

A black and white photograph of a hand holding a paintbrush, painting a vibrant rainbow streak across a dark, textured surface. The rainbow colors transition from red at the top to purple at the bottom. The background is dark and grainy.

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THOUGHT LEADING INVESTMENT

Investment De-risking Methods & Approaches
What every actuary should be aware of!

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Missed the “obvious”?

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Everything is going to be OK

OK $\longrightarrow$ OK

- Consider the investment strategy for assets backing the **pensioner component** of a pension fund
- The fund is **closed**
- The fund has a **pension increase policy that targets 100% of inflation**
- The Actuary uses the yield on the **R197 inflation-linked bond** (maturing 2023) as a discount rate in the valuation
- The **yield on the R197** as at 1 January 2012 was **2.25%**
- Actuary confirms the **Fund is 100%** solvent on this basis

The fund sets the return objective as CPI + 2.25%

- 📊 **Inflation** for the 2012 calendar year was **5.7%**
- 📊 Fund's investment return was **9.8%**
 - ✓ **Outperformed inflation** by 4.1%
 - ✓ **Outperformed the return target** of CPI+2.25% by 1.85%
- 📊 Trustees and Investment Advisor **pat themselves on the back**

Celebrations...

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Celebrating too soon?

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The Actuarial Valuation ruins the party

- 31 December 2012 Actuarial Valuation reveals that the **Fund is now 91% funded**
- Solvency deteriorated** 9% since the start of the year
- Despite the fact that
 - fund **returns were positive**
 - The fund **outperformed CPI+2.2%** (the return target) by 1.8%
 - there was **no mortality loss or profit** in the fund

So what happened?

- Actuarial **valuation used** the prevailing yield on the **R197**
- R197 **yield decreased** from 2.25% (1 Jan 2012) to 0.91% (31 Dec 2012)
- Liabilities increased** by 20.84%!
- Investment approach **failed to account for interest rate risk**
- Liabilities increased due to the accrual of interest and inflation (CPI+2.25%) AND an interest rate effect due to the fall in interest rates
- This is **not a hypothetical scenario** – many funds saw their liabilities increase in excess of 20% during 2012

- % **Market based valuations** result in more significant value of liabilities
- % **Required** by Accounting Standards (IAS 19/ FAS 87)
- % Even discount rates using **Equity Risk Premium** have the **yields on appropriate government bonds** as the starting point in derivation
- % ***Liabilities therefore have a Market Value!***
- % ***Seems unreasonable - remember “Actuarial Value of Assets”?***

Possible remedies?

- ‰ Assume **discount rate** stays **constant**
- ‰ In our previous example, **funding level** would have **improved**
- ‰ However, a **static discount rate** implies the **pension increase policy** has **changed**
- ‰ **FSB advise that this is a violation of Section 14B(3) of the Act**
- ‰ Registrar issued guidance on 1 March 2012 requiring valuers to set a basis consistent with the pension increase policy.
 - / **Specifically prohibits the use of a fixed discount rate.**
 - / **Trustee Board cannot disregard the Pension Increase Policy**

Absolute Return Funds

- % Absolute return funds are **dressed up balanced funds**
- % **Return targets or benchmarks** based on inflation
- % They may target returns such as **CPI+3%, CPI+4% and CPI+5%**
- % Introduced around 2005 – at **one stage there was a CPI+10%** fund and even recently CPI+7% existed
- % Such strategies **exposed many funds as real yields fell** from their high starting points and **equities underperformed**

- ‰ Insurance products now available that **guarantee a fixed rate of return** (“the discount rate”)
 - / This guarantees the level pensions
- ‰ Inflation **increases** declared annually based on the **performance of a designated portfolio**
- ‰ **Intuitively attractive**
 - / **Level pensions** are **secure**
 - / Designated portfolio has some **equity exposure**
 - / **Increases** are **formulaic** – black box approach to increases has been removed

- ‰ These **strategies** also **assume the discount rate will remain constant**
- ‰ **Problems** as discussed earlier
- ‰ Of concern is the fact that the **investment strategy drives pension increases!**
FSB guidance is clear that the **investment strategy must be driven by the pension increase policy!**

- % Interest rate risk is **unrewarded risk**

- % It is **possible** to **mitigate** this risk **completely** using
 - / appropriate portfolio of **bonds**;
 - / with the use of derivatives;
 - / a combination of both.

- % The appropriate strategy will depend on many factors including:
 - / Level of **fund solvency**;
 - / Trustee **risk tolerance**;
 - / **Basis** used in the determination of on-going liability values;
 - / Prevailing **market conditions**;
 - / **Regulation** (and interpretation thereof).

- Derivative contracts such as **forwards** or **swaps** can be used to mitigate interest rate risk!
- Supporters of such instruments argue that it is efficient because a **smaller proportion** of a fund's assets are to meet the interest-rate risk
- Important considerations*

% Example:

- / Fund enters into a transaction whereby it will **receive the return on a benchmark bond** and must **pay 3 month JIBAR**
 - / **No physical investment** takes place on implementation date
 - / The Fund chooses not to invest in the appropriate bonds and instead invests in equities
- % Intuitive appeal for Funds that want to address interest rate risk and gain further exposure to equities

- % **JIBAR** is an acronym for **Johannesburg Interbank Agreed Rate**
- % It is a **money market rate**
- % LIBOR is its UK equivalent
- % Calculated daily by SAFEX as **the average prime lending rate** quoted **independently** by a number of different banks
- % 3 Month JIBAR is often used a benchmark of short-term interest rate movements

The dangers of derivatives

- % Fund is advised to **enter into derivative transactions** that provide the requisite interest rate exposure
- % Assets invested in equities
- % **Fund receives bond return** (e.g. the return on the R197) and is **required to pay JIBAR in return**
- % Fund thus **requires equities to outperform its JIBAR benchmark** to meet ongoing payments iro the derivative transaction
- % **Key concern** for a pension fund is a **scenario where interest rates rise and equity markets fall**
- % **Fund must liquidate equities at a low point** in order to meet its obligations
- % Fund has **two sources of loss** – the physical portfolio and the derivative transaction

% Such strategies appear to **violate** the **spirit** of much legislation

- / PF75
- / Regulation 28
- / Derivatives Guidance Note (currently draft)

% PF75

- ✓ “The total potential exposure of a Fund at all times should be limited. In particular, no Fund should ever accept an unlimited risk, no matter how small the probability that any particular consequence may occur”
- ✓ Even though the liability has reduced – if interest rates rise, the Fund can lose more than its current asset base if the strategy is mismatched
- ✓ A strategy that requires JIBAR to be paid will always have a risk that the long position underperforms JIBAR

% Regulation 28

/ Subregulation 3(d):

“A fund must not invest or contractually commit to invest in an asset, including a hedge fund or private equity fund, where the fund may suffer a loss in excess of its investment or contractual commitment in the asset. This does not preclude a fund from investing in derivative instruments subject to subregulation (7).”

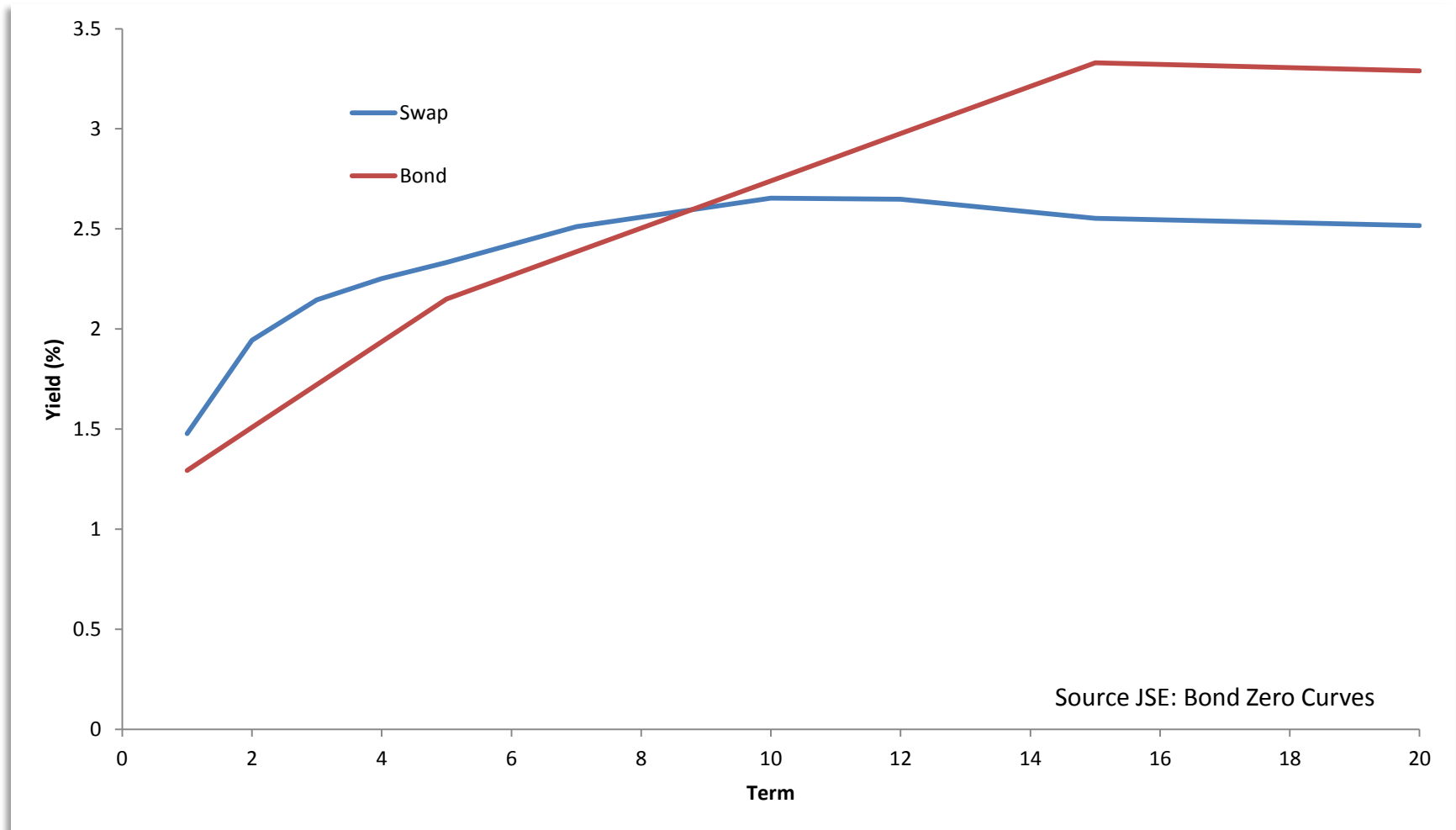
/ Subregulation (7):

“Notwithstanding subregulation 3(d), a fund may invest in derivative instruments subject to conditions as prescribed.”

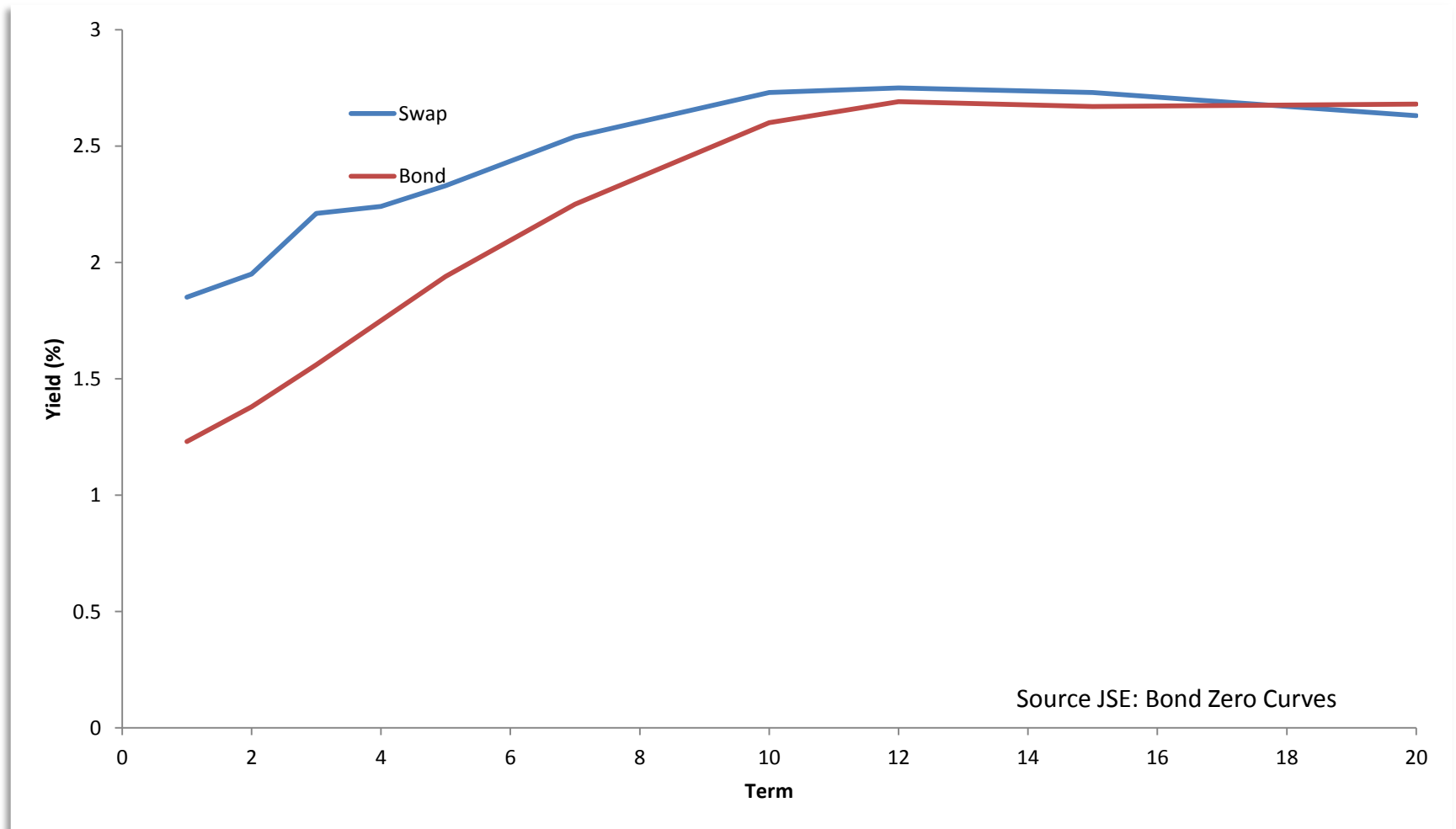
- / Derivative usage conditions only in **draft form**, and above open to interpretation as to whether swap strategies which have the potential to lose more than initial capital are permissible

- Derivatives strategies also introduces “**basis risk**”
- The value of the **liability** is normally **determined**
 - with **reference to government bond yields** but the
 - value of the derivative** determined from a **swap curve**
- The **two curves** can **move very differently** over time

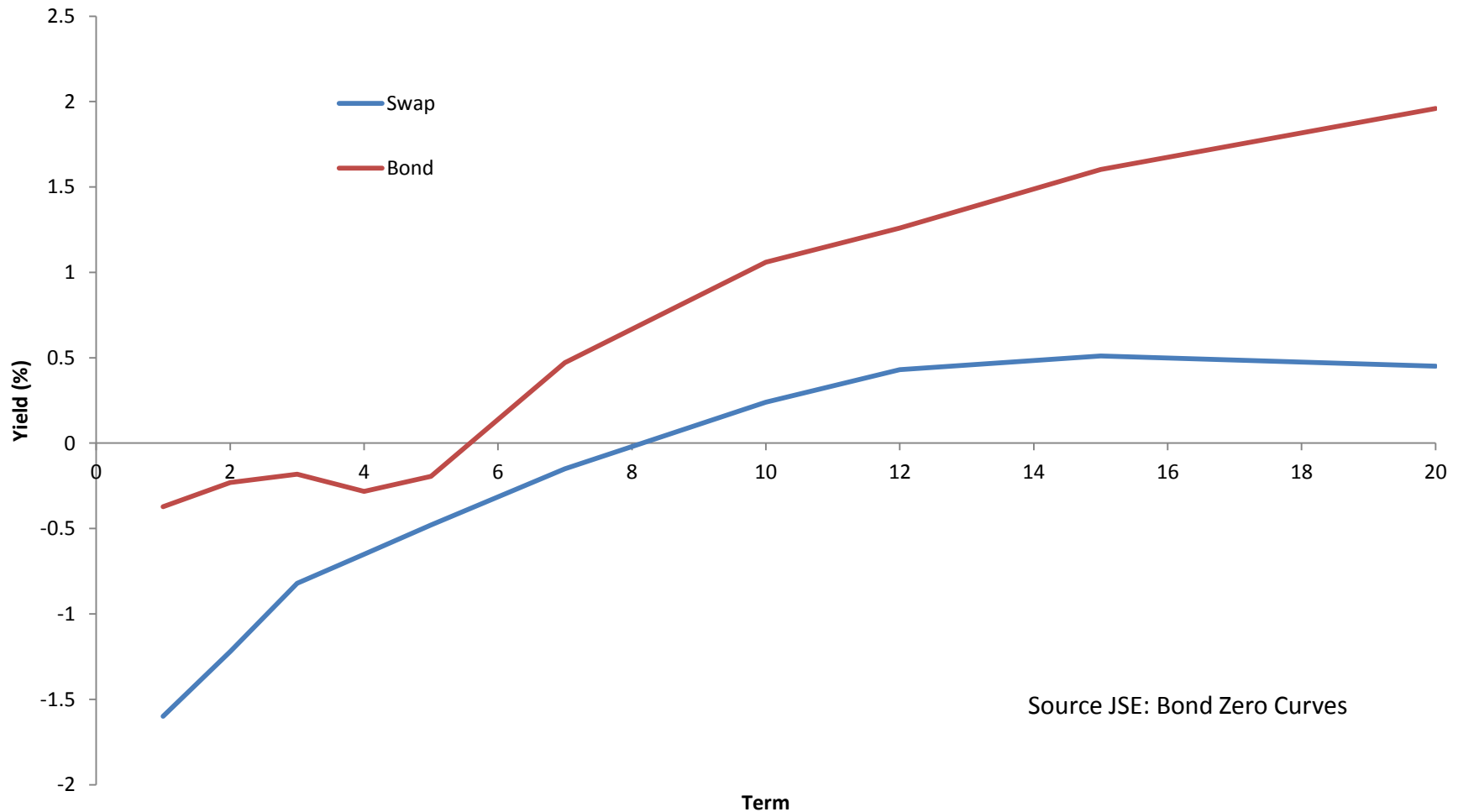
Real Bond and Swap Curves as at 22 January 2010



Real Bond and Swap Curves as at 25 February 2011

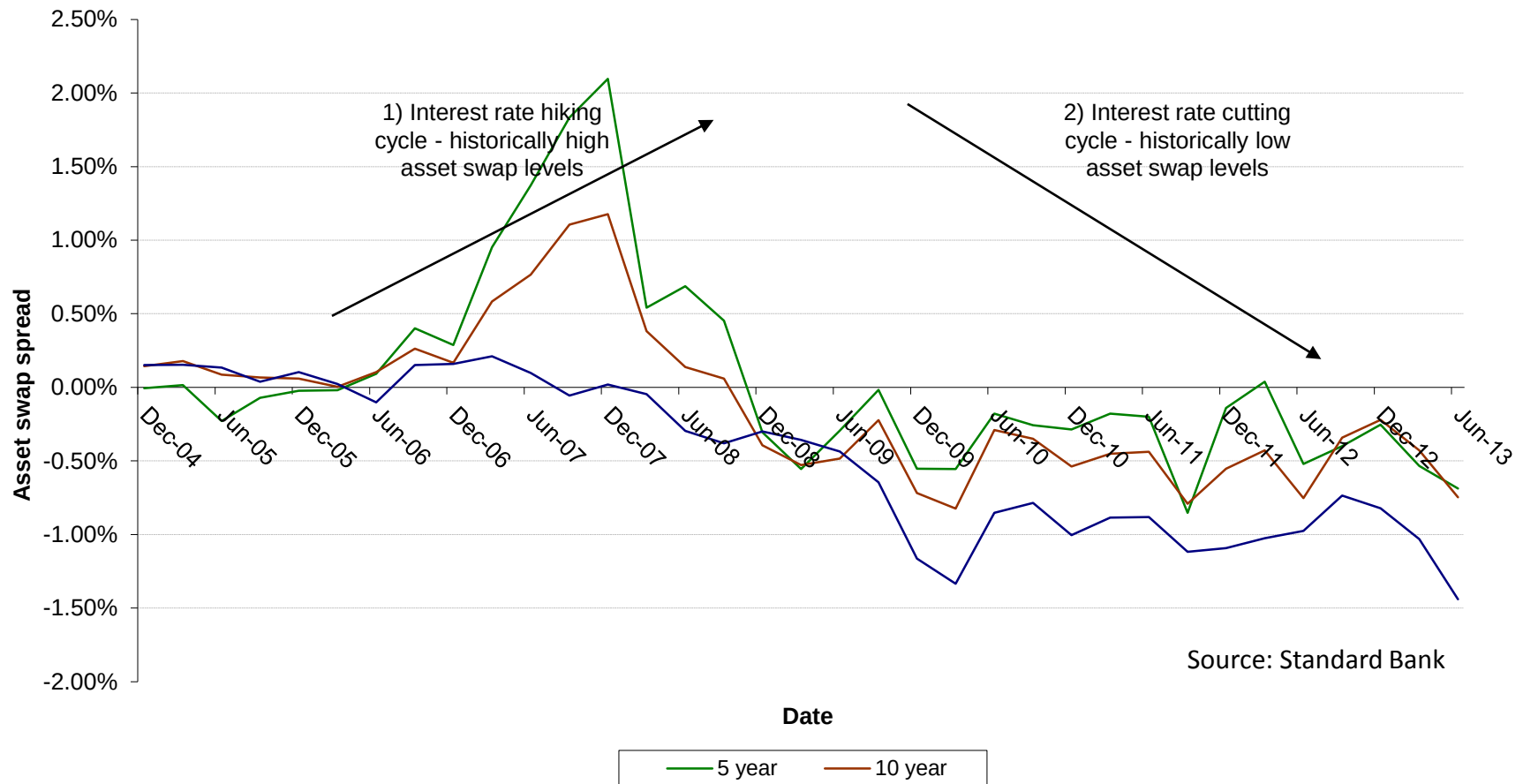


Real Bond and Swap Curves as at 22 February 2013



The dangers of derivatives

Inflation linked asset swap spread history



- 📊 Swaps **trade approximately 1% below government bond yields**
- 📊 A **strategy that uses swaps** for de-risking effectively increases the cost or liability value by 10%
- 📊 **Opportunities do exist** to effectively utilise them but inflation-linked swaps are very expensive in the current conditions

% Inflation-linked bonds are able to mitigate the key investment risks of a liability stream

/ **Inflation risk**

- Only asset class that guarantees CPI each year

/ **Interest rate risk**

- The optimal combination of such bonds will mitigate the interest rate risk

- There are a number of myths surrounding inflation-linked bonds (ILBs)
 - The **market is small** and therefore difficult to access these bonds
 - The range of bonds on offer **do not allow efficient de-risking**
 - CPI is not an appropriate proxy** for the true inflation faced by a fund
 - ILBs are **expensive**

Debunking Myths: Size of the ILB market

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- National Treasury has committed to issuing one third of its issuance in the ILB market
- Size of market has grown significantly since first being issued in 2000
- Market capitalisation of listed ILBs as at 30 June 2013: R 384 billion
- Auctions with in excess of R1bn of bonds issued every Friday by National Treasury

% 9 Inflation-linked government bond issuances

Bond Code	Maturity	Year High Yield	Year Low Yield	Duration	Convexity
R 211	2017	0.02%	-0.70%	3.38	13.39
R 212	2022	1.80%	0.38%	7.70	65.99
R 197	2023	1.70%	0.54%	8.38	82.98
I2025	2025	2.00%	0.74%	10.36	117.92
R 210	2028	2.32%	1.07%	12.30	172.38
R 202	2033	2.50%	1.45%	15.39	283.30
I2038	2038	2.60%	1.67%	19.03	424.82
I2046	2046	2.48%	2.39%	22.48	633.79
I2050	2050	2.63%	1.85%	24.66	777.73

- 📊 Cynics believe that the CPI basket can be manipulated by RSA government
- 📊 Pension increase policies are stated with reference to inflation – as measured by CPI
- 📊 Therefore it offers a match from a liability perspective

- An optimal holding of inflation-linked bonds can be used to mitigate the risks of interest rate changes and guarantee increases in line with increase policy

- 📊 **Reddington style approach to “immunization”** no longer theoretical
- 📊 **Not necessary** to make simplifying assumptions such as **parallel shifts** in the yield curve
- 📊 **Not a passive** solution
- 📊 **Ongoing changes** required to ensure liability is hedged
- 📊 For example, **liabilities are 3 times** more sensitive to changes in interest rates than they were 15 years ago.

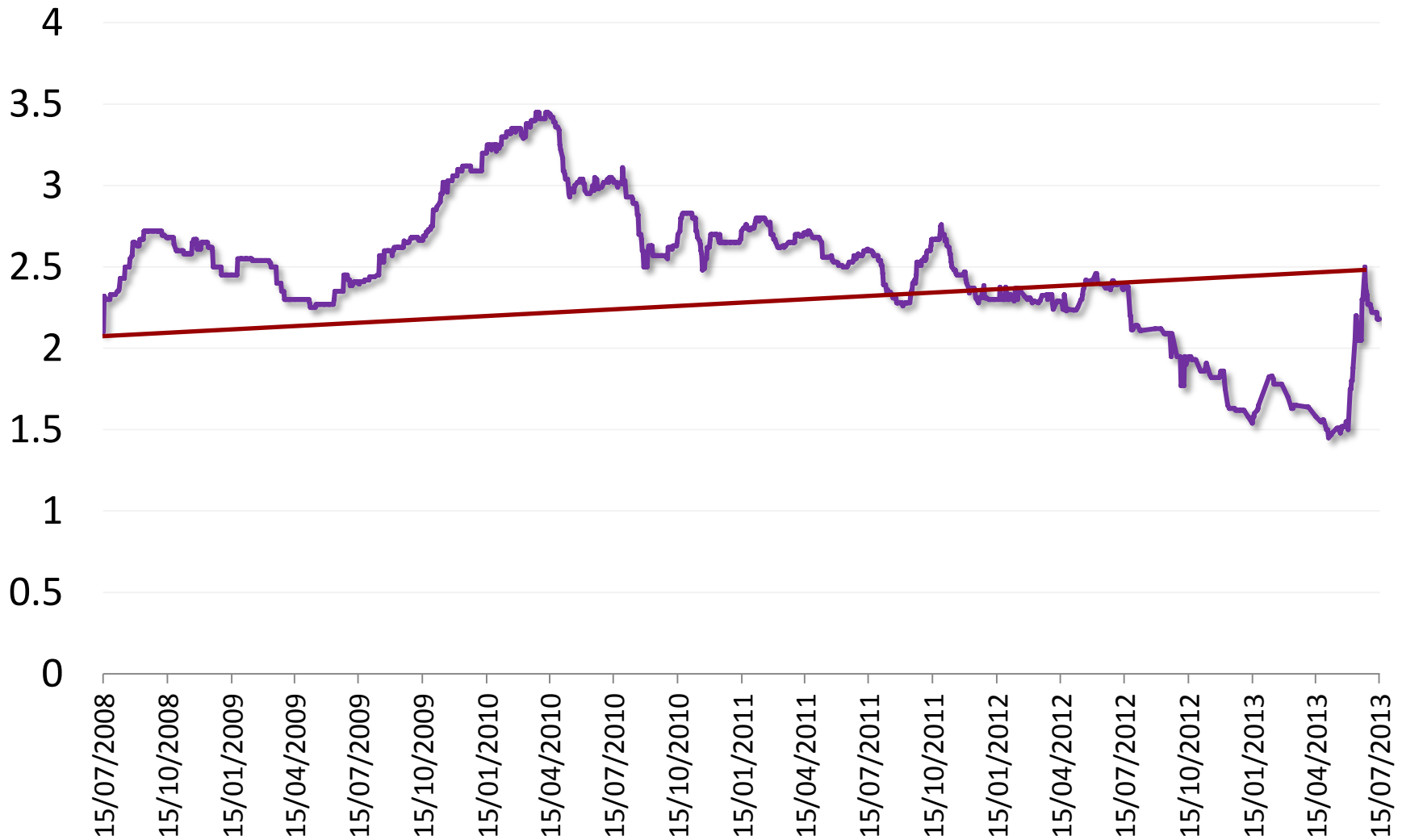
Debunking Myths: ILBs are expensive

- 📊 The cost of any asset needs to be evaluated with reference to alternatives
- 📊 R100 of equities can never be worth more than R100 of bonds
 - ✓ Nothing profound about this statement
 - ✓ But this is what is often argued
- 📊 ILBs currently trade at levels seen 5 years ago

ILBs back at 2008 levels

R202 yields

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- 📊 Ultimately the cost of the ILBs needs to be evaluated with reference to the solvency of a fund
- 📊 If a fund is solvent on a basis that uses government bond yields for the purposes of determining the liability, then the risks of deviating from a matched strategy needs to be understood

- % **LDI** is the **current buzz word** using for de-risking or a liability focussed strategy
- % **Absolute return funds** were/are **dressed up** balanced funds
- % Many LDI offerings now **credit funds dressed up!**
- % A good bond manager is not a good LDI manager!

Both may use similar instruments but there is a danger of picking up something that is not quite understood...

Be careful which instruments you play with! co|ourfield



Thank You

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