Liability hedging in a world without risk-free assets

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Society of Actuaries in Ireland

Agenda

- ❑ **Liability Driven Investment (LDI)**
  - **Background & Regulation Environment**

- ❑ **Liability Hedging: Practitioner's Guide**
  - **Bond**
  - **Synthetic**
  - **Derisking Strategies**

- ❑ **Credit Evolution – what risk free rate?**

- ❑ **Conclusions**

Challenges facing Defined Benefit Plans

DB Schemes facing Fundamental Changes

- Accounting Standards
- Pension Legislation

Increased Focus on Big Decision

- Solvency Position
- Benefit Structure
- Investment Strategy

Emphasise on Risk Management

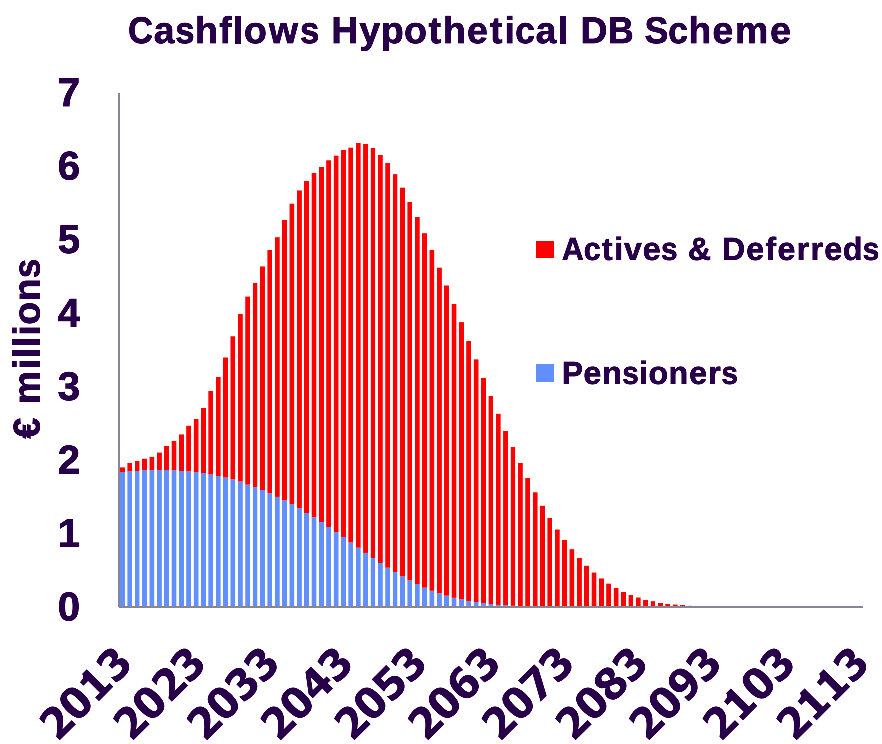
- Asset Liability Management
- Interest Rate & Inflation Hedging

Regulatory impact on Asset Allocation

	IAS19	MFS	Solvency II
Equity	⬇	⬇	⬇
Interest Rate Hedge	⬆	⬆	⬆
▪ **Eurozone Bonds**	⇧	⬆	⇧
▪ **Corp Credit**	⬆	⇧	⬆
▪ **Global Bonds**	⇧	⇧	⇧
▪ **Swaps (IRS & I/L)**	⬆	⇧	⬆

Regulatory changes designed to incentives "Derisking"

DB Liability Matching Objective



1. Liability Valuation Basis
- **MFS ~ Annuities**
- **IAS 19 ~ AA Corporates**
- **Economic**

2. Exposures
- **Nominal**
- **Inflation**

3. Risks
- **Pensioners = 12Yrs**
- **Actives & Deferreds = 28Yrs**
- **Convexity**

Multiple Liability Measures => Complex hedging solution

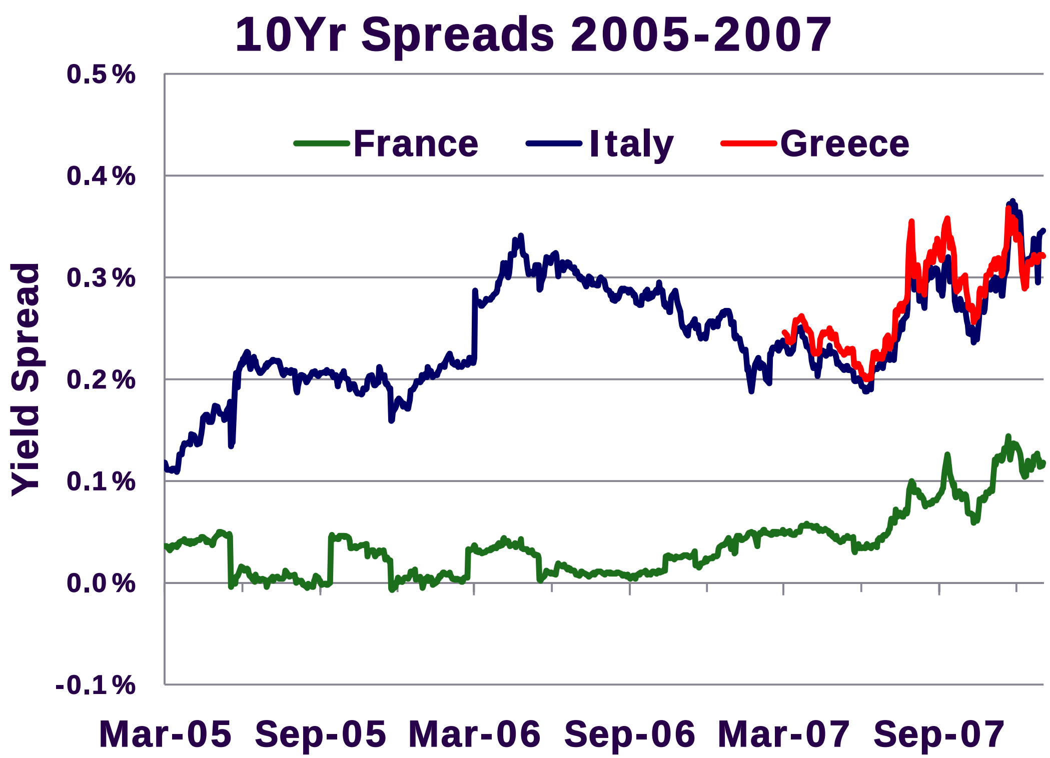
Hedging Assets

Eurozone Bond Market:

- **Limited Supply of Inflation**
- **Principal Strips offer liquid duration**

	Yield	Duration	Max Liquid Duration
Govies >10Yr Index	3.5%	12.5Yrs	22Yrs
French Principal Strips	3.5%		41Yrs
Inflation Index	0.1%	8.9Yrs	22.5Yrs
Corporates Index	2.1%	4.1Yrs	10Yrs
Swaps Nominal	2.3%		40Yrs
Swap Inflation	0%		30Yrs

Pre Eurozone Crises – No Credit Differentiation



	Average Spread	Spread Volatility
France	0.04%	0.07%
Italy	0.24%	0.12%
Greece	0.28%	0.13%

Bond Solutions – 1st Generation

Solution: **1. Emphasise on Carry Front End**
2. Zero Coupon Bonds Hedge Long End

	Weight	Yield	Duration	Duration Contribution
Corporate Index	10%	2.2%	4.1	2.1%
Ireland Index	10%	4.0%	5.1	2.6%
Germany 10+ Index	25%	2.0%	14.4	18.1%
France - Strips	55%	3.2%	28.0	77.3%
	100%	2.9%	19.9	100.0%

Hedge Duration & Curve Risk but Reliance on France

Bond Solutions – 2nd Generation

Eurozone Crises

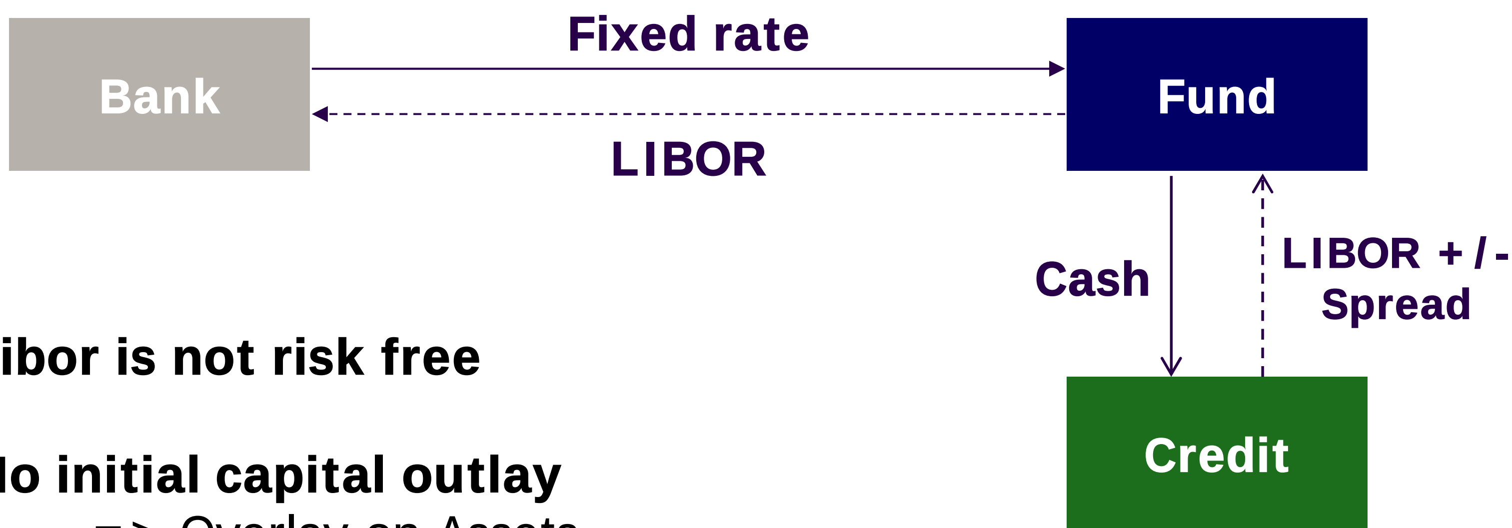
- **Focus on Credit Diversification**

	Weight	Yield	Duration	Duration Contribution
Germany 2042	40%	2.2%	19.9	39.3%
Holland 2042	25%	2.4%	18.7	23.1%
France 2055	35%	3.1%	21.8	37.7%
	100%	2.6%	20.3	100.0%

Options:

1. **Barbell Exposure => Hedge Curve but French Risk**
2. **Bullet Exposure => Hedge Credit but sacrifice Curve**

Swap – Synthetic Duration Asset



- ❑ **Libor is not risk free**
- ❑ **No initial capital outlay**
  => Overlay on Assets
- ❑ **Collateralisation**
  => Reduce Loss Given Default **not Probability of Default**
- ❑ **Reinvestment Risk**
  => Collateral Duration < Swap Duration

Swap Example

Swap Portfolio	Weight	Yield	Spread	Duration
Zero Coupon Portfolio		2.3%		23.0

Cash Backing Swap	Weight	Yield	Spread	Duration
Credit - EUR IG	60%	2.2%	1.5%	4.1
Collateral- AAA 1-10Yr	40%	0.6%	-0.2%	4.4
		1.6%	0.8%	4.2

Impact of Swap Overlay:

1. **Reduce French Exposure**
2. **Hedge Duration + Curve**
3. **Reinvestment Risk => Lower Yield ?**

Liability Hedging Developments

Issue	Proposed Solution
Credit Risk	Ultra Long End ⇒ Reduce reliance on France via Swaps e.g. Linkers ⇒ Expanding Opportunity Set i.e. IG/HY/EMD
Segment Risk	Separate Decision: ⇒ Nominal Rates ⇒ Inflation
Hedge Ratio	Target Hedge > Available Bond Assets
Yield	Total Return Swaps and Repo ⇒ Access Gilt Yield Premium

Hedging Framework => Dynamic Decision Process

Credit Risk Evolution

Credit Crunch Phase of the Crisis

- Collapse of large portion of financial sector
  - *Default of a major market counterparty*
- **Private sector losses transferred to public sector balance sheet**
- Structural issues in Eurozone
- Sovereign Default of an OECD Country

Financials Losses in Credit Crunch

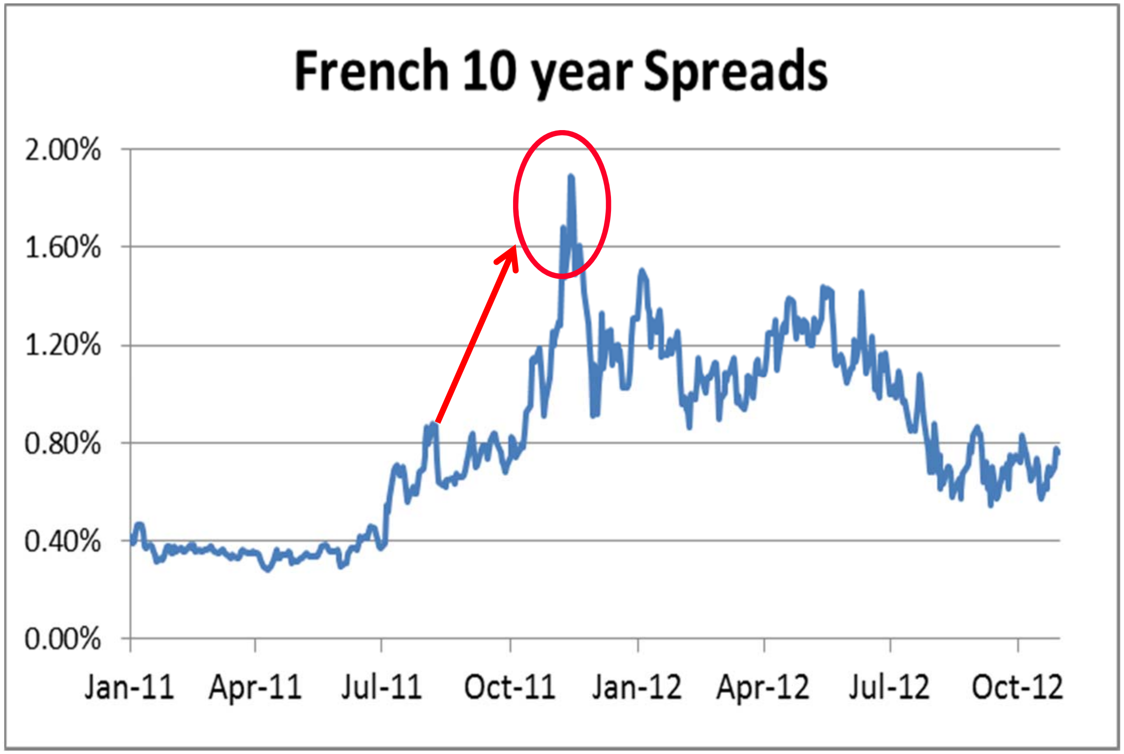
	Losses	Capital Raised
Americas	€1,042 bn	€656 bn
Europe	€538 bn	€483 bn

European Sovereign Debt – Rating Migration

	1995	2005	2011	Current	Bonds Issued	Share
Austria	AAA	AAA	AAA	AA+	€188bn	3.5%
Belgium	AA+	AA+	AA	AA	€295bn	5.5%
Finland	AA+	AAA	AAA	AAA	€79bn	1.5%
France	AAA	AAA	AAA	AA+	€1,179bn	21.8%
Germany	AAA	AAA	AAA	AAA	€1,056bn	19.5%
Greece	BBB-	A-	CC	CCC	€117bn	2.2%
Ireland	AA	AAA	BBB+	BBB+	€88bn	1.6%
Italy	AA	AA-	A	BBB+	€1,473bn	27.3%
Netherlands	AAA	AAA	AAA	AAA	€296bn	5.5%
Portugal	AA-	AA-	BBB-	BB	€98bn	1.8%
Spain	AA	AAA	AA-	BBB-	€535bn	9.9%
				Total	€5,404bn	100.0%

- **AAA Rated Countries: €1.43trn (26.5%)**
- **France: €1.18trn (21.8%)**
- **Peripheral Countries: €2.31trn (42.8%)**

Re-pricing Risk Free Rate



- Markets were questioning the future of the Eurozone
- 10 year Italian bonds were yielding over 7.5%
- Large ECB policy response with LTRO

Decision Making Processes in Times of Stress

Swaps – Risk Free Rate?

- Losses force investors/institutions to re-evaluate counterparty/collateral risks

- Using swaps can help, raises issues with a counterparty defaulting

- What is the collateral behind the mark-to-market of the swaps?
  - alters recover on default, **<u>not probability of default</u>**

- Move to central clearing for swaps

- Strong correlation between default risk and asset values

Captive Capital

Regulatory reforms force investors to buy government debt

- Zero Risk Weighing in Basel
- Liquidity Ratios
- Minimum funding standards

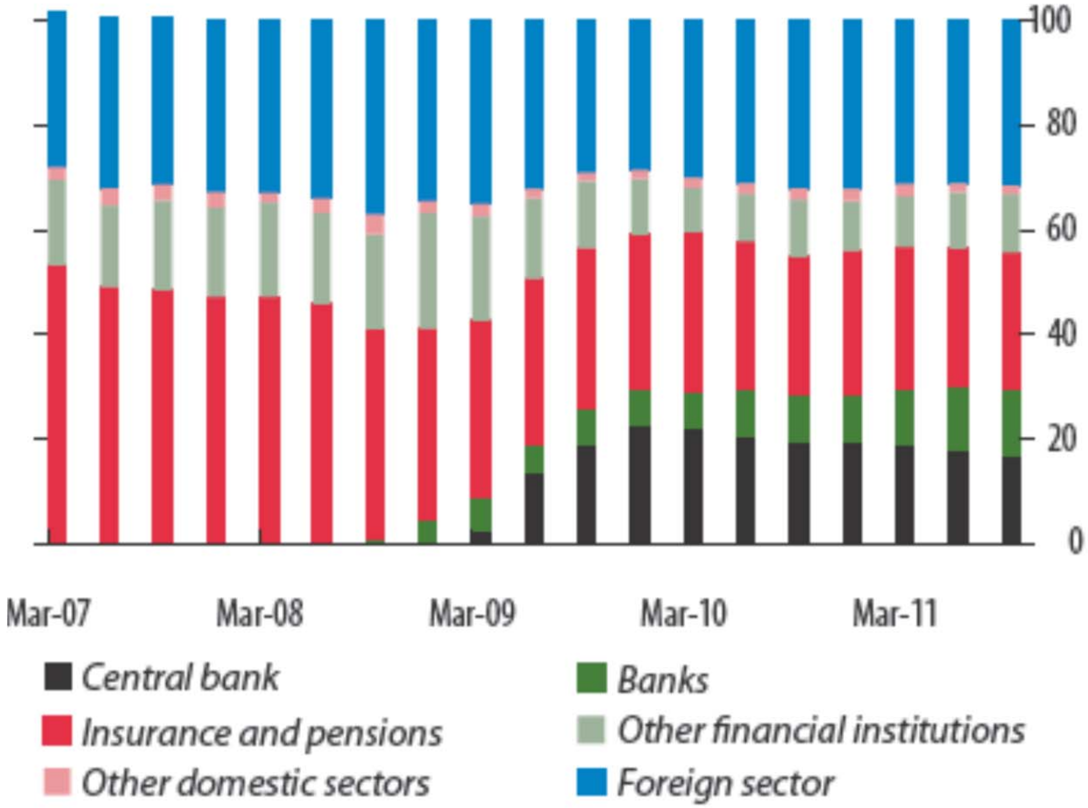
Central Bank policies keep yields low through QE

Policy forces investors to accept low nominal yields or take more risk

Future Inflationary impact?

Policy & Regulation Impacts

Holding Share of UK Gilts as % of Total



- Bank of England along with commercial banks now have 30% of Gilt market from zero 3 years ago
- While cumulative budget deficit was 29% of GDP...

Regulatory Impact – Pensions

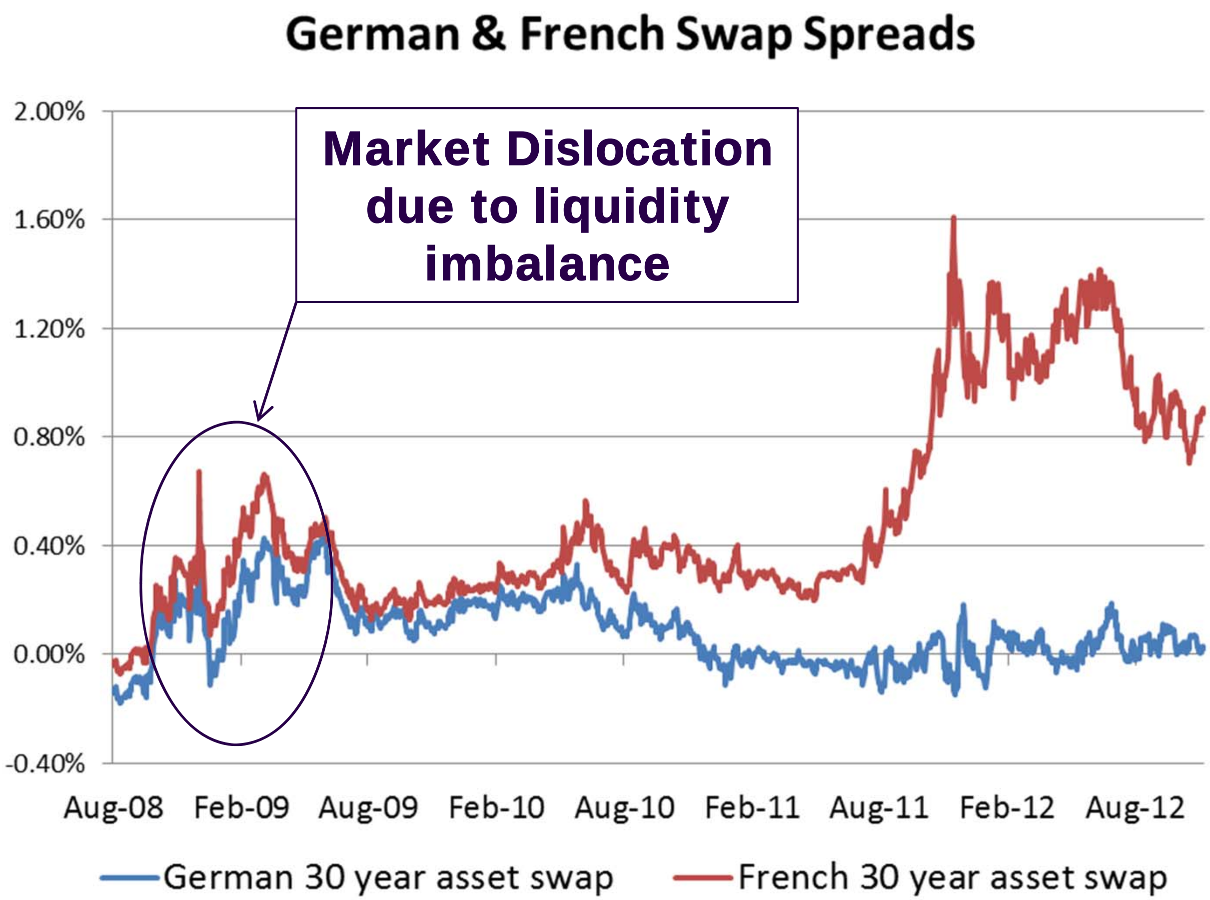
EUROPEAN DEVELOPMENTS

- Ultimate Forward Rates In Holland & Denmark
  - they don't want to lock in at these rates
  - Reduces costs by using higher discount rate
- Impacts market dynamics
- So now we aren't hedging actual economic rate risk

MINIMUM FUNDING STANDARD IN IRELAND

- Stated intention to push schemes into bonds
- Question over credit-worthiness?
- Yields now below levels that significantly help solvency of schemes

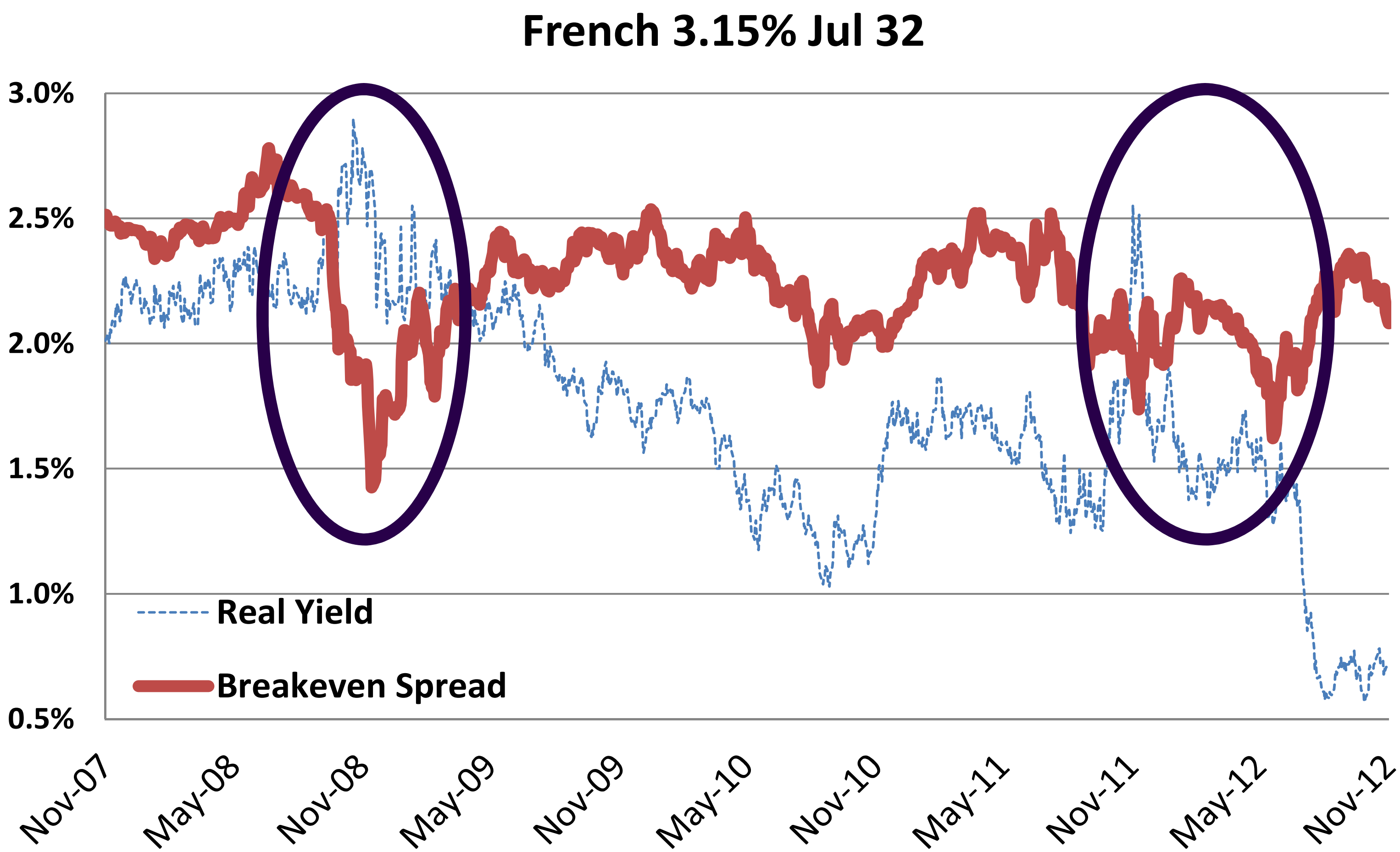
Bonds vs. Swaps – Relative Value



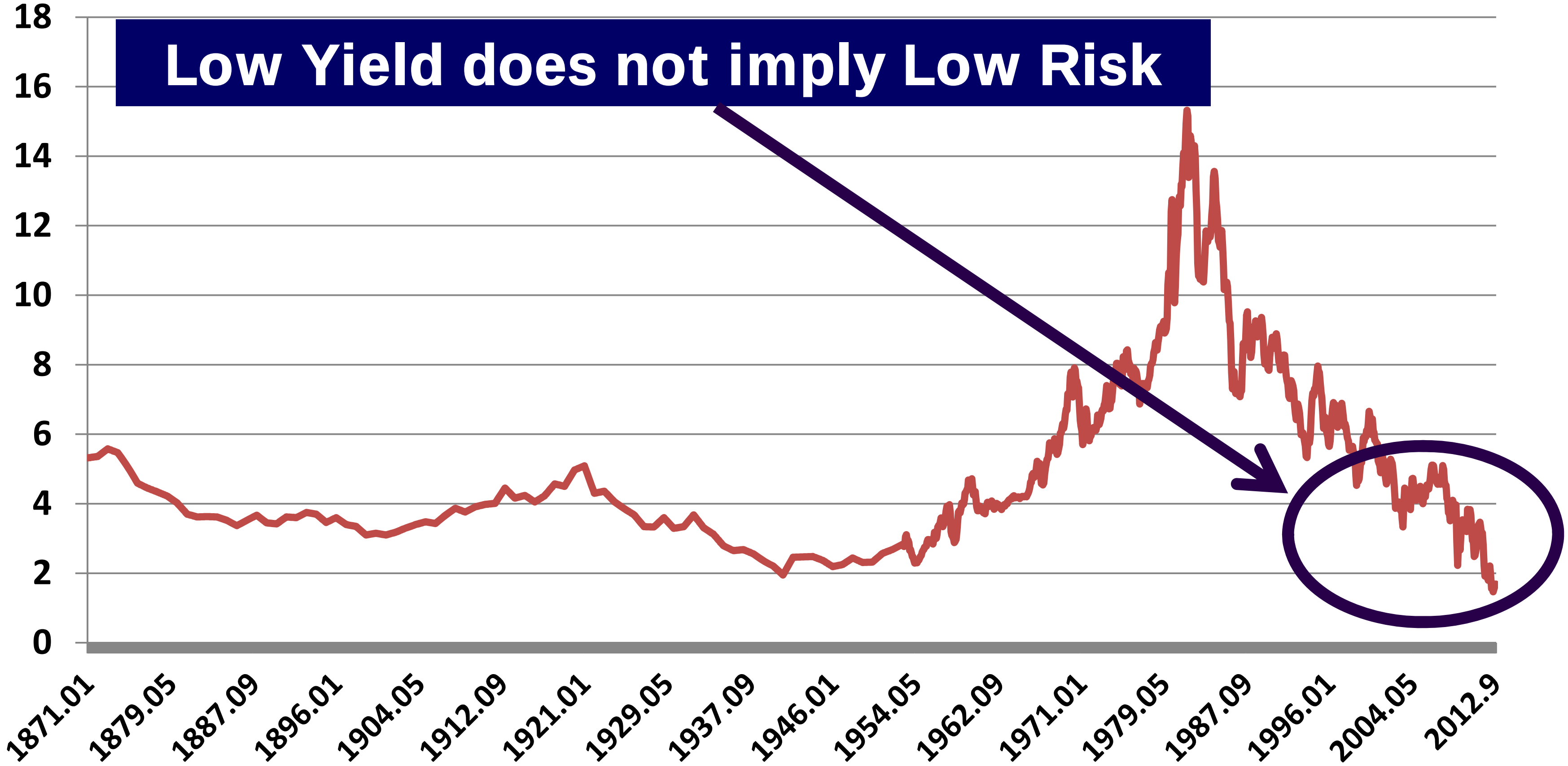
- ❑ Example of stress Lehman's put on the swap market as investors need to re-hedge
- ❑ Shows deterioration of French Credit over time

Opportunistic Derisking

- **Significant Market Volatility => Opportunities & Advice Time Sensitive**



U.S. Treasury Note Yield 1870-Present



- **Opportunistic Derisking:** can improve affordability of Hedging Strategy

Key Area Highlighted

- **Regulation changes:** Incentivising major Asset Allocation Shifts
- **Sovereign Debt Risk:** Volatility set to continue
- **LDI:** useful framework but requires active credit decisions
- **Opportunistic Derisking:** time sensitive nature of decision

Liability Hedging: Dynamic Process requiring Active Oversight

Q&A

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