Deloitte.

Asset & Liability Management for Insurance Companies

Actuarial Breakfast

5 July 2011

Renato Di Iorio – Deloitte

Jérôme Crugnola-Humbert – Deloitte

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Audit.Tax.Consulting.Corporate Finance.

Introduction

Renato Di Iorio
Director
Deloitte A&IS Zürich

Some introductory definitions

- Asset & liability Management (ALM) is the practice of managing an insurer so that actions taken with respect to assets and liabilities are designed to address the broad set of financial risks inherent in their joint behaviour.

- In some markets ALM can go by other names such as Liability Driven Investments, Stochastic Dynamic Financial Analysis, etc.

Why does ALM matter?

Volatility

- Increased regulatory and financial reporting disclosure
- How these figures contrast with competitors and over time will have huge strategic implications

News headlines

No CxO wants to:

- be on a list of insurers who lost billions due to poor financial judgement
- have their hands tied by regulators

Intelligent decisions

- We hear that “large-scale reallocation of assets” will happen – what are the actual ramifications?
- Taking the same decisions as the majority does not necessarily lead to the best result

ALM and Risk Management in general are the two most effective avenues insurers have to help them decrease the severity of negative oscillations

Current and Future ALM Challenges for Insurers

Jérôme Crugnola-Humbert
Director
Deloitte A&IS Zürich

Impact of ALM on financial & regulatory reporting

Modern insurance techniques and regulation take the **financial economic view**, which says the market should be the arbiter of the relative importance of return and risk

- How good key reported numbers will look, and how stable over time, is a direct function of the underlying ALM

Available Capital	Solvency Requirements	P&L volatility
e.g. available solvency capital, Market Consistent Embedded Value (MCEV) etc. **Highly volatile over time** if poorly matched • Cf. MCEV publications , "Economic deviations" … Life: high Time Value of Financial Options & Guarantees thus **lower value** if unhedged	Target Solvency Capital calculated as a function of how much Assets and Liability may diverge in adverse scenarios Weak ALM may send the **Target Solvency Capital skyrocketing** 5th Quantitative Impact Study from Solvency II results for market risk: • Life ≈2/3 of Target Capital • General Insurance: ≈1/3	IFRS 4.1: assets in market value, liabilities in statutory values • Accounting mismatch • Distorted hedging incentives IFRS 4.2: fair-value balance sheet • Without proper ALM, the **reported P&L will be extremely volatile**

ALM and the evolving regulatory environment

When incentives diverge

Financial reporting:

IFRS 9:

- Some assets back to amortized cost, accounting mismatch

MCEV / Solvency II / IFRS 4.2 allowing liquidity premiums:

- What is the matching replicating portfolio?

Regulatory guidelines:

- EEA sovereign debt from Portugal, Ireland, Italy, Greece and Spain still “free of risk” under Solvency II
- No volatility stresses (Solvency II), respectively no property volatility stress (SST)
- Structured products, complex hedging and non-proportional reinsurance poorly taken into account in standard formulae and models

It’s not just about your reported numbers

What happens when the financial or property markets decline

Equitable Life (UK) Bankruptcy

- Deferred annuities sold with high guaranteed annuity rate
- **Risky bet: neither reserving nor hedging the embedded guarantees**
- Interest rates gradually declined in the 90’s, causing tremendous losses
- Policyholders lost confidence, additional **severe liquidity issues due to mass lapses**
- Finally put into run-off in 2001

Manulife (Can), Hartford (US) Financial distress

- Grew aggressively into Variable Annuity (VA) business
- **Improper hedging and insufficient reserves**
- Credit Crisis ’08/’09
- Manulife reported a loss of US$ 3 billion in 2008, Hartford US$ 3 billion in 2008 and US$ 1 billion in 2009

And closer to home in Switzerland

- High guarantees on liabilities covered with increasing equity proportions leading to the crash of ’01/’02
- Guaranteed liabilities matched with bonds with low credit ratings and the Credit Crisis of ’08/’09
- A significant part of the Life industry had an SST ratio <100% in the last 2-3 years, or would have one if not for Ultimate Forward Rate assumptions

General Insurance Specificities

It does matter too

Market risks seem to affect Life and General Insurance businesses in a similar way

- Except that market risk is significantly bigger for Life

However GI companies face specific ALM risks on a potentially larger scale

Liquidity risk: insufficient financial resources available to meet cash-flow obligations in due time, or the company can only secure them at high cost

- Life has mass lapses and pandemics, but GI (in particular reinsurance) faces all sorts of possible large catastrophe claims

Illiquid markets	Markets are not deeply liquid to start with (e.g. Swiss real estate) or suddenly freeze (e.g. corporate bonds during the Credit Crunch)
ALM falling apart	Unforeseen event (default, bad hurricane season ...) suddenly reveal gaping mismatch and treasury needs
Fraud	Investments not actually held, or turn out to be worthless

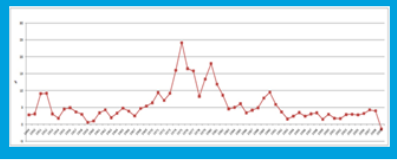
Inflation risk: as opposed to Life, not only costs but also claims are typically inflation-dependent

What does proper ALM require?

The old world ...

Asset & Liability behaviour

Risk modelling



Asset Management

Liabilities & Actuarial

Risk reporting

Executives & Board

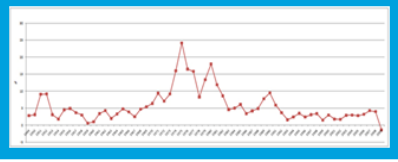
Some understanding of embedded risks

What does proper ALM require?

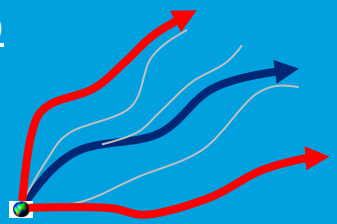
... and the new world

Asset & Liability behaviour

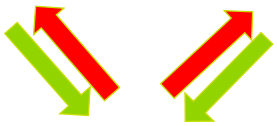
Risk modelling



Scenario analysis



Asset Management ↔ Liabilities & Actuarial



Risk management

Executives & Board

Reduced SCR

Deep understanding of embedded risks

Optimized balance sheet

- Proper ALM requires a multidisciplinary team
- Probably no less than 1 man-year of work when tackled for the 1st time

How much risk does the company retain?

“Traditional insurance” view :

- Perfect ALM is impossible or very expensive
- This is a long-term business and therefore expected return should be weighted higher than short-term volatility
- Conflicts with the “financial economic” view underpinning the current and future regulatory environment

ALM is very similar to traditional reinsurance

- It rarely makes sense to reinsure 100% …
- It rarely makes sense to do nothing …

What is the right amount of ALM?

- Depending on risk appetite

Acceptable to do little hedging, reinsuring etc., if:

- The company has enough available capital, and
- This is a conscious choice, not a by-product of negligence

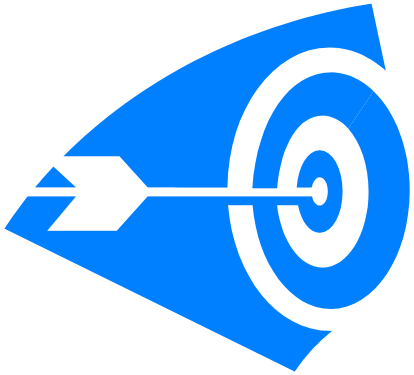
Which kind of ALM works best?

From risk to scenario analysis

- Individual risk modules say little about a real-life event **combining several risk factors**
- Need to move to scenario analysis: find the most likely ruin events, and take preventive measures
  - Historical scenarios
  - "What if" creative thinking
  - Reverse-engineering of solvency models

Targeted Stop-Loss mechanism

- Financial hedging
- Tailored reinsurance
- Dynamic asset strategies
- Etc.



Some key issues with tailored solutions

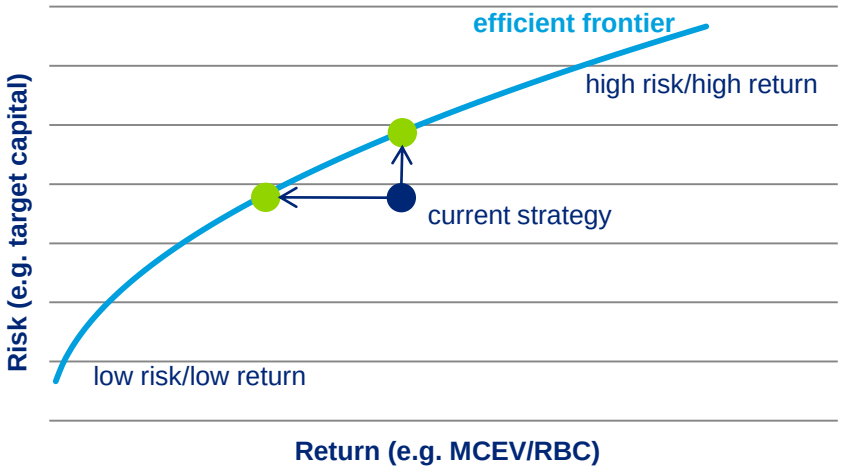
Cost

- Getting quotes from several providers
- Hedging from inception, pricing the cost in

Liquidity

- Compute catastrophe liquidity scenarios to test the likelihood and the impact of having to sell assets at lower prices

Risk – Return Frontier



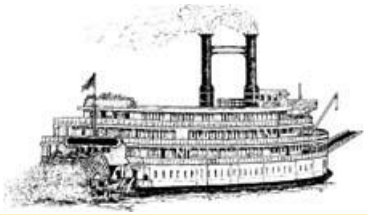
Optimising processes is a must

A simple example: assessing costs/benefits of a hedging strategy

- Cost of purchase (impact on current P&L): *immediate*
- Influence on future profits (impact on available capital/MCEV): *longer*
- Ability to hedge against extreme events (impact on target capital): *much longer*

Repetitive manual work slows you down

- Data gathering & grouping
- High number of scenarios, slow projection tools
- You still need time to analyse the results



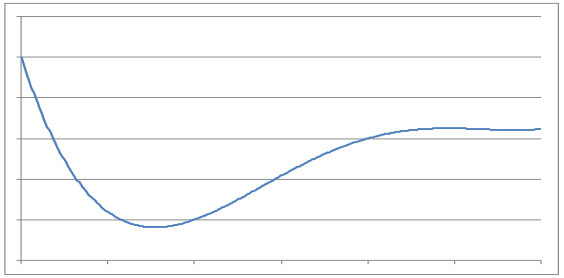
Automation of calculation processes

- Optimise data warehouse & automate input preparation
- Accelerate projection tool / link multiple tools
- Automated results reporting and storage mechanisms

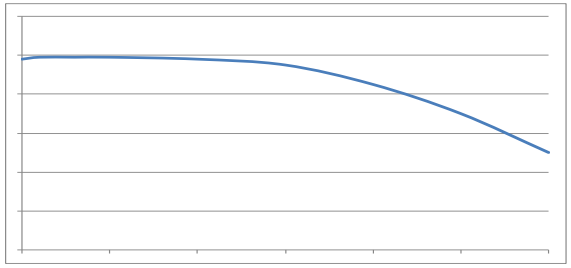
Practical & conceptual obstacles

Can ALM be fully automated?

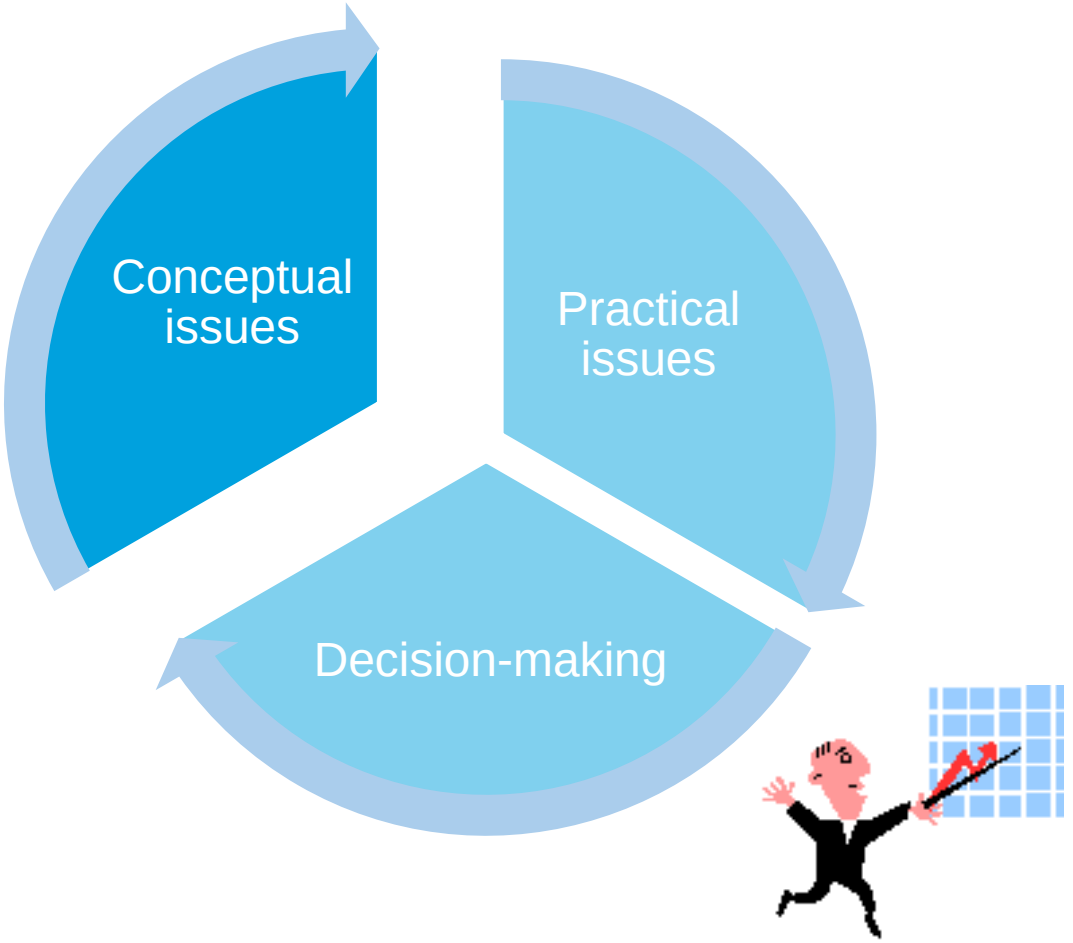
- Could an ideal software test thousands of ALM solutions and deliver an optimal answer?
- Several **local optima** (e.g. interest rates)



- Multiple different **quasi-optima** (e.g. proportion of risky assets)

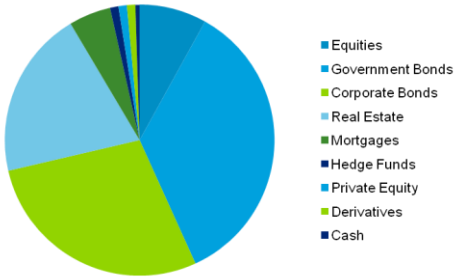


- **Human judgment** remains the core of ALM policy testing

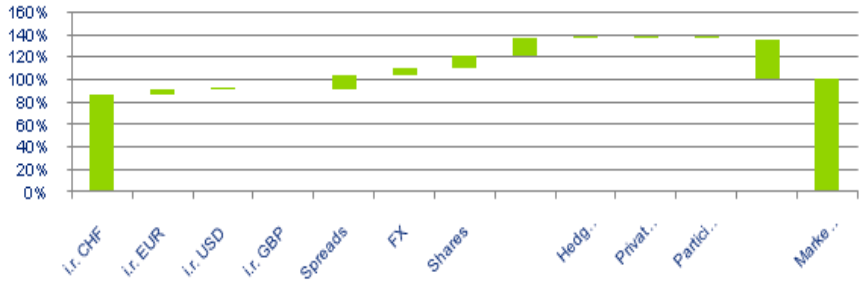


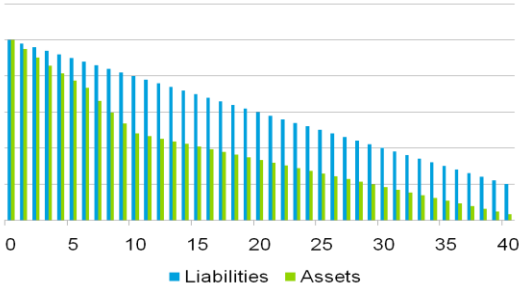
Sample ALM dashboard

Current strategic asset allocation



Target capital





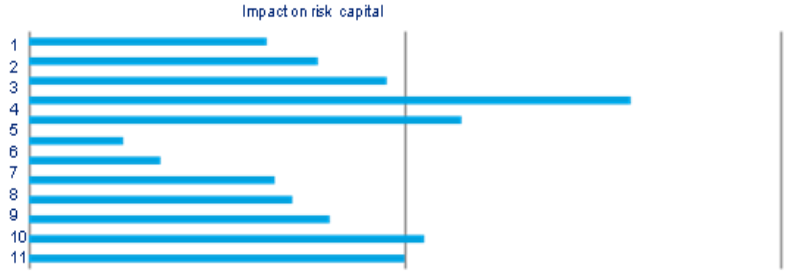
Interest rate risk

Sensitivity	Assets	Liabilities	Net Impact
yield curve +50bp	-100	-50	-50
yield curve -50bp	100	35	65
yield curve +100bp	-150	-75	-75
yield curve -100bp	75	60	15
yield curve +200bp	-200	-125	-75
yield curve -200bp	125	100	25

Currency split

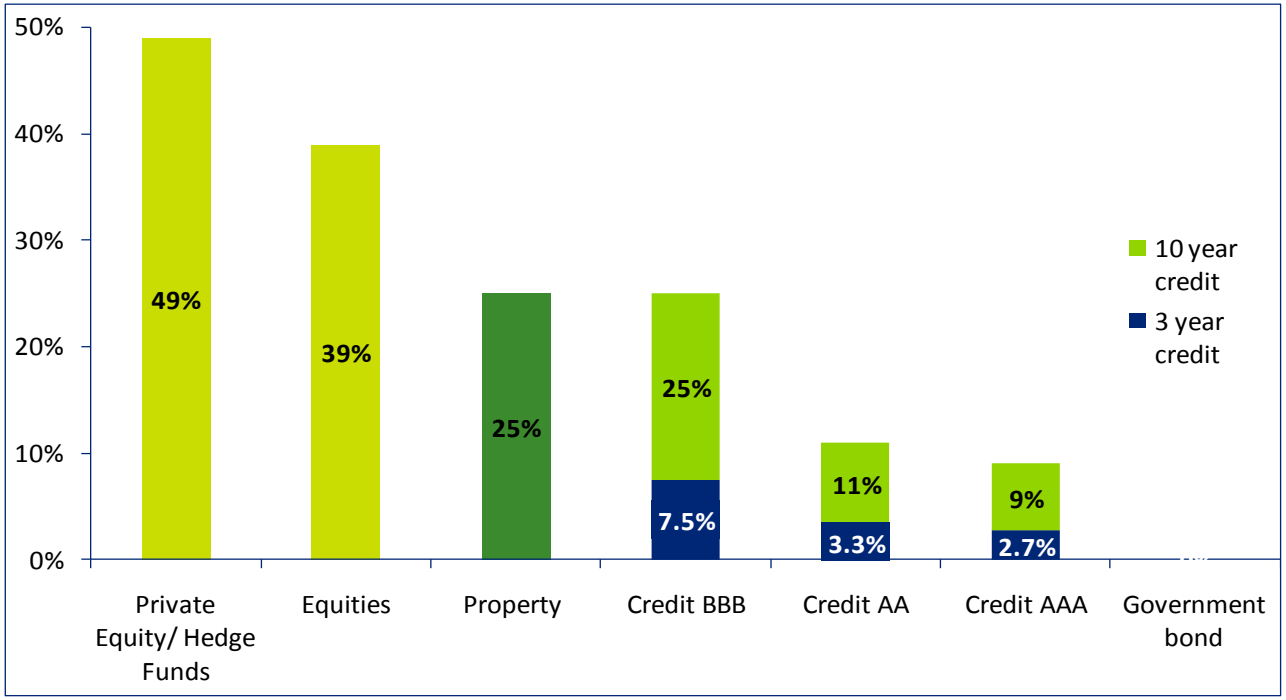
Split by rating

Scenarios



ALM in light of Solvency II

Capital charge by asset type and some consequences



Some predictions you have certainly already heard :

- Increasing demand for government bonds
- Reduction of investments in risky assets
- Increasing demand for derivative instruments and structured products

But also increased discussions regarding:

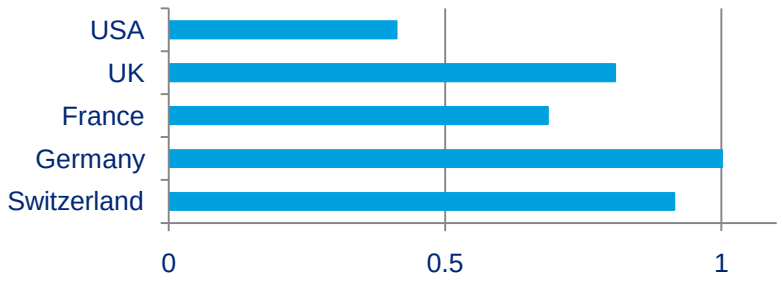
- Risk/return asset profile vs. liability profile
- Initial solvency position and risk appetite
- Business strategy and choice of risks retained

ALM is a **major component of Pillar II and ORSA** (Own Risk and Solvency Assessment)

ALM and Swiss insurance companies

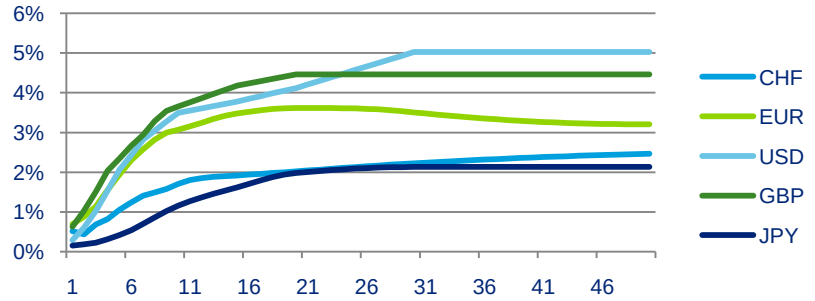
The Swiss bond market: short terms, low returns

Outstanding amount of bonds / GDP



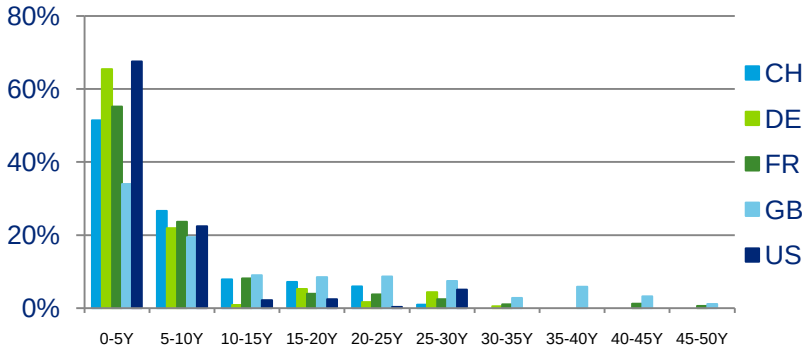
Source: Bloomberg & IMF

Government Yield Curves



Source: FINMA SST Template Q1 2011

Government bond issues



Source: Bloomberg

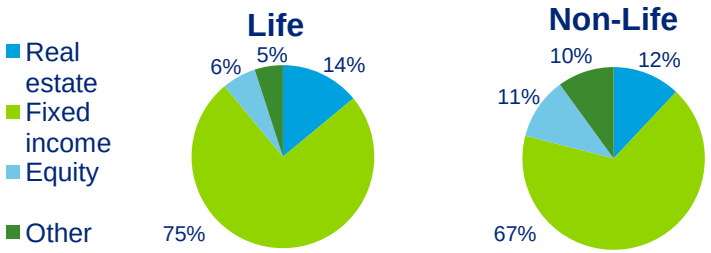
Challenges

- Low returns
- Few long term bonds
- No inflation-linked bonds

ALM and Swiss insurance companies

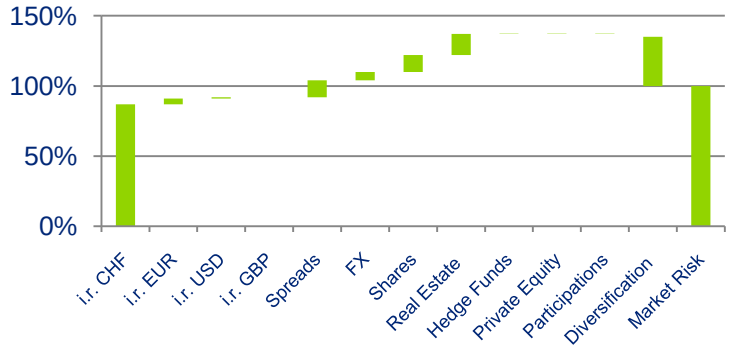
Market Risk

Asset allocation of Swiss companies



Source: FINMA – Report on the insurance market in 2009

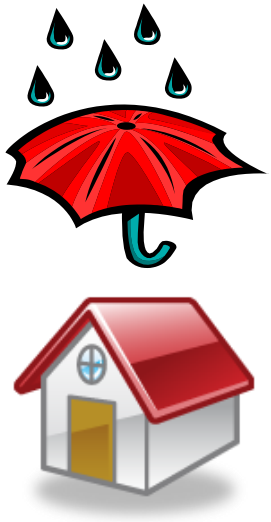
Target capital for Market Risk (Life)



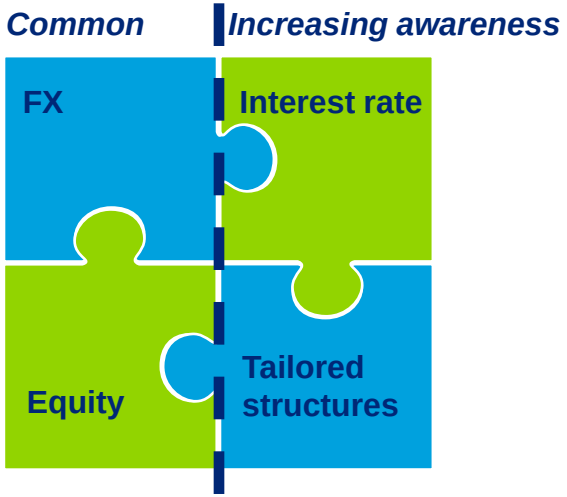
Source: FINMA – SST 2009 Results (30.04.2010)

Swiss property market

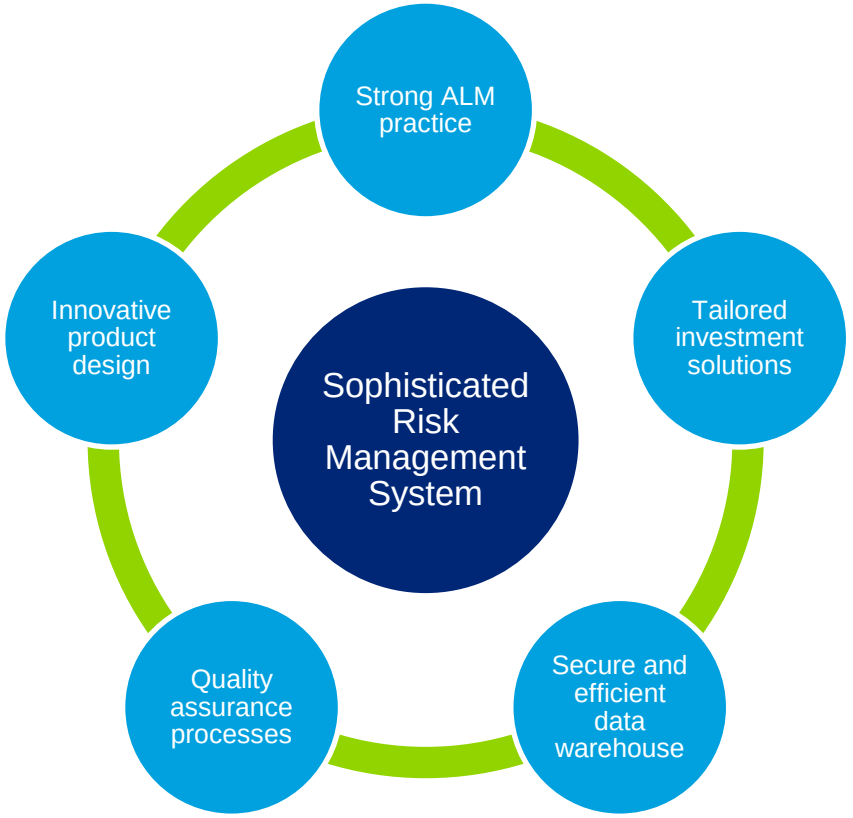
- Seen as high return / low risk by the insurance industry
- Peculiarities: lowest ownership rate in Europe, few transactions (liquidity?)
- Risk of crash often understated

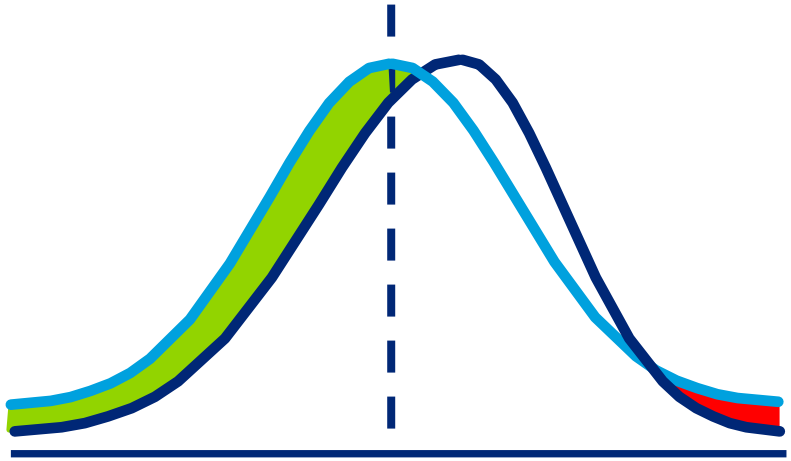


Hedging embedded risks



Consequences and conclusions





ALM is about how much and which upside you sacrifice in order to mitigate downside

Some calculations we performed on a typical Life company in Switzerland:

- Better cash-flow matching within fixed income portfolio: solvency ratio +20-25%
- Buying swaptions at guaranteed rates -50bp: solvency ratio + 5-10% (net of upfront cost)

Optimizing insurance investment processes

Sven Rump, CEO Deutsche Insurance Asset Management Switzerland &
Global Head of Risk Management and Performance

July 5th, 2011

Deutsche Insurance Asset Management: a specialist asset manager within the DB Group

Voted Best Global Insurance Asset Manager for three years in a row (2008-2010) by the readers of *Reactions*, a leading financial magazine for the global insurance market.

Deutsche Insurance Asset Management (Deutsche IAM) focuses exclusively on the management of insurer's assets.

Deutsche Bank

A+ rated by Standard & Poors
Tier 1 capital ratio of 12.3%
Established in 73 countries worldwide

Corporate and Investment Bank		Corporate Investments	Private Clients and Asset Management		
Global Banking	Global Markets	Corporate Investments	**Asset Management**	Private & Business Clients	Private Wealth Management

Deutsche Asset Management
€529 Billion

Insurance	Institutional	RREEF	Retail
Deutsche Insurance Asset Management €143B	DB Advisors €164B	Alternatives €46B	DWS €175B

AuM through March 31, 2011

Investment performance: a big concern for insurers

- Insurance Company Assets: End 2009 USD 22.6 Trillion = ~12 % global financial assets[1]
- Investment performance is among the top concerns of insurance companies[2], in an environment of:
  - Low yields
  - Tighter regulatory standards

➢ Paramount question: How to optimize investment performance while limiting risk in order to:

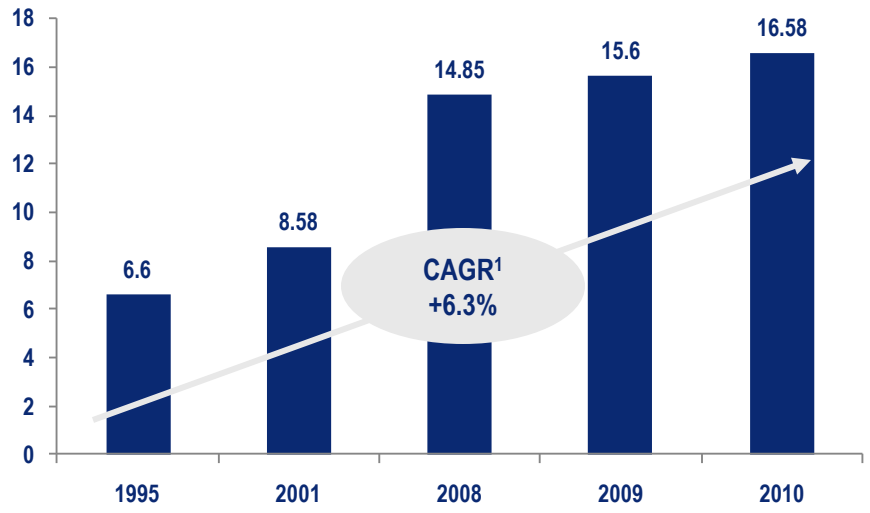
  - Cover claims
  - Meet shareholders‘ return expectations
  - Maintain competitive rates for policyholders

[1] Source: Swiss Re
[2] Source: PriceWaterhouseCoopers surveys of over 400 insurers worldwide

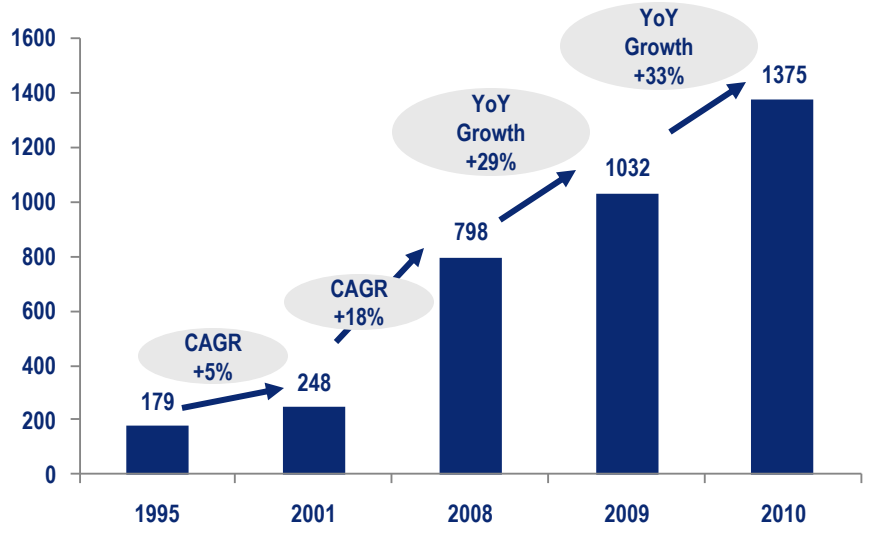
Insurers outsource in order to capture external benefits not available through in-house management

Expertise	Insurers rarely have (or want to afford) the resources required for all asset classes in the depth required for professional investment management
Benchmarking	Insurers outsource parts of their investment management implementation to outside parties to benchmark their own investment managers
Costs	Insurers outsource parts or all of their investment management implementation in order to lower costs

The DB Group has identified insurance asset management outsourcing as a "Mega Trend"



Insurance Assets 5 biggest Markets[2] - USD Bn

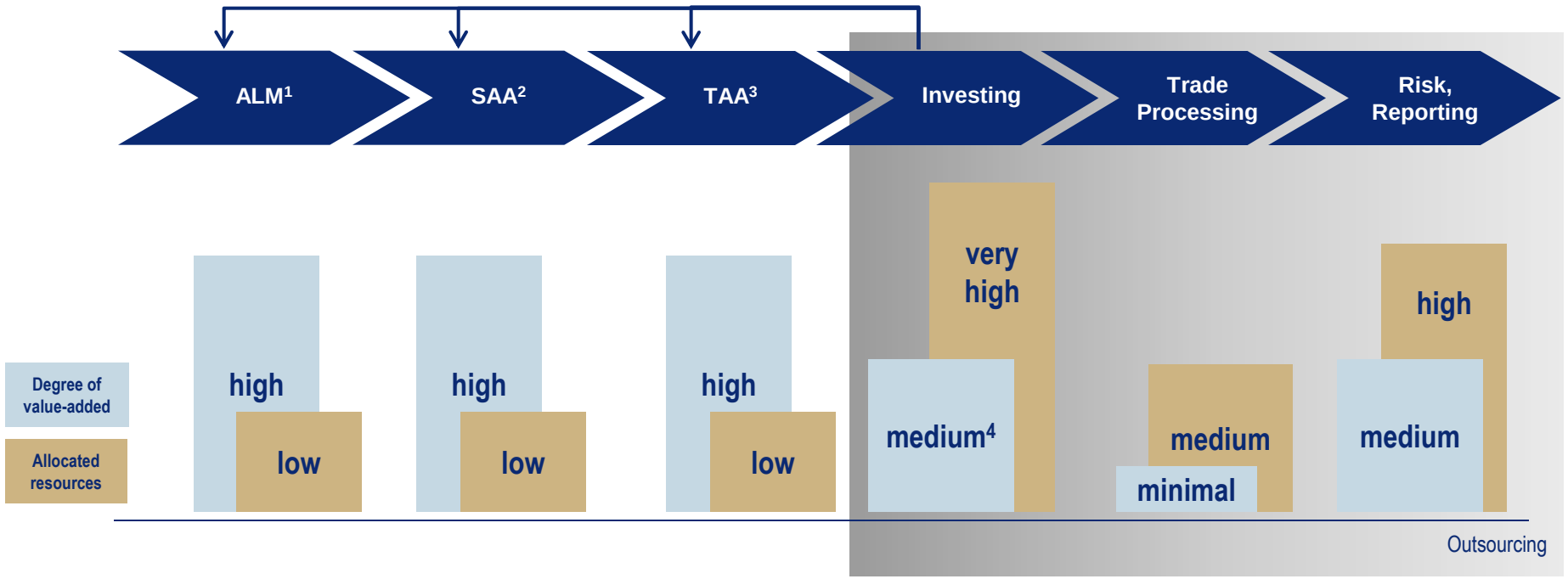


Insurance Outsourced Assets[3] - USD Bn

- Number of investment mandates outsourced to third party asset managers[4]:
  - Increased 95% from 149 (2008) to 290 (2010)
- One of Deutsche's „Mega Trends"
- Reinforced with financial crisis: focus on core competencies!
  - Assessment of investment management skills in changing and very challenging environment
  - Internal risk management capabilities evaluation reinforced by increasing regulatory issues

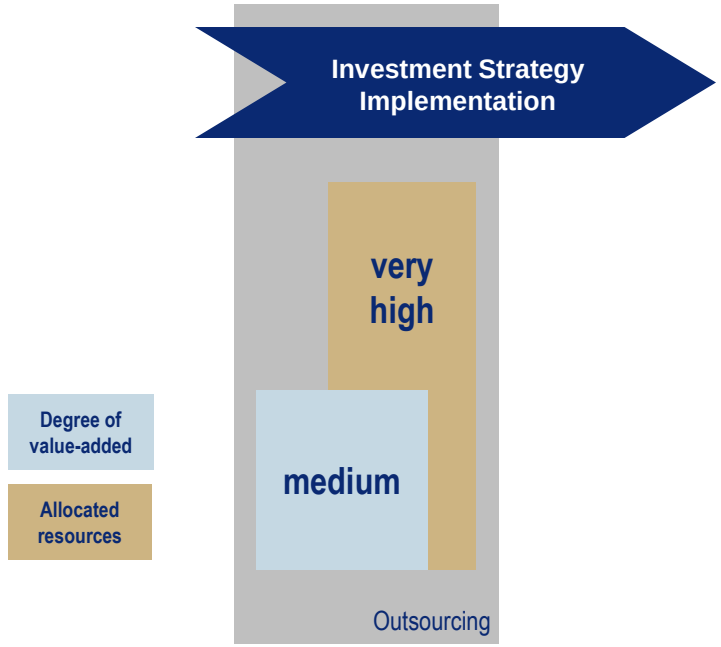
[1] CAGR: Compound Annual Growth Rate
[2] Source: Swiss Re – 5 biggest Markets : US, UK, J, F, D – Figure 2010 estimated on CAGR of 6.3% from 1995-2009
[3] Source: Swiss Re Sigma, 2002 & 2010; Patpatia Associates. 1995 figure is based on a 5% CAGR from 1990-2001. 2010 Figure is a Patpatia Associates estimate.
[4] Source: Insurance Asset Outsourcing Exchange

Value chain of an insurance company's investment function



[1] ALM: Asset Liability Management
[2] SAA: Strategic Asset Allocation
[3] TAA: Tactical Asset Allocation
[4] Depending on investment strategy. Total return type investment mandates tend to rely more on the actual investment management execution compared to book-yield focused investing.

Relatively low value-added tasks are outsourced



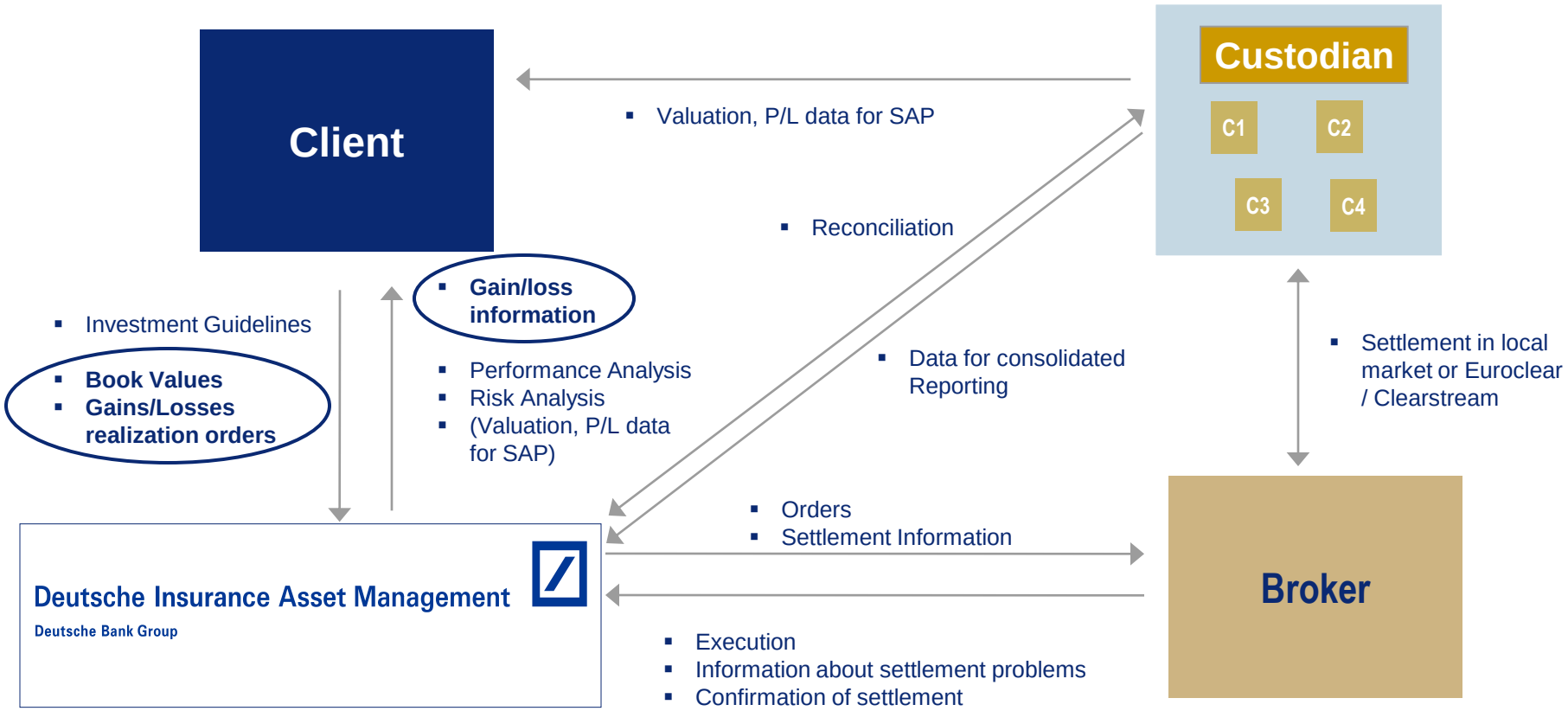
Research	Leverage of larger and specialized institutions' research, decrease of personnel cost
Portfolio Management	Decrease of personnel costs, reduction of succession plan and knowledge transfer risk
Trading and Operations	Transfer of operational risk to asset manager

Note: Retaining control of the gain & loss position is of preeminent importance for an insurer considering outsourcing of on-balance-sheet assets due to immediate implications for the P&L statement. It takes specialists to ensure this.

Sourcing investment management

Pro	Contra
▪ Access specialist knowledge ▪ Leverage large(r) research capabilities ▪ Eliminate home-team bias ▪ Access new asset classes efficiently ▪ Implement asset allocation changes without costly build-up of new internal resources ▪ Benefit from competitive bidding among asset managers ▪ Move from fixed to variable cost basis ▪ Reduce cost ▪ Benefit from world class technology with maintenance as the partners' responsibility	▪ Lose control over investments ▪ Lose pricing knowledge for own product management ▪ Fear irreversibility of decision ▪ Fear becoming dependent upon third party ▪ Fear loss of interest and attention by the third party after the transaction is concluded

Retaining control of P&L is key for an insurer



How are insurer's requirements, such as ALM considerations, taken into account in insurance asset management?

Strictly defined investment guidelines, portfolio managers used to managing with insurance specific restraints and systems enabling sophisticated investment guideline monitoring are crucial, as are highly developed reporting capabilities.

Investment guidelines must be written such as to reflect insurer's investment goals as closely as possible. This may mean the definition of, for instance:

- Duration bands
- Credit quality
- Sector concentration
- Issuer concentration
- Cash limits
- Gain & loss limits
- Turnover limits

Section C)	Sector, Quality, and Risk Limitations		
C-1	Interest Rate Duration	C-1.1	The target duration of the portfolio is 2.9 years and is based on the profile of the Client's liabilities As the duration of the Client's liabilities changes, the Client may change the target duration by notifying the Manager in writing. This may result in a change of the benchmark as set out in B-2. This change in target duration can take place between annual formal reviews of the investment guidelines by the Client. (For the avoidance of doubt, duration means modified duration throughout this document.)
		C-1.2	If the existing benchmark's duration deviates more than +/-0.5 years from the target duration, then the Manager will notify the Client and propose a new benchmark, the duration of which is within +/- 0.5 years of the target duration. In both cases described above, the Client and the Manager will agree on a suitable timeframe for implementation of the new benchmark, the duration of which is in line with the target duration.
		C-1.3	The portfolio's duration may not deviate by more than +/-1 year from the portfolio's target duration.
C-2	Sector Limits	C-2.1	Minimum and maximum sector limits as a percentage of portfolio market value:

Sector	Min. Limit	Max. Limit
EUR denominated government bonds	70%	100%
EUR denominated sovereigns, government agencies, supranationals, local authorities and government guaranteed bank debt.	0%	25%
Cash and cash instruments	0%	the higher of 5% of the portfolio market value or EUR 20m

	Cash Targets	C-2.2	The portfolio shall be managed as to be fully invested into the investment universe. Specific cash targets will be provided from time to time by the Client (e.g. to cover pending claim payments) in which case the limits in Section C-2.1 will not apply. It is understood that while such cash targets act as a constraint, the Investment Objectives (Section B-1) of the mandate may not be achieved.
	Limitations by Credit Quality	C-3.1	All fixed income securities must be investment grade with a long-term issue credit rating of at least A3 by Moody's or A- by S&P. In case of government bonds only, if there is no issue credit rating, the long-term issuer credit rating applies, subject to a minimum credit rating of at least A3 by Moody's or A- by S&P.

B-2	Benchmark		**20% CHF Bonds: new SBI all AAA-A with the following target duration and maturity bucket weights:** Target Duration: 10 years 1-3 years: 10.0% 3-5 years: 7.5% 5-7 years: 5.0% 7-10 years: 12.5% 10+ years: 65.0%

➢ Benchmark reflects the liability profile

Case study 1: outsourcing of a BBB-corporate credit mandate

Swiss mid-sized insurance company with over EUR 10bn in AuM realized the need to invest into lower-rated asset classes. Internal research capabilities were not sufficiently existing and a make or buy decision had to be taken.

The decision was made to outsource this mandate – the first outsourcing ever for this client.

Rationale:

- **Allocate resources to higher value added functions (ALM, SAA, TAA, Risk)**
- **Source strategy implementation and operational risk**
- **Leverage specialist knowledge of asset manager in corporate credit (BBB rating)**
- **Gather first experience with outsourcing investment strategy implementation**

Case study 2: full outsourcing of credit fixed income

Multinational, Swiss-based insurance company with over EUR 100bn in AuM and worldwide presence outsourced all non-rates fixed income asset management after the crisis of 2008. The initial outsourcing was EUR 14 billion.

Decision to re-engineer asset management operating model was taken after crisis of 2008 due to severe performance issues and cost pressures.

Rationale:

- **Allocate resources to higher value added functions (ALM, SAA, TAA, Risk)**
- **Source strategy implementation and operational risk**
- **Clean-up of legacy portfolio by external partners**
- **Leverage specialist knowledge of asset managers in non-core asset classes**
- **Focus on underwriting expertise**

Thank you for your attention – any questions?

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