EUROPEAN CENTRAL BANK

EUROSYSTEM

2025 MaSTER

Macroprudential Stress Test Extension Report

The views are those of the presenters and do not necessarily represent those of the ECB.

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Overview

EU-wide stress test results are **expanded to assess banks' resilience to materialisation of additional systemic risks** not considered in the EBA 2025 macro scenario and methodology

Additional risks include climate, liquidity and contagion as well as feedback effects to and from the macro-economy, and other financial sectors

Simulation exercises show how the stress test can **support macroprudential policy considerations** when setting or releasing macroprudential buffers

Novel approaches are introduced to **gauge the severity of the adverse scenario**, a key element in designing hypothetical yet plausible scenarios

Adding risks beyond those explored in the EBA stress test increases **capital depletion** marginally, supporting authorities' **cautious approach** to bank capital buffers

Contents

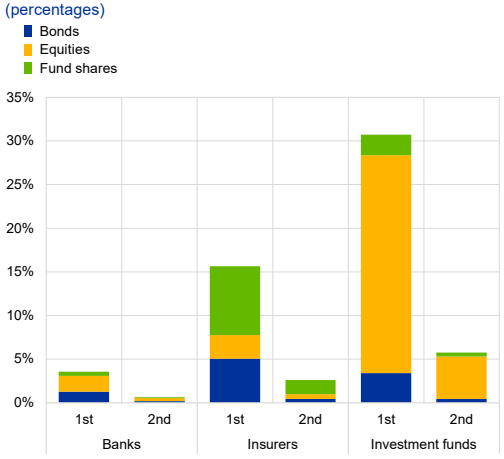
Risk identification

Prepared by: A. Abbondanza, U. Albertazzi, A. Baena, M. Caccavaio, D. Djekic, V. Gattinoni, O. Georgescu, A. Grassi, M. Kosiahn, C. Lelli, M. Losa Martín, M. Moers, P. Molitor, A. Ponte Marques, M. Sydow, M. Vincent and G. Wiersema

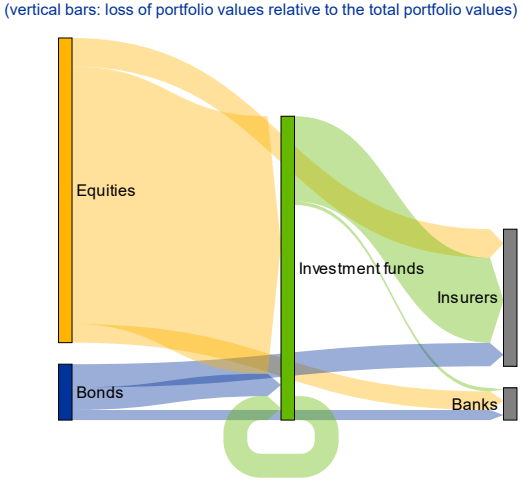
Second round effects increase bank losses by 12% with (equity) investment funds being most affected by EBA adverse market risk scenario

- Stress impacts vary across sectors, with pronounced 1st round losses and milder 2nd round effects
- Funds that predominantly invest in equities suffer majority of investors' redemptions while larger banks are somewhat more affected by 2nd round effects

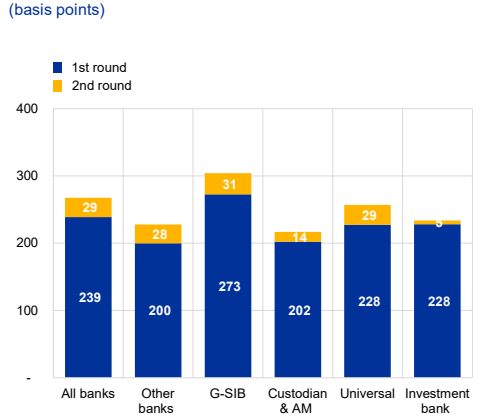
1st and 2nd round losses across sectors relative to portfolio values



Propagation of losses across the network of financial institutions



Average depletion per round by bank business model

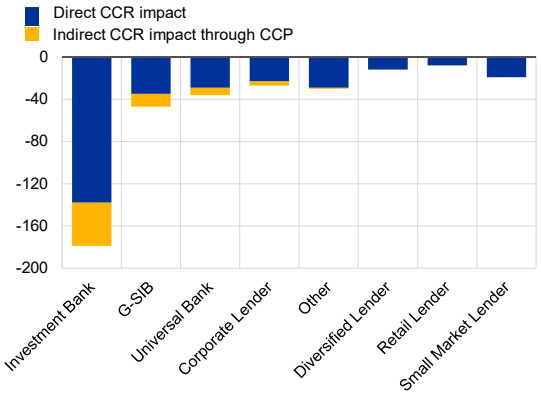


Sources: ECB calculations. 2025 EU-wide stress test data. **Notes**: LHS chart shows the relative losses in percent of portfolio value in the first and second round. Middle chart shows how the fair value losses in securities propagate across the network. The yellow, blue and green colours indicate losses due to equities, bond securities and investment fund holdings respectively.

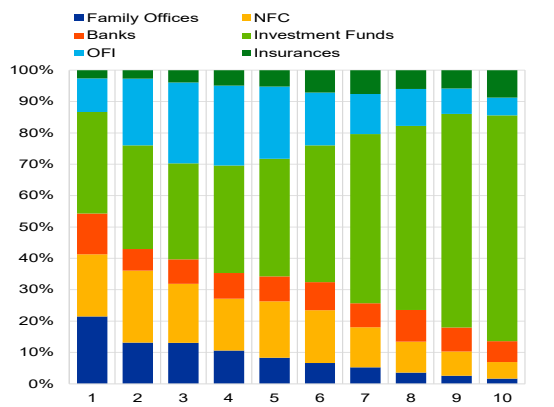
Expanding the counterparty credit risk framework beyond EBA suggests some underestimation of bank risks vis-à-vis CCPs and NBFIs

- Indirect CCR losses through banks' contribution to CCPs' default funds small on average but could amount up to ~75bps for some banks
- CCR losses that consider default correlations largest if banks are more exposed to non-banks

Impact of indirect CCR impact through CCP by business model



Loss drivers under correlated default simulations by loss decile

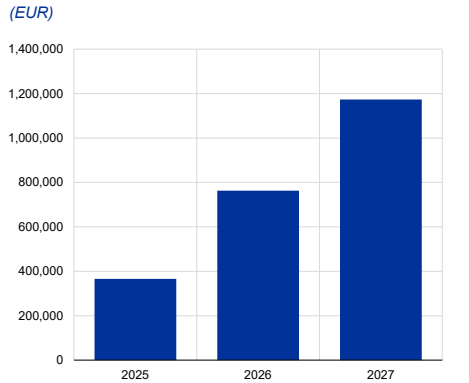


Sources: ECB calculations. 2025 EU-wide stress test data, 2024 CCP ESMA stress test data, SFTDR and EMIR reporting data and ESRB risk dashboard. **Notes**: Right chart: losses generated through simulations under historical (unstresses) correlation. The system represents the 15 banks taking part in the CCR-ES.

Banks with higher exposures to energy-intensive sectors face greater losses from transitional climate risks

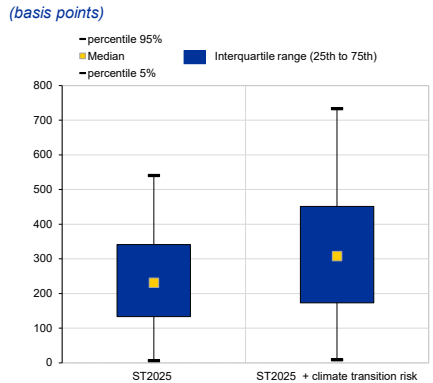
- NGFS NDC scenario implied decrease in emissions financed through green investments which affect firms' balance sheets through higher indebtedness and lower profitability
- Additional CET1 impact in the adverse scenario heterogeneous amounting to ~74 bps on average

Cumulative green investments: firm averages



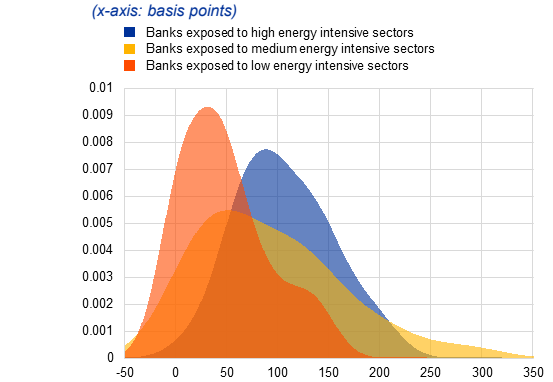
Sources: *ECB and ECB calculations.*
Notes: *Chart shows the average cumulative green investments for EU firms over the stress test horizon 2024-2027 in euros.*

NFC loan losses EBA ST with additional climate transition risk



Sources: *2025 EU-wide stress test and ECB calculations.*
Notes *Chart shows the distribution of NFC credit risk losses under the EBA adverse scenario with the additional transition risk shocks*

CET1 impact - additional NFC loan losses due to climate transition risk in the adverse scenario



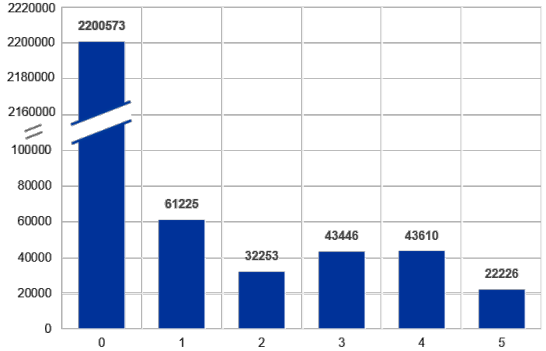
Sources: *2025 EU-wide stress test and ECB calculations.*
Notes: *Chart shows a kernel density of the distribution of the incremental loan losses for banks due to transition risk on NFCs under the EBA adverse scenario, categorized by exposure to sectors with different energy intensity*

The impact from floods on corporate loan losses is assessed by integrating macro- and local effects

- Most firms have low physical risk, but over 22,000 are in the highest-risk category (score 5) and, in affected municipalities, 6.4% firms with the highest climate risk score are assumed to be impacted
- Capital depletion rises under the combined scenarios increase by ~77 bps

Firms' distribution of exposure to physical risk

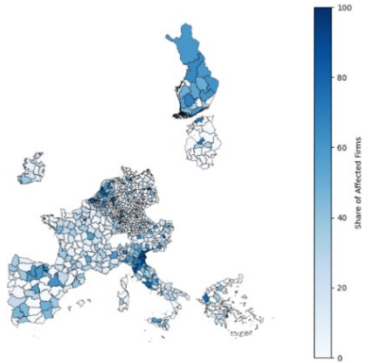
(y-axis: number of firms, x-axis: physical risk score)



Sources: *ECB calculations.*
Notes: *The histogram refers to firms reported in AnaCredit by at least one bank in the sample of the 2025EU-wide stress test in December 2024. The physical risk score refers to river flooding and is based on the Representative Concentration Pathway 4.5 scenario by the Intergovernmental Panel on Climate Change for the period 2021–2050 and is calculated at the borrower level. 0 means low risk, 5 very high risk.*

Share of affected firms by municipality

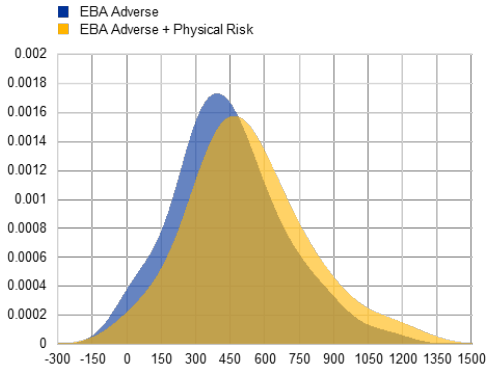
(percent)



Sources: *ECB calculations.*
Notes: *EU map of municipalities gradient colored by share of affected firms (white for low share and dark blue for highest share).*

Distribution of banks' credit risk losses under different scenarios

(basis points)



Sources: *EU wide Stress Test and ECB calculations.*
Notes: *Kernel density estimate plot visualising the distribution of impairments in basis points across banks.*

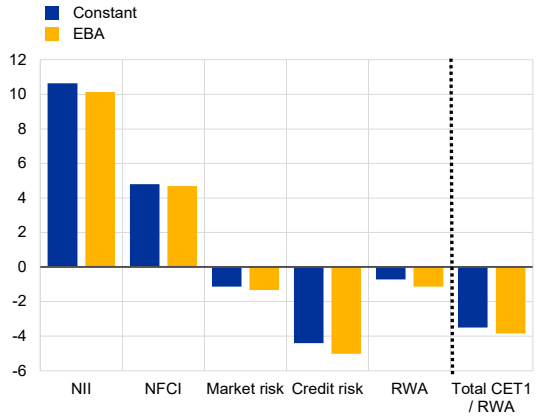
Informing policy

Prepared by: M. Caccavaio, C. Cascini, C. Couaillier, G. De Nora, I. Dimitrov, F. Faber, J. M. Figures, M. Forletta, I. Mikaliūnaitė-Jouvanceau, A. Nunes, M. Pirovano, A. Pollastri, N. Röhm and F. Shaw

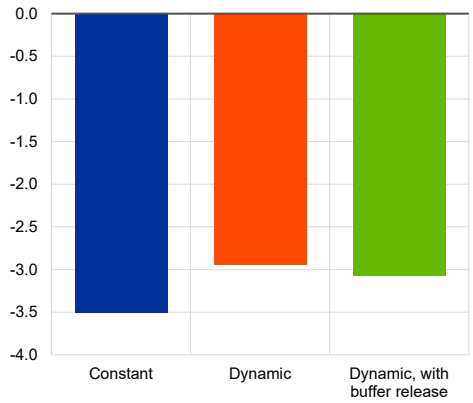
Banks' deleveraging provides slight capital relief with negative impact on GDP

- Dynamic balance sheet analysis shows that banks' deleveraging improves their CET1 ratio, but leads to lower credit supply which deepens the GDP contraction
- Releasing buffers proves effective in mitigating the crisis while preserving banks' solvency

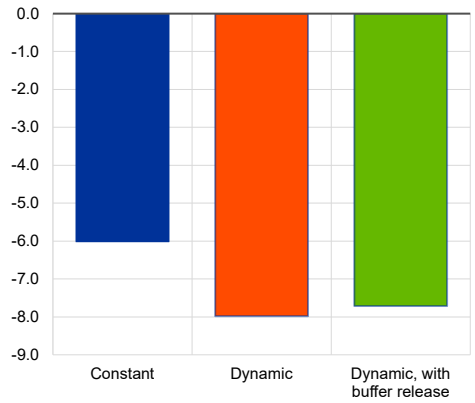
Contributions to CET1 capital ratio with constant balance sheet simulations *(percent)*



Decrease in CET1 capital ratio with constant and dynamic balance sheets *(percent)*



Impact on real GDP with constant and dynamic balance sheets *(deviation from starting point)*

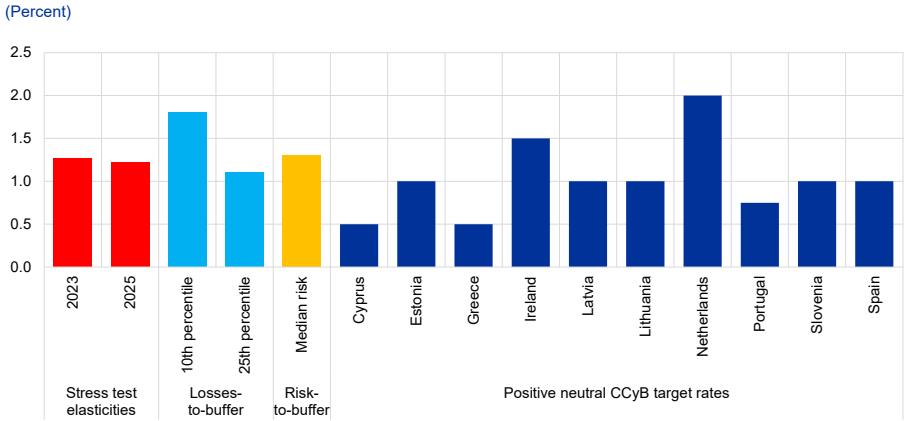


***Sources**: EU-wide Stress Test and ECB calculations. **Notes: Left:** Chart compares EU-wide stress test results with BEAST constant balance sheet simulations. **Centre and right:** the impact on CET1 ratio and real GDP is quantified using the BEAST with differing modelling and policy assumptions.*

Elasticities derived from past stress test data confirm available model-based estimates for the calibration of the target PNR CCyB

- Stress testing frequently used to inform the calibration of the target positive neutral CCyB rate
- Proposed approach relies on data from past stress tests (2018-2025)
- It uses elasticities linking stress test losses and macro variables …
- … which are combined with adverse scenarios where cyclical systemic risks are neither subdued nor elevated
- Results in line with other calibration methods and most targets announced by euro area jurisdictions

ECB model-based PN CCyB target rates for the EA aggregate and PN CCyB target rates in EA countries



***Sources**: ECB calculations, EU-wide stress tests and national notifications. **Notes**: The EU-wide stress test approach shows the average results obtained with two different scenario and two different regression specifications (including bank and business model fixed effect, respectively). Regressions are weighted by Risk Exposures Amounts. The 2023 sample includes EU-wide stress test results from the exercises conducted in 2018, 2021, and 2023, while the 2025 sample incorporates results from the exercises conducted in 2018, 2021, 2023, and 2025. The Losses-to-buffer approach (De Nora et al., 2025) suggests that a positive neutral CCyB rate of 1.8% (1.1%) would be sufficient to cover up to the 10th (25th) percentile of Return On Assets realisations. The Risk-to-buffer approach (Couaillier and Scalone (2024) and Herrera et al. (2025)) calibrates the CCyB rate in different phases of the cycle and the chart shows the suggested PN CCyB rate (1.3%) associated with a median risk level.*

Gauging scenario severity

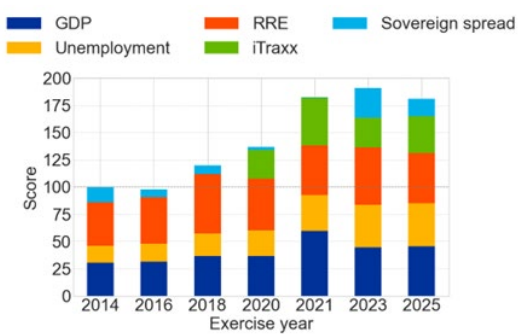
Prepared by: J. M. Figures, B. Montero Prieto, V. Scalone, L. ter Steege, J. Willem t Hooft, and C. Vallotto

Measuring scenario severity key to support stress test credibility, communication and policy use

- Scenario severity increased over time, reaching a peak in the 2023 exercise and stabilizing in 2025
- When accounting for systemic risk, 2025 scenario appears to be slightly more severe than 2023

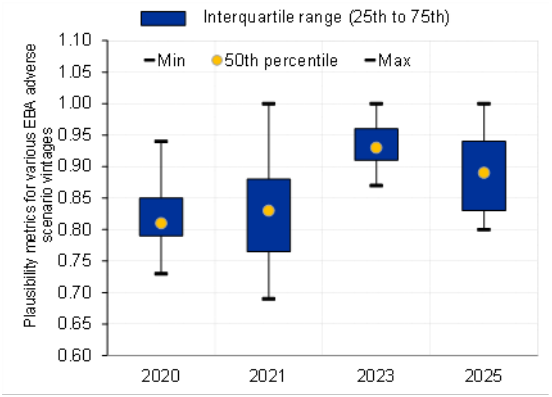
Backward looking Severity Index: Deviation from baseline score

(severity score per exercise year, EA12)



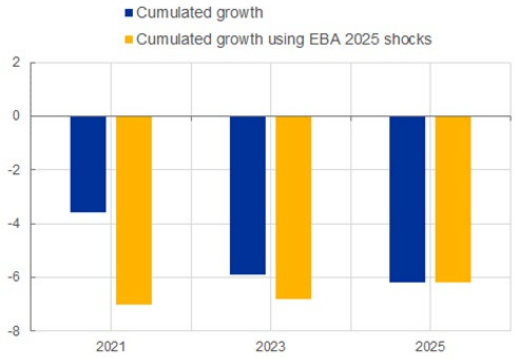
Cross-sectional distribution of the forward-looking severity index

(probability)



Severity assessment with cyclical risk correction: GDP growth across EBA scenarios

(% deviation from the starting point)



Notes: ECB calculations. Left: The deviation from baseline score reflects the maximum difference between adverse and baseline scenarios. Center: The panel shows the cross-country distribution of the posterior modes of the plausibility distributions. Right: . The panel reports the cumulative GDP growth under the EBA adverse scenarios (blue bars) for 2021, 2023 and 2025, and the corresponding cumulative growth in case the same shocks used to generate the 2025 cumulated GDP growth were applied considering risk levels of the corresponding year (yellow bars).

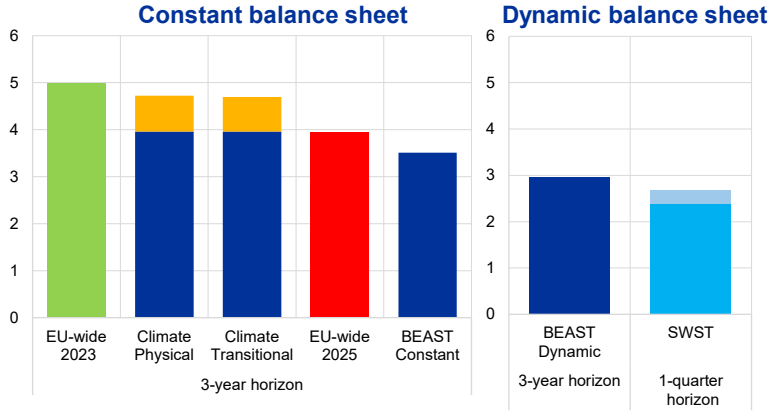
Conclusion

Prepared by: C. Rodriguez d'Acri and F. Shaw

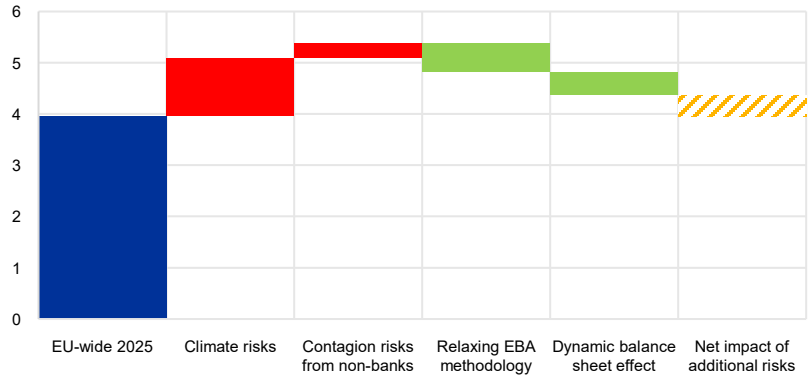
The inclusion of additional risks beyond those explored in the EBA stress test supports authorities' cautious approach to bank capital buffers

- Accounting for additional risks increases net losses, despite the relief afforded by relaxing EBA methodological constraints and balance sheet assumptions

System-level depletion across different stress test extensions (percent, CET1 ratio depletion)



Impact of stress test simulations in addition to EU-wide exercise (percent, CET1 ratio depletion)



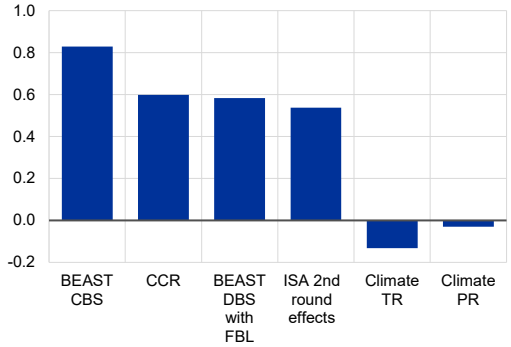
__Sources__: ECB calculations. 2025 EU-wide stress test data. __Notes__ Depletion is expressed as CET1 transitional ratio depletion. __Left:__ Simulation results are presented for constant and dynamic balance sheet approaches separately, with the stress horizon specified at the bottom. "Climate transitional" and "Climate physical" losses can be considered as additional risks and are presented as additive to the EBA stress test depletion (yellow bars). For the BEAST simulations, the constant balance sheet exercise removes a number of EBA methodological assumptions, while the BEAST dynamic simulation allows banks to deleverage and derisk. For the system wide stress test losses, first and second round effects are separately identified (turquoise and light turquoise bars). __Right:__ Physical and transition risks are presented jointly by taking the maximum depletion from each module for each bank. Only the second round SWST losses that capture contagion risks from NBFIs are presented. Finally, only the differences between the EBA results and the BEAST constant and dynamic balance sheet simulations are included.

Incorporating new risks, such as climate, brings additional information to the EU-wide stress test

- Larger banks, on average, more affected under macroprudential extension exercises
- Including additional climate risks results in more banks breaching the MDA threshold than in the EU-wide stress test, while relaxing methodological constraints reduces this number

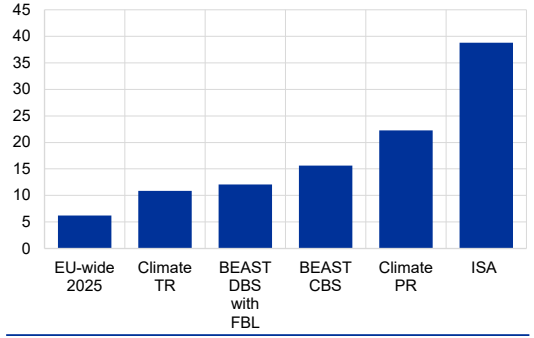
Correlations between macroprudential and 2025 EU-wide exercises

(y-axis: Correlation coefficient)



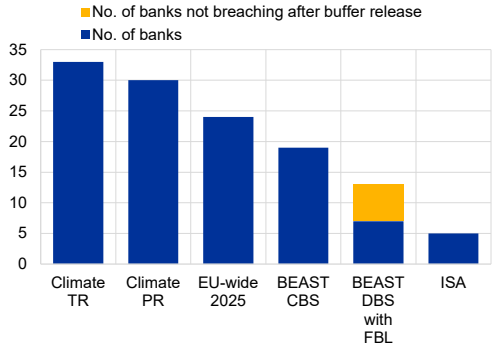
Share of system-level REA for banks in the bottom 20th percentile tail

(y-axis: percent)



Number of banks that breach the MDA threshold

(y-axis: Number)



Sources: ECB calculations. 2025 EU-wide stress test data. **Notes**: LHS: "CCR" only considers 15 entities in the analysis. "Climate TR" and "Climate PR" consider only the climate related depletion. "ISA 2nd round effects" depletion relates only to the 2nd round effect component. Center: Share is calculated as the sum of REA for banks in the 20th percentile tail divided by total system REA. RHS: Climate TR and PR considers losses on top of EU-wide losses for MDA analysis.

Conclusion

- The EU-wide stress test provides inputs for broader, macroprudential, stress tests, which allow for a more nuanced assessment of financial stability risks
- 2025 Macroprudential Stress Test extensions show that **euro area banks are resilient to a variety of risks but that pockets of vulnerabilities exist**
- Looking ahead, **EU-wide stress tests hold significant potential to inform macroprudential policy**, in addition to their current microprudential use

2025 MaSTER

- **Article 1**: “Beyond the single bank: macroprudential insights from the 2025 EU-wide stress test” (C. Rodriguez d´Acri and F. Shaw)
- **Article 2**: “Simulating dynamic balance sheet reactions and macroprudential policy using the 2025 EU-wide stress test” (C. Couaillier, I. Dimitrov, F. Faber, M.Forletta, I. Mikaliūnaitė-Jouvanceau, A. Nunes, A. Pollastri, N. Röhm)
  - **Box 2.1**: “BEAST, the top-down stress test modelling framework of the ECB” (C. Couaillier, I. Dimitrov, F. Faber, M.Forletta, I. Mikaliūnaitė-Jouvanceau, A. Nunes, A. Pollastri, N. Röhm)
- **Article 3**: “Integrating contagion risk into the 2025 EU-wide stress test: a system-wide analysis with amplification effects between banks and NBFIs” (A. Grassi, M. Kosiahn, C. Lelli, M. Losa Martín, M. Moers, M. Sydow, M. Vincent, G. Wiersema)
  - **Box 3.1**: “Adding Central Counterparty Clearing-induced counterparty credit risk to the 2025 EU-wide stress test” (A. Baena and P. Molitor)
  - **Box 3.2**: “Revisiting bank counterparty credit risk when defaults are not independent” (A. Grassi and A. Baena)
- **Article 4:** “Integrating climate risk into the 2025 EU-wide stress test: the effects of climate risks for firms” (A. Abbondanza, M. Caccavaio, V. Gattinoni, O. Georgescu)
  - **Box 4.1**: “Flood events in the EU and impact on firms’ loan quality” (by A. Abbondanza, U. Albertazzi, D. Djekic, and A. Ponte Marques)
- **Article 5:** “A framework to assess the severity of EU-wide adverse stress test scenarios” (J. M. Figures, V. Scalone, J. Willem t Hooft, L. ter Steege, B. Montero Prieto and C. Vallotto)
- **Focus Piece 1**: “Informing the positive neutral countercyclical capital buffer using stress test data” (M. Caccavaio, C. Cascini, C. Couaillier, G. De Nora, M. Pirovano and F. Shaw)

➢ **2025 MaSTER coordinators**: C. Rodriguez d’Acri and F. Shaw

➢ **Comments and approval**: K. Assenmacher