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Investment and Hedging in Light of Regulatory Change

Simon Freedman & Robin Thompson, RBS

25 May 2016

Agenda

- Regulatory Change
- Market Impact
- Pension vs. Insurance: Investments
- Pension vs. Insurance: Hedging

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Regulatory Change

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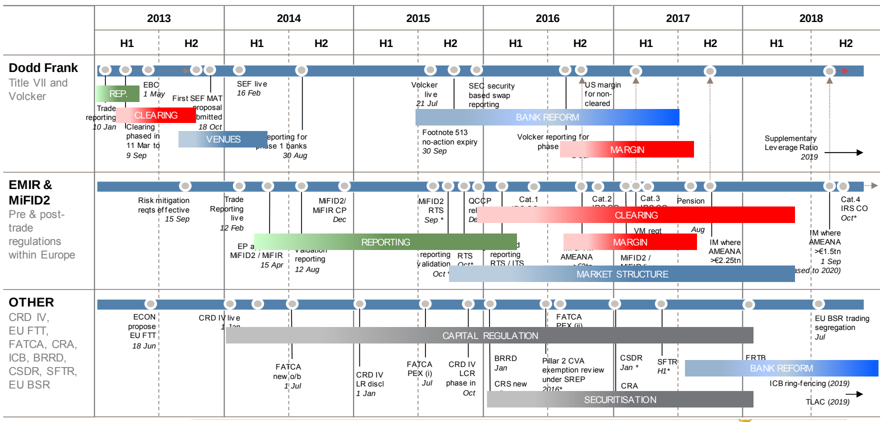
Regulatory landscape: bank timelines

… direct and indirect impact for us all



- Solvency II (capital) – January 2016
- IORP II Directive Report (no capital)– January 2016

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Regulatory change affecting Pension Funds

Mandatory Central Clearing

- Exemption to 2017
- Roll to 2018
- “Clearable” Trades
- Initial Margin (IM)

Margin Rules - Bilateral Derivs

- Non-cleared derivatives
- Phased-in IM, notional >€8bn by 2020
- IM Collateral > £1bn concentration limits
- T+1, Variation Margin (VM) - March 2017

Basel III/CRD IV Capital Rules

- CVA capital exemption for PFs
- Leverage Ratio and NSFR impacts
- Higher charges for non-cash VM trades

Cash-only CSAs

- Increased costs for banks under bond collateralised CSAs
- Some PFs moving to cash-only CSAs
- Clarity and transparency of pricing
- No IM implications of cleared swaps

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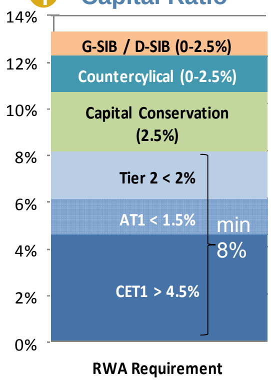
Basel III / CRD IV Capital Rules

Capital Requirements Regulation

1 Capital Ratio



2 Leverage Ratio (LR)

$$LR = \frac{\text{Qualifying Tier 1 Capital}}{(\text{Total assets}) + (\text{Off balance sheet items})} \geq 3\%$$

3 Liquidity Coverage Ratio (LCR)

$$\frac{\text{Stock of high quality liquid assets}}{\text{Net cash outflows over a 30-day time period}} \geq 70\%$$ in 2016, 10% p.a. increase

4 Net Stable Funding Ratio (NSFR, 2019)

$$NSFR = \frac{\text{Available amount of stable funding}}{\text{Required amount of stable funding}} \geq 100\%$$

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LR impacts Repo cost

- Inability to net-off non-cash collateral received
- Impacts securities financing transactions (SFTs) including:
  - **repos**
  - **reverse repos**
  - **securities lending**
  - **securities borrowing**
  - **margin lending**

30-year Gilt Reverse Repo	LR	RWA	Comments
Total exposure	**10m**	**340K**	Haircut of **3.4%** for RWA
RWAs		34K	**10%** risk weight
Implied capital	**400K**	**4.4K**	**4% LR** **13% CET1 ratio**
Cost of Capital	48K	530	@ 12%
Cost/income	96K	1060	50% cost / income ratio
Charge	**96bp**	**1bp**	

- Can lead to a **50-100bp requirement for leverage capital**

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LR / NSFR Impacts on Derivative Pricing

Impact of Bond versus Cash collateralisation

- Example: 30y Par IRS & Inflation Swap
- LR: MtM + PFE Add-on approach:

Product	IRS 100bps OTM Inflation 100bps ITM		At the money		IRS 100bps ITM Inflation 100bps OTM	
	MtM	PFE	MtM	PFE	MtM	PFE
Interest Rate Swap (Bank pays fixed)	2-5bp	<1bp	5-10bp	<1bp	10-20bp	<1bp

- Higher costs for ITM positions to bank
- NSFR behaves similarly
- Ring fencing may exacerbate

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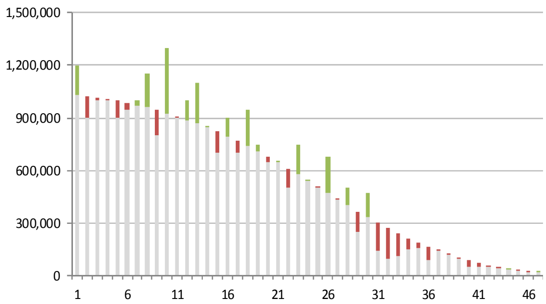
SII Matching Adjustment (MA)

Regulatory background

Cash flow matching requirements under **MA** add an additional layer of rigour vs pre-SII

The PRA introduced three **quantitative tests** to help firms understand their expectations for close matching.



Quantitative tests

1. Accumulated **shortfall** must not exceed 3% of PV of BEL
2. Undiversified 99.5th %ile one-year VaR for **interest rates**, **inflation** and **currency** must not exceed 1% of BEL
3. Firms should be able to enter into a **notional set of swaps** to perfectly match liability cash flow by scaling asset cash flows by a factor in the range 99-100%

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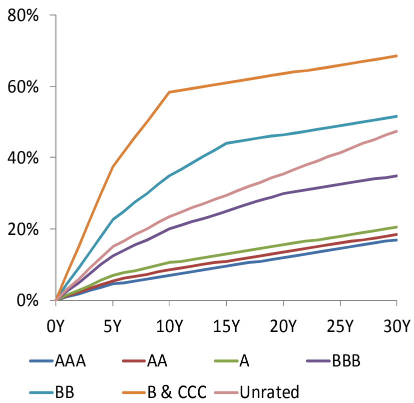
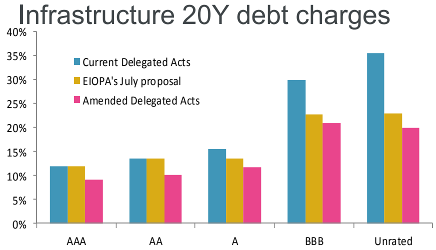
[1]http://www.bankofengland.co.uk/pra/Documents/solvency2/intmodmaupdatemar2015.pdf

SII Capital Charges – Standard formula

Corporate debt charges



Infrastructure 20Y debt charges



- Real estate debt: Same as corporate bond unless unrated
- OECD Listed Equity stress: 39% $\pm$10%
- Other equity, PE, Hedge Funds: 49% $\pm$10%
- Infrastructure equity: 70% * 49% = ~35%
- Real Estate: 25%

Capital charges are lowered for investment grade under the MA
But long-dated credit attracts significant capital for insurers

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Market Impact

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Moving to an 'Originate to Share' model

- Post Crisis – banks are capital restricted (CRD IV & Basel III)
- The ICB recommendations (ring-fencing) become a key factor from 2019

Hold Co.

Ring-Fenced Bank
~80% of RWAs

Non Ring-Fenced Bank
~20% of RWAs

- Long-dated illiquid assets are particularly punitive on bank B/S
- Teams being set up to distribute illiquid assets
- US Banks practiced more of an 'O2S' model pre-crisis than European Banks

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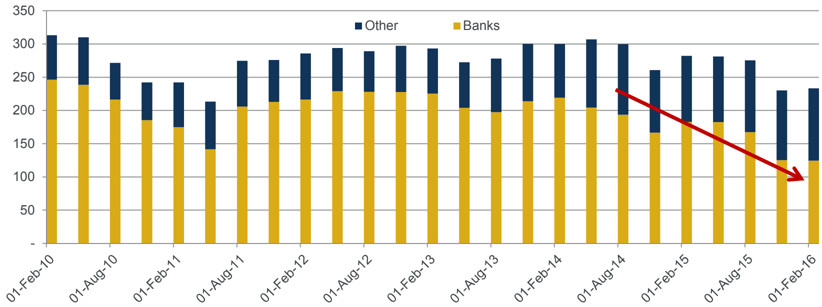
Reduction in repo financing has begun

Pricing to be driven by Leverage and Liquidity metrics

Non-Bank Repo has only partially replaced Bank Repo



"In the future, we anticipate that the demand for repo financing from the LDI industry will outstrip bank appetite to transact, as programmes are extended over time, unless there is a very significant increase in financing costs."
– *Blackrock, November 2014*

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Source: Bank of England, February 2016

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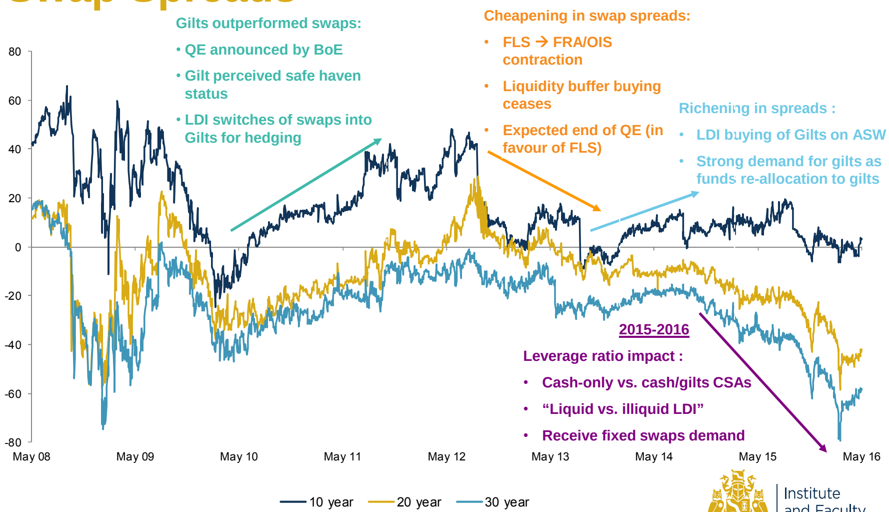
Swap Spreads



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Collateral Arrangements for Derivatives

Legacy [1990s]

CSA [2000-3]

Libor Curve CSA [2003-08]

CSA specific [2009]

Dirty to Clean CSA [2011-12]

Cash vs. Cash & Gilts CSA [Dec 2014]

Cash vs. Cash & Gilts (Leverage Ratio) CSA [Q4 2015 / Q1 2016 onwards]

CSA	Cash only seen as capital light C&G is capital heavy
Event	C&G CSA terms not being signed by some banks Banks charge high costs or refuse to quote C&G CSA terms Can take hours to price a recoupon
Valuation	Based on capital impact There is no such thing as valuing a “swap” - it is a Before portfolio and After portfolio net effect

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Source: RBS, Redington

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Pension vs. Insurance: Investments

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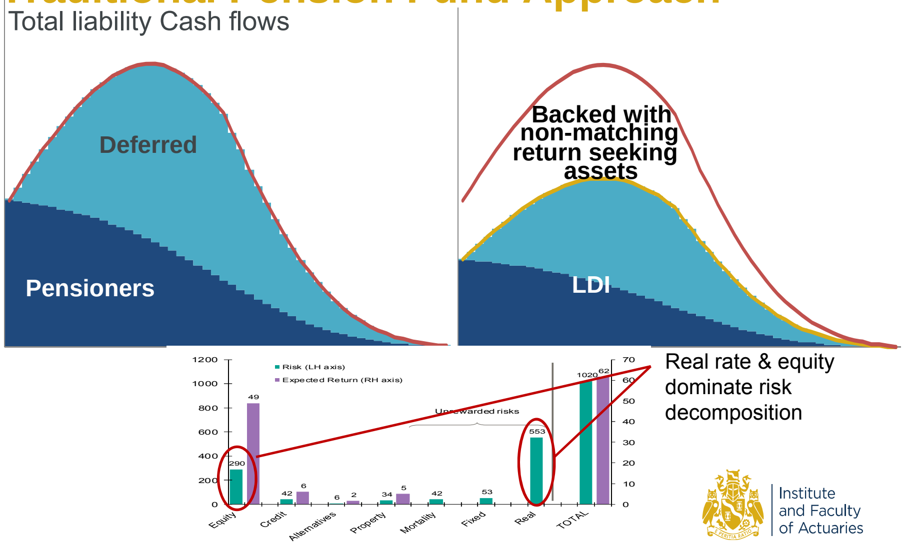
Traditional Pension Fund Approach



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Source: RBS, Aviva

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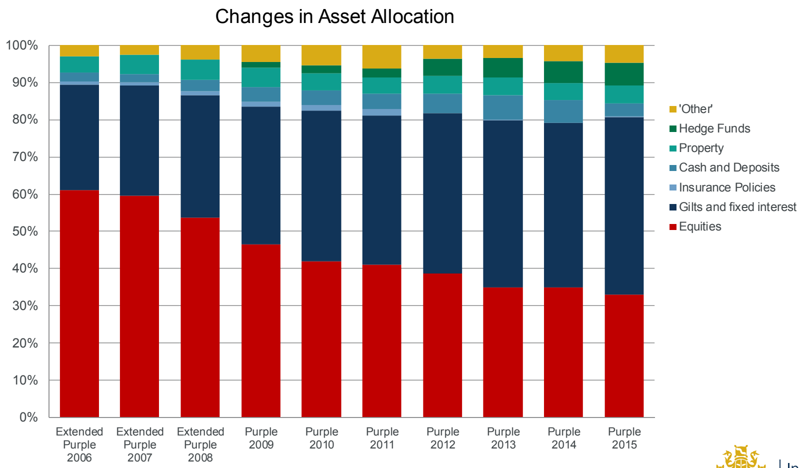
Trends in UK Pension Scheme Investment



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Source: PPF, Purple Book 2015

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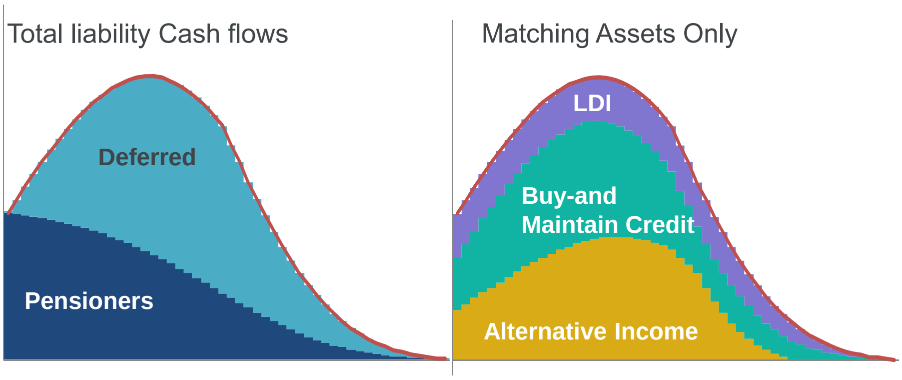
Insurers' Approach



Credit and longevity dominate risk decomposition

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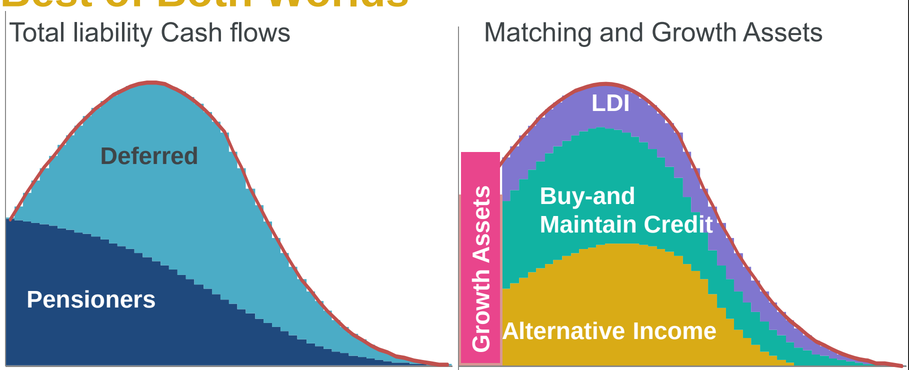
Source: RBS, Aviva

Best of Both Worlds



Credit, equity & longevity dominate risk decomposition

If possible, link liability discount rate to spread on credit and alternative assets

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Source: RBS, Aviva, KPMG

Sources of Alternative Income

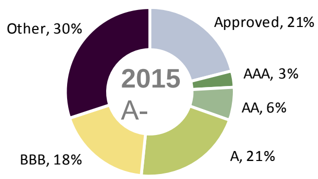
- Long-dated and / or unrated / lower rated credit, e.g.
  - Leverage Loans
  - Commercial Real Estate
  - Infrastructure Debt

Insurers hold capital against risks

- Non-fixed cash flows
  - Equity Release
  - Callable Bonds

Insurers need to restructure

Average Annuity Portfolio Mix



- Relative Value / Macro
  - Foreign Bonds — Insurers need xccy swaps
  - Foreign Inflation — Insurers can only back foreign-inflation-linked liabilities

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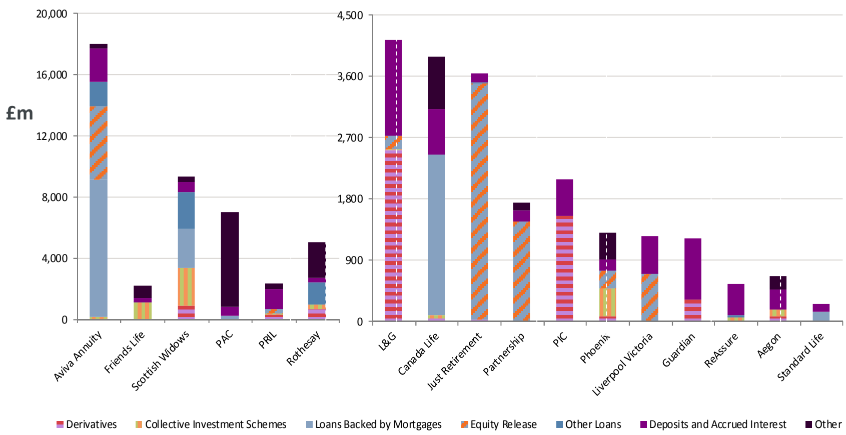
Insurers' "Other" Assets



Source: PRA Returns end-2015, Form 13, App 9.4, Report and Accounts

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Adopting this approach

- Holistic approach to strategy design
  - Move away from 2 bucket approach
  - Use wide range of asset classes and strategies

- Make extensive use of matching assets
  - Higher yielding assets with predictable cash flows
  - Buy-and-maintain credit
  - Alternative income

- Link valuation discount rate with yield on matching assets
  - Reduces funding level risk reduction

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Source: RBS, Aviva

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Pension vs Banks: Hedging

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Leverage Ratio Friendly Hedging

- Alternatives to Cash & Gilt CSAs
  - Clearing
  - Cash CSA
  - Sunset CSA

- Leverage Ratio friendly financing:
  - Forward Gilt & Asset Swaps via Netted Repo
  - Releasing cash while avoiding LR charges
  - Buy-side Clearing

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Source: KPMG, A new perspective on Portfolio Construction, Feb 2016

Alternatives to Cash & Gilt CSAs

	Cash Only CSA	Cleared CSA	Sunset CSA
CSA	Cash only Collateral T+1, from March 2017 IM for large schemes, from 2020	Cash only Collateral T+1 (clearing dates) IM required	Cash/gilts until [x] date, switch to cash only Cash only after [x] date
Event	C&G CSA terms not being signed by some banks Banks charge high costs or refuse to quote C&G CSA terms Can take hrs to price a recoupon		
Valuation	Liquid SONIA-flat Pricing Transparency Bank Valuation PFE Add-on Re-hypothecation (cash)	Liquid SONIA-flat Pricing Transparency CCP Valuation IM impact PFE Add-on Full re-hypothecation daily	Liquid SONIA-flat Pricing Transparency Bank Valuation No exposure to further widening of cash vs cash-and-gilts

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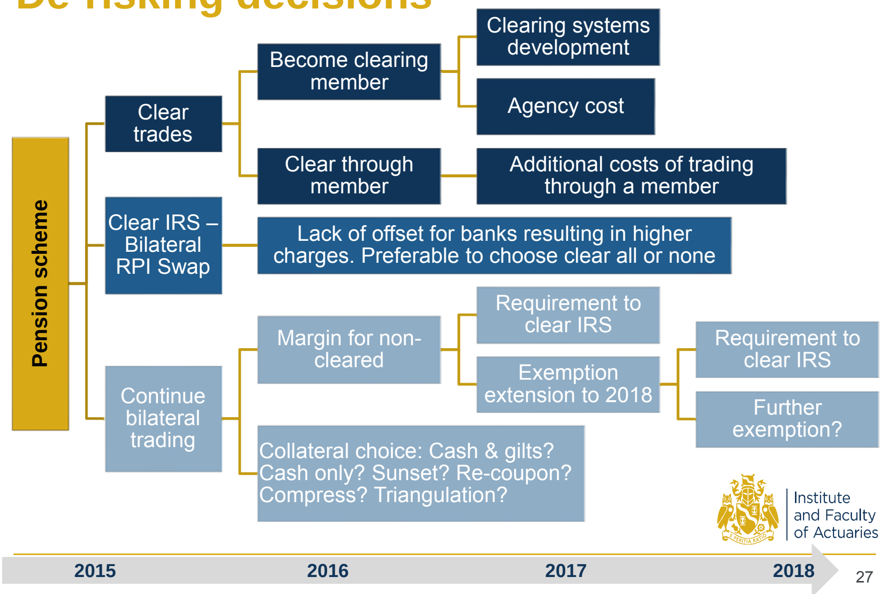
Source: RBS, Redington

De-risking decisions



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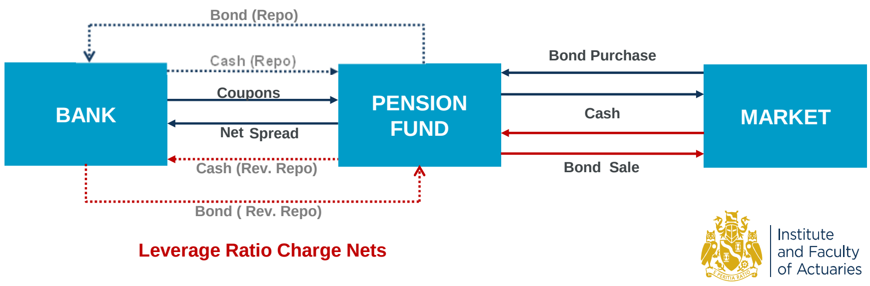
Forward Gilts via Netted Repo

- Repo causes a Leverage Ratio charge for banks
- Forward-starting gilt trades involve the opposite trade being performed on a shorter maturity bond
- **The offsetting reverse repo can allow netting to occur from a Leverage Ratio perspective, lowering capital charges**
- **To achieve full netting, the trades need to be confirmed with the same legal entity, netting set, maturity date and offsetting cash proceeds amounts**



Leverage Ratio Charge Nets

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Forward Gilts & ASW Levels

- Upward sloping yield curves
- Spread between gilts and swaps wider at long end
- Better hedging levels with forwards both
  - asset swap spreads
  - outright gilt levels
- "Best" levels around 15Y10Y

Excess of gilt yield over swap rate

	Forward						
Tenor	Spot	1YR	5YR	10YR	15YR	20YR	30YR
1YR	-38	-59	-35	42	140	139	50
5YR	-16	-15	26	72	139	133	32
10YR	4	12	47	103	137	113	30
15YR	24	35	74	112	123	89	46
20YR	47	56	86	109	105	76	60
30YR	64	68	82	90	92	82	62

Source: RBS, Bloomberg, 9th March 2016

Excess of forward gilt yield

	Forward					
Tenor	1YR	5YR	10YR	15YR	20YR	30YR
1YR	-7	34	98	141	84	-42
5YR	12	69	94	106	63	-62
10YR	13	59	85	80	37	-65
15YR	12	54	71	59	12	-49
20YR	11	47	57	39	-2	-35
30YR	9	34	35	21	-1	-26

Source: RBS, Bloomberg, 9th March 2016

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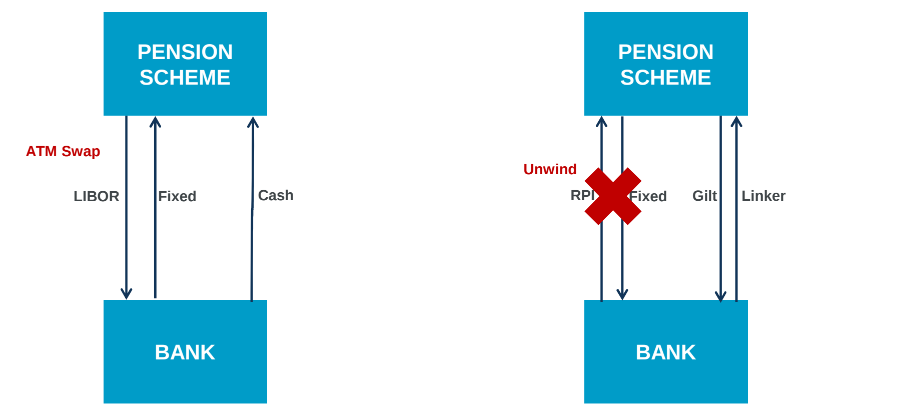
Releasing cash from derivatives

Traditional: Leverage Ratio unfriendly

New – Leverage Ratio friendly



Source: RBS, Bloomberg

Source: RBS, Bloomberg

The new approach takes advantage of +ve iota spread locking in a higher Z-spread

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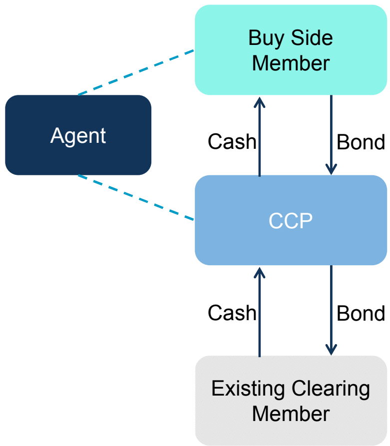
Clearing Broker vs Agency Clearing

Agency Clearing Model



Buy Side Member - trade directly with the CCP not via Clearing Broker

Agents will be required to support Default Fund Contributions as well as Operational Overheads

CCP member base will expand with new category clients

Existing Clearing Member will trade with Buy Side Member and agree to clear with a cleared price (repo rate)

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