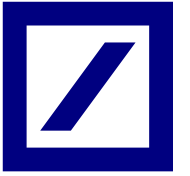




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How to Use Investment to Hedge Solvency Risk?

- Europe and Asia Case Studies

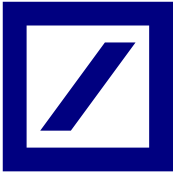
Deutsche Bank
10 May 2019

A stylized silhouette of the Chengdu skyline in shades of pink and red, featuring various buildings and the Oriental Pearl Tower.

Chengdu



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Agenda

- Solvency Regimes
- Assets – Liabilities Management
- Useful Investment Tools



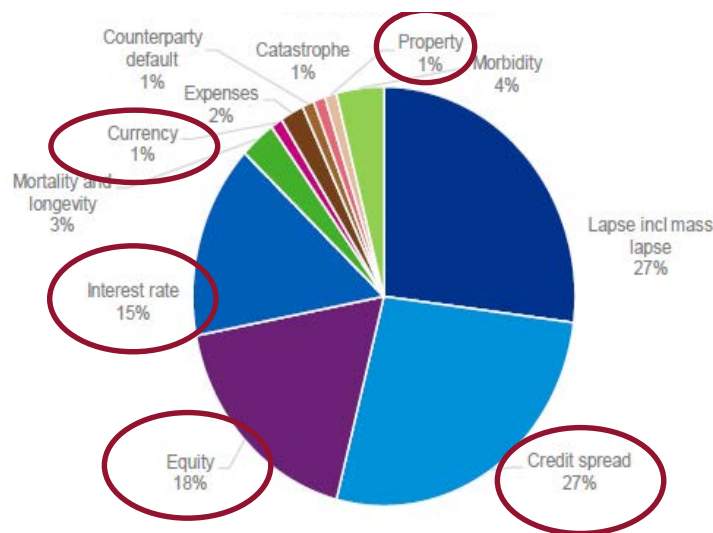
Asset portfolio decides some key parameters in solvency calculations

Solvency Regimes	Duration Variation	Product Lines	Dynamic VA	Post LLP
ICS2.0	Yes, spread adjustments depend on tenor	Methodology specific: Three buckets, Revised HQA and OAG	No, same fixed VA applied at interest rate shock scenarios	Yes
HK RBC QIS 2	No, flat adjustment is applied up to LLP	Same VA applied for all product lines	TBD	Yes
C-ROSS	No, flat adjustment	Yes, 3 levels of comprehensive premium is set for different product lines	No, same set of comprehensive premium is applied at interest rate shock scenarios	No
Singapore RBC 2 Consultation	No, flat adjustment is applied	Only applicable to Whole Life, Endowment and Annuity products	No, same fixed VA	Yes
SII	No, flat adjustment is applied up to LLP	MA is determined per “matched” liability portfolio	Allowed in some EU countries for internal model, e.g. Netherlands	Yes

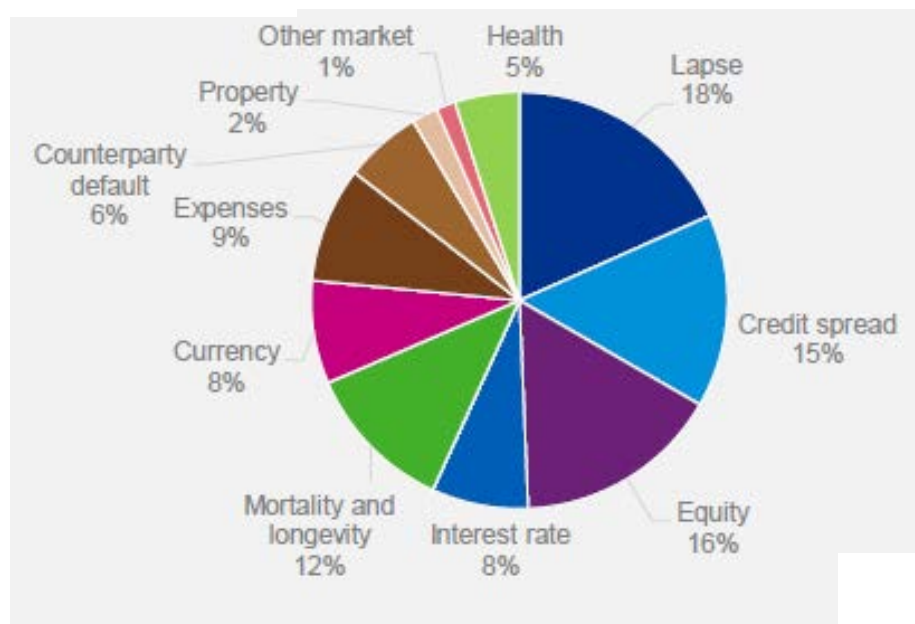


Market risks have driven the capital requirements

HK RBC QIS 1



UK SCR YE16



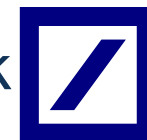
- Other example includes interest rate risk takes 81% of total minimum capital requirements (before diversification) under C-ROSS.



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Investment under risk based solvency regime

- The recent solvency regime changes in insurance industry brings new challenges and considerations to the investment strategy
- Balance between
 - Capital requirements vs. expected return, e.g., government bonds and high quality bonds vs. equities
 - Benefit of diversification vs. (potentially) higher capital consumption for certain underlyings
 - Transparency vs. management talent
 - Spot optimization vs. multi-period dynamic optimization
 - Risk/capital allowance vs. potential performance, cyclical vs. countercyclical
- Products and strategies that fit the new solvency framework



Example: Optimize the asset portfolio for existing assets

Example:

Asset allocations between participating business and traditional business, total asset size 100mn HKD.

Prior optimization

Products	FI (mn HKD)	Equity (mn HKD)
PAR	50	50
Traditional	50	50

After optimization

Products	FI (mn HKD)	Equity (mn HKD)
PAR	0	100
Traditional	100	0



Equity Risk down 18mn HKD

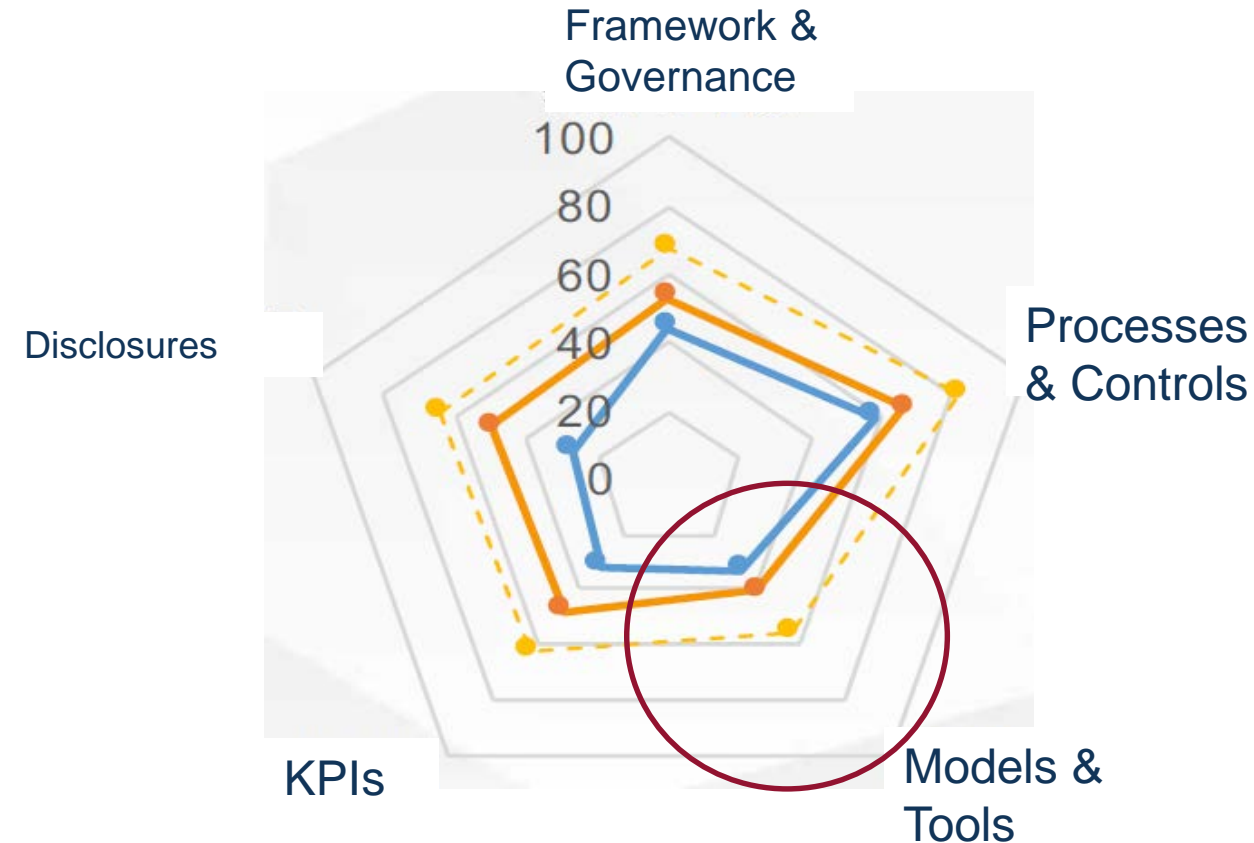
The individual PCR for the equity risk represented 19% of the total PCR even though the equity exposure represented 7.3% of the asset exposure. The significant PCR relative to the exposure appeared to be due to the **Life Insurance companies may not appropriately hypothecate** their assets and the **General insurance companies had not sufficiently applied look-through in CIS.**

"IA HK RBC QIS 2 – Equity Risk Calibration Paper_20180412"



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How to implement ALM decisions has been an issue

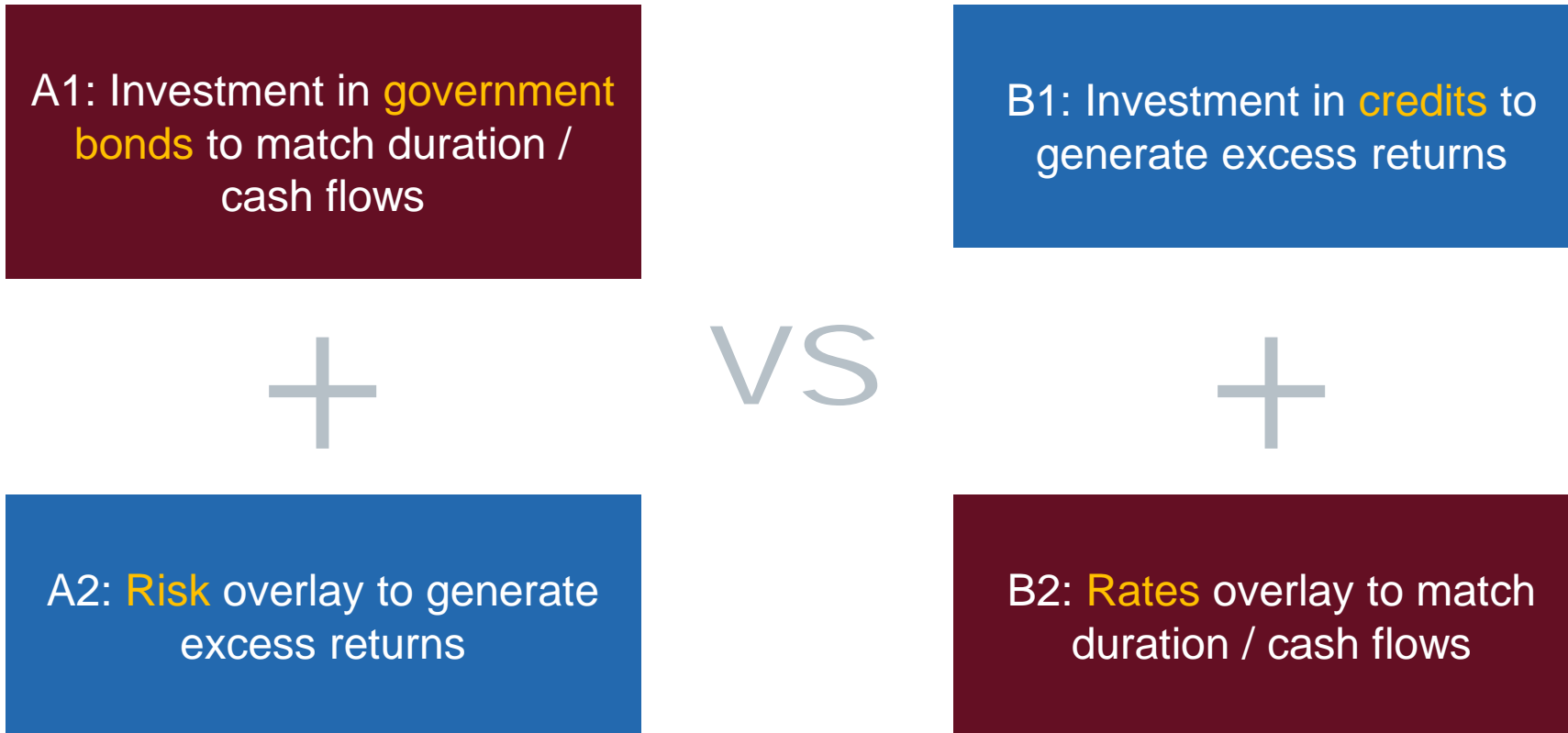


- Unlike Europe, insurers' main KPIs on ALM remain as absolute investment return in most of the jurisdictions in the region.
- Lacking sufficient products on offer to help insurers to manage its solvency risks
- Most of the currencies are less liquid comparing with developed markets in the region. Some of them are restricted cross border.

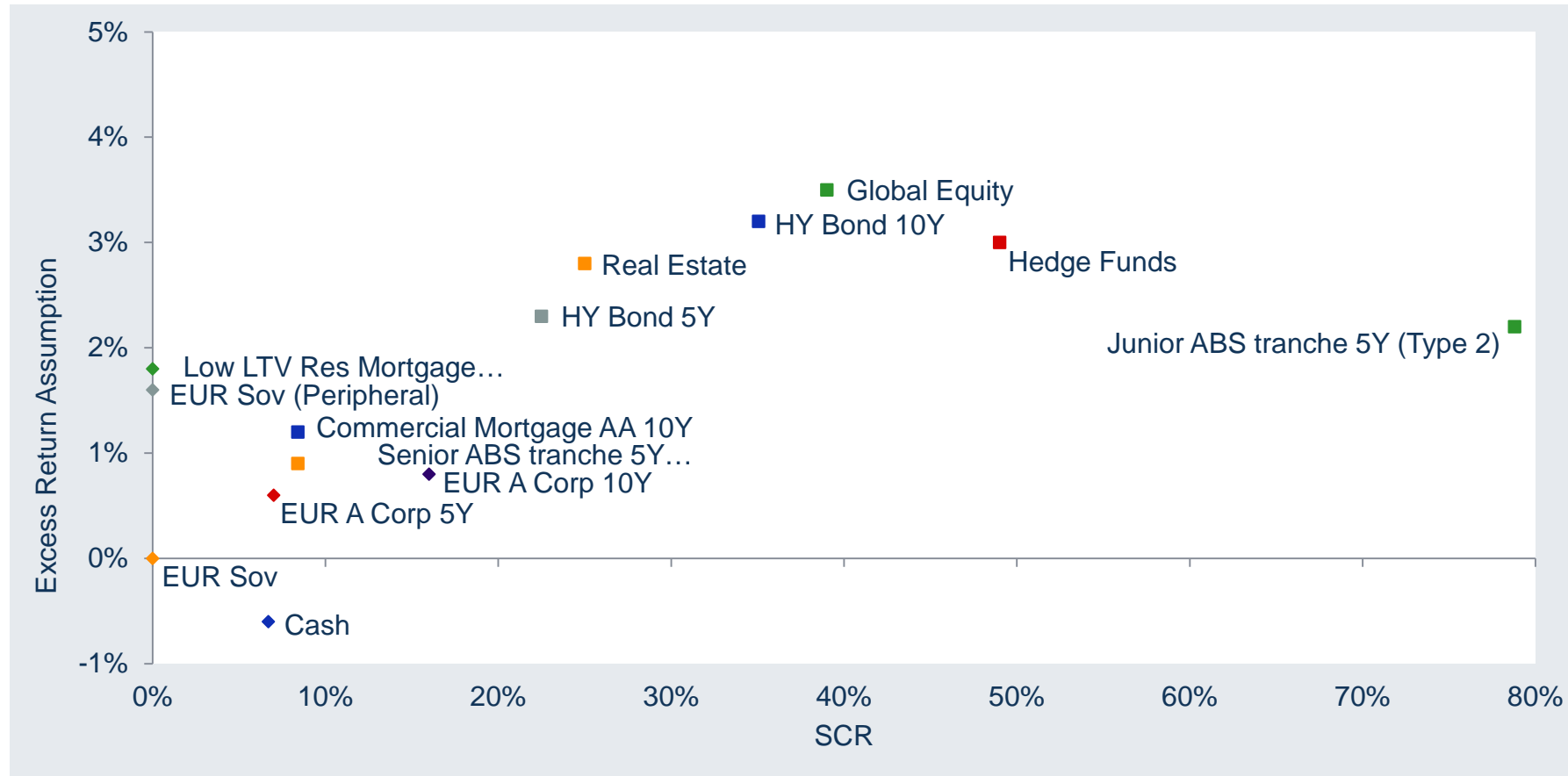


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Approaches of ALM



Example – Assets under SII



Source: Deutsche Bank



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Example – Asset Solvency Template

Topic	Reducing SCR	Increasing IFRS Returns	Minimising SCR Ratio Vol.	Liquidity Management
Defensive Strategy				
Hedging Return on SCR	Market Risk ↓		Stablise SCR ↔	Collateral Needs ↑
Forward Bonds	Rates Risk ↓	Asset Return ↑		
Dynamic Hedging	Market Risk ↓			
Re-risking within VA Environment	Market Risk ↑	Asset Return ↑	Hedge VA Vol.↔	
Volatility Bonds	Market Risk ↓			
Liquidity Management				
Cash ETF	Market Risk ↓	Asset Return ↑		
Collateral Swap		Asset Return ↔		Collateral Needs ↔
Contingent Liquidity Facility		cash buffer ↓		Collateral Needs ↓
Capturing Illiquidity Premium				
Investing in Foreign Assets	Market Risk ↓	Asset Return ↑		Collateral Needs ↑
Illiquid Assets	Market Risk ↑	Asset Return ↑		Liquidity Buffer ↔
Optmising MA	Market Risk ↑	Asset Return ↑		Liquidity Buffer ↔
Structured Notes				
Yield Enhancement using leverage				
Leveraged Credit	Market Risk ↔	Asset Return ↑		
Dual Bond Forward		Asset Return ↑		
Ultra-long bonds		Asset Return ↑		
Cashflow swaps	Market Risk ↔	Asset Return ↑		Collateral Needs ↔

Source: Deutsche Bank



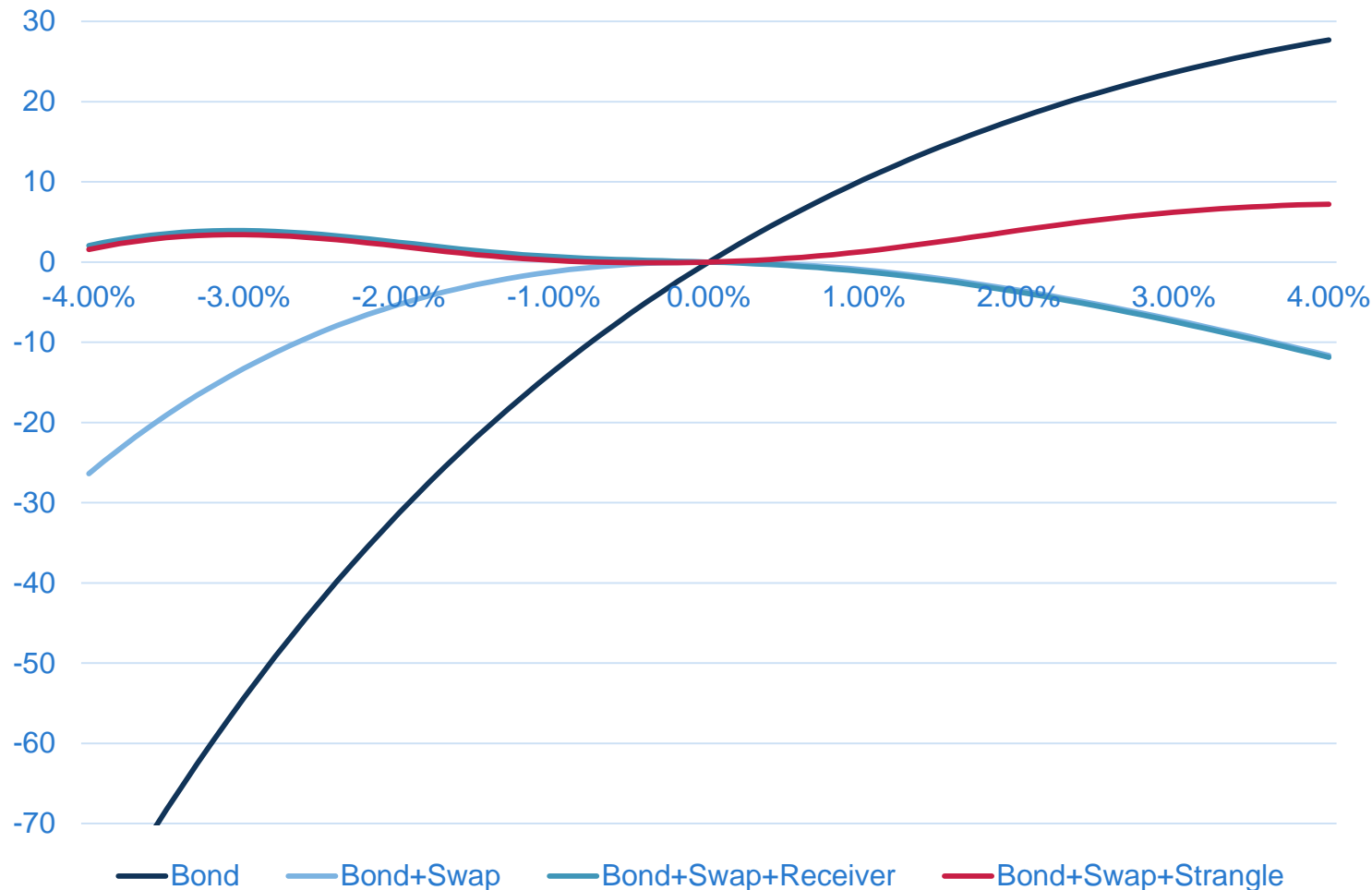
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B2: Using Derivatives to Extend Duration

- Managing the duration to reduce interest rate sensitivity substantially reduces capital requirement without giving up much expected return
- Derivatives provide a cost/cash efficient way to manage duration
- Instruments
 - Interest Rate Swaps and Swaptions
 - Bond Forward and Bond Options
 - Callable Bonds
- Delivery
 - Local markets: Mainland China, South Korea, Taiwan, Malaysia, Thailand, etc.
 - Regional and international hubs: Singapore, Hong Kong, London, etc.
 - Onshore and offshore, cross border



B2 Case Study: ALM with Swaption



Source: Deutsche Bank

Liability: 100mio Market Value 20yr Payment Obligation

Bond: 100mio Market Value 10yr 4% Bond

Swap: 142.5mio Notional 10yr mid rate Swap (receive fixed). Notional is set to make the portfolio interest rate risk neutral

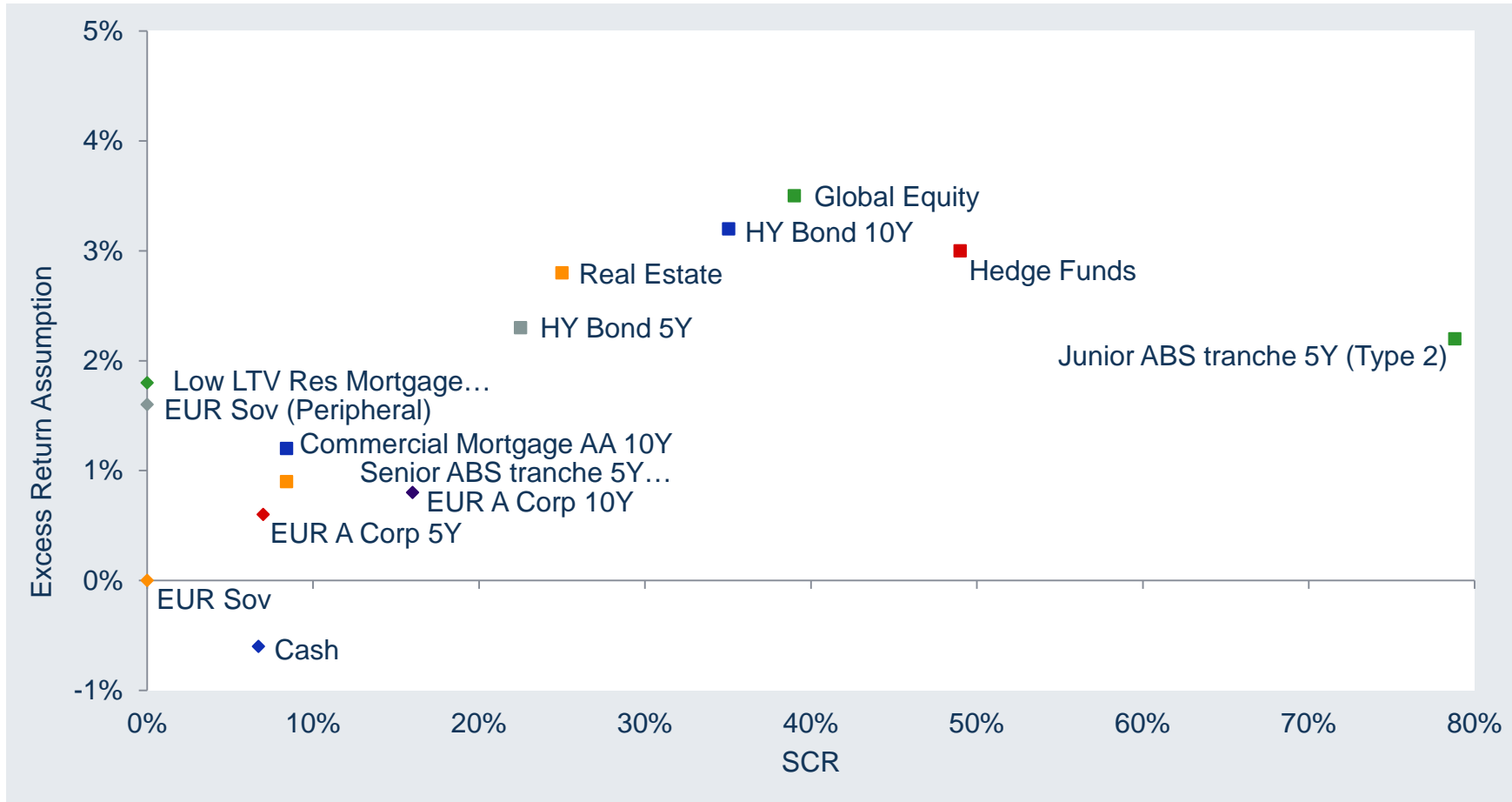
Receiver Swaption: 100mio Notional 1y10y receiver swaption strike mid rate – 1%

Payer Swaption: 100mio Notional 1y10y payer swaption strike mid rate + 1%



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Using Structured Investments for Capital Heavy Assets



Source: Deutsche Bank



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Case Study: Fixed Income Portfolio

- Sample: Structured Investment linked to a Dynamic Portfolio of Long Term US Treasury and iTraxx Crossover
- Client has the flexibility to adjust the duration and credit exposure
- Reduction in transaction cost
- Transparent asset allocation
- Principal protection



Transparent Access to Alpha Strategies

- Diversification from traditional asset classes helps in both spot capital consumption and dynamic optimization
- Benefit of diversification from Hedge funds and funds without look through, is countered by heavy capital consumption under Solvency II, even they are fixed income focused
- Access major risk factors and risk premiums with transparency
 - Return potential
 - Diversification
 - Lower capital requirement



Case Study: Risk Premia

Equity	Rates	FX	Credit	Commodity	Cross-Asset
Value	Carry: Municipal	Value	Value / Carry	Curve	Trend
Quality	Carry: Diversified	Carry	Momentum	Carry	Carry
Momentum	Curve	Momentum	Curve	Momentum	Trend + Carry
Low Beta	Momentum	Implied vs. realised Volatility		Trend	
Merger Arb	Implied vs. realised Volatility			Implied vs. realised Volatility	
Size	Long Volatility			Liquidity	
Mean Reversion	Basis				
Implied vs realised Dividends					
Implied vs. realised Volatility					

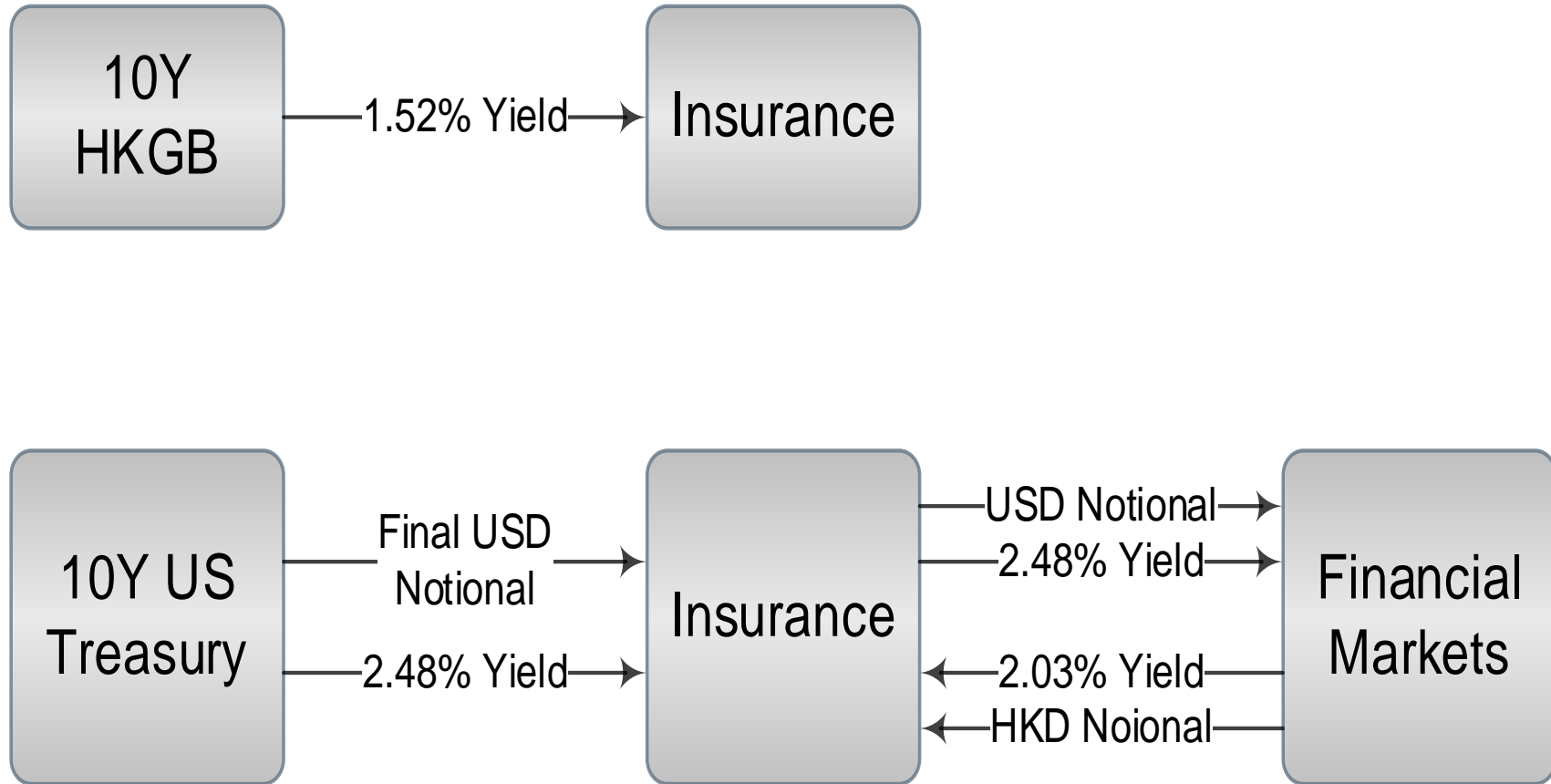


Matching Investment to Liability

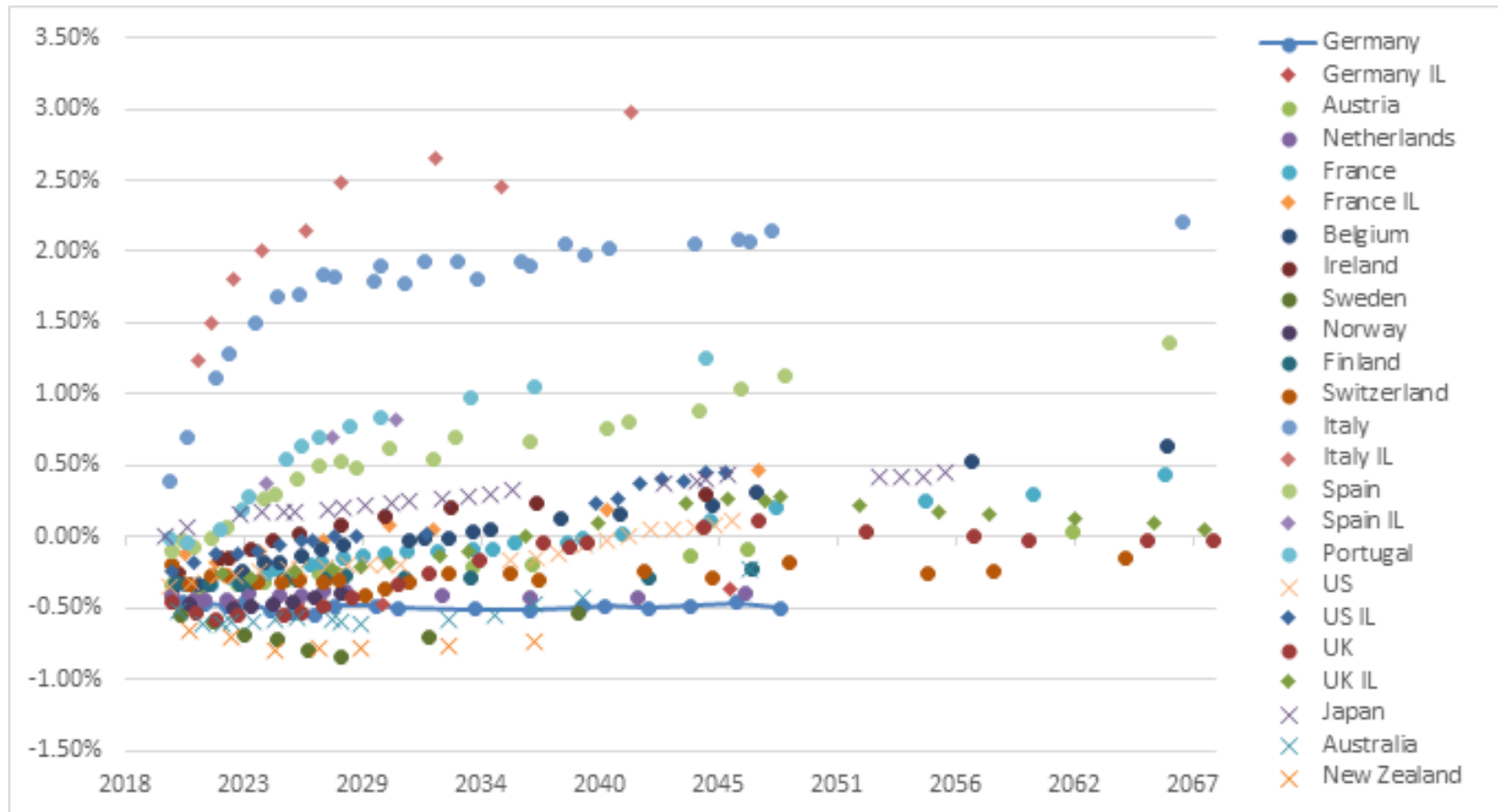
- The ultimate way of asset and liability management for capital reduction is to match the investment exactly to the liability
- Design your liability with
 - Customized investment strategy that can be hedged cost-efficiently
 - Multi-asset
 - Geographically diversified
 - Dynamic to market conditions
 - Long term guarantee, performance lock-in
 - Transparent
- Delivered in local markets



Synthetic Investments – Better Return without Compromising Risks



Synthetic Investments – Better Return without Compromising Risks



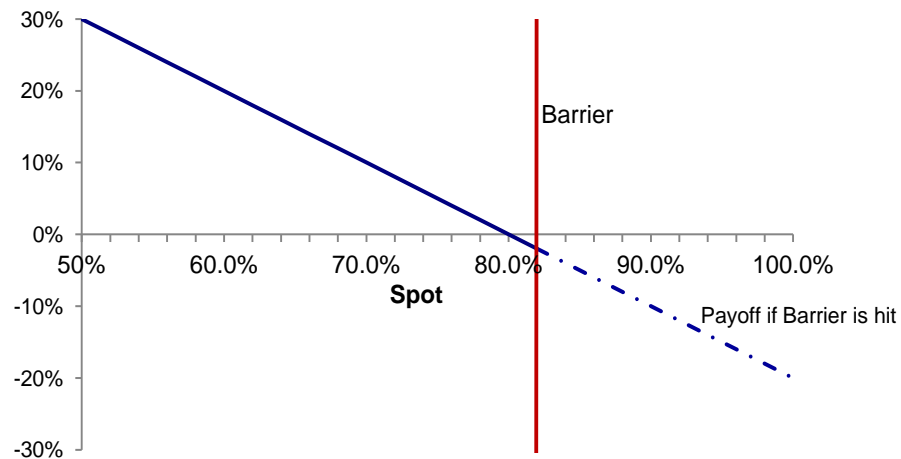
Source: Deutsche Bank



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Knock-in protection for liquid risky assets

Example payoff profile at maturity



Investors can also pursue a linear hedging strategy - immediate implementation however leads to a loss of all exposure and a management rule may not be accepted.

Accordingly investors can oblige themselves to buy protection at certain levels (knock-in structure).

For a benefit in the stress scenario, the trigger levels need to be closer to current market levels than the respective stress scenarios.



Questions

Comments

Expressions of individual views by members of the Institute and Faculty of Actuaries and its staff are encouraged.
The views expressed in this presentation are those of the presenter.

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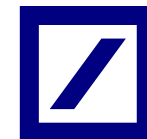
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