The adjusted PD path, together with the initial transition matrix (TM), serves as input to the beta-linking methodology (Gross and Población, 2019), which is used to derive IFRS 9-compliant transition matrices (TMs) for each bank and lending segment.

Loss Given Default Estimation

34. LGD rates for collateralized lending are calibrated via structural modelling (Gross et al., 2020). This approach uses reported information on the value of collateral in loan-to-value (LTV) metrics, starting with reported LGDs and estimating property price paths. Bank-specific property price growth paths are used to arrive at LGD projections and are calculated as weighted averages of aggregate country-level property price paths, with weights based on each bank's real estate exposures and estimated using the same methodology applied for the respective PDs. Notably, under both adverse scenarios, the substantial decline in property values materially affects the LGD of secured lending. This, in turn, has a consequential impact on the credit risk charges associated with mortgage lending.

35. The LGD rate for unsecured lending is calibrated via the Frye and Jacobs (2012) method. Starting LTVs for collateralized lending and starting LGDs for all lending segments are reported in the STE templates for credit risk. Both secured and unsecured LGDs have been calibrated at the bank-specific portfolio level.

Credit Risk Impact through Profit and Loss (P&L)

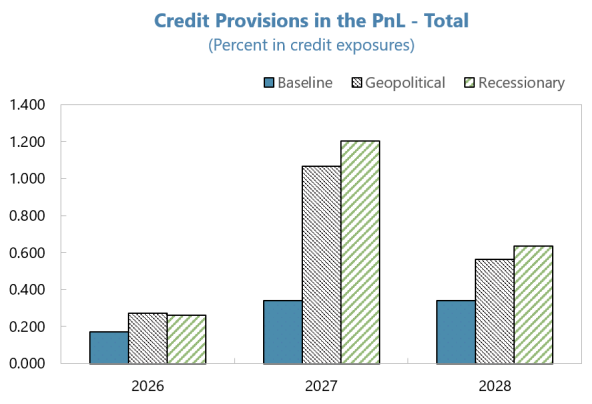
36. Credit impairments are calibrated in accordance with IFRS9, which has been adopted by all banks included in the solvency stress test. Due to the lack of long historical time series of credit risk TMs, the TM projections in the scenarios are estimated via beta-linking (Gross et al., 2020), where an aggregate probability of default is projected and adapted to stage 1 and stage 2 exposures, according to the most recently observed TMs. Starting TMs that are required for the beta-linking for every bank and lending segment are constructed with data from FINREP (F04.04.1 for balance stocks and F12.02 for flows between stages).

37. Loan loss provisions reported in the balance sheet and credit impairments recognized in the P&L statement are estimated in accordance with IFRS 9. Provisions are calculated on a 12-

month basis for stage 1 exposures and on a lifetime basis for stage 2 and stage 3 exposures, with stage 3 PDs assumed to be 100 percent. Exposure at default (EAD) includes both on-balance sheet amounts and off-balance sheet items, with the latter weighted according to the characteristics of each segment. As part of the static balance sheet assumption, matured loans are assumed to be reinitialized at the same stage as the one they were in when they matured. No write-offs are assumed; stage 3 (defaulted) exposures thus either remain in default or cure and migrate to stage 1 or stage 2 based on the projected transition matrix. Credit impairments recorded in the P&L reflect the flow of new provisions during the year, measured as the annual change in the balance sheet stock of provisions—that is, the difference between last year's provision balance and the newly estimated provision balance at year-end.

38. Estimated loan impairment charges increase significantly across the adverse scenarios but stay at manageable levels. For the full sample of nine banks, provisions amount to 0.2 percent of total loans in 2026 under the baseline and rise modestly to 0.3 percent in 2026 and 2027 (Figure 9). In the recessionary scenario, provisions increase from 0.3 percent in 2026 to a peak of 1.2 percent in 2027—a significant increase but at a manageable level—and then moderate to 0.6 percent in 2028. The geopolitical scenario follows a similar but less pronounced pattern (rising to 0.3 percent in 2026, 1.1 percent in 2027, and 0.6 percent in 2028). Results by bank type reveal a similar pattern, with a more modest reduction in 2028 for foreign subsidiaries. For all bank types, the 2027 spike reflects the point at which deteriorating macroeconomic conditions, including the largest drop in property prices, drive the sharpest migration of exposures into stages 2 and 3; the decline in 2028 follows the recovery of GDP growth and partial recovery of property prices.

Figure 9. Portugal: Credit Provisions in the P&L



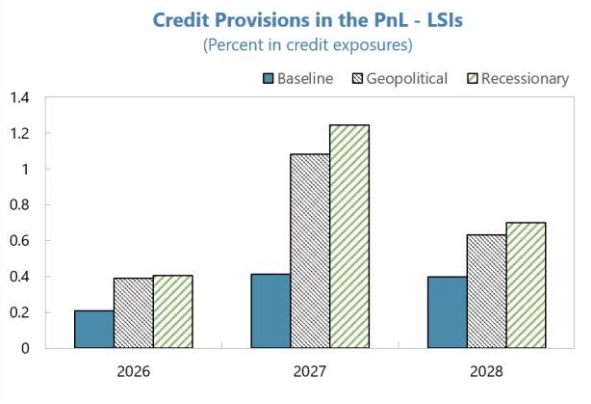
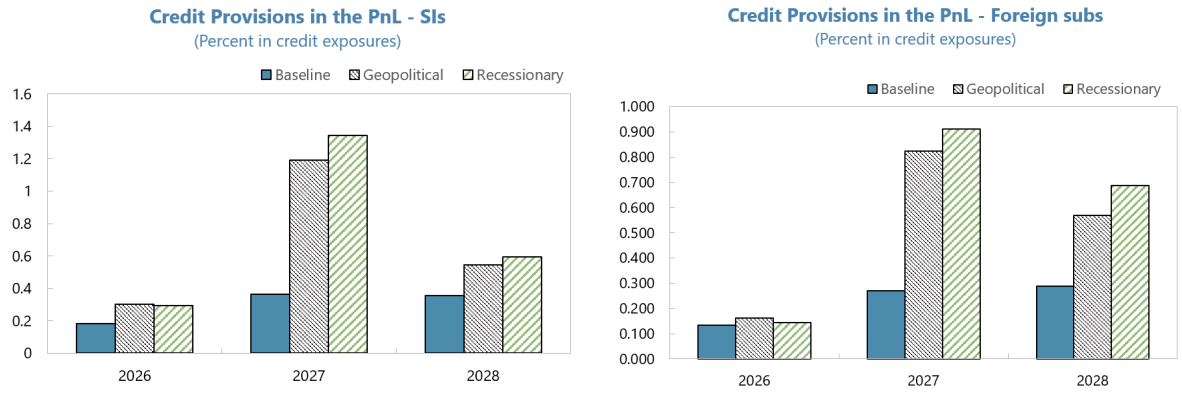


Figure 9. Portugal: Credit Provisions in the P&L (concluded)



Source: IMF Staff calculations.

39. Estimated loan impairment charges are driven by corporate and consumer loans, while mortgage loans impairment charges are small. Across all banks, corporate loans represent about 40 percent of total loans and are subject to the largest rise in PDs in the adverse scenarios (Figure 4 and 8). As a result, corporate loans account for more than 60 percent of additional provisions in 2027—the second year of the scenarios (Figure 10). For LSIs, they account for as much as 80 percent of the provisions. Mortgage loans, despite representing as much as 50 percent of loans, account for only 10 percent of impairment charges. There are, however, significant variations across groups. LSIs, for example, do not have impairment charges linked to mortgage loans in 2027 under any of the two adverse scenarios. Foreign subsidiaries, on the other hand, face 17 percent in impairment charges in the geopolitical scenario. Consumer loans—despite accounting for only 6 percent of total loans—account for 30 percent of LSIs' aggregate impairment charges in the adverse geopolitical scenario and up to 40 percent for Sis.

Figure 10. Portugal: Impairments

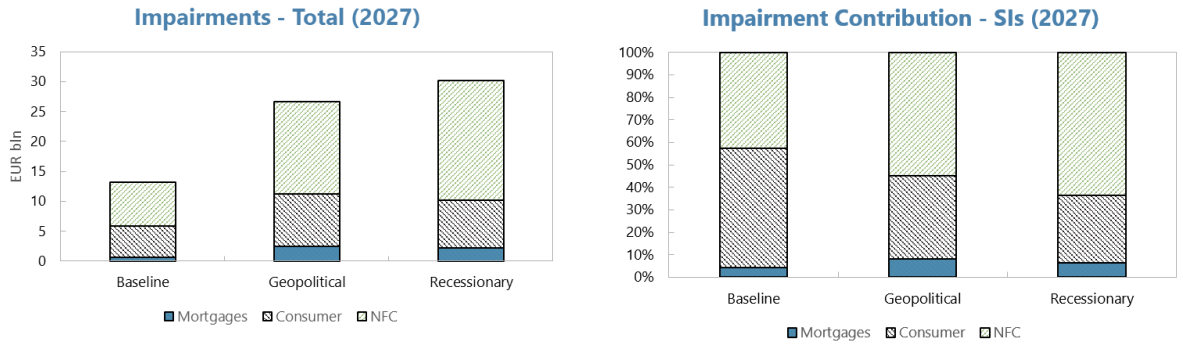
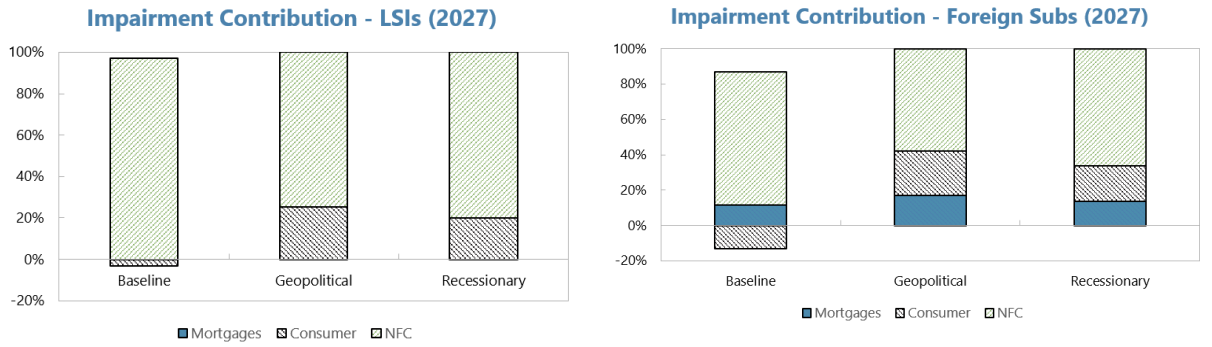


Figure 10. Portugal: Impairments (concluded)



Source: IMF Staff calculations.

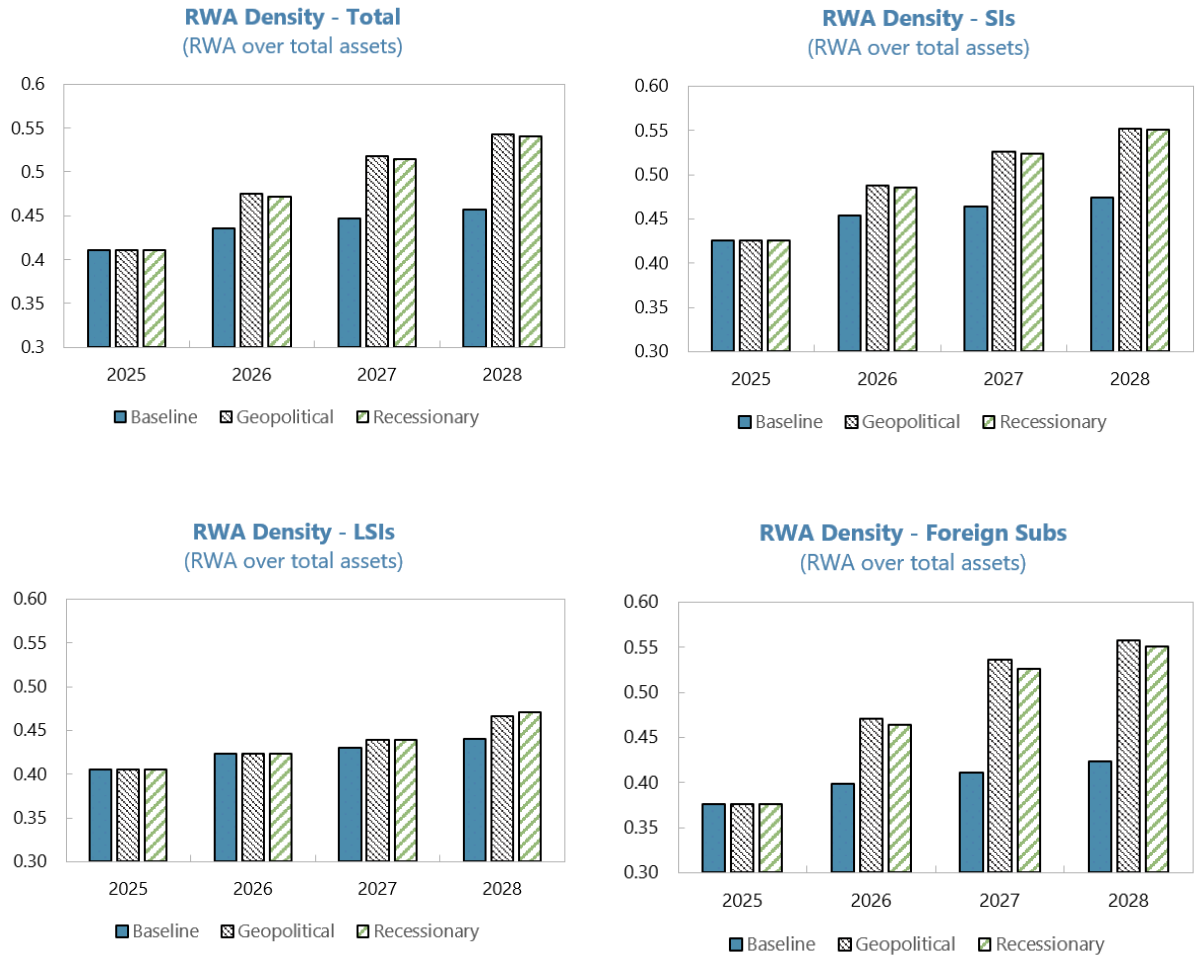
Capital Requirements for Credit Risk

40. Credit risk charges in RWAs are simulated separately for portfolios using Basel's internal ratings-based (IRB) and standardized (STA) approaches. For IRB portfolios, the asymptotic single risk factor model for unexpected losses is implemented for different types of exposures (following Basel III). RWAs are adjusted for changes in PDs and LGDs, provisions for credit losses, and the credit conversion factor of off-balance sheet items. Regulatory through-the-cycle (TTC) PDs are calibrated through the scenario as the weighted average of PiT PDs for each year of the scenarios (weighted by 0.2) and the respective TTC PDs of the previous year (weighted by 0.8, starting with the TTC PDs reported in COREP). Regulatory downturn (DT) LGD is considered the maximum between the reported DT LGD at period zero and the estimated PiT LGD.

41. For the banks that follow the standardized approach, credit risk charges are estimated using the density of credit RWA at the cut-off date (end of Q2 2025). Non-performing exposures (NPEs) are subtracted from RWA at time zero, assuming a risk weight of 100 percent. Next, the ratio of performing RWA to performing exposures is calculated. The credit risk chart for each year of the scenario is determined by multiplying the performing exposures by this ratio, and adding the total non-performing exposures, multiplied by the non-performing exposure RWA density (assumed to be 100 percent). This calculation is performed separately for each bank, to account for its individual RWA profile and exposures.

42. Adverse scenarios account for a significant increase in RWAs. With constant total assets, any increase of RWA is driven by RWA density (Figure 11). While the increase in the baseline scenario is limited and on aggregate goes from 0.41 to 0.45, in the adverse scenarios, it increases up to 0.54—an increase of 36 percent. While RWAs do not increase considerably for LSIs, RWAs increase by 50 percent for foreign subsidiaries. This rise is driven by higher LGD related to the real estate shock in the adverse scenarios and the accumulation of stage 3 and stage 2 assets.

Figure 11. Portugal: RWA Density



Source: IMF Staff calculations.

D. Net Interest Income

43. The analysis covers all interest-earning assets and interest-bearing liabilities, with the exception of derivatives. This includes instruments classified as AC and fair value—both FVOCI and FVPL. Only on-balance sheet items were covered. Derivatives were excluded due to data limitations. NPEs were assumed to generate no interest income. Although banks may be able to collect some interest income from NPEs, their income was set to zero in the stress test, both to ensure conservativeness and due to data challenges for calibrating collection rates for NPEs. Contrary to the EA FSAP and the EBA stress tests, NII has not been capped at the starting point level. This way the exercise captures a key transmission channel of the scenarios, namely the impact of changes in short-term interest rates in the Portuguese banking system which has a large share of floating-rate loan portfolios. Interest-rate movements affect NII and credit impairments in opposite directions, and removing the cap allows this interaction to be appropriately reflected in the results.

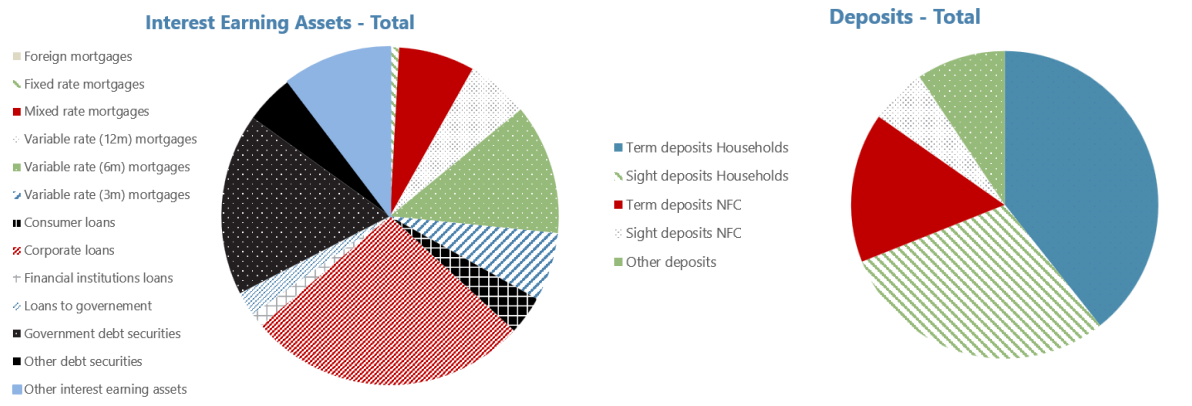
44. The interest income and interest expense for each portfolio segment is projected using a structural approach (Appendix IV). This approach requires three data inputs for each portfolio

segment: (i) the bank-level repricing structure of the portfolio at the starting point ("repricing ladder"); (ii) a time series for interest rates for newly originated exposures and liabilities ("interest rates for new business"); and (iii) interest rate levels at the starting point. The FSAP first projected the interest rate for new business for each portfolio segment at the country level using satellite models and then computed via the structural model its impact on interest income and expense using the bank-level repricing ladder and starting interest rates.

Segmentation

45. Net interest income was modeled across 18 different bank portfolio segments, reflecting its importance for Portuguese banks' profitability. Interest earning assets represent about 85 percent of Portuguese banks' balance sheet and interest-bearing liabilities amount to 80 percent of total liabilities. The analysis covers 10 portfolio segments for loans, two segments for debt securities and one for remaining assets (Figure 12). Mortgages have been segmented more granularly to reflect the different dynamics stemming from fixed, mixed, or variable rate mortgages. Variable rate mortgages have been further broken into sub-segments to account for reference rates and their different repricing schedules. For loans, besides Portugal, the only other material geographical exposure is from Poland, mostly due to one subsidiary of an SI. For government debt securities, all EA countries are covered and explicitly modelled.

Figure 12. Portugal: Portfolio Segmentation
(In percent)

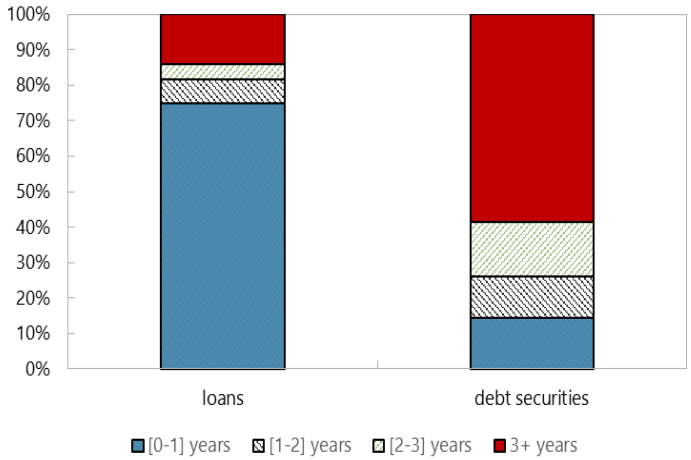


Sources: Banco de Portugal (FINREP) and IMF Staff calculations.

Repricing Ladder

46. Most interest-earning assets and interest-bearing liabilities reprice over the horizon of the stress test scenarios. Using bank-level data provided by BdP and complemented by COREP, 85 percent of loans reprice over the scenarios' three-year horizon, and 75 percent reprice each year, underscoring the predominance of variable interest rate mortgages (Figure 13). Regarding debt securities, 40 percent reprice over the scenarios' horizon. Finally, among interest-bearing liabilities, 90 percent reprice every year, due to the large share of sight deposits and the 6-month average maturity of term deposits.

Figure 13. Portugal: Aggregate Repricing Ladder of Interest Earning Assets



Sources: Banco de Portugal, and IMF Staff calculations.

New Business Rates Projection

47. New business rates are estimated for all segments for each scenario year. Passthroughs for loans and deposits are estimated using country-level quarterly data provided by BdP for mortgage loans and country-level data from MIR for corporate and consumer loans and deposits. New business rates deltas are estimated for all loans and deposits, except variable rate mortgages using this specification:

$$IR\ loan/deposit_t = \alpha + \beta_1 \Delta ST\_rate_t + \beta_2 \Delta ST\_rate_{t-1} + \beta_3 \Delta LT\_rate_t + \beta_4 \Delta LT\_rate_{t-1} + \beta_5 \Delta infl_{t-1} (+\beta_6 HPg_t + \beta_7 GDPg_t) + \varepsilon_t \quad (2)$$

where Δ denotes quarterly changes, ST_rate the short-term rate, LT_rate the long-term rate, and $infl$ the yearly inflation. The equation for variable rate mortgages also includes HPg—the house price yearly growth, and $GDPg$—the annual GDP growth, to reflect dynamics specific to these loans. Debt securities' interest rate projections are taken from the scenarios' long-term rates. Variable rate mortgages deltas are derived from the projected short-term and long-term rate projections (Appendix III).[19] The estimated passthrough for variable interest rates are the highest at 1.1 in the first year and 1 in the second year. They are lower for fixed and mixed rates mortgages and for corporate and consumer loans, ranging between 0.1 to 0.6 after two years (Appendix IV, Table 1).[20] The passthrough for term deposits is higher for corporate deposits—at 0.7 in the first year and 0.9 after two years, while term deposits for households reach 0.2 in the first year and 0.6 in the second year. Passthrough for sight deposits are close to zero, albeit a bit higher for corporate deposits. These asymmetric passthroughs suggests that banks in Portugal benefit significantly from the rise in interest rates.

[19] Long-term rates are projected for 20 major countries and cover the vast majority of Portuguese banks government debt securities portfolio. A simple yield curve is estimated using interpolated values between the projected short-term and long-term rates of the scenarios.

[20] Passthrough can be calculated over one year or two due the presence of a lag in the equation (Equation 2).

48. Yearly projected rates are derived by applying the last quarter of estimated deltas to the starting point (Appendix IV, Figure 1). Starting interest rates are derived from the bank-level data provided by BdP for all segments covered. The projected rates vary based on the estimated passthrough which means, for example, that variable-rates mortgages have significantly different paths under the geopolitical and recessionary scenarios due to the different path of the short-term interest rate. Sight deposits' interest rate is almost flat at around zero as a result of a low passthrough and the zero-percent floor applied on the rates. Sight deposits represent about 30 percent of Portuguese banks' liabilities, guaranteeing a low-cost source of funding and contributing to the high profitability of Portuguese banks.

Projected Net Interest Margins (NIMs)

49. NIMs are projected under all three scenarios. The projections follow the scenarios' path for short-term interest rates, with NIM broadly increasing in the geopolitical scenario and falling in the recessionary scenario. At the aggregate level, NIM is broadly stable in the baseline scenario, remaining at 2.7 percent of interest earning assets over the course of the three years (Figure 14). In the geopolitical scenario, the NIM increases sharply by about 30 percent, reaching 3.6 percent, while the recessionary scenario is associated with a milder decline, with the system-wide NIM falling by 10 percent to 2.4 percent by 2028. Business model heterogeneity is limited. All banks exhibit the same dynamic that closely follows the policy rate path, though foreign subsidiaries have a more pronounced dynamic, with a larger increase and reduction of their NIM. Overall, the drop in NIM in the recessionary scenario is not as pronounced as the increase in the geopolitical scenario, despite the dominance of variable interest rate loans. This is due to the significant portfolio of debt securities held by Portuguese banks and the rise in long-term interest rates in all adverse scenarios. This generates an additional source of NIM, in particular in the recessionary scenario, which partly compensates for the drop of NIM from loans.

Figure 14. Portugal: Net Interest Margin Projections

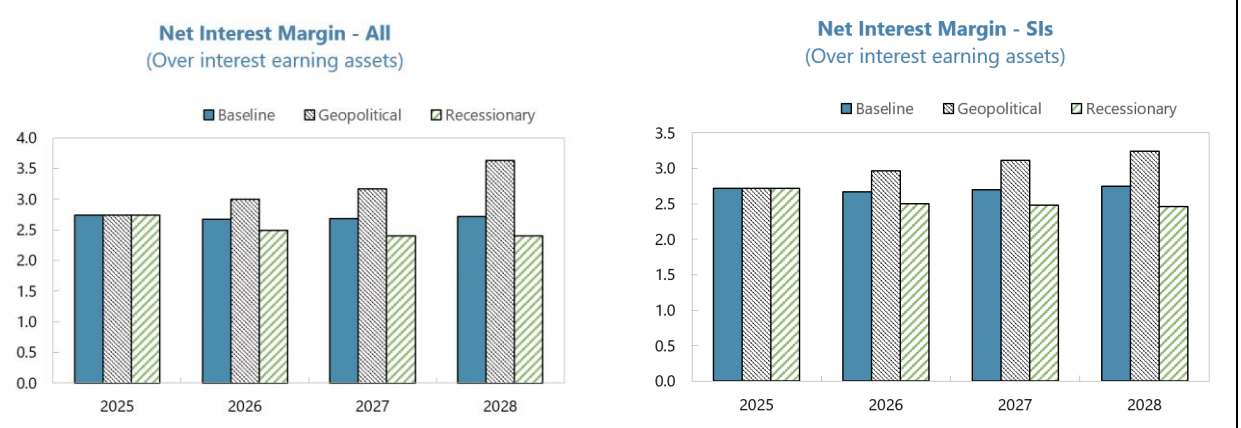
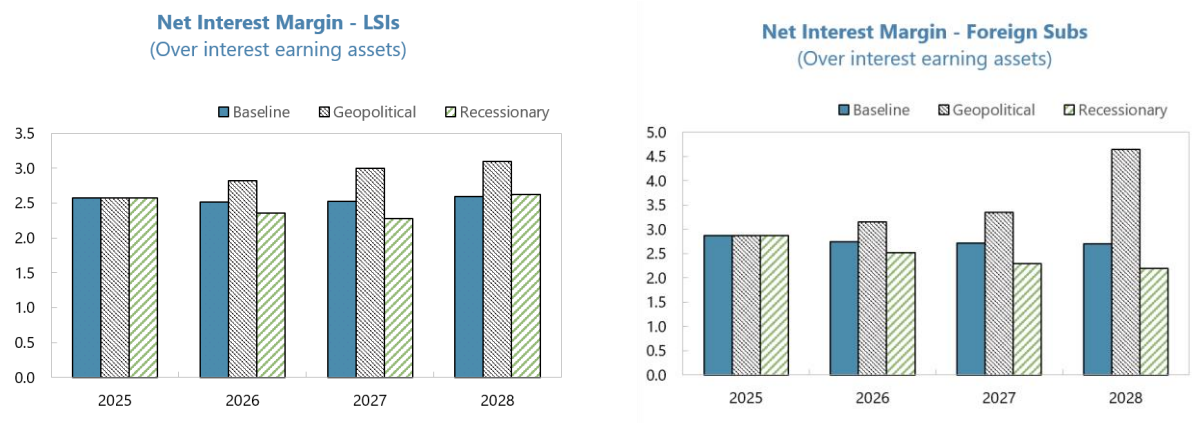


Figure 14. Portugal: Net Interest Margin Projections (concluded)



Source: IMF Staff calculations.

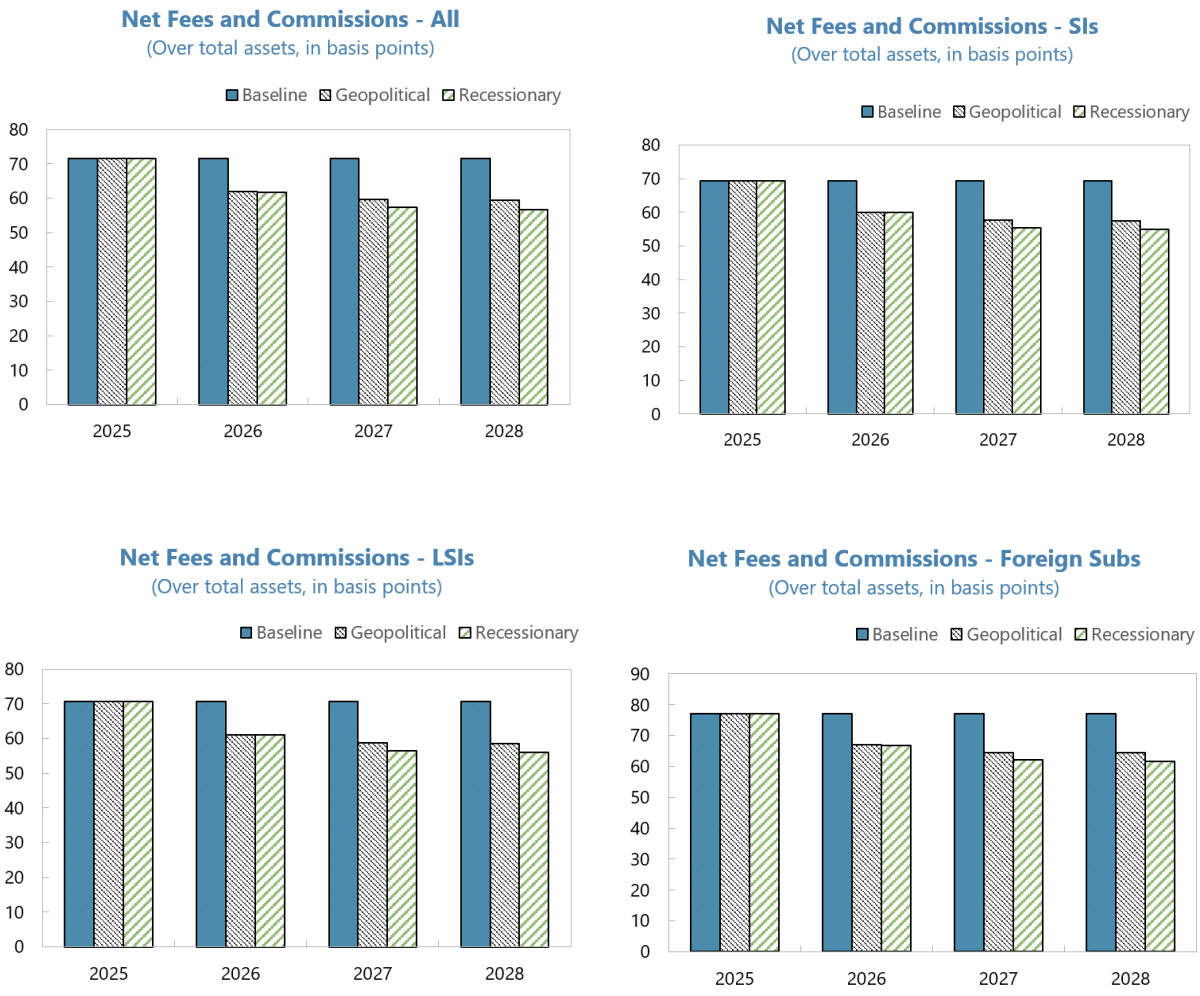
E. NFCI and Other Profit and Loss Items

Net Fees and Commissions

50. The ratio of net fee and commission income (NFCI) to total assets is projected using a satellite model. The econometric specification is the same as in the EA FSAP (IMF, 2025) and is similar to Kok, Mirza and Pancaro (2017). A panel regression on annual data with bank-specific fixed effects was used and a LASSO methodology was applied to help select relevant variables. NFCI was projected at the aggregate level using data on small EA banks from Haver (excluding G-SIBs). Table 2 in Appendix IV shows the estimation results.

51. Projected NFCI drops by about 20 percent on aggregate (Figure 15). On aggregate, the NFCI in the baseline follows a flat path of 72 basis points (bps). Under the geopolitical scenario, the ratio falls to 59 bps by 2028, while in the recessionary scenario the drop is slightly larger and ends at 57 bps by the same year. Across groups, the pattern is similar, with all types of banks losing about 20 percent of NFCI in the adverse scenario.

Figure 15. Portugal: Net Fees and Commissions



Source: IMF Staff calculations.

52. Some client revenues from trading activities are reported as net trading income (NTI), rather than fees and commissions. The FSAP accounted for this by considering, in the baseline scenario, an annual income from client revenues given by the 5-year average of the ratio of NTI to total assets. In the two adverse scenarios, client revenues were set to zero in the first year of the stress test, to reflect the impact of the market shock on revenues from client revenues. A 20 percent haircut relative to baseline was applied to these revenues in the remaining years of the adverse scenarios. This approach may over- or underestimate client revenues because NTI also includes the revaluation of fair value instruments. However, by averaging over a long period of time, the gains and losses from revaluation of instruments in different years may cancel out, thus mitigating the potential bias. NTI is not a significant source of income for Portuguese banks.

Other Profit and Loss Items

53. All other P&L items were projected by taking a five-year average relative to total assets and the path of inflation. These remaining items consist mostly of non-interest expenses, such as

wages and other costs associated with operating branches. These P&L items are scaled with the path of inflation in the macroeconomic scenarios. Because tax information is available only at the consolidated level and cannot be allocated reliably across the individual jurisdictions in which each bank operates, a historical effective-rate approach is applied. Specifically, each bank's average effective tax rate, defined as income-tax expense divided by profit before tax (PBT), over the past five profitable fiscal years is computed. The five-year average smooths out short-term volatility in tax payments and one-off items. It is then applied only to periods in which the bank reports a positive PBT. When a bank records a loss, no tax expense is recognized for that year. If a loss in one year is followed by a profit in the subsequent year, the current year PBT is first adjusted to offset the accumulated loss carry-forward before calculating the tax.

54. Dividends were calibrated based on the bank projected net income and capital buffer. A payout rate of 80 percent is applied to the bank's total comprehensive income (TCI), i.e., profit after tax, and other comprehensive income. This high level of dividend distribution aims to reflect the large transfers between the numerous subsidiaries in Portugal and their parent companies. If the bank incurs losses, dividends are set to zero. Banks prioritize capital preservation; thus, dividends

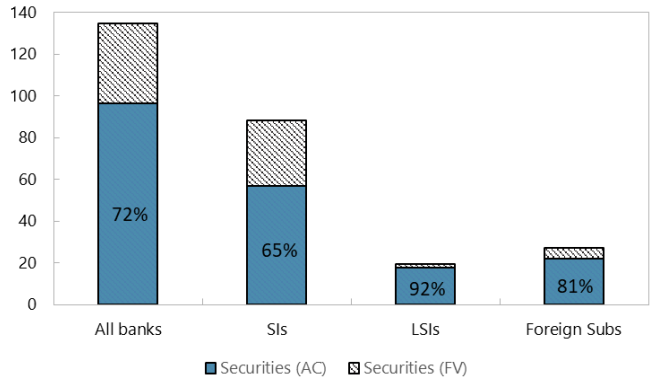
were further adjusted based on the bank's capital position relative to the total regulatory capital requirements. Specifically, when a bank's capital position breaches the minimum regulatory requirements (both Pillar 1 and 2), dividends are adjusted to zero.

F. Market Risk

55. Market risk was assessed using a modified duration approach to revalue debt securities held at fair value in the two market stress scenarios. The assessment only covers debt securities given that other market positions are marginal for Portuguese banks. Debt securities are a major component of Portuguese banks' balance sheet (on aggregate, 30 percent of total assets); this share is as high as 40 percent for LSIs. Only positions held at fair value (i.e., those categorized as FVOCI and FVPL) were revalued, while the AC portfolio was excluded. Given the large size of AC securities in Portuguese banks' portfolio (Figure 16), sensitivity analysis is performed to gauge the extent of potential unrealized losses on securities held at AC under the same adverse scenario conditions.

Figure 16. Portugal: Share of AC Securities

(In billions of EUR)



Sources: IMF Staff calculations.

56. The impact of market risk on bank capital was incorporated into the broader solvency stress test as a one-off overlay in the first year. The estimated valuation losses are not reversed in subsequent years. This approach is designed to capture the impact of short-term market distress episodes that can occur at any time during the stress testing horizon. No market shocks were applied in the baseline scenario. Potential hedging is not captured in the revaluation due to data limitations, meaning that the estimated losses represent an upper band.

Revaluation Approach

57. The shock used in the revaluation depends on the geography of the exposure and the associated risk category. The shock is derived from the columns "delta shock" in Table 1 of Appendix III and combines shocks on the risk-free interest rate and the credit spread. While the former is common to all exposures depending on their remaining maturity, the latter depends on the risk classification of the country of exposure.

58. The analysis relied on a mix of data provided by BdP and COREP. For seven out of the nine banks, bank-level SHSG data was available, while for the two remaining banks COREP reporting on debt securities (C33.00.a) was used. For banks where COREP data is used, duration is approximated as the mid-point bucket maturity, while duration information was provided by Banco de Portugal.

59. Debt portfolio revaluations depend on the evolution of the interest rate and of the portfolios' starting duration and value. Losses are the result of multiplying the portfolio's modified duration by the changes in benchmark rate and the portfolio valuation:

$$FV_t = FV_{\{t-1\}}(1 - MD_t \cdot \Delta r_t) \quad (3)$$

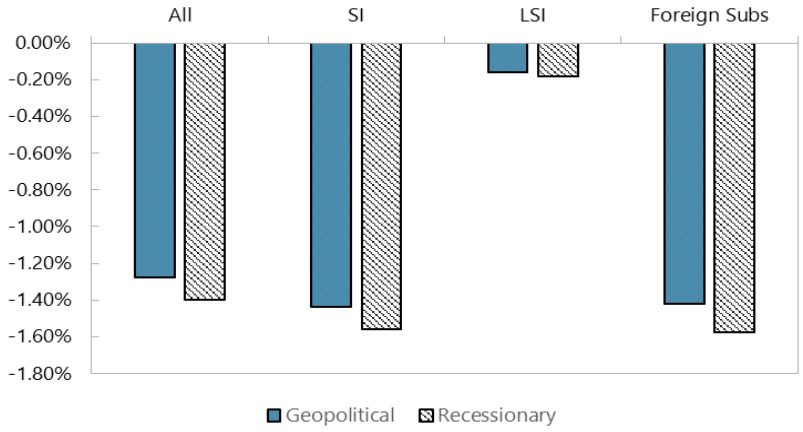
where FV_t is the fair value at time t, MD_t, the modified duration and Δr_t, the shock on the relevant interest rate (the "delta shock" in Table 1 of Appendix III).

Capital Impact

60. Estimated losses are sizeable but manageable. The total losses amounted to EUR2.5 billion or 1.35 percent of the aggregate initial RWA (Figure 17). Overall, the losses were slightly higher in the recessionary scenario. LSIs suffered less losses due to their very low share of debt securities held at fair value. SIs and foreign subsidiaries made more losses due to their higher share of fair value securities but also lower diversification in the case of foreign subsidiaries, whose debt securities are more concentrated in higher-risk countries exposed to larger shocks.

Figure 17. Portugal: Market Risk Losses

(Percent of initial RWA)



Sources: IMF Staff calculations.

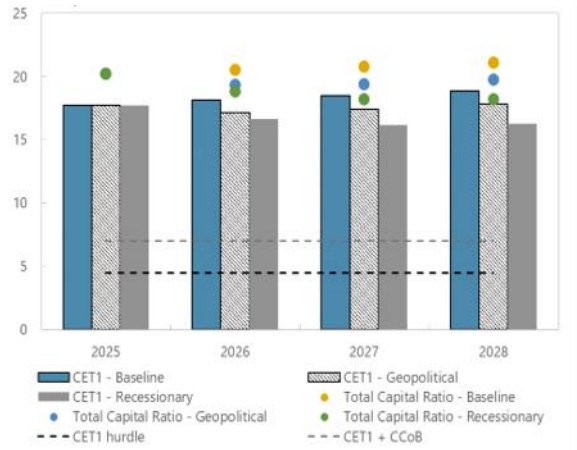
G. Solvency Stress Test Results

61. In aggregate, the Portuguese banking system is resilient and across the scenarios maintains high capital ratios above the regulatory buffers (Figure 18). The initial capital ratios are high at 17.7 percent for CET1 and 20.2 percent for total capital ratio (TCR). Baseline path shows a gradual strengthening, with CET1 rising to 18.8 percent in 2028 and TCR reaching 21.2 percent. In the geopolitical scenario, CET1 falls in the first year to 17.1 percent, but recovers slightly in the next two years, reaching 17.8 percent in 2028. In the recessionary scenario, the drop is more pronounced with a final CET1 ratio at 16.3 percent. Overall, aggregate results are driven by SIs, while LSI experience a lower drop in their capital ratios and Foreign Subsidiaries register an increase of their CET1 at the end of the third year in both adverse scenarios. These results reflect the high profitability of Portuguese banks and the relatively low level of credit risk at the start of the scenarios.

Figure 18. Portugal: Bank Capital Adequacy in Stress Test Scenarios

Capital Adequacy – All

(In percent of RWA)



Capital Adequacy – SIs

(In percent of RWA)

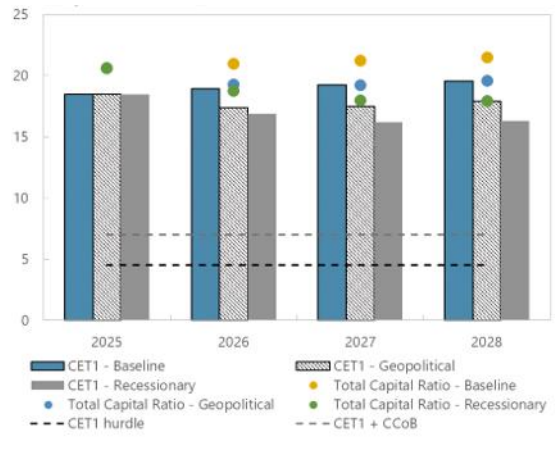
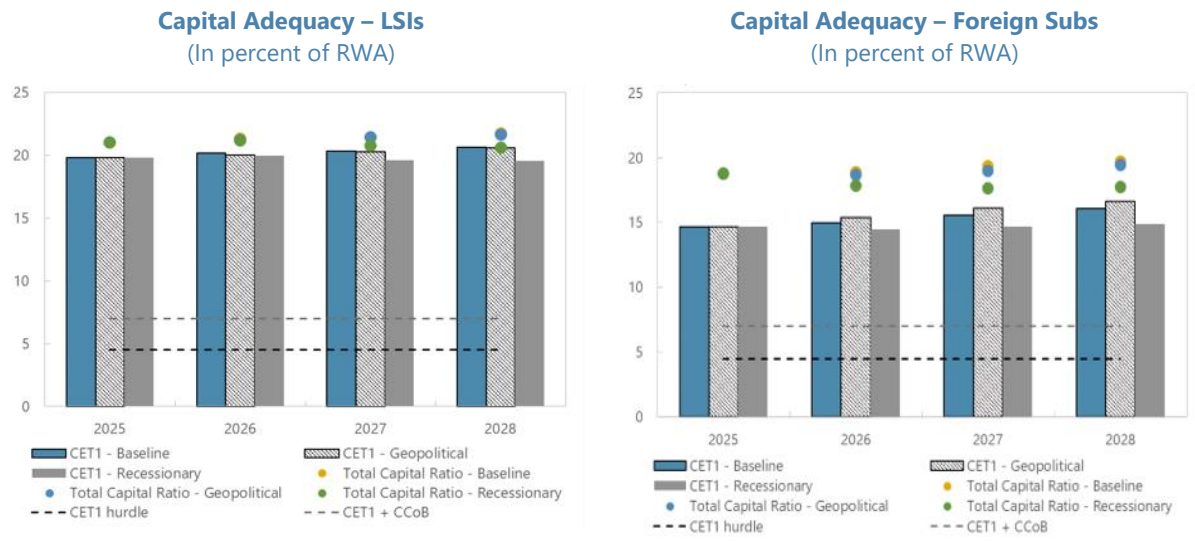


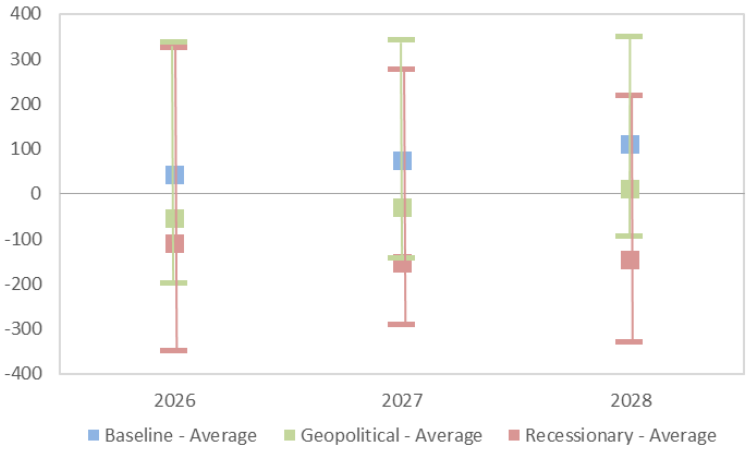
Figure 18. Portugal: Bank Capital Adequacy in Stress Test Scenarios (concluded)



Source: IMF Staff calculations.
Notes: Capital thresholds shown are illustrative and differ from those applied in the stress test, which incorporate confidential, bank-specific Pillar 2 requirements.

62. However, losses are heterogenous across banks, with some banks suffering larger losses. No bank breaches its combined buffer requirements, reflecting high initial capital positions. The heterogeneity of losses is reflected in the quartile distribution of ending CET1 ratio across scenarios (Figure 19). In the first year of the scenarios, the first quartile of the CET1 ratio drops to 14.2 percent under the recessionary scenario and to 15.7 percent for the geopolitical scenario. This corresponds to capital ratio reductions of 350 basis points and 200 basis points, respectively. This represents losses that are roughly double the sample average.

Figure 19. Portugal: Interquartile Range of CET1 Losses
(In basis points)



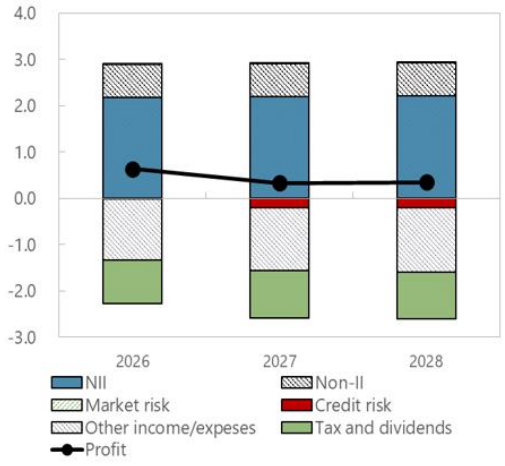
Source: IMF Staff calculations.

Profitability

63. Portuguese banks remain profitable in all scenarios but are most impacted in the recessionary scenario. In the baseline, banks show strong profitability, reaching a peak return on assets of 0.64 percent in 2026 before softening to 0.35 percent at the end of the scenario horizon (Figure 20). Under the recessionary scenario, profits fall to 0.57 in the first year—mainly due to a market-valuation shock due to geopolitical events—and decline further in the following year to 0.47, as credit-risk charges increase. A constant drop of NII over the scenario also contributes significantly to the fall in profits. In the geopolitical shock, similar dynamics are at play regarding market risk and credit risk, but they are more than offset by a significant increase in NII. This gain comes from the repricing of variable-rate loans to higher rates and a modest increase in loan impairments.

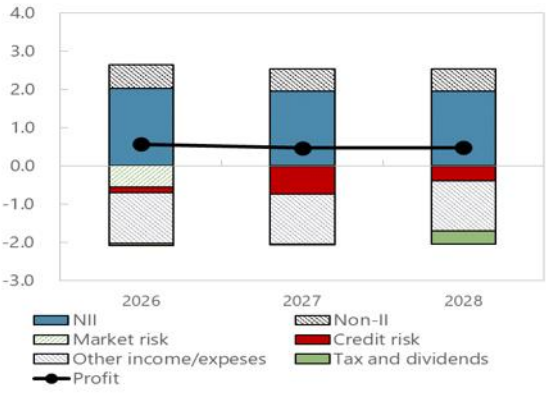
Figure 20. Portugal: Profitability Dynamics

Contribution to Profit - Baseline
(Percent of total assets)

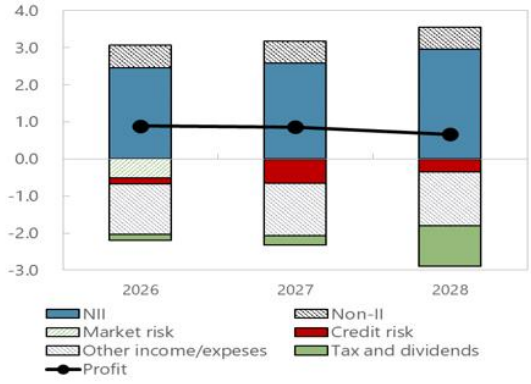


- *In the baseline, banks stay comfortably profitable throughout, with earnings tapering but still positive by 2028.*
- *In the recessionary scenario, profits stay positive despite credit impairments and weaker interest income.*
- *In the geopolitical scenario, profits increase compared to baseline, despite significant credit impairment, thanks to a bump in net interest income due to higher interest rates.*

Contribution to Profit - Recessionary
(Percent of total assets)



Contribution to Profit - Geopolitical
(Percent of total assets)



Source: IMF Staff calculations.

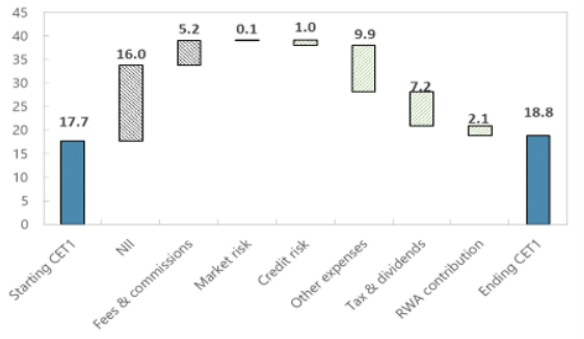
Drivers of Capital Ratio Dynamics

64. In the baseline scenario, strong NII and robust fee generation boost system-wide capital despite moderate credit-loss charges.[21] Large income streams are partly offset by operating costs, taxes, and dividends, while gradual growth in RWA is associated with a slight decrease in the ratio toward the end of the period. The overall effect is an increase of 110 bps of capital buffers over the three-year horizon (Figure 21).

65. Under adverse conditions, the capital ratio dynamics are mainly driven by changes of the NII. In the geopolitical scenario, the CET1 ratio remains broadly unchanged from its initial position. Despite losses from market risk, a threefold increase in credit-risk provisions, a rise in RWAs due to the accumulation of NPLs, and a rise in the LGD with the house price shock, the revenues grow even more significantly. In the recessionary scenario, the NII is compressed. Combined with slightly heavier credit and market losses, the CET1 ratio ends up 140 bps below its initial position. Detailed results by bank type are provided in Appendix V.

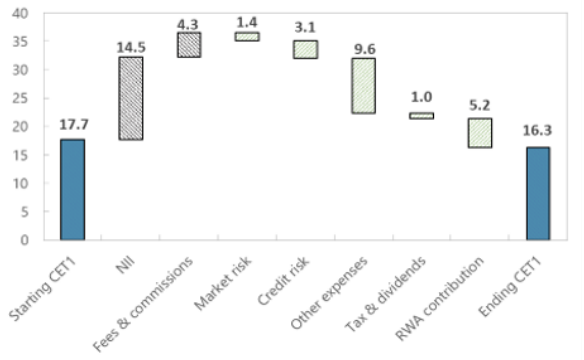
Figure 21. Portugal: Drivers of the Capital Ratio

Capital Ration – All - Baseline
(Percent of 2025 RWA, except of Ending CET1)

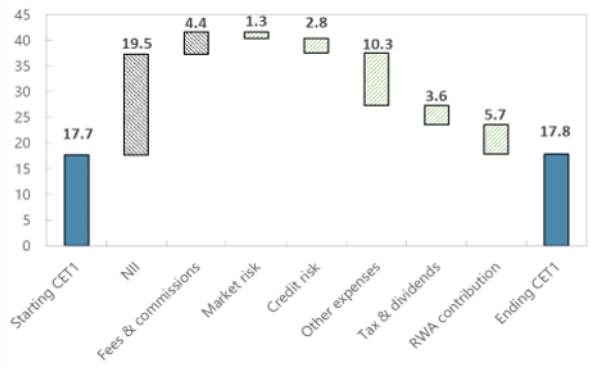


- *In the baseline scenario, core earnings (net interest + fees) outweigh credit-losses and RWA growth, so the CET 1 ratio increases over the horizon of the stress test.*
- *In the recessionary scenario, revenue compression and larger credit-losses/RWA inflation push the CET 1 ratio to the lowest endpoint, underscoring NII compression, credit risk, and RWA growth as the key capital drains.*
- *In the geopolitical scenario, higher revenues compensate for slightly lower credit losses and higher stress-driven RWA and maintain the CET 1 ratio at the same level as the baseline.*

Capital Ration – All - Recessionary
(Percent of 2025 RWA, except of Ending CET1)



Capital Ration – All - Geopolitical
(Percent of 2025 RWA, except of Ending CET1)



Source: IMF Staff calculations.

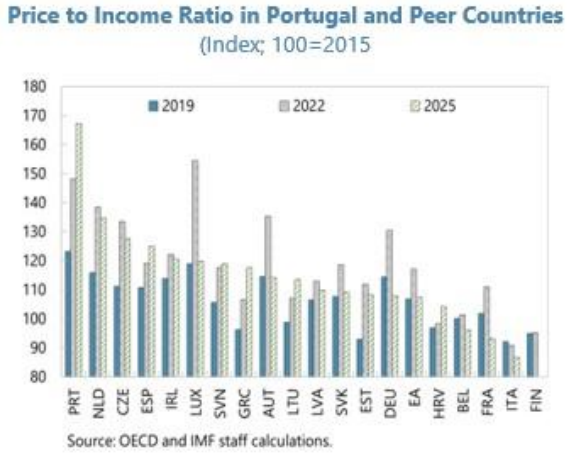
[21] Figure 21 is a waterfall chart that tracks how successive incomes and expenses items (along with change in RWA) move the system-wide CET 1 ratio from its 2025 starting point to its 2028 end-point under each scenario.

H. Sensitivity Analyses

66. The FSAP team conducted four sensitivity analyses to explore risks not directly covered in the main solvency stress test and assess the banking sector's resilience. Sensitivity analyses assess material risks faced by the banking system one factor at a time, all else equal. They model extreme-tail risks to gauge banks' exposures to risks that are plausible but have a very low likelihood of realization and consider reverse stress tests that probe the level of risks that lead to bank undercapitalization. The first sensitivity analysis assessed the impact of a tail shock on residential real estate prices in terms of banking sector losses. The second sensitivity analysis assessed risks stemming from unrealized losses in the portfolio of debt securities held at AC. The third sensitivity analysis assessed the extent of system's large exposures and how a complete default of few counterparties could generate meaningful losses to banks. The fourth sensitivity analysis is akin to a quasi-reverse stress test in credit risk and assessed what level PDs should reach to generate meaningful losses, assuming other factors remain constant.

Additional Capital Impact from Tail Shocks to Residential Real Estate Prices

67. House prices have surged by 169 percent since 2015, and residential real estate now accounts for about 28 percent of total bank assets. Prices have risen faster than incomes, with the price-to-income ratio increasing to 170 percent in 2025 from 100 percent in 2015. Current estimates point to an overvaluation of 20-40 percent (Cousin et al., 2025). The stress test incorporates house price shocks of 20 and 25 percent under the recessionary and geopolitical scenarios, respectively. However, the degree of real estate price overheating in Portugal warrants an assessment of more extreme tail risks to house prices, to evaluate whether larger-than-assumed price decline could materially affect banking sector resilience.



68. Two complementary approaches were applied using aggregated banking-system data.[22] First, the FSAP's macrofinancial scenario-based stress testing exercise was re-run, with the house price shock in the recessionary scenario adjusted up to the upper bound of current overvaluation estimations at 40 percent (from 20 percent previously) and the associated spillovers to other macrofinancial variables endogenously propagated through the scenario framework.[23] The previously estimated satellite models were reused to translate the stronger shock into higher PDs.[24]

[22] The analysis was undertaken after the completion of the onsite mission, and individual bank-level data could not be accessed.

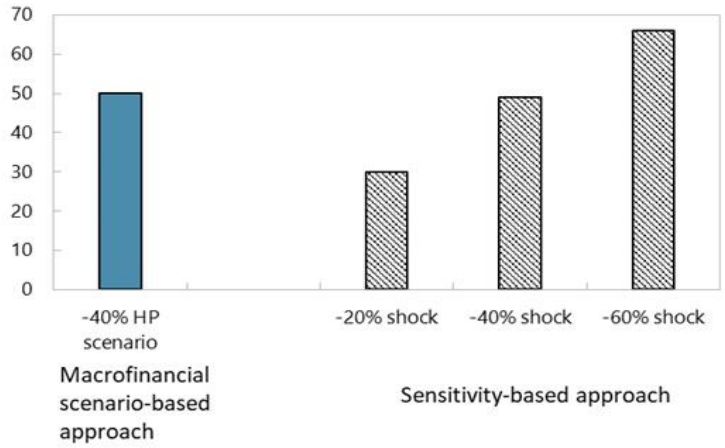
[23] The same global macrofinancial model used to build the scenarios form the main exercise was reemployed to derive a coherent path of all macroeconomic variables. For illustration, the shock on GDP reaches -5.7 percent in that scenario and -4.4 in the recessionary scenario.

[24] Satellite models used in this sensitivity analysis differ from the those used in the main stress test exercise due to technical constraints (see Appendix IV for more details).

This analysis captured both the P&L channel via higher provisions and the RWA channel via RWA expansion in both SA and IRB exposures, assessing the capital impact of the shocks across portfolios. Second, a sensitivity analysis assessed the impact of price declines of varying magnitude on the banking sector's mortgage portfolio via the P&L channel. Incremental credit losses were estimated as expected losses (PD×LGD×EAD), primarily via stressed LGDs (and, to a lesser extent, PDs) and capital impacts were mapped accordingly. This approach likely underestimates the overall impact, as it abstracts from spillovers to other portfolios that are at least partially captured in the first approach.

69. The resulting losses are sizable but do not generate capital shortfalls at the aggregate level. Under the macrofinancial scenario-based approach, capital declines by an additional 50 bps relative to the primary FSAP stress tests, leading to a post-stress CET1 ratio of 15.8 percent (Figure 22). The sensitivity-based approach indicates that each 20 percent house price decline is associated with about 20 bps of losses in the mortgage portfolio. Overall, the banking system appears sufficiently capitalized to absorb even extreme housing corrections. An important caveat is that this finding rests on simplifying assumptions and relies on aggregated data and may thus not capture pockets of vulnerability.

Figure 22. Portugal: Additional CET1 Depletion from Tail House Price Shocks
(In basis points of initial RWA)



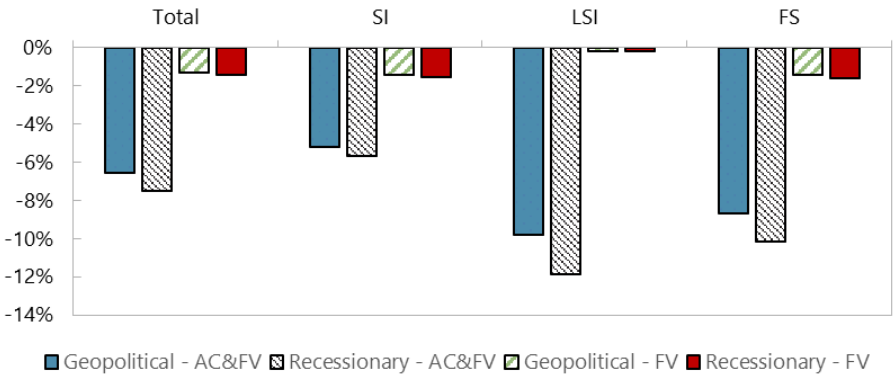
Source: IMF Staff calculations.

Revaluation of Debt Securities Held at Amortized Cost

70. Most Portuguese banks' debt holdings are held at AC (72 percent) and may generate unrealized losses. Unrealized losses arise when assets not held at fair value see their potential market value diverge significantly from their accounting value. When unrealized losses exceed capital, banks become economically insolvent. This can trigger a loss of confidence and, ultimately, deposit withdrawals, forcing banks to realize these losses. Although Portuguese banks hold a large stock of high-quality liquid assets (HQLA), which can be used as collateral in the euro area repo market or in the ECB monetary policy operations to cover potential outflows, unrealized losses still warrant ongoing monitoring. This sensitivity analysis assesses potential unrealized losses under the adverse stress-test scenarios.

71. Under the adverse scenarios, including unrealized losses on debt securities held at AC, market losses would reach EUR10 billion. Losses on debt securities portfolio, when including potential unrealized losses, would be multiplied by five on aggregate compared to the revaluation of debt securities held at FV only. This represents up to seven percent of initial RWA in aggregate (Figure 23). Losses would reach up to six percent for SIs and up to 10 percent for foreign subsidiaries. For LSIs, the losses would reach up to 12 percent. Potential unrealized losses can reach up to 600 bps in aggregate and up to 1100 bps for LSIs.

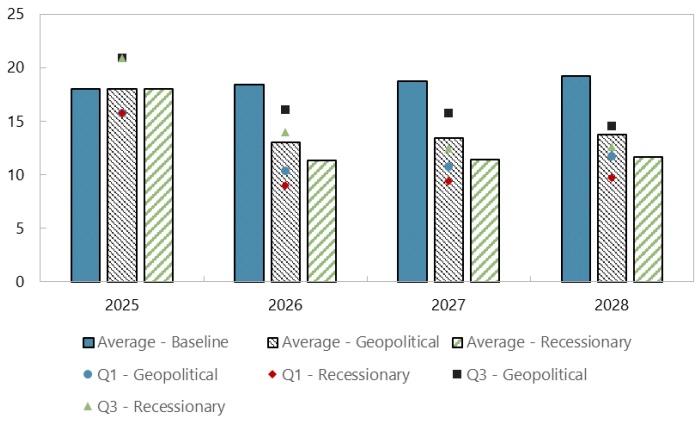
Figure 23. Losses on Debt Securities
(In percent of initial RWA)



Source: IMF Staff calculations.

72. The addition of potential unrealized losses to the solvency stress test leads to a breach of the combined buffer by two banks. However, the shortfall represents only 50 bps of the banking system initial RWA. More generally, the CET1 ratio would be significantly lower across the board, with the average CET1 dropping to a low of 13 percent in the geopolitical scenario and 11.3 percent in the recessionary scenario (Figure 24), compared with 17.9 and 17.2 percent respectively in the main solvency stress tests (Figure 19). The first quartile dips to 9 percent (Figure 24) against 14.2 percent in the main stress test (Figure 19).

Figure 24. Portugal: Average and Quartile CET1 Ratios Across Scenarios
(In percent of initial RWA)



Source: IMF Staff calculations.

Large Exposures

73. The total large exposures of the banking sector at the group level highlight the importance of credit risk mitigation (CRM) measures in containing concentrated exposures. Total large exposures, mainly to NFCs in a broad range of sectors, exceed 100 percent of Tier 1 capital pre-CRM but fell substantially to 70.7 percent after applying eligible collateral, guarantees, and other recognized risk mitigants (Table 3). The system's large exposure profile is dominated by the largest groups of connected clients, with the top 10 groups accounting for 56.9 percent of Tier 1 capital after considering eligible CRM instruments. Assuming an extreme tail scenario of complete default of the 11 identified common large exposures, the system could face a loss of roughly 35.7 percent of Tier 1 capital post-CRM.[25]

Table 3. Portugal: System's Group-Level Large Exposures (LEs)
(In percent of Tier 1 Capital)

	Pre-CRM	Post-CRM
Total LEs [1/]	127.0	70.7
Common LEs [2/]	40.1	35.7
Top 10	110.6	56.9
Top 5	85.0	38.6
Top 3	69.1	23.7

[1]/ Group-level totals reflect exposures that qualify as large at the level of the group of connected clients. This excludes exposures to sovereigns and households.
[2]/ Common LEs refer to large exposures where the same group of connected clients appears across more than one bank, based on the overall set of total LEs.
Source: COREP_LE, C.29.00.

Quasi-Reverse Solvency Stress Test

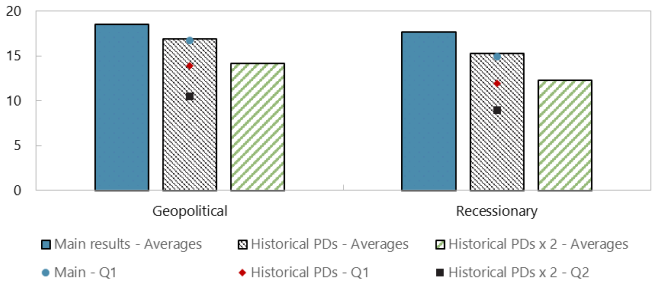
74. To account for model uncertainty and further assess Portuguese banks resilience, the FSAP team has re-run the solvency stress test using households' and corporates' historical peak PDs. Using these historically high points is a way to assess the current resilience of the Portuguese banking system compared to its situation in 2012. Under the adverse scenarios PDs rise to 1.6 percent for households and 6.3 percent for corporates, both below the respective peaks of 2.7 percent and 10 percent in 2012. This approach makes the strong assumption that besides PDs everything else is equal and does not construct a complete coherent scenario. But this exercise provides an estimation of the resilience of the banking system under even more severe conditions.

75. Even when applying highest historical PDs, no banks dip into their buffers but aggregate losses increase significantly. On average, losses increase by 150 to 240bps for respectively the geopolitical and the recessionary scenario (Figure 25). The first quartile of the distribution of CET1 ratio rises to 13.9 and 11.9 percent, respectively, for the geopolitical and the recessionary scenarios. Only after applying exorbitant PDs (twice the historical peak), a few banks dip

[25] This simple sensitivity analysis represents a conservative upper-bound estimate, without accounting for potential additional recoveries from asset realizations or residual value of the defaulted borrower, which could further reduce actual losses.

into their minimum buffers, with average losses rising by an additional 500bps of initial RWA compared to the main solvency results. The first quartile of the distribution of the CET1 ratio reaches 10.5 and 8.9 percent for the geopolitical and the recessionary scenario, respectively.

Figure 25. Portugal: Average and Quartile CET1 Ratios Under Alternative PDs
(In percent of initial RWA)



Source: IMF Staff calculations.

I. Additional Analysis to Assess the Potential Impact of the Middle East Conflict

76. To assess the potential spillovers from the Middle East conflict, the analysis is anchored in the IMF's April 2026 WEO severe downside scenario. The scenario features a large oil price shock alongside higher inflation expectations, wider risk premia, and tighter lending rates relative to the October 2025 baseline (Figure 2 in Appendix III).[26] The conflict could transmit to Portugal mainly through higher and more persistent commodity prices, renewed supply disruptions, and a broader "risk-off" repricing in global financial markets, with tourism, transportation, and manufacturing sectors most likely to be affected. These channels could also materially increase households' cost of living via higher energy and food prices, and increasing debt service burdens. The implied GDP growth shock for Portugal is materially less severe than in the FSAP adverse scenarios (despite a broadly comparable inflation path), so the exercise is best viewed as an illustrative sensitivity check rather than a reassessment of the core stress test conclusions.

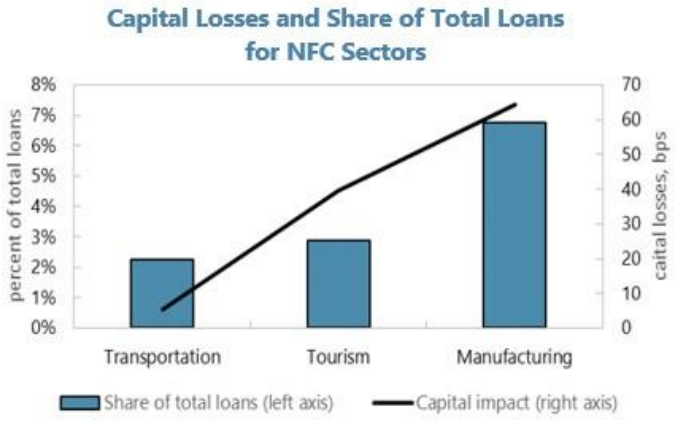
77. Two targeted sensitivity analyses were conducted to capture transmission channels arising from the conflict without recalibrating the full solvency stress test. First, potential credit losses on banks' loan exposures to the tourism, transportation, and manufacturing sectors (jointly 11.9 percent of total lending) were estimated via a simple expected losses approach (PD × LGD × EAD).[27] The PDs were stressed to historical peak default rates—up to about three times the levels embedded in the FSAP's geopolitical adverse scenario—to approximate an extreme but plausible tail outcome that could materialize in the context of the Middle East conflict. Second, the household

[26] In the severe scenario, (i) the shock to commodity prices is persistent, with oil prices increasing by 100 percent starting in 2026, relative to the October 2025 baseline. (ii) One-year-ahead inflation expectations ratchet up by as much as 100 basis points in advanced economies. (iii) A significant risk-off episode pushes up risk premiums in advanced economies by 100 basis points. The last two shocks result in an increase of 200 basis points in lending rates relative to the October 2025 baseline. (iv) Food prices increase by 25 percent, in line with the correlation between oil prices and food prices observed during the energy crisis of 2022.

[27] The tourism, transportation, and manufacturing sectors were proxied by NACE sectors I, H, and B+C, respectively.

stress test was re-run using the same micro model as in the main FSAP work (see the section Private Sector Balance Sheet Vulnerabilities for details), mapping the WEO severe adverse macrofinancial paths into household budgets via higher living costs and higher mortgage repayments (due to higher lending rates). These approaches abstract from other channels (e.g., potential offset from higher net interest income as rates rise), and should therefore be read as partial-equilibrium, conservative sensitivity metrics.

78. Results indicate that, even under these extreme assumptions, losses remain contained and do not alter the overall resilience assessment. While the direct potential credit losses from the household loans portfolio (accounting for 57 percent of bank loans), are contained at 30bps, the impact on households is significant, with the share of overburdened households doubling in the sensitivity assessment, to reach 40 percent of households, putting 32 percent of bank debt at risk. Corporate lending losses have only a modest effect on bank capital and are largely concentrated in manufacturing. Altogether, total credit losses for the tourism, transportation, and manufacturing sectors, and from rising household defaults are assessed to be up to 140 basis points (or about half of credit losses from the FSAP's adverse stress test scenarios), with the banking sector's capitalization remaining comfortably above minimum requirements given sizeable buffers.



BANK LIQUIDITY STRESS TEST

A. Overview and Key Findings

79. Liquidity risk analysis of the banking sector was structured around two themes. The analysis included: (i) a static (structural) assessment of the banking sector's liquidity coverage ratio (LCR) and net stable funding ratio (NSFR), benchmarking liquidity positions against regulatory thresholds (Section B); and (ii) a cash flow-based stress test of nine banks, which represents 85 percent of total banking sector's assets (Section C). The cash flow-based stress test applies three scenarios—general risk aversion, market sovereign distress, and idiosyncratic funding—to examine potential liquidity shortfalls from overnight up to a one-year horizon. The structural analysis also considers the asset encumbrance ratio, assessing Portuguese banks' position relative to other EU countries, and their funding structure.

80. Banks entered the stress scenarios from a position of strength. The sector's strong starting liquidity position is supported by the large stock of high-quality liquid assets (HQLAs) on banks' balance sheets. While a key source of funding is sight deposits, the predominance of stable retail funding supports the system's overall funding resilience.

81. Net liquidity shortfalls, albeit marginal, materialize only under the idiosyncratic funding shock scenario. Banks' net liquidity positions remain resilient under general risk aversion and market sovereign distress scenarios. Three banks would experience a negative liquidity position by the five to six months horizon, under the idiosyncratic funding shock, although the shortfalls are marginal relative to banks' total assets. The liquidity drain under this scenario is driven mainly by stronger wholesale deposit outflows.

B. Structural Liquidity Analysis

Liquidity Coverage Ratio

82. The banking system demonstrates a strong structural liquidity position. The LCR shows that all banks comfortably exceeded the minimum regulatory requirements (Figure 26). The aggregate LCR reached 260 percent in 2025Q2 driven by a steady increase in the share of HQLA to total assets, while the net outflow remained broadly constant. By banking group, liquidity positions are heterogeneous. LSIs consistently held the highest ratios, while SIs broadly tracked the system average. Foreign subsidiaries operated with thinner cushions, with LCRs declining from 182 percent in 2021 to 139 percent in 2022, before recovering to 161 percent in 2025Q2.

Net Stable Funding Ratio

83. The evolution of the NSFR shows distinctly the strengthening of the banking sector's structural funding resilience since 2021. The aggregate NSFR continued to increase to 156 percent in Q2 2025 from 143 percent at end-2021, indicating that banks held substantial long-term funding surpluses above the regulatory requirement (Figure 26). The foreign subsidiaries' NSFR levels were closer to the prudential thresholds, suggesting higher dependence on short-term or intragroup funding. Retail deposits constitute more than 70 percent of the available stable funding of both SIs and LSIs, highlighting the central role of stable retail deposits in underpinning banks' long-term structural funding stability.

Figure 26. Portugal: Liquidity Ratios and Asset Encumbrance

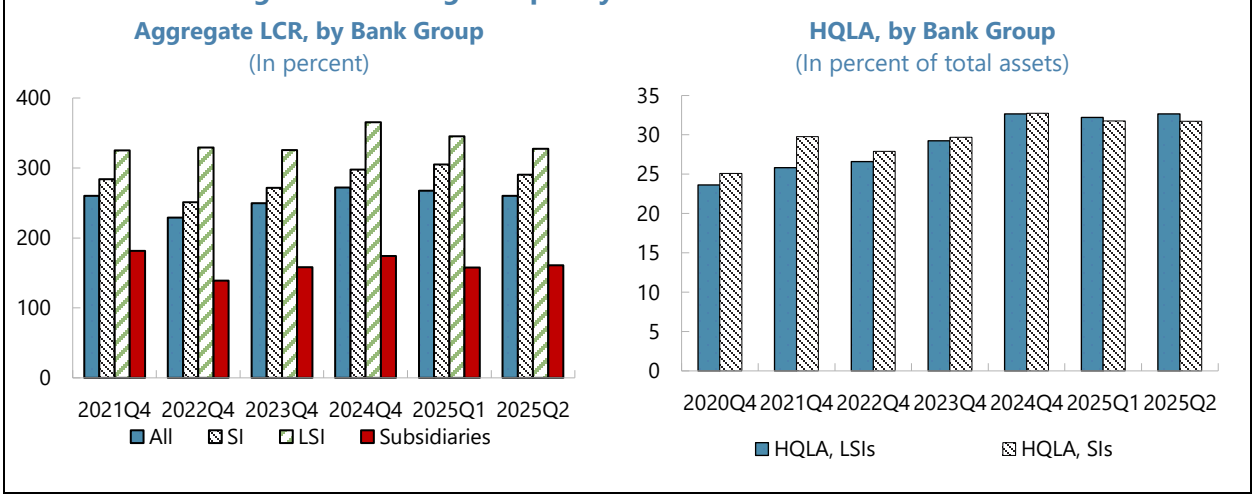
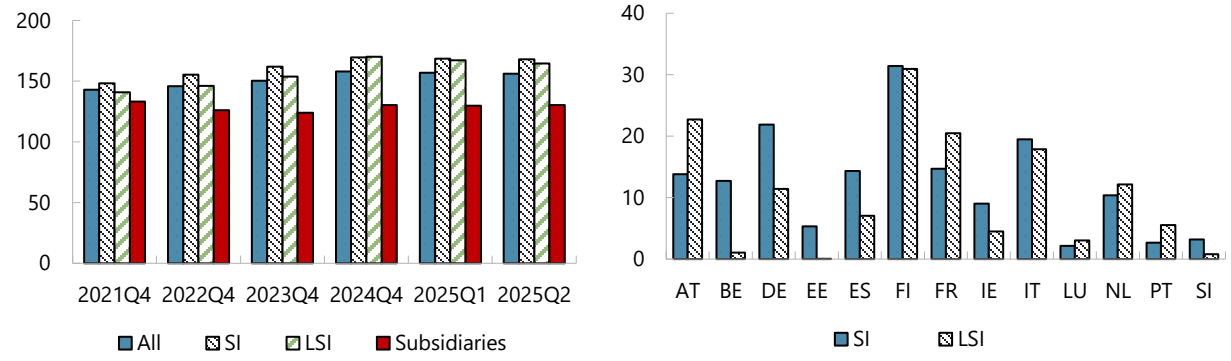


Figure 26. Portugal: Liquidity Ratios and Asset Encumbrance (concluded)



Sources: Banco de Portugal, ECB Data Portal, and IMF Staff calculations.

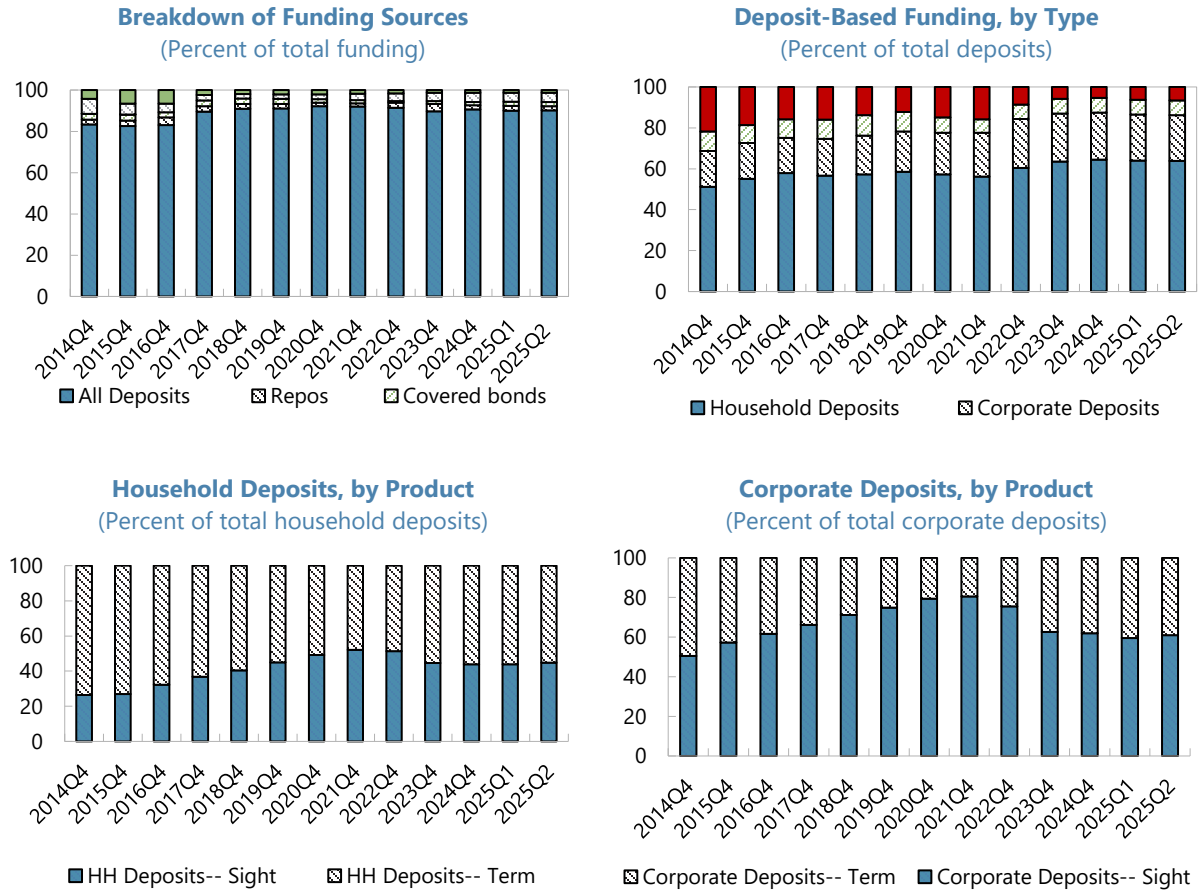
Asset Encumbrance

84. The asset encumbrance ratio of Portuguese banks is among the lowest in the EU (Figure 26). The low degree of encumbrance points to a solid liquidity cushion and flexibility to raise funding through secured operations, if needed. The liquid buffers are of high quality, with HQLA accounting for 74 percent of the sample banks' total counterbalancing capacity (CBC), of which more than half comprise Level 1 assets. Within Level 1 tradable assets, high-rated sovereign securities—i.e., credit quality steps (CQS) 2–3—account for the largest share of the portfolio. This composition is relevant for the stress test results, as these assets would be subjected to large haircuts under the market sovereign distress scenario (Appendix VI).

Funding Structure

85. Banks' funding structure is predominantly retail-based, reflecting a stable traditional funding model. Deposits represent about 80-85 percent of total liabilities, with market funding playing only a limited role (Figure 27). Household deposits have been the dominant, stable form of deposit funding, accounting, an average for 58 percent of deposits in Q1 2015-Q2 2025. Corporate deposits provide additional liquidity, while interbank and other deposits remain small. Term deposits still anchor household funding, but sight balances have steadily increased over the past decade, from 26 percent in 2014 to a peak of 52 percent in 2021, before easing to 45 percent in Q2 2025.

Figure 27. Portugal: Evolution of Bank Funding Composition



Sources: Banco de Portugal and IMF Staff calculations.

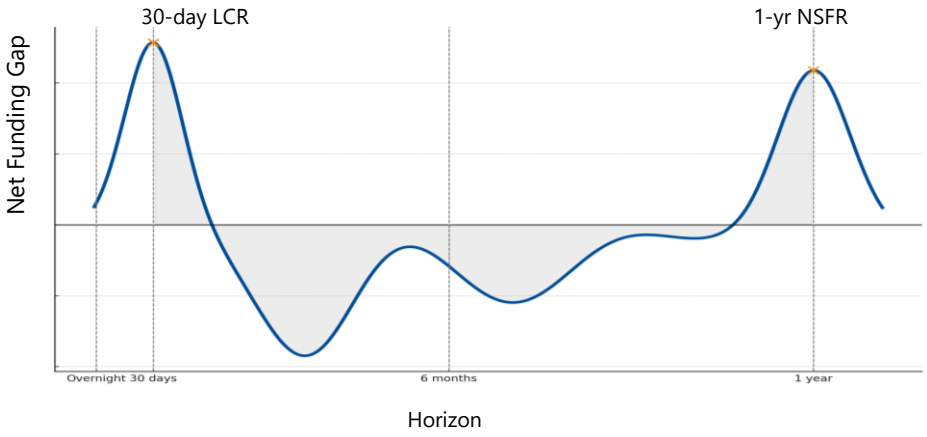
C. Cash Flow-Based Liquidity Stress Test

Overview

86. The cash flow-based liquidity stress test identifies potential liquidity gaps at various horizons, from overnight up to one year. Using the June 2025 COREP C66 data on contractual cash flows by maturity buckets, the stress test was conducted under three scenarios (Appendix VI).[28] The analysis focuses on evaluating banks' net liquidity positions, after considering all expected inflows and outflows (cumulative net contractual gaps), liquidity buffers that can be mobilized under stress (cumulative counterbalancing capacity), and the additional outflows that could materialize under adverse scenarios such as drawdowns from funding facilities. This approach complements the LCR and NSFR by capturing liquidity risks across all interim maturity buckets, ensuring that potential shortfalls below 30 days, and between 31 days and one year are not overlooked (Figure 28).

[28] The key assumptions underpinning the cash flow stress scenarios are also explained in Appendix VI.

Figure 28. Illustrative Cash Flow-Based Liquidity Stress Test Profile

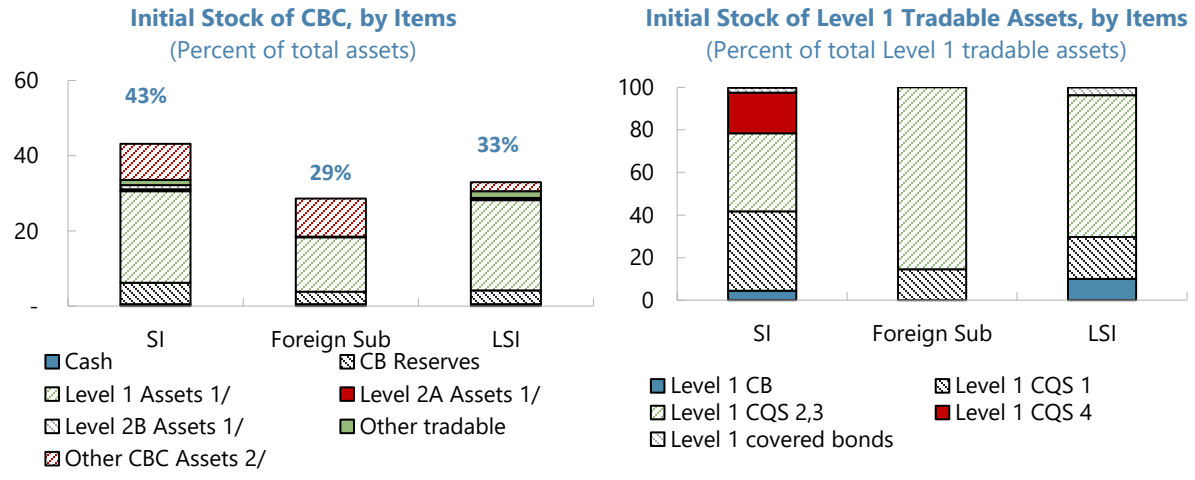


Note: The net funding gap, expressed as percent of banks' total assets, is calculated as the sum of the cumulative net contractual gap (inflows minus outflows), cumulative counterbalancing capacity, outflows from committed facilities, and outflows from uncommitted funding facilities.
Source: IMF staff.

Counterbalancing Capacity

87. The initial stock of liquidity buffers is robust, dominated by Level 1 tradable assets. The system-wide CBC amounts to 38 percent of total assets, over half of which is made up of Level 1 tradable assets and other CBC-eligible collateral. By bank type, SIs held the highest coverage at around 43 percent, followed by LSIs at 33 percent, while foreign subsidiaries maintained lower buffers at around 29 percent (Figure 29). Within Level 1 tradable portfolios, highly-rated sovereign debt (rated CQS 2-3) accounts for the largest share, which is most pronounced among foreign subsidiaries.

Figure 29. Portugal: Composition of CBC, by Type of Bank



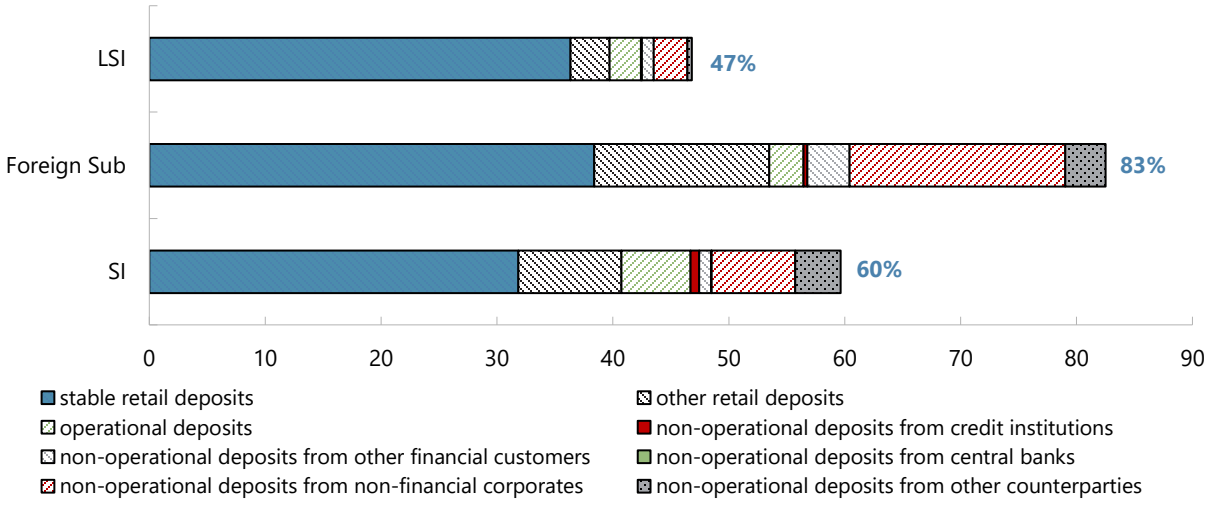
Notes: Weighted averages (bank grouping) are calculated within each group as the ratio of the group's total stock of CBC items to the group's total assets (left panel chart) and ratio of the group's Level 1 items to the group's total Level 1 tradable assets (right panel chart).
1/ Level 1 and Level 2 categories refer to the Liquidity Coverage Ratio classification of HQLAs.
2/ Includes nontradable assets (CB eligible), own issuance eligible CB, and undrawn committed facilities received.
Sources: Banco de Portugal and IMF Staff calculations.

Deposit-Based Funding Maturity Profile

88. Funding across all bank groups is broadly dominated by stable retail deposits, with sight deposits accounting for a large share. Looking at the share of deposits that could hypothetically be withdrawn overnight provides insights into how much liquidity pressure could be concentrated at the earliest time bucket. Among bank groups, foreign subsidiaries exhibit the largest proportion of this type of funding reported as "overnight," accounting for about 83 percent of their deposits and where non-operational wholesale funding is also notable (Figure 30). SIs show a moderate share of deposits reported as "overnight" at around 60 percent, reflecting a mix of stable retail and wholesale components. By contrast, LSIs have the lowest share at only 47 percent, consisting predominantly of stable retail deposits.

Figure 30. Portugal: Overnight Maturity Deposits, by Bank Group

(As percent of deposits with maturity of less than one day)



Note: Weighted averages (bank grouping) are calculated within each group as the ratio of the group's O/N maturity deposits to the group's deposits with remaining maturity of less than one year.

Sources: Banco de Portugal and IMF Staff calculations.

Results of the Cash Flow-Based Liquidity Stress Test

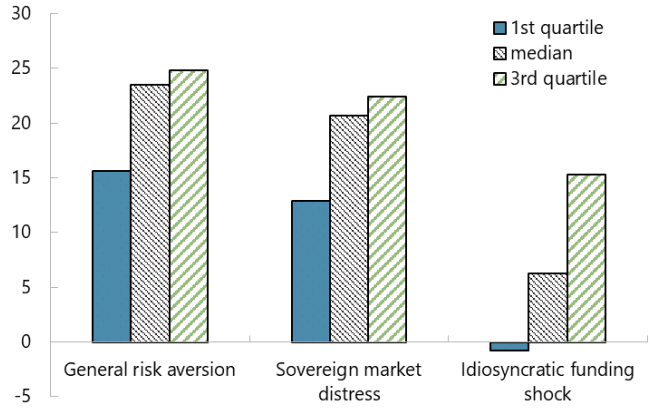
89. Banks' net liquidity positions are more dispersed under the idiosyncratic funding scenario, indicating that liquidity pressures are limited to only a few banks. Under the general risk aversion and market distress scenarios, all quartiles remain comfortably positive, demonstrating system-wide resilience (Figure 31). In contrast, the idiosyncratic funding scenario (SC3) pushes the 25th percentile slightly below zero at about 0.75 percent of total assets. A time bucket assessment reinforces this narrative, with three banks experiencing a negative liquidity position by the 5-6-month bucket onward.[29]

[29] A few banks experience marginal negative liquidity position before the 5–6-month horizon, but details on the timing and the number cannot be reported due to confidentiality rules that prevent disclosing results aggregating less than three banks.

90. Group-level net liquidity profiles differ across bank types under the idiosyncratic funding scenario. The LSIs and SIs maintain positive net liquidity balances across the horizon of the analysis. SIs start with the highest initial stock but experience a sharper step-down than the LSIs at the overnight bucket, followed by a steady, gradual reduction until the 9–12-month horizon. By contrast, the foreign subsidiary group displays a thinner starting liquidity buffer which is depleted in the horizon of the exercise. This pattern may be due to a funding structure characterized by a relatively higher share of sight deposits. However, the shortfall only reaches 2.5 percent of the total group assets, and foreign subsidiaries may draw on intragroup funding and liquidity support from their parent institutions, which mitigates potential liquidity strains.

Figure 31. Portugal: Banks' NLP Quartile Distribution, by Scenario

(Percent of total assets)

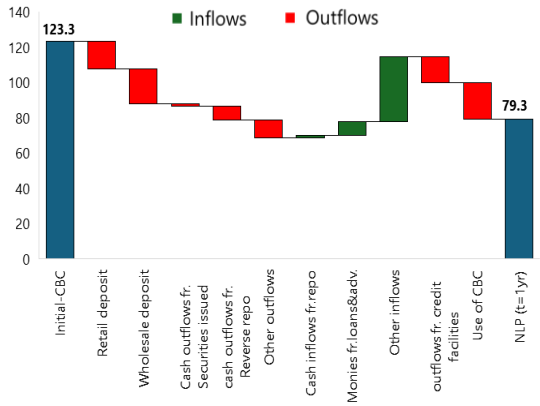


Note: Net liquidity position (NLP) is calculated as the sum of the cumulative net contractual gap (inflows minus outflows), cumulative counterbalancing capacity, outflows from committed facilities, and outflows from uncommitted funding facilities.
Source: IMF Staff calculations

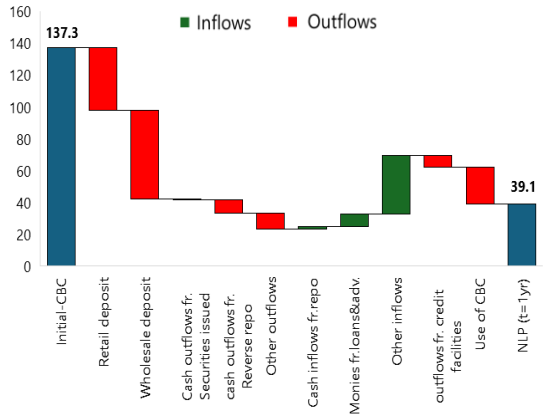
91. Liquidity decreases more rapidly under the idiosyncratic funding scenario due to greater deposit outflows, despite a higher initial CBC. A waterfall decomposition of the cash flow analysis shows the main contributors to changes in banks' NLP under both the sovereign distress and idiosyncratic funding scenarios. In the sovereign distress scenario, the system's cumulative NLP declined to EUR79.3 billion over the 1-year horizon, with net outflows totaling roughly 27 percent of total assets (Figure 32). In contrast, under the idiosyncratic funding shock, the system starts with a higher CBC but experiences a far steeper decline than in the sovereign distress scenario, ending the year with EUR39.1 billion. This sharper liquidity contraction, representing total net outflows of 39 percent of total assets, is driven mainly by greater deposit outflows, particularly wholesale deposits which have higher run-off rates (see Appendix VI on the details of the parameters used).

Figure 32. Portugal: Waterfall Decomposition of Cash Flow Analysis

Market Sovereign Distress Scenario
(System's 1-yr NLP, in billion EUR)



Idiosyncratic Funding Scenario
(System's 1-yr NLP, in billion EUR)



Note: The NLP reported here is not the lowest point reached by sample banks over the horizon but the cumulative cash flow position at the one-year mark.
Source: IMF Staff calculations.

INTERCONNECTEDNESS ANALYSIS

A. Overview and Key Findings

92. The analysis provides a structural assessment of the extent of cross-sectoral financial interlinkages in Portugal. Using the network mapping approach and the from-whom-to-whom financial exposures, the analysis: (i) examines exposures across sectors, including banks, NBFIs, corporates, government, households, and nonresidents (Section B); and (ii) analyzes the evolution of the interconnectedness between banks and NBFIs (Section C).[30,31]

93. Financial cross-sectoral exposures in Portugal are limited and have declined considerably from a decade ago. Intra-financial (bank-NBFI) linkages contributed to the transmission of risks during the GFC and the European debt crisis. Since then, financial sector interlinkages (between banks and NBFIs) have weakened, when rising risk aversion and deleveraging were associated with a reduction in exposures and heightened fragmentation. Banks' financial exposures with the sovereign and the rest of the world have also declined, and reliance on funding from households (mostly deposits) has increased. While aggregate net external financing to the domestic economy waned, the network map analysis shows considerable external funding to NFCs.

B. Evolution of Sectoral Balance Sheets and Financial Exposures

94. Net financial positions show a gradual narrowing of sectoral asset-liability gaps since end-2013. The government (GG) and the NFC sector—both net borrowers—have significantly

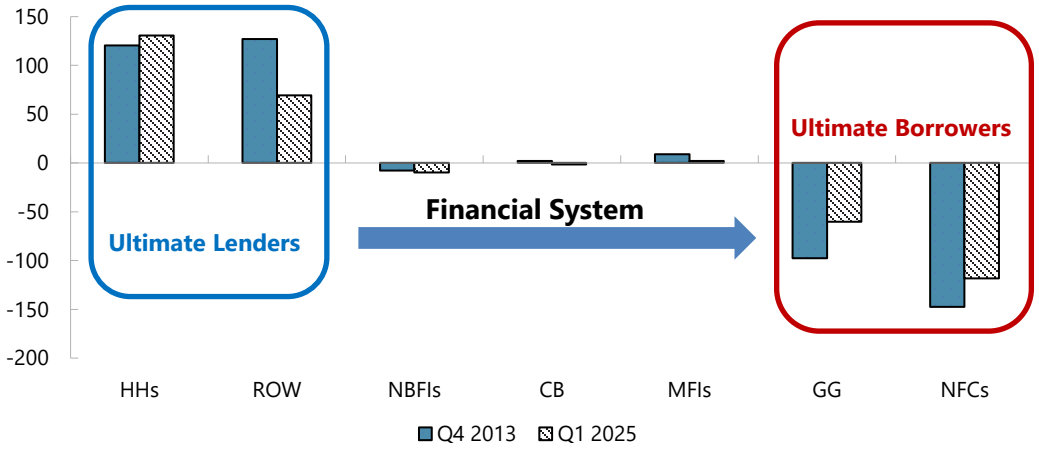
[30] The network mapping approach is a visual presentation of the from-whom-to-whom interconnectedness of economic sectors using the aggregate balance sheet data of each sector at a specific point in time.

[31] Banks and monetary financial institutions (MFIs) are used interchangeably in this section.

deleveraged since the European debt crisis, supported by fiscal consolidation efforts from the government and balance sheets repair steps by the NFCs (Figure 33). The household sector and the external (rest of the world—ROW) sector are both net lenders. While the household sector's net lending position has remained stable, the ROW's position has steadily declined since 2013. The NBFI sector has maintained a small but steady net borrower position over the past decade.

Figure 33. Sector-Level Net Financial Position

Net Lenders (+) and Net Borrowers (-)
(Percent of GDP)



Legend: HHs = households; ROW = rest of the world; NBFIs = nonbank financial institutions; CB = central bank; MFIs = monetary financial institutions (banks); GG = general government; and NFCs = nonfinancial corporations.
Sources: ECB Data Portal and IMF Staff calculations.

95. Cross-sectoral linkages reveal a structural shift in financing patterns between 2013 and 2025. In 2013, immediately after the European debt crisis, the domestic economy relied heavily on external funding, with the ROW sector acting as the largest net lender (127 percent of GDP), with net funding channeled primarily to the government (GG) and NFC sectors (Figure 34, left panel).[32] Households and MFIs (banks) were also net creditors in 2013, with the latter lending primarily to NFCs and the government. By Q1 2025, aggregate net external financing to the domestic economy moderated significantly, as ROW's net position declined to 69 percent of GDP. The NFCs' cross-border net exposure, however, remained high, increasing to 53 percent of GDP in Q1 2025 from 48 percent in 2013, mainly through issuance of unlisted shares and other equity. Within the domestic economy, both NFCs and MFIs retrenched sharply, with their net financial positions falling to 118 percent and 2 percent of GDP, respectively, from 148 percent and 9 percent at end-2013. Households' creditor role strengthened, reflected in a rise in their net financial position.

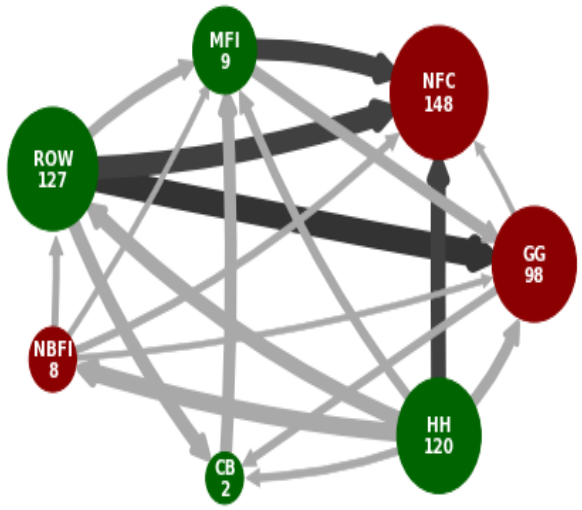
[32] In gross terms, ROW sector's claims on government and NFCs in 2013 accounted for 28.7 percent and 26.3 percent of ROW's total financial assets, respectively.

Figure 34. Network of Cross-Sectoral Net Financial Exposures

(In percent of GDP)

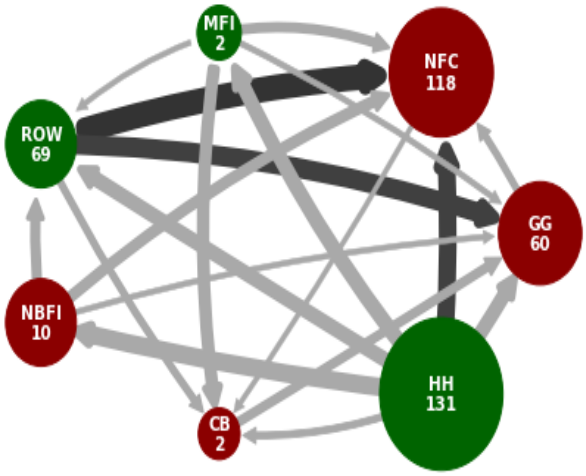
Q4 2013 Network Map

ROW was the top net lender in Q42013, with significant external financing flowing into GG and NFC sectors



Q1 2025 Network Map

HH remained net lender, NFC the main net borrower, while MFI retrenched from lending to NFC and GG



Legend: Green nodes = net creditor/lender; Red nodes = net debtor/borrower. Numbers inside the nodes reflect the size of each sector's total net financial position (in percent of GDP) with all sectors; CB = Central Bank; MFI = Monetary Financial Institutions (Banks); NFC = Nonfinancial Corporations; ROW = Rest of the World; NBFI = Nonbank Financial Institutions; GG = General Government; HH= Households.

Notes: The arrowheads correspond to the recipient of the funds (debtor) from the source (creditor). The thickness of the arrows indicates the relative size of each sector's net financial exposure to its different counterparts. Arrow shading indicates link strength: the black-shaded arrows highlight the three strongest inter-sectoral links (highest exposure values).

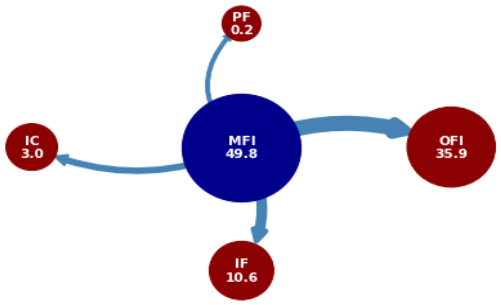
Sources: Banco de Portugal and IMF Staff calculations.

C. Bank-NBFI Interconnectedness

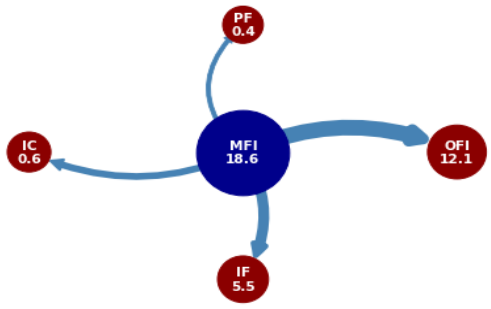
96. The interlinkages between banks and NBFIs have declined significantly since the 2012 European debt crisis, alongside a reduction in banks' exposures to the government. The banks' gross exposures to NBFIs have contracted sharply on both sides of the balance sheet since end-2013. Banks' claims on NBFIs fell by over 60 percent—from about EUR49.8 billion to EUR18.6 billion—while liabilities to NBFIs declined by nearly 70 percent, from EUR60.5 billion to EUR18.7 billion in Q1 2025 (Figure 34). This overall reduction was driven primarily by OFIs—the largest NBFI sub-sector—where banks' claims dropped from EUR35.9 billion to EUR12.1 billion and liabilities from EUR39 billion to EUR9.8 billion over the same period (Figure 35). Relative to banks' total assets, banks' exposures to NBFIs dropped from 10.1 percent at end-2013 to 3.9 percent in Q1 2025, driven mainly by a reduction in debt securities holdings. Funding from NBFIs has also fallen to 3.9 percent of banks' total liabilities from 12.6 percent during the same period (Figure 36). Banks have also reduced their exposures to the government, now representing only 5.9 percent of bank's total assets, down from 9.8 percent at end-2013 (Figure 36).

Figure 35. Portugal: Bilateral Financial Exposures Between Banks and NBFIs

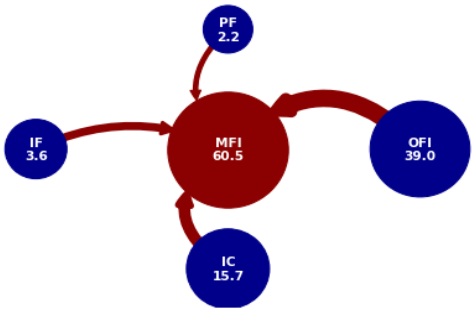
Banks' Claims on NBFIs, Q4 2013
(Billions of Euros)



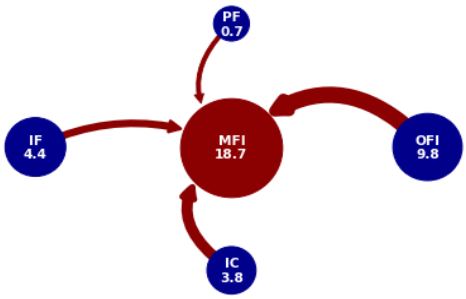
Banks' Claims on NBFIs, Q1 2025
(Billions of Euros)



Banks' Liabilities to NBFIs, Q4 2013
(Billions of Euros)



Banks' Liabilities to NBFIs, Q1 2025
(Billions of Euros)

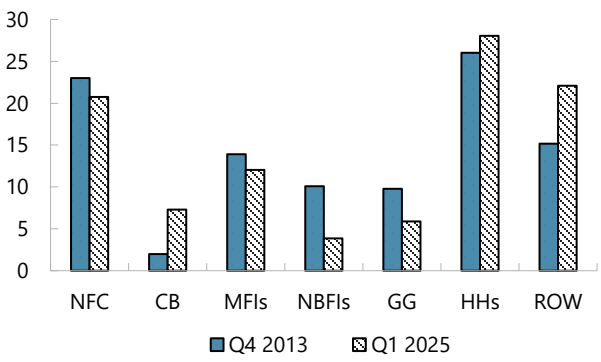


Legend: Blue nodes = creditor; Red nodes = debtor.
IF = Investment Funds; OFI = Other Financial Institutions (captive financial institutions and money lenders, financial auxiliaries, and other financial intermediaries); IC = Insurance Corporations; and PF = Pension Funds
Notes: Numbers inside the nodes show banks' gross claims on and liabilities to NBFI sub-sectors (in billions).
The arrowheads correspond to the recipient of the funds (debtor) from the source (creditor). The thickness of the arrows indicates the relative size of MFI sector's gross financial exposure to NBFIs.

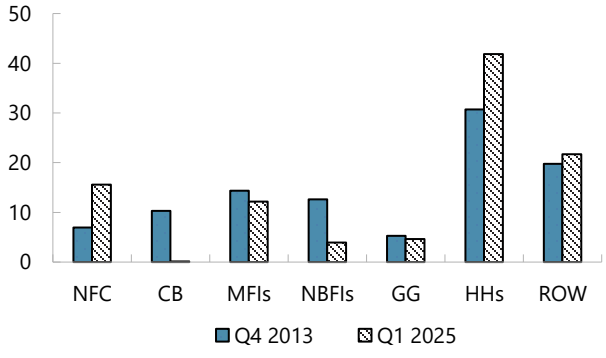
Sources: ECB; Banco de Portugal and IMF staff calculations.

Figure 36. Portugal: Gross Exposures of Banks to Different Sectors

Banks' Asset Portfolio, by Counterpart
(Percent of banks' total assets)



Banks' Financing Sources, by Counterpart
(Percent of banks' total liabilities)



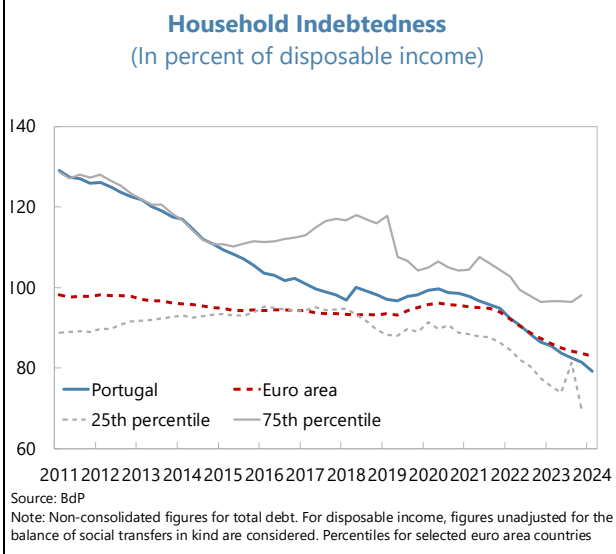
Legend: CB = Central Bank; MFI = Monetary Financial Institutions (Banks); NFC = Nonfinancial Corporations; ROW = Rest of the World; NBFI = Nonbank Financial Institutions; GG = General Government; HH= Households
Sources: ECB Data Portal, Banco de Portugal, and IMF Staff calculations.

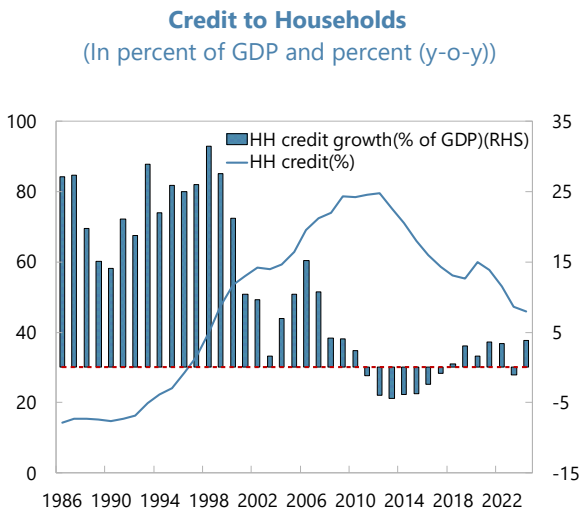
PRIVATE-SECTOR BALANCE SHEET VULNERABILITIES

A. Household Vulnerability Analysis

97. Household leverage in Portugal has declined but some vulnerabilities remain and require close monitoring. Deleveraging and robust income growth have led Portugal's household debt to disposable income ratio to decline by about 40 percentage points over the past decade to a level below the EA average as of end-2024. Bank credit to households fell from a peak of 81 percent of GDP in 2012 to 46 percent in 2025 and credit growth has been subdued over the past decade before accelerating to 7.4 percent in 2025 (Figure 37). At the same time, a rise in cost of living and interest rates can put pressure on household finances, especially for low-income households, which represent, however, a small share of mortgage loans. The prevalence of adjustable-rate outstanding mortgages heightens households' vulnerability to rising interest rates. However, in recent years, the predominance of newly originated housing loans with initial rate fixation periods typically exceeding 2 years (mixed-rate mortgages), has somewhat reduced the short-term sensitivity of households' debt service costs on new loans to interest rate increases.

Figure 37. Portugal: Selected Household Indicators





Sources: Banco de Portugal, INE, Haver Analytics, and IMF Staff calculations.

98. The analysis uses micro-level data from the 2023 (latest) Household Finance and Consumption Survey (HFCS) survey to simulate the impact of macrofinancial shocks on household finances and to link household stress to bank credit risk.[33] The analysis is run on the baseline and three adverse scenarios, including the FSAP geopolitical scenario, the FSAP recessionary scenario, and a 'cost-of-living' scenario.[34] Results suggest that under the FSAP geopolitical scenario,

[33] The approach is based on Barbieri, Moya, and Valderrama, IMF working paper (forthcoming).

[34] The cost-of-living scenario combines a 200-basis-point increase in lending rates with an income shock, consisting (continued)

household stress would rise. The share of vulnerable Portuguese households (debt service and essentials exceeding 70 percent of income) is projected to increase by 40 percent relative to initial levels—reaching roughly one-quarter of all households (vs. about one-fifth in the EA). Similarly, the share of "debt at risk"—i.e. the portion of total household debt held by these vulnerable borrowers—could increase to 20 percent of banks' household loan portfolio (a 60 percent increase from the starting point, same as Euro Area average. In the "cost-of-living" shock scenario, the rise in vulnerability is larger: up to 60 percent more households than baseline may become overburdened (potentially approaching 30 percent of all households), and debt at risk could increase by 75 percent, although the conclusions should be interpreted with caution due to lags in the survey.[35]

99. Portuguese banks are more exposed to vulnerable borrowers in the bottom half of the income distribution, than euro-area banks. The distribution of vulnerabilities by income group is noteworthy. Lower-income households are disproportionately affected: under the geopolitical scenario, about 60 percent of low-income households in Portugal become overburdened (up from roughly 45 percent at the starting point), compared to 17 percent of middle-income and only 2 percent of high-income households becoming stressed. This concentration of stress at the lower end means that credit risk is skewed toward those least able to cope. Indeed, Portugal's "debt at risk" is more concentrated in lower-income segments than in the EA: under the geopolitical shock, 46 percent of at-risk debt is owed by low-income borrowers (versus 34 percent in the EA average), while only 13 percent of at-risk debt is held by high-income borrowers (versus 30 percent in the EA) (Figure 38). Consistently, the scenario analysis finds the impact of the cost-of-living shock is greater in Portugal than the EA: up to 90 percent of bank debt is at risk within the low-income bucket under this severe scenario (compared to 70 percent in the starting point), a higher fraction than projected in the EA. It should be noted, however, that the debt profile structure of the households has changed since the survey year, namely considering the impact of BdP's macroprudential recommendation on credit to consumers and the associated improvement in debtors' credit risk profile (BdP, 2025a).

100. The analysis estimates how household shocks lead to migration of exposures from Stage 1 to Stages 2 and 3, with corresponding increases in bank provisions. The IFRS9 stages are broadly matched with individual household balance sheet metrics in the following manner: (i) Stage 1: Households not in arrears and not struggling (cost-adjusted-debt service-to-income ratio below 70 percent); (ii) Stage 2: Households struggling (cost-adjusted-debt service-to-income ratio above 70 percent, but not on arrears); and (iii) Stage 3: Households in arrears, irrespective of their financial ratios.[36]

of a 10 percent decline in household disposable income and a 5-percentage-point unemployment shock (accounting for unemployment benefits), as well as a 20 percent increase in food and energy prices. All shocks are defined relative to baseline projections.

[35] The 2024 HFCS survey was conducted in 2021, during the COVID19 pandemic, aged to 2024 based on relatively aggregate assumptions, and therefore results should be taken with some caution. See Appendix VII on methodology.

[36] Banks classify exposures into three stages based on expected credit losses (ECL): Stage 1 (performing), Stage 2 (significant increase in credit risk since origination), and Stage 3 (non-performing). Our approach is conservative, as some banks use arrears exceeding 90 days as a proxy for Stage 3 loans, rather than classifying exposures as Stage 3 based on arrears regardless of their duration.

101. The rising household stress feeds directly into banks' loan loss projections. In the FSAP geopolitical scenario, previously performing loans are expected to migrate to higher risk categories (Stage 2 under IFRS 9, indicating significant credit deterioration since origination) or to default (Stage 3). The analysis tested multiple classification approaches for staging based on the DSECTI threshold and arrears status. All approaches show an increase in Stage 2 loans. Under the FSAP geopolitical scenario, roughly one-fifth of banks' household credit portfolio would be at Stage 2 under stress, roughly doubling S2 loans relative to initial levels.[37] Actual defaults (Stage 3) also increase, though from a low base—the household loan default rate is projected to rise by about 35 basis points in the FSAP geopolitical scenario. This relatively modest uptick in outright defaults reflects that many vulnerable borrowers would be captured as Stage 2 rather than immediate default; however, the credit quality deterioration implies that, if the shock persists, some Stage 2 loans could eventually turn into Stage 3. The results are less severe under the FSAP recessionary scenario due to lower interest rates. The results of the solvency stress test show that Portuguese banks remain resilient to the increased households loan losses under both adverse scenarios.

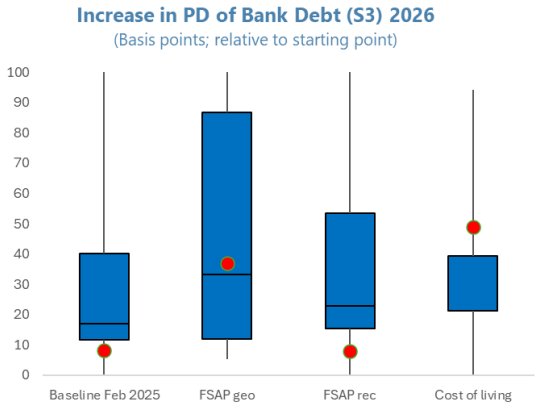
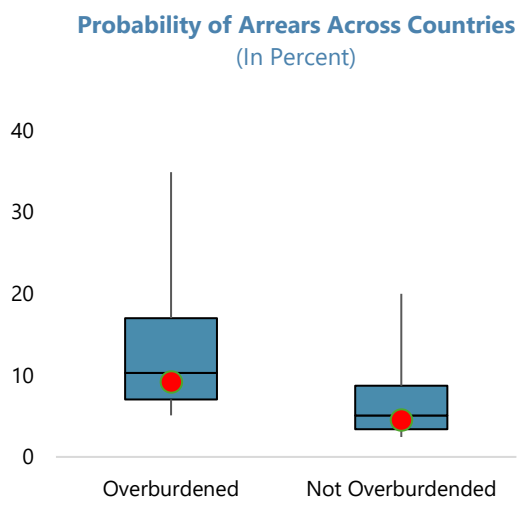
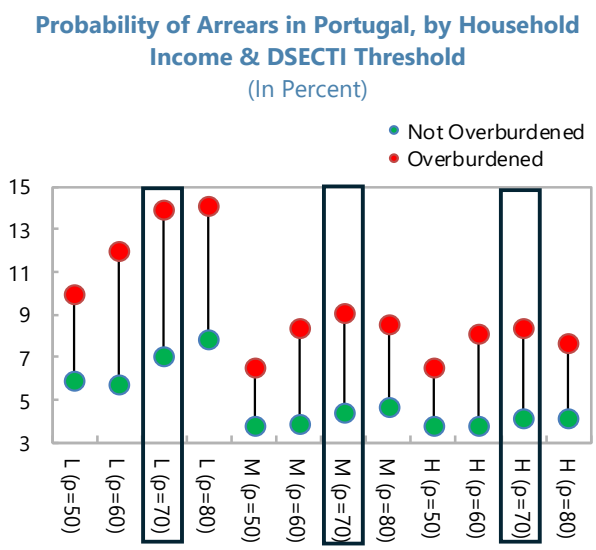


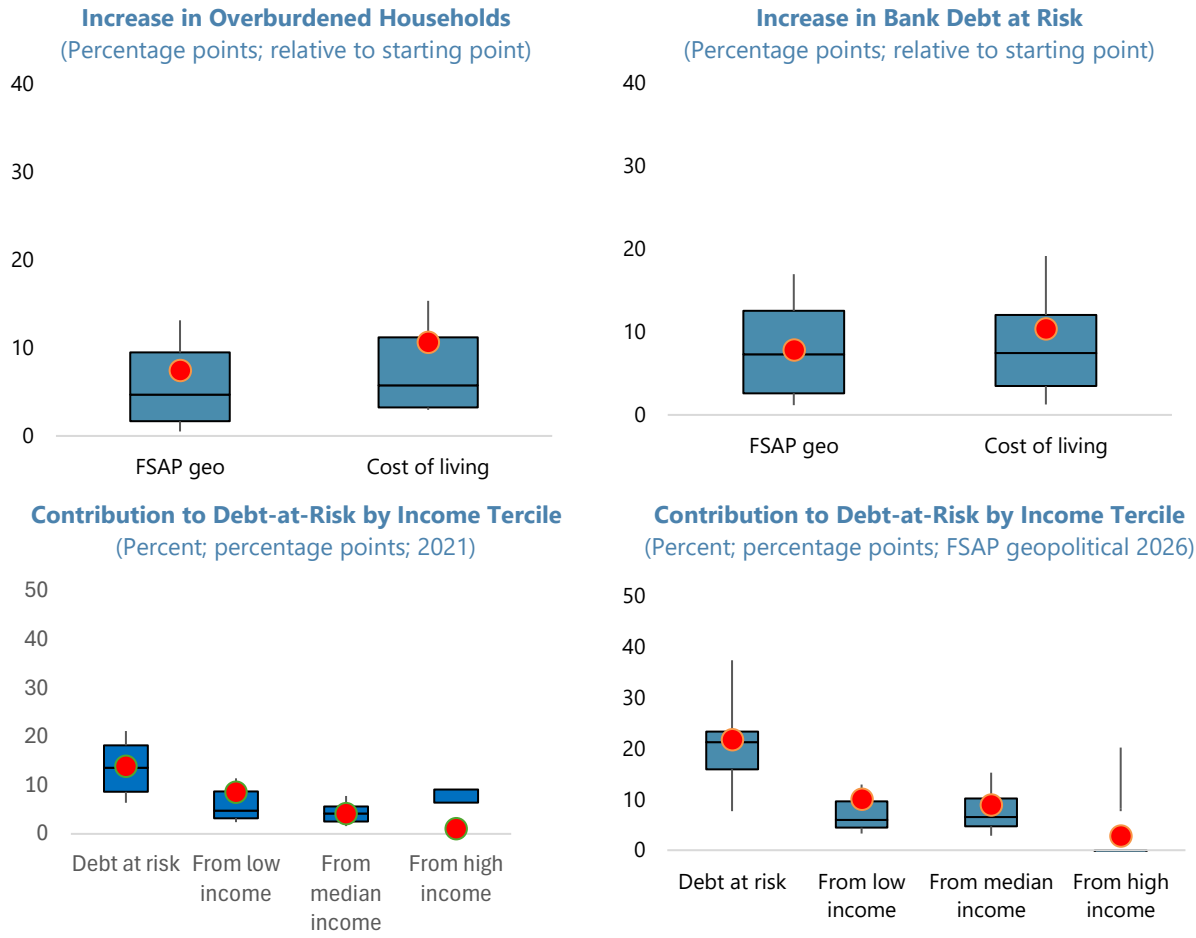
Figure 38. Portugal: Household Vulnerability Assessment





[37] According to model simulations, the estimate share of S2 loans in the starting point was 12 percent, compared to 10 percent reported by Portuguese banks at end 2021 (the date of the survey).

Figure 38. Portugal: Household Vulnerability Assessment (concluded)



Note: The box plot show country distribution across euro area countries, while Portugal is shown in red dots. A household is "overburdened" when debt service and essential consumption (food, utilities, rents) to gross income ratio (DSECTI) exceeds 70 percent. The top right panel shows the probability of arrears by DSECTI threshold (i.e., 50, 60, 70, and 80 percent) and by income tercile (L: low tercile; M: middle tercile; H: high tercile). The probability of arrears is estimated with a logistic regression on the DSECTI ratio controlling for income tercile and household-level and personal-level characteristics. The share of "Bank debt at risk" is the debt held by overburdened households as a share of total bank debt. The middle charts show the increase in ratios relative to starting points (the 2023 HFCS data). The bottom charts show the debt-at-risk and the contribution by income tercile at the starting point (HFCS survey) and under the FSAP geopolitical scenario.
Sources: 2023 HFCS and IMF Staff calculations.

102. Beyond financial stability, household vulnerabilities could impact the real economy by reducing consumption. As more households become financially stretched, their capacity (and willingness) to consume is curtailed. Households struggling to afford debt payments could cut back sharply on spending, dampening aggregate demand. The analysis identifies a subset of households as "consumers at risk"—whose total expenses (including debt service and rents) absorb their entire income, forcing them to cut non-essential spending. The analysis assumes that these consumers reduce discretionary spending to avoid breaching their budge constraint. Under the FSAP recessionary (geopolitical) scenario, about 6 percent (7 percent) of aggregate consumption may need to be reduced, weighing down on GDP growth in Portugal, broadly in line with average projections for the EA.

B. Corporate Sector Vulnerabilities

103. The financial indicators of the NFC sector in Portugal have improved significantly over the past decade. Most notably, the corporate sector has gone through a significant deleveraging, with bank loans to non-financial corporates in percent of GDP falling from a peak of 67 percent in 2009 to 24 percent in 2025. Excluding the COVID-19 period, year-on-year growth of bank loans to NFCs stayed negative since 2010 and only turned positive in 2025. Both NFCs' total and net debt (debt net of deposits) as a share of GDP have declined below EA levels since 2021. Corporate profitability in the post-pandemic period has also been stronger than in past periods, albeit with considerable heterogeneity across firm sizes and a less pronounced heterogeneity across sectors. Average capital and interest coverage ratios have increased, driven by better-performing firms, but with little change for firms at the 25th percentile. The composition of corporate debt has also changed, with the share of bank loans in total debt declining, especially in the construction and accommodation and food sectors. Higher reliance on other loans and, more recently, on debt securities has accounted for this change. The share of short-term debt in total debt has also declined compared to 2009, despite the slight increase since 2020. Financing by the nonbank financial sector remains marginal (Figure 39).

Figure 39. Portugal: NFC Selected Financial Indicators

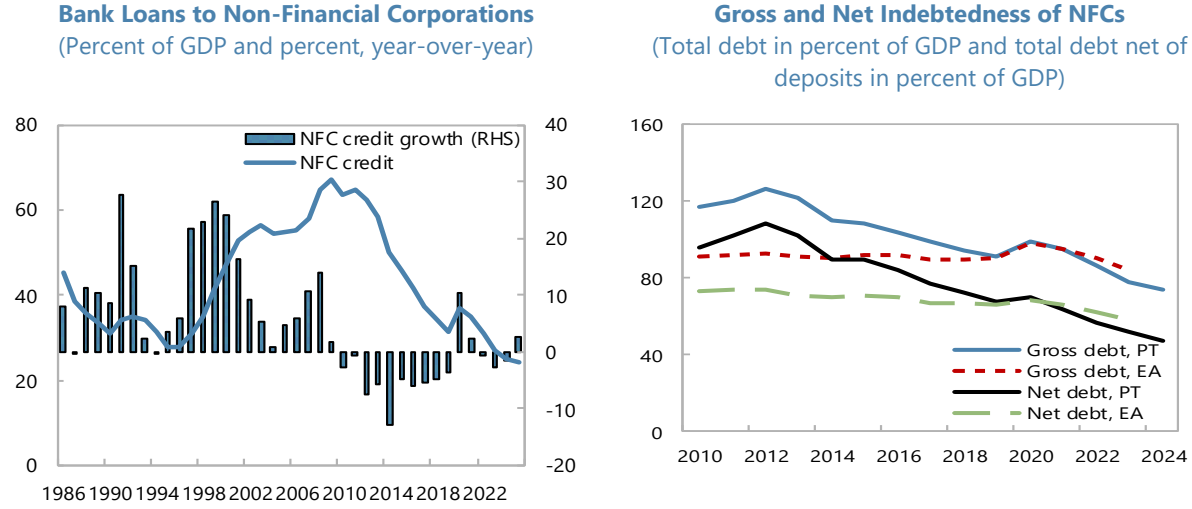
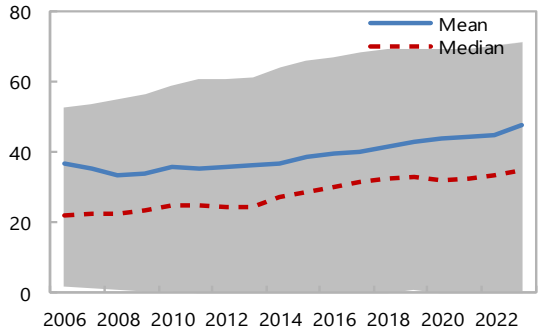
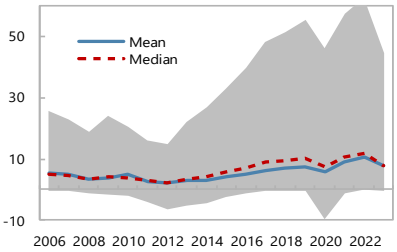


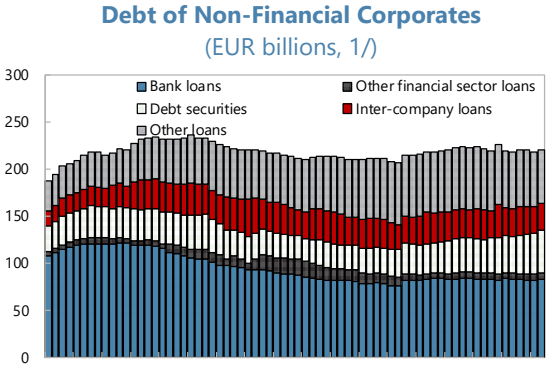
Figure 39. Portugal: NFC Selected Financial Indicators (concluded)



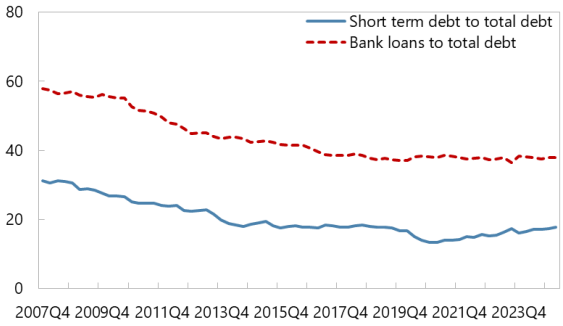
Notes: Shaded area shows the range between the 25th and 75th percentiles computed at firm level



Notes: Shaded area shows the range between the 25th and 75th percentiles computed at firm level.



1/ Excludes trade credit debt vis-a-vis holdings and special purpose entities.



Sources: BdP, INE, Haver Analytics, and IMF staff calculations.

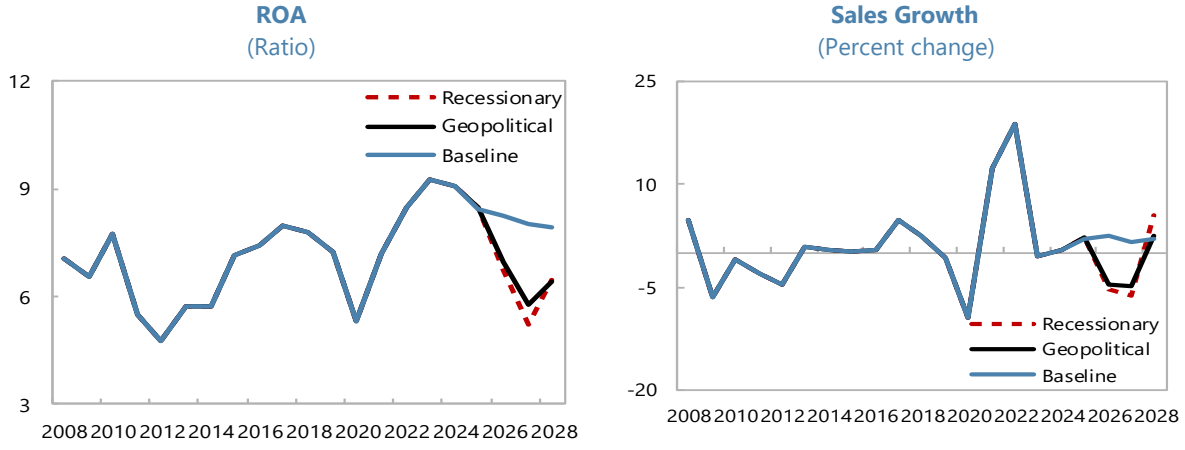
104. To assess corporate sector vulnerabilities, complementary approaches of dynamic scenario-based analysis and static sensitivity analysis were employed. The methodology is similar to Tressel and Ding (2021). The dynamic scenario-based analysis uses data on key financial indicators of firms disaggregated into 10 sectors and 4 sizes. Panel data consisting of the averages of each of the resulting 40 categories for 2006-24 are used to project corporate performance, including default rates, under the baseline and two adverse scenarios. The static sensitivity analysis uses firm level data for 2024 to assess the share of the NFCs that would experience cash shortfalls or difficulties servicing their debt under calibrated shocks to sales and interest costs, with assumed firm-level behavioral responses.

105. The dynamic analysis involves three steps. First, profitability, sales growth, and leverage are estimated with panel regressions using sector and size fixed effects. Holding structural firm characteristics constant at their 2024 levels, values for 2026-28 are predicted recursively for three scenarios, featuring different real GDP growth and unemployment paths. Next, other key financial indicators, including the effective interest rate and interest coverage ratio are predicted from accounting identities and using the scenario assumptions on the path of short-term and long-term

interest rates. Finally, probability of default is estimated for the three macroeconomic scenarios as a function of both firm-specific and macroeconomic variables.[38]

106. The findings indicate that shocks matching the severity of those observed during the European debt crisis would result in lower increases in default rates. In the two adverse scenarios, return on assets and sales growth are predicted to decline by magnitudes similar to those experienced during the European debt crisis, and the effective interest rate to increase even more, especially in the geopolitical scenario (Figure 40).[39] But, despite increasing sharply in the adverse scenarios, leverage remains significantly lower than its peak during the crisis. The higher pre-shock profitability also helps mute the impact of shocks on ICR. As a result, the PD increases by 3 percentage points (2 percentage points) in the recessionary (geopolitical) scenario compared to the baseline, reaching 63 percent (50 percent) of the 2012 level, respectively. These results suggest that the significant deleveraging since the European debt crisis has helped enhance the resilience of the corporate sector. While the overall trajectory of predicted PDs is similar across sectors, there is notable heterogeneity, with the highest default rates predicted for the construction and real estate sector (Figure 41).

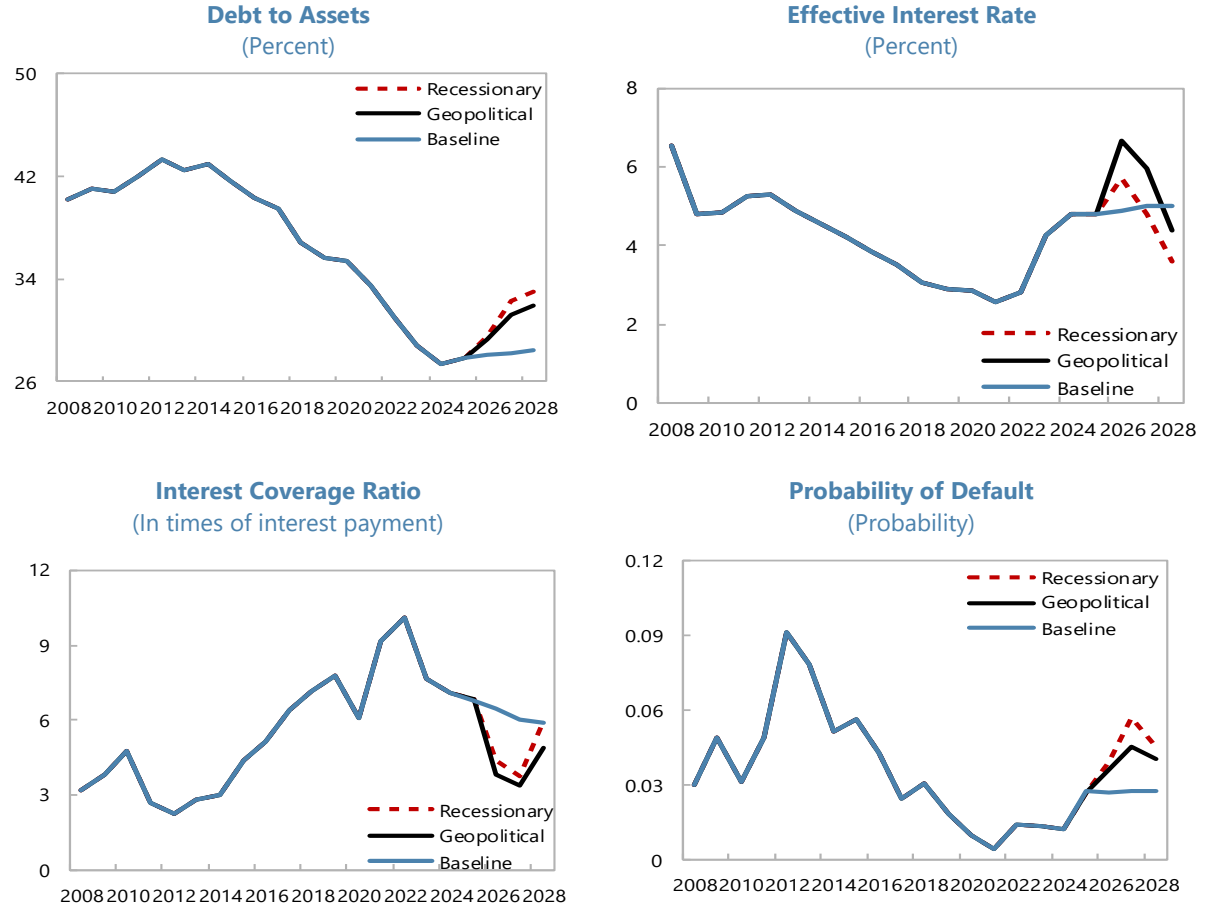
Figure 40. Portugal: Dynamic Scenario-based Analysis of NFC Vulnerabilities
(Debt-weighted averages)



[38] See Appendix VII on methodology.

[39] All metrics are debt-weighted averages, as reported in Figures 40 and 41. In addition to the reported debt-weighted averages, results weighted by number of firms, bank loans, and employment were calculated. Employment-weighted PDs were similar to debt-weighted PDs, while bank-loan-weighted PDs were slightly higher. PDs weighted by number of firms were significantly higher, reflecting the higher riskiness of micro and small firms.

Figure 40. Portugal: Dynamic Scenario-based Analysis of NFC Vulnerabilities (concluded)
(Debt-weighted averages)



Sources: Banco de Portugal and IMF Staff calculations.

Figure 41. Portugal: Historical and Predicted PDs in Selected NFC Sectors
(Debt-weighted averages; probability)

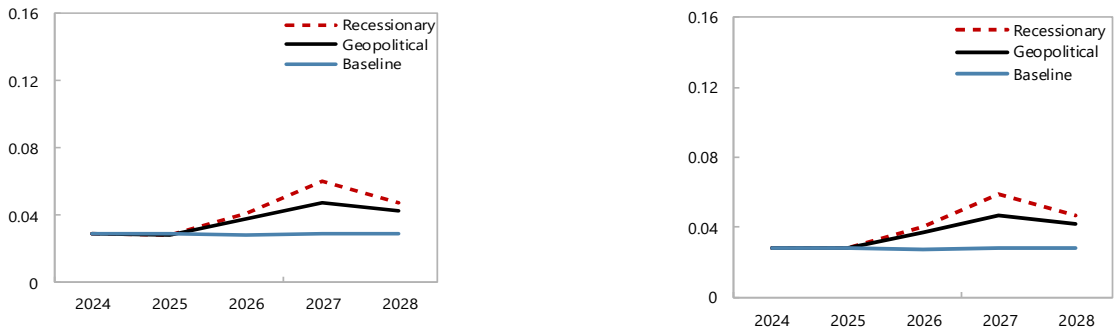
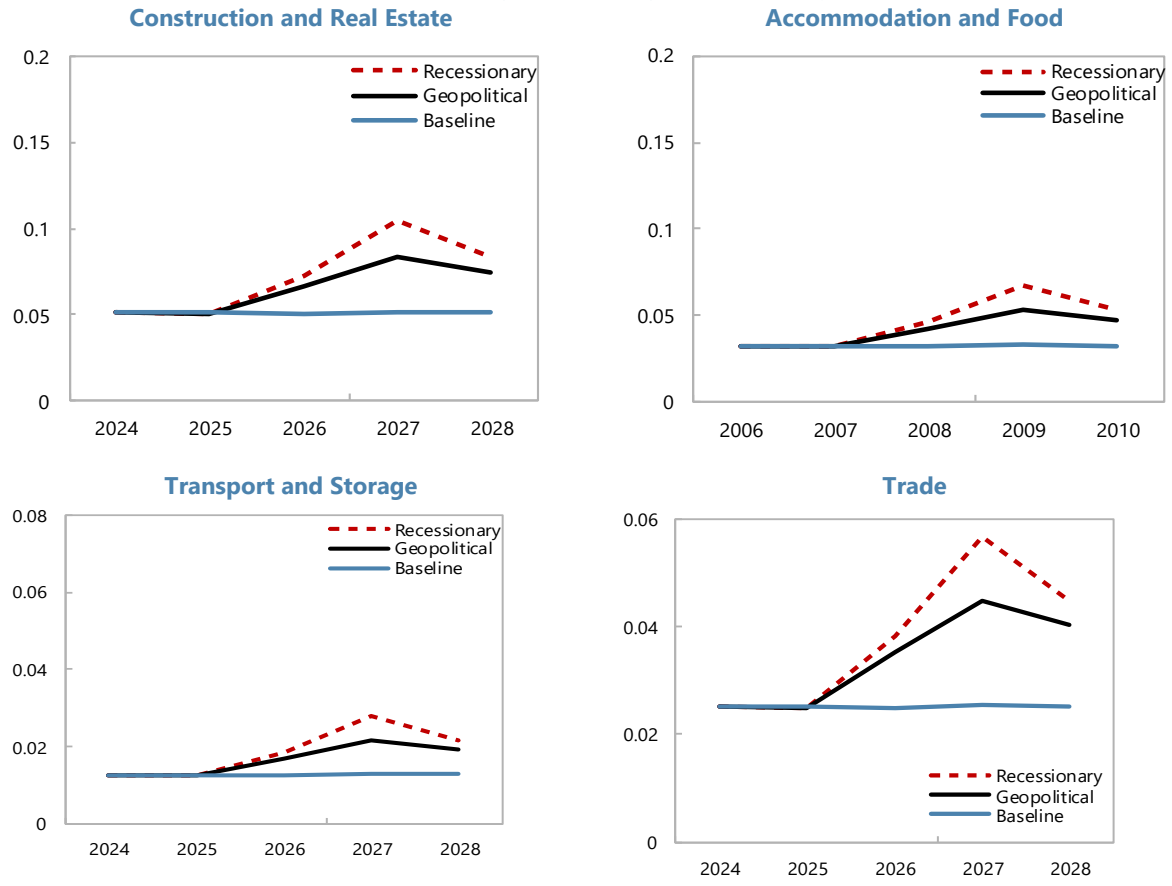


Figure 41. Portugal: Historical and Predicted PDs in Selected NFC Sectors (concluded)
(Debt-weighted averages; probability)



Sources: Banco de Portugal and IMF Staff calculations.

107. The static sensitivity analysis[40] evaluates the impact of scenario shocks on firms' interest coverage ratio and cash position. The shocks to NFCs' sales and effective interest rates are calibrated as the bank-debt-weighted averages of the peak annual shocks for each sector under each scenario, as estimated in the dynamic analysis. Several behavioral responses of firms are considered, including reductions of cost of goods sold, other operating expenses, and labor costs, and are calibrated at the national level based on earlier analysis conducted by the Bank of Portugal (Marques et al. 2022). These calibrations are then applied to firm-level data to calculate their post shock interest coverage ratios and cash balances. The following criteria are applied for the sensitivity tests: for ICR, firms are considered "at risk" when their interest coverage ratio would fall below 1, indicating insufficient earnings to cover interest costs; for cash balance, firms are considered "at risk" when their existing cash balances and current earnings would become insufficient to cover interest payments.[41]

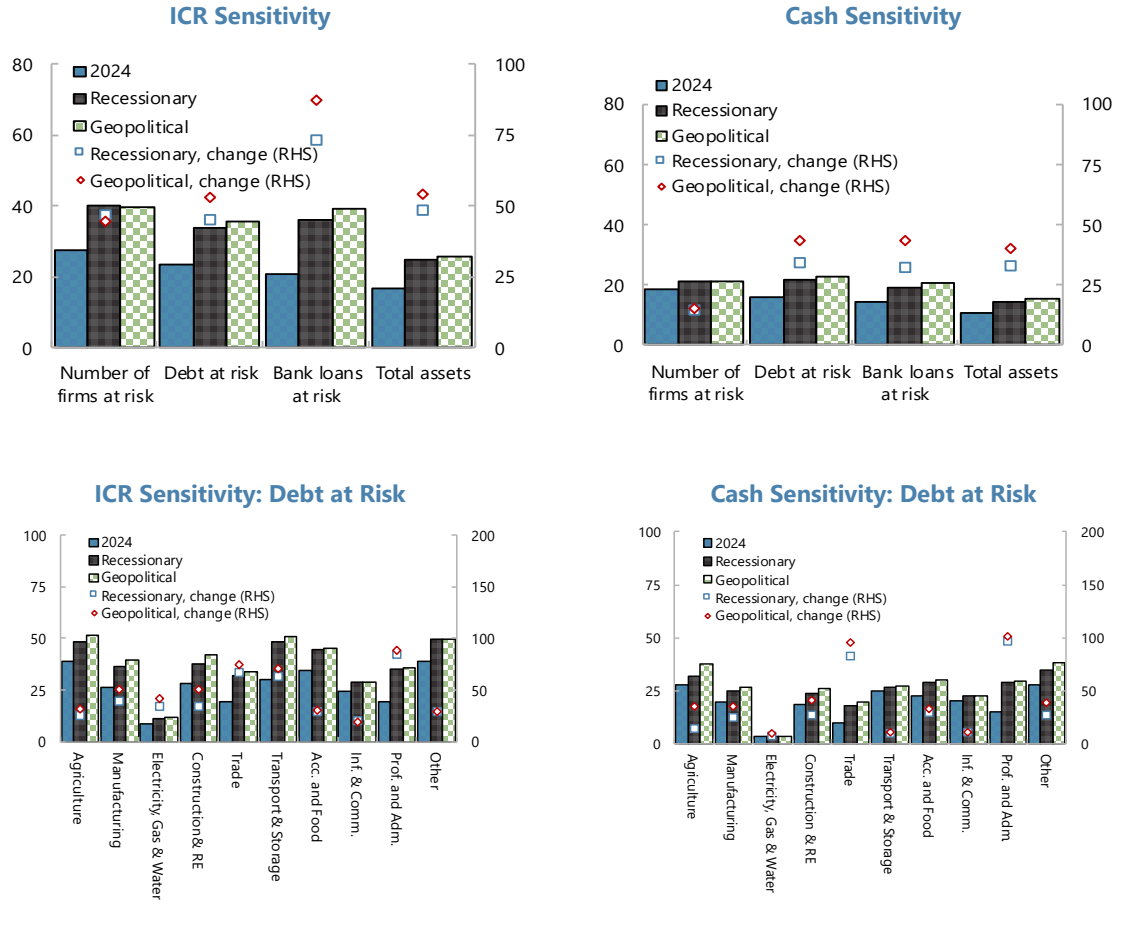
108. Sensitivity analysis shows a significant rise in vulnerability for ICR and a more moderate increase in vulnerability for cash balances. While the share of firms falling below the ICR threshold increases by about 45 percent in both scenarios, the geopolitical shock has a larger

[40] The static sensitivity was conducted at firm-level in a joint work with the experts from Financial Stability Department of Banco de Portugal.

[41] See Appendix VII on methodology.

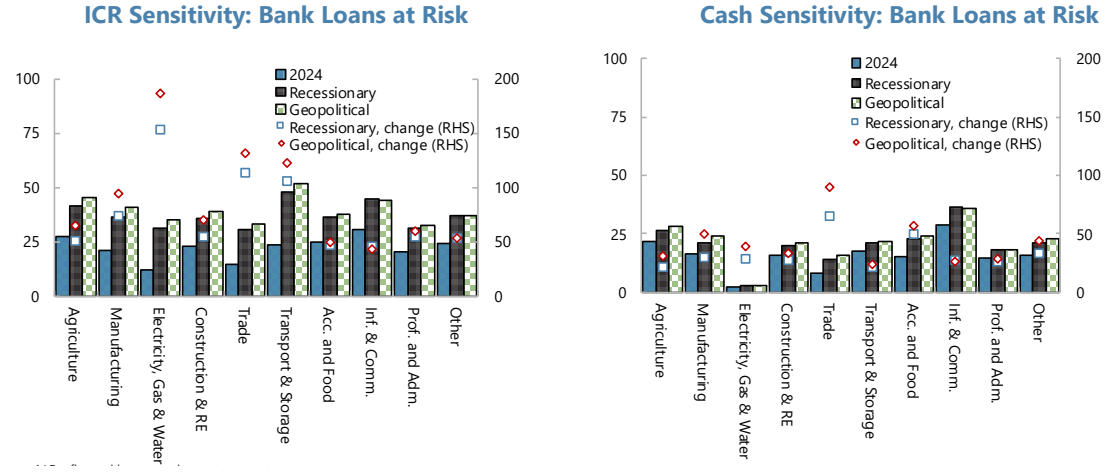
impact on debt at risk, and especially on bank loans at risk, leading these ratios to increase by 53 and 87 percent respectively (Figure 42). Results by sector show that debt at risk increases most in professional services, trade, and transport sectors, while bank loans at risk increase the most in the utilities sector (albeit from a relatively low base). Vulnerability based on cash balances is generally lower and increases less in stress scenarios than the vulnerability based on ICR, in part thanks to robust cash buffers of firms. Results by sector show that debt at risk and bank loans at risk increase between 10 and 30 percent for most sectors except for trade, accommodation and food, and professional services where increases range from 50 to 100 percent. In absolute terms, debt-weighted average ICR below threshold levels would increase from 23 percent to 34 (36) percent in the recessionary (geopolitical) scenario, comparable to the levels observed during COVID but lower than the ones observed during the European debt crisis (43 percent in 2012). Debt-weighted average cash below threshold levels would increase from 15 percent to 21 (23) percent in the recessionary (geopolitical) scenario slightly lower than during COVID and significantly lower than during the European debt crisis (33 percent in 2012) (Figure 43).[42]

Figure 42. Portugal: Sensitivity Analysis of the NFC Sector
(In percentage below threshold and percent change)



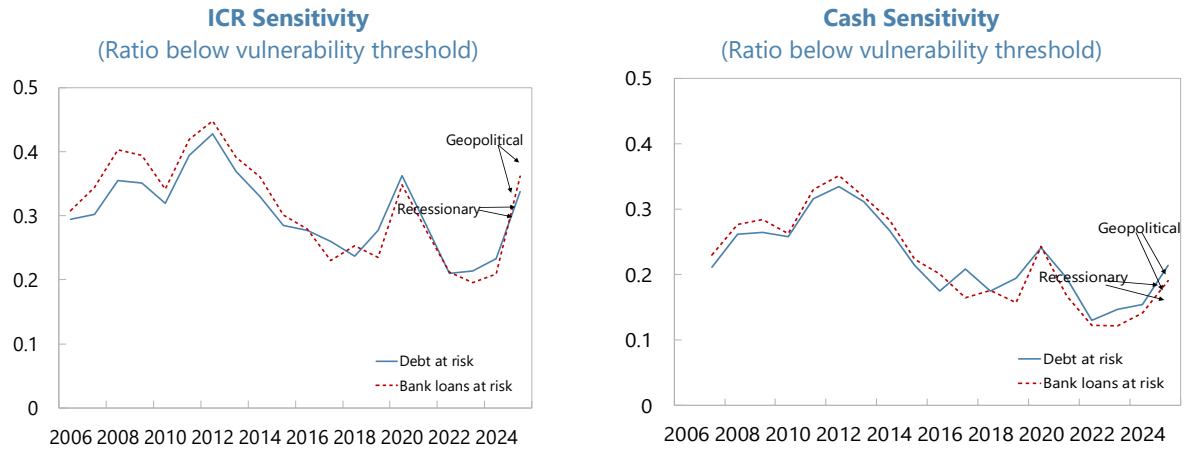
[42] Note that the historical series on the cash sensitivity indicator would not necessarily coincide with the actual cash position of firms because the indicator does not consider the measures that firms may have taken to boost their cash positions such as obtaining new financing or increasing earnings retention.

Figure 42. Portugal: Sensitivity Analysis of the NFC Sector (concluded)



Note: For firms with nonzero interest payments.
Sources: Banco de Portugal and IMF Staff calculations.

Figure 43. Portugal: NFC Sensitivity Analyses: Historical Comparison



Sources: Banco de Portugal and IMF Staff calculations.

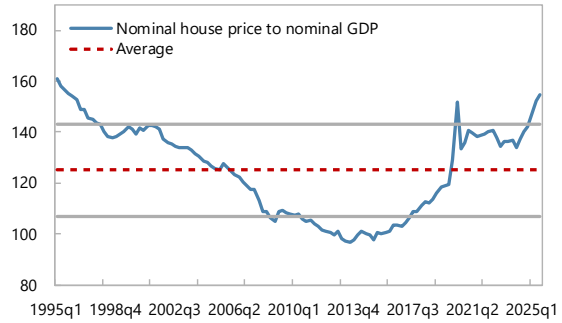
C. Real Estate Market Analysis

109. House prices have risen sharply in recent years. They grew by 19 percent y-o-y in 2025Q4 and 180 percent since 2015, compared to an EA average of 56 percent. The price-to-income and price-to-rent ratios are currently 27 percent and 52 percent above their historical averages, respectively. Credit has not been a key driver of house prices, as the stock of mortgage loans did not increase concurrently with house prices, contrary to the EA overall, although this dynamic may be changing, as in recent quarters mortgage growth in Portugal has been picking up faster than in the EA. The ratio of new housing credit to total value of house purchase transactions has been less than 50 percent on average since 2012. This is in part due to the important role of nonresidents in the market (who on average account for 6 percent of the number of transactions but buy houses that are on average 80 percent more expensive) and the significant share of Portuguese household savings that flow into real estate, likely due to lack of alternatives. Nonresident demand for housing stayed strong after the discontinuation of the golden visa program for residential real estate investors in

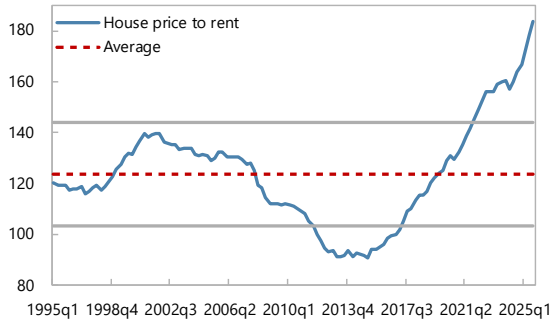
2023, as evidenced by growing FDI in the real estate sector. Supply constraints appear to be an important contributor to imbalances, as the supply of new houses to the market, while picking up in recent years, remains below the historical average (Figure 44). The 2024 ESRB report assessed vulnerabilities in the residential real estate sector of Portugal as medium (ESRB, 2024).

Figure 44. Portugal: Real Estate Market Developments

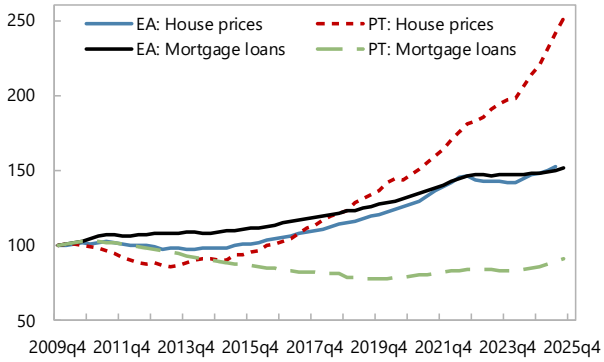
Price to Income Ratio
(Index, 2015=100)



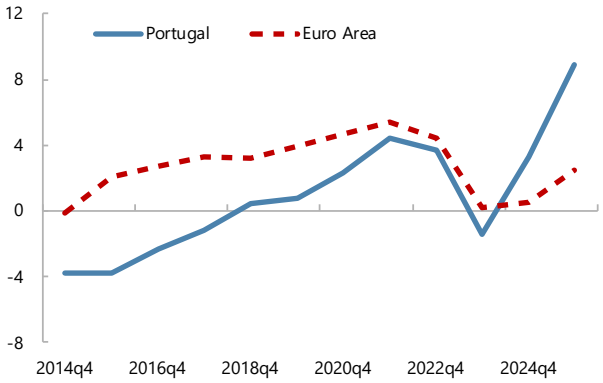
Price to Rent Ratio
(Index, 2015=100)



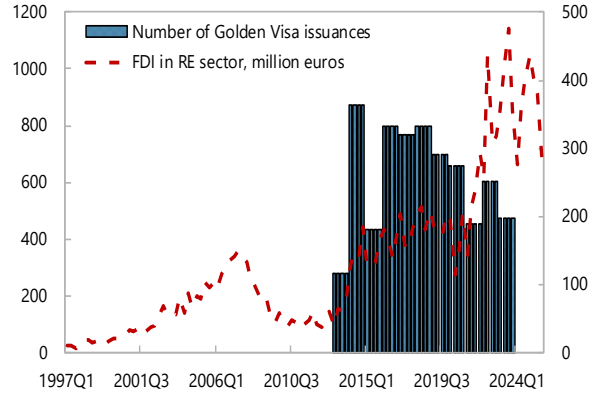
House Prices and Stock of Mortgage Loans to Households
(2009q4=100)



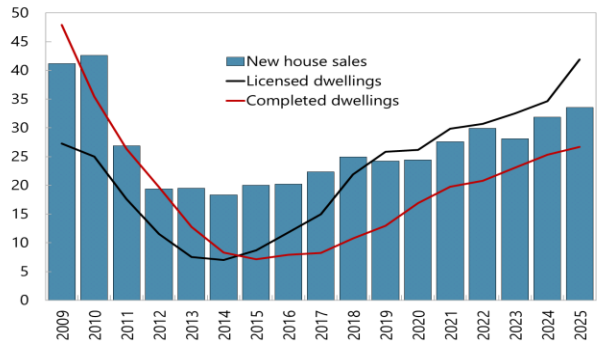
Mortgage Loans to Households
(Year-on-year percent change)



Foreign Demand for Real Estate in Portugal



Supply of New Houses
(Thousand Units)



Sources: INE, ECB, Eurostat, Haver Analytics, Banco de Portugal, and IMF Staff calculations.

110. To assess real estate market vulnerabilities, short-term and long-term determinants of house prices were analyzed.[43] Conceptually, as housing is a good, demand for it is expected to increase as national income increases, implying a long-term equilibrium relationship between house prices and income, while short-term deviations from this equilibrium may arise from cyclical factors (Igan and Lougani, 2012). The speed at which these deviations correct depends on the housing supply response, which, in turn, may be subject to shocks. Specifically, as a first step, the long-run relationship between real house prices and real GNDI per household is estimated. Using the "per household" income measure, rather than the standard "per capita" measure, helps capture the significant impact of declining household size on housing demand. The estimations suggest that as of 2025Q2 real house prices were about 21 percent higher than predicted by real GNDI per household.

111. Model results suggest that unemployment, financial conditions, and foreign demand are important determinants of house price growth. To estimate the short-term drivers of house prices, real house price growth is regressed on the residual from the long-run regression, the unemployment rate (as a proxy for fluctuations of aggregate demand), a measure of financial conditions, and a proxy for the foreign demand for real estate in Portugal. A rise in the unemployment rate is found to be associated with lower house price growth: keeping all else constant and increasing the unemployment rate to 10 percent (from 6 percent currently), reduces real house price growth by 3 percentage points. A reduction of real estate FDI to GDP ratio by 0.1 percentage points (equivalent to one standard deviation in the post-pandemic period) reduces real house price growth rate by 7 percentage points, while tightening of financial conditions by 1 standard deviation reduces real house price growth by 4 percentage points. Importantly, model results also suggest that house price growth does not consistently adjust to reduce the gap between real house prices and their long-term equilibrium levels as determined by real gross disposable income per household.[44] Finally, the analysis also attempted to capture the impact of recent government measures to support young homebuyers. While more data points are needed to analyze in more depth the impact of these demand support measures on buying activity, credit, and price decisions, high-level estimates show that the measures have likely contributed to house price growth and are unlikely to have led to a significant rise in house purchases.

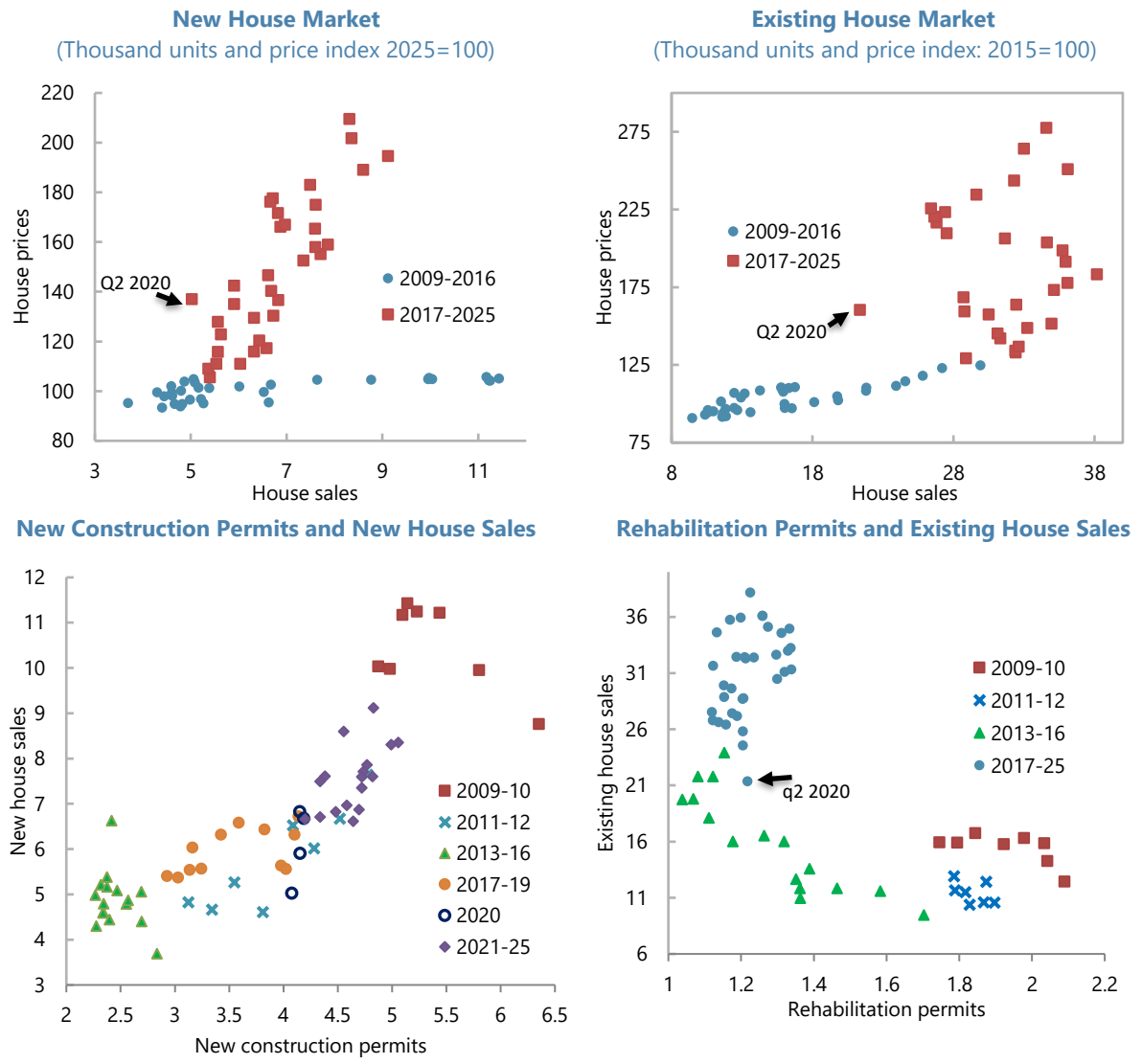
112. Persistent house price deviations from their long-term equilibrium are associated with slow supply responses in the housing market. There has been a structural shift in the housing market, as the construction boom in the years leading up to the European debt crisis and the subsequent contraction were followed by a period of lower price elasticity of housing supply. The structural shift is also reflected in the relationship between house sales and construction permits, with permits typically regarded as a leading indicator of sales. In the new house market, the years 2009-10 were characterized by very high levels of permits and sales, followed by a sharp decline to very low levels during 2013-16. Since 2017, higher permits were accompanied by slow growth of sales, which accelerated after the pandemic. In the existing house market, the relationship between

[43] See Appendix VII.

[44] Although the coefficient of the error term has the expected negative sign, it is not always statistically significant across alternative specifications and does not significantly improve the model's explanatory power.

rehabilitation permits and sales is less direct but there appears to be a positive correlation in the years after the European debt crisis (Figure 45).

Figure 45. Portugal: House Prices, Sales, and Construction Permits



Sources: Banco de Portugal; and IMF Staff calculations.

113. Bottlenecks in the construction sector are contributing to low supply elasticity in the new house market, while owner disincentives to sell underused properties further restrict supply. The low and falling productivity in the construction sector, exacerbated by the predominance of small firms, has been identified as an important factor for the low supply elasticity of housing in the EU (Cousin et al., 2025). While the productivity of the construction sector has remained stable in Portugal over the past two decades, it is relatively low compared to peers, and, as of 2024, 86 percent of firms operating in the sector were micro-enterprises (BdP, 2025b). Widespread skill shortages and mismatches and overly restrictive building regulation and lengthy building permit procedures are also recognized as key factors behind the low efficiency in the construction sector. The market for existing houses is impacted negatively by the reliance on transaction taxes instead of recurrent property taxation, which disincentivizes the sale of underused properties (OECD, 2026).

Empirical results also show that licensing for short-term tourist rentals is associated with lower sales of existing properties without necessarily boosting new construction. Separately, despite Portugal having the highest share of dwellings not used as primary residence in OECD, the rental market remains small and inefficient, raising the demand for house purchases.

Appendix I. Risk Assessment Matrix

Overall Level of Concern		
Source of Risk	**Likelihood (1-3 years)**	**Impact**
Global Risks		
Geopolitical Tensions and Intensification of Conflicts (§G1). Rising geopolitical tensions, and a weakening of multilateralism, raise the risk of an escalation in military conflicts, accompanied by damage to key physical and financial infrastructure, disruptions in major transit routes and supply chains, higher migration pressures, additional financial frictions and market volatility.	**High**	Adverse spillovers weaken Portugal's economic growth; higher risk premia elevate funding costs. The broad-based economic slowdown impairs banks' asset quality, with a negative impact on profitability and possible solvency difficulties for some institutions. Pre-existing governance challenges (including weaknesses in board oversight, risk management, or internal controls) could intensify banks' solvency distress. Trade-related uncertainty underpins commodity price volatility (see §G3), further undermining growth.
Protectionism and Trade Disruptions (§G2). Tariff and nontariff measures disrupt global supply chains, weighing on activity while increasing inflation. Trade diversion triggers broader protectionism.	**High**	Trade-related uncertainty exacerbates economic uncertainty and undermines economic growth. A deterioration of corporate balance sheets and growth slowdown impact negatively banks' asset quality and profitability, leading to possible solvency distress for some institutions. Pre-existing governance challenges (including weaknesses in board oversight, risk management, or internal controls) could intensify banks' solvency distress.
Commodity price volatility (§G3). Supply and demand imbalances—triggered by geopolitical tensions, coordinated production decisions, shifts in investor preferences, or structural changes in demand—fuel commodity price swings, amplifying external and fiscal pressures, social unrest, and macro instability.	**High**	The rise in global uncertainty, which underpins the commodity price volatility, impairs economic activity and capital inflows, leading to a sharp slowdown of the economy. A possible rise of commodity prices can get passed through to domestic price and an uptick of inflation. Exports slow down as exporters in key sectors (manufactured goods; agricultural products) face higher uncertainty in expected returns.

Fiscal Vulnerabilities and Higher Interest Rates (§G4). Higher public debt and deficit levels put further upward pressure on long-term interest rates, sharply tightening global financial conditions, amplifying currency volatility, and reducing consumption and investment that exacerbate adverse debt dynamics.	**High**	Sharp swings in global real interest rates, risk premia, and asset repricing amid economic slowdowns and policy shifts could raise the government's external funding costs or preclude a debt rollover. This would exacerbate fiscal pressures and impair growth, with a negative impact on financial institutions' asset quality.
Domestic Risks		
Cyberthreats (§D1). Cyberattacks on physical or digital infrastructure, technical failures, or misuse of AI technologies could trigger financial and economic instability.	**High**	Large-scale disruptions in the continued delivery of payment and other financial services, with possible adverse impact on the overall soundness of financial institutions.
A rapid correction of house prices (§D2). Banks' high direct and indirect exposures to the real estate market make them vulnerable to a downward correction in the housing market.	**Medium**	A rise in interest rates or an economic slowdown could impair borrowers' repayment capacity and worsen banks' asset quality. A contraction in consumption to support debt servicing could have second-round crippling effects on growth.
Climate Change (§D3). Extreme climate events and rising temperatures could cause loss of life, damage to infrastructure, food insecurity, supply disruptions, and heighten economic and financial instability.	**Medium**	A rise in the frequency and intensity of extreme weather would have adverse impacts on economic growth and on specific sectors, such as agriculture. Financial institutions would, as a result, see a rise in credit, liquidity, and operational risks.

Appendix II. Stress Testing Matrix

A. Banking Sector: Solvency Stress Test		
Top-down by IMF		
1. Institutional Perimeter	Institutions Included	• 9 banks, of which 3 are SIs, 3 are LSIs and 3 are foreign bank subsidiaries.
	Market Share	• 85 percent of the banking sector assets.
	Data and Baseline Date	• Data vintage: 2025:Q2. • Supervisory data: Bank balance sheet and supervisory statistics (including FINREP and COREP), information on interest rate risk in the banking book (IRRBB), short-term exercise (STE), provided by the ECB. • Data from Banco de Portugal: (i) historical PDs, loan portfolio maturity structure and interest rates derived from national credit register and (ii) debt portfolio maturity structure disaggregated by sector, country and accounting treatment derived from the granular securities portfolio database (SHSG). • Household analysis relies on household survey microdata from the 2021 (latest) HFCS survey, covering 83,000 households across 22 countries (EA, CZ, and HU) and 200,000 personal files. Montecarlo simulations of unemployment shocks at the person level. Projections of households' balance sheets, consumption, and debt repayments, allowing for new issuances of maturing loans. • Corporate analysis: data from Orbis, Capital IQ and disaggregated data series derived from company-level data from Portugal's Central Balance Sheet Database (CBSD) and Central Credit Register were used. The data is annual and covers 2006-24. In addition, company level data from CBSD was used in an exercise performed by BdP in a partnership with the IMF team. • Real estate analysis: publicly available data from INE (Portuguese National Institute of Statistics), Bank of Portugal, and Eurostat. • Market and publicly available data, such as information from ECB's MIR on funding and lending rates for new businesses by type of asset and funding portfolios, complemented with commercial databases such as Capital IQ. • Scope of consolidation: highest level of consolidation for banks having their headquarters in Portugal and sub-consolidation level of all Portuguese activity for foreign subsidiaries. • Coverage of sovereign and non-sovereign securities exposures: debt securities measured through fair value (FVPL and FVOCI) and amortized cost (AC) account.
2. Channels of Risk Propagation	Methodology	FSAP team satellite models and methodologies. • For internally modelled exposures (IRB), projection of PiT and TTC PDs, PiT and DT LGDs, EAD, and RWA. For SA exposures, projection of new flows of defaulted exposures and RWA based on risk weights for performing and nonperforming loans separately. Provisioning for IRB and SA modeled using IFRS 9 transition matrix approach.

		• Static balance-sheet approach, allowing the re-issuance of maturing loans at current market rates, keeping the maturity structure constant. • Provisioning for IRB and SA are modeled using IFRS9 transition matrix approach. • Traded risk impact from the revaluation of debt securities held at fair value (FVPL and FVOCI, excluding hedging instruments) assessed the interest rate and credit risk deltas projected in the market scenarios. The market stress scenarios are one-off shocks, happening at the start of the scenarios and whose narrative is aligned to the macro scenarios (e.g., in the geopolitical scenario, the one-off market stress event features higher interest rates and commodity prices, while the opposite occurs in the recessionary scenario). Risk factors include interest rate, commodity, equity, FX, and credit spread.
	Satellite Models for Macrofinancial Linkages	Models for credit losses, funding costs, lending rates: • Within EA, for household, PD are estimated using micro-data at individual household (based on household survey, HFCS). For Poland (the only material non-EA country), PDs are estimated as a weighted average of peer countries. Corporate PDs are estimated using Tressel and Ding (2021) based on company-level data from Portugal's Central Balance Sheet Database (CBSD) and Central Credit Register were used. The data is annual and covers 2006-24. • LGD shocks for collateralized exposures are linked to paths for real estate prices in the scenario using a smoothing factor to account for the TTC regulatory approach. • Interest income and expense projected at the portfolio segment level using a structural approach applying interest rate shocks on new business and the repricing structure of the portfolio.
3. Tail Shocks	Stress Test Horizon	• 2026 – 2028 (three years)
	Scenario	Three scenarios: • A baseline scenario drawn from the October 2025 WEO macroeconomic projections. • Adverse scenario 1: A geopolitical scenario featuring an escalation of geopolitical conflicts. • Adverse scenario 2: A recessionary scenario showing a synchronized global slowdown amplified by sovereign debt distress in EA. The two adverse scenarios rely on GFM, a structural macro econometric model of the world economy, disaggregated into 40 national economies, documented in Vitek (2015).
	Second-round Effects and Sensitivity Analysis	• Household 'consumption at risk,' defined as the consumption of "economically vulnerable households" (for which the sum of debt service and consumption exceeds gross income) as a share of aggregate consumption. The elasticity of unemployment to changes in consumption will be used to test second-round effects on default risk.
4. Risks and Buffers	Risk Covered	• Risks covered include credit (on loans and debt securities), market (valuation impact of financial instruments with respect to market risk factors such as interest rates, foreign exchange, credit spread, equity prices) and interest rate risk.

		• Sensitivity analyses on revaluation of debt securities portfolio held at amortized cost, quasi-reverse stress test on credit risk using more severe PDs, and assessment of large exposures.
	Behavioral Adjustment	• Static balance sheet approach: size of portfolios (gross of NPLs) remains constant throughout the stress testing horizon (with no write-offs allowed). • In projecting RWAs, standardized and IRB portfolios are differentiated. For the standardized portfolios, RWAs change due to the shift in the composition of performing and non-performing exposures. For the IRB portfolios, through-the-cycle-PDs, downturn LGDs and EAD for each asset class/industry are used to project risk weights. • Interest income from nonperforming loans is not accrued. • Dividends are paid out by banks that remain profitable and adequately capitalized. The tax rate is based on historical bank-level tax rate, while the dividend rate is set at 80 percent to account for the transfer of profits from the foreign subsidiaries to the headquarter.
5. Regulatory and Market-Based Standards and Parameters		• Consider two hurdle rates: (i) "Minimum capital hurdle" consists of SREP capital requirements (the Basel 4.5 percent CET1 ratio) plus P2R; (ii) "Combined buffers requirement" includes the minimum capital requirements and the CCoB and O-SII capital buffers. The CCyB and sSyRB are assumed to be zero in the adverse scenarios. • Leverage ratio during the stress test horizon assessed against the 3 percent Basel III minimum requirement.
6. Reporting Form for Results	Output Presentation	• Aggregate capital path for each scenario by groups of banks, categorized by bank groups. • Outputs also include information on impact of different result drivers, including profit components.
B. Banking Sector: Liquidity Test		
Top-Down by FSAP Team		
1. Institutional Perimeter	Institutions Included	• 9 banks, of which 3 are SIs, 3 are LSIs and 3 are foreign bank subsidiaries.
	Market Share	• 85 percent of the banking sector assets.
	Data and Horizon	• Data vintage: 2025 Q2 • Data: Supervisory data from Implementing Technical Standards (ITS) files (COREP). • Scope of consolidation: highest level of consolidation for banks having their headquarters in Portugal and sub-consolidation level of all Portuguese activity for foreign subsidiaries.
2. Methodology	Methodology	• Structural analysis: evolution of LCR, NSFR, asset encumbrance, and funding structure. • Dynamic analysis: Cash flow-based stress test.
	Stress Test Horizon	• 1 year horizon for cash flow analysis.
3. Type of analyses	Scenario Analysis	• For cash flow liquidity stress tests, various stress scenarios are considered, including general risk aversion, market sovereign distress, and idiosyncratic funding to examine potential liquidity shortfalls from overnight up to one-year horizon.

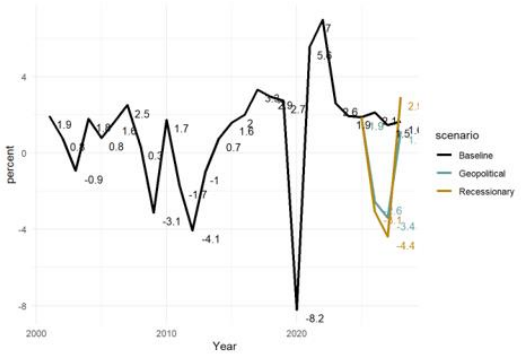
4. Buffers	Buffers	• Capacity of banks to generate liquidity from inflows and from assets under stress (i.e., counterbalancing capacity).
5. Regulatory standards	Regulatory / accounting and market-based standards	• For the LCR and NSFR, the hurdle rate is set at 100 percent at the aggregate currency level (per Basel III and domestic regulation). For cashflow analysis, the outcomes of interest are the Net Liquidity Position and the survival period.
6. Reporting format for results	Output presentation	• Output includes (1) descriptive analysis of LCR, NSFR, asset encumbrance, funding structure, and stock of CBC, (2) Net liquidity position over the horizon for the cash flow analysis.

Appendix III. Scenarios

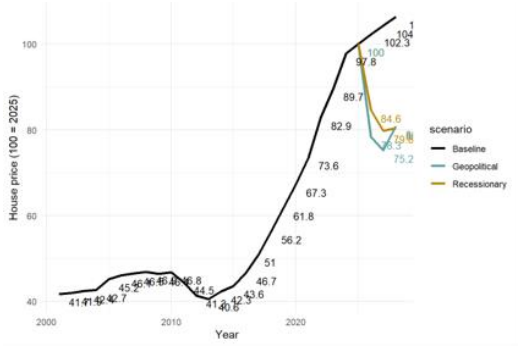
This appendix presents additional details on the macroeconomic and market scenarios.

Appendix III. Figure 1. Portugal: Macroeconomic Scenarios

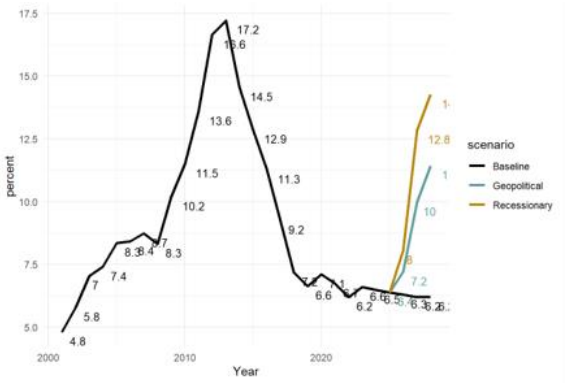
Real GDP Growth – Historical Comparison



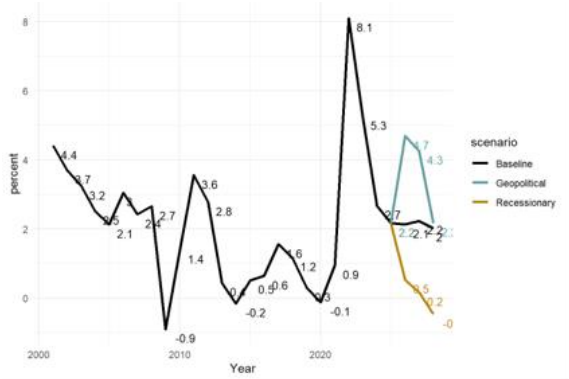
House Price – Historical Comparison



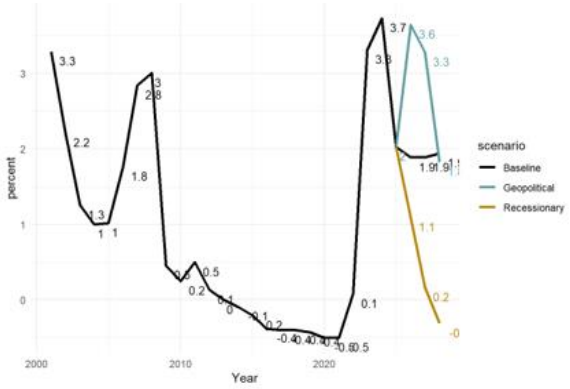
Unemployment Rate - Historical Comparison



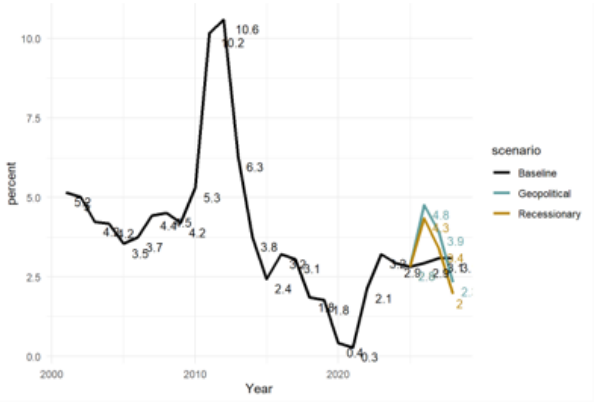
Inflation - Historical Comparison



Short-term Rates - Historical Comparison



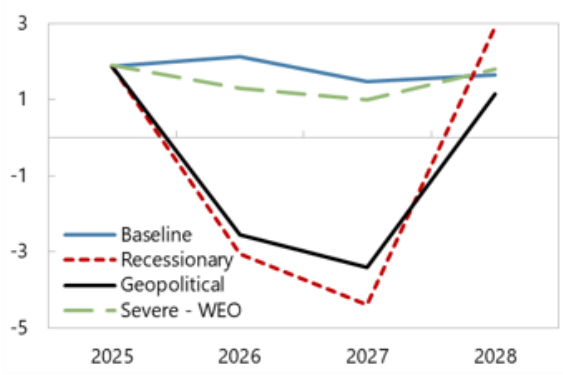
Long-term Rates - Historical Comparison



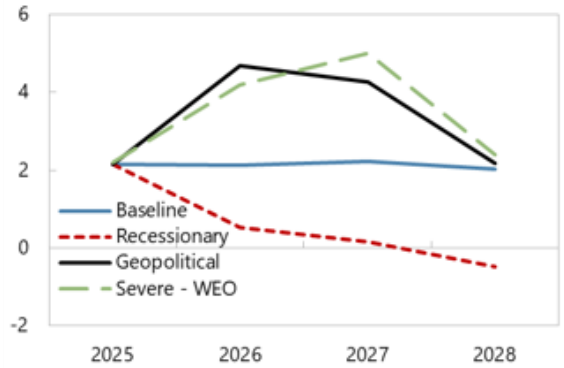
Source: IMF Staff calculations.

Appendix III. Figure 2. Portugal: WEO Severe

GDP Growth
(In percent; year-on-year)



Inflation
(In percent; year-on-year)



Source: GFSR April 2026, IMF Staff calculations.
Notes: In the severe scenario, (1) The shock to commodity prices is more severe and persistent, with oil prices increasing by 100 percent starting in 2026, relative to the October 2025 baseline. (2) One-year-ahead inflation expectations ratchet up by as much as 100 basis points in advanced economies. (3) A significant risk-off episode pushes up risk premiums in advanced economies by 100 basis points. The last two shocks result in an increase of 200 basis points in lending rates compared to the October 2025 baseline. (4) Food prices increase by 25 percent, in line with the correlation between oil prices and food prices observed during the energy crisis of 2022.

Appendix III. Table 1. Portugal: Market Scenarios

Factor	Unit	Geopolitical - Market		Recessionary - Market	
		Delta Shock	Vol Shock	Delta Shock	Vol Shock
energy	relative change, percent	56.3		-58.8	
industrial metals		24.8		-28.1	
precious metals		17.4		-18.3	
CR-low-5Y	absolute change, bps	85.5		72.1	
CR-low-10Y		83.2		68.3	
CR-mid-5Y		117.8		168.8	
CR-mid-10Y		108.9		159.6	
CR-high-5Y		206.8		319.3	
CR-high-10Y		206.8		319.3	
CR-Europe		82.9		82.9	
CR-US		98.3		98.3	
EQ-Asia	relative change, percent. PP change for vol	-42.6	40.0	-42.6	40.0
EQ-JP		-40.8	40.8	-40.8	40.8
EQ-Latam		-46.8	40.0	-46.8	40.0
EQ-US		-38.2	56.0	-38.2	56.0
EQ-Europe		-32.0	57.1	-32.0	57.1
EUR-1M	absolute change, bps. PP change for vol	148.7	14.8	0.0	14.8
EUR-6M		160.4	10.8	49.6	10.8
EUR-1Y		178.7	13.5	120.8	13.5
EUR-5Y		175.4	5.3	142.2	5.3
EUR-10Y		156.6	4.8	156.6	4.8
EUR-20Y		131.0	6.8	164.4	6.8
EUR-30Y		131.0	6.8	172.7	6.8
USD-1M		155.8	19.1	155.8	19.1
USD-6M		158.8	21.0	158.8	21.0
USD-1Y		171.4	23.6	171.4	23.6
USD-5Y		164.2	7.6	164.2	7.6
USD-10Y		151.0	71.8	151.0	71.8
USD-20Y		127.2	8.2	127.2	8.2
USD-30Y		112.4	8.3	112.4	8.3

Appendix IV. Solvency Stress Test Specifications

This appendix explains additional technical details of the methodological approach used to project credit risk, net interest income, and net fee and commission income.

Net Interest Income

1. The NII projections draw from supervisory reports and the Portuguese credit register:

- The NII in the year before the cut-off date, $NII_{b,t=0}$, was obtained from FINREP (F16.01).
- Exposures and liabilities for each segment were obtained from FINREP (F20.04 and F20.06, respectively).
- The repricing ladder and starting interest rates for each segment were provided by BdP for Portuguese loans, using the credit register, while for loan exposures to Poland a similar approach to the EA FSAP was used (see IMF, 2025).
- Projections for the new business rate were obtained from satellite models estimated using data provided by the BdP and the ECB's dataset "MFI Interest Rates Statistics" (MIR).

2. Loans and deposits are split across 18 different bank portfolio segments. The analysis covers 10 portfolio segments for loans, two segments for debt securities and one for remaining assets. Mortgages have been segmented more granularly to reflect the different dynamics stemming from fixed, mixed, or variable rate mortgages. Variable rate mortgages have been further broken into sub-segments to account for reference rates and their different repricing schedules.

3. All formulas in the following apply at the bank-segment level; the notation omits these subindices for simplicity. The model requires two key inputs:

- A repricing ladder at T0, given by the value of exposures in each repricing bucket $[k, k+1]$ (i.e., exposures with time-to-repricing between k and $k+1$ years), denoted as $E_0^{[k,k+1]}$. The corresponding fraction of total exposures in that bucket is denoted as $\theta_0^{[k,k+1]}$. This is summarized in the following table:

Repricing Buckets	Value of Exposures	Share of Exposures
[0;1] yrs	$E_0^{[0,1]}$	$\theta_0^{[0,1]} = E_0^{[0,1]}/E_0$
[1;2] yrs	$E_0^{[1,2]}$	$\theta_0^{[1,2]} = E_0^{[1,2]}/E_0$
[2;3] yrs	$E_0^{[2,3]}$	$\theta_0^{[2,3]} = E_0^{[2,3]}/E_0$
[3,4+] yrs	$E_0^{[3,4+]}$	$\theta_0^{[3,4+]} = E_0^{[3,4+]}/E_0$

  Any exposure with time-to-repricing larger than three years can be allocated to the [3;4+] year bucket. This is without loss of generality because those exposures will not reprice within the three-year stress-testing window.

- Scenario-specific projections for the interest rate on new business, denoted as r_t^{nb}.

4. The model calculations are conducted in three steps:

Step 1: Simulate the exposures originated or repriced in each maturity bucket and period.

- The model simulates the "law of motion" of exposures across buckets. Consider the value of exposures in bucket $[k-1,k]$ at the end of year 1. The exposures in that bucket will correspond to exposures that at end of year 0 were in bucket $[k,k+1]$ (so one year later they have moved to the bucket with 1-year lower time-to-repricing), or to exposures that have been newly issued/repriced during year 1. The corresponding equation for this is:

(1) $E_t^{[k-1,k]} = E_{t-1}^{[k,k+1]} + I_t^{[k-1,k]}$

where $I_t^{[k-1,k]}$ are the newly issued or repriced loans in bucket $[k-1,k]$ during year-t. In order to pin down the value of $I_t^{[k-1,k]}$, the key assumption is that the shares of exposures across buckets are constant over time. That is,

(2) $\theta_t^{[k,k+1]} = \theta_0^{[k,k+1]}$ for all t,k

This assumption is consistent with the static balance sheet used throughout the stress test.

Step 2: Simulate the average interest rate for each bucket and period.

- Denote as $r_{t-1}^{[k,k+1]}$ the average interest rate of the exposures that at end of year $(t-1)$ were in bucket $[k,k+1]$. This interest rate can be calculated recursively. From equation (1), $E_t^{[k-1,k]}$ is the sum of the exposures that were in bucket $[k,k+1]$ at end of year $(t-1)$ and the newly issued/repriced exposures $I_t^{[k-1,k]}$. Then, it must be that the average interest rate of $E_t^{[k-1,k]}$ is an exposure-weighted average of the respective interest rates of these two terms. That is:

$$r_t^{[k-1,k]} = \rho_t r_{t-1}^{[k,k+1]} + (1-\rho_t) r_t^{nb} \text{ where } \rho_t = \frac{E_{t-1}^{[k,k+1]}}{E_t^{[k-1,k]}}$$

- The recursive definition in equation (3) requires an initial condition, $r_0^{[k-1,k]}$. The assumption will be that the initial interest rate in all buckets is equal to the average interest income rate of the portfolio at T0, denoted as IIR_0.

Step 3: Calculate the interest income.

- Consider first the case without NPEs; the interest income (II) is:

(3) $II_t = \sum_{k=0}^{3} r_{t-1}^{[k,k+1]} E_0^{[k,k+1]} + (1-\omega)\left(r_t^{nb} - r_{t-1}^{[0,1]}\right) E_0^{[0,1]}$ where $\omega = \frac{avg\ days\ to\ repricing}{365}$

- The first term is the base rate, which is determined in year $(t-1)$ and is therefore unaffected by the year t interest rate shock; the second term captures the effect of the year t interest rate shock on the interest income from interest-sensitive assets (i.e., exposures that reprice during year- t). The interest-sensitive assets will, on average, continue to earn the old interest rate $r_{t-1}^{[0,1]}$ during the fraction ω of the year, and during the remaining fraction $(1-\omega)$ their rate will change by a magnitude $r_t^{nb} - r_{t-1}^{[0,1]}$. The exposures have a T0 subindex because of the static balance sheet assumption.

- For variable rates, the interest rate is split between a spread and a reference rate: $r_t = i_t + s$ and the spread is kept constant over the scenarios: $r_t^{nb} = i_t^{nb} + s$ where i_t^{nb} is the relevant reference rate (either Euribor 3 months, 6 months or 12 months) projected based on scenarios long-term and short-term rates and starting points.

- For mixed rates, all loans with one year or less remaining maturity was treated as a variable rate, while the remaining used the projected r_t^{nb} for mixed rates.

- In order to incorporate NPLs into the model, the simplifying assumption is that the NPE ratio is the same across buckets. The interest income is therefore:

$$(4)\quad \widetilde{II}_t = (1 - NPEr_t) \cdot II_t$$

That is, the interest income $\widetilde{II}_t$ from equation (4) is multiplied by the exposure-weighted average share of performing exposures for the portfolio segment.

5. New business rates are projected over the horizon of the scenarios using regressions to estimate their passthrough. The empirical analysis uses quarterly macroeconomic data from the IMF's World Economic Outlook with year-on-year dynamics (2000Q1–2025Q2), mortgage interest rates for fixed, mixed and variable contracts from Banco de Portugal (2018Q4–2025Q2), and MIR data on consumer and corporate loans as well as households' and corporates' term and sight deposits. The regressions estimate lending and deposit rates deltas as a function of short-term policy rates, long-term interest rates and their changes, inflation, and selected macroeconomic controls. An initial correlation analysis guided the selection of explanatory variables, followed by standard post-estimation diagnostics including multicollinearity tests, residual normality checks, and back-testing. Results indicate that contemporaneous short-term rates and long-term rate changes generally have the expected positive sign, except for mixed-rate mortgages, likely reflecting the limited sample and weaker link to current rates. Lagged interest rates are usually insignificant or positive, while negative coefficients for fixed and mixed rates reflect their pricing below prevailing market rates. Inflation enters positively in most loan regressions capturing forward short-term rates dynamics, except for corporate loans where declining inflation may increase spreads due to anticipated lower future profits. House prices are negatively associated with consumer loan rates, consistent with improved collateral conditions. For deposit rates, short-term rates and inflation are the main drivers, while long-term rates also matter as a proxy for alternative bank funding costs, with higher long-term yields inducing stronger competition for deposits. Inflation as a proxy of forward short-term rate is also of the expected sign.

Appendix IV. Table 1. Portugal: Passthrough Estimations—Loans

	Δ Mortgage Fixed Rate	Δ Mortgage Mixed Rate	Δ Mortgage Variable Rate	Δ Corporate Loans Rate	Δ Consumption Loans Rate
Constant	-0.10*	-0.07	-0.08	-0.01	-0.05
	(0.05)	(0.08)	(0.17)	(0.04)	(0.05)
Δ Short-term Rate	0.92***	0.35*	1.13***	0.56***	0.13
	(0.11)	(0.18)	(0.14)	(0.08)	(0.11)
Δ Short-term Rate (t-1)	-0.43***	-0.19	-0.14	0.11	0.39***
	(0.09)	(0.15)	(0.11)	(0.09)	(0.12)
Δ Long-term Rate	0.28**	-0.22	0.32*	0.02	-0.002
	(0.13)	(0.21)	(0.17)	(0.05)	(0.06)
Δ Long-term Rate (t-1)	-0.09	0.58***	-0.16	0.17***	0.04
	(0.11)	(0.18)	(0.15)	(0.05)	(0.06)
Δ Inflation	0.01	0.07*	0.04	-0.04**	0.08***
	(0.02)	(0.04)	(0.03)	(0.02)	(0.03)
House Price Growth			-0.01		
			(0.02)		
GDP Growth					-0.02
					(0.01)
Observations	23	23	23	97	86
Adjusted R^2	0.96	0.85	0.97	0.85	0.60
Residual Std. Error	0.18 (df = 17)	0.30 (df = 17)	0.23 (df = 16)	0.39 (df = 91)	0.48 (df = 79)
F Statistic	110.77*** (df = 5; 17)	25.35*** (df = 5; 17)	126.11*** (df = 6; 16)	105.87*** (df = 5; 91)	22.67*** (df = 6; 79)
Note:					*p**p***p<0.01

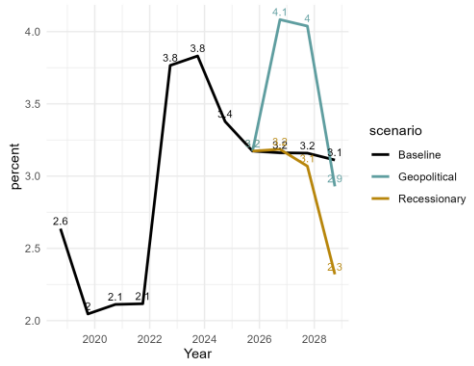
Appendix IV. Table 2. Portugal: Passthrough Estimations—Deposits

	Corporate Sight Deposit Rate PDs	Households Sight Deposit Rate	Corporate Term Deposit Rate	Households Term Deposit Rate
Constant	-0.03*	-0.01***	-0.01	-0.004
	(0.02)	(0.003)	(0.04)	(0.04)
Δ Short-term Rate	0.08**	0.003	0.65***	0.18**
	(0.04)	(0.01)	(0.08)	(0.08)
Δ Short-term Rate (t-1)	0.12***	0.03***	0.22***	0.46***
	(0.04)	(0.01)	(0.08)	(0.08)
Δ Long-term Rate	-0.01	-0.01**	0.37***	0.12***
	(0.02)	(0.004)	(0.05)	(0.04)
Δ Long-term Rate (t-1)	-0.003	0.01**	-0.23***	0.05
	(0.02)	(0.004)	(0.05)	(0.04)
Δ Inflation	0.04***	0.01***	-0.01	-0.0003
	(0.01)	(0.002)	(0.02)	(0.02)
Observations	86	86	97	97
Adjusted R^2	0.67	0.57	0.89	0.86
Residual Std. Error	0.16 (df = 80)	0.03 (df = 80)	0.38 (df = 91)	0.35 (df = 91)
F Statistic	34.79*** (df = 5; 80)	23.43*** (df = 5; 80)	164.07*** (df = 5; 91)	117.48*** (df = 5; 91)
Note:				*p**p***p<0.01

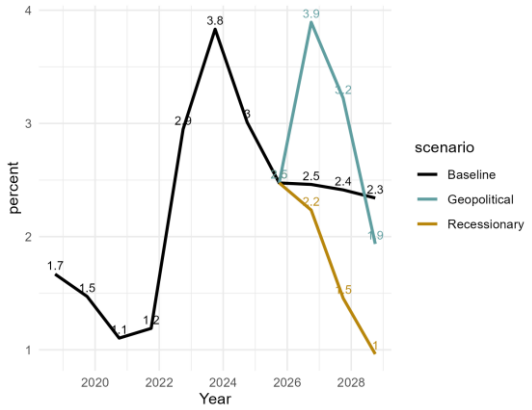
Appendix IV. Figure 1. Portugal: New Business Rate Projections

(Historical and Projections)

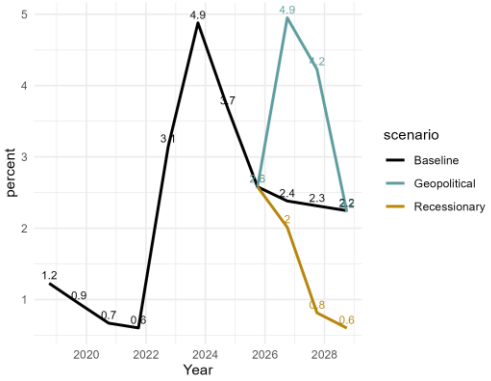
Mortgage (fixed) Rates



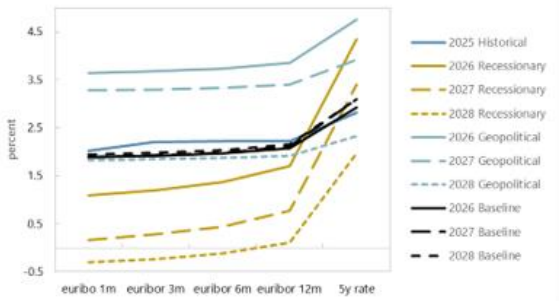
Mortgage (mixed) Rates



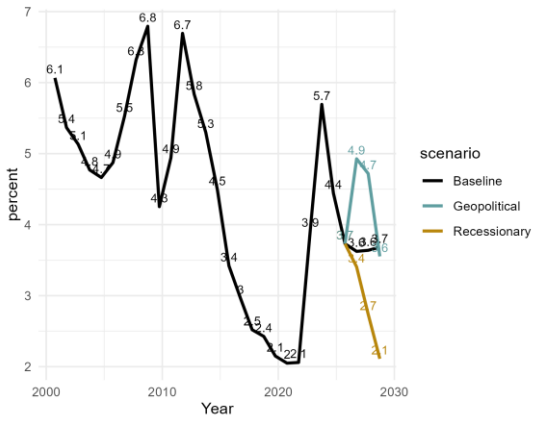
Mortgage (variable) Rates



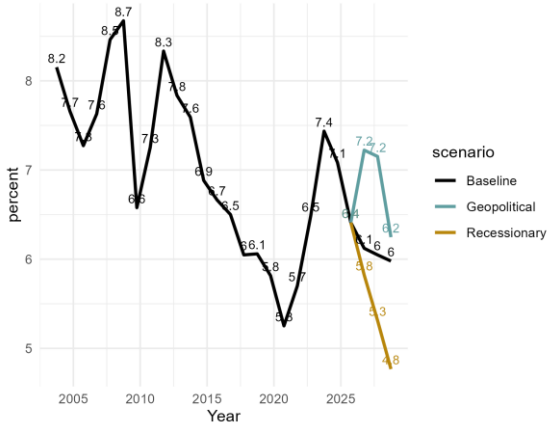
Yield Curves



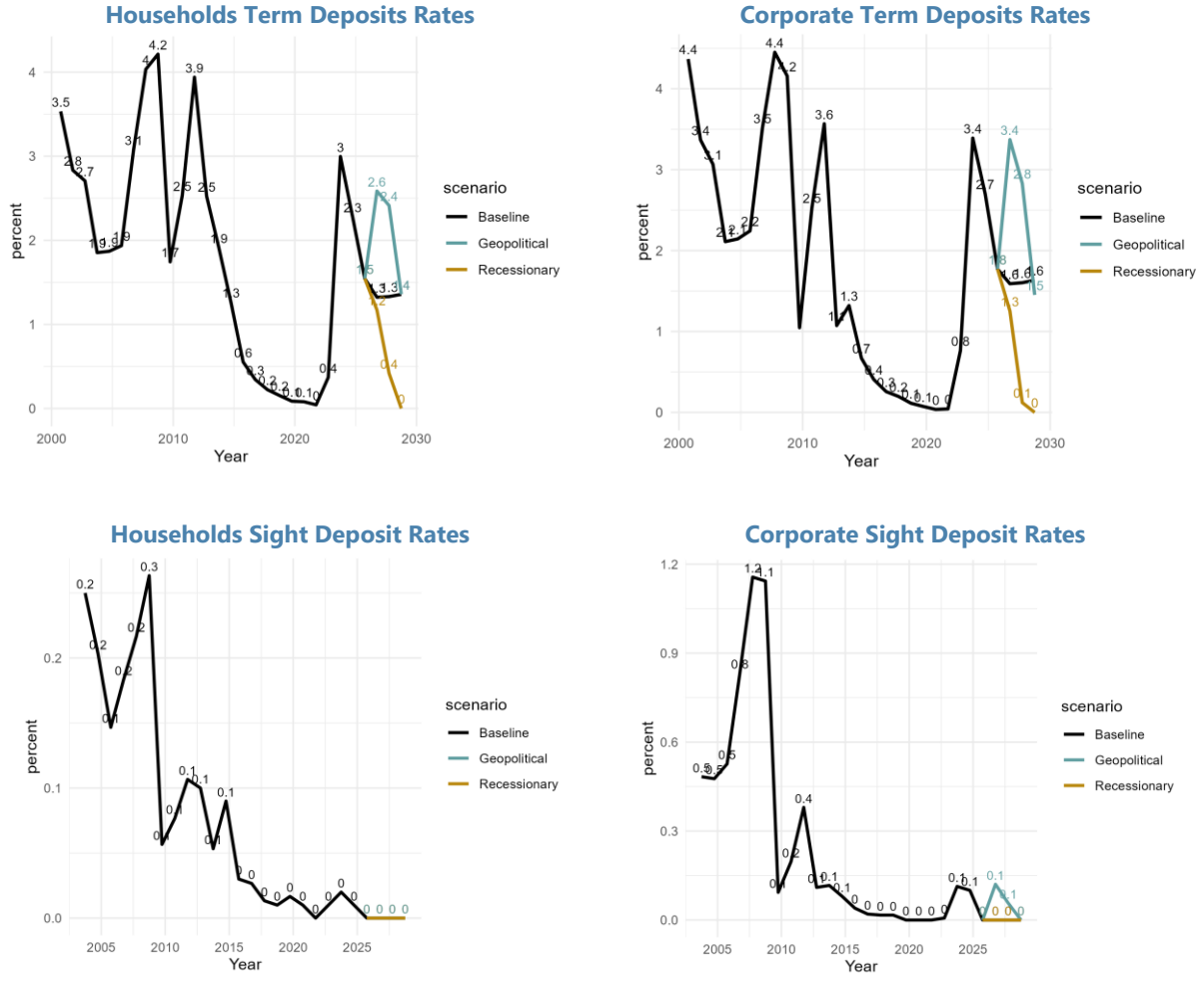
Corporate Rates



Consumer Loan Rates



Appendix IV. Figure 1. Portugal: New Business Rate Projections (Concluded)
(Historical and Projections)



Source: IMF Staff calculations.

Net Fees and Commissions

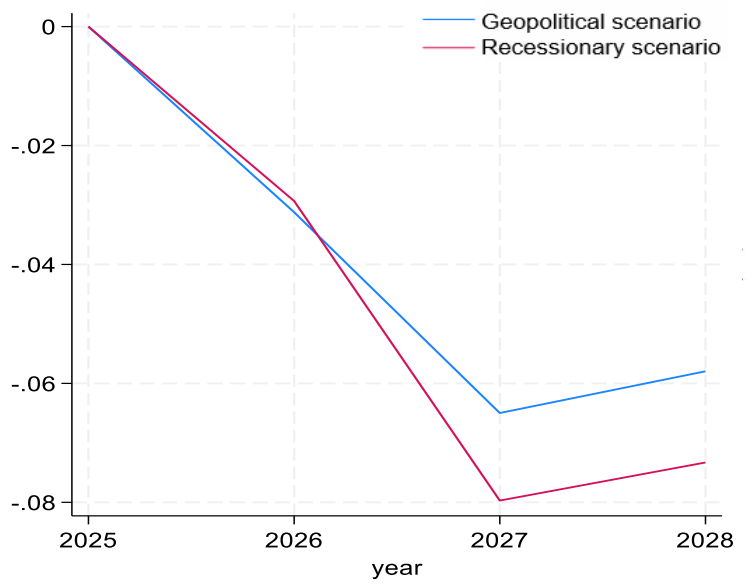
6. A panel regression is used to project NFCI over total assets (Appendix IV. Table 3). NFCI was projected at the aggregate level using data on small EA banks (excluding G-SIBs) from Haver, over the period 1995-2023. The econometric specification includes bank fixed-effects. The main drivers are real GDP growth and the EURIBOR one month delta. The signs are as expected, with higher real GDP and stock price growth indicate a better performing real economy and growing financial markets, which both imply an expansion of the financial services that generate fee and commission income. The negative coefficient on the EURIBOR rate suggests that higher rates are associated with lower bank business volumes, thus reducing fees and commission income from payment services (linked to current accounts and credit cards). With a starting NFCI of 0.72 percent of total assets, the resulting projected NFCIs reflect a drop of about 10 percent in the geopolitical scenario and 14 percent in the recessionary scenario (Appendix IV. Figure 2).

Appendix IV. Table 3. Portugal: NFCI Econometric Estimations

	All Regressors	Lasso-selected Regressors	Arellano-Bond Estimator
NFCI ratio (t-1)	0.723***	0.720***	0.469***
Real GDP growth	0.00599***	0.00546**	0.00555***
Real GDP growth (t-1)	0.000415	6.13E-05	0.00204
Stocks growth	0.000284	0.000293	0.000578
Stocks growth (t-1)	0.000662	0.000587	0.000666
d.Euribor 1 month	-0.0201***	-0.0223***	-0.0253***
d.Euribor 1 month (t-1)	-0.0172**	-0.0183**	-0.0206***
Sovereign bond yield 10 year	8.04E-05		
Sovereign bond yield 10 year (t-1)	0.00631	0.00626	0.00537
CPI inflation	-6E-06	-7.7E-05	-0.00129
CPI inflation (t-1)	0.00462	0.00624**	0.00566**
HPI growth	-0.00145		
HPI growth (t-1)	0.00195***	0.00107	0.00151
US Stocks growth	0.00171***	0.00149***	0.00118
US Stocks growth (t-1)	-0.00046		
EUR/USD FX change	0.00133*		
EUR/USD FX change (t-1)	0.000311	0.000433	0.000888
Constant	0.00122***	0.00119***	0.00266***
R2	0.607	0.605	
BIC	-10975.8	-10997.1	.
N	1074	1074	992

Appendix IV. Figure 2. Portugal: NFCI Projections

NFCI Ratio to Total Assets, Projected Delta with Baseline



Source: IMF Staff calculations.

Probability of Default (for House Price Tail shock sensitivity analysis)

7. For the House Price Tail shock sensitivity analysis, PDs were projected using a time series estimation (Appendix IV. Table 4 and Figure 3). Due to technical constraints, the PDs used in the sensitivity analysis on house price are not derived from the Households and Corporate vulnerabilities analyses described in Section "Private-Sector Balance Sheet Vulnerabilities" but are projected using an econometric approach. The PD satellite models are estimated using quarterly year-over-year macroeconomic data from the WEO over 2000Q1–2025Q2, combined with sector-level aggregated PD data from Banco de Portugal (2000Q1–2025Q2 for corporate PDs and 2010Q2–2025Q2 for mortgage and consumer loans). Projections are produced under baseline, recessionary, and geopolitical scenarios. Model specifications favor parsimony:

(5) $PD_t^{corp} = \alpha + \beta_1 GDP\_g_t + \beta_2 GDP\_g_t * covid + \beta_3 covid + \beta_4 unemp_{t-1} + \beta_5 infl_t + \beta_6 LT\_rate_{t-1} + \varepsilon_t$

(6) $PD_t^{mort} = \alpha + \beta_1 GDP\_g_t + \beta_2 GDP\_g_t * covid + \beta_3 covid + \beta_4 unemp_{t-1} + \beta_5 infl_t + \beta_6 LT\_rate_t + \varepsilon_t$

(7) $PD_t^{cons} = \alpha + \beta_1 GDP\_g_t + \beta_2 GDP\_g_t * covid + \beta_3 covid + \beta_4 unemp_{t-1} + \varepsilon_t$

For mortgages, inflation and short-term interest rates did not materially improve estimation results or projections, likely reflecting the growing share of fixed- and mixed-rate contracts that weakens the link between short-term rates and effective borrowing costs (see Appendix IV. Table 4 and Figure 3). For corporates, inflation is more informative, plausibly capturing developments in nominal profits, while consumer loan PDs remain more sensitive to short-term rates given the prevalence of variable-rate lending. House prices, in levels or growth rates, did not significantly affect mortgage PD

estimates, likely reflecting the absence of major house price shocks in the recent sample. Across portfolios, unemployment and GDP are the main drivers with expected signs, with GDP interacted with a COVID dummy to account for the pandemic-related decoupling. While the split between mortgage and consumer PDs relies on a shorter sample, the use of quarterly data provides a sufficient number of observations for estimation.

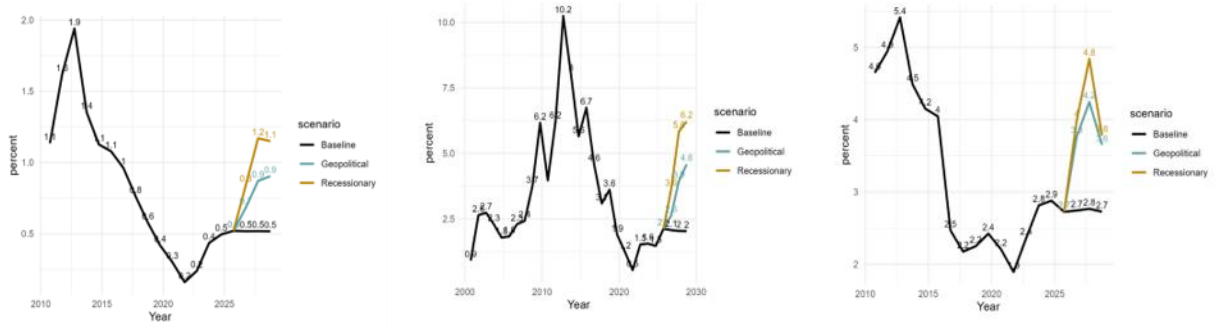
Appendix IV. Table 4. Portugal: PDs Econometric Estimations

	Corporate Loans PDs	Mortgage PDs	Consumption Loans PDs
Constant	-0.89*	-0.03	2.00***
	(0.45)	(0.12)	(0.35)
GDP Growth (annual)	-0.11	-0.02	-0.20***
	(0.07)	(0.02)	(0.05)
COVID (dummy)	-0.60	-0.17*	-0.81***
	(0.42)	(0.09)	(0.23)
Unemployment (t-1)	0.52***	0.08***	0.17***
	(0.04)	(0.01)	(0.03)
Inflation	-0.14**	-0.02**	
	(0.07)	(0.01)	
Long-term Rate	0.05	0.04**	
	(0.08)	(0.01)	
GDP growth * COVID	0.11	0.02	0.19***
	(0.08)	(0.02)	(0.05)
Observations	101	61	61
Adjusted R^2	0.83	0.93	0.80
Residual Std. Error	1.00 (df = 94)	0.13 (df = 54)	0.53 (df = 56)
F Statistic	81.36*** (df = 6; 94)	142.87*** (df = 6; 54)	62.17*** (df = 4; 56)
Note:			*p**p***p<0.01

Appendix IV. Figure 3. Portugal: PD Projections

(Historical and Projections)

Mortgage PDs **Corporate PDs** **Consumer PDs**



Source: Banco de Portugal and IMF Staff calculations.

Appendix V. Solvency Stress Test Detailed Results

This appendix describes the drivers of capital depletion and profitability by groups of banks.

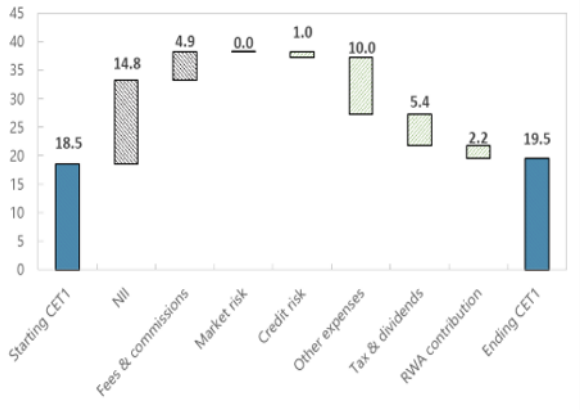
Detailed Results: SIs

1. In the baseline, SIs enjoy large NII and healthy fee generation with moderate credit-loss charges (Appendix V Figure 1). Large income streams are partly offset by operating costs, taxes, and dividends, while gradual growth in RWA reduces the ratio at the end. The overall effect is an increase of 100 bps of capital buffers over the three-year period.

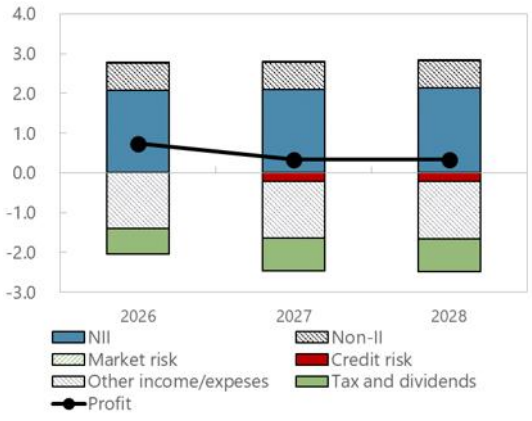
2. Under adverse conditions, capital ratio dynamics are mainly driven by changes of the NII (Appendix V Figure 1). In the recessionary scenario, NII is compressed, and combined with higher credit and market losses, and an even larger surge in RWAs, the resulting CET1 ratio ends up 220 bps below the starting point. In the geopolitical scenario, revenues grow significantly, while NFCI is slightly reduced. Losses from market risk, credit-risk provisions being multiplied by about three, and a stress-driven increase in RWAs, pushes the CET1 capital ratio down by about 60 bps. SIs suffer the largest credit and market risk losses compared to LSIs and Foreign subsidiaries.

Appendix V. Figure 1. Portugal: Capital Ratio Drivers and Profitability—SIs

Capital Ratio – SIs – Baseline
(Percent of 2025 RWA, except of Ending CET1)

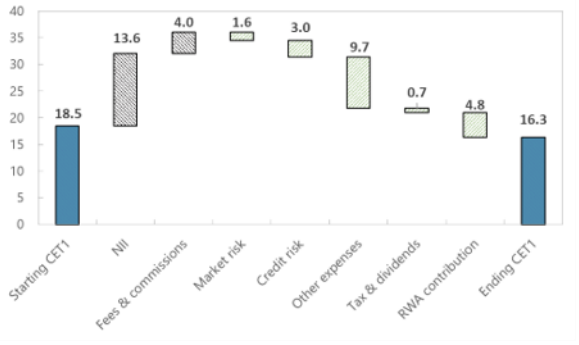


Contribution to Profit – SIs – Baseline
(Percent of total assets)

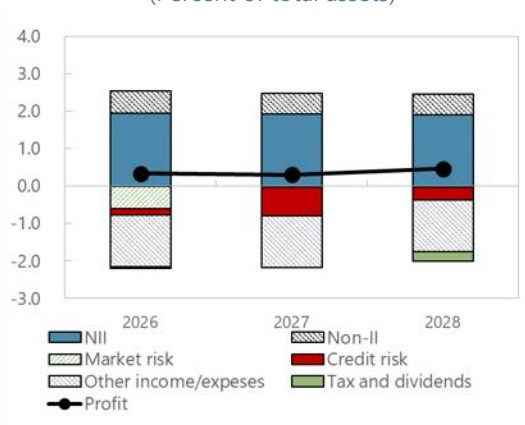


Appendix V. Figure 1. Portugal: Capital Ratio Drivers and Profitability—SIs (Concluded)

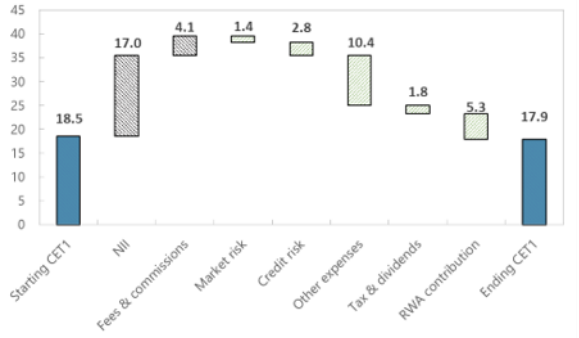
Capital Ratio – SIs – Recessionary
(Percent of 2025 RWA, except of Ending CET1)



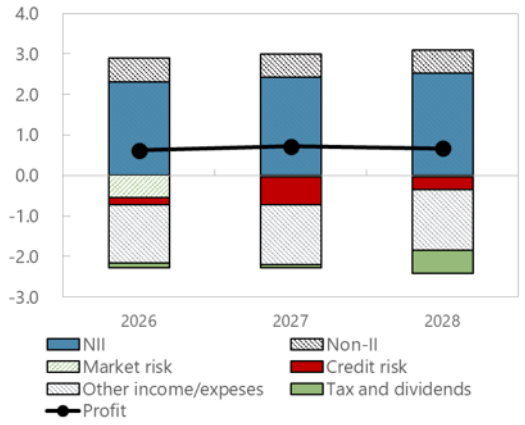
Contribution to Profit – SIs - Recessionary
(Percent of total assets)



Capital Ratio – SIs - Geopolitical
(Percent of 2025 RWA, except of Ending CET1)



Contribution to Profit – SIs - Geopolitical
(Percent of total assets)



Source: IMF Staff calculations.

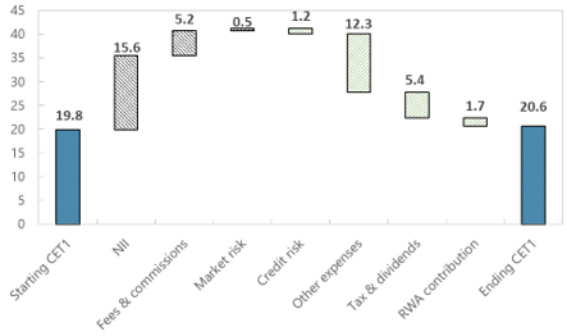
Detailed Results: LSIs

3. In the baseline, LSIs enjoy large NII and healthy fee generation with moderate credit-loss charges (Appendix V Figure 2). Large income streams are partly offset by operating costs, taxes, and dividends, while gradual growth in RWA reduces the ratio at the end. The overall effect is an increase of 100 bps of capital buffers over the three-year period.

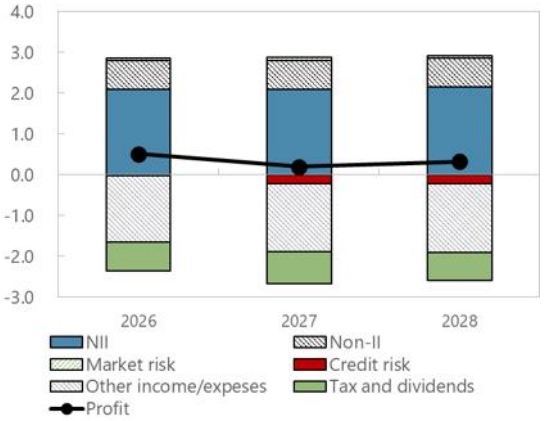
4. Under adverse conditions, capital ratio dynamics are mainly driven by changes of the NII, and credit risk losses (Appendix V Figure 2). In the recessionary scenario, NII is compressed, but are enough to cover for credit and market losses, with the resulting CET1 ratio ending at about the same level as the starting point. In the geopolitical scenario, revenues grow significantly, losses from credit-risk are lower and other expenses increase, pushing the CET1 capital ratio up by about 80 bps. LSIs enjoy a stronger NII compared to SIs and lower credit and market risk losses, allowing them to post higher capital ratios than the SIs.

Appendix V. Figure 2. Portugal: Capital Ratio Drivers and Profitability—LSIs

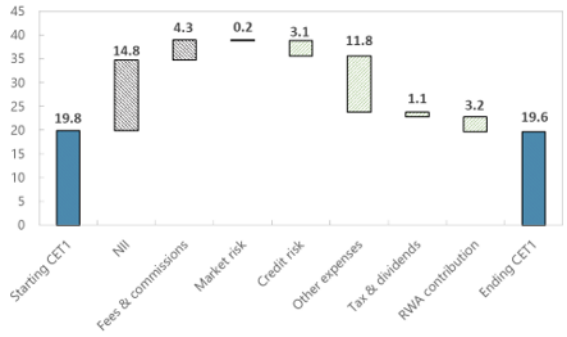
Capital Ratio – LSIs – Baseline
(Percent of 2025 RWA, except of Ending CET1)



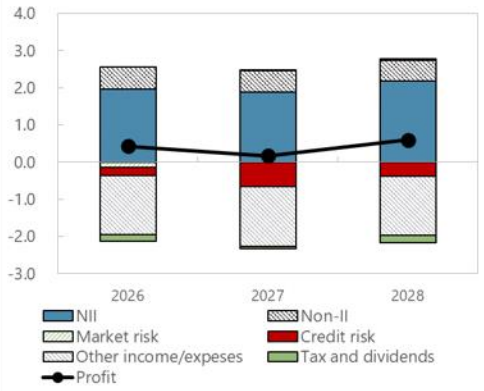
Contribution to Profit – LSIs – Baseline
(Percent of total assets)



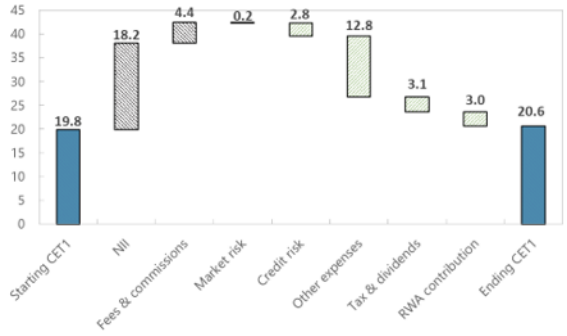
Capital Ratio – LSIs – Recessionary
(Percent of 2025 RWA, except of Ending CET1)



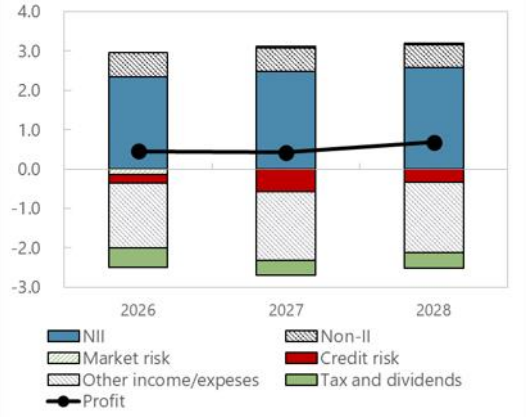
Contribution to Profit – LSIs - Recessionary
(Percent of total assets)



Capital Ratio – LSIs - Geopolitical
(Percent of 2025 RWA, except of Ending CET1)



Contribution to Profit – SIs - Geopolitical
(Percent of total assets)



Source: IMF Staff calculations.

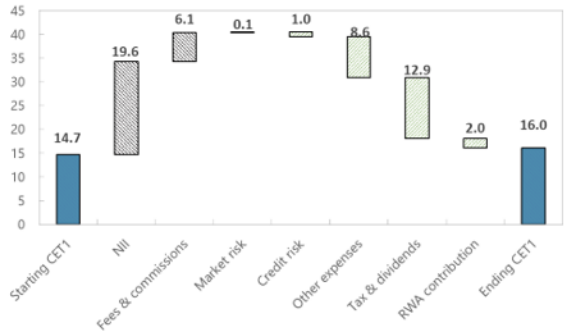
Detailed Results: Foreign Subsidiaries

5. In the baseline, Foreign Subsidiaries enjoy large NII and healthy fee generation with moderate credit-loss charges (Appendix V Figure 3). Large income streams are partly offset by operating costs, taxes, and dividends, while gradual growth in RWA reduces the ratio at the end. The overall effect is an increase of 130 bps of capital buffers over the three-year period.

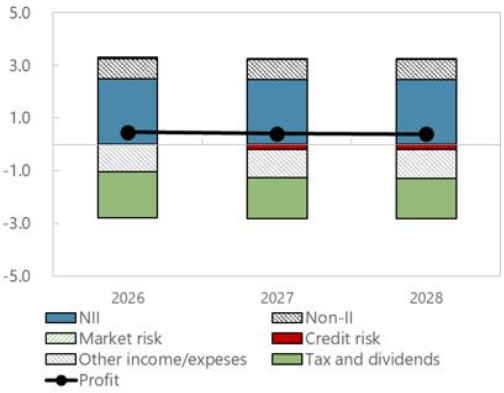
6. Under adverse conditions, capital ratio dynamics are mainly driven by changes of the NII, and credit risk losses (Appendix V Figure 3). In the recessionary scenario, NII is compressed, but are enough to cover for credit and market losses, with the resulting CET1 ratio ending at about the same level as the starting point. In the geopolitical scenario, revenues grow significantly and more than compensate losses from credit-risk which increase slightly due to RWAs and other expenses increase, pushing the CET1 capital ratio up by about 190 bps. Overall, Foreign subsidiaries display the lowest starting level of CET1 ratio but are able to generate more income over the horizon of the scenarios than SIs and LSIs.

Appendix V. Figure 3. Portugal: Capital Ratio Drivers and Profitability—Foreign Subs

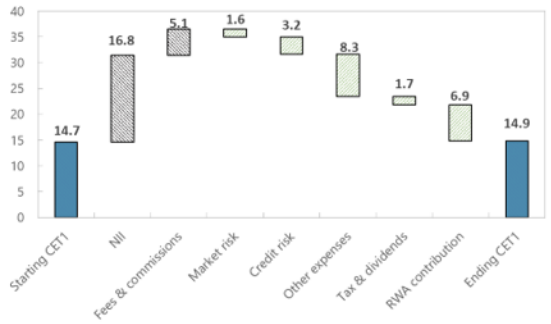
Capital Ratio – Foreign Subs - Baseine
(Percent of 2025 RWA, except of Ending CET1)



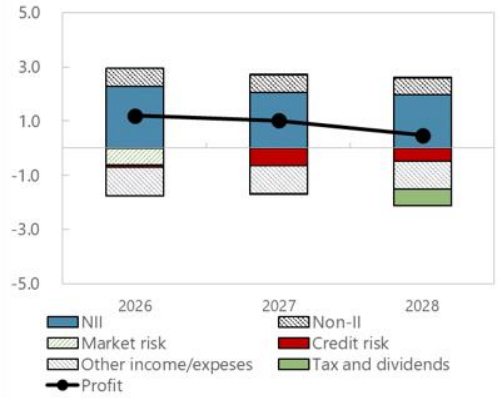
Contribution to Profit – Foreign Subs - Baseline
(Percent of total assets)



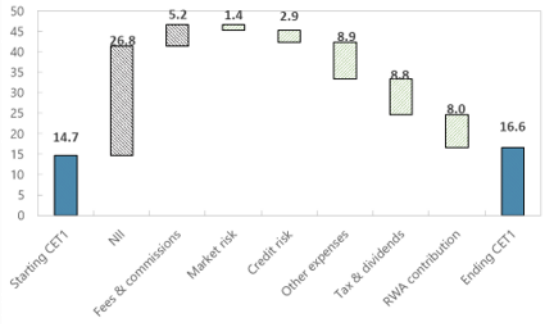
Capital Ratio – Foreign Subs - Recessionary
(Percent of 2025 RWA, except of Ending CET1)



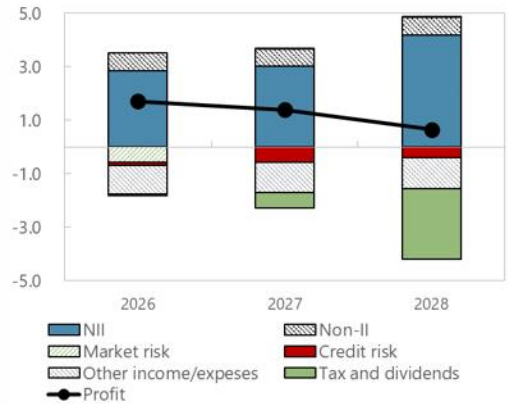
Contribution to Profit – Foreign Subs – Foreign Subs Recessionary
(Percent of total assets)



Capital Ratio – Foreign Subs - Geopolitical
(Percent of 2025 RWA, except of Ending CET1)



Contribution to Profit – Foreign Subs – Foreign Subs Geopolitical
(Percent of total assets)



Source: IMF Staff calculations.

Appendix VI. Liquidity Stress Test Scenario Specifications

This appendix presents a description of the cash flow stress scenarios and assumptions, including the scenario parameters that are applied uniformly for each maturity bucket.

1. The stress scenarios were aligned with macro scenarios from solvency stress tests, using similar narratives and tailoring cash flow rates and haircuts. The cash flow analysis runs three scenarios that apply uniform shocks to outflows, inflows, and CBC across all maturity buckets. The first scenario is a general risk aversion shock, representing a mild tightening of funding conditions typically associated with shifts in investor sentiment. The second scenario is a market sovereign distress shock, reflecting larger haircuts and a severe drawdown of liquidity facilities. Finally, scenario 3 represents an idiosyncratic funding shock that leads to severe deposit withdrawals across all funding sources. While the key deposit outflow parameters are prudently conservative, the assumed run-off rates are less severe compared to ECB's 2019 liquidity stress test (LiST) (Table 1). However, the assumption that the open-maturity deposits mature overnight represents a more conservative approach that implies a higher degree of immediate severity in the scenarios.

Appendix VI. Table 1. Portugal: Deposit Run-off Rates (ECB vis-à-vis EA and PT FSAP)

Key Deposit Items	ECB 2019 LiST	EA and PT FSAP
Term deposits (commercial/NFC)	27-76%	25-76%
Sight deposits (stable/commercial/NFC)	18-74%	5-49%
Sight deposits (financial counterparts)	100%	100%

2. Key assumptions underpinning the scenarios include the following:

(i) **Constant interest rate.** The stress test is run under this assumption, meaning that banks' defense mechanism is removed in the model (that is, they are not assumed to raise rates to slow down deposit outflows). By holding rates constant, the test takes a conservative approach—if banks cannot immediately offset funding pressures through pricing, the implied outflows must be higher to produce an equivalent level of stress severity.

(ii) **CBC components.** All CBC items, including non-tradable but central bank–eligible assets, are assumed to be fully monetizable either through the market or central bank facilities.

(iii) **Open maturity outflows.** The analysis assumes that outflows from open maturing items are fully reflected overnight, reflecting a conservative approach of liquidity risk from a regulatory perspective.

(iv) **Contractual maturity outflows.** The run-off rates are the same across time buckets, in line with the EA and other FSAP methodologies.

(v) **Inflows.** The roll-over assumptions for inflows follow the EA FSAP framework. All inflows are recognized at 100 percent except those from loans to households, NFCs, and other borrowers, which were set at 2-3 percent reflecting banks' limited ability to accelerate repayments and their incentive to preserve franchise value by avoiding actions that could undermine long-term borrower relationships.

3. The different run-off rates, roll-off rates, and haircuts applied across outflows, inflows, and counterbalancing capacity are shown in Table 2 below.

Appendix VI. Table 2. Portugal: Detailed Cash Flow Stress Test Parameters
(In percent)

Description	Scenario 1 (General risk aversion)	Scenario 2 (Market sovereign distress)	Scenario 3 (Idiosyncratic funding)
Outflows			
Unsecured bonds due	50	100	50
Regulated covered bonds	50	100	50
Securitizations due	50	100	50
Other liabilities from issued securities	50	100	50
Secured lending-- Level 1 central bank	100	100	100
Secured lending--Level 1 (CQS 1)	100	100	100
Secured lending--Level 1 (CQS2, CQS3)	100	100	100
Secured lending--Level 1 (CQS4+)	100	100	100
Secured lending--Level 1 covered bonds (CQS1)	100	100	100
Secured lending--Level 2A corporate bonds (CQS1)	100	100	100
Secured lending--Level 2A covered bonds (CQS1, CQS2)	100	100	100
Secured lending--Level 2A public sector (CQS1, CQS2)	100	100	100
Secured lending--Level 2B Asset Backed Securities (ABS) (CQS1)	100	100	100
Secured lending--Level 2B covered bonds (CQS1-6)	100	100	100
Secured lending--Level 2B: corporate bonds (CQ1-3)	100	100	100
Secured lending--Level 2B shares	100	100	100
Secured lending--Level 2B public sector (CQS 3-5)	100	100	100
Secured lending--other tradable assets	100	100	100
Secured lending--other assets	100	100	100
Secured lending--Level 1 tradable assets	100	100	100
Secured lending--Level 2A tradable assets	100	100	100
Secured lending--Level 2B tradable assets	100	100	100

Appendix VI. Table 2. Portugal: Detailed Cash Flow Stress Test Parameters (continued)			
Secured lending--other tradable assets	100	100	100
Secured lending--other assets	100	100	100
Stable retail deposits	5	5	8
Other retail deposits	10	10	40
Operational deposits	25	15	49
Non-operational deposits from credit institutions	100	50	100
Non-operational deposits from other financial customers	75	50	100
Non-operational deposits from central banks	0	0	0
Non-operational deposits from non-financial corporates	25	25	76
Non-operational deposits from other counterparties	25	25	76
FX-swaps maturing	50	100	100
Derivatives amount payables other than those reported in 1.4	50	100	100
Other outflows	50	100	100
Inflows			
Level 1 central bank	100	100	100
Level 1 (CQS 1)	100	100	100
Level 1 (CQS2, CQS3)	100	100	100
Level 1 (CQS4+)	100	100	100
Level 1 covered bonds (CQS1)	100	100	100
Level 2A corporate bonds (CQS1)	100	100	100
Level 2A covered bonds (CQS1, CQS2)	100	100	100
Level 2A public sector (CQS1, CQS2)	100	100	100
Level 2B ABS (CQS1)	100	100	100
Level 2B covered bonds (CQS1-6)	100	100	100
Level 2B: corporate bonds (CQ1-3)	100	100	100
Level 2B shares	100	100	100
Level 2B public sector (CQS 3-5)	100	100	100
Other tradable assets	100	100	100
Other assets	100	100	100
Loans and advances granted to retail customers	2	2	2
Loans and advances granted to non-financial corporates	2	2	2
Loans and advances granted to credit institutions	100	100	100
Loans and advances granted to other financial customers	100	100	100

Appendix VI. Table 2. Portugal: Detailed Cash Flow Stress Test Parameters (concluded)			
Loans and advances granted to central banks	100	100	100
Loans and advances granted to other counterparties	3	3	3
FX-swaps maturing	100	100	100
Derivatives amount receivables	100	100	100
Paper in own portfolio maturing	100	100	100
Other inflows	100	100	100
Counterbalancing Capacity			
Coins and bank notes	100	100	100
Withdrawable central bank reserves	100	100	100
Level 1 central bank	100	100	100
Level 1 (CQS 1)	98	90	98
Level 1 (CQS2, CQS3)	95	85	95
Level 1 (CQS4+)	75	60	75
Level 1 covered bonds (CQS1)	97	90	97
Level 2A corporate bonds (CQS1)	85	80	80
Level 2A covered bonds (CQS 1, CQS2)	85	80	80
Level 2A public sector (CQS1, CQS2)	85	80	80
Level 2B ABS (CQS1)	75	60	75
Level 2B covered bonds (CQS1-6)	75	60	75
Level 2B corporate bonds (CQ1-3)	75	60	75
Level 2B shares	75	60	75
Level 2B public sector (CQS 3-5)	75	60	75
Other tradable assets-- central government (CQS1)	75	60	75
Other tradable assets-- central government (CQS 2 & 3)	75	60	75
Other tradable assets-- shares	75	60	75
Other tradable assets-- covered bonds	75	60	75
Other tradable assets-- ABS	75	60	75
Other tradable assets	75	60	75
Non tradable assets eligible for central banks	62	50	62
Own issuances eligible for central banks	62	50	62

Appendix VII. Private-Sector Balance Sheet Vulnerabilities Specifications

This appendix explains additional technical details of the methodological approach used in the analyses conducted on household sector, corporate sector and real estate market.

Household Vulnerability Analysis

1. The analysis employs a microdata-driven approach using the 2021 (latest) Household Finance and Consumption Survey (HFCS) for Portugal and other EA countries. The survey includes 83,000 households and 200,000 personal files across 22 countries (20 EA countries, Czech Republic, and Hungary). The number of Households' balance sheets, incomes, and expenditures are "aged" to end-2024 to reflect recent economic conditions.[1]This granular framework simulates macro-financial shocks (interest rate increases, income declines, inflation surges, commodity price shocks) and evaluates their transmission to household finances. The simulation draws on macrofinancial projections from the FSAP scenarios and incorporates Monte Carlo simulations of unemployment shocks at the individual level, accounting for employment status and contract type. Unemployment benefits (in terms of workers' pre-unemployment base wage and duration of benefits) are factored in at the income quartile using Portugal Social Security microdata. All employed borrowers are subject to random unemployment shocks aligned with projected aggregate unemployment paths. Fixed-term contract holders are more likely to face unemployment than those with permanent contracts, with the relative likelihood estimated using Portugal Labor Force survey.

2. To link household stress with bank credit risk, the analysis maps household financials to loan performance using logistic regressions. Key stress indicators are defined to gauge household vulnerability. The conventional debt-service-to-income (DSTI) ratio is augmented for cost of living, yielding a "DSECTI" ratio—Debt Service plus Essential Consumption to Income. This metric includes mortgage payments, rents, and essential expenses (food, energy), capturing the squeeze from higher prices and rates. Using logistic regressions on microdata, the analysis finds that a 70 percent DSECTI is a critical threshold: when essential payments and debt obligations exceed 70 percent of disposable income, the probability of default rises sharply. This "overburden" benchmark (significantly above the traditional 40 percent DSTI rule) best discriminates distressed borrowers in the current high-inflation environment. Households breaching this threshold are deemed vulnerable. In Portugal, the likelihood of falling into arrears roughly doubles (from 4.5 percent to 9.2 percent) once a household becomes overburdened. Additionally, a household is flagged as a "stretched consumer" if essential expenses plus debt service exceed income—implying that any non-essential consumption must be curtailed.

3. The analysis is applied to a range of scenarios. The study considers the July 2025 baseline (WEO projections) and several adverse scenarios, including the FSAP "geopolitical" scenario (an

[1] While the HFCS provides a detailed look at the rich heterogeneity in household finances, it has a 3–5-year production lag. To have a timely measure of households' financial data as of 2024, we combine this dataset with aggregate data from national statistics, OECD, and Eurostat following a similar approach to Krimmel et al (2013), Ampudia et al (2016), and Valderrama et al (2023). Each household financial is updated each year by applying estimated changes in interest rates, wages, consumer prices, rents, unemployment, and commodity prices.

escalation of geopolitical tensions causing higher interest rates and commodity prices), the "recessionary scenario" (a synchronized global slowdown, amplified by sovereign debt distress and political uncertainty, triggering sovereign rating downgrades) and a range of sensitivity scenarios including a "cost-of-living" scenario (combined 200 bps interest rate increase, and a 20 percent rise in food and energy prices relative to baseline). These shocks are applied over the stress test horizon (2026–2028). Household-level financial indicators under each scenario—particularly the DSECTI ratio—are computed, and the share of households crossing the 70 percent stress threshold is projected.

4. Using these estimates, the model projects the migration of banks' loan exposures across IFRS 9 stages. The analysis estimates how household shocks lead to migration of exposures from Stage 1 to Stages 2 and 3, with corresponding increases in bank provisions. We broadly match the IFRS9 stages with individual household balance sheet metrics in the following manner: (i) Stage 1: Households not in arrears and not struggling (cost-adjusted-debt service-to-income ratio below 70 percent); (ii) Stage 2: Households struggling (cost-adjusted-debt service-to-income ratio above 70 percent, but not on arrears); and (iii) Stage 3: Households in arrears, irrespective of their financial ratios.[2] This allows an estimation of increased provisions and expected credit losses for banks under each scenario. The methodology thus integrates household vulnerability analysis with bank stress testing: rising household stress (from higher rates and living costs) feeds into higher probabilities of default on loans, more loans moving into Stage 2/3, and ultimately higher credit loss projections.

Corporate Sector Vulnerability Analysis

5. The data for the dynamic analysis comprises of a panel of 40 sector-size combinations over 2006-24. The sources of the data are the Portuguese Central Balance Sheet Database (CBSD) and Central Credit Register managed by Bank of Portugal. The 10 sectors are: (A) Agriculture, forestry, and fishing; (B+C) Manufacturing; (D+E) Electricity, gas, and water; (F+L) Construction and real estate activities; (G) Trade and repair of vehicles; (H) Transport and Storage; (I) Accommodation and food service activities; (J) Information and communication; (M-70100+N) Professional and administrative activities; (P+Q+R+S) Education, health and other activities. The 4 size categories are (1) Micro; (2) Small; (3) Medium; (4) Large, defined consistent with the methodology of the European Commission. For each variable, the mean in each of the 40 categories is used in the analysis, implying that variation with a category is not considered.

6. As a first step for dynamic analysis, panel regressions are used to estimate profitability, sales growth, and leverage. Specifically, the following fixed-effects model is used:

$$Y_{i,t} = \alpha \cdot Y_{i,t-1} + \beta \cdot \{Firm\}_{i,t-1} + \gamma \cdot \{Macro\}_t + d_s + \pi_z + \nu_{i,s,z,t} ,$$

where $Y_{i,t}$ is profitability (return on assets), leverage (ratio of total debt to total assets), and year-on-year sales growth, $\{Firm\}_{i,t-1}$ includes structural firm characteristics of asset tangibility (ratio of fixed assets to total assets) and cash flow generation capacity (ratio of sales to total assets), $\{Macro\}_t$

[2] Banks classify exposures into three stages based on expected credit losses (ECL): Stage 1 (performing), Stage 2 (significant increase in credit risk since origination), and Stage 3 (non-performing). Our approach is conservative, as some banks use arrears exceeding 90 days as a proxy for Stage 3 loans, rather than classifying exposures as Stage 3 based on arrears regardless of their duration.

includes annual real GDP growth and unemployment rates and a dummy variable for covid, d_s and π_z denote sector and size fixed effects respectively, and $\nu_{i,s,z,t}$ is the error term, clustered to account for within-group correlation. $Y_{i,t}$ is predicted recursively for three scenarios that differ by real GDP growth and unemployment paths for 2026-28.[3] Structural firm characteristics of fixed assets to total assets, sales to total assets, as well as the estimated sector and size fixed effects are assumed to stay constant at their 2024 levels in all scenarios.

7. Other key financial indicators are derived from accounting identities. The effective interest rate (ratio of interest payments to total debt in the previous period) is predicted using the scenario paths of long-term and short-term interest rates as follows:

$$EIR_{i,t} = EIR_{i,t-1} + \left[\frac{LTD}{TD}_{i,2024} \cdot \Delta LTI_t + \ (1 - \frac{LTD}{TD})_{i,2024} \cdot \Delta STI_t\right],$$

where ΔLTI_t and ΔSTI_t are the changes of long-term and short-term interest rates respectively from their 2024 levels in year t under each scenario. The ratio of long-term debt to total debt, $LTD\ /\ TD$, is assumed to stay constant at its 2024 level for the projection horizon. The following approximation:

$$EBIT_{i,t} \approx ROA_{i,t} \cdot TA_{i,t-1}\ ,$$

allows to predict interest coverage ratio as:

$$ICR_{i,t} = \frac{EBIT_{i,t}}{Interest\ Expense_{i,t}} \approx \frac{ROA_{i,t}}{\left[(^{TD}/_{TA})_{i,t-1} \cdot\ EIR_{i,t}\right]}$$

8. Probability of default is estimated as a function of both firm-specific and macroeconomic factors. A zero-inflated beta regression model is used, which allows to treat zero and non-zero default as driven by separate processes. Specifically,

$$PD_{i,t} = \alpha\ D\_ICR_{i,t} * \left(\frac{TD}{TA}\right)_{i,t-1} + \beta \left(\frac{TD}{TA}\right)_{i,t-1} + \gamma(Real\ growth_t) + \tau(Unemployment_t) + \pi(Covid_t)$$
$$+ \omega(Covid_t) * (Real\ growth_t) + \delta_s + \ \mu_z + \varepsilon_{i,s,z,t}\ , if\ PD_{i,t} > 0,$$

$$PD_{i,t} = \theta\ ROA_{i,t} + \rho \left(\frac{TD}{TA}\right)_{i,t-1} + \sigma(Covid_t) + \delta_s + \ \mu_z + \varepsilon_{i,s,z,t}\ \ , if\ PD_{i,t} = 0,$$

where $PD_{i,t}$ is the probability of default in category i in year t (a continuous variable bound between 0 and 1) and $D\_ICR_{i,t}$ is a dummy variable that equals one when the ICR ratio falls below 1. The interaction term between leverage and the ICR dummy captures the nonlinear relationship between leverage and probability of default, as default tends to be more likely when higher leverage coincides with low capacity to service debt. The interaction term between GDP growth and the covid dummy is meant to capture the effects of policy support measures during covid that temporarily reversed the

[3] As the data end in 2024, values for 2025 are predicted as in the baseline scenario.

relationship between growth and default. As opposed to non-zero probability of default, for zero defaults profitability appears an important factor. Sector and size fixed effects are also significant.

9. For the static sensitivity analysis, firm level data are used, covering the same economic sectors as in the dynamic analysis. To exclude firms with little or no economic significance, firms with no employees and/or no assets and/or no sales and/or no interest payments were dropped from the sample The resulting sample covers 42 percent of all firms, 81 percent of employees, 70 percent of assets, 85 percent of sales, and 70 percent of total debt. An important caveat is that the analysis treats all firms as separate entities and doesn't consider the fact that some firms may be part of the same economic group. This implies that, for example, intragroup financing is treated as equivalent to other types of financing.

10. To assess firms' sensitivity, the impact of shocks to sales and interest rates on firms' interest coverage ratio and cash position is considered. The cash impact of sales shock and the post-shock interest expense are calculated as:

$$Cash\ impact\ of\ sales\ shock = x\% \cdot [Net\ sales\ - y\% \cdot (COGS + SES) - z\% \cdot Wages],$$

$$Interest\ Expense_{post\ shock} = Interest\ Expense_{pre\ shock} * (1 + ie\%),$$

where x is the share of sales lost and ie is the change in the effective interest rate in adverse scenarios, while y and z are the share of wage and other productions costs that firms adjust in response to the shocks. The shocks x and ie are calibrated as sectoral bank debt-weighted averages of the peak annual impacts under each scenario estimated in the dynamic analysis (Figure A1). The behavioral responses are calibrated based on earlier analysis conducted by Bank of Portugal as $y = 95\%$ and $z = 60\%$.[4] The post-shock interest coverage ratio, cash balance, and equity are calculated as:

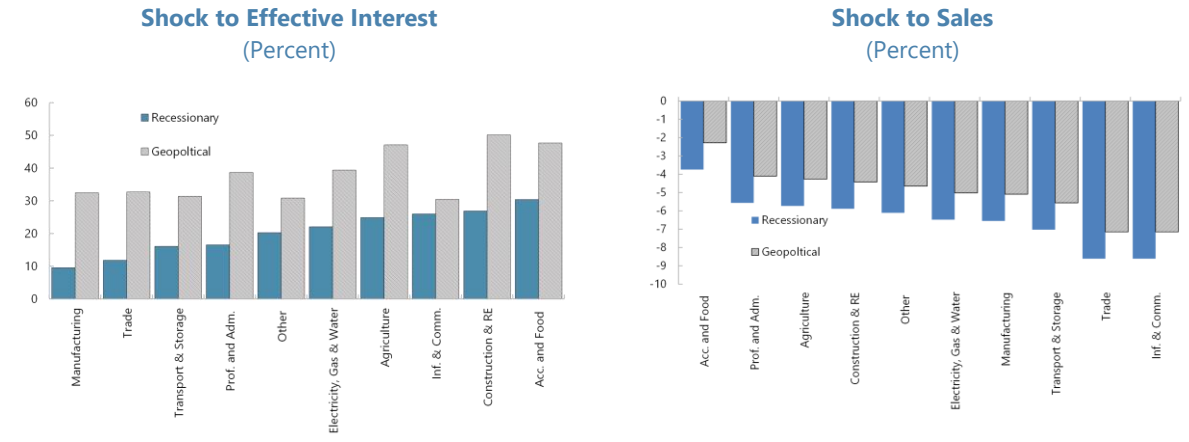
$$ICR = \frac{EBIT_{pre\ shock} - Cash\ impact\ of\ sales\ shock}{Interest\ Expense_{post\ shock}},$$

$$Cash\ Balance_{post\ shock} = Cash\ Balance\ _{pre\ shock} + EBIT_{pre\ shock} - Cash\ impact\ of\ sales\ shock\ - Interest\ expense_{post\ shock},$$

where it is assumed that firms do not take any additional action to alleviate the stress on their cash position, such as obtaining new financing or retaining more earnings.

[4] See Marques et al. (2022).

Appendix VII. Figure 1. Portugal: Calibration of Shocks



Source: IMF Staff calculations.

Real Estate Market Analysis

11. To assess the long-term relationship between house prices and income, two alternative models are tested. Table 1 reports the results of OLS regressions of real house price index (deflated by CPI) on real GNDI per household and real GDP per household (in logs).[5] Using the "per household," rather than the more standard "per capita" income measure has the advantage of directly capturing the impact of declining household size, which implies more housing units needed for a given population.[6] Both models show a significant correlation, with the GNDI model having higher explanatory power. In addition, statistical tests confirm that real house prices are cointegrated with real GNDI per household, but not with real GDP per household, implying that model (2) is preferred for estimating the error correction process in the short-term. The results suggest that real house prices are currently about 21 percent higher than predicted by real GNDI per household and by almost 50 percent higher than predicted by real GDP per household.

Appendix VII. Table 1. Portugal: Real House Prices Over the Long Term

	(1)	(2)
Real GDP per household	3.080***	
Real GNDI per household		2.738***
Covid	0.400***	0.198***
Obs	82	82
R-squared	0.54	0.83

* p<0.10, ** p<0.05, *** p<0.01

12. To estimate the short-term drivers of house prices, real house price growth is regressed on the residual from the long run regression and other short-term factors. The models include

[5] Because of a structural break in the measurement of number of households during 2020-22, these data points have been replaced by a linear interpolation. For 2025Q1-Q2, the number of households is projected using the year-on-year growth rate in 2024.

[6] While these housing units may be smaller and therefore less expensive on the margin, this effect should be largely accounted for due to the "constant quality" approach in the calculation of the Housing Price Index.

the lagged unemployment rate (as a proxy for fluctuations of aggregate demand), a proxy for foreign demand for real estate in Portugal (ratio of FDI in the real estate sector to GDP, moving average over 3 periods to reduce volatility), a measure of financial conditions (the first principal component of several financial variables relevant for house prices as described Table 2), and a dummy variable set to 1 starting 2024Q3 to capture the measures introduced by the government to support young homebuyers.[7]

Appendix VII. Table 2. Portugal: Measure of Financial Tightness

*Variable**	*Explanation*	*Loading*
ECB policy rate	ECB deposit facility rate, percent	(+)
Short-term spread	Difference between 3-month Euribor and ECB deposit rate, percent	(+)
Long-term spread	Difference between Euro Area 10-year government bond yield and 3-month Euribor, percent	(-)
Household deposit rate	Interest rate on new household deposits of matuturity less than 1 year, percent	(+)
NFC deposit rate	Interest rate on new NFC deposits of matuturity less than 1 year, percent	(+)
Mortgage loan rate	Interest rate on new loans to households for house purchase	(+)

**All variables are standadized for the PCA*

13. Model results suggest inconsistent adjustment to long-term equilibrium and a strong role for foreign demand and financial conditions in driving house price growth. The coefficient of the lagged residual from the long-term regression has the expected negative sign in models (1) and (2) but it is not consistently significant, and excluding it doesn't meaningfully diminish the explanatory power of the model (Table 3).[8] As expected, a higher unemployment rate is associated with lower price growth, although in the model with residual from the house price regression on real GNDI per household the coefficient of unemployment loses its significance likely because of combination of structural and cyclical effects of real income and unemployment. Keeping everything else constant and increasing the unemployment rate to 10 percent (as compared to about 6 currently) leads to 3 percentage points lower real house price growth. A reduction of real estate FDI to GDP ratio by 0.1 percentage points (equivalent to one standard deviation over the post-pandemic period) reduces real house price growth rate by 7 percentage points, while tightening of financial conditions by 1 standard deviation (over the entire sample) reduces real house price growth by 4 percentage

Appendix VII. Table 3. Portugal: Short Term Determinants of Real House Price Growth

	(1)	(2)	(3)
Error correction			
Model with GNDI	-0.168***		
Model with GDP		-0.068	
Lagged unemployment	-0.001	-0.002*	-0.003**
Financial tightness	-0.022***	-0.021***	-0.020***
FDI in real estate	0.085***	0.075***	0.058***
Policy	0.076***	0.078***	0.065***
Obs	81	81	90
R-squared	0.836	0.797	0.811

* p<0.10, ** p<0.05, *** p<0.01

[7] The measures target first time homebuyers under 35 years old and include (i) a public guarantee up to 15% of the price which makes it possible to obtain financing at 100% of the value of the transaction, (ii) exemption from the municipal tax and stamp duty on the purchase of own permanent residence.

[8] Model (1) implies that reducing the deviation of house price level from equilibrium by half would reduce real house price growth by about 1.6 percentage points.

points. While a crude proxy, the positive and significant coefficient of the policy dummy variable suggests that the introduction of the measures was associated with higher house price growth.

14. To explore the reasons behind persistent deviations of house prices from equilibrium levels predicted by income, determinants of housing supply are considered. Table 4 reports the results of instrumental variables regressions of sales growth of houses estimated as a function of house price growth, number of local accommodation licenses issued over the past year, and the ratio of new housing construction cost index to CPI over the past two years. To control for endogeneity, house price growth variables are instrumented with lagged growth of GNDI per household and the lagged ratio of FDI in real estate to GDP. For new houses, the estimated price elasticity is lower, and the overall fit of the model is poorer. Notably, while higher construction costs in recent years have likely contributed to lower supply, the coefficient estimated over the entire sample is not significant for new house sales. On the other hand, the negative and significant coefficient of touristic licenses implies that use of accommodation for short-term rentals has reduced the supply of houses available for sale. The policy dummy for measures introduced by the government is not significant, suggesting that the measures have not necessarily led to additional house purchases.

Appendix VII. Table 4. Portugal: Factors affecting House Sales Growth

	All houses	Exising houses	New houses
House price growth 1/	0.222***		
Exising house price growth 1/		0.246***	
New house price growth 1/			0.211***
Touristic licesnes	-0.121***	-0.125***	-0.060
Construction cost	-0.027	-0.047**	0.031
Covid	-0.255***	-0.243***	-0.179*
Policy	-0.116	0.063	-0.151
Obs	62	62	62
R-squared	0.496	0.527	0.384
Cragg-Donald F	31.960	34.470	22.444
Anderson LM	33.325	34.487	27.862
Sargan p	0.940	0.657	0.643

* p<0.10, ** p<0.05, *** p<0.01
1/ Instruments for house price growth: lagged GNDI per household growth, lagged FDI in real estate to GDP ratio.

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