

# Hedging strategy evolution: Cashflow Driven Investment considerations

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## Pension market landscape

### Funding levels - Asset growth offset by increasing liabilities

#### Pension Scheme Funding Levels - PPF 7800 Index

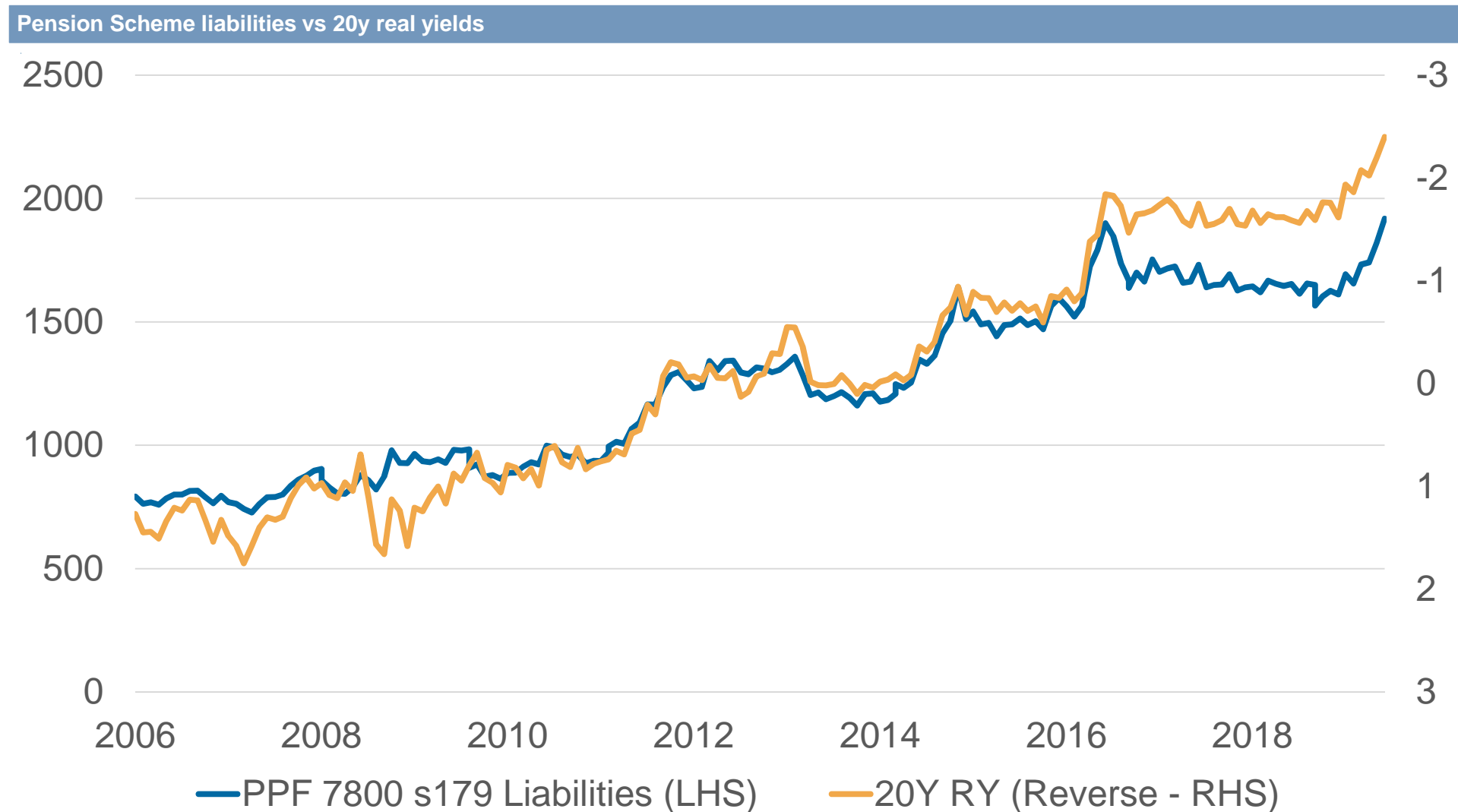


Source: PPF, JPMorgan

- Pension scheme assets have performed strongly over the last decade
- However, the growth in assets has been offset by similar growth in liabilities, leaving the average scheme underfunded, even when looked at on more 'generous' discounting metrics

# Pension market landscape

Liabilities closely tracking real yield levels

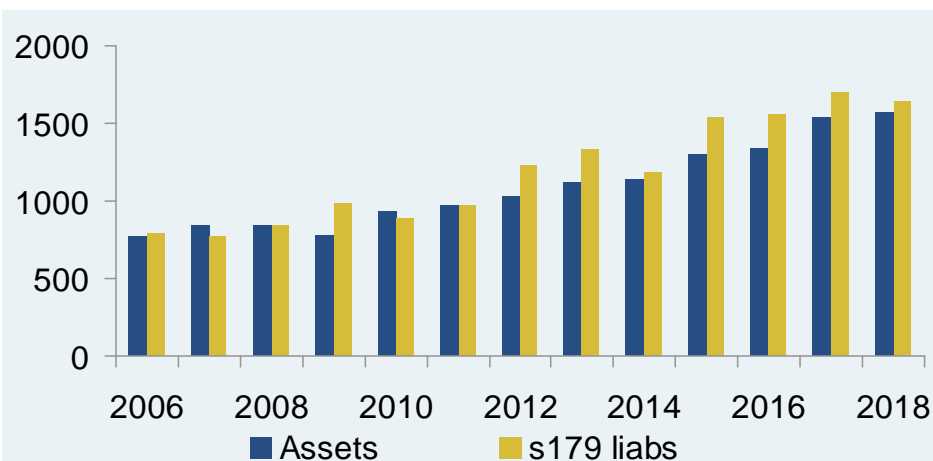


Source: PPF, JPMorgan

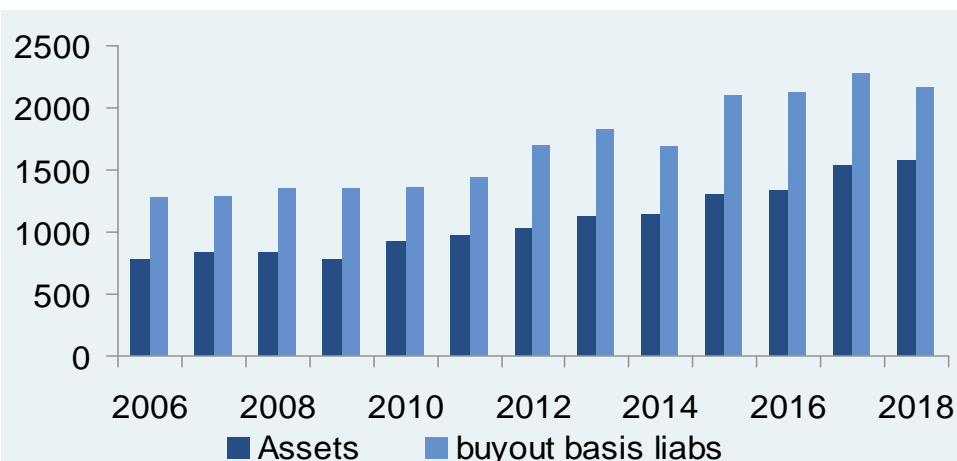
# Pension market landscape

## Funding levels highly contingent on liability valuation approach

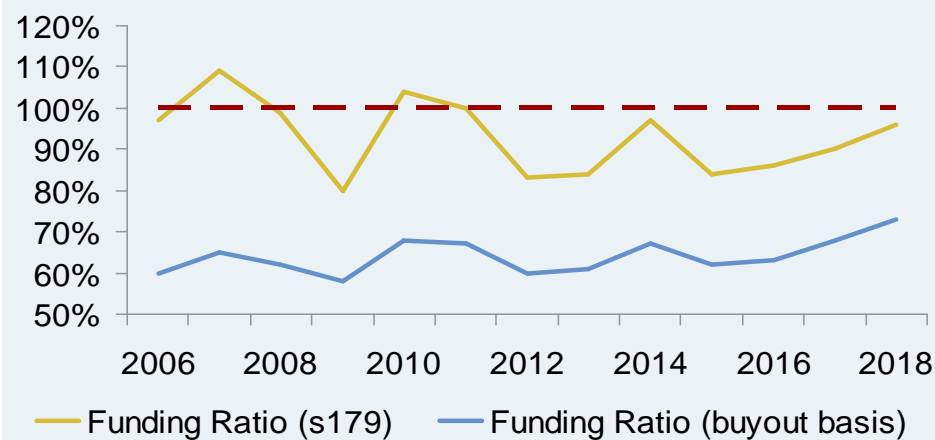
PPF 7800 Index – S179 basis



PPF 7800 Index – buyout basis



Funding Ratio (buyout and PPF s179)



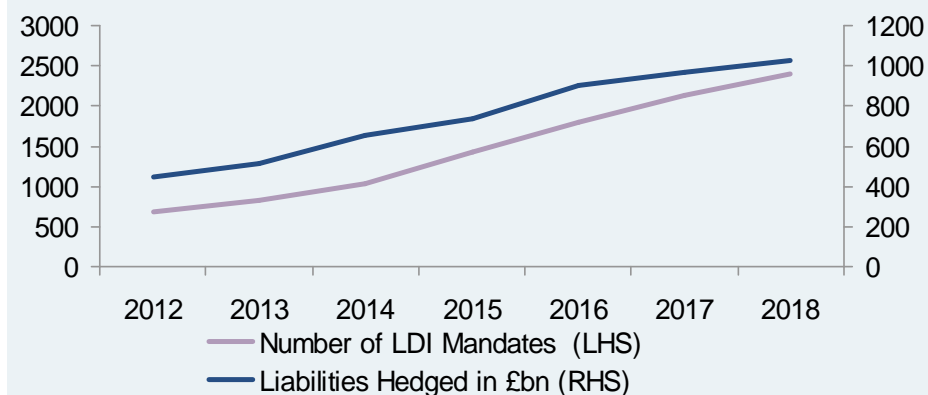
- S179 basis is ‘generous’ on funding level
- Buyout basis is a rough estimate, but shows challenges
- There are numerous other discounting measures
- Large dispersion between scheme positions:
  - Funding level
  - Hedge ratio
  - Strength of sponsor
- No “one size fits all” approach, but yield enhancement is being targeted by the majority of schemes

Source: for all charts: PPF, JPMorgan

## Pension market landscape

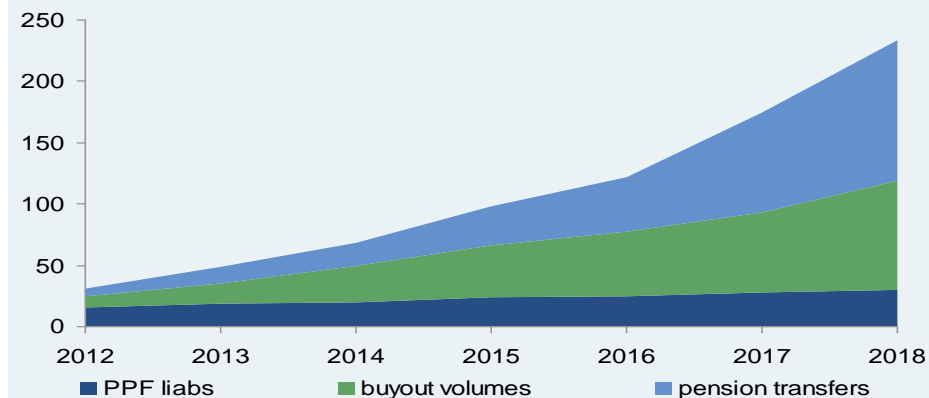
Increase in hedging, Increase in 'outflows'

### Growth in LDI mandates and liabilities hedged



Source: KPMG and XPS LDI reports 2012-2018

### Cumulative buyouts, PPF and pension transfers since 2012- £bn



Source: PPF annual reports, LCP pensions de-risking report 2019, ONS, J.P.Morgan

#### ■ There have been a few notable recent trends in LDI:

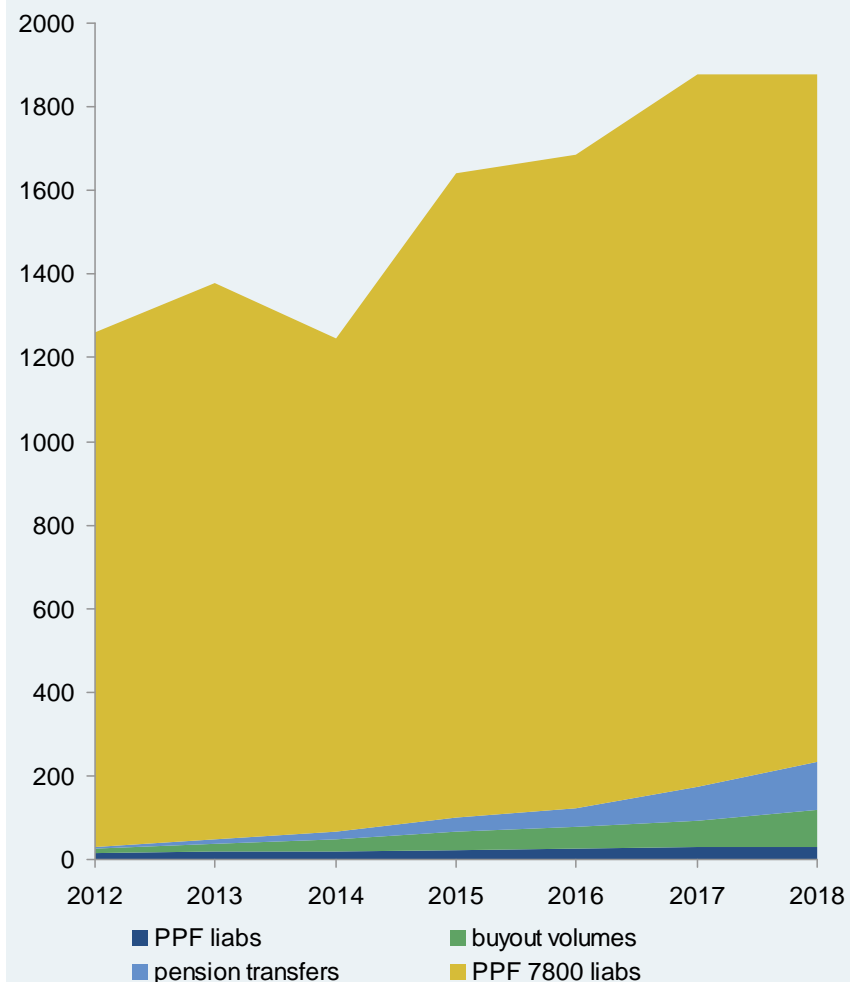
- **Growth in LDI mandates**, with 250% increase of number of schemes using LDI over the past 6 years
- However, **many new LDI mandates are smaller** (often using pooled solutions), with the value of liabilities hedged increasing by 131% over the same time 6 year period (with some of this growth being 'organic' due to market moves as real yields dropped)
- **Buyout has continued to expand** with significant YoY growth
- Over this time period, the **PPF continued to grow** as more schemes transitioned in
- **Pension transfers spiked** after pension freedoms as many opted to transfer to DC offerings and drawdown products. Although expectation is that this will tail off



## Pension market landscape

DB pension liabilities still significantly outnumber those which have left the sector

### 'Outflows' vs remaining DB liabilities



Source: JPMorgan, PPF, ONS

### Transition 'out' of Pension Funds

- Whilst there is growth in pension risk transfer, it is worth noting proportionality
  - For pension transfers it's reasonable to assume that the pace of transfer will likely decrease over time
    - Those with multiple pots look at consolidating / utilising freedoms for additional pensions
    - Most engaged more likely to act quickly
    - Potential increase in requirements around advice
  - For buyout there remain challenges
    - Affordability
    - Asset availability / market capacity (capital)
    - Risk concentration (longevity risk etc)
- There are also both schemes and individuals who are unlikely to leave a DB scheme:
  - Axa IM / MallowStreet conducted a survey on trustees across 48 pension funds and 10 investment consultants and found that 52% of schemes were targeting self-sufficiency and just 25% were aiming for buyout

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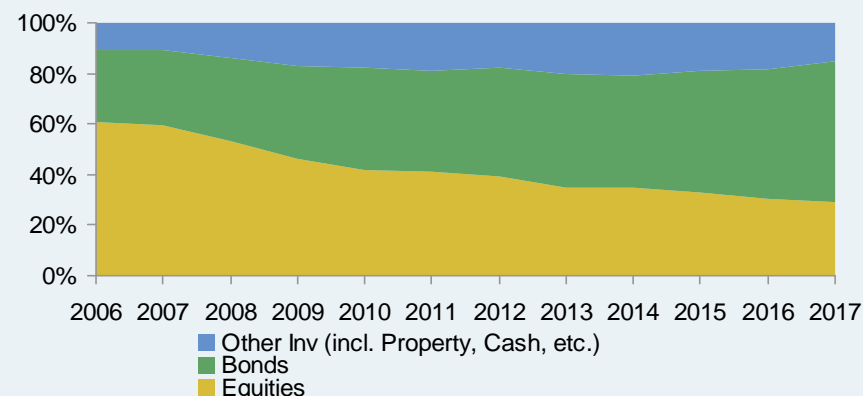
## Scheme Journey Plan

### The balance between de-risking and enhancing funding levels

#### Return vs Risk Trade-off

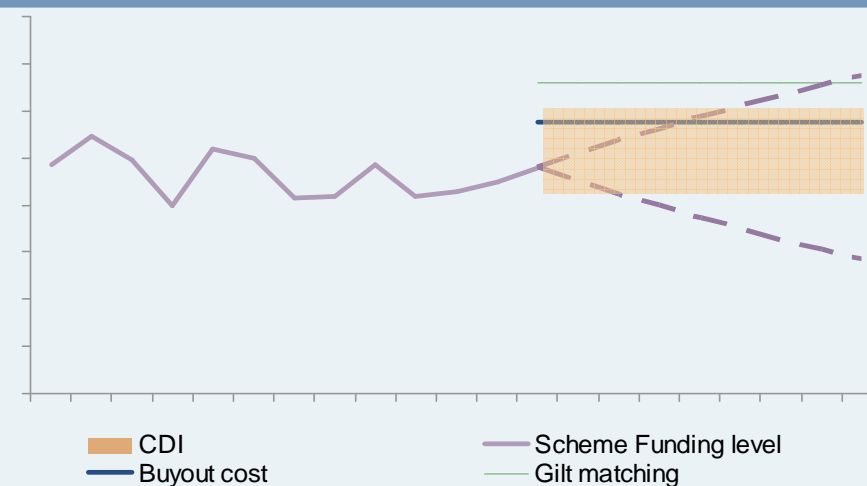
- The average scheme is underfunded and underhedged (albeit with an improving hedge ratio)
- There is a general desire to de-risk over time, using approaches such as:
  - Asset rotation
  - LDI strategies
  - Tail Risk hedging
- However, additional return/yield is needed from:
  - Illiquidity
  - Additional market risk (credit etc)
  - Active strategies
  - Leverage
  - Sponsor contributions

#### Asset Allocation progression – PPF 7800



Source: PPF Purple Book 2017

#### Illustrative funding level journey plan



Source: JPMorgan

# Scheme Journey Plan

## Variety of 'Endgame' strategies for pension schemes

### Selection of 'endgames'

- For an individual pension scheme, there are choices of endgames to aim for

	Matching cashflows through Gilts	Transition to buyout (or other consolidator)	Matching cashflows through Gilts, Credit and Illiquids
Suitable for	Well funded / overfunded schemes	Well funded schemes	Fairly well funded schemes
Pros	High certainty of cashflows with 'risk-free assets'	Removal of risk from scheme sponsor (transfer to insurer)	Yield enhancement from assets allows more affordable solution with limited risk
Cons	Low yielding assets mean that either excess returns are needed from risk-seeking assets or higher sponsor contributions to afford solution	Cost of buyout can be challenging – and can be difficulties in managing transition	Potential for default risk of assets; impact on liquidity risk from corporate bonds and illiquid assets

- For many schemes the desired end goal would be fully Cashflow matched with Gilts/Swaps/Cash (as liquid/risk free) assets with an additional buffer. However, given funding ratios this is unaffordable
- Buyout may also be challenging for some schemes in the short term (although affordable to those with a strong funding ratio and/or a sponsor making a significant contribution)

## Scheme Journey Plan

### Pension scheme transition to buyout or self-sufficiency

#### Evolution of pension scheme transitioning to buyout



- For pension schemes looking to transition to buyout we can break down the journey into a variety of stages
- At each stage there would typically be a portfolio transition to reflect the potential risks and desired asset balance
- The trends over time are typically for a rotation out of equities into fixed income (govt bonds, swaps, corporate bonds and Illiquids)
- The assets accumulated pre-buyout are typically gathered with consideration of the transition to buyout

#### Evolution of pension scheme transitioning to self-sufficiency

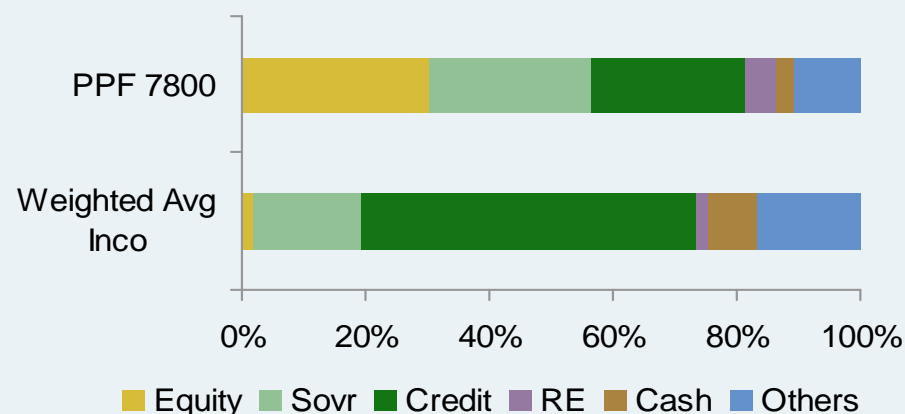


- For funds looking at self-sufficiency, the transition is more organic, with less of a step between stages
- Without a change of regulatory regime (to Solvency II), there is less of a step change in the transition

## Scheme Journey Plan

Continued transfer to fixed income (particularly credit and illiquids) looks likely

### Broad asset breakdown comparison – PF vs Insurance



Source: PPF Purple Book 2017, Insurance company annual reports, JPM

### Shifting asset mix from buyout transition

- Compared to the average pension scheme, buyout has a much larger allocation to “credit” and illiquids
- CDI also typically has a significantly larger allocation to credit than a traditional combination of LDI strategies and Buy and Maintain. However, data on ‘CDI’ is harder given the boundaries to LDI are softer

### CDI vs Buyout considerations

- However, despite the consistency in the high level shifts, there are some notable differences between the approaches of CDI and Buyout, in part driven by Solvency II considerations, for example:
  - Solvency II can make it less appealing to buy assets with uncertain cashflows, such as callables
  - Solvency II would typically require termed out x-ccy swaps to get Matching Adjustment treatment rather than rolling FX forwards

### Asset selection considerations

- There may be a yield pick-up for assets that are less suitable under solvency II, but still have economic appeal
- Given that many of the assets that may be targeted are illiquid, there will be wider bid-offers, therefore they are less suitable as investments with a shorter term investment horizon.
- Therefore the optimal assets under a CDI strategy may not be optimal under a Buyout approach, and vice versa

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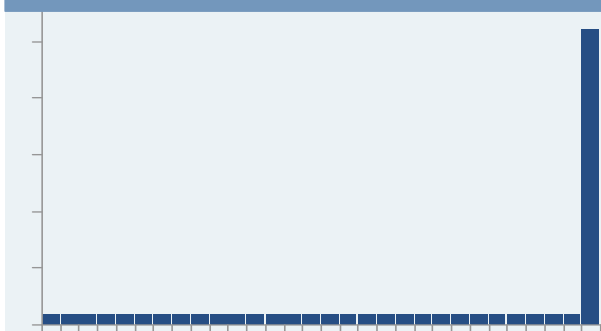
# CDI Implementation

## Different Risk Frameworks

### CDI vs Buyout considerations

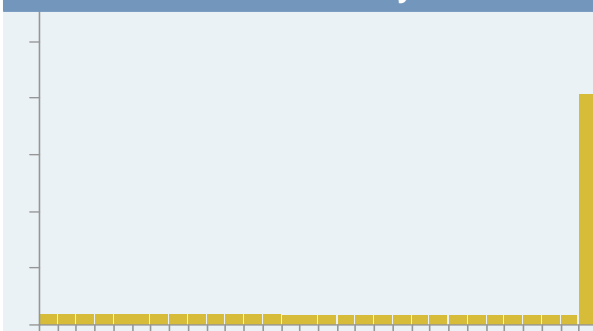
- There are a multitude of frameworks that can be used to discount both assets and liabilities
  - Cashflows
  - Risk free sensitivity - Gilt or Sonia discounting
  - Discounted by other relevant discount rate (e.g. technical provisions, buyout proxy, asset yields etc)
  - Discount by risk adjusted asset yield

#### Cashflow Framework



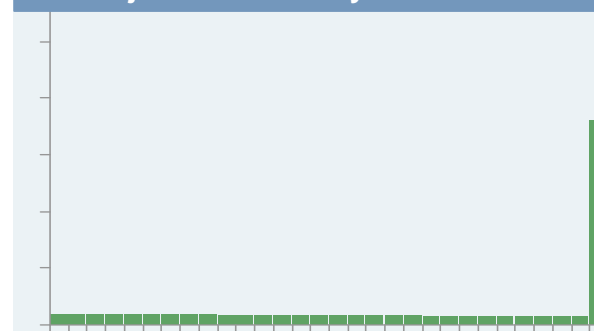
- Raw future value cashflows can be used to project both assets and liabilities
- This ignores all risk elements and just focuses on contractual cashflows and assumes they will occur

#### Market consistent sensitivity



- “Risk Free’ metrics can look at the rates sensitivity using a ‘risk-free’ rate such as Sonia or Gilts
- An extension of this would be market consistent approaches of discounting assets by their yields,

#### Risk adjusted sensitivity

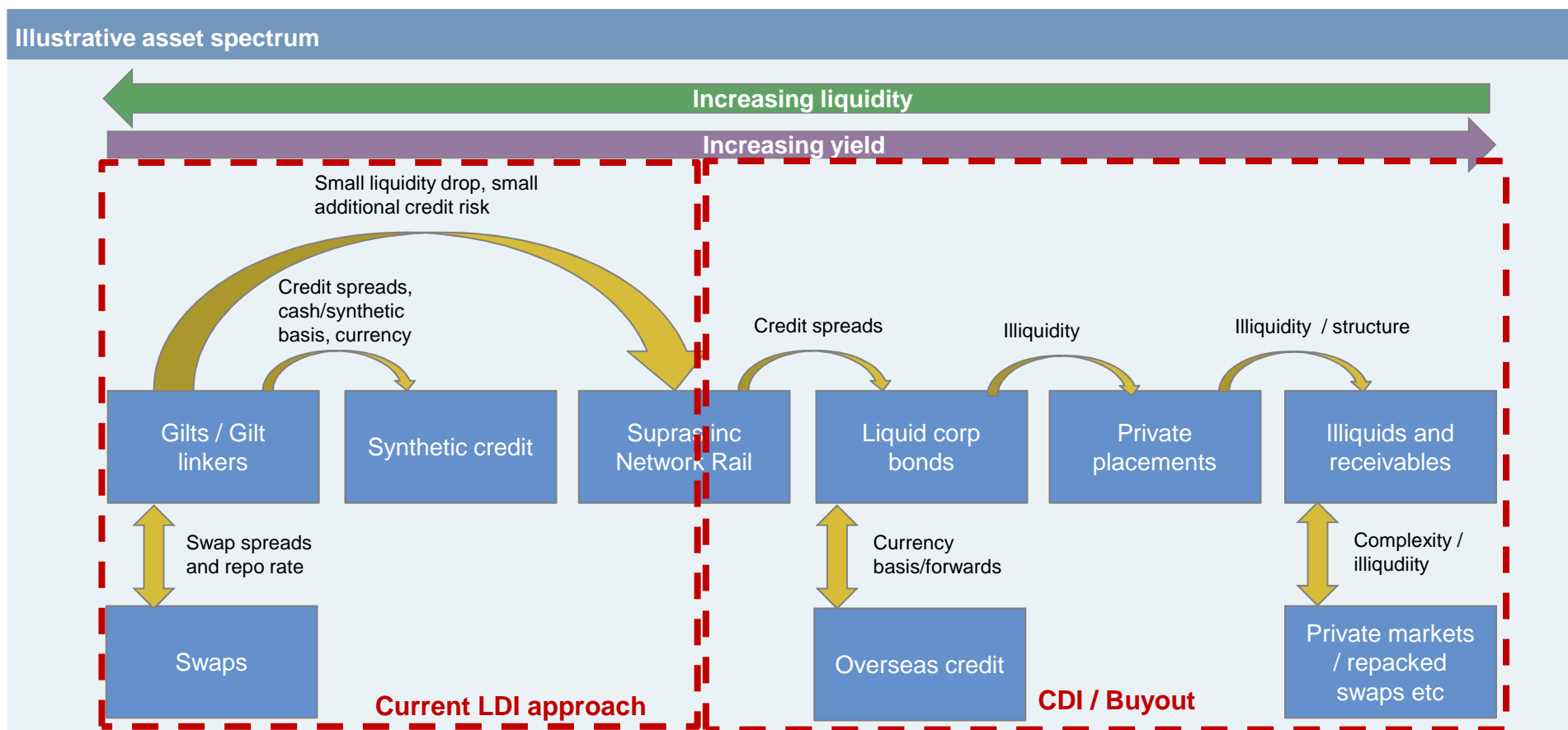


- CDI assumes that certain risks, such as credit and illiquidity risk, are well compensated.
- As such there are approaches akin to Solvency II Matching Adjustment that can be used to adjust discount yield



# CDI Implementation

## CDI: Expansion of asset spectrum



- Traditional LDI approaches focused mainly on swaps and Gilts (with repo)
  - There has been a growth in the use of synthetic credit (typically selling protection to enhance yield)
  - Historically there was some interest in Supras, in particular Network Rail. However, compressed credit spreads and the spike in repo costs in 2016 lessened demand
- CDI solutions can both expand the universe of available de-risking instruments and find synergies with existing holdings

# CDI Implementation

## Variations of CDI

### Summary of variations of CDI

- CDI is used as a homogenous term, when there are actually a number of variants of approach all frequently referred to under the same heading:

	Coupon Boosting	Cashflow Matching	Yield enhancement
Background to approach	<ul style="list-style-type: none"> <li>Duration has been prioritised in many hedging strategies, leaving large holdings of low coupon Gilts</li> <li>Mature schemes can have cash shortfalls for payments to pensioners/transfers</li> </ul>	<ul style="list-style-type: none"> <li>For better funded, better hedged schemes, CDI can finesse cashflows to better align with projected liabilities</li> </ul>	<ul style="list-style-type: none"> <li>Even without the targeted nature of cashflow matching, the incremental yield pick-up may be beneficial for schemes looking to duration/bucket hedge</li> </ul>
Potential benefits	<ul style="list-style-type: none"> <li>Cash generation may remove the need for liquidation of assets or financing to generate cashflows</li> </ul>	<ul style="list-style-type: none"> <li>Once implemented, schemes can have light maintenance, with changes to reflect cross gamma, or less hedgeable risks</li> </ul>	<ul style="list-style-type: none"> <li>Yield enhancement without a cashflow focus can lead to greater flexibility in the range of solutions possible</li> </ul>
Potential drawbacks	<ul style="list-style-type: none"> <li>Focus on front end cashflows can leave longer dated cashflows unchanged, exposing the scheme to reinvestment risk</li> </ul>	<ul style="list-style-type: none"> <li>Risk of directly competing for assets suitable for insurers in Solvency II</li> <li>Minimising re-investment risk may mean that otherwise efficient assets are missed</li> </ul>	<ul style="list-style-type: none"> <li>Yield enhancement without cashflow focus can mean that there are still shortfalls in cash generation required and possible re-investment risk</li> </ul>

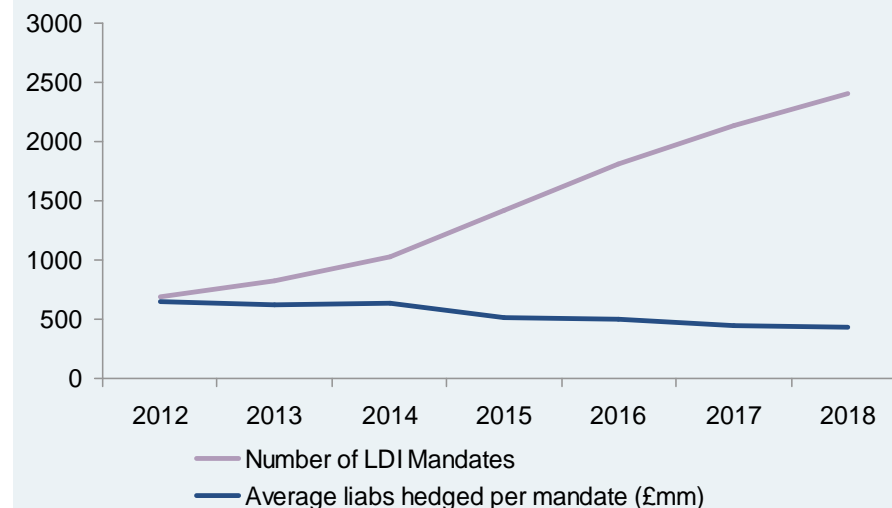
## CDI Implementation

### Pools vs Segregated

#### Pooled vs segregated solutions

- A significant proportion of the growth in LDI in the past years has been through smaller schemes
  - The 2018 XPS LDI Survey showed that 92% of new mandates in 2018 were pools, whilst 87% of new mandates in 2017 were pools. 73% of all mandates are now pooled
- As both the number of LDI mandates and value of liabilities hedged have grown, the average liabilities hedged per mandate has decreased
  - This is even more striking as there would typically be an expectation that incremental hedging would lead to a steady drift up over time
  - Therefore for this number to be decreasing, the size of new schemes joining must be sufficiently small to more than compensate for this

#### Growth in LDI mandates and liabilities hedged



Source: KPMG LDI reports 2012-16, XPS LDI reports 2017-2018

- Pooled funds require simple, scalable strategies that are easy to trade in and out of at transparent levels.
  - As such, CDI strategies involving illiquid assets may be more challenging
  - Synthetic CDS overlays can be used for yield enhancement

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## Strategy design considerations

### Types of risk for yield enhancement – credit risk

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#### Risk drivers of yield enhancement

- There are a few major avenues that can be pursued as yield enhancement for fixed income assets, including:
  - Credit risk
  - Illiquidity premium
  - Currency risk
- Each of these is likely to have a place within a successful CDI strategy. However, each is a new risk, so should be monitored and managed

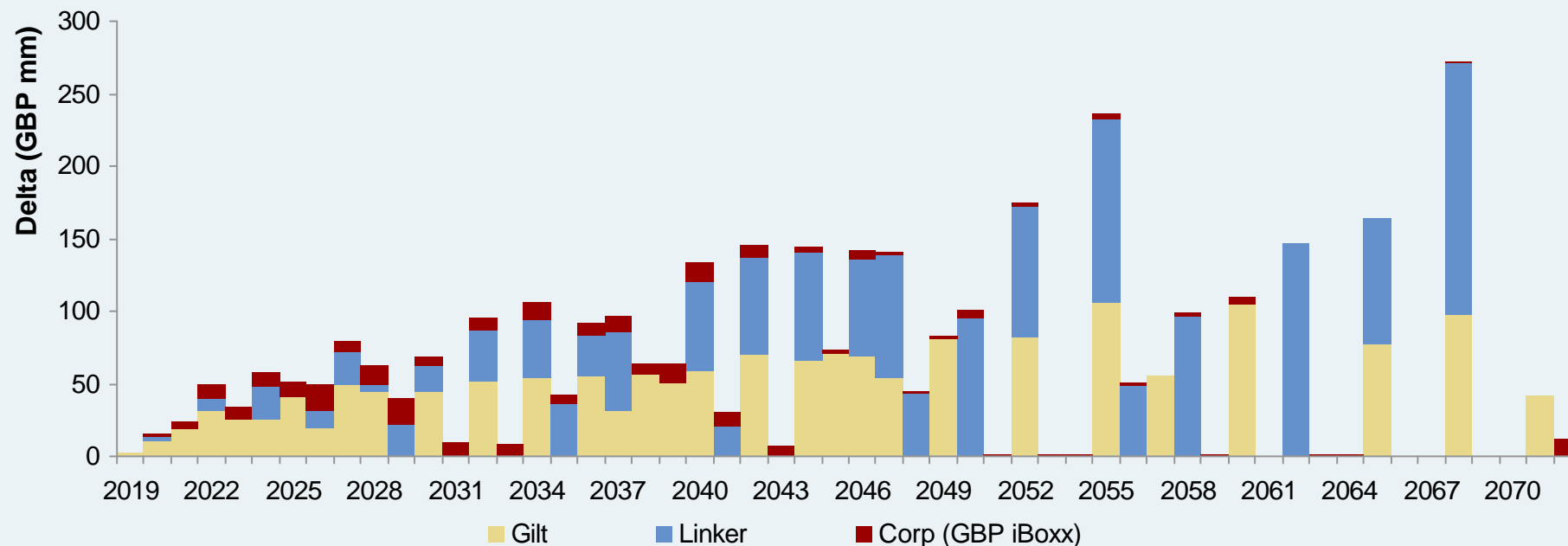
#### Credit Risk

- Of these, Credit Risk is the most well understood, with “Buy and Maintain” mandates being part of pension fund allocations
- The general logic is that for corporate bonds, the excess spread paid above ‘risk free’ is greater than the expected loss calculated from reasonable, independent probability of default and loss given default calculations
- Or course, some of this can be attributed to the relative lack of liquidity of corporate bonds compared to ‘Risk-free’ instruments such as Gilts. Therefore caution must be exercised to ensure consistency with how the liquidity premium is calculated

## Strategy design considerations

The GBP investment grade corporate sector is much smaller than the Gilt market

### GBP denominated instruments – Gilts, Linkers and Investment Grade Corporates



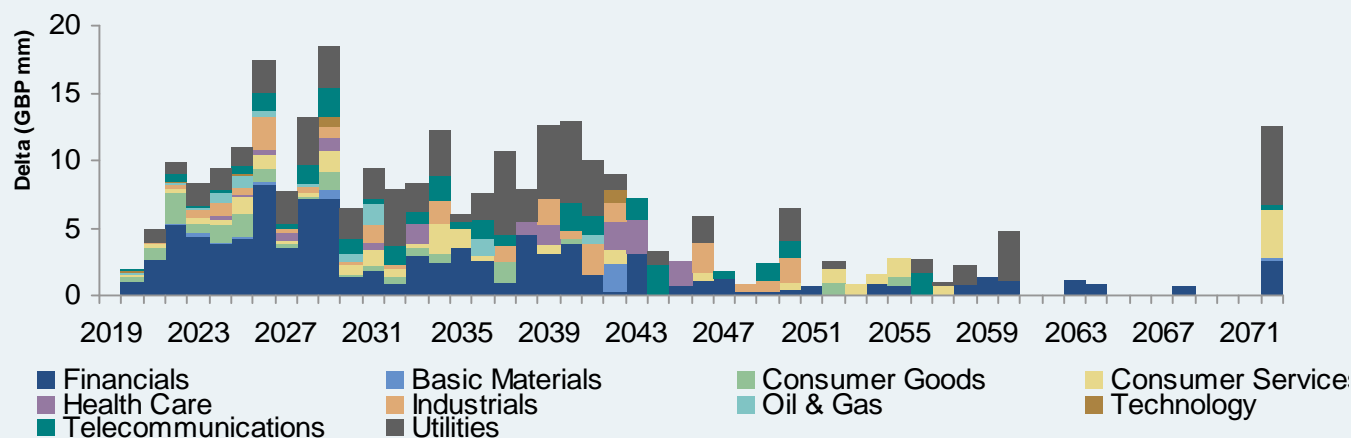
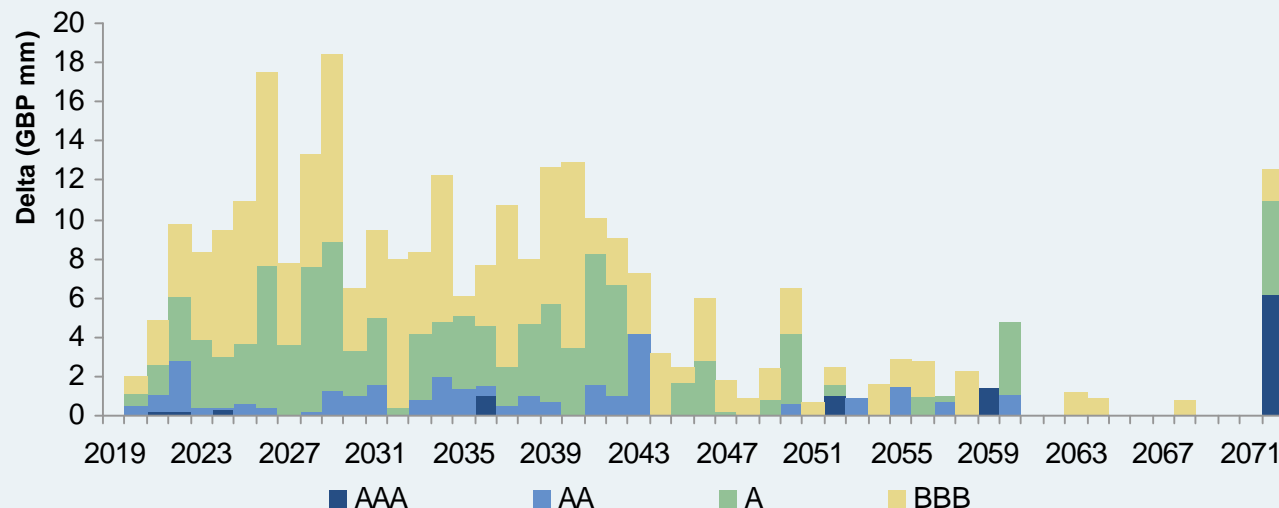
Source: Bloomberg, iBoxx, JPM

- For many investment strategies originating from Defined Benefit liabilities (CDI, buyout etc) there is an increasing appetite for yield enhancement. This typically means corporate credit
- However, it is worth noting the overall deltas:
  - GBP iBoxx: 295mm / bp
  - Gilts: 1,647mm/bp
  - Inflation Linked Gilts: 1,592mm/bp

# Strategy design considerations

## Issuance concentrations

GBP denominated instruments – distribution of corporate bonds



- Aside from scale there are other challenges when looking at benchmark investment grade GBP corporates
- There is a shortage of longer dated assets, with only 15% of the delta being in assets with a final maturity >30y
- There is also a concentration of ratings with ~50% of GBP iBoxx issuance being rated BBB. This may be more challenging to insurers, where the capital treatment of BBB names with a greater downgrade risk (i.e. non-utilities) can deter investment
- There are also sectoral concentrations with the average final maturity for utility issues being almost double that of the oil and gas sector

Charts Source: Bloomberg, iBoxx, JPM

# Strategy design considerations

## Currency management considerations

### Currency risk management

- Given the relative scarcity of GBP assets (particularly long dated), there is a rationale to look at assets in other currencies
- This can lend itself to a wider range and potentially higher yielding pool of assets although this would lend itself to FX risk
- Buyout, under a Solvency II framework, requires termed out x-ccy swaps in order to get Matching Adjustment treatment. However, under CDI there is the potential to look at rolling FX forwards as an alternative to manage this risk
  - A cross currency swap is an exchange of a stream of cash flows in one currency into a stream of cash flows in another currency where notionals are exchanged at inception and termination
  - An FX forward is shorter term (usually <1y) with no periodic payments. The only payments on an FX forward are the exchanges of cash amounts at the outset and at the end of the period

	Cross currency swaps	Rolling FX Forwards
Basis levels	The cross currency basis is locked at the start of the period	You are exposed to “roll risk” from the basis changing
Liquidity	Liquidity (& cost) can vary depending on tenor, resetting vs non resetting and float-float vs fix-fix	3 month FX forwards are the most liquid market for FX hedging so trading cost tend to be lower
Flexibility	As basis is locked at the start of the period you can end up locking the basis at less favourable levels with no upside potential when the basis moves in your favour	A rolling FX forward offer a natural roll point when size or term can be amended. It can also be used as a temporary hedging strategy until basis looks more favourable.



## Strategy design considerations

### Breaking down fixed-fixed cross-currency swaps into their components

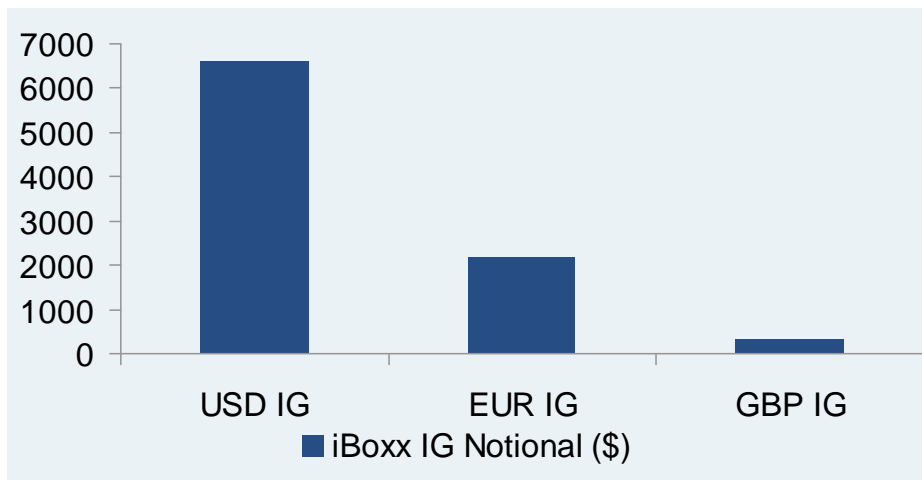
Overview of the different markets that are crossed to convert a fixed USD coupon into a fixed GBP coupon



## Strategy design considerations

### Types of risk for yield enhancement – currency risk

#### GBP denominated instruments – distribution of corporate bonds



- Whilst the GBP Corporate market is relatively limited in size, the USD and EUR markets offer significant scale
- However, some of the issues around average maturities remain, with average durations as:
  - EUR 5.2y
  - USD 7.2y
  - GBP 8.2y
- Additionally, the currency risk requires management

#### Worked example – EDF Bond

- We can look at a worked example with a couple of bonds compared high level:

EDF USD 6.95% Jan-39      yield 3.71%

EDF GBP 5.5% Oct-41      yield 2.73%

- The USD issue swaps back on a fixed-fixed x-ccy swap to a GBP yield of 2.68%
- i.e. there is a 5bp drop (pre-costs) from the USD issue

#### High level proxy of yield differential

- Whilst this is not a precise metric, we can proxy the x-ccy swap from screen rates
  - USD yield: 3.71%
  - differential 20y pars (1.93% - 1.06%) = 0.87%
  - 20y GBP 3s6s = 0.09%
  - 20y x-ccy basis = 0.07%
$$3.71\% - 0.87\% - 0.09\% - 0.07\% = 2.68\%$$

## Strategy design considerations

### Currency management considerations

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- There are some additional considerations when looking at cross currency swaps

#### Resetting vs Non-resetting

- Resetting swaps set the notional at the beginning of each calculation period, based on the prevailing spot FX rate, while non resetting swaps lock in the FX rate at the start of the transaction
- Both trades lock in the cross currency basis at the start of the period
- FX gains/losses are crystallised quicker in resetting cross currency swaps leading to smaller forward MtM
- Resetting swaps are the market standard for interbank trades, so screen references reflect these transactions

#### Counterparty risk

- Cross currency swaps trade bilaterally, therefore there is exposure to the counterparty with who it is traded with. Whilst this is almost always mitigated with collateral, the discount rate applied in relation to the collateral set can add sensitivity

#### Collateral Availability

- By locking in future exposures, there is also greater MtM exposure from a term x-ccy swap compared to a rolling forward. This can lead to significant potential collateral exposures, particularly under market stress
- Most collateral agreements are typically restricted to GBP Cash & Gilts, which means that there can be a 'pincer movement' in switching to USD corporates
  - Reduced collateral eligibility as Gilts are switched into USD corporates
  - Greater collateral requirement from derivatives to manage currency risk

## Strategy design considerations

### Historical GBPUSD Cross-currency basis levels

#### GBPUSD Cross currency basis levels

- Along with all of the other factors discussed, from a market rates perspective, the decision of whether to “lock-in” currency basis can be thought of as a function of:
  - Current term structure
  - Current levels in historical context



Source: Bloomberg

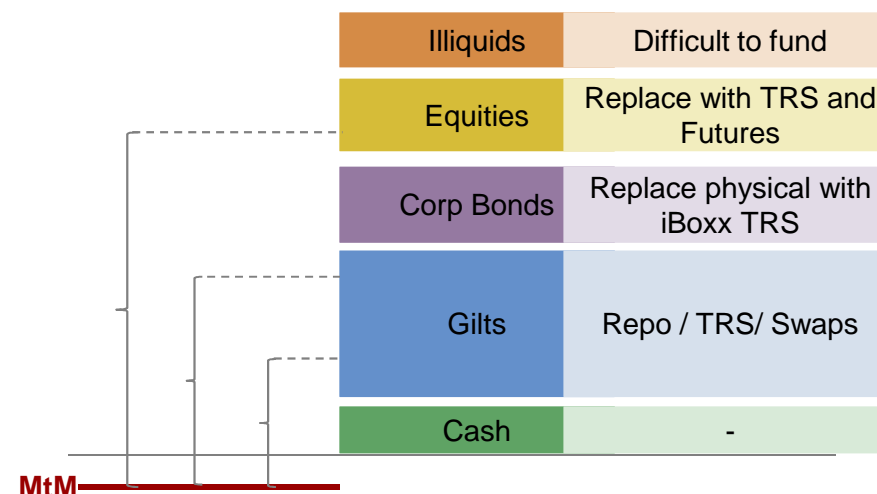
# Strategy design considerations

## Liquidity considerations

### Liquidity and optimisation

- For cashflow matching CDI approaches, there is strong rationale to harvest illiquidity premium
- However, liquidity must be measured and managed, with the optimal approach heavily contingent on the individual scheme/fund
- Illiquidity premium will typically offer the ability to pick-up enhanced yields, therefore for more stable holdings, the holding of illiquid issues can be an effective means of boosting yield.
- However, there can be outflows caused by:
  - Payments to pensioners
  - Pensions transfers
  - Moves in unhedged parameters, for example longevity assumptions
  - Fund outflows
  - Collateral postings may not cause hard outflows, but will typically require cash or Gilts to be posted to counterparties for any out of the money swaps

### Segregated vs pooled solutions



- Looking at what the liquidity requirements may be alongside cost of liquidity at each point (under stress) can give a “cost of excess liquidity”
- This won’t be the same between schemes, or even for the same scheme over time

# Agenda

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## Summary

### Takeaways on CDI Strategies

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#### **Why are people talking about CDI?**

- Current scheme funding levels lead to the desire for yield enhancement
- Scheme maturities and Cashflow negativity lead to a desire for Cashflow matching
- Combining the 'silos' of rates, credit and illiquids can add synergies to pension scheme risk management

#### **What is CDI**

- CDI is the name given to a wide range of (quite different) strategies
- However, the use of credit and illiquids underpins many strategies labelled as CDI

#### **What are the considerations around CDI?**

- The optimal asset mix will be a function of 'endgame' desires – buyout vs self-sufficiency
- Scarcity of long-dated, GBP assets possibly with inflation linkages adds challenges
- Currency risk management becomes an important dynamic
- Liquidity, credit and collateral risks may become more important considerations
- Consideration across a variety of frameworks can lead to optimal solutions