

W

U

T

I

S



Global Markets Division

Contingent Convertible Bonds

Delving into the Complex Interplay of Risk & Reward

Investment Horizon: 1 – 1.5 Years

Matthias Erhart, Maximilian Herlitschek, Julija Letnik, Zofia Szczekocka

Vienna, February 2nd 2024

| | | |
|---|--------------------------|----|
| 1 | Introduction to AT1 | 3 |
| 2 | Risks | 5 |
| 3 | Basel III Framework | 7 |
| 4 | European Banking Sector | 11 |
| 5 | Portfolio Construction | 13 |
| 6 | Macroeconomic Evaluation | 18 |
| 7 | Sources | 22 |

Team Overview

Global Markets



Matthias Erhart

Associate

- Storyline
- Market analysis
- Basel III
- Portfolio construction

J.P.Morgan
ASSET MANAGEMENT

BSc. Business & Economics



Julija Letnik

Associate

- Risk analysis
- Quantitative factors
- Portfolio construction



BSc. Business & Economics



Maximilian Herlitschek

Associate

- Market research
- Risk analysis



B.Sc. Business Administration



Zofia Szczekocka

Analyst

- Risk analysis
- Basel III
- European banking



BA. International Business Administration

AT1 and CoCo Bonds

AT1 bonds are a type of convertible bond created after the GFC to increase liquidity in times of turmoil.

Description



Convertible debt securities with triggers for **conversion** to common stock



Used by banks to absorb losses and satisfy regulatory **capital requirements**

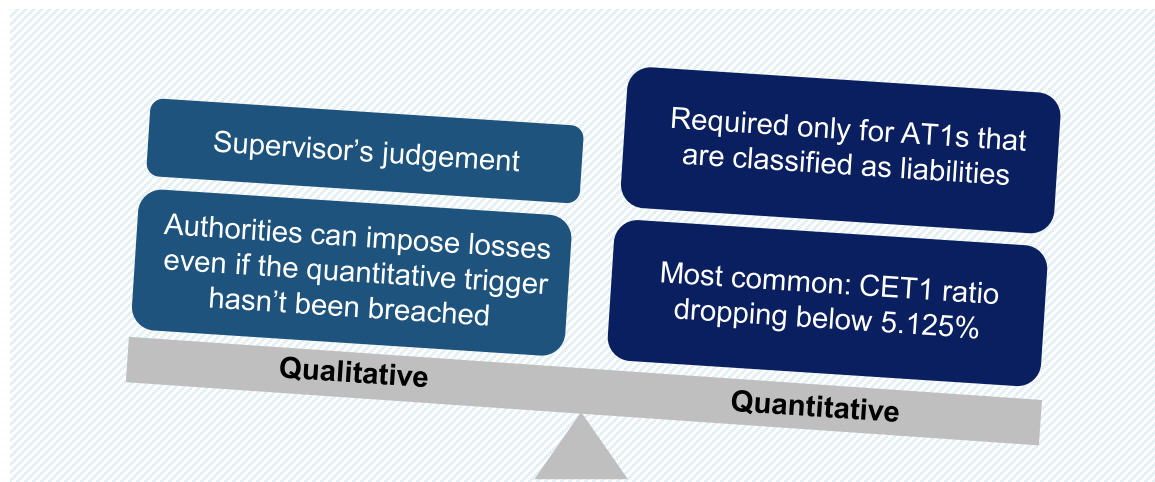


Created after the 2008 GFC to help banks and to **prevent** taxpayer-funded **bailouts**



Primarily aimed at institutional investors and **not accessible** for **retail investors**

Triggers



Characteristics

- Perpetual and callable**
Calling the bond only with consent of respective regulators
- Hybrid nature – combines debt and equity elements**
Yields interests for the investor & has the capacity to absorb losses
- High-risk & high-yield product**
Higher yields than other convertible bonds due to high inherent risks
- Least senior debt instrument**
Seniority only above equity
- Open the way for a "bail-in"**
As distressed banks transfer the risks to investors (away from tax-payers)

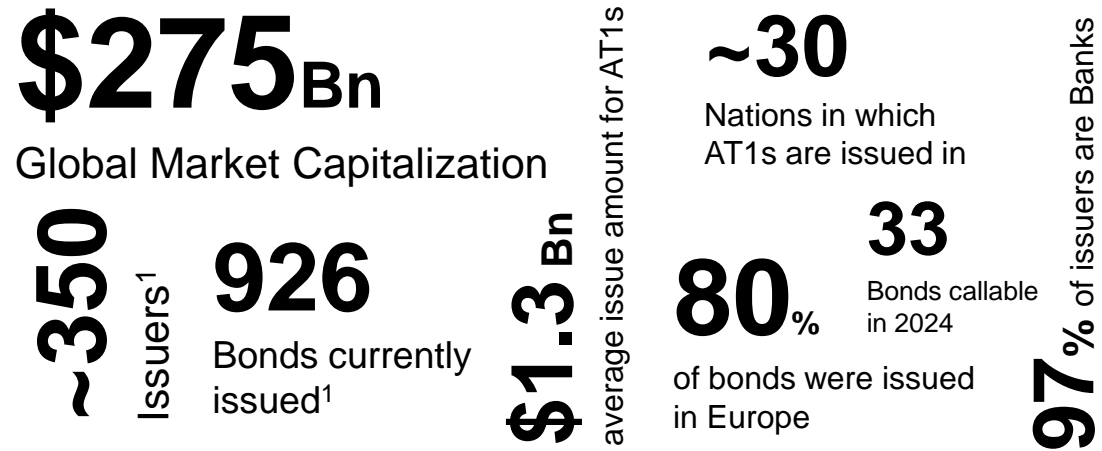
Role for Banking Industry

| Purpose | Advantages | Additional Function |
|--|---|--|
| <ul style="list-style-type: none"> Capital cushion required by regulators Automatic loss absorption tool Opportunity to exploit market discrepancies | <ul style="list-style-type: none"> Postponing the interest payments thanks to perpetuity Debt removal from balance sheet after conversion to shares | <ul style="list-style-type: none"> Issuance of CoCos as an indicator of bank's health Banks able to provide these bonds are typically considered to be in a resilient financial form |

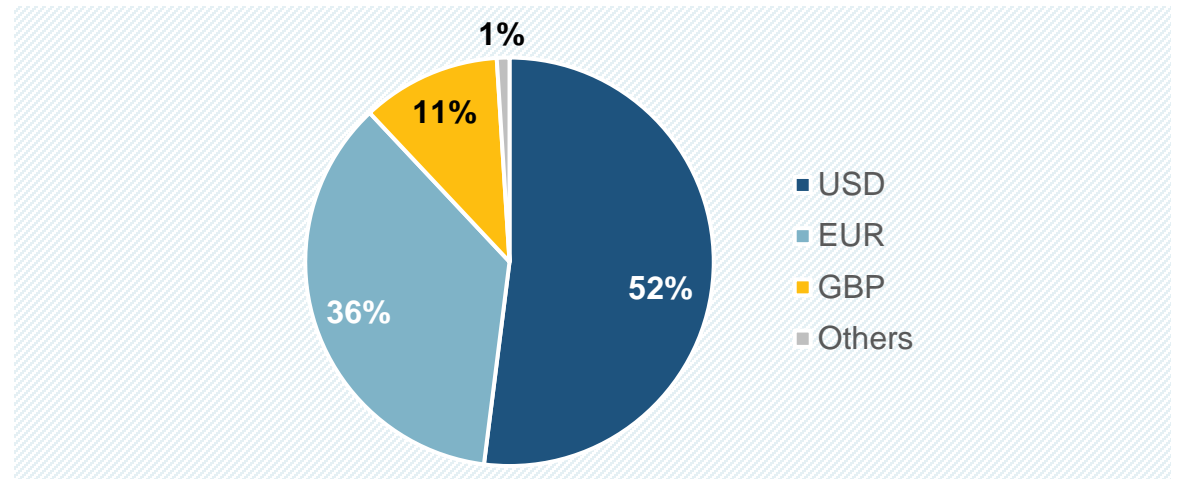
Market Size and Overview

The AT1 market was established with Basel III and grew heavily thereafter.

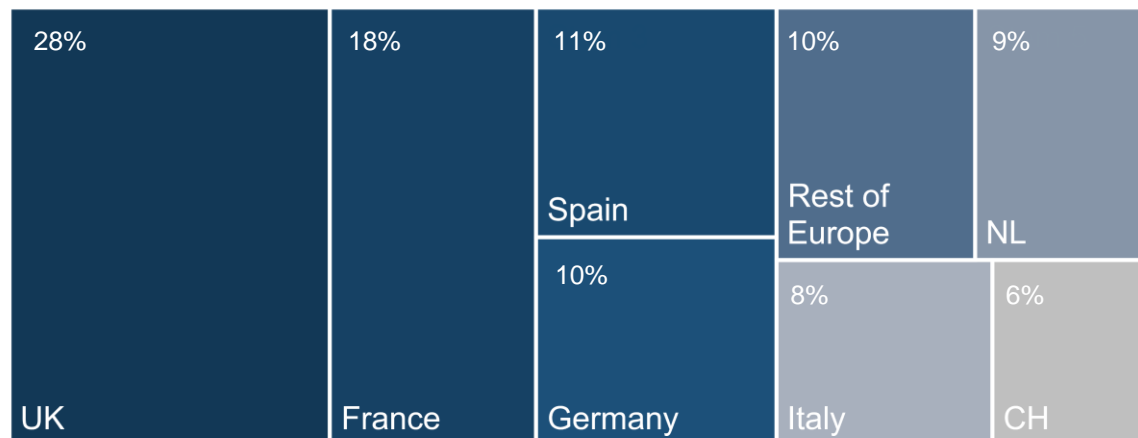
Facts & Figures



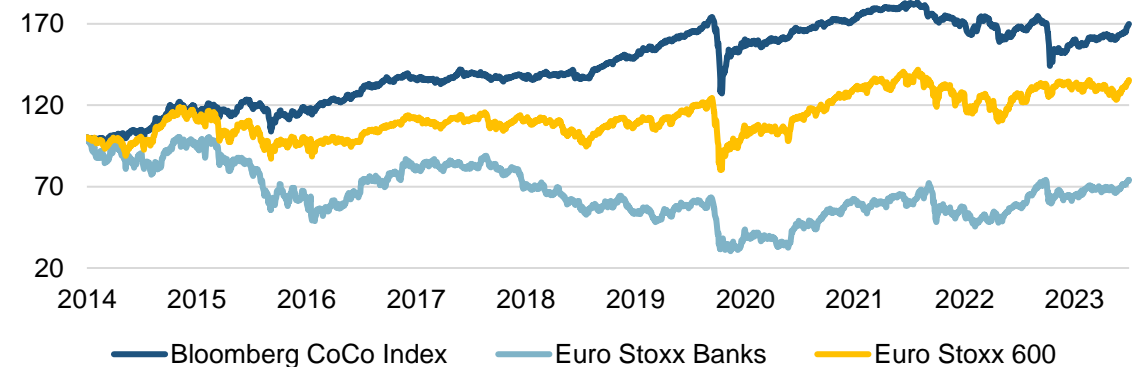
Market Split by Currency



Market Share by Geography



Market Development



¹Found by using Bloomberg SRCH. double-counting possible
Source: Lazard, Bloomberg Finance L.P.

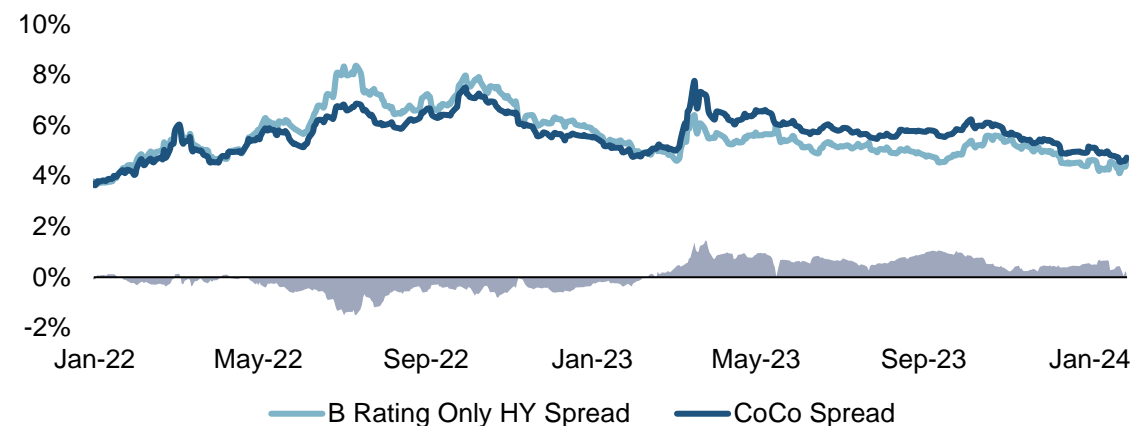
Quantitative Factors

CoCos have outperformed equities over the long-term, offering an attractive risk-reward profile.

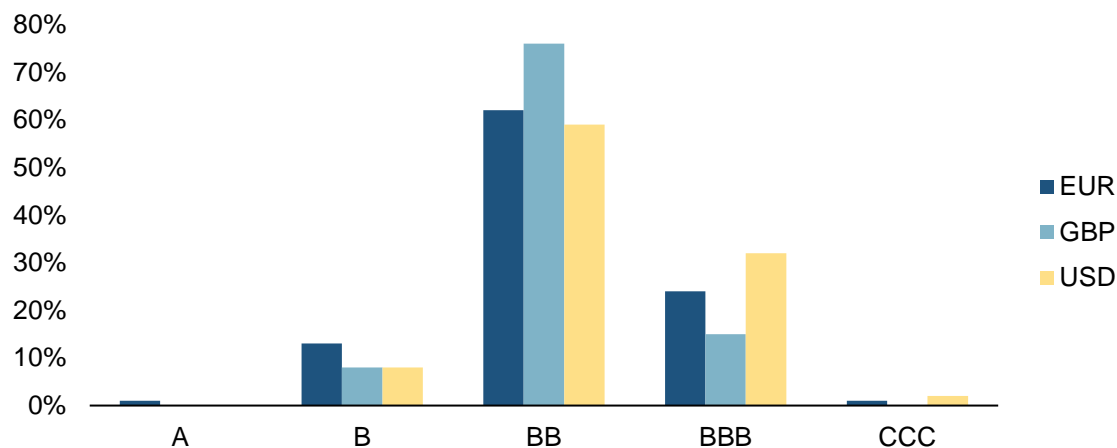
Risk-Return Profile

| Value | Annual. Return | | Volatility | | Sharpe Ratio | |
|-------|----------------|------------|------------|------------|--------------|--------------|
| | CoCo | Euro Banks | CoCo | Euro Banks | CoCo | Euro Banks |
| 1Y | 3.15% | 28.25% | 11.73% | 22.73% | 0.06 | 1.13 |
| 5Y | 4.76% | 12.13% | 8.40% | 30.20% | 0.27 | 0.32 |
| 10Y | 6.32% | 0.13% | 8.09% | 28.06% | 0.48 | -0.08 |
| Mean | 3.96% | 20.19% | 10.06% | 26.47% | 0.27 | 0.46 |

Contingent Convertible – B Rating Only High Yield Spread



CoCo Rating Distribution



Key Points

Performance

CoCos show **above average performance** in long-term period, with **lower performance** in last year due to the **Credit Suisse bankruptcy**

Ratings

Despite the **high risk** reflected in CoCos ratings, their **outstanding historical performance** serves as a compensating factor





Spreads

Higher correlation with **subordinated debt** spreads than to CDS or equity prices, **currently at elevated level**

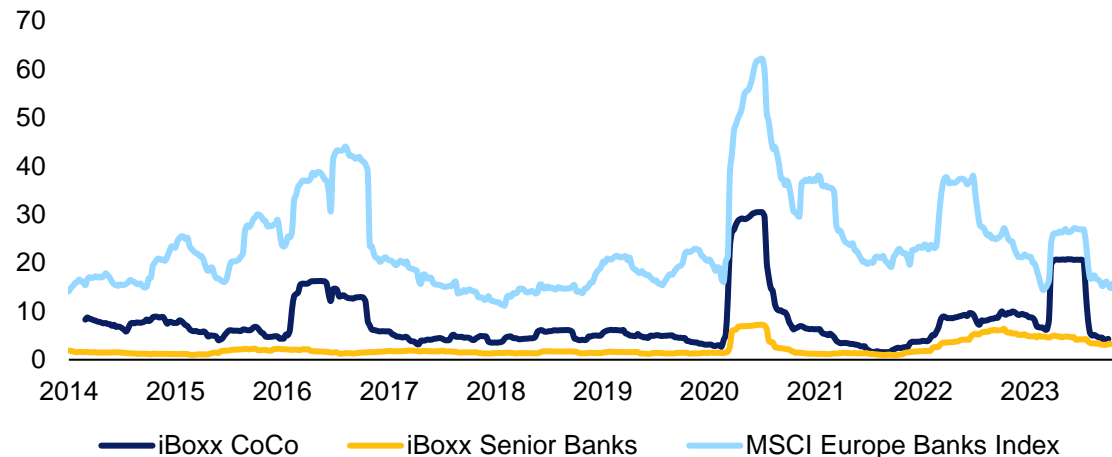
Important Risk Factors

CoCos bring a multitude of risks but tend to stay less volatile than equities.

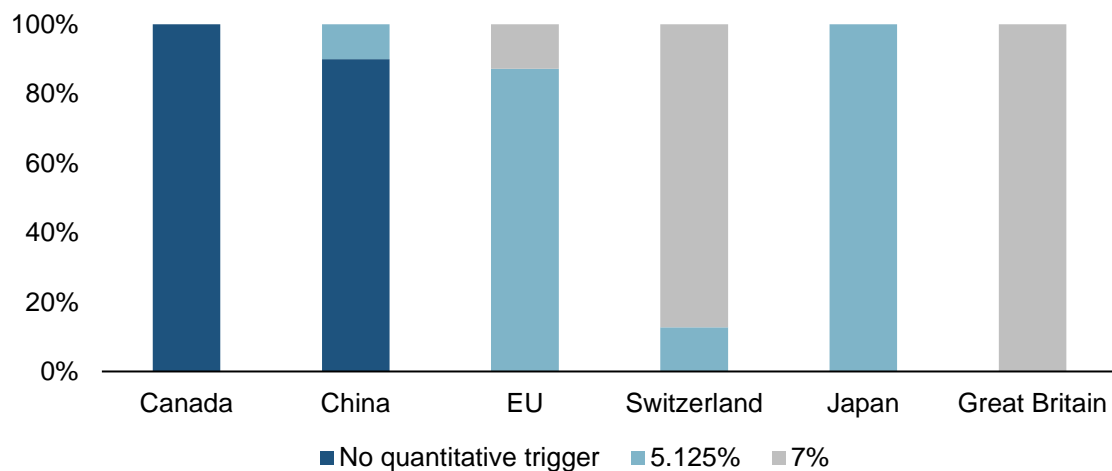
Types of Involved Risks

-  Loss of coupon: if issuer has insufficient distributable items or the payment would exceed Maximum Distributable Amount (MDA)
-  Write-down (temporary or permanent)
-  Regulator can call the bond at any time – no formula
-  Interest rate → similar to normal bonds



Volatility Comparison



Differences in Quantitative Trigger Level by Country



Trigger Levels

-  Quantitative triggers for AT1 instruments that classify as liabilities
-  No selected jurisdiction mandates thresholds above 5.125% CET1
-  AT1 loss mechanisms and bank resolution triggers may not always align

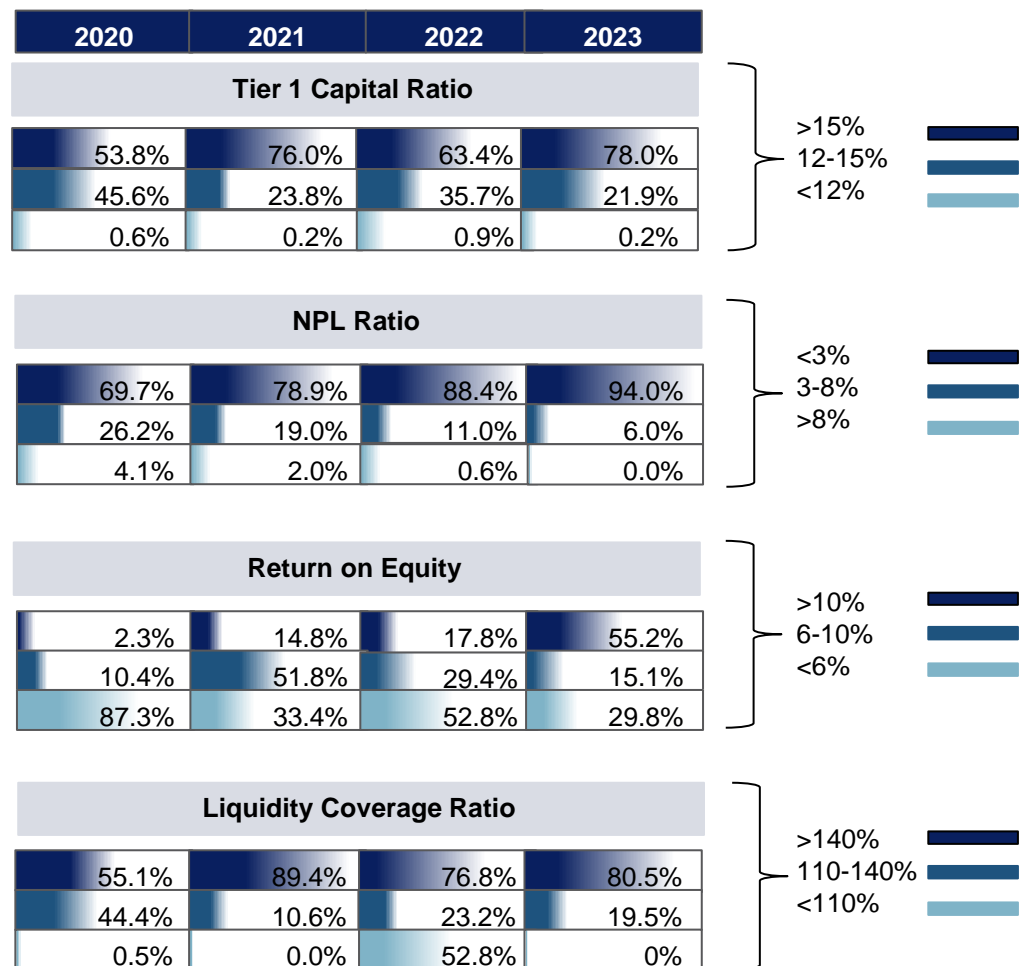


Analysis & Portfolio Construction

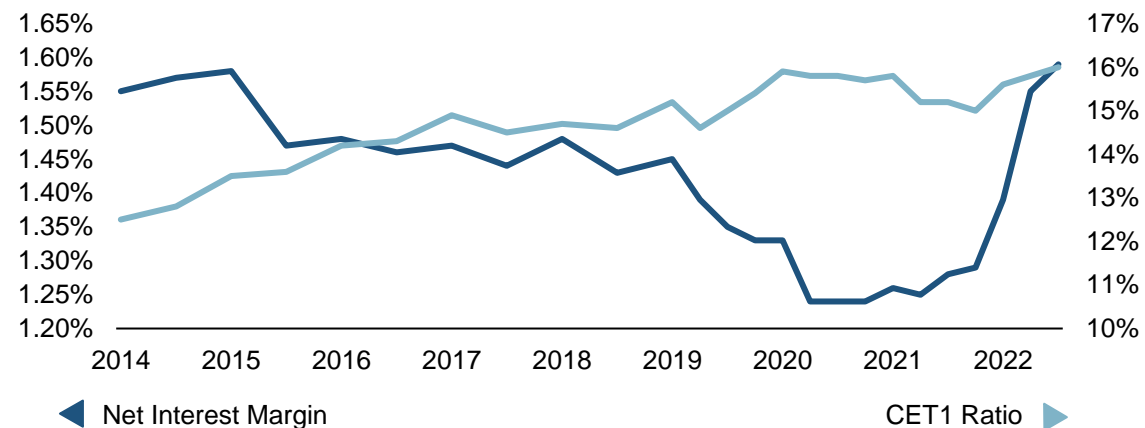
Status Quo of European Banking

The sector remains healthy and stable with adequate buffers and improving profitability.

Heatmap of the Risk Indicator Trends



Net Interest Margin & CET1 Ratio



Key Points



Banking Union Structure

- SSM – Supervision
- SRM - Resolution
- EDIS - Insurance
- “Single Rulebook”



Strength & Resilience

- Promising rebound
- Resistant asset quality
- Profitability surge
- Capital ratios recovery



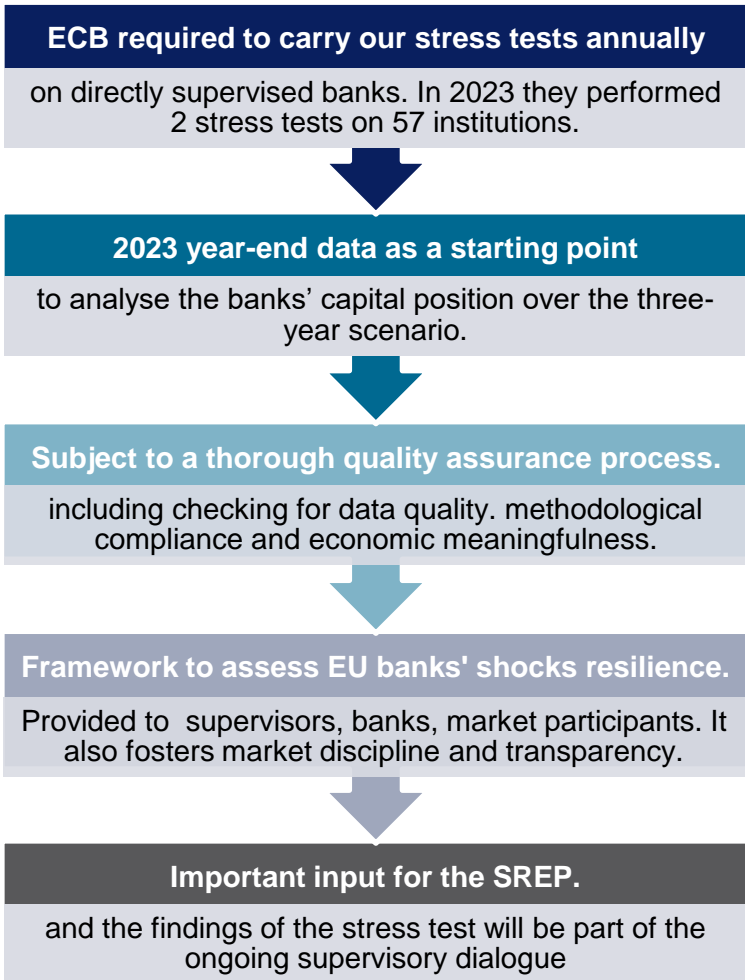
Challenges

- Rising interest rates
- Inflationary pressures
- Reduced GDP growth
- Economic fallout (2020)

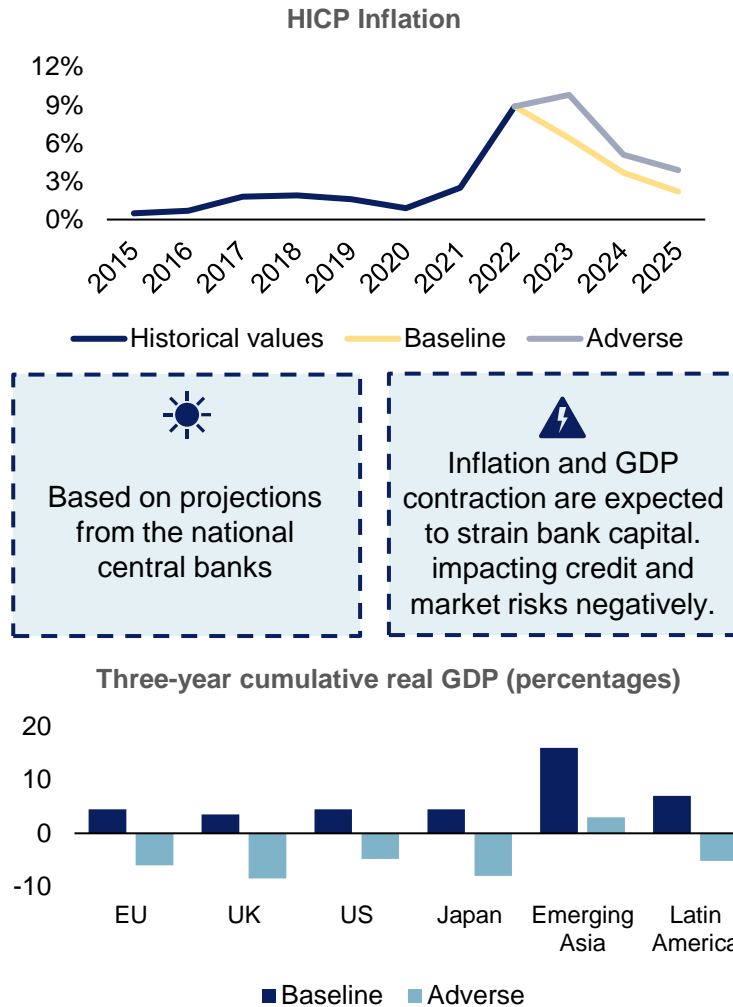
2023 Stress Test of Euro Banks

Crunching numbers, testing resilience.

Drivers



Scenarios



Impact

Credit

The key factor for depletion in adverse scenarios, driven by **unsecured exposures** and **rising NPE ratios** influencing loan loss trends

Market

Market **risk rises** with heightened risk premia and financial uncertainty, driven by **interest rate, credit spread, and equity shocks**

Profit

Net interest income sharply falls, impacting banks asymmetrically. Custodians and asset managers see a larger **drop in net fee** and commission income

Operational

Conduct and operational risk losses **represent 0.6%** of total capital depletion, with material conduct risk aligning with historical trends

Country Screening

Screening countries based on their economic performance in order to mitigate risk.

Screening Criteria



Inflation Differential

Potential for tighter financial conditions



GDP Growth

Indicator of natural growth in various sectors



Country Risk Premium

Additional risk that can hardly be quantified



Probability of Default

Country default would hugely impact banking industry



Loss Given Default

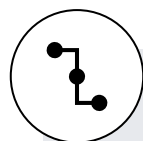
Higher LGD would imply more severe outcomes

Reasoning



Country Risk

European countries have become heterogenous, making careful selection even more important



Idiosyncratic Risk

Political risk remains elevated, with banking industries being at the mercy of regulators



Currency Risk

Although most countries have Euros, there are outliers (i.e. Denmark, Hungary) that could lead to losses

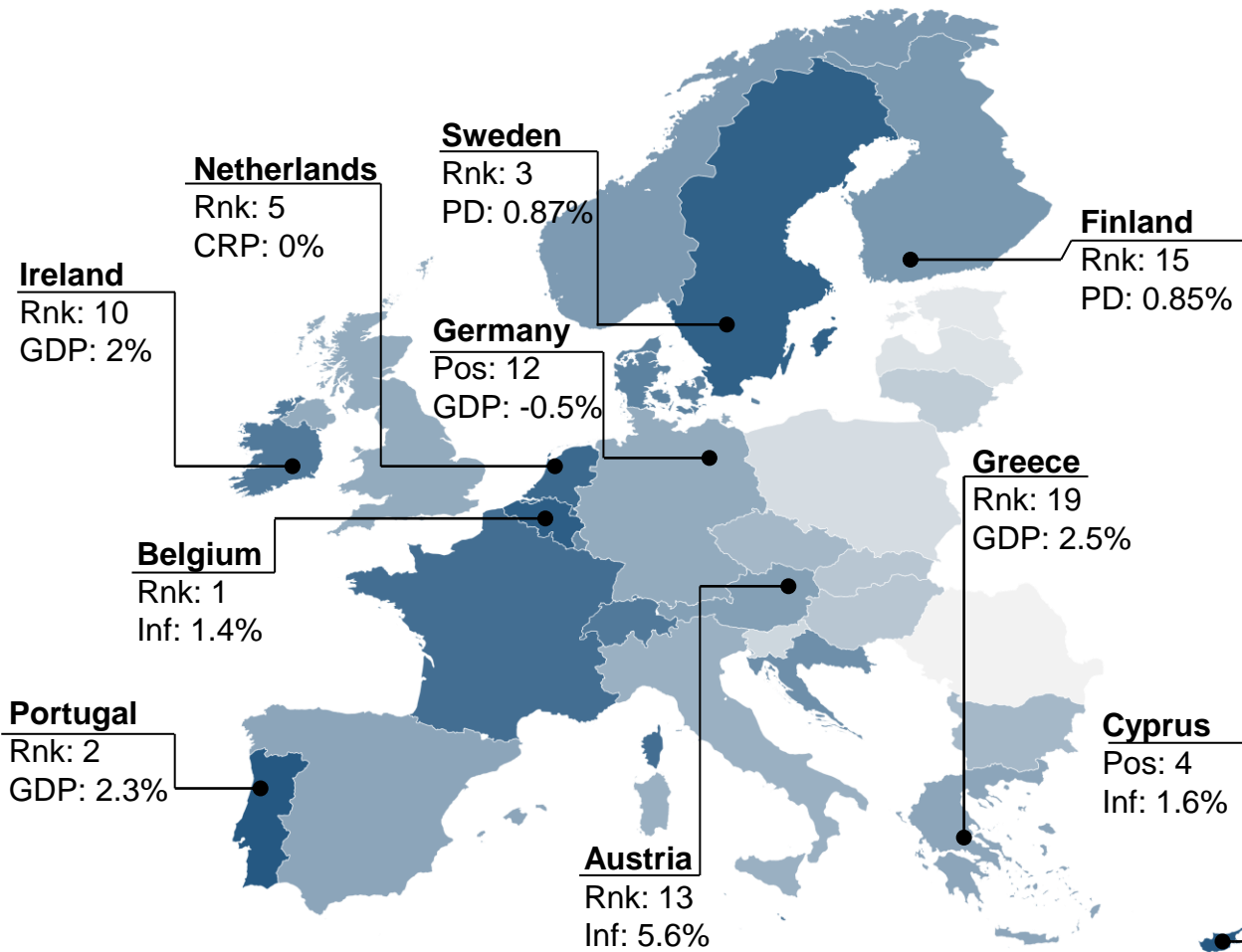
Screening Data

| Country | Inflation | GDP Growth | CRP | PD | LGD | Average Ranking |
|----------------|-----------|------------|--------|-------|--------|-----------------|
| Belgium | 1.4% | 1.0% | 0.877% | 0.67% | 29.38% | 5.64 |
| Portugal | 1.4% | 2.3% | 1.753% | 0.68% | 27.31% | 6.50 |
| Sweden | 1.9% | -0.7% | 0.000% | 0.87% | 29.82% | 7.79 |
| Cyprus | 1.6% | 2.2% | 2.785% | 0.98% | 29.15% | 7.79 |
| Netherlands | 1.2% | 0.6% | 0.000% | 0.86% | 30.30% | 8.36 |
| Denmark | 0.4% | 1.7% | 0.000% | 0.87% | 30.36% | 8.43 |
| Malta | 3.6% | 3.8% | 1.238% | 1.34% | 24.25% | 8.64 |
| Switzerland | 1.7% | 0.3% | 0.000% | 0.93% | 31.68% | 8.71 |
| Luxembourg | 3.2% | -0.4% | 0.000% | 0.80% | 30.30% | 10.00 |
| Ireland | 3.9% | 2.0% | 0.877% | 0.94% | 29.44% | 10.14 |
| France | 3.7% | 1.0% | 0.722% | 1.07% | 29.53% | 10.43 |
| Germany | 3.7% | -0.5% | 0.000% | 0.95% | 30.02% | 11.21 |
| Austria | 5.6% | 0.1% | 0.584% | 0.75% | 31.18% | 12.07 |
| Norway | 4.8% | -1.9% | 0.000% | 0.89% | 25.41% | 12.14 |
| Finland | 3.3% | -0.1% | 0.584% | 0.85% | 31.91% | 12.57 |
| Spain | 3.3% | 2.5% | 2.338% | 1.06% | 32.12% | 13.21 |
| UK | 4.2% | 0.5% | 0.877% | 1.07% | 30.11% | 13.43 |
| Czech Republic | 7.6% | 0.2% | 0.877% | 0.80% | 30.15% | 14.43 |
| Greece | 3.0% | 2.5% | 3.661% | 1.13% | 32.53% | 15.21 |
| Italy | 0.6% | 0.7% | 3.214% | 1.28% | 31.10% | 15.93 |

Country Comparison II

Selecting only specific economies in Europe helps to avoid country-specific risks.

Selection of chosen European economies¹



Overview & comments

- Belgium:** very **stable economy** with steady GDP growth, **inflation** below **target level**
- Portugal:** Strong **GDP growth** expectations with **low** expected **probability of default**
- Sweden:** at 1.9% inflation very **close to target**, CRP is **virtually zero**
- Cyprus:** prosperous region with **high GDP/Capita**, **great recovery** after banking crisis
- Netherlands:** low **inflation of 1.2%**. high fintech-density and **solid future prospects**

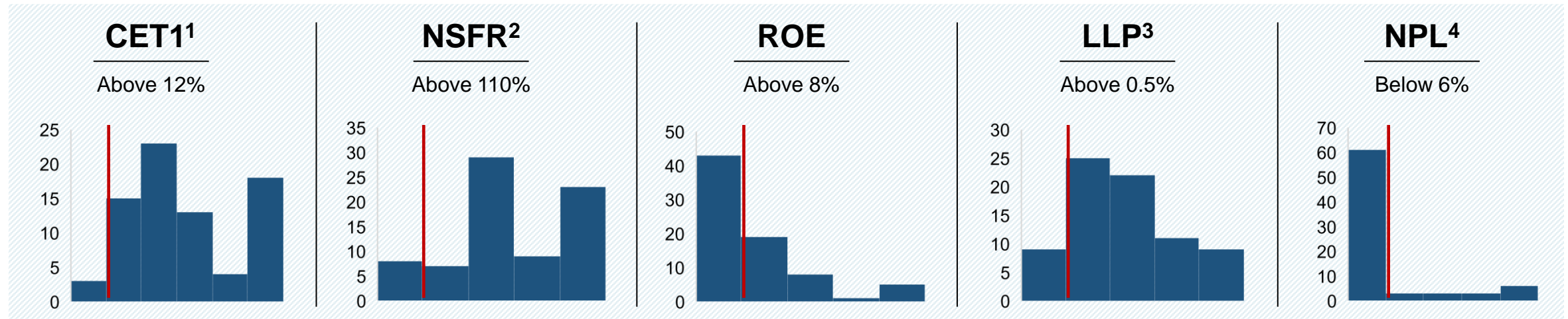
| Table with Remaining Countries | | | | | |
|--------------------------------|--|-------------|--|--------------------|--|
| 6. Denmark | | 11. France | | 16. Spain | |
| 7. Malta | | 12. Germany | | 17. UK | |
| 8. Switzerland | | 13. Austria | | 18. Czech Republic | |
| 9. Luxembourg | | 14. Norway | | 19. Greece | |
| 10. Ireland | | 15. Finland | | 20. Italy | |

¹Rnk = Rank. GDP = GDP Growth. CRP = Country Risk Premium. Inf = Inflation. PD = Probability of Default







Company Overview

Screening companies with solvency, liquidity, credit risk and profitability ratios, we find 37 fitting companies.





Screening Criteria & Process



Exemplary Companies

| | | |
|--|--|--|
| <p>Vestjysk Bank</p>  <p>Domicile: </p> <p>CET1: 21%</p> <p>ROE: 16%</p> <p>NSFR: 142%</p> | <p>Moneta Bank</p>  <p>Domicile: </p> <p>CET1: 15.5%</p> <p>ROE: 15.5%</p> <p>NSFR: 141%</p> | <p>TF Bank</p>  <p>Domicile: </p> <p>CET1: 12.2%</p> <p>ROE: 23.5%</p> <p>NSFR: 138%</p> |
|--|--|--|

Final Companies

| | | | |
|---|--|---|---|
|  37 Banks |  12 countries |  14 Bn avg. Market Cap |  39 AT1 bonds issued |
| <p>Information: Danish Banks perform well in an international comparison, with 7 out of 37 firms being incorporated there. The United Kingdom and Norway follow as attractive banking hotspots.</p> | | | |

¹Debt/Equity Ratio also included (below 500%), ²Liquidity Coverage Ratio also included (above 130%)
³Loan Loss Reserves to Total Loans, ⁴Non-performing loans to Total Loans

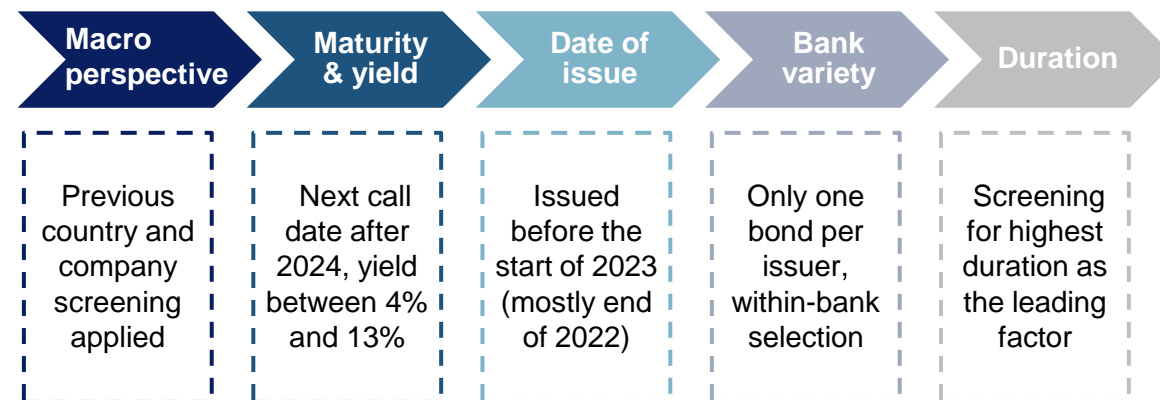
CoCo Bonds: Screening & Selection

15 CoCo bonds were selected through characteristics-based criteria.

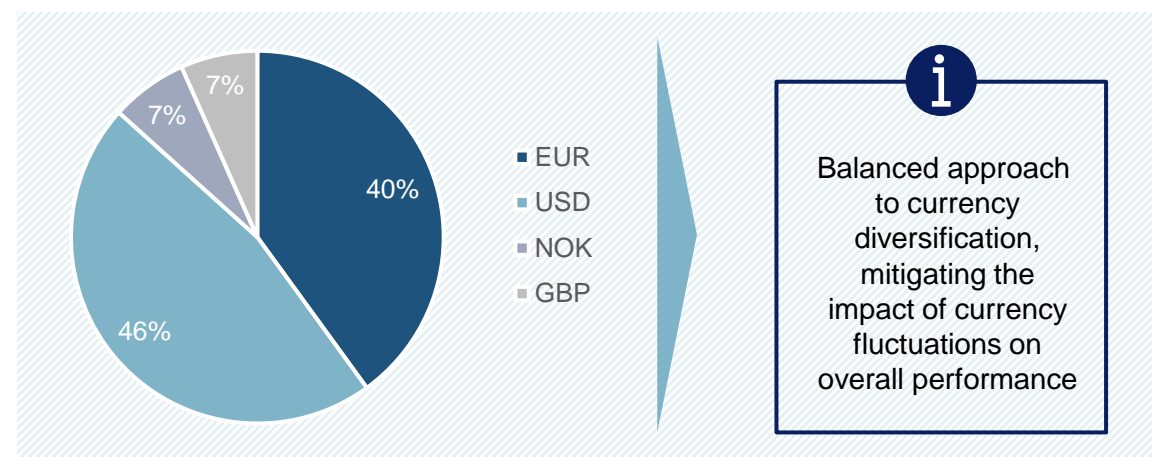
Coco Overview Table

| Issuer name | ISIN | Mod Dur | Coupon | Yield to Next Call |
|-------------------------------|--------------|-------------|-------------|--------------------|
| ABN AMRO Bank | XS1693822634 | 3.20 | 4.75 | 7.09 |
| BBVA | US05946KAF84 | 3.27 | 6.13 | 9.08 |
| Caixa Bank | ES0840609038 | 4.52 | 3.63 | 8.71 |
| DNB Bank | NO0012618992 | 3.37 | 6.72 | 6.08 |
| HSBC | US404280CQ03 | 5.64 | 4.70 | 8.02 |
| ING | US456837AZ69 | 6.15 | 4.25 | 9.20 |
| KBC | BE0002592708 | 1.61 | 4.25 | 7.80 |
| Lloyds | US539439AF68 | 8.63 | 6.66 | 6.68 |
| Nationwide Building Society | GB0001777886 | 4.56 | 7.86 | 9.27 |
| NatWest | US639057AD02 | 6.28 | 4.60 | 8.98 |
| Raiffeisen Bank International | XS2207857421 | 2.55 | 6.00 | 8.52 |
| Skandinaviska Enskilda | XS2479344561 | 2.98 | 6.88 | 7.23 |
| Swedbank | XS2377291963 | 4.73 | 4.00 | 8.75 |
| Sydbank | XS1713462742 | 1.00 | 5.25 | 8.25 |
| Unicaja Banco | ES0880907003 | 2.93 | 4.88 | 11.35 |
| Average | | 4.2Y | 5.4% | 8.1% |

Screening Criteria



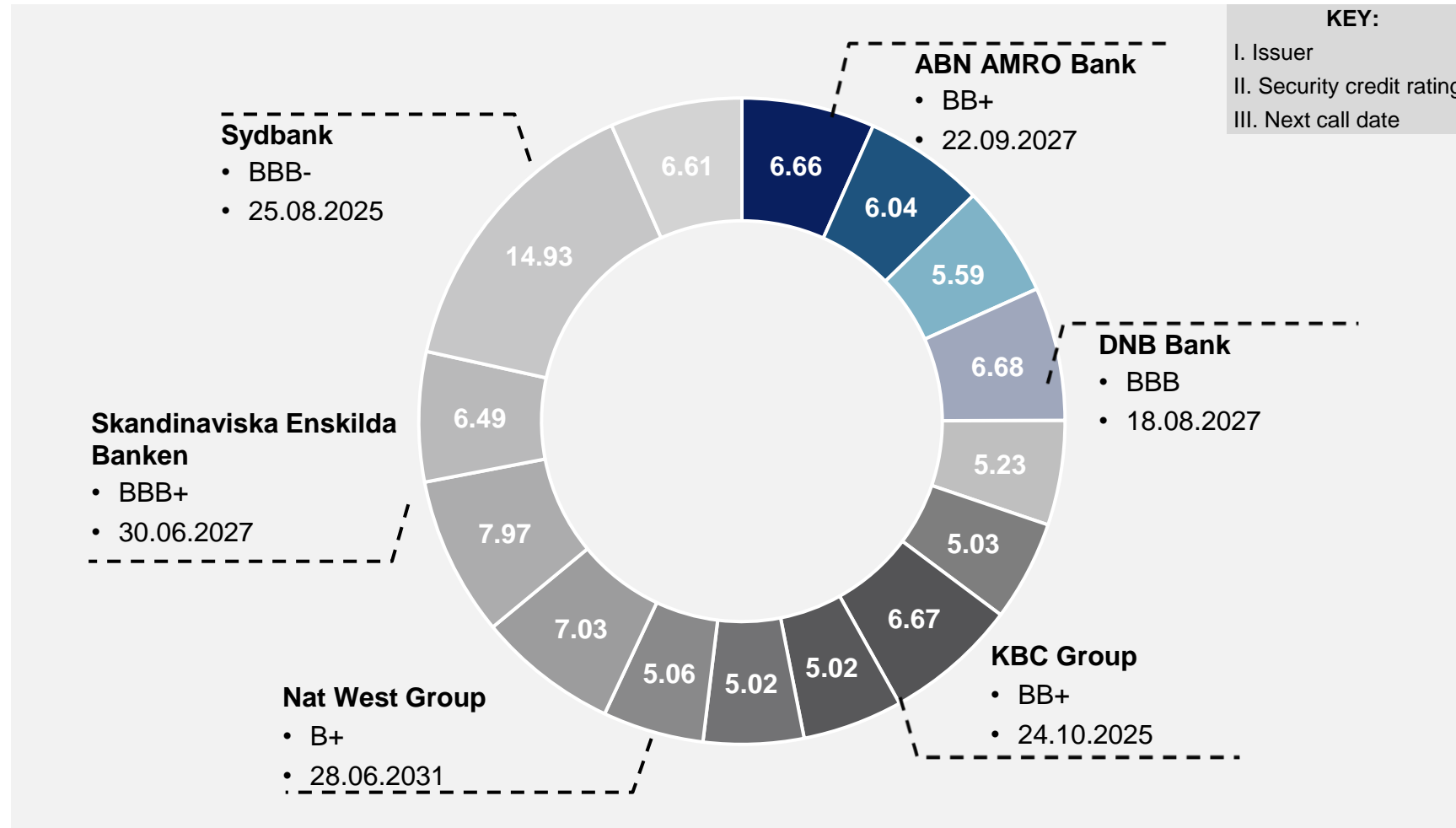
Currency Split



Contingent Convertible Bond Portfolio

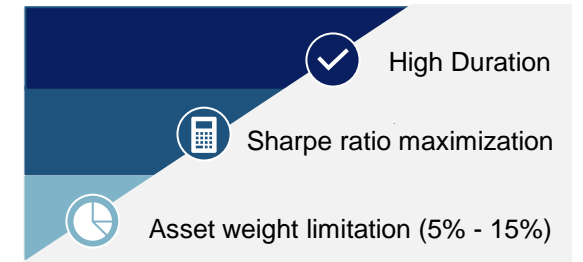
Optimizing the portfolio for a balanced and diversified allocation.

Portfolio Allocation

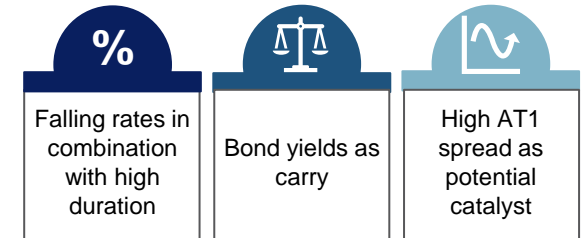


Overview

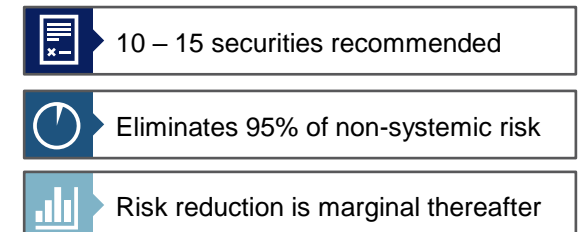
Composition



Drivers



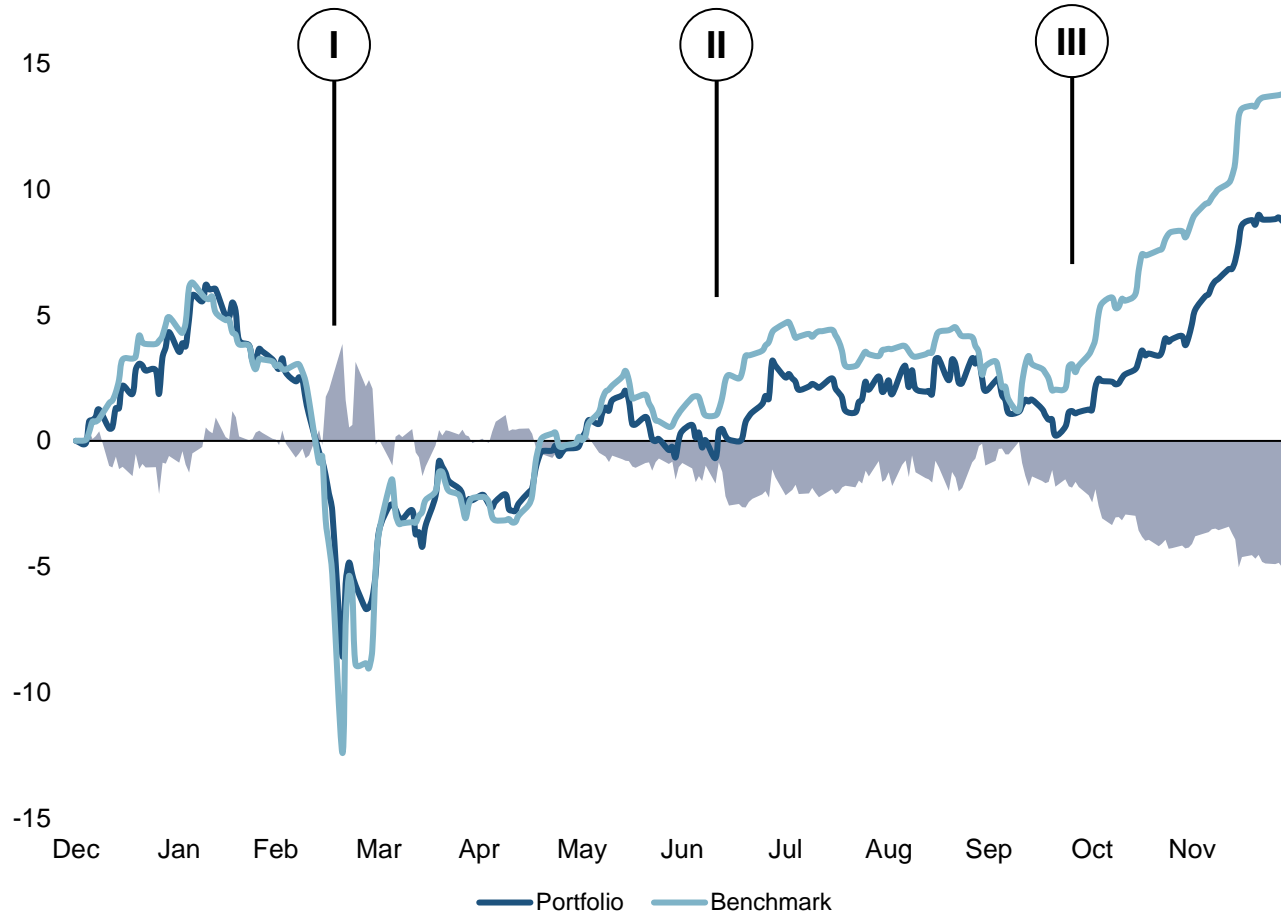
Portfolio Diversification



Portfolio Backtest

Portfolio underperformance is due to duration difference, a feature that is intended for future upside.

Portfolio Performance (CY 2023)

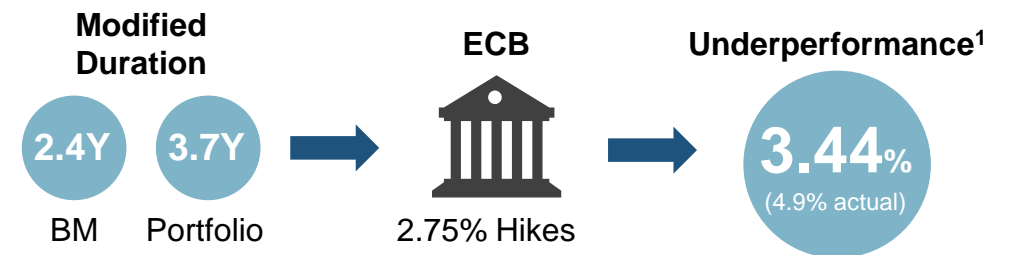


Overview

Events

- I 19. 03.2023: Credit Suisse defaults; 17bn of bonds get wiped out
- II 26.07.2023 Last interest rate hike
- III 07.10.2023 Israel-Hamas War

Underperformance



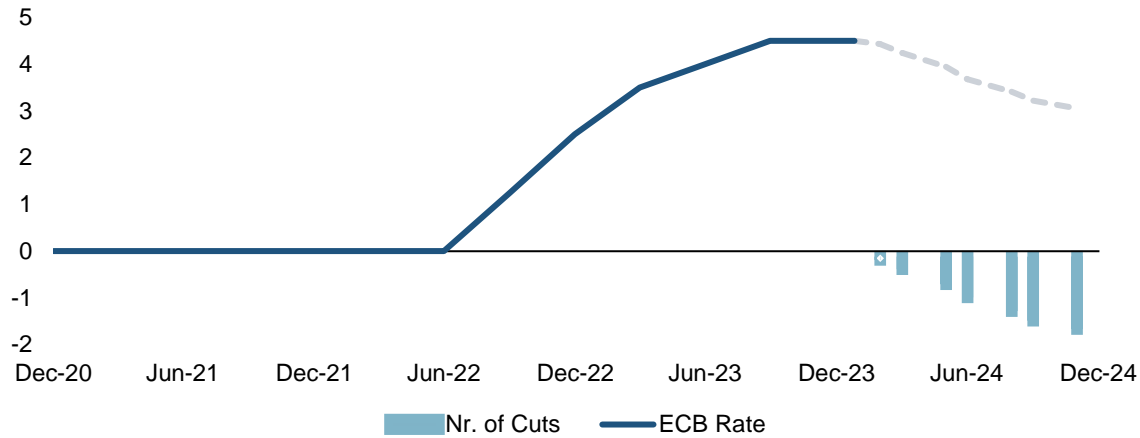
Set-up for the future

| | | |
|---|---|--|
| <p>% Duration</p> <p>Profit through OW on duration in dovish times</p> | <p>↩ High Carry</p> <p>Yield higher than BM (8.1% vs 8.3%)</p> | <p>⏏ Selection</p> <p>Quality of companies should reduce default risk</p> |
|---|---|--|

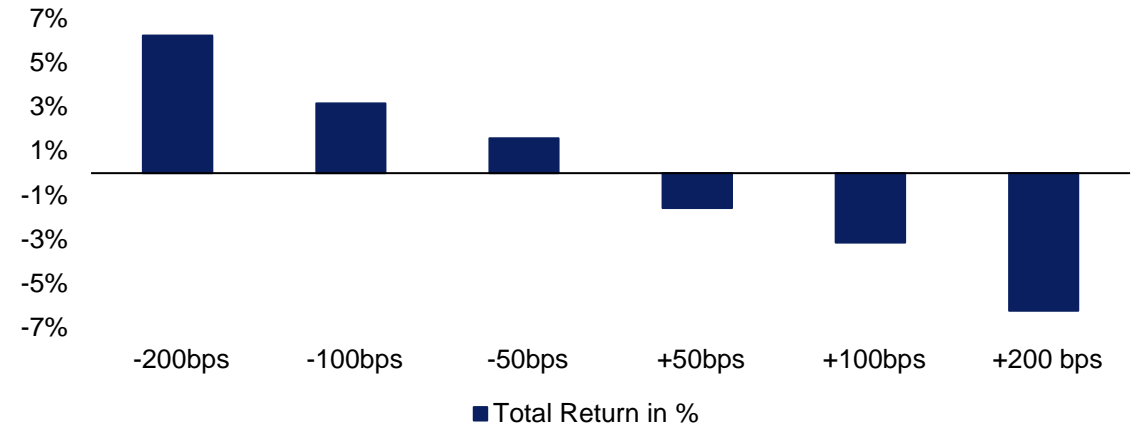
¹More of the underperformance is explained by the even higher portfolio duration in the beginning of 2023 - 15 - | Valid until 01/08/2023

Portfolio returns are strongly affected by the interest rates levels and fluctuations.

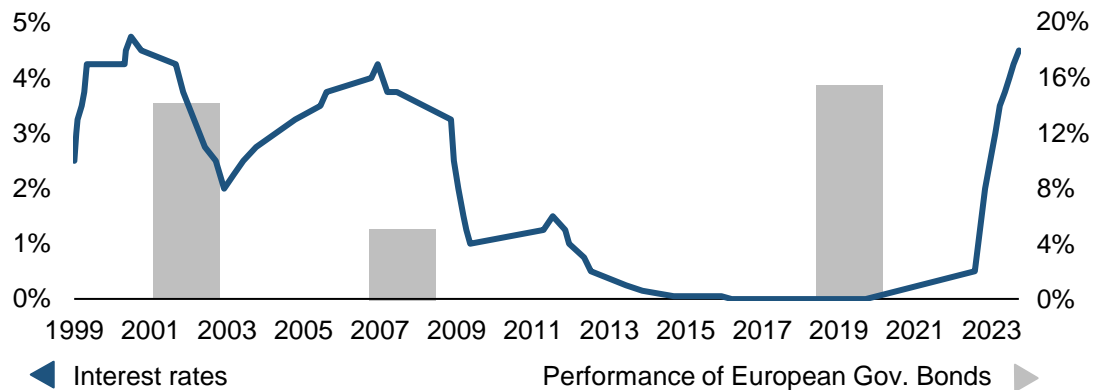
ECB Interest Rate Expectation



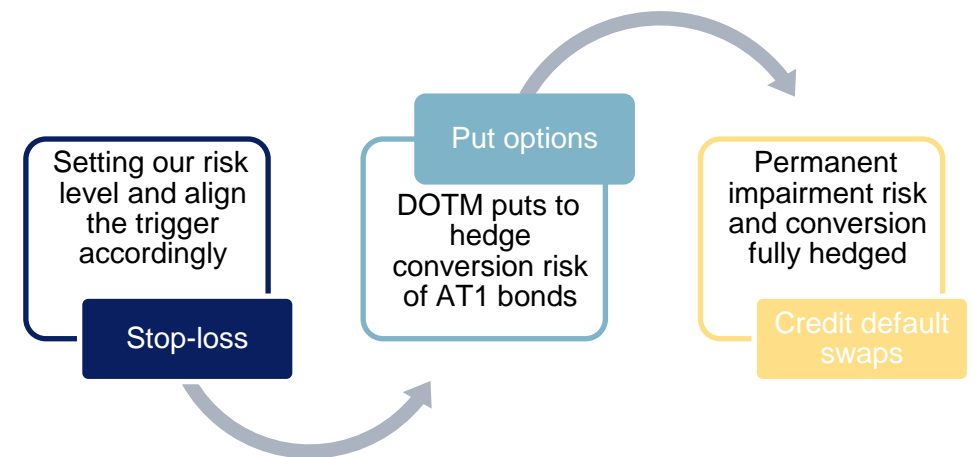
Scenario Analysis – Sensitivity to ECB Rate Changes



Performance of Gov. Bonds during European Recessions



Other Hedging Possibilities

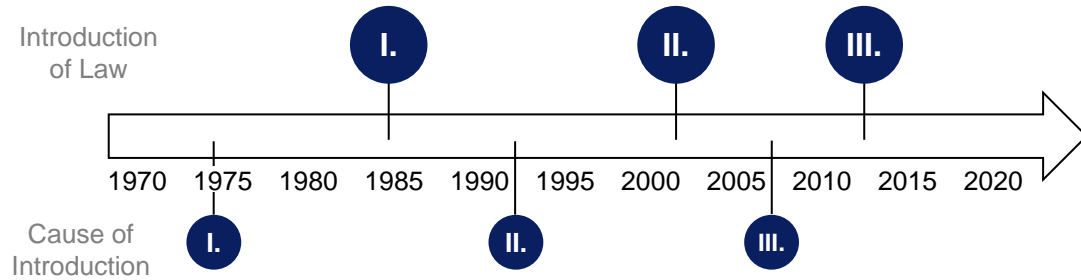




Appendix

Basel III is one of the fundamental building blocks of the European Banking Industry.

History of European Financial Regulation



- I. 1988: Basel I**
Event: Liquidation of Bank Herstatt
- II. 2004: Basel II**
Event: Low returns associated with bad RM
- III. 2013: Basel III**
Event: Great Financial Crisis

Details of Basel III – Introduction



Basel Committee (BCBS)

Established in 1974 by central bank governors from the G10 countries (now 45 members)



The main goal

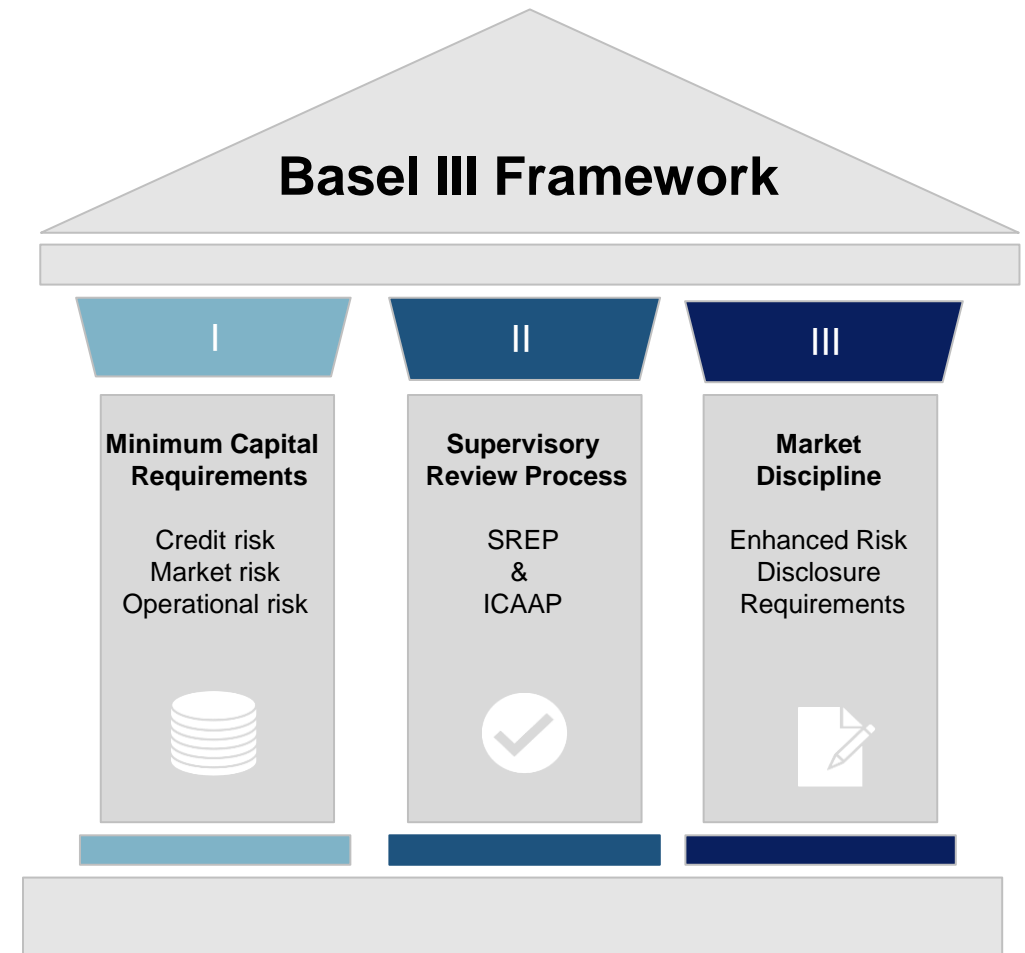
Stopping banks from hurting the economy by taking too much risks



The work

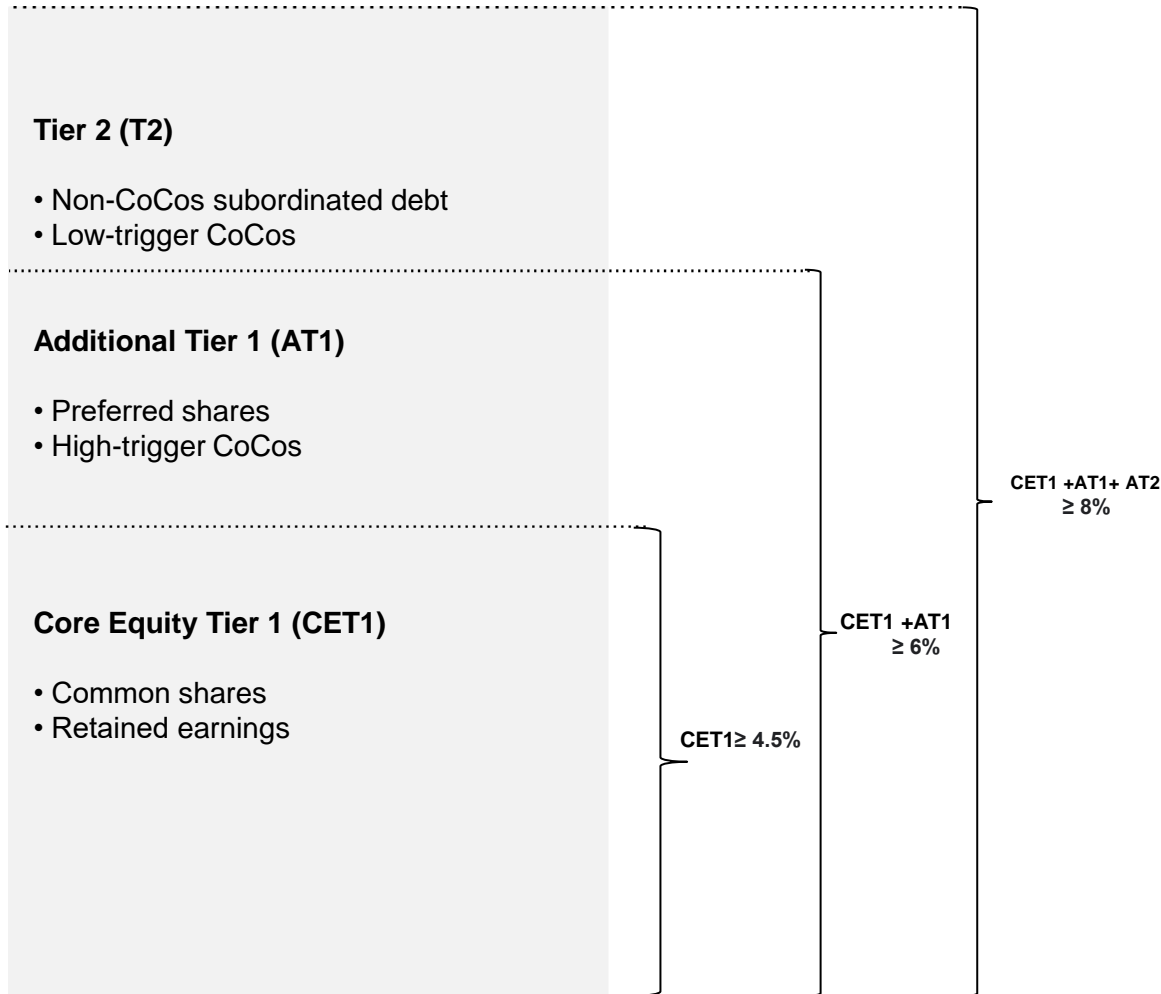
A forum and regulatory body for cooperation on banking supervision (part of BIS)

Basel III Framework



The introduced regulation is based on quantitative evaluation with the goal of a more robust industry.

The Position of CoCos in Basel III Capital Requirements



Objectives

- Improving the **resilience of banks** in the events of financial shock
- Strengthen the **transparency and disclosure** practices of banks
- Enhance the **systemic risk management and governance**
- Minimize the probability of **recurrence of financial crises**

Norms & Ratios

| Capital Adequacy | Leverage | Liquidity |
|---|-----------------------------|----------------------------|
| Capital buffer against RWA ¹ | Leverage ratio: at least 3% | Fulfilling LC & NSF ratios |
| | | |

Liquidity Coverage Ratio

Sufficient amount of **high liquidity assets** to withstand a predetermined **30-day financial distress**

Net Stable Funding Ratio





Stable funding above a predetermined requirement level for **1 year**

¹RWA = Risk-weighted Assets

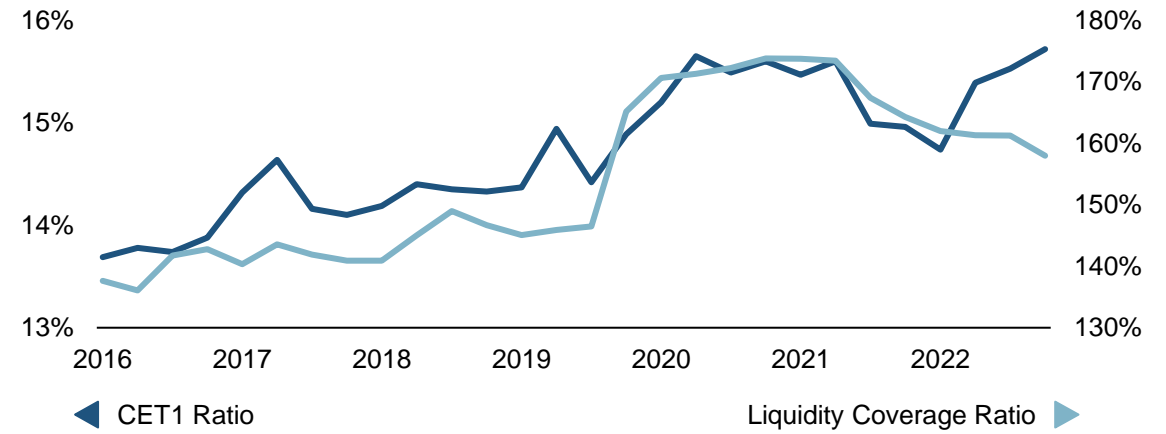
Basel III Developments

Despite the initial criticism, Basel III proved to support European banking industry.

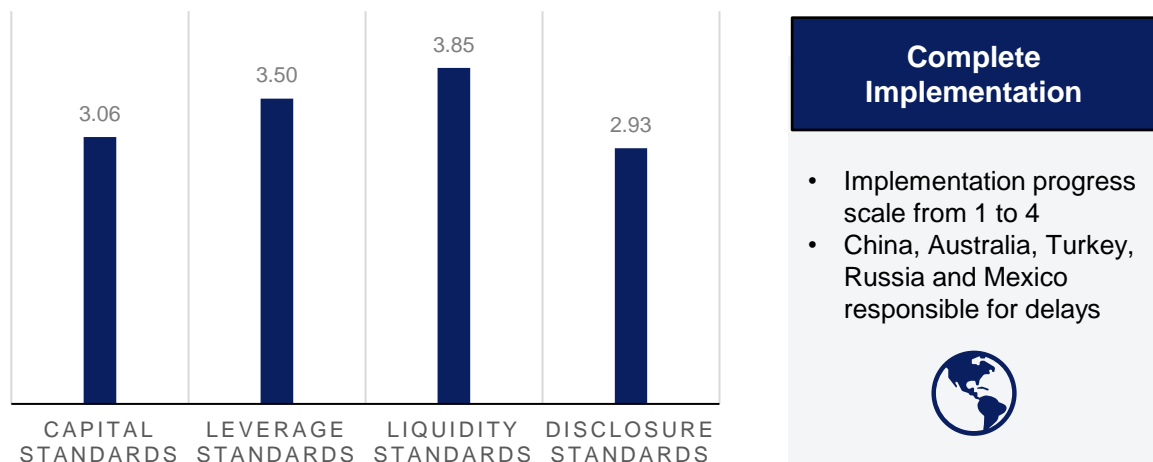
Initial Criticism

-  Reducing the **competition among banks** as the entry barriers increase
-  Increased reliance on **asset and risk rating agencies**
-  Insufficient addressing of **implementation issues**
-  Framework's incompatibility to **smaller banks**

Impact of Implementation



Adoption of Implementation Standards – Average Global Progress



Outlook – "Basel IV"



| Source Name | Link | Date of Retrieval | Used for |
|---|----------------------|-------------------|--|
| European Central Bank | Link | 09.12.2023 | CET1 Ratio, Liquidity Coverage Ratio |
| Bloomberg L.P. | - | | Trade idea, quantitative factors |
| Avdjiev et.al. (2015). Coco Bond Issuance and Bank Funding Costs. | - | 28.11.2023 | CoCos Position in Basel III Graph |
| Bank of International Settlements (BIS) | Link | 04.12.2023 | Global Progress in Basel III adoption |
| Corporate Finance Institute | Link | | Basel III objectives, impacts, ratios |
| Lazard | Link | 15.11.2023 | Introduction, risk, quantitative factors |
| Bank of International Settlements (BIS) | Link | 30.11.2023 | Introduction. risk |
| OeNB | Link | 10.12.2023 | Introduction |
| IHS Markit | Link | 11.10.2023 | The quantitative factors |
| ECB: Banking Supervision | Link | 15.01.2024 | 2023 stress test of euro area banks |
| School of Economics and Business, University of Sarajevo | Link | 26.01.2024 | Diversification Theory |

This document is being made available by WUTIS Trading and Investment Society, acting through its society ("WUTIS"), for information purposes only and for the sole and exclusive use of the addressee in connection with the matter or possible transaction to which this document relates. This document is incomplete without reference to, and should be assessed solely in conjunction with, the oral briefing provided by WUTIS.

This document is strictly confidential and remains the property of WUTIS. You agree that you shall only use this document for the purpose of evaluating and considering the matter or possible transaction to which this document relates. This document may not be distributed, published, reproduced, or disclosed, in whole or in part, to any other person, nor relied upon by you or any other person, nor used for any other purpose at any time, in each case without the prior written consent of WUTIS.

This document does not constitute nor does it form part of an offer to sell or purchase, or the solicitation of an offer to sell or purchase, any securities or any of the businesses or assets described herein or an offer or recommendation to enter into any transaction described herein nor does this document constitute an offer or commitment to provide, arrange or underwrite any financing. You are responsible for making your own independent investigation and appraisal of the risks, benefits, appropriateness and suitability of any transaction or matter contemplated by this document and WUTIS is not making any recommendation (personal or otherwise) or giving any investment advice and will have no liability with respect thereto. The decision to proceed with any transaction or action contemplated by this document must be made by you in the light of your own commercial assessments and WUTIS will not be responsible for such assessments.

Neither WUTIS nor any of its subsidiaries or affiliates, nor any of their respective officers, directors, employees or agents (WUTIS together with such persons being the "WUTIS Group") accepts any liability whatsoever for any direct, indirect or consequential losses (in contract, tort or otherwise) arising from the use of this document or its contents or any reliance on the information contained herein. WUTIS Group is not responsible for any specialist advice, including legal, regulatory, accounting, model accounting, tax, actuarial or other advice.

This document was prepared on the basis of information and data, obtained from publicly available sources and, where applicable, from you and/or any other entity that may be involved in any transaction or matter contemplated by this document (and/or any of your or the aforementioned entities' affiliates), in each case prior to or on the date hereof. The information in this document has not been independently verified by WUTIS. WUTIS has relied on any information provided by you or from third party or public sources as complete, true, fair, accurate and not misleading. With respect to any financial or operating forecasts and analyses provided to it, WUTIS has assumed that they are achievable and have been reasonably and properly prepared on bases reflecting the best currently available information, estimates and judgments as to the future financial performance of the entity(ies) to which they relate and that such forecasts or analyses would be realised in the amounts and time periods contemplated thereby. No member of the WUTIS Group, makes any warranty or representation, express or implied, as to the accuracy, completeness or reasonableness of the information (including projections and assumptions) contained in this document whether obtained from or based upon third party or public sources or otherwise.

This document is given as at the date hereof, may not be final, is based on information available to WUTIS as at the date hereof, is subject to any assumptions set out therein and is subject to change without notice. Accordingly, this document may be based on (a) data and information that may no longer be current and (b) estimates that may involve highly subjective assessments. It should be understood that subsequent developments may affect this document and the WUTIS Group does not undertake any obligation to provide any additional information or to update any of the information or the conclusions contained herein or to correct any inaccuracies which may become apparent. Any data or information regarding, or based on, past performance is no indication of future performance.

Members of the WUTIS Group are involved in a wide range of commercial banking, investment banking and other activities out of which conflicting interests or duties may arise. In the ordinary course of its business, the WUTIS Group may provide services to any other entity or person whether or not a member of the same group as you (a "Third Party"), engage in any transaction (whether on its own account, on behalf of any Third Party or otherwise, and including any transaction or matter contemplated by this document), notwithstanding that such services, transactions or actions may be adverse to you or any member of your group, and the WUTIS Group may retain for its own benefit any related remuneration or profit. The WUTIS Group operates in accordance with a conflicts of interest policy which identifies conflicts of interest it faces in the ordinary course of its business, and establishes organisational and procedural measures to manage those conflicts where it is reasonably able to do so. Neither WUTIS nor any other part of the WUTIS Group shall have any duty to disclose to you or utilise for your benefit any non-public information acquired in the course of providing services to any other person, engaging in any transaction (on its own account or otherwise) or otherwise carrying on its business. WUTIS' research analysts and research departments are independent and are subject to certain regulations and internal policies. WUTIS research analysts may hold opinions and make statements or investment recommendations and/or publish research reports with respect to any company referred to herein, the transactions contemplated herein or any person or entity involved therein or related thereto that differ from or are inconsistent with the views or advice communicated by WUTIS.