



Reacfin

Seasonal Breakfast



The use of Business Projection Tools to support decision-making & management actions in Financial Institutions

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- **Overview of Business Projection Tools**
 - What are Business Projection Tools?
 - Increased need for both stochastic and deterministic projection tools
 - Typical architecture of Business Projection Tools, organization, processes, modeling approach and sound practices
- **Case studies of practical applications:**
 - For an Insurance Company
 - For a commercial bank
- **About Reacfin's offering**

Overview of Business Projection Tools

What are Business Projection Tools?

- Forward-looking cash-flow models
- Used to project economic & financial situation of companies under predefined (sets of) scenario's
 - Balance Sheet
 - Income Statement
 - Off-Balance sheet items
 - Solvency & Liquidity ratios
- **In Book Value** (possibly under various accounting standards)
- **In Fair Value**
- **For cash-flows**
- **Sensitivities (e.g. durations, etc.)**
- What scenario's for which use
 - **Stochastic (Monte-Carlo) simulations**
 - Forward looking Risk Assessments of as-is business
 - Business-mix assessments
 - Portfolio allocations and optimization
 - **Deterministic scenarios**
 - Business plans & budgeting
 - Stress testing

Overview of Business Projection Tools

Increasing need for Business Projection tools

Regulatory requirements

Banking CRR/CRD

Including Pillar 2 with forward looking risk appetite requirements (ICAAP/ILAAP, ORSA, Pillar 2 guidance, etc.)

Insurance Solvency II

EMIR

Including collateral & clearing obligations

Supervisors assessments

Additional stress-testing, scenario analysis, local supervisors requirements

IORP & pension funds rules

(Local) standards wrt. to endowments requirements

etc.

Accounting standards

IFRS 9
Financial Instruments

Including forward looking credit risk assessments

IFRS 17
Insurance Contracts

Including valuation of complex embedded optionality

etc.

Evolving clients behaviors

- Rates sensitive Mortgages prepayment
- Dynamic lapses on insurance contracts
- Market sensitive savings & investment preferences
- etc.

Standard business decisions may have consequences which become challenging to estimate intuitively.

Management increasingly needs reliable & exhaustive assessment of proposed business decisions.

While many institutions have developed advanced models for Risk and Capital Management purposes, such tools often prove too heavy to support day-to-day decision making.

Overview of Business Projection Tools

Added value for management

Concept

- Develop **“agile” Business Projection Tool** to support management decision
- Tool ran in parallel with detailed internal models (but periodically reconciled with these models through recalibration and model review)

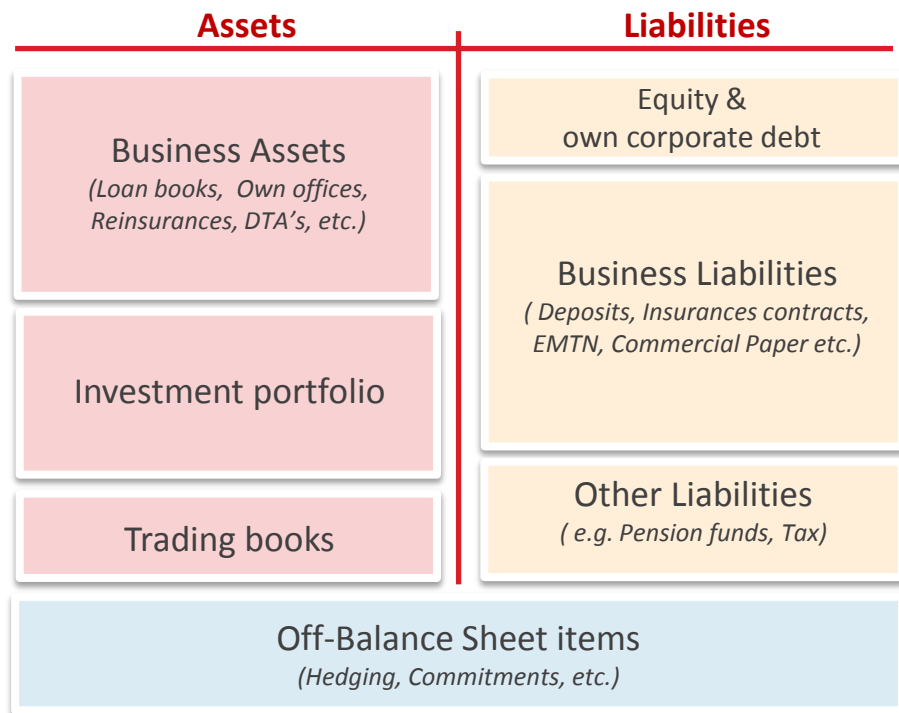
Benefits

- Systematic assessment of potential decisions consequences
- Allowing more options to be assessed without creating bottlenecks at main internal models used
- Quantifying benefits and risks related to the potential choices (and allowing stronger rationales to be prepared by the operational teams)
- Allows to rationalize “combination of solutions” in case of expected problem (incl. assessing the materiality of the effort to be considered in each solutions and identifying synergies among the different solutions considered).
- Pre-optimizing decisions (usually to be confirmed by detailed internal models) allowing for faster and economically sounder decision (directly supporting the company’s bottom-line)

Overview of Business Projection Tools

A business-centric approach

Full Business items projection



Different dimensions

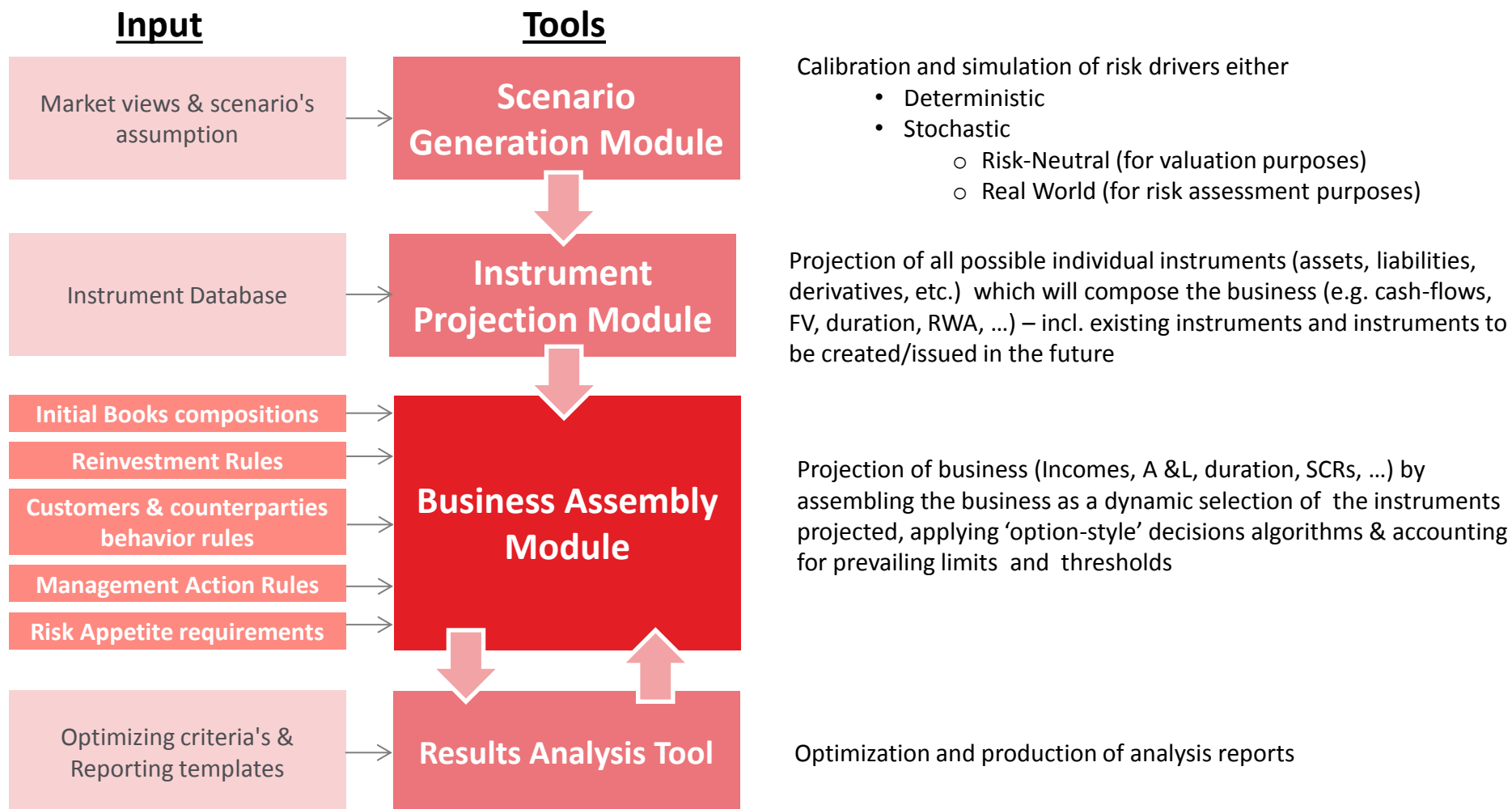
Taking into account

- the company's **business model** & balance sheet
- The company's **business strategy** (incl. commercial developments, dividend strategy, funding strategy, etc.)
- medium & long-term **risk appetite** (incl. diversification requirements)
- the **capital requirements** (i.e. CRD/CRR, Solvency II)
- **Accounting** framework
- Potential impacts on the company's **liquidity** profile
- **Various sets of assumptions** for future market conditions

Develop simplified business projection tools **sufficiently precise to ensure reliability** & exhaustiveness but **sufficiently "agile" to enable day-to-day use** in management decision support (e.g. to validate proposed management actions).

Overview of Business Projection Tools

A Typical model architecture



Overview of Business Projection Tools

Organization and processes to calibrate the model input

Market views & scenario's assumption

- A “base case” set of assumptions for Real-World stochastic assumptions and deterministic assumptions is **defined centrally on a periodic basis** (e.g. Annually by the Economic Research department or by external service providers).
- Real World assumptions are **underpinned by a “market view story line”**
- If **calibration for valuation purposes** (Risk Neutral) are required they will typically be updated more frequently **considering prevailing market conditions**.

Instrument Database

- Data basis of **all possible instruments** (Assets, Liabilities, Off-Balance Sheet)
- **Defined centrally** and reviewed on periodic basis (e.g. annually), either by internal model owners or by external service providers and **reconciled** (e.g. FV, durations, Book Value, RWA/SCRs) for “as-is position
- Typically requiring **model-points aggregation** (in particular for granular instruments such as loans)

Initial Books compositions

Reinvestment Rules

Customers & counterparties behavior rules

Management Action Rules

Risk Appetite requirements

- Managed centrally by model owners – typically reviewed and reconciled on periodic basis (annually to quarterly)

- Set of standard assumptions defined annually by model owners and validated by management
- Amended on request of Management along the specificities of the simulations required

Optimizing criteria's & Reporting templates

Who is typically the central owner of the model?

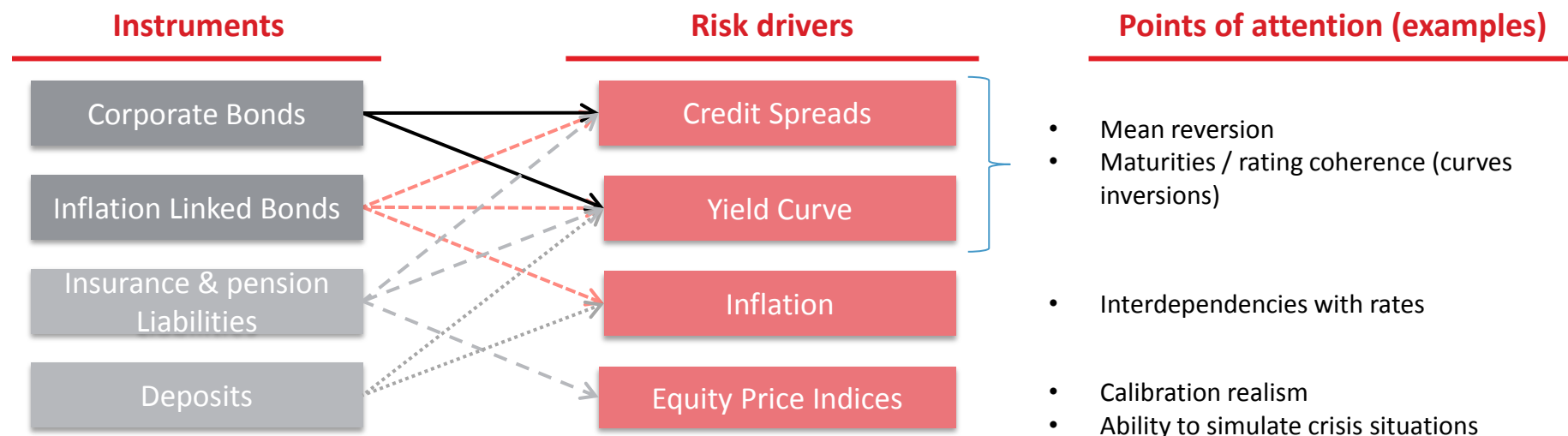
- At Banks: Central Risk, Finance, ALM or CPM
- At insurance companies: Rather Risk to ensure coherence with SII projection models

Overview of Business Projection Tools

Building the scenarios: A methodology based on risk drivers

To capture the dynamics and interdependencies of the various business components, Business Projection Tools will simulate risk drivers, not prices

- Risk Drivers are the fundamental parameters (the building blocks) which determine the risk & performance profile of a specific asset or liability
- E.g. in the market risk model a mapping is needed to picture the evolution of the asset prices through the evolution of a limited number of risk drivers.

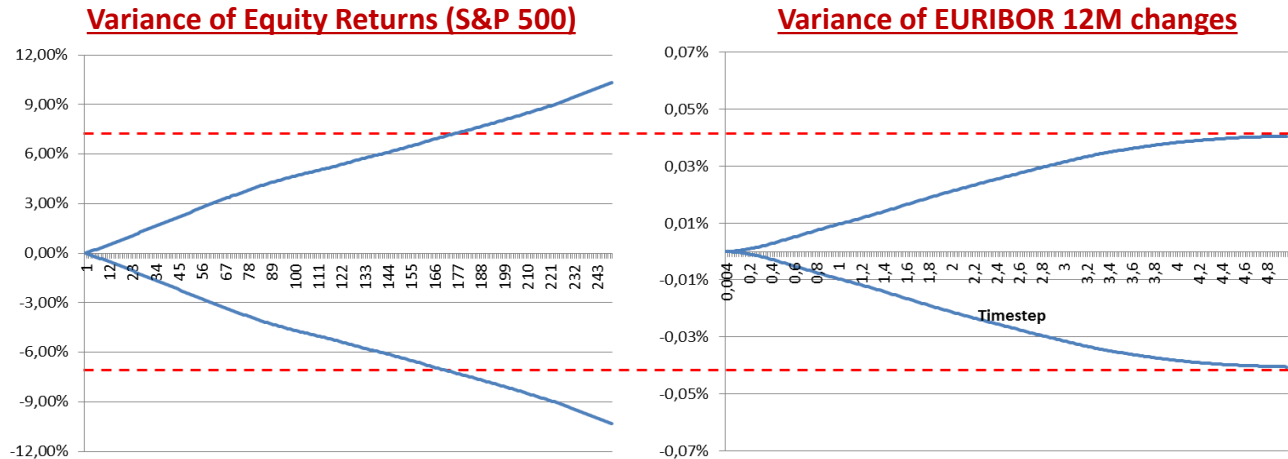


Attention point: Calibration the scenarios (whether deterministic or stochastic Economic Scenario Generators) must be carefully organized and automated as it proves among the largest workloads

Overview of Business Projection Tools

Example of challenges with the calibration of scenarios: Interest rates Mean Reverting levels

- Unlike Equities, real estate or commodities, interest rates tend to show empirically that their dispersion stabilizes over time.



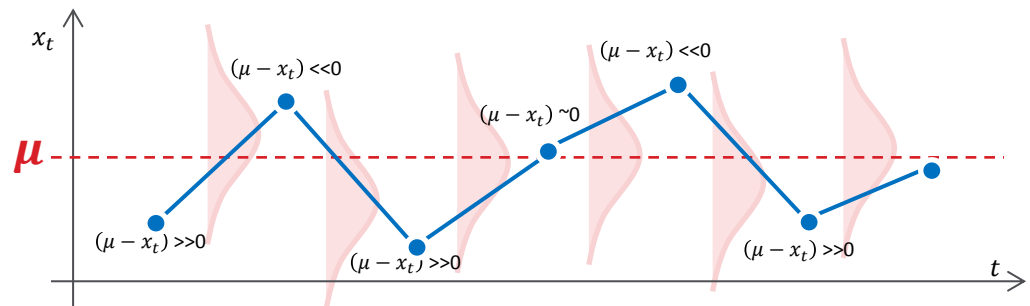
- A common stochastic modeling approach is to use Mean-Reversion process of the type Ornstein-Uhlenbeck

$$x_t = \underbrace{\theta(\mu - x_t)dt}_{\text{Time dependent drift term}} + \underbrace{\sigma dW_t}_{\text{Volatility Term}}$$

Where,

- μ = Mean Reversion level (i.e. long term average value for x)
- θ = mean reversion speed
- σdW_t = Wiener process (i.e. Normally distributed increments) with standard deviation σ

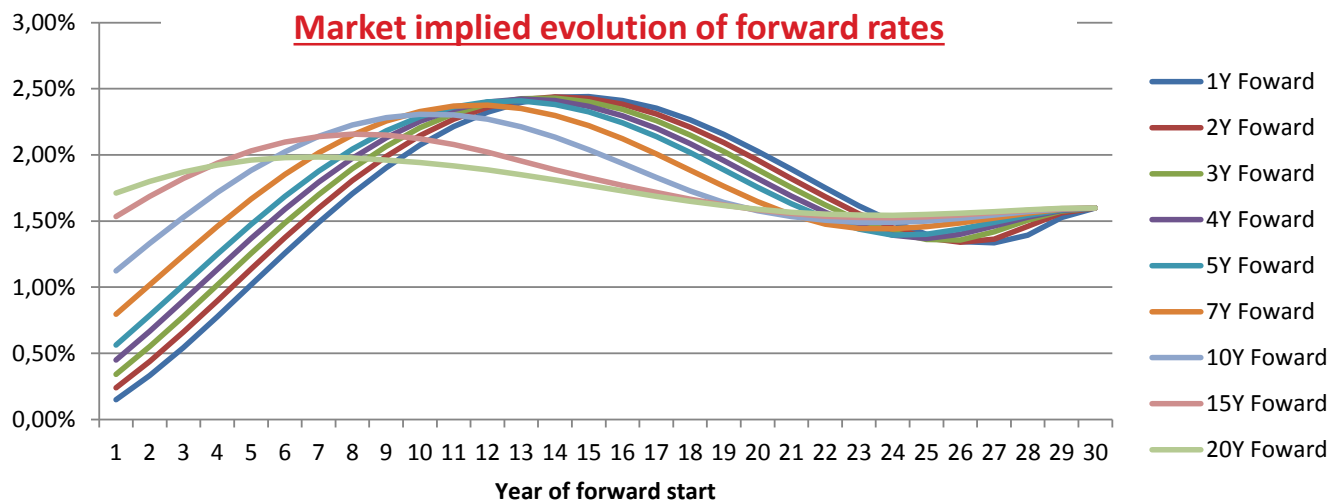
When x_t is above (resp. below) the long term average μ the drift term is negative (resp. positive) so that the process is pulled downwards (resp. upwards).



Overview of Business Projection Tools

Example of challenges with the calibration of scenarios: Interest rates Mean Reverting levels

- Calibrating mean-reverting levels to reflect Real-World assumptions should ensure a **intuitive and commonly agreed** average scenario's could realize (e.g. respecting the a common view on reasonably acceptable yield curves).
- Sound practices will:
 - Start from **market views** based on Macro-Economic rationale
 - Consider **time dependent mean-reverting levels** (μ_t) to better control the evolution in time, yet limiting the number of points where the mean-reversion level is reset (to keep the model sufficiently simple)
 - **Avoid over reliance on long-term historical averages** (Historical rates decreases could induce unrealistically high mean reversion levels)
 - **Don't rely on "risk neutral"-like calibrations:** for instance using the market implied forward rates as future mean reversion levels will typically induce unrealistic assumptions of long lasting yield curve inversions



Overview of Business Projection Tools

Instruments projections: concept

- **Concept:** pre-computing instruments universe (Assets, Liabilities, Off-Balance Sheet) across the entire simulation horizon for all considered scenarios
- Sound practices for the modeling of liabilities may include replicating portfolio's approach to best model interdependencies
- All "stand-alone" characteristics of the instruments get precomputed (e.g. Cash-Flows, Fair Values, Book Values, Durations/convexities, stand-alone RWA/SCR characteristics, etc.)
- **Example:** Assume you allow investment in A-rated 3y corporate bonds on a 5 years horizon, the instrument projection tool will precompute:
 - The characteristics of 3y corporate A-rated bonds invested in the past (i.e. 1, 2 and 3 years ago) which will be used to compose the balance-sheet "as-is"
 - The characteristics of 3y corporate A-rated bonds invested currently
 - The characteristics of 3y corporate bonds, across the different rating classes which will be investable instruments in the future i.e.
 - Forward starting 3years instruments in 1, 2, 3, 4 and 5 years
 - Need to foresee all rating classes as a result of potential rating migrations

Results in large database of instruments which will be used as building blocks by the "Business Assembly Module".

Batch pre-computation fasten the next business simulations and will facilitate the model's testing & reconciliation.

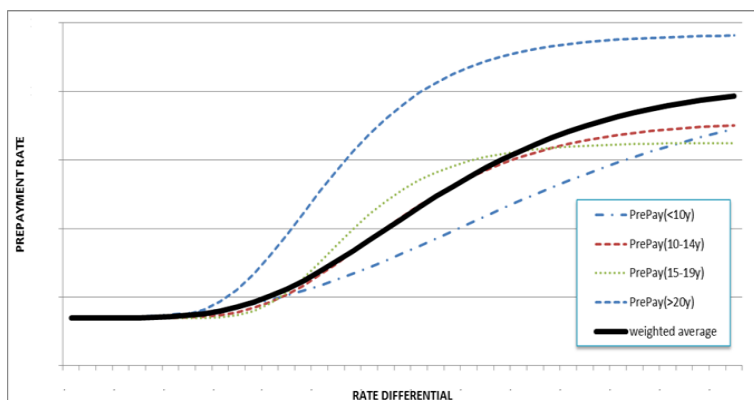
Overview of Business Projection Tools

Business assembly module – Sound practices

- Initial Books composition: **Carefully reconcile the “as-is” balance-sheet** modelled in the simplified with the results obtained by the central/production models (incl. Book Value, Fair Values, Durations, etc.). Short-cuts used in either models may create material discrepancies.
- Reinvestment rules: **Keep them simple!** No model will adequately reproduce market inefficiencies which would justify advanced trading strategies. Sound practices may consist in simple “Buy & Hold” strategies which only get rebalanced when Risk Appetite limits/tolerances are breached (e.g. Downgrades, Equity allocation, etc.).
- Customer/counterparties behaviors: **Modelled as options** (e.g. prepayment/lapses behaviors based on market rates, evolution of demand/volumes given market conditions, etc.) but like for reinvestment rules, **keep them simple and limit their numbers** to keep a model who’s results are intuitively understandable (i.e. for which one will remain able to assess the quality of results).
- Management actions: Like for customer/counterparties behaviors, they will typically be **modelled as options** and must be kept **limited in numbers and reasonably simple**.

Examples:

Modeling life insurance lapses or mortgage prepayments as logit-functions of rates differentials



Modeling dividend policies as path dependent options

$$Div(t) = \max[Div(t - 1); x * Net\ profit(t)]$$

Where,

$Div(0)$ = last dividend paid/announced

x = targeted proportion of dividends to be paid

Such stable & growing dividend may induce more events of stress in the simulations as no condition is set for dividend suspension (e.g. condition on solvency level).

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- **About Reacfin's offering**

Case Study

Insurance

Case Studies: Insurance

Description Initial Balance Sheet

- **Current Asset Allocation:**
 - Govies: 70% (AA rating , average duration of 10 years)
 - Corporates: 20% (A rating, average duration of 2,5 years)
 - Equity: 6%
 - Property: 3%
 - Cash: 1%
- **Current Business Mix**
 - Group Insurance: 33%
 - Individual Insurance: 66%
- **Other**
 - Duration gap of 2,5 years
 - Solvency Ratio of 250%

Case Studies: Insurance

Base Case Assumptions

- **Dividends**: 100% of net profit is distributed as dividend
- **Operational Costs**: 90bp of the total bookvalue
- **Pricing new Production**:
 - Group Insurance: minimum guaranteed rate by law
 - Individual insurance: OLO 10Y
- **Target Asset Allocation**:
 - Govies: 70% (AA rating , average duration of 10 years)
 - Corporates: 20% (A rating, average duration of 2,5 years)
 - Equity: 6%
 - Property: 3%
 - Cash: 1%
- **Target Business Mix**
 - Group Insurance: 33%
 - Individual Insurance: 66%

Case Studies: Bank

Methodologic Notes

- **Modeling Granularity**
 - Assets
 - Investment portfolio → line-by-line
 - Liabilities
 - Insurance liabilities → model points (based on remaining maturity, coupon, etc.)
- **Projection market values/Best Estimates/Durations**
 - Full repricing based on economic scenario
- **Projection accounting**
 - IFRS accounting rules
- **Projection Solvency Capital Requirements (SCR)**
 - SCR Interest Rate Risk: full evaluation
 - SCR Spread: full evaluation
 - SCR Equity/Property: full evaluation
 - SCR Default: predefined % of asset classes
 - SCR Life: predefined % of best estimate
 - Aggregation according the SII correlation matrices

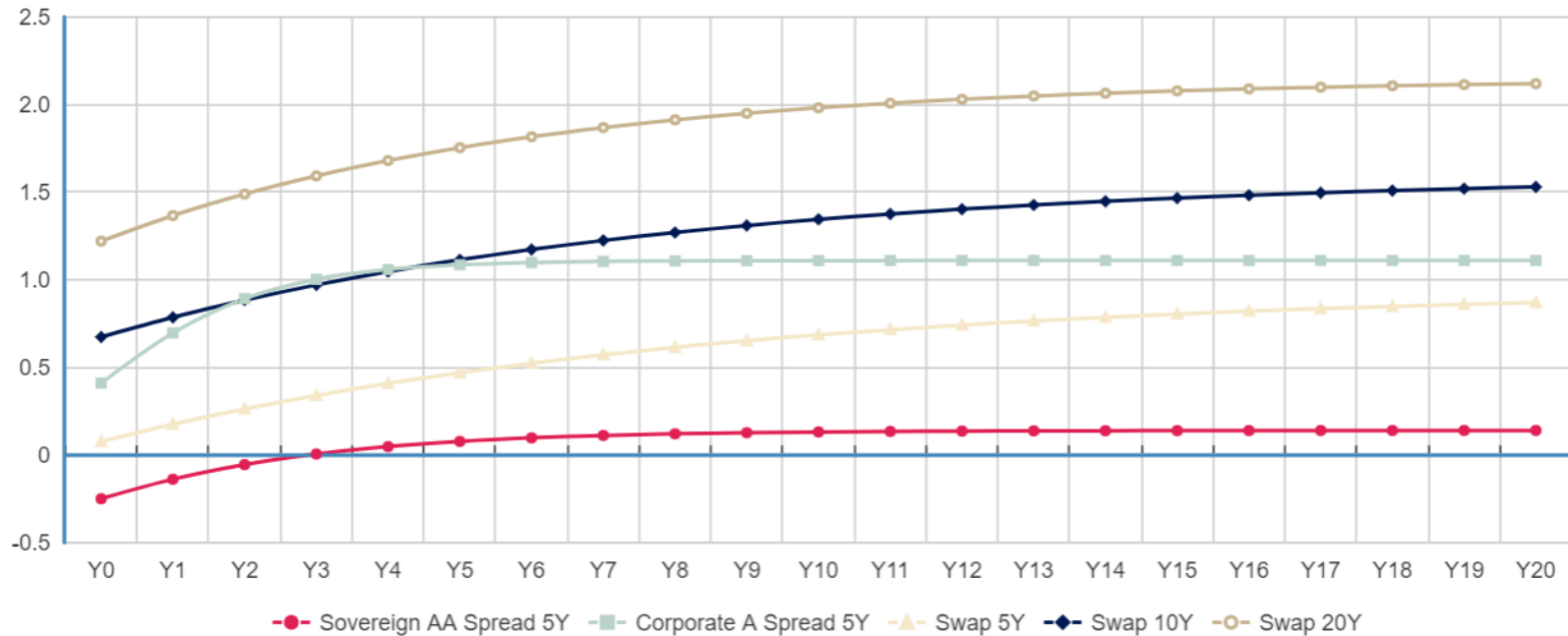
Case Studies

Financial Markets Scenario

- Starting point: year-end 2016
- Interest rates and spreads are expected to increase but remain low in historical perspective

Evolution main ESG risk drivers

Rates (%)



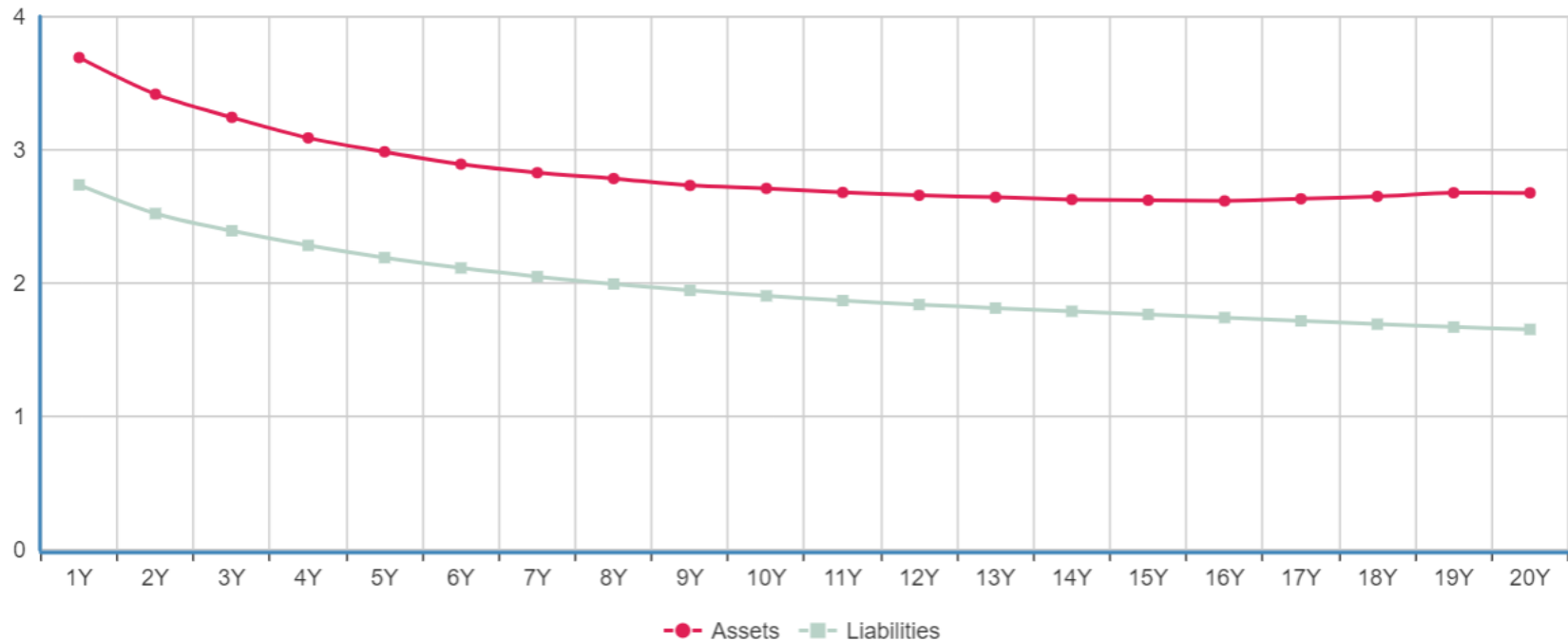
Case Studies: Insurance

Base Case Results

- Key observation 1 : **reduced profitability** over the next 5-10 years.

Profitability: mean scenario

Book Value Returns (%)



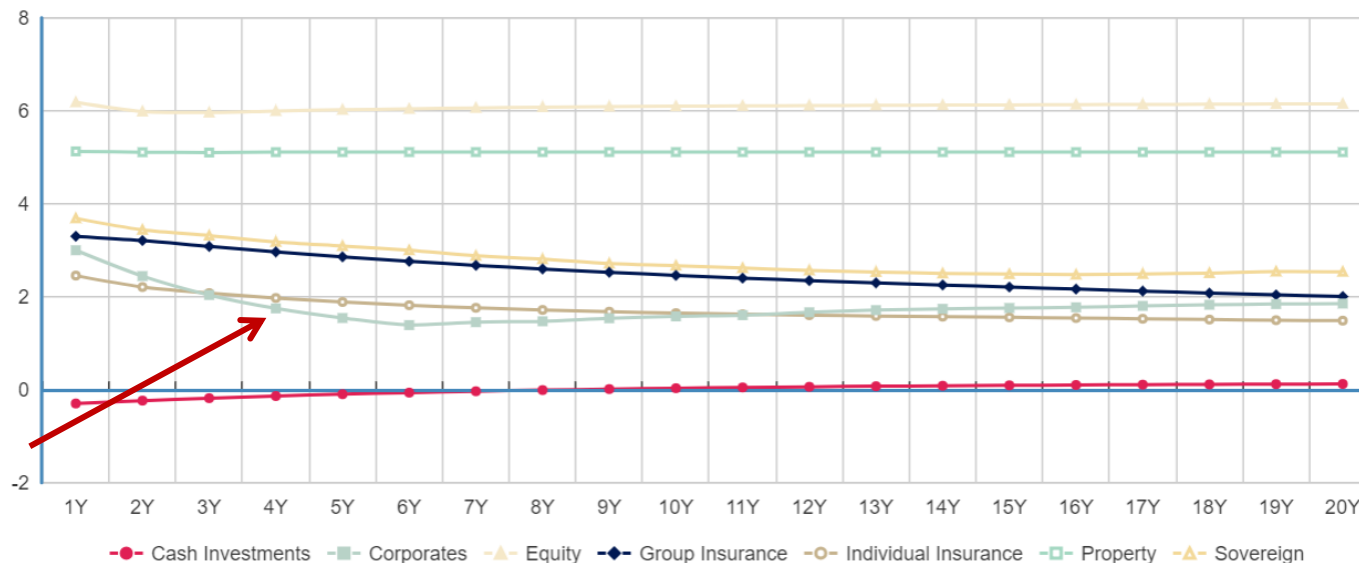
Case Studies: Insurance

Base Case Results

- Reduced profitability comes from the fact the insurance company has invested too short, mainly due to investments in corporates which have to be **reinvested at interest rates which are lower than the guaranteed rates** on the insurance portfolio.

Profitability: mean scenario

Book Value Returns (%)



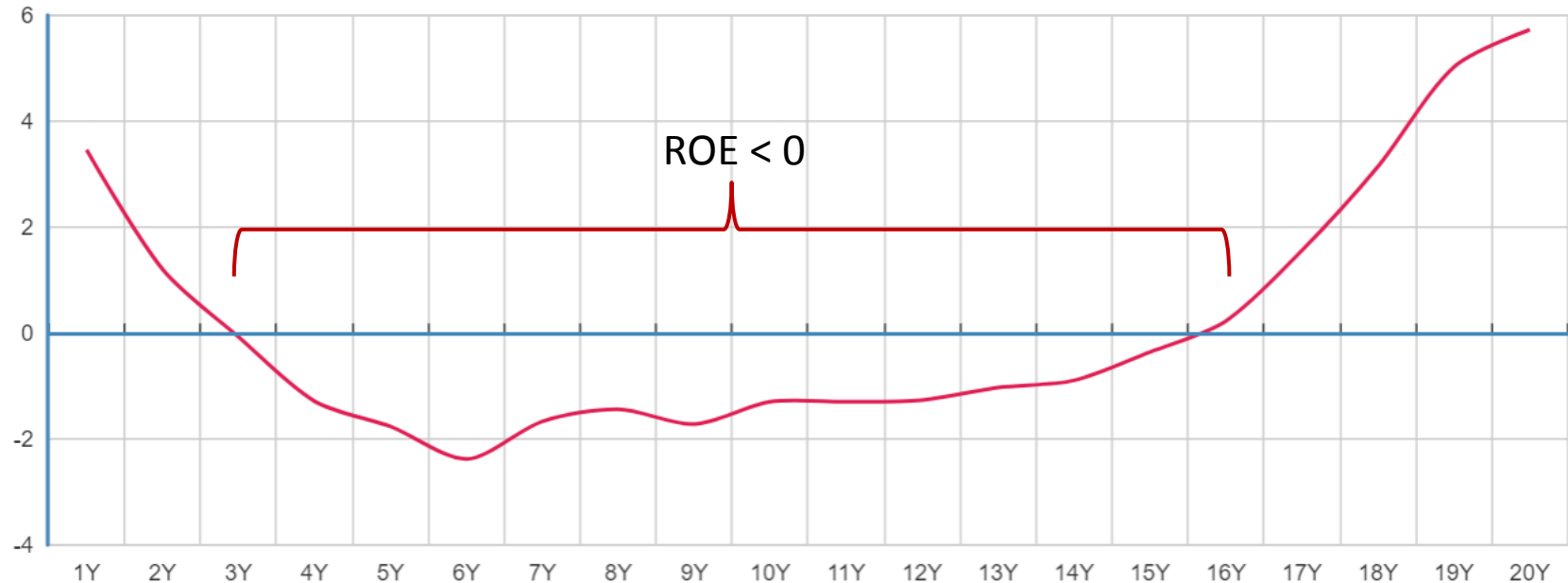
Case Studies: Insurance

Base Case Results

- Reduced profitability results in **negative return on equity** (since financial margin < operational costs)

Profitability: mean scenario

Return (%) on Equity



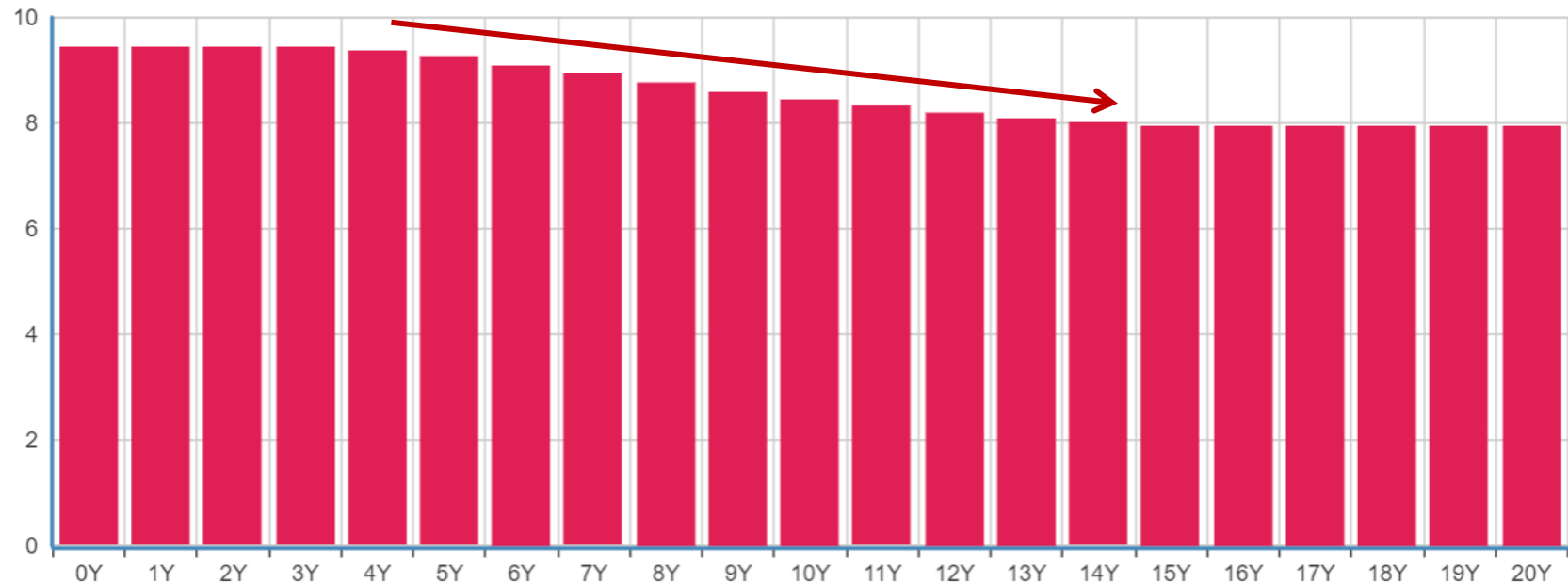
Case Studies: Insurance

Base Case Results

- Negative P&L results in reduction of book value own funds

Book Value Own Funds: mean scenario

Amounts in EUR



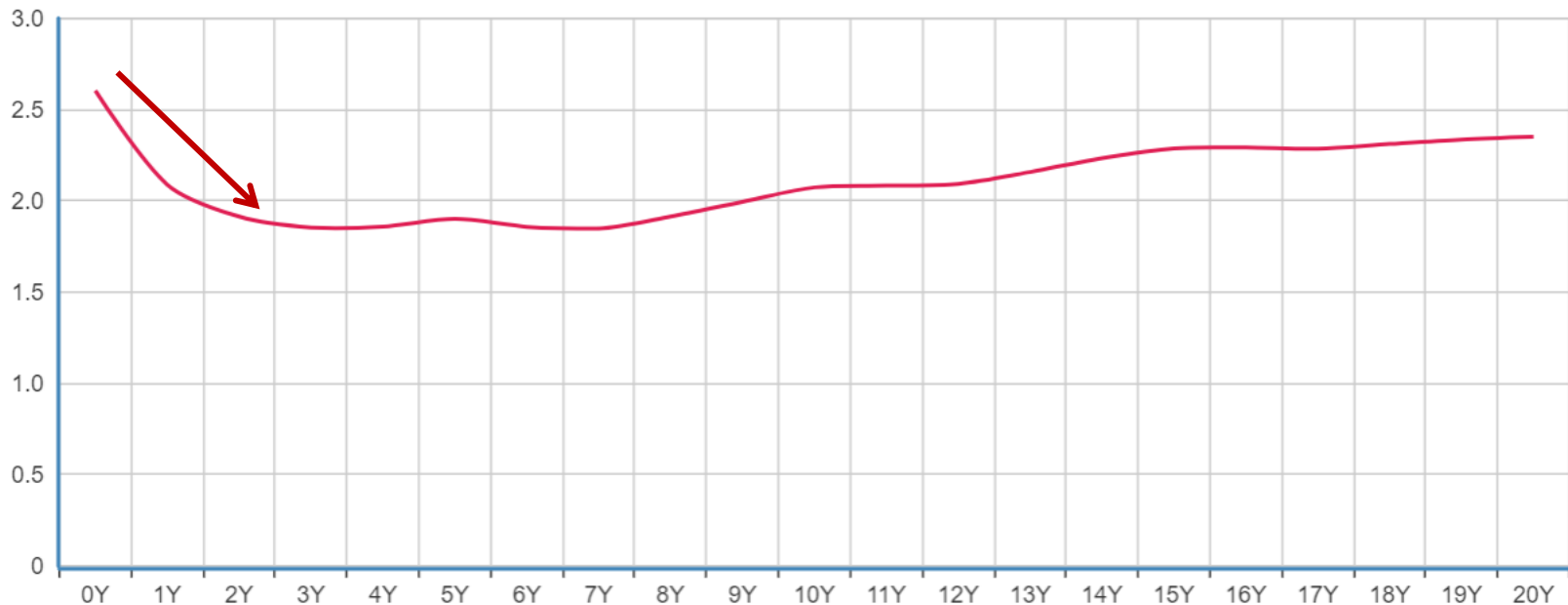
Case Studies: Insurance

Base Case Results

- Key observation 2 : decrease in Solvency Ratio over the next years

Solvency Ratio: mean scenario

Solvency Ratio (%)



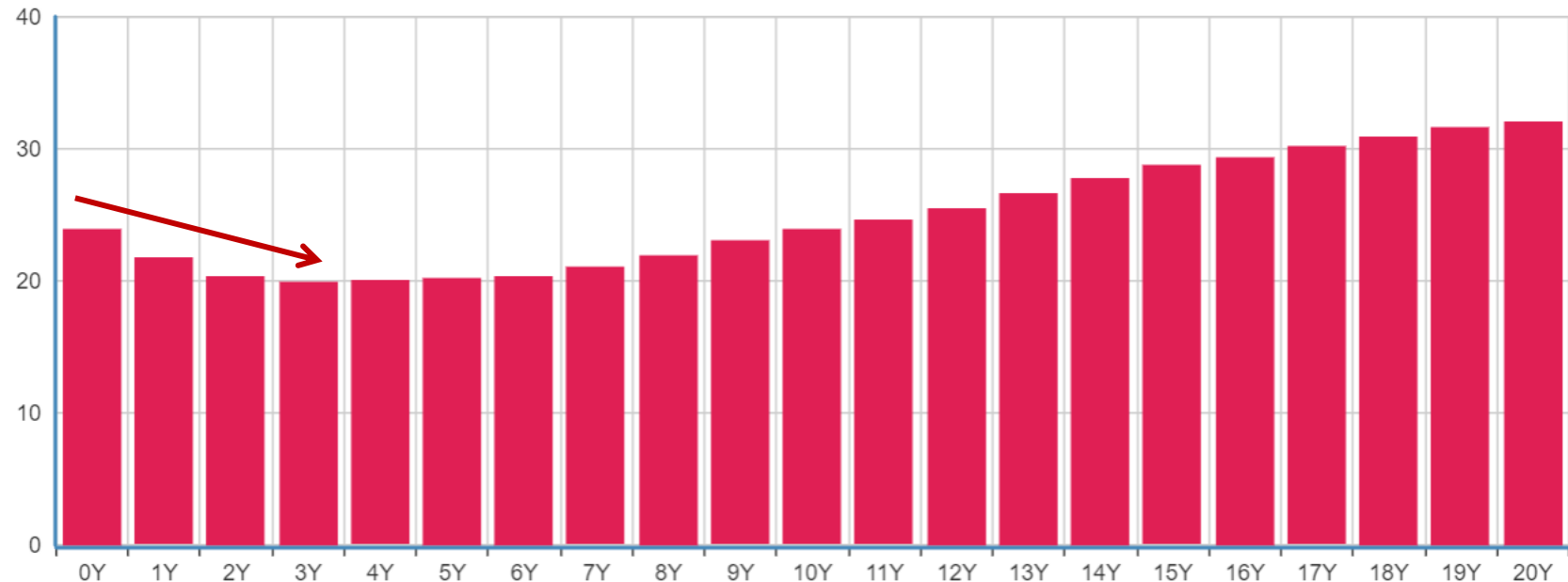
Case Studies: Insurance

Base Case Results

- The decrease in the solvency ratio is caused by a **decrease in market value own funds**

Market Value Own Funds: mean scenario

Amounts in EUR



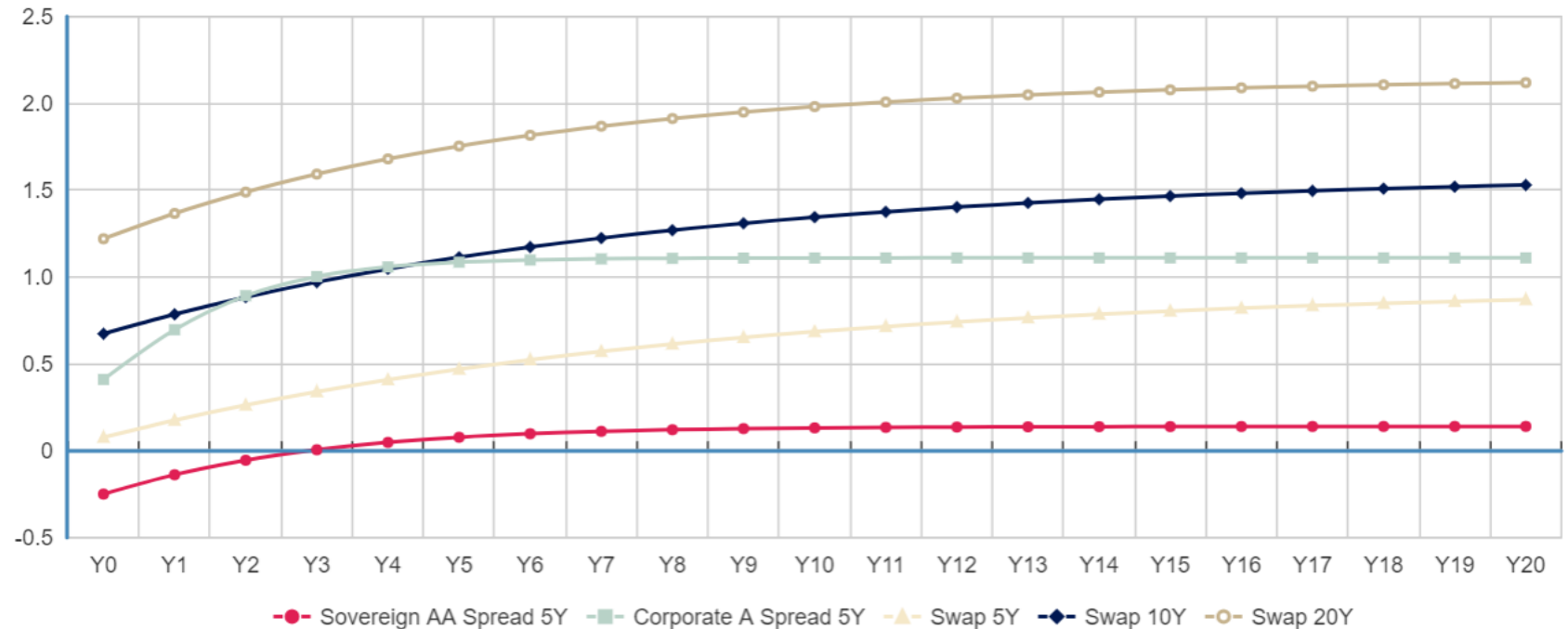
Case Studies: Insurance

Base Case Results

- The decrease in the solvency ratio is caused by the **increase in credit spreads** over the next years which outweighs the more gradual increase in interest rates.

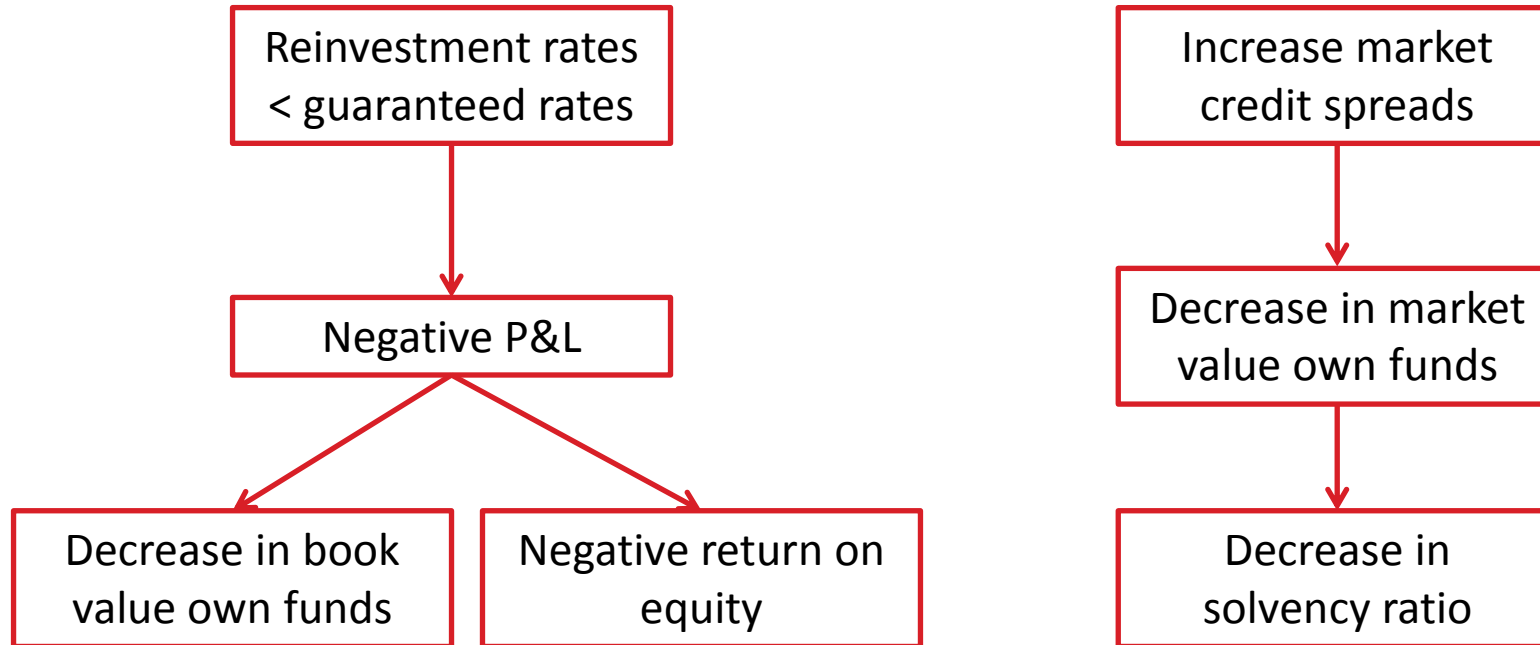
Evolution main ESG risk drivers

Rates (%)



Case Studies: Insurance

Base Case Summary



Case Studies: Insurance

Assessing possible remediation: Alternative Case Assumptions

- **Dividends**: **No dividend will be paid the next 10 years.** Thereafter 100% of net profits will be distributed.
- **Operational Costs**: 90bp of the total bookvalue
- **Pricing new Production**:
 - Group Insurance: minimum guaranteed rate by law
 - Individual insurance: OLO 10Y
- **Target Asset Allocation**:
 - Govies: **59%** (AA rating , average duration of 10 years)
 - Corporates: **25%** (A rating, average duration of 2,5 years)
 - Equity: **10%**
 - Property: **5%**
 - Cash: 1%
- **Target Business Mix**
 - Group Insurance: **20%**
 - Individual Insurance: **80%**

Proposed Management Actions

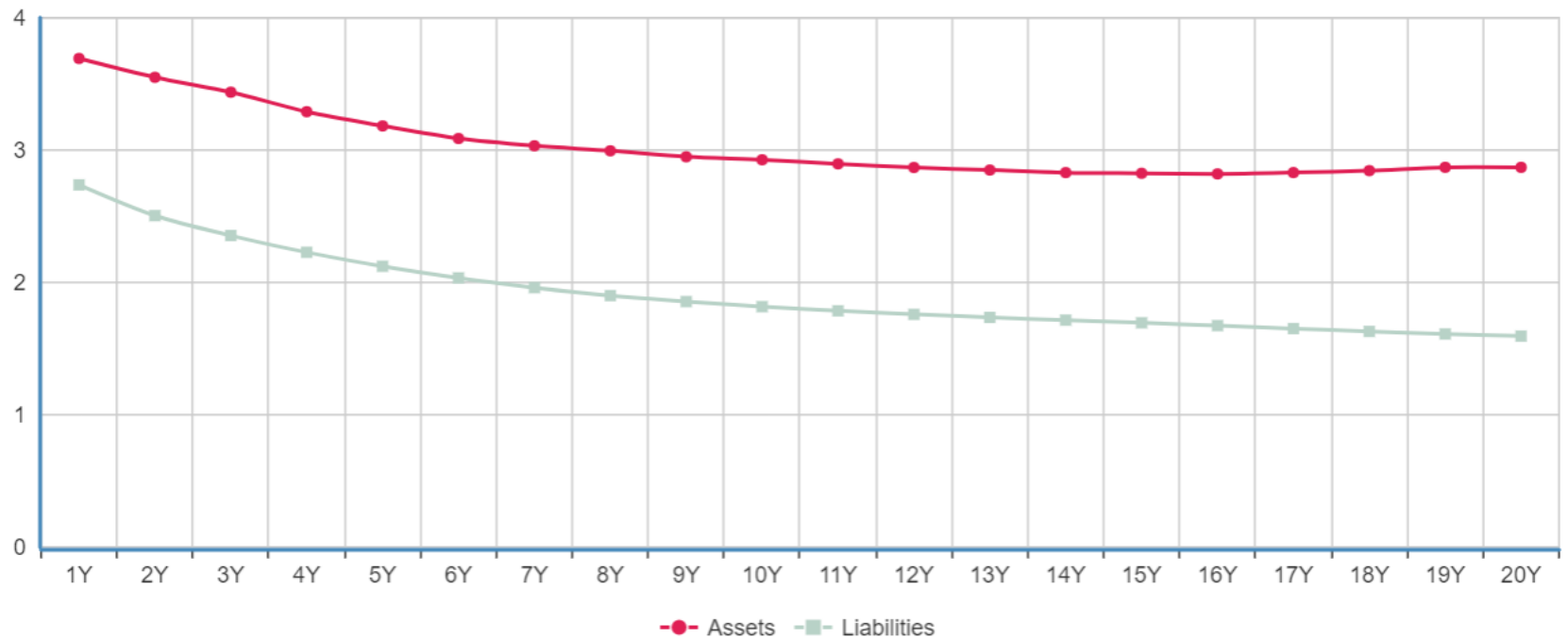
Case Studies: Insurance

Assessing possible remediation: Alternative Case Results

- Key observation 1: **Profitability is restored**

Profitability: mean scenario

Book Value Returns (%)



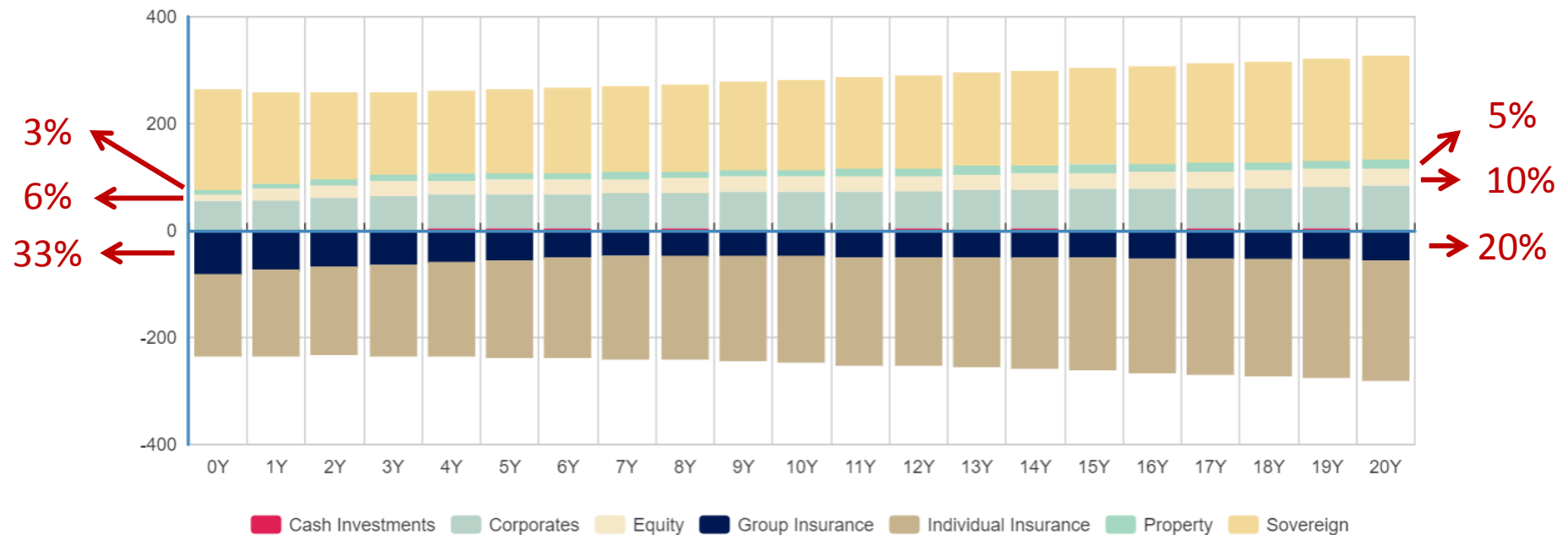
Case Studies: Insurance

Assessing possible remediation: Alternative Case Results

- Profitability is restored by investing more in equity and decreasing production in group insurance (with high guaranteed rate)

Market Value Assets and Liabilities: mean scenario

Amounts in EUR



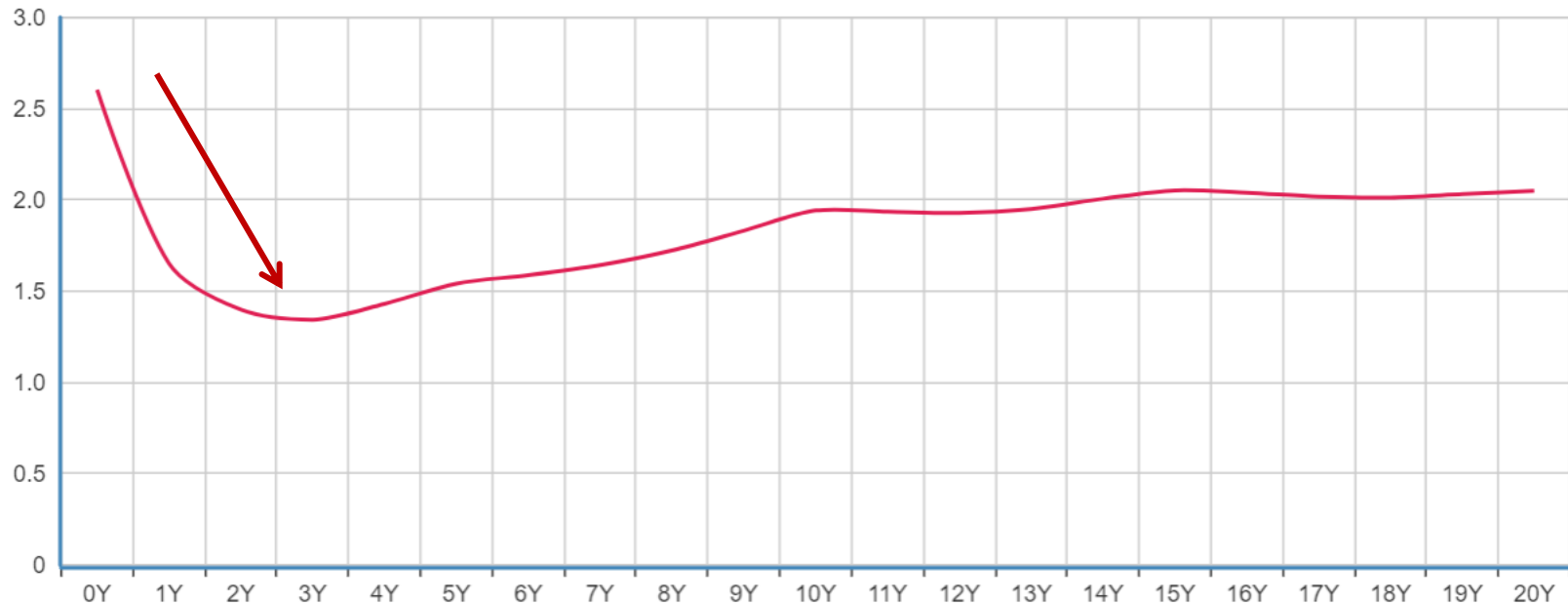
Case Studies: Insurance

Assessing possible remediation: Alternative Case Results

- Key observation 2: **Solvency Ratio exhibits a sharper decrease** (compared top base case) but **increases and stabilises around 200% afterwards**

Solvency Ratio: mean scenario

Solvency Ratio (%)



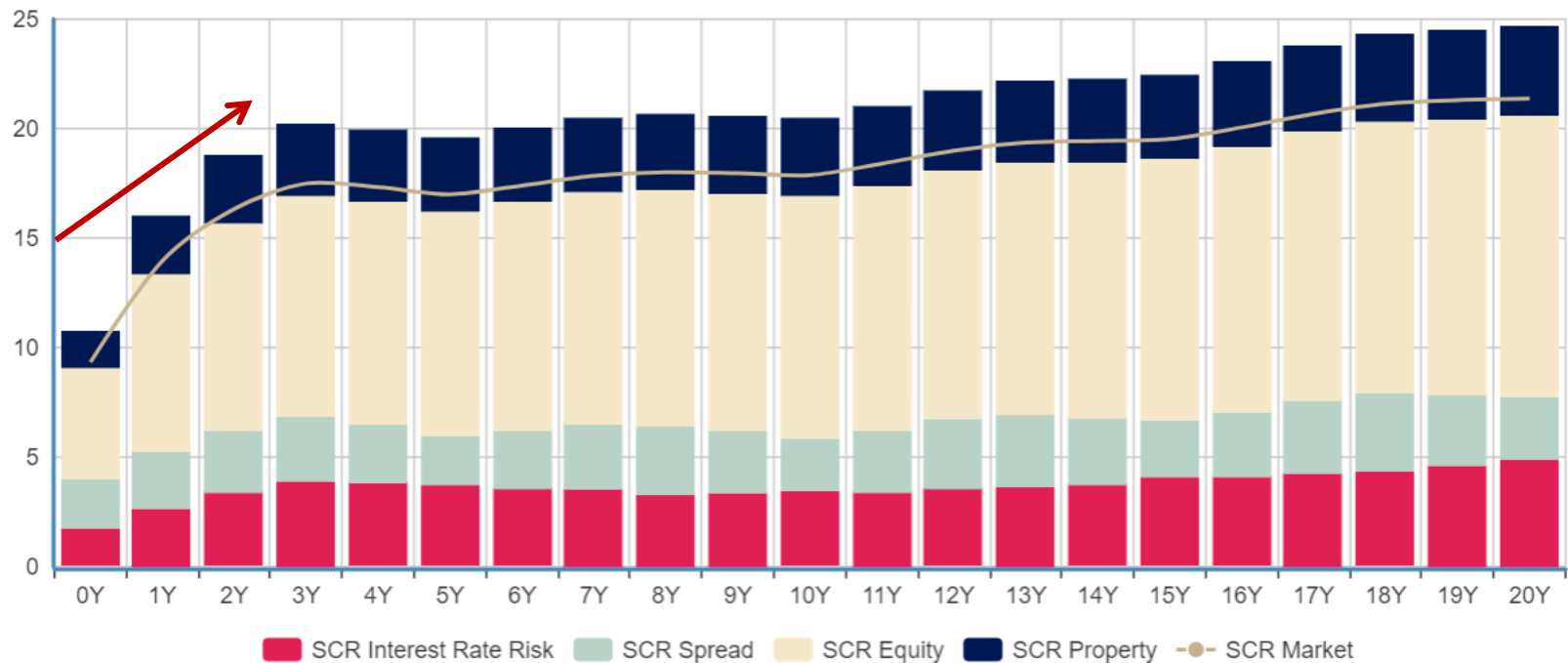
Case Studies: Insurance

Assessing possible remediation: Alternative Case Results

- Sharper decrease in Solvency Ratio is explained by the increase capital requirements due to more risky investment strategy (mainly SCR Equity).

Breakdown SCR Market: mean scenario

Amounts in EUR



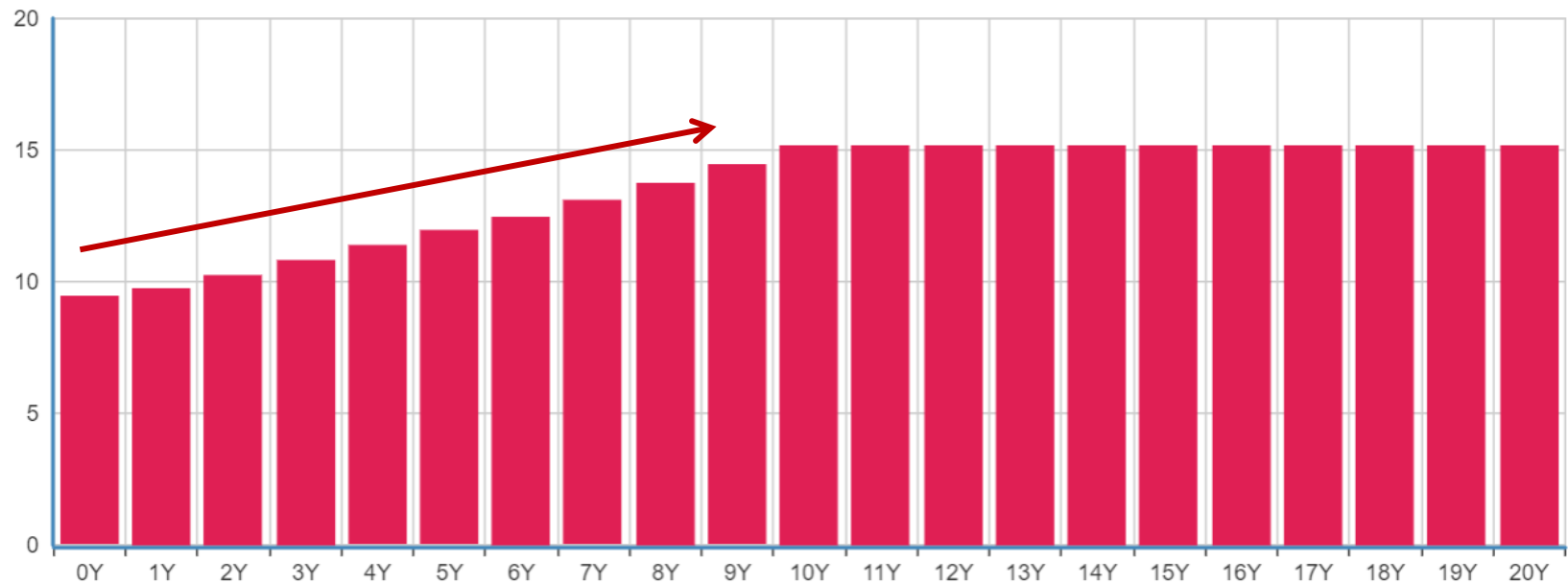
Case Studies: Insurance

Assessing possible remediation: Alternative Case Results

- Solvency ratio is restored by **increasing the own funds** (book value and market value) since all profits over the next 10 years are kept with the company.

Book Value Own Funds: mean scenario

Amounts in EUR



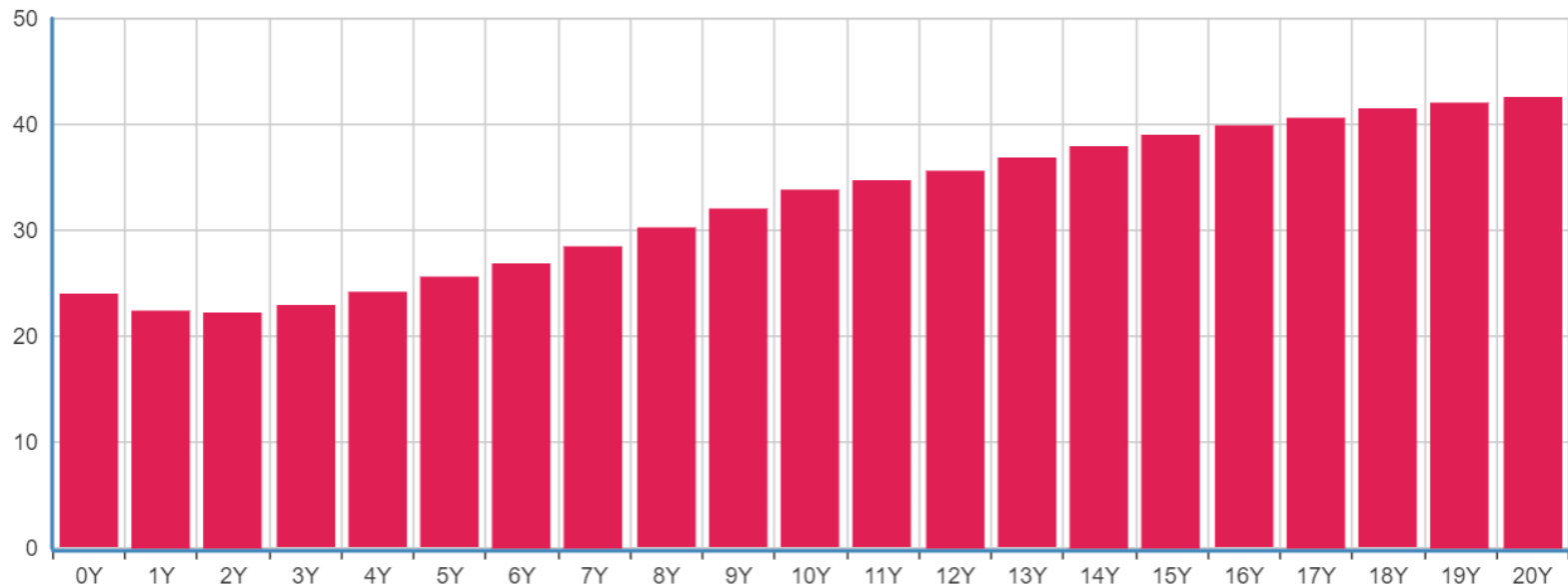
Case Studies: Insurance

Assessing possible remediation: Alternative Case Results

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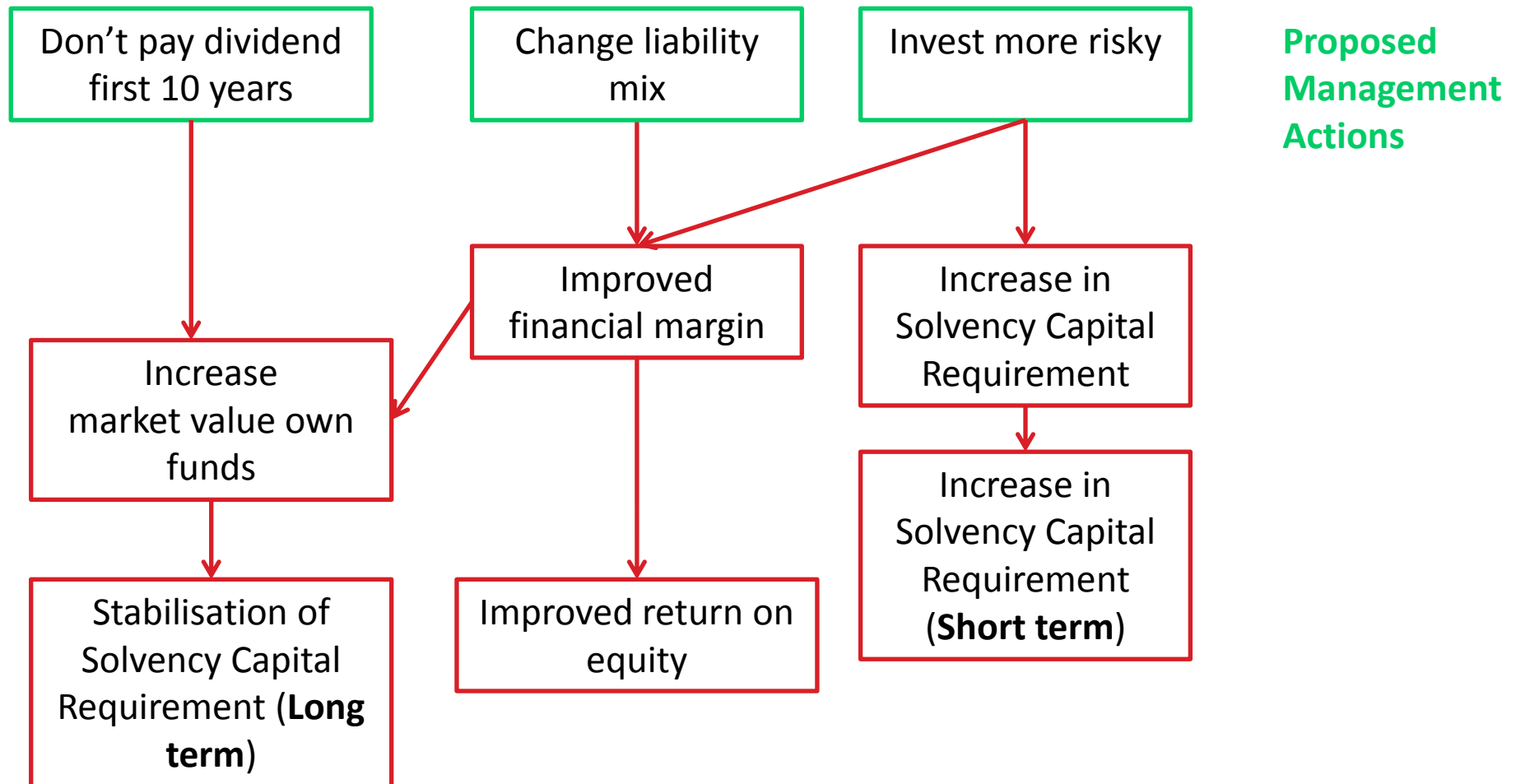
Market Value Own Funds: mean scenario

Amounts in EUR



Case Studies: Insurance

Assessing possible remediation: Base Case Summary



Case Study

Bank

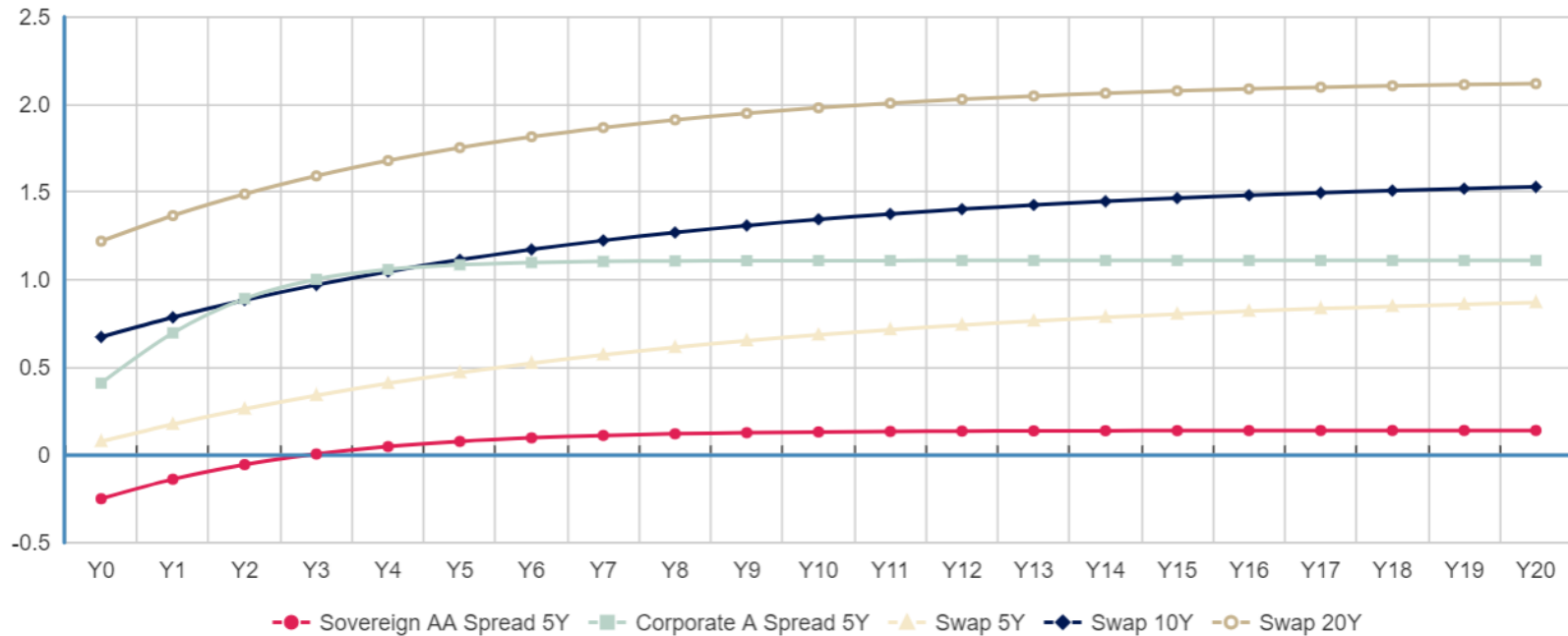
Case Studies

Financial Markets Scenario

- Starting point: year-end 2016
- Interest rates and spreads are expected to increase but remain low in historical perspective

Evolution main ESG risk drivers

Rates (%)



Case Studies: Bank

Description Initial Balance Sheet

- **Current Asset Allocation:**
 - Govies: 23% (AA rating , 3M floating rate, average WAL of 5 years)
 - Corporate loans: 40%% (fixed rate, average WAL of 2,5 years)
 - Mortgage loans: 39% (60% fixed and 40% floating rate + different initial maturities)
 - Equity: 1%
 - Cash investments: 7%
- **Current Liability Mix**
 - Saving Accounts: 55%
 - Sight Accounts: 31%
 - Cash borrowing 7%:
- **Other**
 - Duration gap of 3 months
 - Tier 1 ratio of 8%
 - Leverage ratio of 3,25%

Case Studies: Bank

Base Case Assumptions

- **Dividends**: 100% of net profit is distributed as dividend
- **Operational Costs**: 90bp of the total bookvalue
- **Pricing new Production**:
 - Saving accounts: replicator approach (using market rates as replicating instruments)
 - Mortgages:
- **Target Asset Allocation**:
 - Govies: 23% (AA rating , 3M floating rate, average WAL of 5 years)
 - Corporate loans: 40%% (fixed rate, average WAL of 2,5 years)
 - Mortgage loans: 39% (60% fixed and 40% floating rate + different initial maturities)
 - Equity: 1%
 - Cash investments: 7%
- **Target Liability Mix**
 - Saving Accounts: 55%
 - Sight Accounts: 31%
 - Cash borrowing 7%:

Case Studies: Bank

Methodologic Notes

- **Modeling Granularity**
 - Assets
 - Loans → model point approach (based on coupon type, maturity, etc.)
 - Investment portfolio → line-by-line
 - Liabilities
- **Projection market values**
 - Full repricing based on economic scenario
- **Projection accounting**
 - IFRS accounting rules
- **Projection Risk Weighted Assets (RWA)**
 - Based on predefined RWA % per asset class

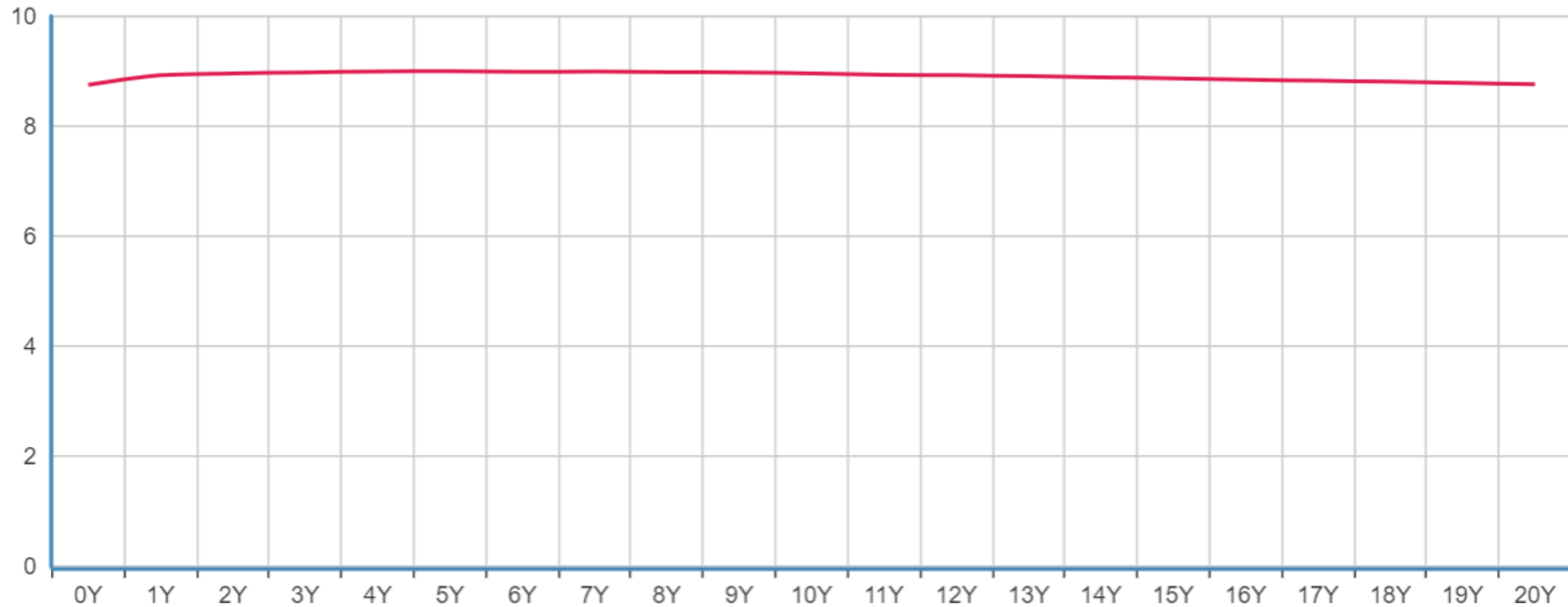
Case Studies: Bank

Base Case Results

- Key observation 1 : **Tier 1 ratio is low** but stable

Core Tier 1 Ratio: mean scenario

Tier 1 Ratio (%)



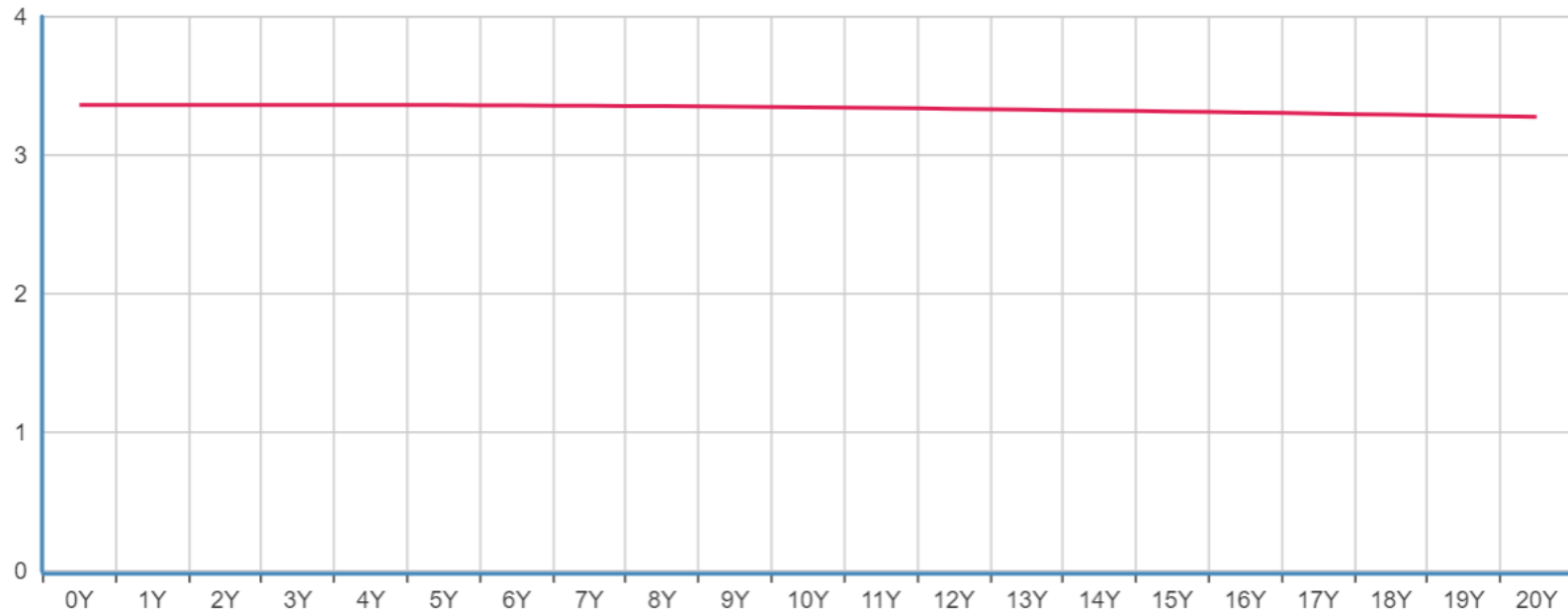
Case Studies: Bank

Base Case Results

- Key observation 2 : Leverage ratio is low but stable

Leverage Ratio: mean scenario

Leverage Ratio (%)



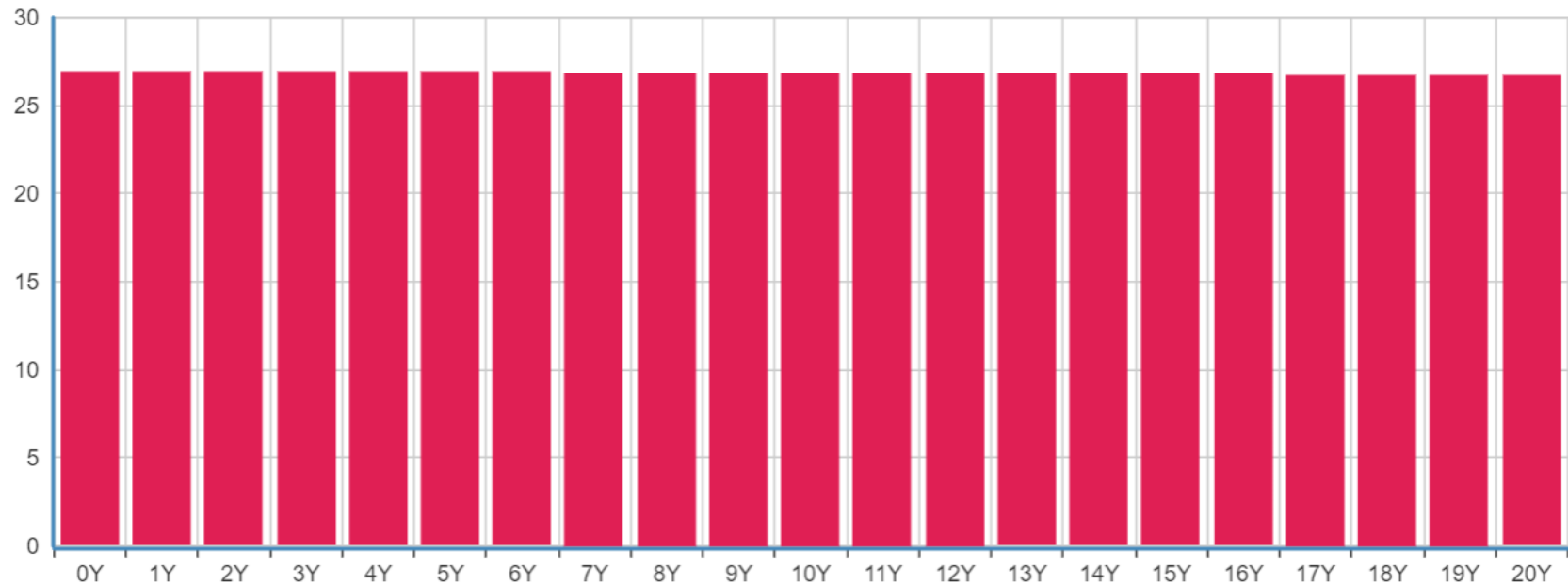
Case Studies: Bank

Base Case Results

- Both observations are explained by low book value own funds

Book Value Own Funds: mean scenario

Amounts in EUR



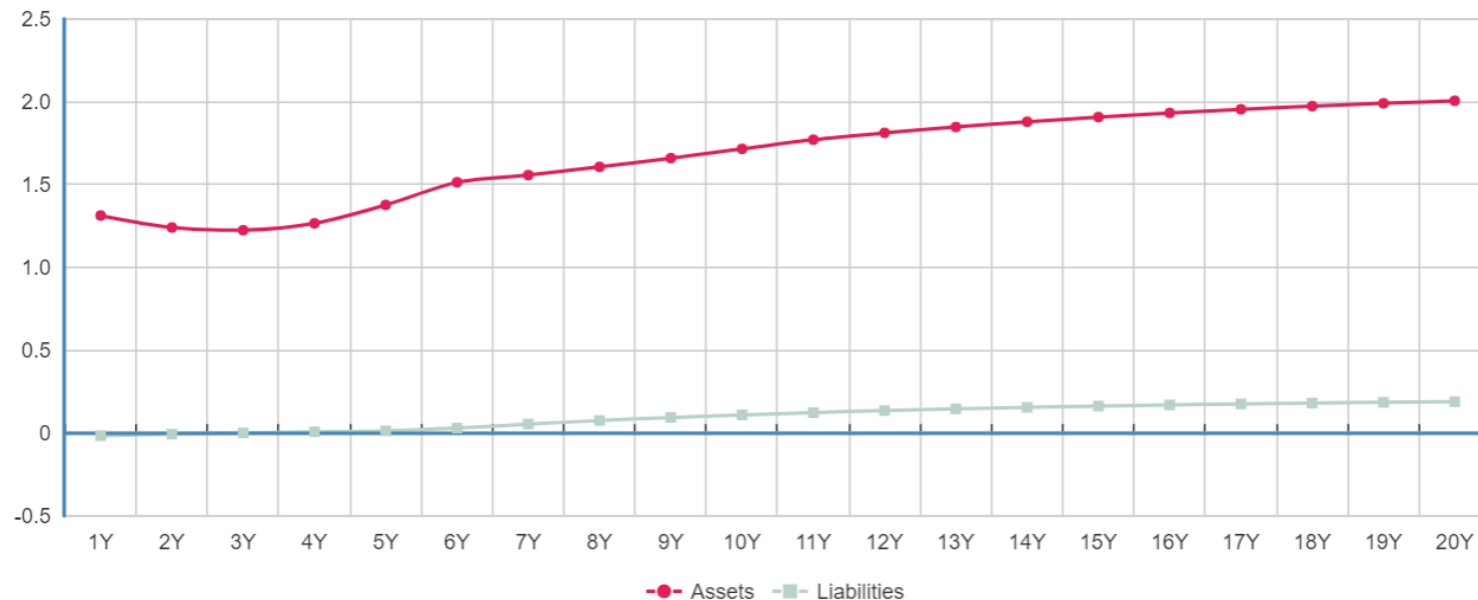
Case Studies: Bank

Base Case Results

- **Profitability is good and will increase** due to rise in market interest rates. Increase in liability cost lags behind the increase in investments rates since liabilities are currently overpriced due to legal minimum interest rate on saving accounts.

Profitability: mean scenario

Book Value Returns (%)



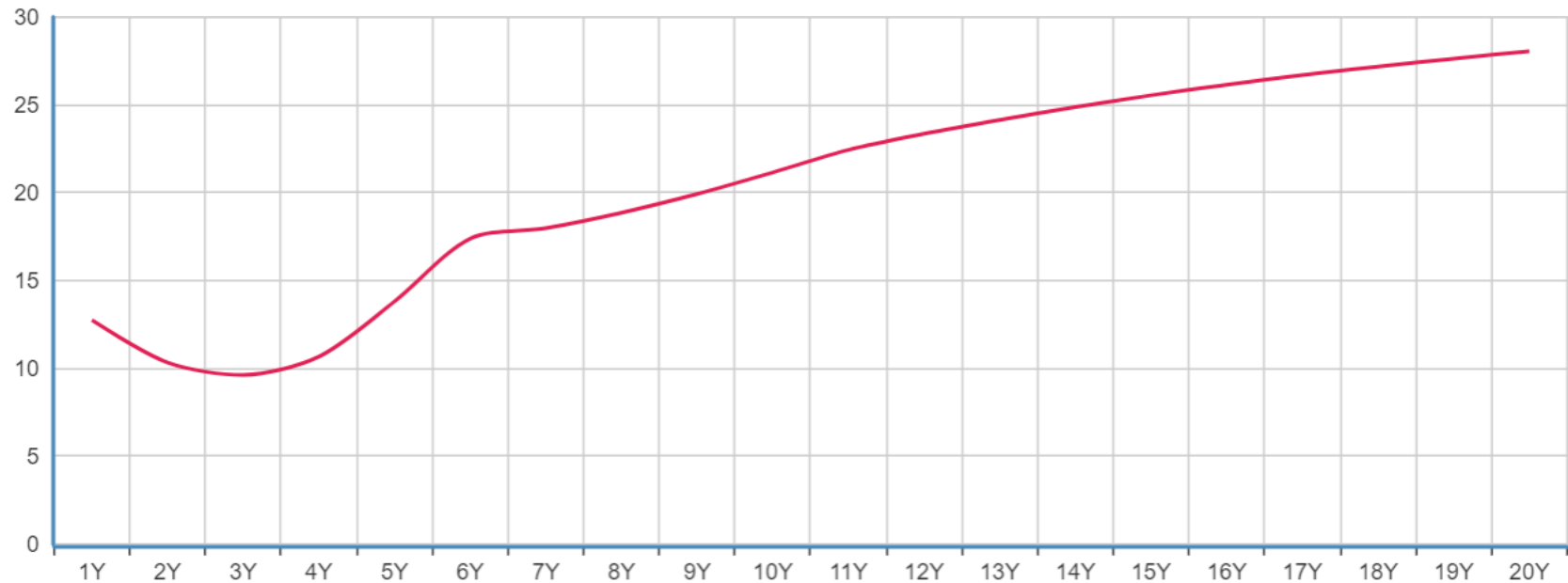
Case Studies: Bank

Base Case Results

- Increase in profitability and in combination with low own funds leads to **very high return on equity**

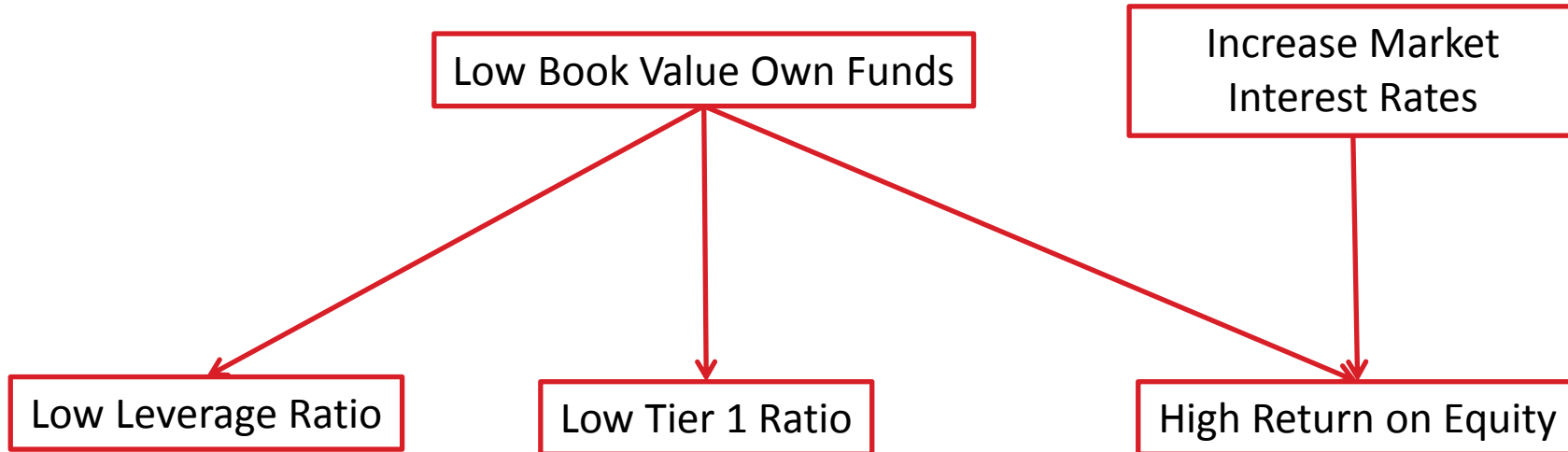
Profitability: mean scenario

Return (%) on Equity



Case Studies: Bank

Base Case Summary



Case Studies: Bank

Assessing possible remediation: Alternative case

- **Dividends**: No dividend will be paid the next 5 years.
- **Operational Costs**: 90bp of the total bookvalue
- **Pricing new Production**:
 - Saving accounts: replicator approach (using market rates as replicating instruments)
 - Mortgages:
- **Target Asset Allocation**:
 - Govies: 23% (AA rating , 3M floating rate, average WAL of 5 years)
 - Corporate loans: 30% (fixed rate, average WAL of 2,5 years)
 - Mortgage loans: 39% (60% fixed and 40% floating rate + different initial maturities)
 - Equity: 1%
 - Cash investments: 7%
- **Target Liability Mix**
 - Saving Accounts: 55%
 - Sight Accounts: 31%
 - Cash borrowing: 7%

Proposed Management Actions

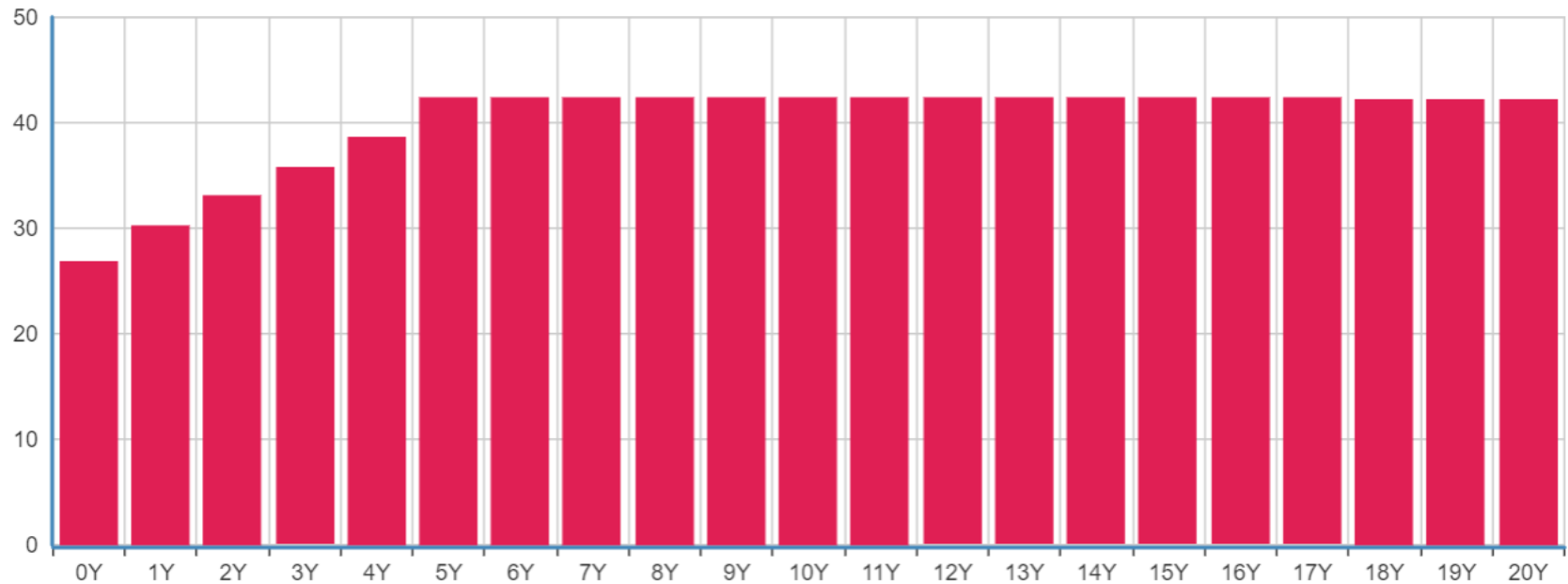
Case Studies: Bank

Assessing possible remediation: Book Value evolution in Alternative Case

- Key observation 1 : **Book Value own funds are increased** by keeping the profit in the company for the first 5 projection years

Book Value Own Funds: mean scenario

Amounts in EUR



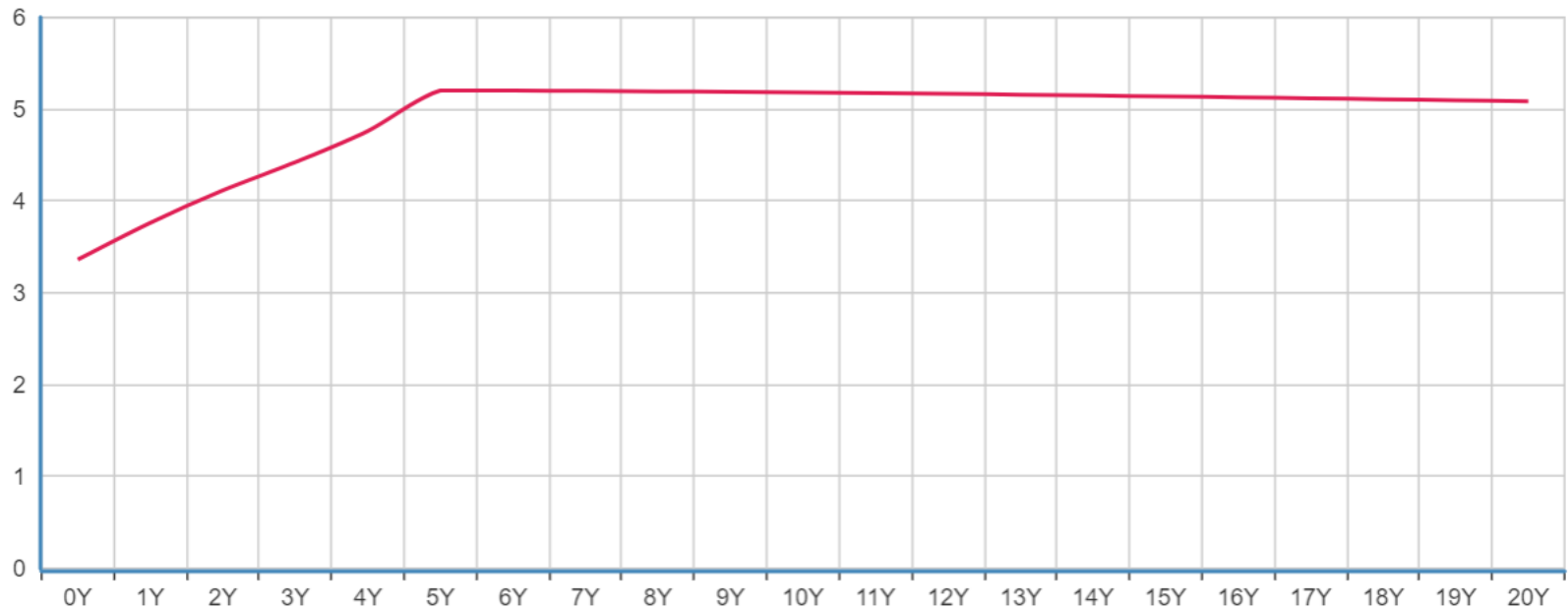
Case Studies: Bank

Assessing possible remediation: Leverage Ratio in Alternative Case

- Increase in book value own funds directly improves the leverage ratio

Leverage Ratio: mean scenario

Leverage Ratio (%)



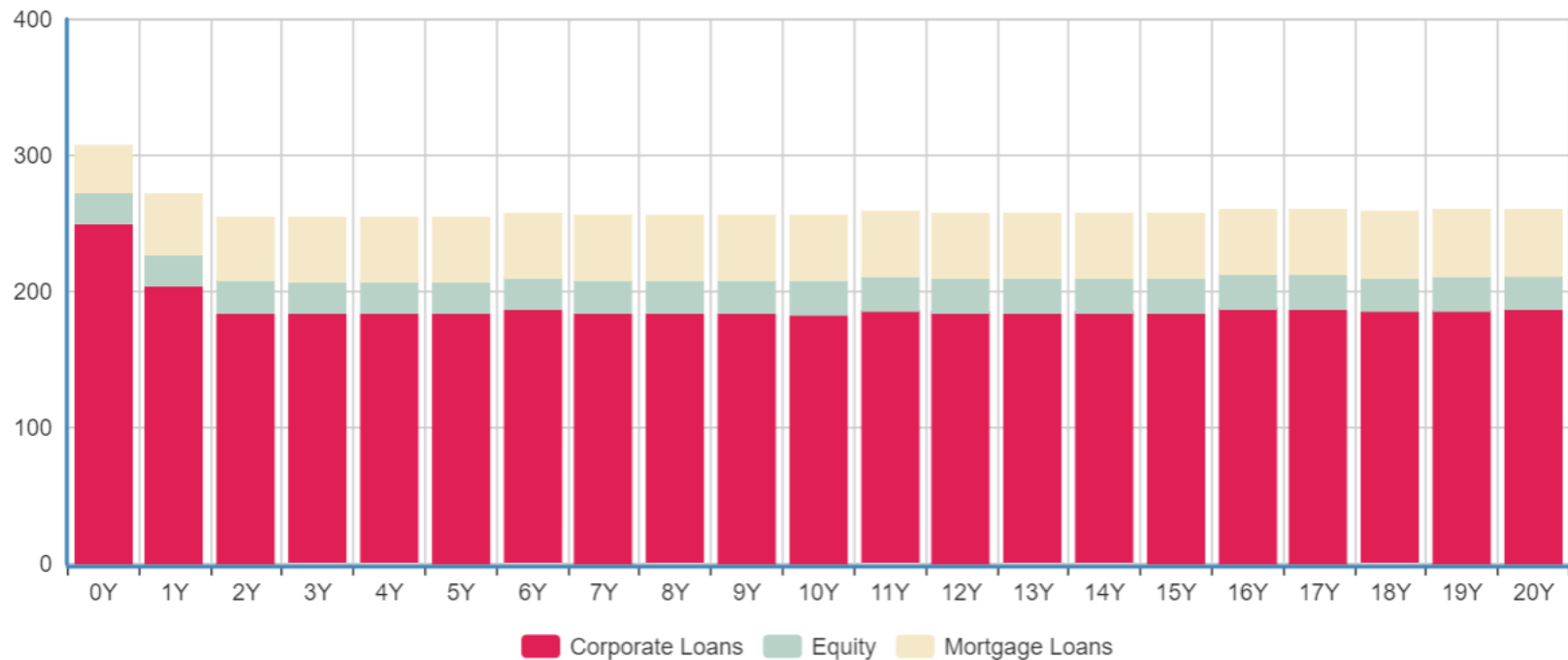
Case Studies: Bank

Assessing possible remediation: RWAs in Alternative Case

- Key observation 2 : **Risk weighted assets are decreased** by shifting the corporate loan production to mortgages

Risk Weighted Assets: mean scenario

Amounts in EUR



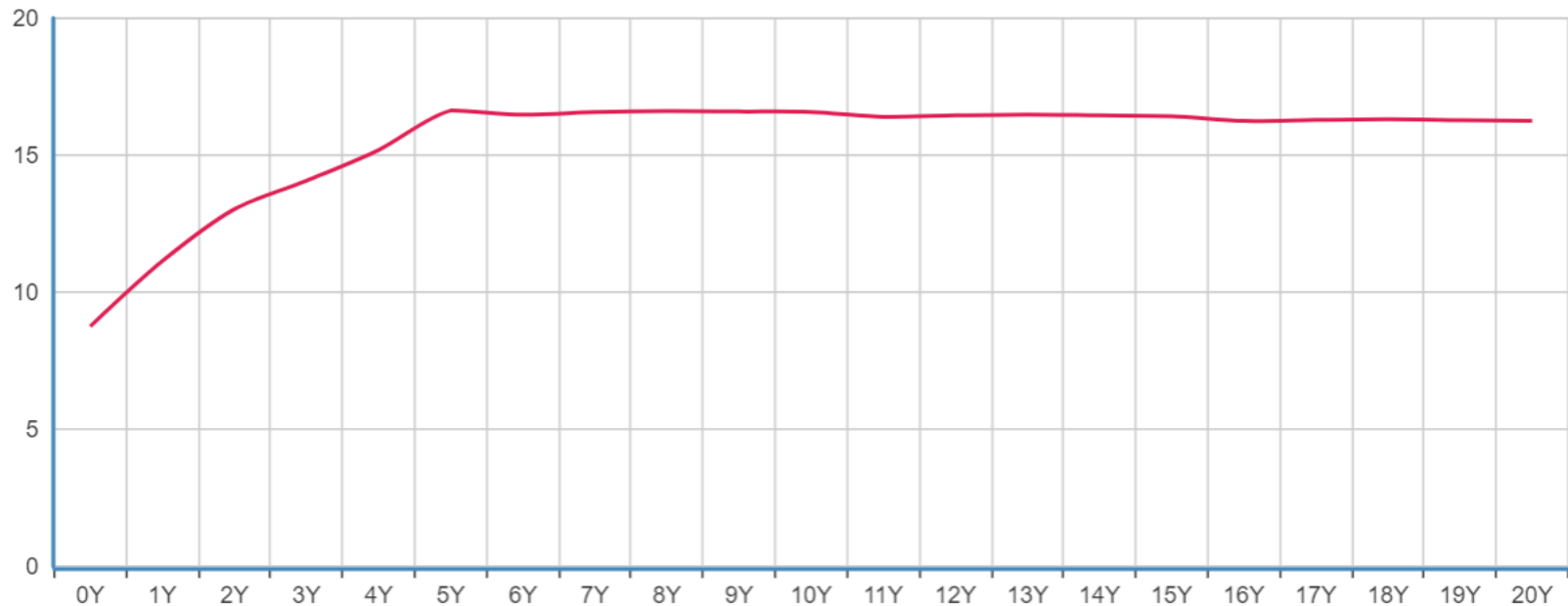
Case Studies: Bank

Assessing possible remediation: CET1 ratio evolution in Alternative Case

- The Tier 1 ratio improves by (1) decrease in RWA's and (2) increase in own funds

Core Tier 1 Ratio: mean scenario

Tier 1 Ratio (%)



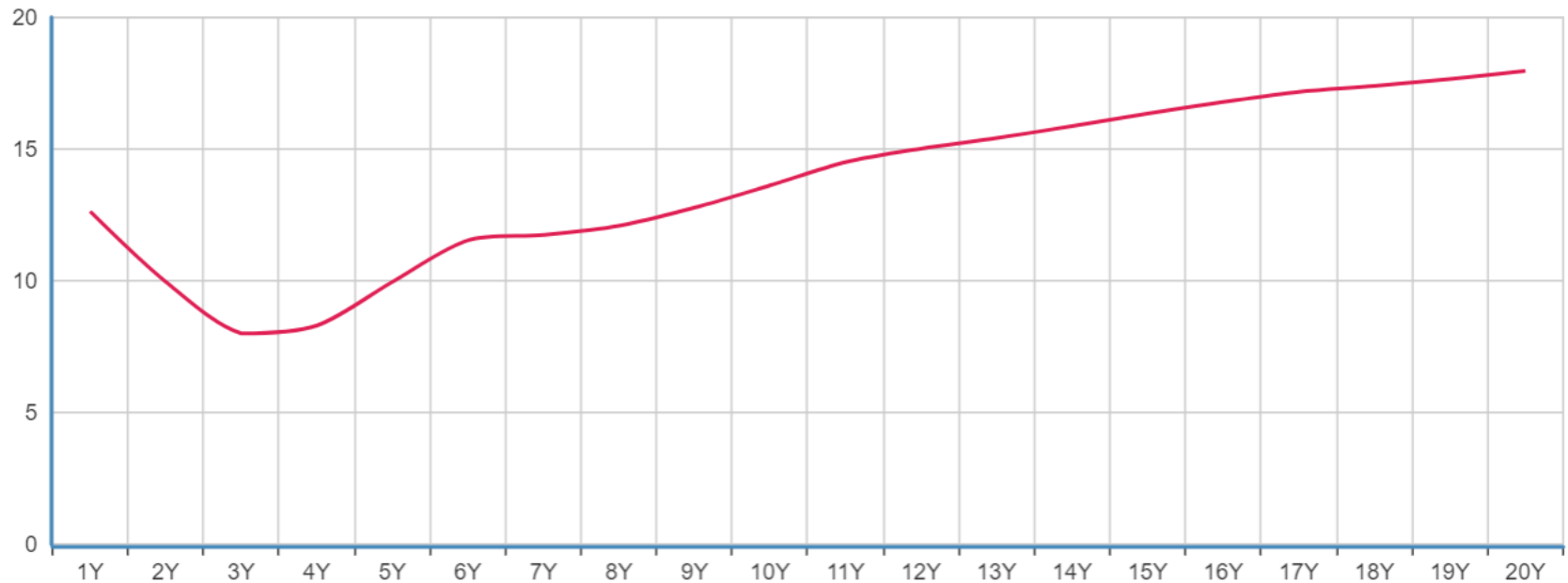
Case Studies: Bank

Assessing possible remediation: ROE evolution in Alternative Case

- Return on equity is decreased by increase in own funds.

Profitability: mean scenario

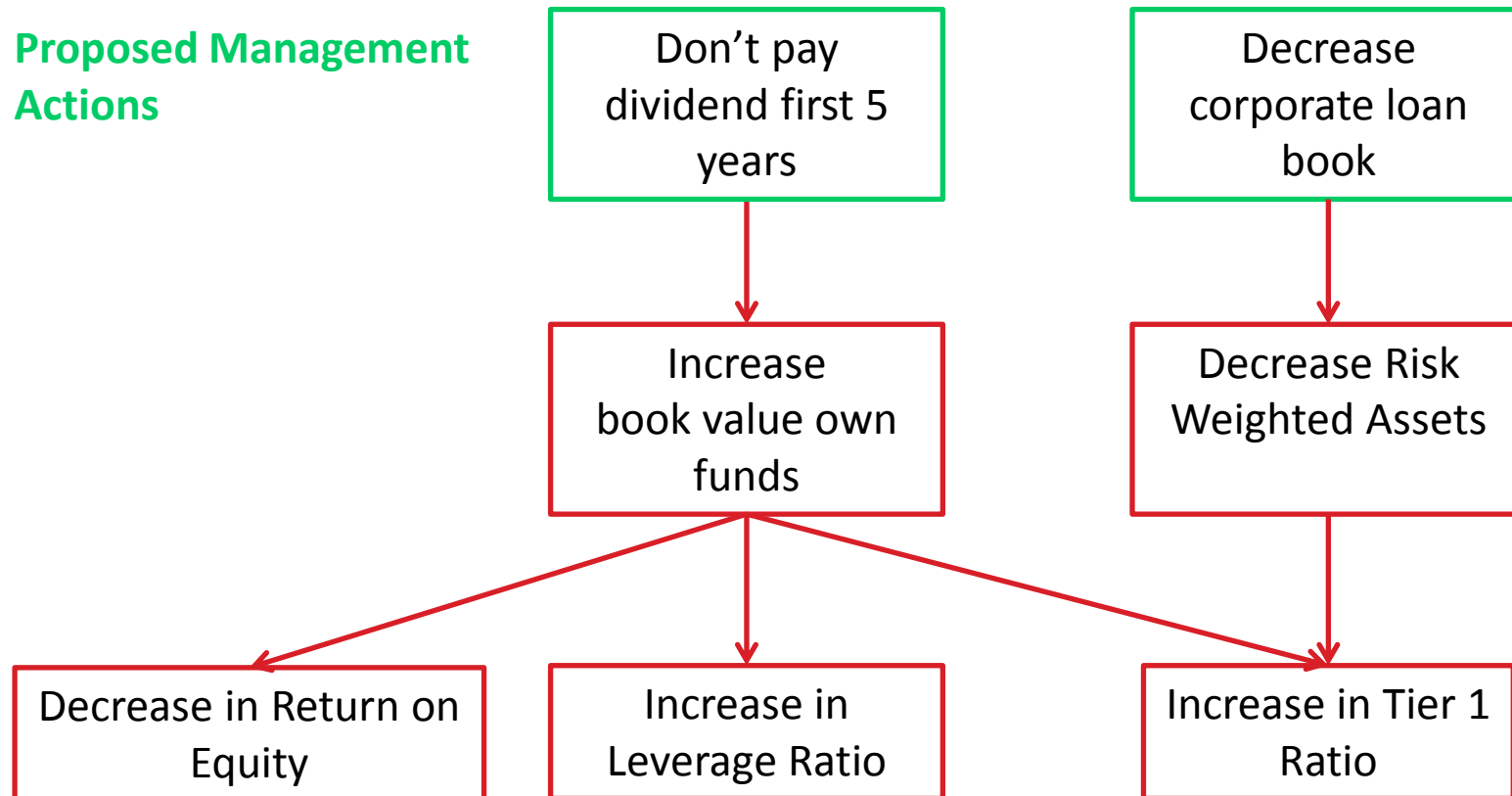
Return (%) on Equity



Case Studies: Bank

Alternative Case Summary

Proposed Management Actions



Other

What else?

Aspects not covered in these case studies

- Testing balance sheet evolution under multiple economic scenarios;
- Assessing the distribution of results using a large set of stochastic scenarios generated by an Economic Scenario Generator (ESG);
- Changing the investment strategy with asset classes (e.g. Different rating, maturities, coupon types, etc.)
- Other management actions:
 - Profit Sharing products (insurance);
 - More complex dividend payout rules.
- Modeling of behavior aspects
 - Different business mix depending on rate environment (e.g. Term accounts versus saving accounts).

- **Overview of Business Projection Tools**
 - What are Business Projection Tools?
 - Increased need for both stochastic and deterministic projection tools
 - Typical architecture of Business Projection Tools, organization, processes, modeling approach and sound practices
 - **Case studies of practical applications:**
 - For an Insurance Company
 - For a commercial bank
- **About Reacfin's offering**



Reacfin s.a. is a Belgian-based **consulting firm specialized in**

- **actuarial science,**
- **risk,**
- **portfolio management and**
- **data science.**

We develop innovative solutions and robust tools **for Financial institutions.**

The company started its activities in 2004 as a spin-off of department of statistics and actuarial science of the University of Louvain. Reacfin employs about 30 consultants most of which hold PhD's or highly specialized university degrees.

We articulate our offer along **3 brands:**



Technical advisory in model development, deployments, validation and maintenance.
Specialized consulting in Financial Institutions organization, governance and business strategy



Tailored computational solutions designed and developed to integrate smoothly into your company's systems and processes (incl. open-source offerings)



Combination of On-Site and On-Line Executive Education solutions including theoretical and methodological concepts, real-life case studies and exercises

Advisory services organized along 5 centers of Excellence

Risk & Portfolio Management

Insurance specialties

ALM, Portfolio Management & Quantitative Finance

- Implementation/calibration of stochastic models
- Pricing of financial instruments
- Development of AM & ALM models
- Design/review/implementation of systematic trading & hedging strategies

Life, Health and Pension

- Pricing , product development & reserving
- Dynamic Financial Analysis (DFA)
- Capital Requirement optimization
- Business valuation support
- Actuarial function report or outsourcing

Risk & Finance Solutions *(Strategy, Organization & Operations)*

- Strategic opportunities assessment and business valuations
- Industrialization of processes, organizational optimization & change management
- Business intelligence, benchmarking & surveys
- Internal & regulatory reporting (KRI's & KPI's dashboards)
- Validations, model review frameworks and model documentation

Non-Life

- Implementation or review of reserving methodologies
- Development of innovative pricing methodologies and tools
- Valuation & profitability analysis models
- Risk mitigation optimization
- Business valuation , capital management and actuarial function support

Data Science

- Machine learning models and processes robotization
- Text mining solutions and qualitative financial environment analysis
- Data visualization (dynamic dashboards, automated reports,, etc.)
- Creation of structured dataset thanks to scraping methodologies



Robust & user-friendly tools

As standardized stand-alone tools or included in our tailored consulting services deliverables, Reacfin develops state-of-the-art computer programs for financial institutions.

Test our free online demo's available on <https://reacfin.com/en/know-how-to-risk/online-apps>



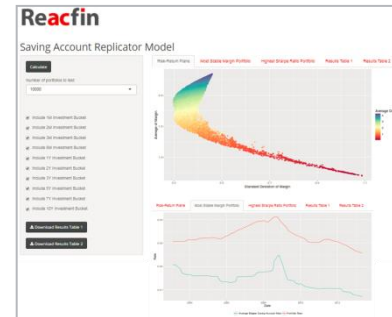
Some illustrative examples of some recently developed solutions

Economic Scenario Generators



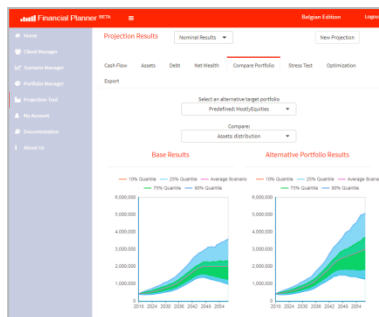
Generating stochastic market scenarios for Risk and Capital requirements assessment

Saving Account replicators



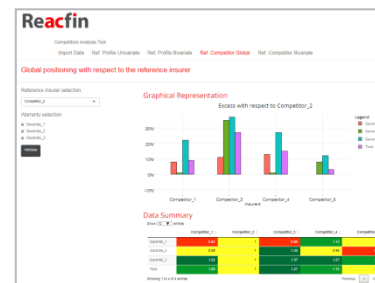
Assessing the implied duration (Interest rates risks) of non-maturing liabilities

Financial Planner



Wealth management support through stochastic simulations and portfolio optimization

Competitors pricing analysis



Reverse engineering competitors product pricing and benchmark vs. own offering

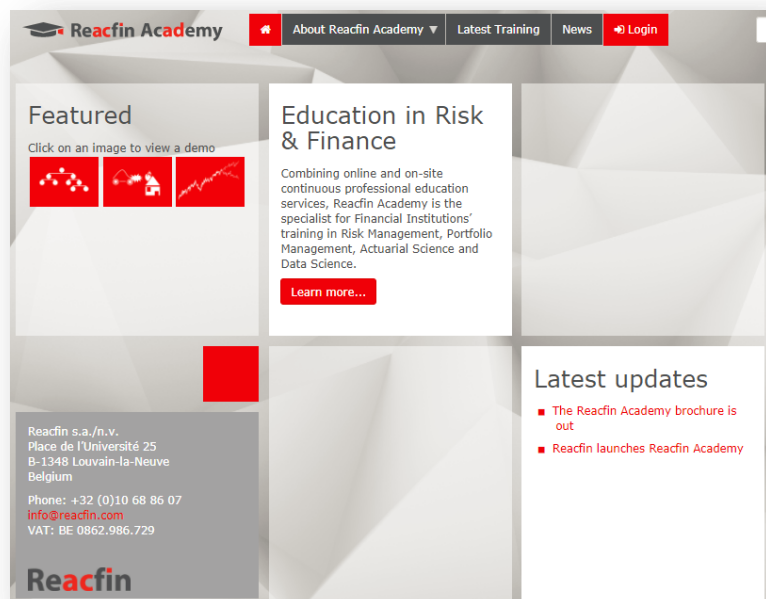
Hands-on training

Reacfin Academy is our business line dedicated to **professional continuous education in Risk, Finance, Actuarial Science, Data Science and the Management of Financial Institutions.**

We offer a unique **mix of academic expertise & pedagogy with real-life practitioners' experience.** Our staff combines their professional career with lectures on Finance, Risk & Portfolio management or Actuarial Science in highly reputed universities.



www.ReacfinAcademy.com



Reacfin Academy proposes both **Online and On-Site education services.**

Our Online Services include:

- Online dynamic presentation (in SCORM, Flash or HTML5)
- Online tests and certifications
- Interactive e-classrooms or webinars
- Online downloadable documentation (e.g. PDF's)
- Hands-on exercises (e.g. Excel spreadsheets, R code, etc.)
- Centralized Learning Management Systems (LMS)

Our Onsite Services include:

- Traditional class rooms trainings at your place
- Practical case studies and exercises with trainer support
- 1-on-1 executive training

Our driving values

Reacfin's management put great emphasis at enforcing in the firm:

Excellence

We attract the best people

We develop their skills and career through diversified missions and rigorous knowledge management

We go the extra-mile to deliver the best quality in our work & services

our
outstanding
feature

Innovation

By acting as a bridge linking academic excellence with best market practices, we select the latest research that best serves our clients

Through out of the box thinking, we apply state-of-the-art techniques that offer our clients pragmatic added-value solutions

our
founding
ambition

Integrity

We put work ethics, client's best interest and confidentiality as the foundation of our work

We commit at promoting the greatest transparency and knowledge sharing in all our clients' solutions

our
every-day
commitment

Solution-Driven

We are dedicated at clearly understanding the needs of our clients

We deliver solutions that produce measurable value

Our deliverables are tailored and actionable solutions to our clients' challenges

our
primary
focus

Reliability

We develop sustainable partnerships with our clients

We never compromise on our commitments including level of quality, budgets & deadlines

All our deliverables are designed, developed and tested to last over time with constant efficiency

our
deliverables
characteristic



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