



Institute
and Faculty
of Actuaries

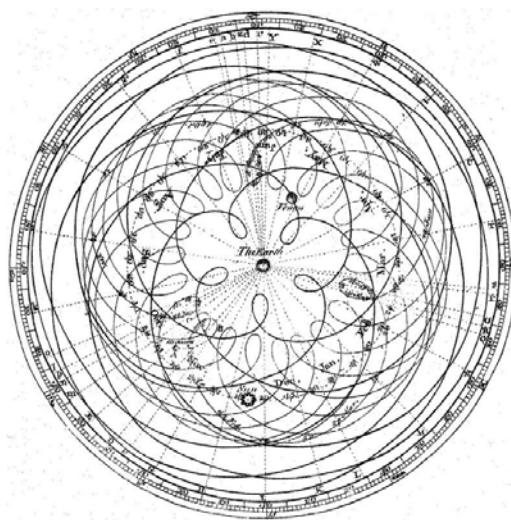
Fundamentally re-thinking ALM

Neil Snyman, Aviva Investors
Paul Fulcher, Nomura International plc

20 November 2015

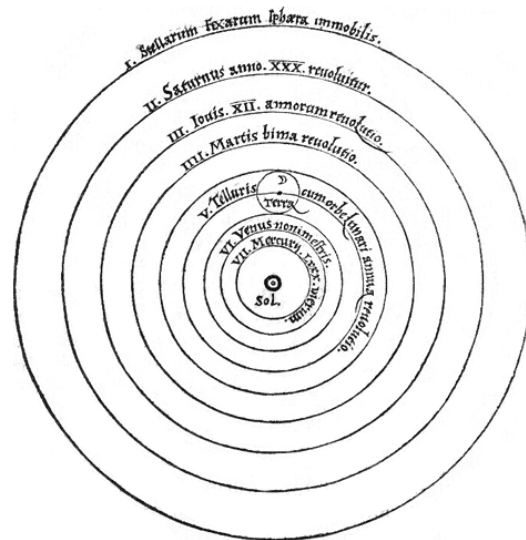


What we hear when we discuss general insurance investment...



The ideal: Risk Based Capital Constrained Portfolio Management

- Clear investment objective driving investment strategy
- Focus on economic value not accounting profits
- Risk appetite clearly expressed
- Clear governance within set risk limits
- Transparent view of risk and relevant performance



3

Jargon Buster

- Funding



- Liquidity



- Capital



- RWA



- Leverage



"Give me a lever long enough and a place to stand and I will move the entire earth", Archimedes

- Spread



4

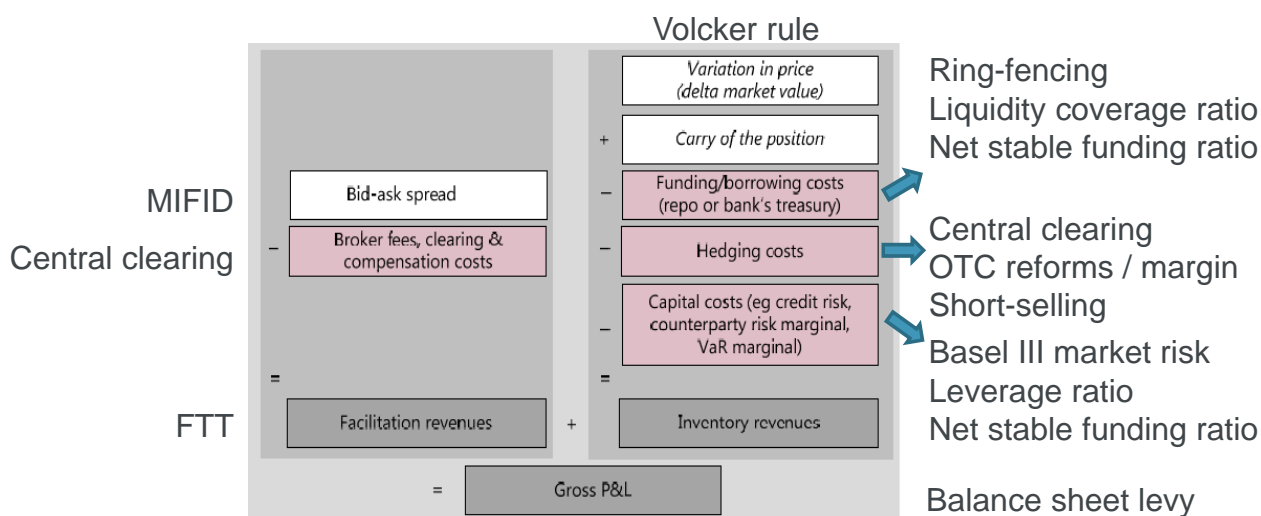


Institute
and Faculty
of Actuaries

A step back: The competitive landscape

ertise
ponsorship
Thought leadership
Progress
Community
Sessional Meetings
Education
Working parties
Volunteering
Research
Shaping the future
Networking
Professional support
Enterprise and risk
Learned society
Opportunity
International profile
Journals
Support

Pressure on banks

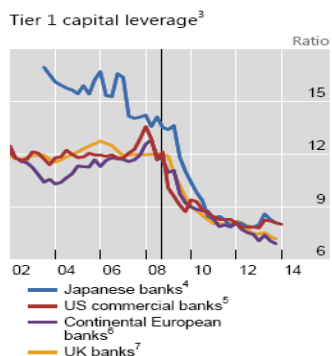


Source: CGFS Paper No 52 "Market making and proprietary trading: industry trends, drivers and policy implications"

6

Implications

Reduced leverage



Falling inventory



“Although liquidity may on average be higher, the risk that liquidity may not be available when it is needed most has also risen.”

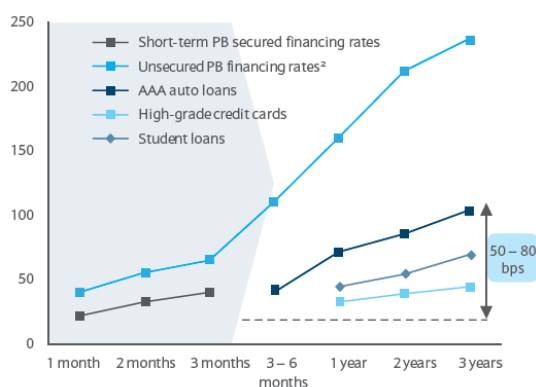
Source: CGFS Paper No 52 "Market making and proprietary trading: industry trends, drivers and policy implications"
Bank of England Deputy Governor speech, Dealing with change: Liquidity in evolving market structures, October 2015

7

Knock-on effect for hedge-funds



Current and potential benchmark rates for PBs' repo borrowing



2. Estimated typical PB unsecured debt issuance rates
Source: Barclays Trading team; Strategic Consulting analysis

Source: Barclays, "Evolution of the Hedge Fund Financing Model", September 2012
<http://www.risk.net/risk-magazine/feature/2349066/hedge-funds-to-be-hit-by-prime-broker-charges-under-basel-iii>
<http://www.risk.net/risk-magazine/feature/2361104/no-arbitrage-new-rules-make-markets-less-efficient>

8

So who can fill the gap

Long-term investors. Market participants with medium- or long-term investment horizons, such as pension funds, life insurance companies and reserve managers, tend to be **less sensitive to changes in liquidity conditions.** In principle, these market players are well positioned to mitigate the impact of reduced market-making supply during times of temporary order imbalances, eg by buying assets at depressed levels or by lending out their inventory to support market-makers.

→ Liability profile

Yet, once the current environment of monetary accommodation is changing, more prudent investment policies in the aftermath of the global financial crisis may encourage a structural shift towards investing in less risky and more short-term instruments, possibly accentuating the impact of reduced risk-taking by dealers.²⁷ This shift comes in addition to **ongoing accounting and regulatory changes** to improve transparency and solvency. Greater use of fair value accounting under IFRS, for example, may limit the scope for taking long-term or illiquid assets on balance sheet, particularly during times of elevated market volatility. Likewise, **higher risk charges may disincentivise allocations to corporate bonds.**

→ Solvency II

→ Exposure to volatility

Source: CGFS Paper No 52 "Market making and proprietary trading: industry trends, drivers and policy implications"

9

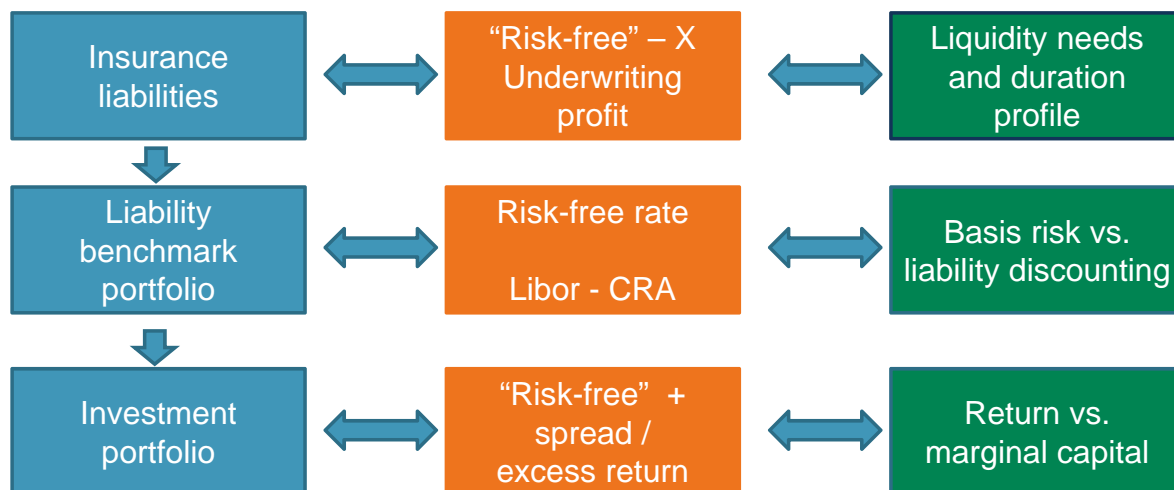


Institute
and Faculty
of Actuaries

The opportunity for insurers

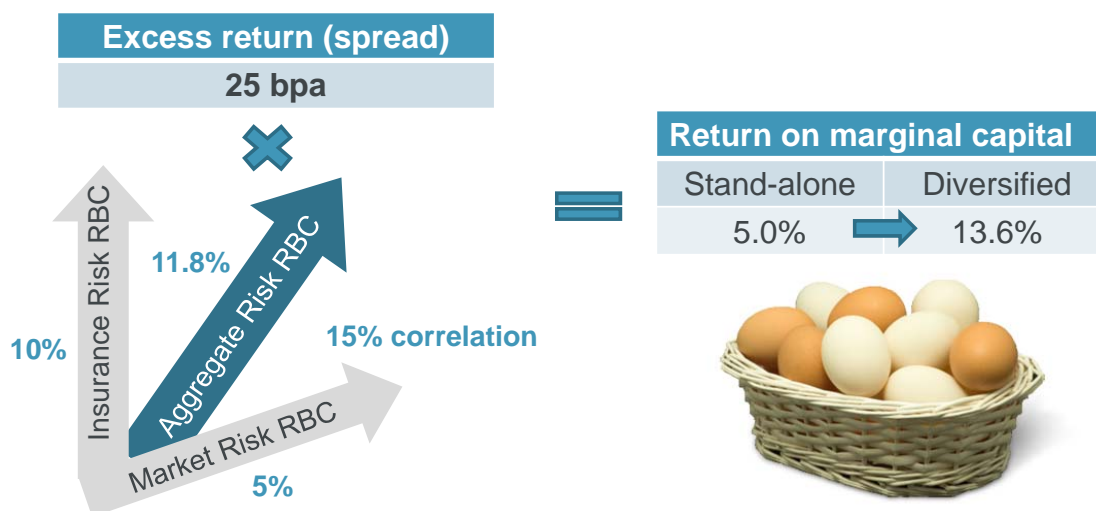
Sponsorship
 Thought leadership
 Progress
 Community
 Sessional Meetings
 Education
 Working parties
 Volunteering
 Research
 Shaping the future
 Networking
 Professional support
 Enterprise and risk
 Learned society
 Opportunity
 International profile
 Journals
 Support

Allocating the cost of funding



11

Insurance vs. market risk



12

But what about the Volatility Adjustment?



Source: "Damp Squid, the English Language laid bare", Jeremy Butterfield

13

But what about the Matching Adjustment?



14

Examples...

"Float"
Funding @ 2.2%
(T-bills - 3%)



Leverage
1.6-1



Information ratio
0.66



	Fraction of years with negative cost	Average cost of funds (Truncated)*	Spread over benchmark rates				
			T-Bill	Fed Funds rate	1-Month Libor	6-Month Libor	10-Year Bond
1976-1980	0.79	1.67	-4.59	-5.65			-5.76
1981-1985	0.20	10.95	1.10	-0.27			-1.28
1986-1990	0.00	3.07	-3.56	-4.61	-4.80	-4.90	-5.30
1991-1995	0.60	2.21	-2.00	-2.24	-2.46	-2.71	-4.64
1996-2000	0.60	2.36	-2.70	-3.10	-3.33	-3.48	-3.56
2001-2005	0.60	1.29	-0.82	-0.96	-1.05	-1.19	-3.11
2006-2011	1.00	-4.00	-5.84	-6.06	-6.29	-6.59	-7.67
Full sample	0.60	2.20	-3.09	-3.81	-3.69	-3.88	-4.80

1965-2014

Berkshire Hath. Book value	Berkshire Hath. Market value	S&P 500 Total return
19.4% p.a.	21.6% p.a.	9.9% p.a.
751,113%	1,826,163%	11,196%

Source: Berkshire Hathaway Inc. Shareholder Letter 2014,
Buffett's Alpha by Frazzini, Kabiller, and Pedersen (2013), NBER Working Paper

15

Examples ...

"Attractive **cost of funding** allows us to be **patient**, disciplined and **opportunistic** in our investment philosophy – our asset allocation is driven by market opportunity...

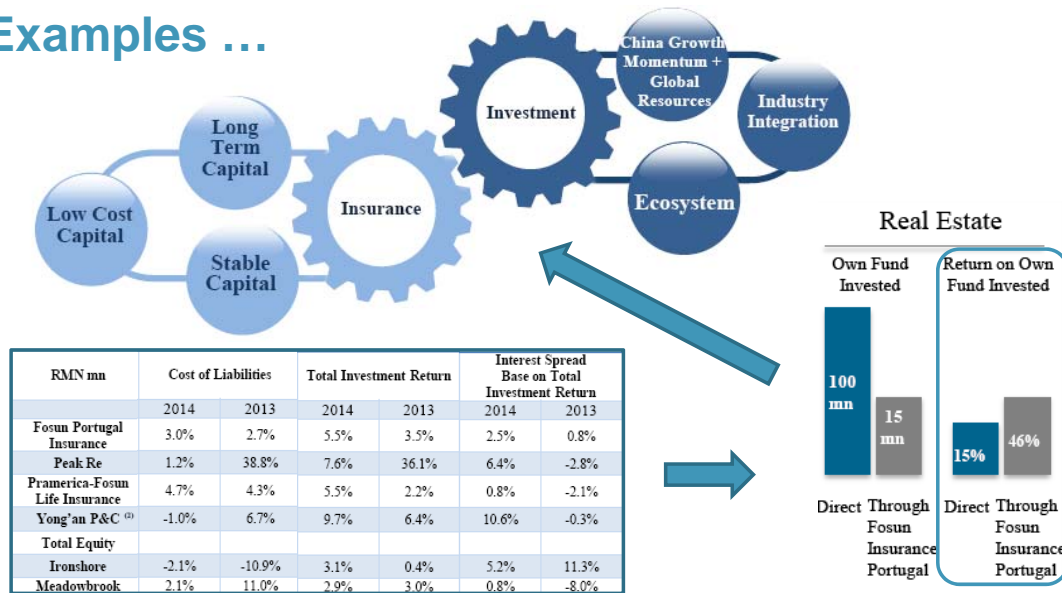
... capturing incremental spread by assuming incremental **liquidity and complexity risk** rather than credit risk"

Return on equity illustration	
Assets	\$1,500
Reserves	\$1,400
Capital [7%] (15 * leverage)	\$100
Liabilities	\$1,500
Income statement	
Investment income [6%]	\$90
(Cost of reserves [3.5%])	(\$49)
Spread income	\$41
Overheads & taxes [1.5%]	(\$21)
Operating income	\$20
Return on equity	20%

Source: Athene Holdings, High-Level Business Model Overview – Investor Presentation, 2013 and Investor Day October 2015

16

Examples ...



Source: Fosun International 2014 Annual Results Presentation

17



Institute
and Faculty
of Actuaries

Risk Based Capital Constrained Portfolio Management

Sponsorship
 Thought leadership
 Progress
 Community
 Sessional Meetings
 Education
 Working parties
 Volunteering
 Research
 Shaping the future
 Networking
 Professional support
 Enterprise and risk
 Learned society
 Opportunity
 International profile
 Journals
 Support

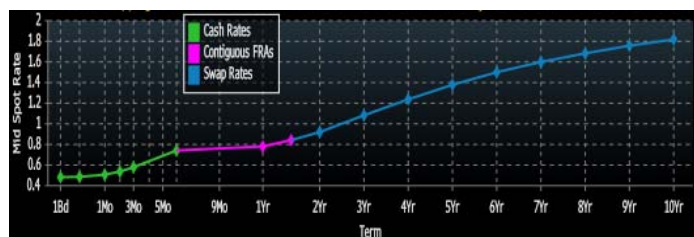
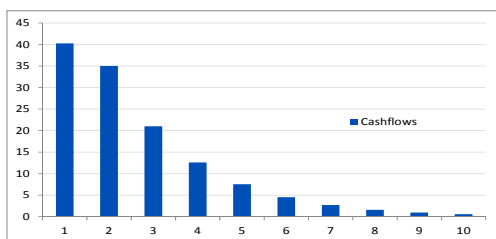
Where structural premiums originate

- Not all investors are in an equal position!
- Rationale for structural investor specific advantages are:
 1. **Illiquidity** - It is difficult to trade out of the positions during life of the transaction.
 2. **Complexity** - Trades require significant structuring expertise and due diligence, which must be compensated.
 3. **Cost of funding** - Funding cost of participants active in the market may be larger than for insurer
 4. **Regulatory** - Regulatory constraints can increase cost of consuming risk for aggregate participant, often via mismatches between economic and regulatory capital requirements
 5. **Size** – Some illiquid trades come in large sizes and are typically accessible only to large institutional investors

19

How liabilities enter the picture

Liability cashflows x (swap implied) discount factors



- The present value of a liability is the projected cashflows discounted at the relevant discount rate
- For the economic basis this discount rate is implied from the interest rate swap market
- Therefore there is market risk embedded in liabilities as changes in swap rates result in changes in liability



20

How we manage liability risk

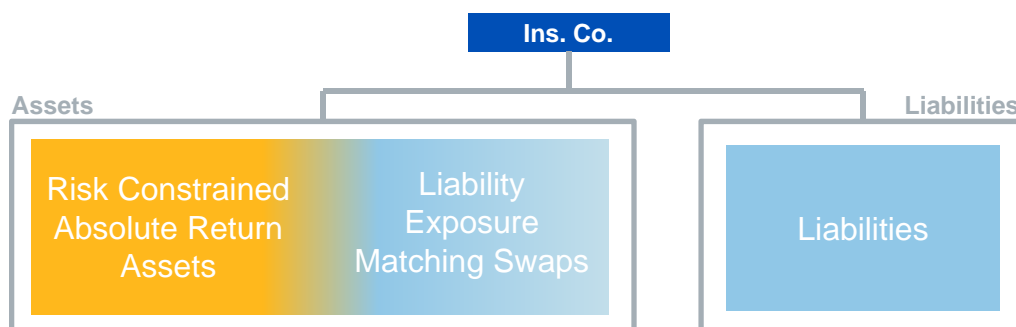
- Liability value is calibrated to market instruments (IRS + potentially others)
- Can construct a portfolio of swaps that offsets any change in market value of the liabilities due to market movements
- Will need to receive the fixed rate on the swaps to match the fixed liability payments
– leaves us with a floating rate payment
- Floating rate is 6 month LIBOR
– this is the effective liability funding rate
- The market risk exposure of the liabilities have been matched by a portfolio of assets and we have to make regular LIBOR-linked payments



21

What that means for the assets

- Investment objective is to invest in assets to meet the liability funding rate of LIBOR
- Return in excess of this will add to the surplus
- Need to be aware of and able to manage the risk taken to earn this target
- Effectively a risk constrained absolute return investment objective

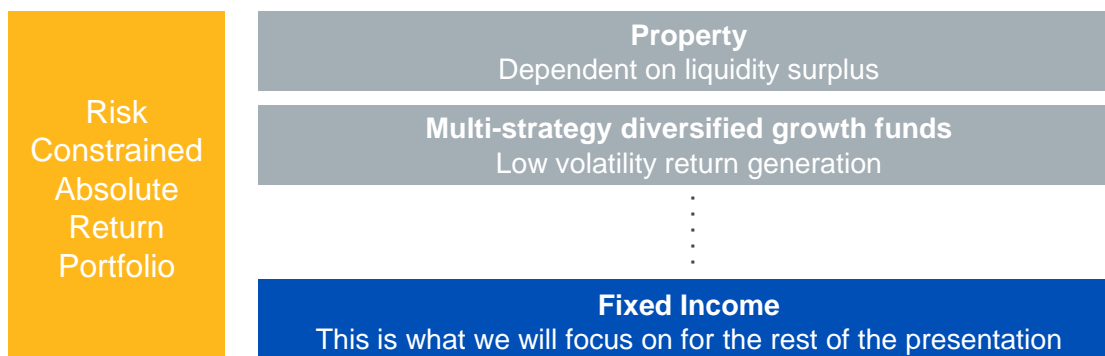


22

Risk Constrained Assets

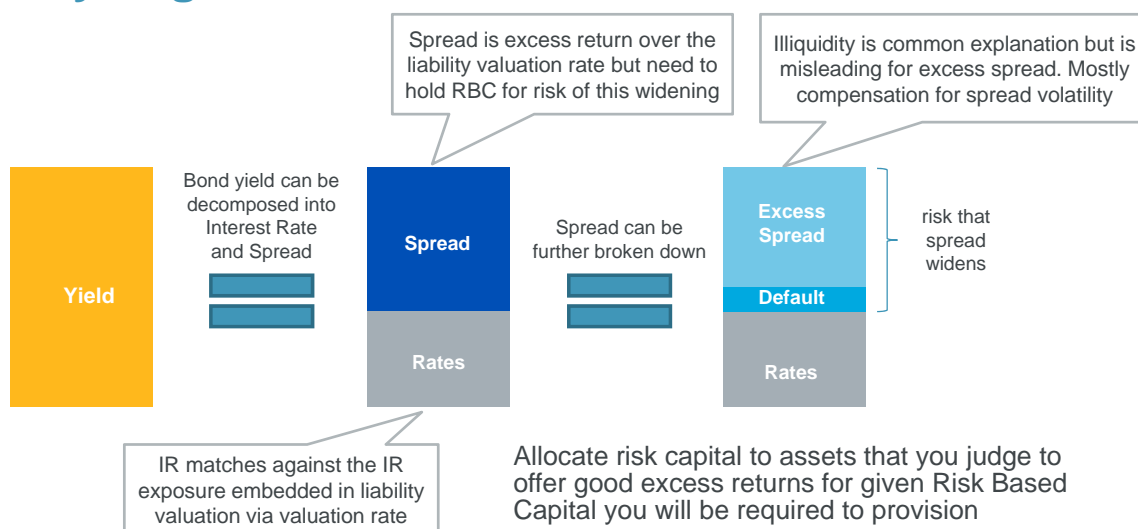
Focusing on the risk/required capital constrained assets.

The investment objective becomes one of allocating risk/capital budget to assets that are expected to offer excess returns for their given risk



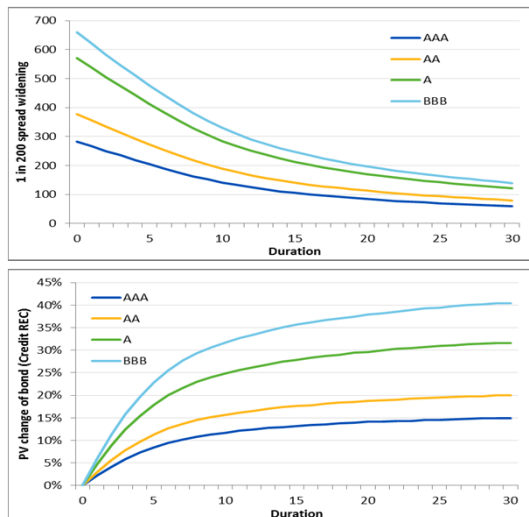
23

Analysing Fixed Income Returns

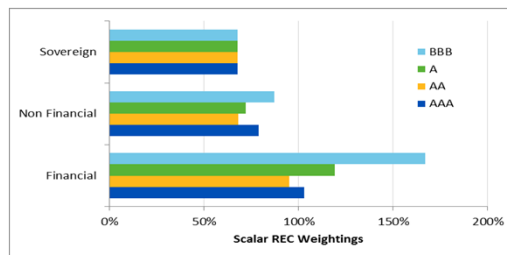


24

Economic Capital for Spread Risk



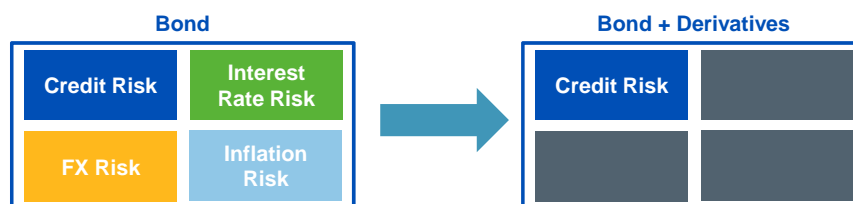
- Credit spread volatility curve is downward sloping
- Viewed in market value terms the RBC required increases with longer maturity and lower credit rating



25

Using Derivatives

- Derivatives are a useful tool for risk management
- Fixed income securities contain various risks:
 - credit risk
 - interest rate risk
 - exchange rate risk (if denominated in a foreign currency)
 - inflation risk (if payments are linked to inflation)
- Derivatives allow you to manage these risks and isolate the credit risk.
This is where we want to spend our risk based capital, allowing us to take the risks we want to with the aim of earning returns in excess of our target rate.



26

Break-even target asset return

- We have shown that the liability value grows at LIBOR (less CRA)
 - Leaving LIBOR as the asset target return to keep up with the liabilities
- We also need to consider the market risk of the assets
 - And the RBC we need to provision for this risk
 - This capital that has been provisioned needs to be remunerated
- This leads to target return over a time horizon to meet the liabilities and remunerate the capital provisioned for market risk

$$\text{Breakeven return} = \text{LIBOR} + \text{RBC} \times \text{CoC} \times \text{diversification}$$



Returns in excess of this breakeven rate add economic value as it delivers asset value gains over and above what is required to meet the liability and the cost of capital for the risk taken

27

How does MA affect the framework

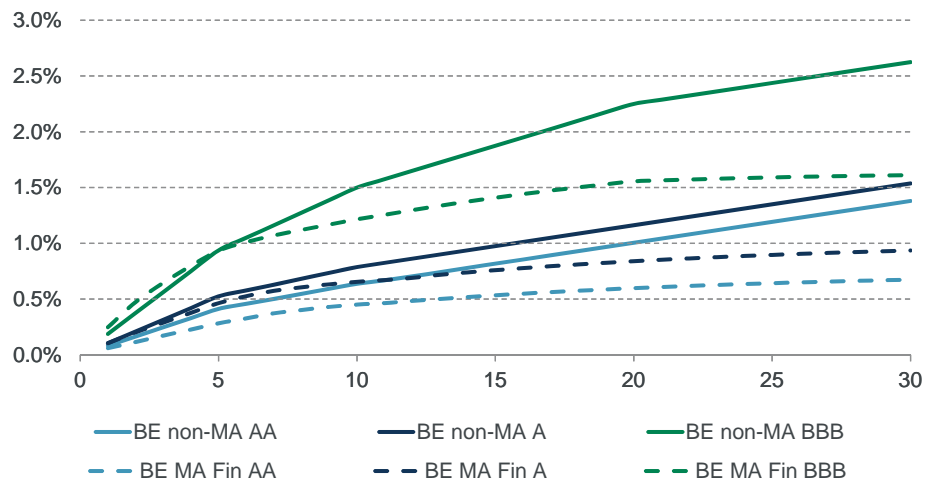
- Liabilities are valued relative to invested portfolio of liability cashflow replicating assets
 - allowing for defaults
- Risk Based Capital is dampened
 - as some of widening in credit spread shock scenario is matched by higher liability valuation rate, and
 - the matching adjustment allows expected spread income to be capitalised
- The hold to maturity requirement of the assets drives an equivalent time horizon on balance sheet impact

$$\begin{aligned} \text{Breakeven return} &= \text{LIBOR} + \text{Exp Def} + (\text{RBC} \times \text{dampener} - \text{MA}) \times \text{CoC} \times \text{diversification} \\ &= \text{LIBOR} + \text{Exp Def} + [\text{RBC} \times \text{dampener} - \text{dur} \times (\text{spread} - \text{FS})] \times \text{CoC} \times \text{diversification} \end{aligned}$$



28

Impact on break-even target



29

Considerations - Portfolio Composition

Given the investment objective to maximise return relative to economic risk (or return for an amount of Risk Based Capital) what needs to be considered when composing a portfolio?

Some caveats:

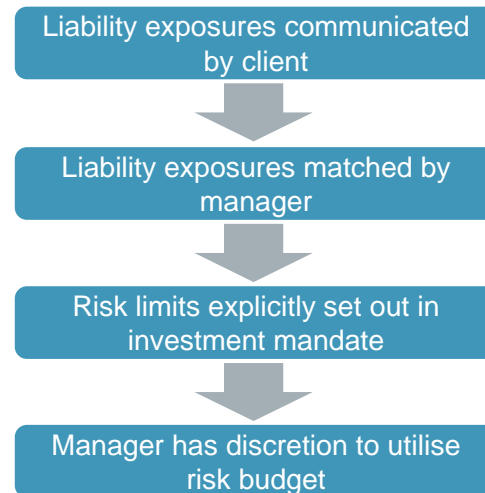
- Actual returns are retrospective
- Expected returns are prospective and subjective
- Neither are the same thing as yields or spreads
- But yields/spreads are useful for illustration purposes as it is transparent, objective and simple. Avoids the subjectivity from overlaying investment views



30

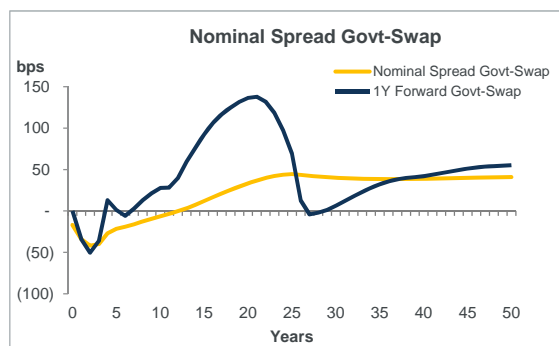
Governance and Discretion

- Liability exposures to be matched can be communicated in terms of interest rate, inflation and liquidity
- Risk appetite made explicit in terms of company aligned metrics such as RBC, counterparty limits, liquidity, etc.
- This leaves the manager free to utilise risk budget for opportunities that provide good excess returns
- Discretion gives ability take advantage of and benefit from dislocations in the market and relative value opportunities
- Transparent risk and performance reporting



31

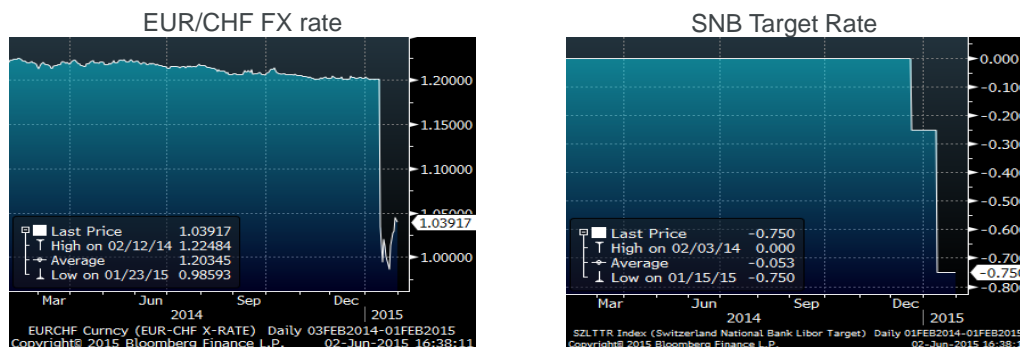
Example 1 – UK Government Bonds



- Risk Based Capital increases with credit duration
- The spread curves flatten off at the long (high RBC) end
- Want to position such that we can **maximise return vs risk**
- Forward credit spread exposures can be more efficient than plain long only

32

Example 2 – Swiss AAA Covered Bonds

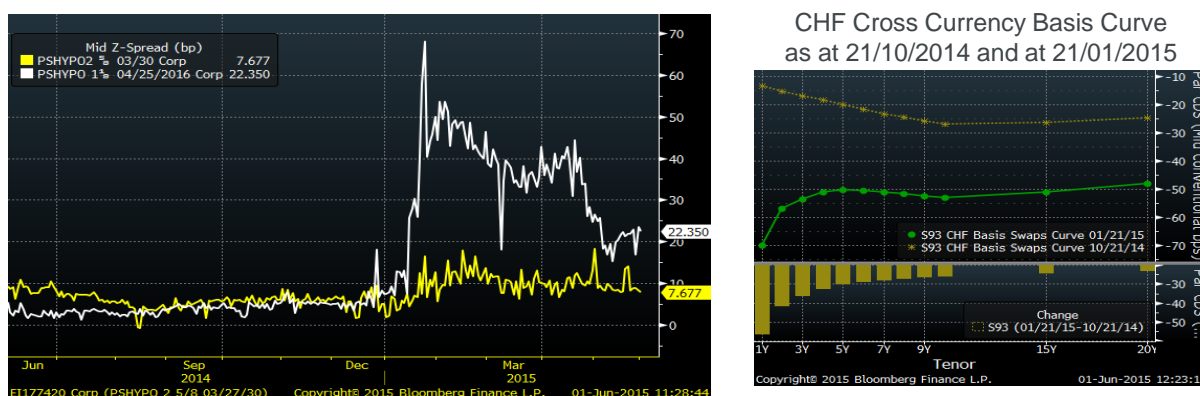


- The Swiss National Bank applied a currency floor of the EUR CHF exchange rate to stop the CHF strengthening
- In Jan 2015 the Swiss National Bank abandoned the peg and cut its target interest rate to -0.75%
- This unexpected and abrupt move caused market dislocations

Source: Bloomberg

33

Example 2 – Swiss AAA Covered Bonds



- The white curve shows the spread of a short dated AAA Swiss covered bond
- The yellow curve shows the spread of a longer-dated 15 year bond from the same issuer
- As shown in the graph, the spread of the short-dated bond widened whereas the long-dated bond did not move as much \Rightarrow it is not a credit quality related spread move
- At the same time the cross currency basis widened significantly

Source: Bloomberg

34

Example 3 – XCCY Relative Value

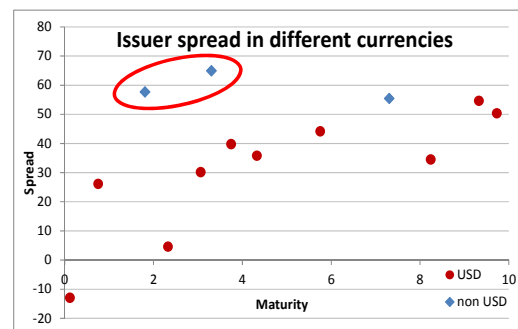
Corporates issue bonds in multiple currencies

- Facilitates currency specific funding needs
- Increases and diversifies the investor base
- Relative funding value

Valuations across currencies vary as local investor sentiment and local liquidity conditions amongst other factors change.

The underlying credit risk remains the same

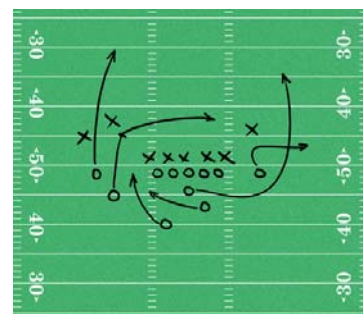
This provides opportunities to buy in another currency swapped back to liability currency



35

Recap

- Investment objective is to target economic value when investing
- Target excess returns compared to liability funding rate
- Need to provision (and remunerate) capital for market risk taken
- Clear risk aligned investment mandates delineates overlapping issues
- Matching market exposures of the liabilities with a portfolio of derivatives, we are left with a risk constrained absolute return asset portfolio
- Target is to meet liabilities and pay for the capital provisioned (which is itself a function of the assets held)
- A bond is a package of risks. Derivatives can isolate these risks and allow better investment outcomes
- Insurers have a structural investment advantage in some markets



36



Questions



Comments

The views expressed in this presentation are those of invited contributors and not necessarily those of the IFoA. The IFoA do not endorse any of the views stated, nor any claims or representations made in this presentation and accept no responsibility or liability to any person for loss or damage suffered as a consequence of their placing reliance upon any view, claim or representation made in this presentation.

The information and expressions of opinion contained in this presentation are not intended to be a comprehensive study, nor to provide actuarial advice or advice of any nature and should not be treated as a substitute for specific advice concerning individual situations. On no account may any part of this presentation be reproduced without the written permission of the IFoA or authors.