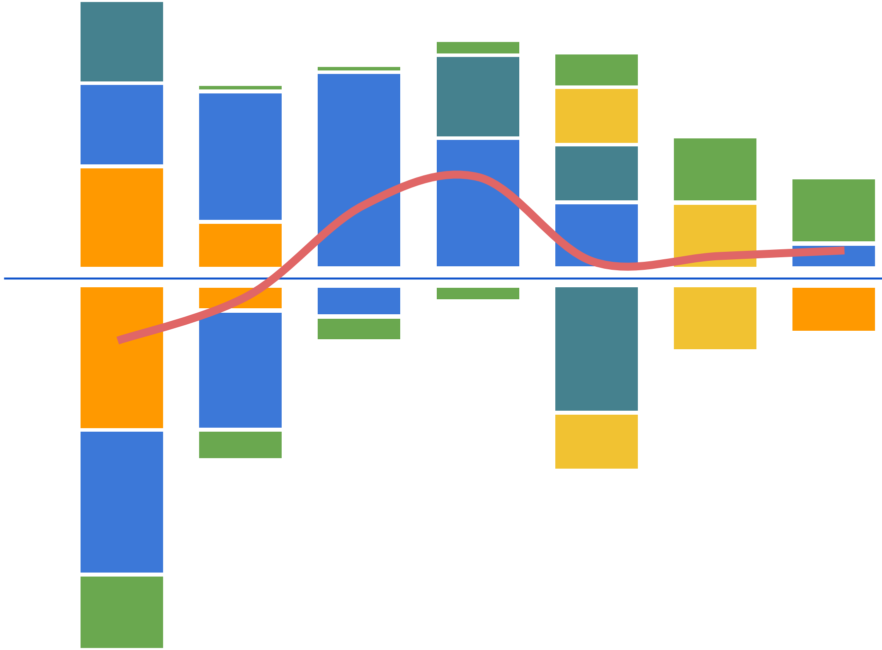


Interest Rate Risk: deviation from the plan and proposed measures.

ALCO, 17 April 2023

ALM Risk Division

Contents

Abbreviations

The following abbreviations and definitions are a result of simplification of the original. Original abbreviations and definitions may be found in internal risk documents and EBA guidelines.

ALCO - asset and liability committee. Manages interest rate risk, liquidity risk and exchange-rate risk.

ALM - asset and liability management.

IRR (IRRBB) - interest rate risk (of the banking book). Potential losses due to change in interest rates (banking book means the exclusion of Trading operations).

ECAP - economic capital. Money required to cover potential losses from risk.

Risk Appetite - amount of potential losses which the Execute Board has agreed to tolerate.

Stress rates scenario - a scenario in which future market rates significantly differ from expected.

(Δ)NII - (a change in the) net interest income on 1 year horizon.

(Δ)EVE - (a change in the) economic value of equity (or balance sheet cashflows) as a result of change of the market interest rates.

FTP - funds transfer pricing. Rates at which Treasury borrows from and lends to business units.

Summary (plain text)

At the end of 2022 Risk Management has assessed the capital required to cover the risk in 2023 based on a business plan draft. In January 2023 the plan for mortgage loans has been exceeded, as Retail business unit sees an opportunity to grow its mortgage portfolio and increase the bank's market share in retail segment due to the temporarily increased demand.

Exceeding the planned mortgage portfolio has affected the EVE limit utilization, which is now in the yellow zone. This is a situation of elevated interest rate risk, which requires an action from ALCO due to the Interest rate risk Policy (based on the paragraph 44(e) of the EBA guidelines), which has been last updated and approved by the Board in the end of 2022.

ALM risk management team proposes a hedge in the form of IRS (Treasury), partial securitization of mortgages (MBS issue in the long term), and a long-term corporate liability, as discussed with the Corporate business unit. Treasury proposes a motivational correction of FTP rates.

Proposed IRS measure + Corp Deposit will result in a drop of the risk utilization from the current 92% to 87% (green zone). Any one of these measures is enough to maintain the risk till the end of the 2023. The effect has been modeled in ALM system and double-checked manually by the team.

The cost of the Corporate deposit has to be negotiated with the Client. For this cost we get (besides IRR decrease): LCR increase (drop in denominator), NSFR increase (liability term increase -> larger coeff.). The cost will be allocated on the Treasury through the introduction of an FTP premium.
For discussion: Is there a need to lift the whole FTP curve on the long end in order to motivate business units to prefer the new long-term borrowings over short-term?

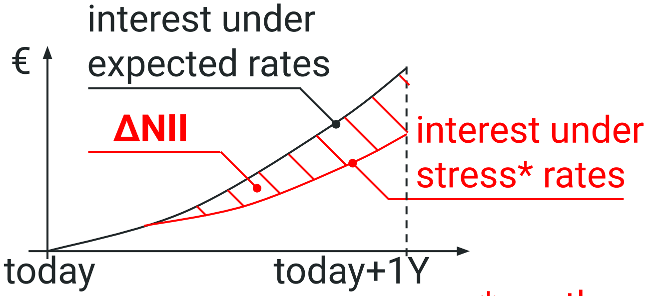
Current situation: Elevated exposure to IRRBB

! **Soft limit breach (warning level)**:
Economic Capital for the risk (**ECAP**) has grown into the **yellow zone** of the approved **Risk Appetite**:
IRR ECAP **yellow zone** = max(**ΔNII, ΔEVE**); **red zone** = max(**ΔNII, ΔEVE**) × 1.02 (model risk adj.)

ECAP

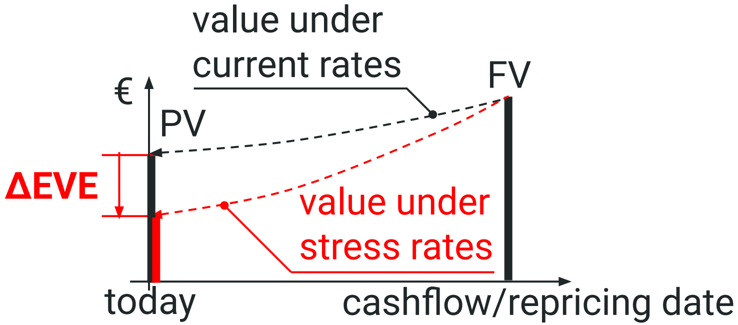
Possible drop in Net Interest Income - **ΔNII**

! Possible loss of Economic Value of Equity - **ΔEVE**



*see the model details slide

Limit	€ 0.9 B
Utilization	€ 0.8 B, 89%



Limit	€ 5.080 B
Utilization	€ 5.084 B, 100.1%

Planned vs Actual exposure to IRRBB

Business plan 2023 includes an estimation of the future exposure, upon which the limit is based.

	€, B (fact/plan)	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23
Assets	Retail	94/91	98/92	102/93	94	95	96	97	98	99	100	101	103
	Corporate	147	149	150	152	153	155	156	158	159	161	162	165
	Wholesale	35	35	35	35	35	35	35	35	35	35	35	35
	Bonds	57	58	58	59	59	60	60	61	61	62	62	63
	Derivatives	12	12	12	12	12	12	12	12	12	12	12	12
	TOTAL	**345**	**351**	**357**	**351**	**354**	**357**	**360**	**363**	**366**	**369**	**372**	**378**
Liabilities	Retail	32	32	33	33	33	34	34	34	35	35	35	36
	Corporate	217	218	220	221	222	223	225	226	227	228	230	232
	Wholesale	68/65	71/65	74/65	65	65	65	65	65	65	65	65	65
	Bonds	35	36	37	38	38	39	40	41	42	43	43	45
	Derivatives	12	12	12	12	12	12	12	12	12	12	12	12
	TOTAL	**364**	**369**	**375**	**368**	**371**	**373**	**376**	**378**	**380**	**383**	**385**	**390**
	ΔEVE:	4.694	4.889	5.084	4.677	4.721	4.766	4.810	4.855	4.899	4.944	4.989	5.078

current utilization

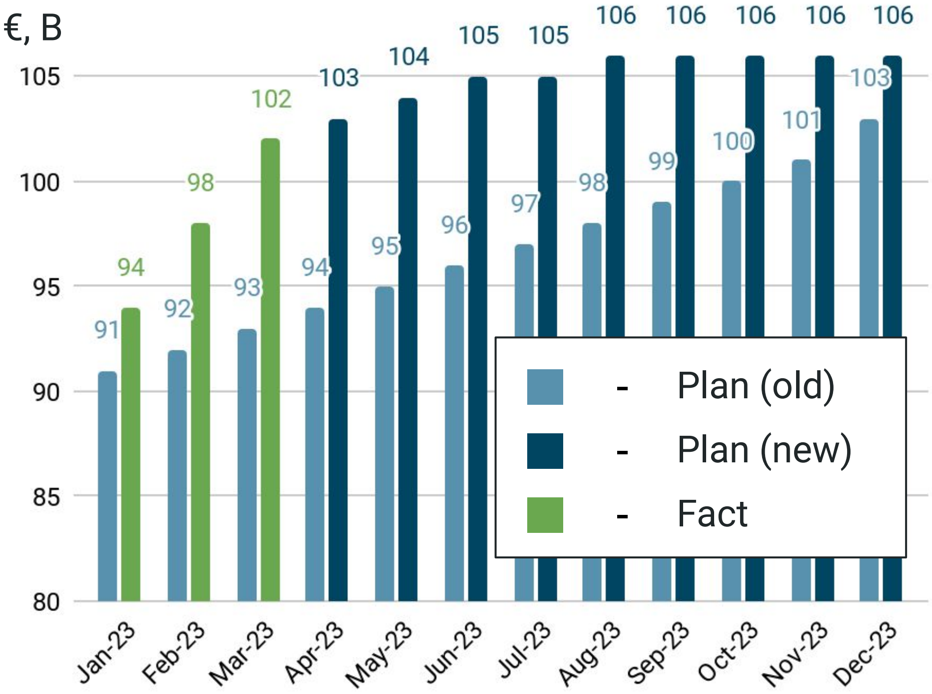
limit base

The root cause of the elevated exposure to IRRBB

The Retail business plan has been revised* to capture the market share growth opportunity created by the current high demand. Analytics believe the demand anomaly is brought by the soaring rates.

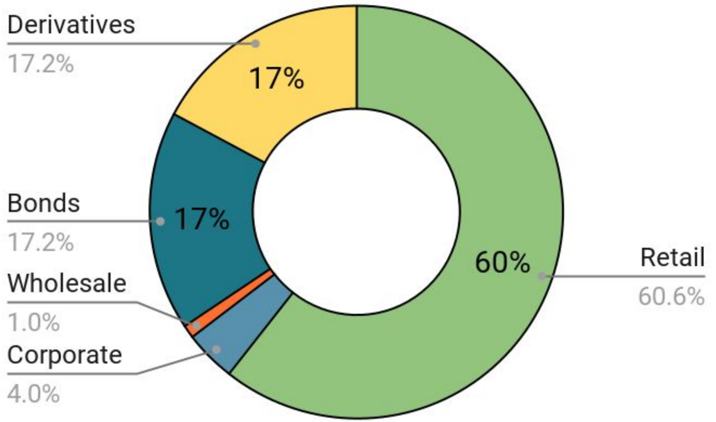
Retail loans volume Plan/Fact:

€, B



Mortgages are the "longest" assets, making **ΔEVE** measure most sensitive to changes in the Retail portfolio.

ΔEVE sensitivity by asset type, %:



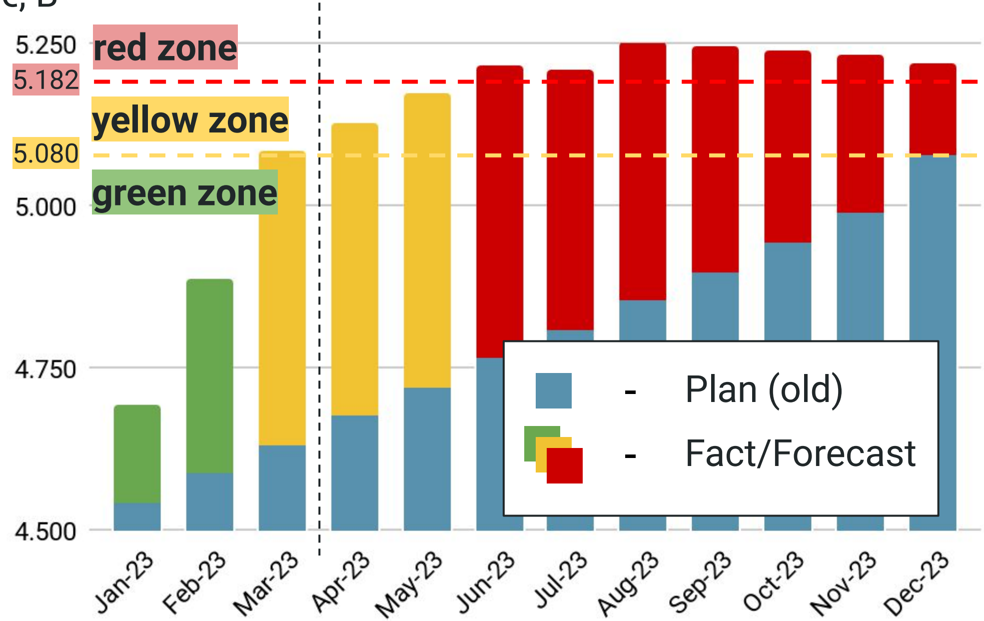
*Budgeting committee res. #23, 21.03.2023.

IRRBB exposure forecast

! The IRRBB exposure forecast shows that ECAP will enter the **red zone** of Risk Appetite in June 2023. Forecast has been built in the RM* system and verified manually in Python. All models used during calculation have been validated by the Validation Group according to the ICAAP procedures.

ΔEVE Plan/Fact/Forecast:

€, B



According to the ICAAP procedures, the following actions can be taken by ALCO:

1. Limit adjustment

! Unfeasible due to regulatory concerns (see the next slide).

2. Position adjustment

! Unfeasible - decision on the portfolio extension has already been made**.

3. Hedging

Feasible. See the proposed resolution.

*See the IT Architecture reference slide.

**Credit committee res. #487, 17.03.2023; Budgeting committee res. #23, 21.03.2023.

Regulatory concerns

Given enough available capital, using the **shortcut rule** allows to pass the Executive Board in 2 months for ECAP rebalancing and KPI adjustment. But SREP requirements for 2023 and CSRBB introduction make the Bank tight on capital in terms of the **Business Continuity and Recovery Plan** (**BCRP**), which is approved at the Supervisory Board level.

ECAP/Limit change checklist:

- ✅ ECAP redistribution: possible in 2 months
- ✅ Treasury KPI update: possible in 2 months
- ❌ Capital sufficiency (BCRP): **not enough capital**

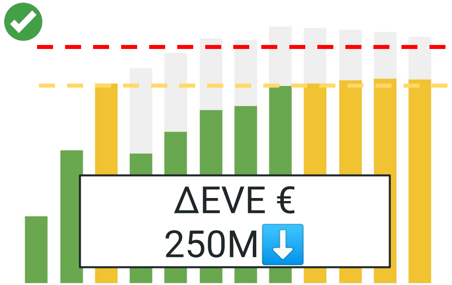
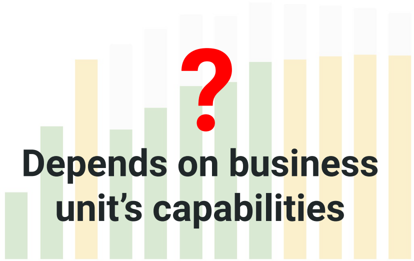
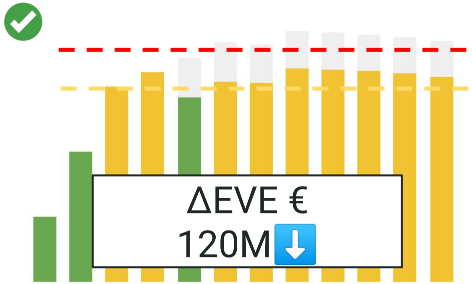
Levels of approval:

ALCO (1-2 weeks)	**Executive Board (2 months*)**	**Supervisory Board (3+ months)**
IRRBB and CSRBB limits	ECAP redistribution	Risk Appetite
Gap risk	KPIs	BCRP
Basis risk		
Option risk		

*a shortcut in corporate procedures allows for faster approval of local changes in the business plan

Suggested measures and associated costs

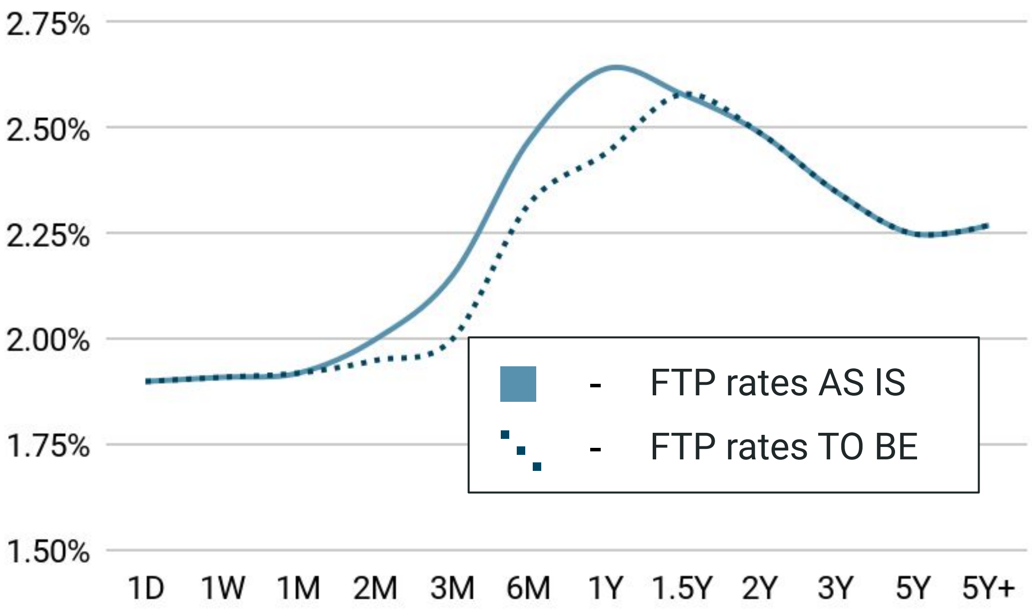
ⓘ The following measures to reduce the risk exposure may be taken by Treasury (mortgage securitization is not included because it takes around 6 months to issue MBS):

Proposed measure:	IRS hedge (3Y, € 9.5B OIS)	FTP curve adjustment	Long-term (5Y, € 3B) Corporate Deposit
Expected effect:			
Cost:	10bp, € ~10M/year	€ ~0	TBA
Time to effect:	1 day	~1 month	~2 weeks
Suggested action:	Wait for the feedback from FTP adjustment	Implement ASAP (details on the next slide)	Communicate the cost with the Client

FTP adjustment (proposed by Treasury)

In order to motivate business units to borrow long-term and lend short-term, Treasury proposes to lower the FTP yield curve on short tenors following the recent decline of the long-term market rates.

Proposed change of the FTP yield curve, %:



	AS IS	TO BE	Δ
1D	1.90%	1.90%	-
1W	1.91%	1.91%	-
1M	1.92%	1.92%	-
2M	2.00%	1.95%	-5bp
3M	2.15%	2.00%	-15bp
6M	2.47%	2.32%	-15bp
1Y	2.64%	2.44%	-20bp
1.5Y	2.58%	2.58%	-
2Y	2.49%	2.49%	-
3Y	2.35%	2.35%	-
5Y	2.25%	2.25%	-
5Y+	2.27%	2.27%	-

Proposed ALCO resolution

ALM Risk Division proposes to initiate hedging of IRR-bearing position with respect to the available 2-month term.

1. Approve changes to the FTP curve: 2M -5bp, 3M -15bp, 6M -15bp, 1Y -20bp, **effective 17.04.2023**;
2. **Corporate Business Unit**, until **01.05.2023**: communicate rate conditions for the 5Y € 3B corporatie deposit and inform Treasury and ALM Risk on the result;
3. **ALM RIsk**, until **01.06.2023**: report on the effect of the FTP correction on risk metrics.

Reference slides

- ❏ RM system architecture: Data Flowchart for IRR data
- ❏ Interest rates model

RM system architecture: Data Flowchart for IRR data

Data Sources (IT-managed)

Back office:
- Accounts
- Amounts
- Transactions
- Contracts

Corporate Data Warehouse (**DWH**)

Trading System:
- Deals
- Positions
- Market data

Data Storage & Preprocessing (ALM Risk-managed)

ALM Risk DB (Data mart):
- Latest date slice
- Contracts: historical
- Amounts: historical
- Cashflows: historical
- Rates: historical
- Product trees markup
- Time series for model fitting
- **Dynamic balance sheet**

Data QA on loading (ETL) to ALM Risk Data mart

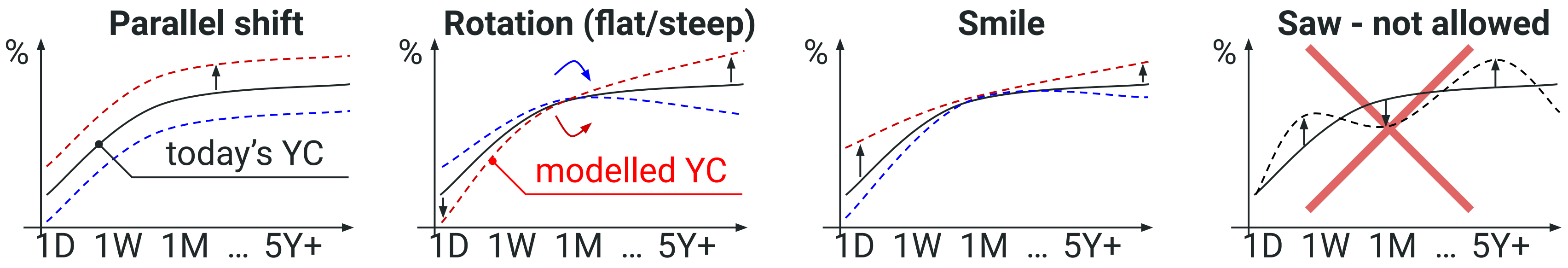
Data Processing (ALM Risk-managed)

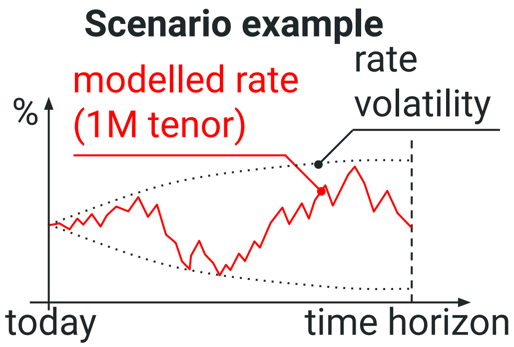
Python **models**:
- Monte-Carlo simulation of interest rates
- Prepayment models
- Embedded options
- Non-maturity Deposits
- Product rate sensitivity

Spreadsheet analysis:
- Pivot data analysis
- Charts for reporting
- Numerical data for ALCO presentations
- Audit & Validation

Interest rates model

The goal is to produce a set of 10 000 scenarios of the yield curve (YC) for every day of the given time horizon. For the resulting curves to appear realistic, the perturbations are constrained as follows:





- Having generated the curves (see github.com/asozykin for maths and code), we calculate PnL resulting from the change in interest rates for each scenario.
- Average PnL over 1% (100 out of 10 000) of scenarios with the lowest PnL gives us the value of the risk metric ΔEVE or ΔNII.