

SOLVENCY II

*‘Solvency II is the main problem for **nine out of ten** insurers in EMEA, according to research by State Street and the Economist Intelligence Unit’.*

International [Re]Insurance Intelligence. 24th of July 2013.

BLOOMBERG INDUSTRIES

(Pillar 1)

1. {BI LIFEE<GO>}
2. Two Analysts (CG, EC)
3. Intellectual Capital
4. Genesis of SII Product
5. FFM Synergy

6. Inclusion of UFR solution

Solvency II Business Model

CORE PRODUCT & QUANT

(Pillar 1)

1. UFR → SWPM & MARS
2. Discount LT Liabilities;
3. Sensitivity Analysis
4. Standard v UFR

(Pillar 2): End All of Solvency:
OSRA: Key for senior manag.
MARS – Key solution.
P1 & P3 -> Converging to P2...

ENTERPRISE CONTENT

DISTRIBUTION (Pillar 3)

1. CIC & NACE code Infrastructure;
2. Enterprise Solution; / security
3. Exceptions: ABS, RMBS, BVAL OTC

AIM (OMS) (Pillar 3)

1. Data Aggregation
2. Reporting Module
3. Transparency/Auditing

AVAILABLE PRODUCT, PRE 2013 SUMMIT

PROPOSED PRODUCT 2013 SUMMIT

SII: Yield Curve Construction

- Main changes introduced:
 - Solvency Capital Requirement (SCR)
 - Risk oriented approach based on market consistent valuations of both assets and liabilities.
- Draft Framework Directive states:
 - “The best estimate shall correspond to the probability weighted average of future cash-flows, taking account of the time value of money (expected PV of Future cash-flows, **using the relevant risk-free interest rate term structure.**” Article 76(2), Draft Framework Directive
- What financial instruments should be used in the construction of the risk free curve?

Quantitative Impact Studies

- Field Test of how a particular set of rules will affect a certain industry.
 - Specifically of how Solvency II rules will affect the European Insurance Market.
 - 267 firms, submitted their Q15 returns to the FSA
- Earlier Quantitative Impact Studies
 - Use of Government Bond Curves as Benchmark.
 - **Q15: Prescribes the use of swap curves with small adjustments to credit risk.**

QIS5 proposals: Bloomberg Solutions

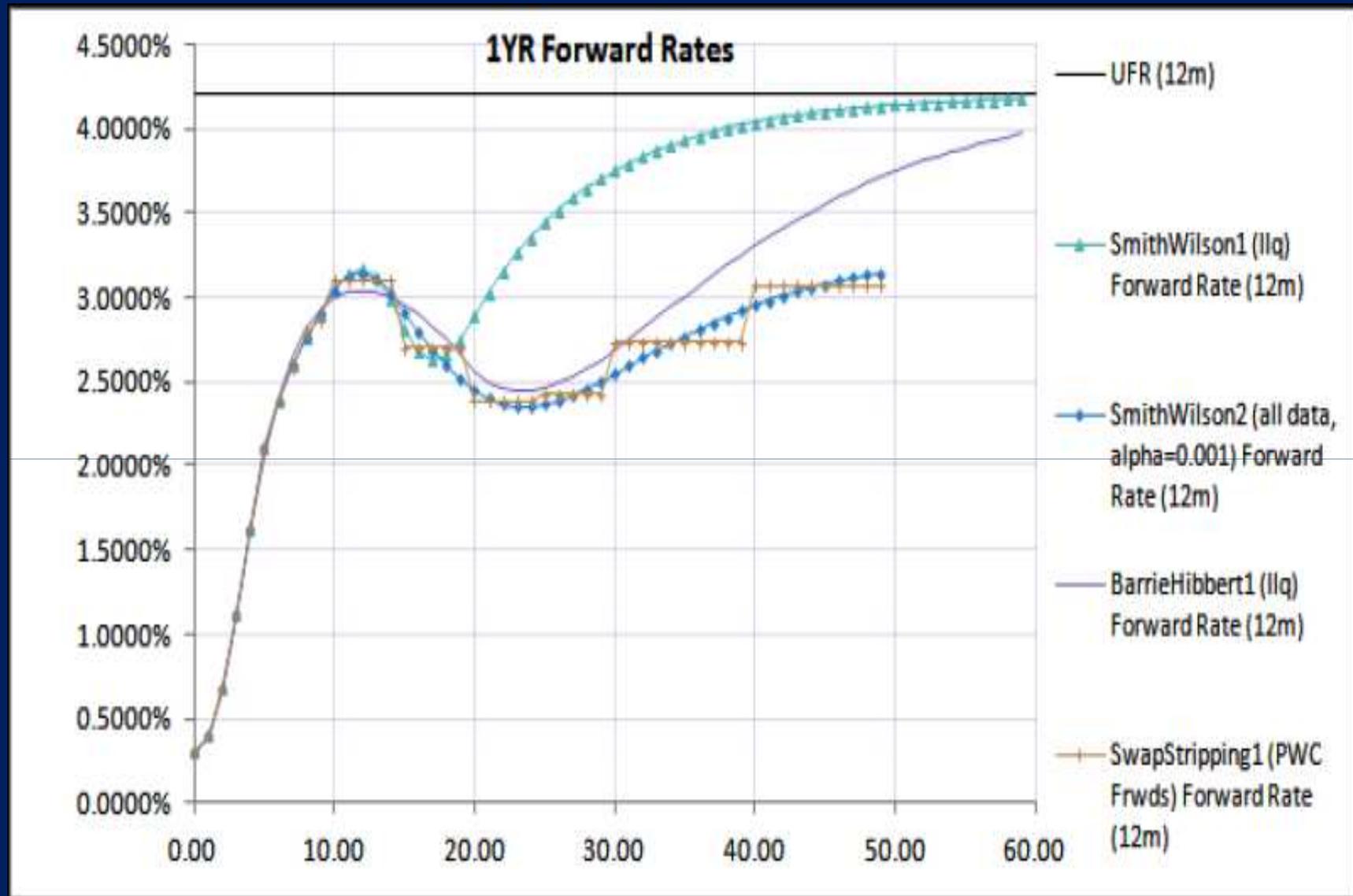
Currency	Abbreviation	(1) Inter-bank swap curve (Bloomberg ticker)	(2) Adjustment for credit risk (bps)	(3) Entry point to extrapolation
European Euro	EUR	EUSATT	10	30
UK Pound Sterling	GBP	BPSWTT	10	50
US Dollar	USD	USSWTT	10	30
Japanese Yen	JPY	JYSWTT	10	20
Swiss Franc	CHF	SFSWTT	10	15
Swedish Krona	SEK	SKSWTT	10	10
Danish Krone	DKK	EUSATT, GDBR10, GDGB10yr	10	30
Norwegian Krone	NOK	NKSWTT	10	10
Czech Koruna	CZK	CKSWTT	10	15
Polish Zloty	PLN	PZSWTT	10	15
Hungarian Forint	HUF	HFSWTT	10	15
Romanian Lei	RON	RNSWTT	10	10
Bulgarian Lev	BGN	BLSATT	10	10
Turkish Lira	TRY	TYSWTTV3	10	10
Iceland Krona	ISK	IKSWTT	10	5
Estonian Kroon	EKK	EUSATT	10	30
Latvian Lats	LVL			
Lithuanian Litas	LTL			

Source: CRO FORUM. QIS 5 Technical Specification. Risk-free interest rates. 2010.

{http://ec.europa.eu/internal_market/insurance/docs/solvency/qis5/cfo-forum-cro-forum-paper-risk-free-rates_en.pdf}

Ultimate Forward Rate

- Technical Challenge:
 - Insurance Liabilities can extend for very long periods.
 - How to extrapolate the risk-free rate to periods far beyond the maturity of quoted liquid instruments such as swaps and government bonds?
- QIS4: Extrapolation based on assumption of constant forward rates.
- Introduction of the “Ultimate Forward Rate; UFR” concept.



Source: Solvency II Excel Curve Extrapolation Prototype

Extrapolation methods, Bloomberg Implementation

- Methods implemented by Bloomberg for yield curve extrapolation:
 - **Smith-Wilson (SW)**. Including Dutch Modified SW version.
 - Nelson-Siegel.
- Solvency II (QIS5) proposes the use of the SW method.
 - Method has been adopted by the Danish and Dutch insurance companies.

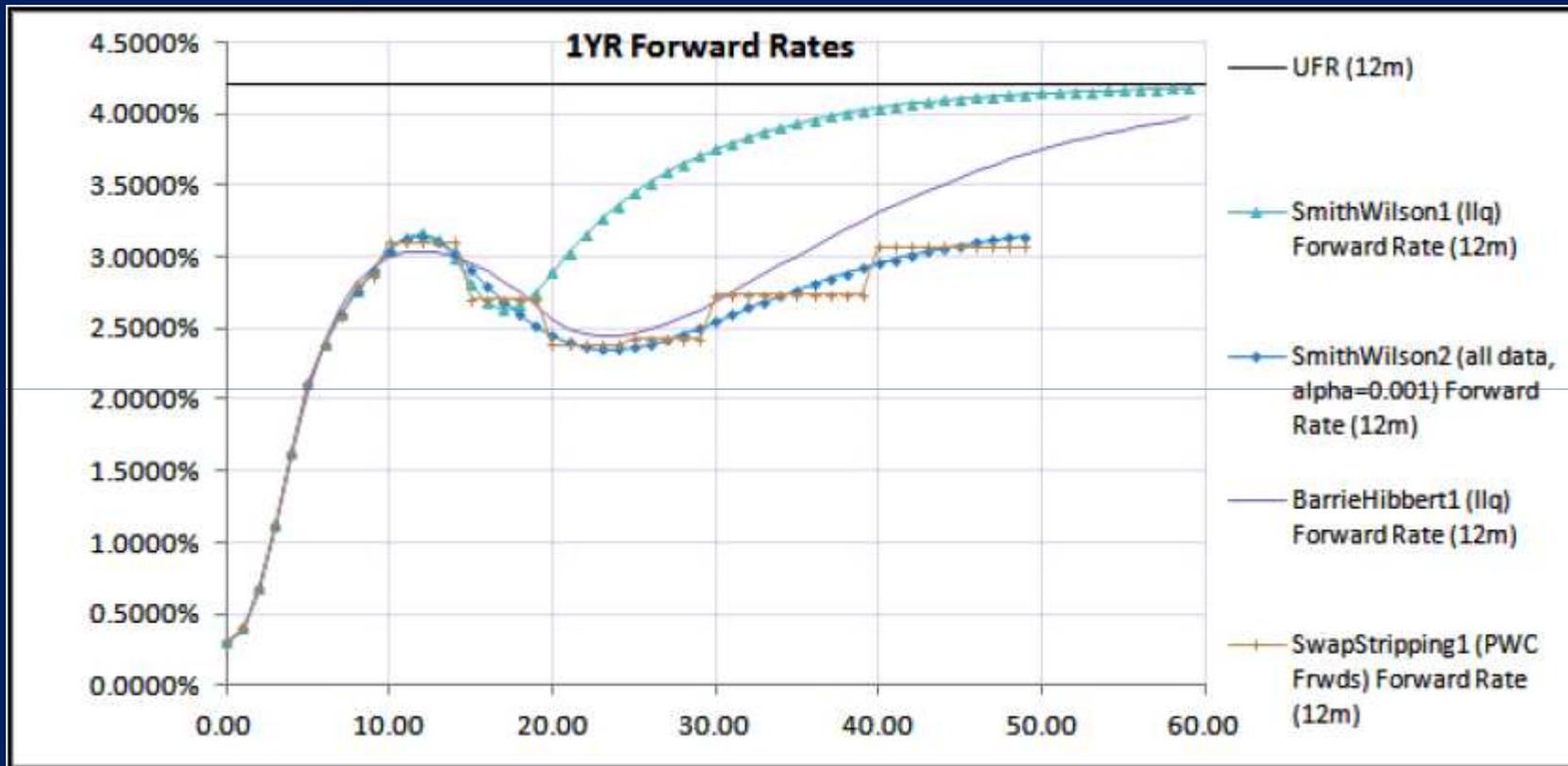
Smith Wilson

- SW postulates a functional form for the discount function:
 - Linear combination of spline functions.
 - Allows for exact fit of the instruments considered liquid, i.e with maturities prior to the *Last Liquidity Point (LLP)*.
 - Contains two additional parameters, the **UFR** and α_{sw} that controls how fast the *UFR* is approached.

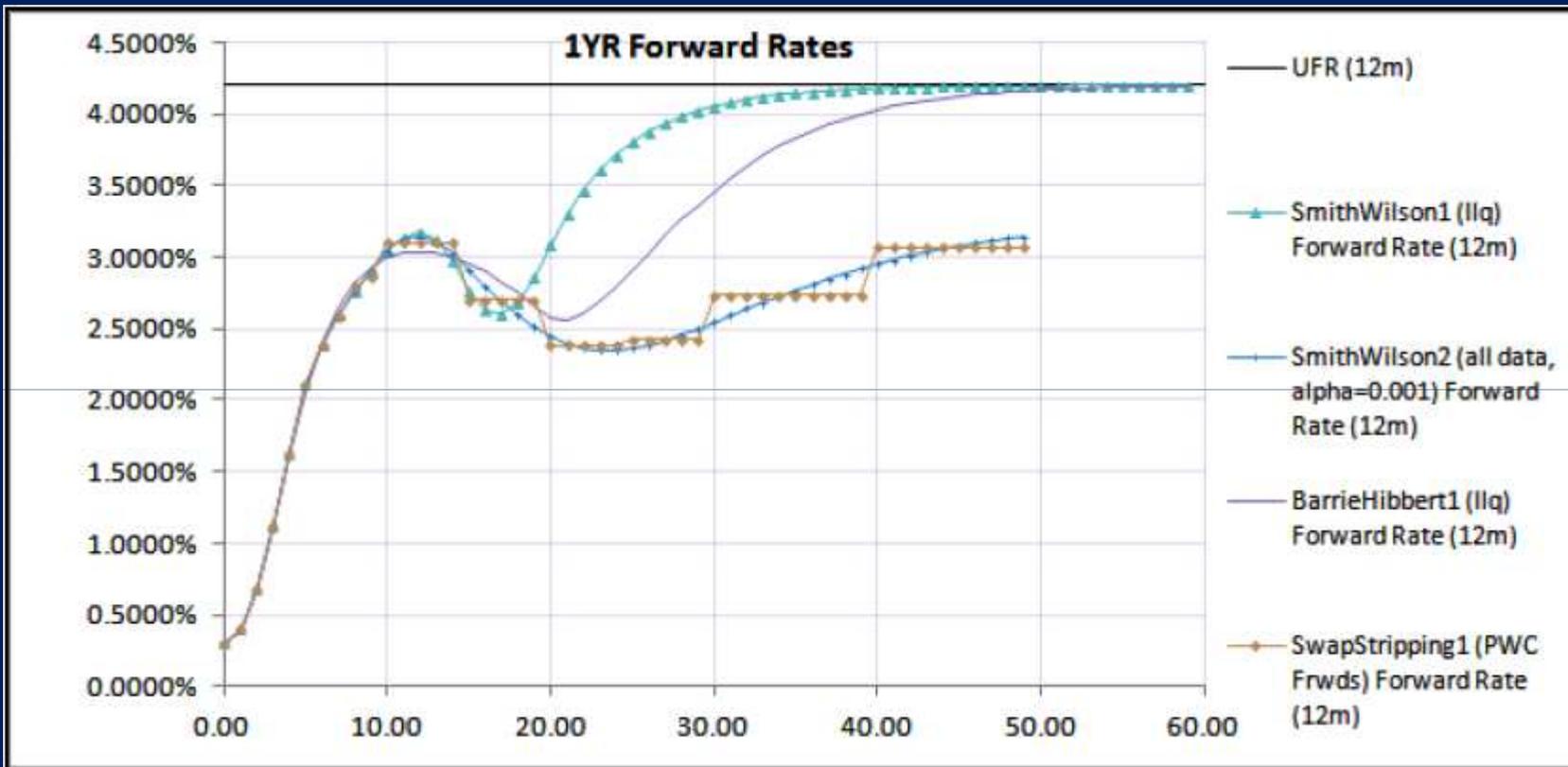
Smith Wilson

- SW does not prescribe a specific maturity (call it T_2) at which the UFR is reached.
- The value of α_{sw} is in effect a **speed of convergence factor** used to ensure that at a specified maturity T_2 the forward curve is close to the UFR.
- QIS5 specification: $\alpha_{sw}=0.1\%$
 - If extrapolated rate deviates from the UFR at $T_2 > 0.03\%$, α_{sw} is recalibrated to ensure $\Delta_{(Fwd,UFR)} < 0.03\%$

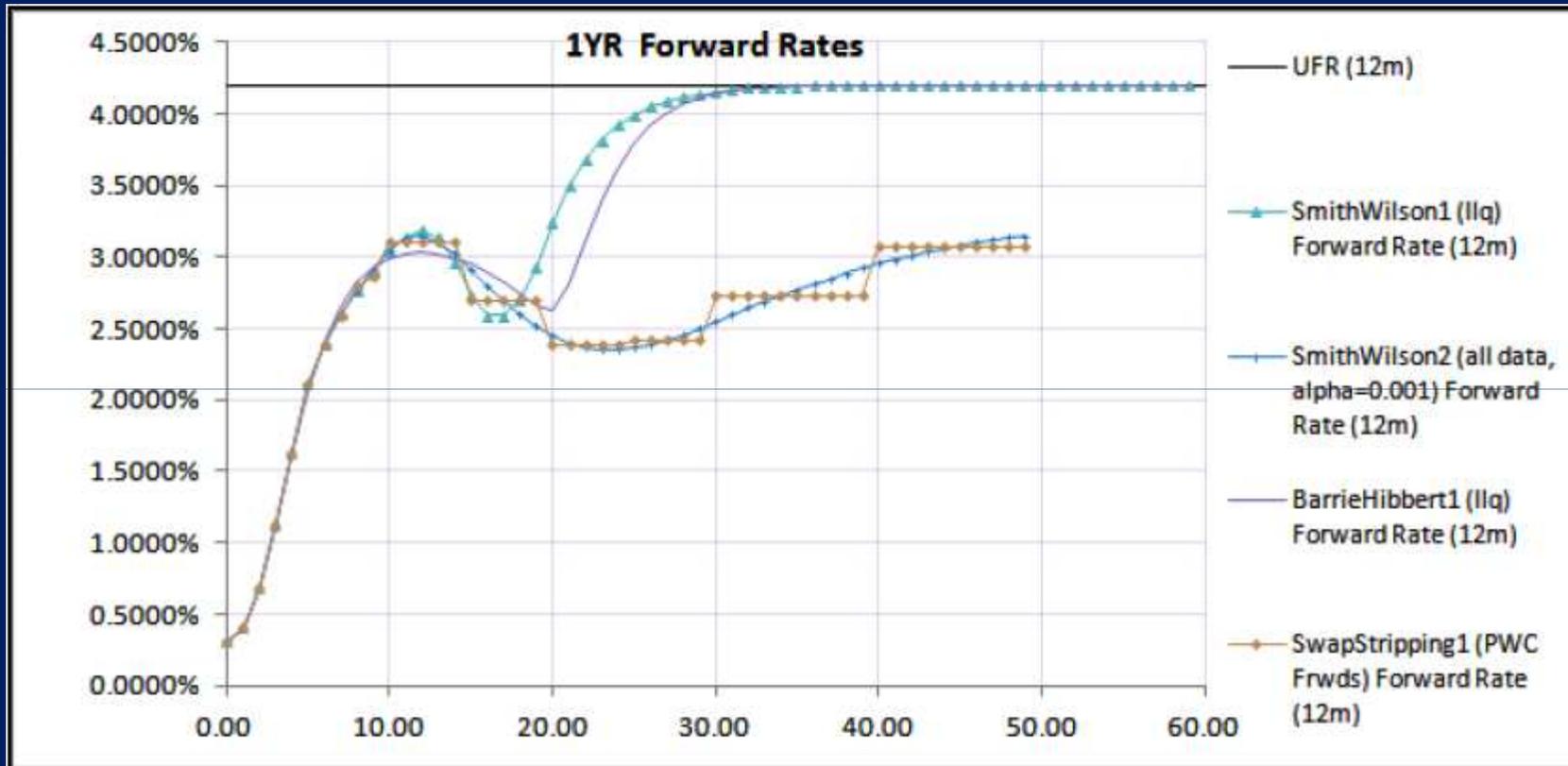
SW1 and NS1 methods: UFR=4.2%, LLP=20,
 $\alpha_{SW} = \alpha_{NS} = 0.1$



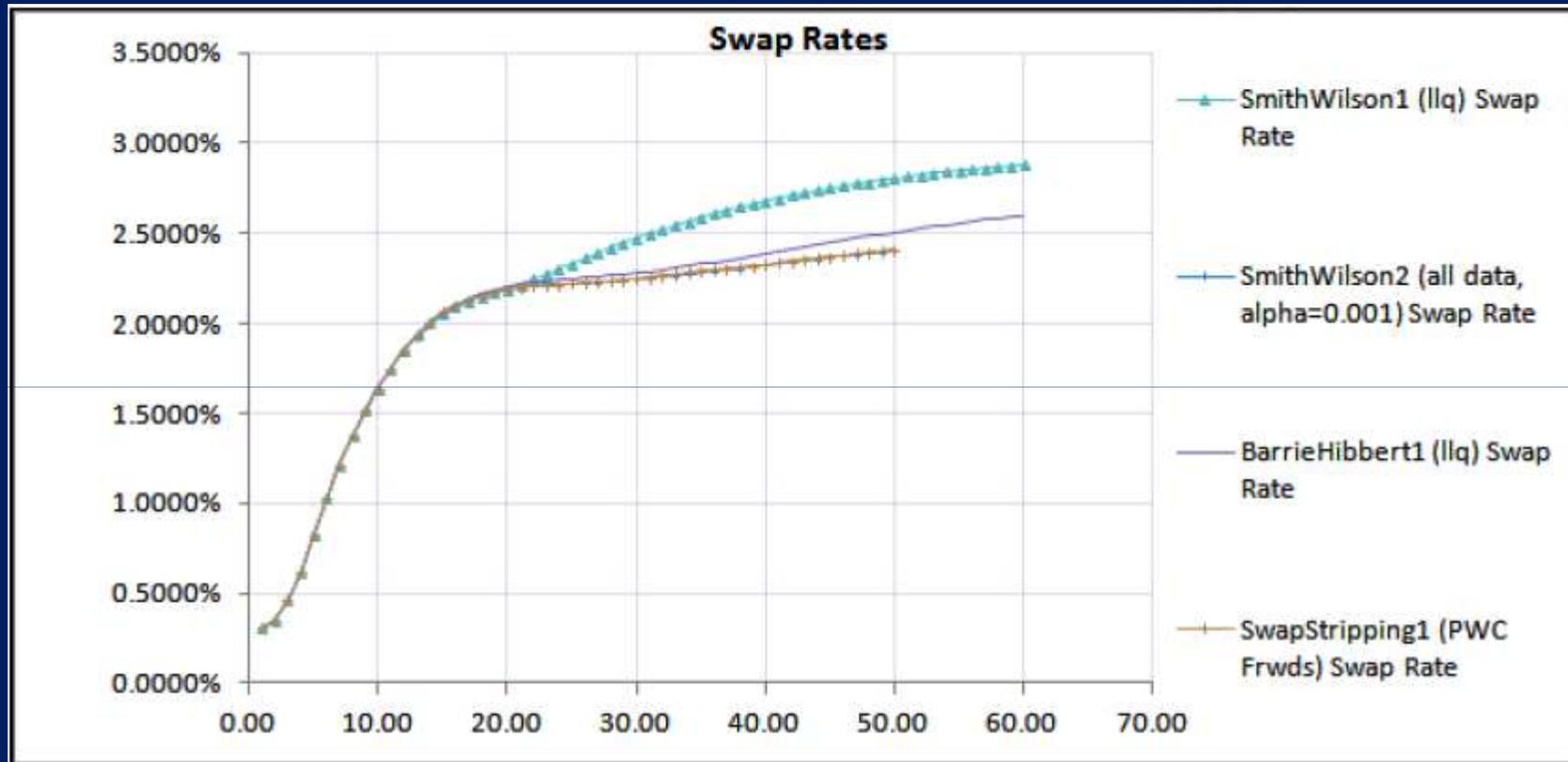
SW1 and NS1 methods: UFR=4.2%, LLP=20,
 $\alpha_{SW} = \alpha_{NS} = 0.2$



SW1 and NS1 methods: UFR=4.2%, LLP=20,
 $\alpha_{SW} = 0.3$ $\alpha_{NS} = 0.5$



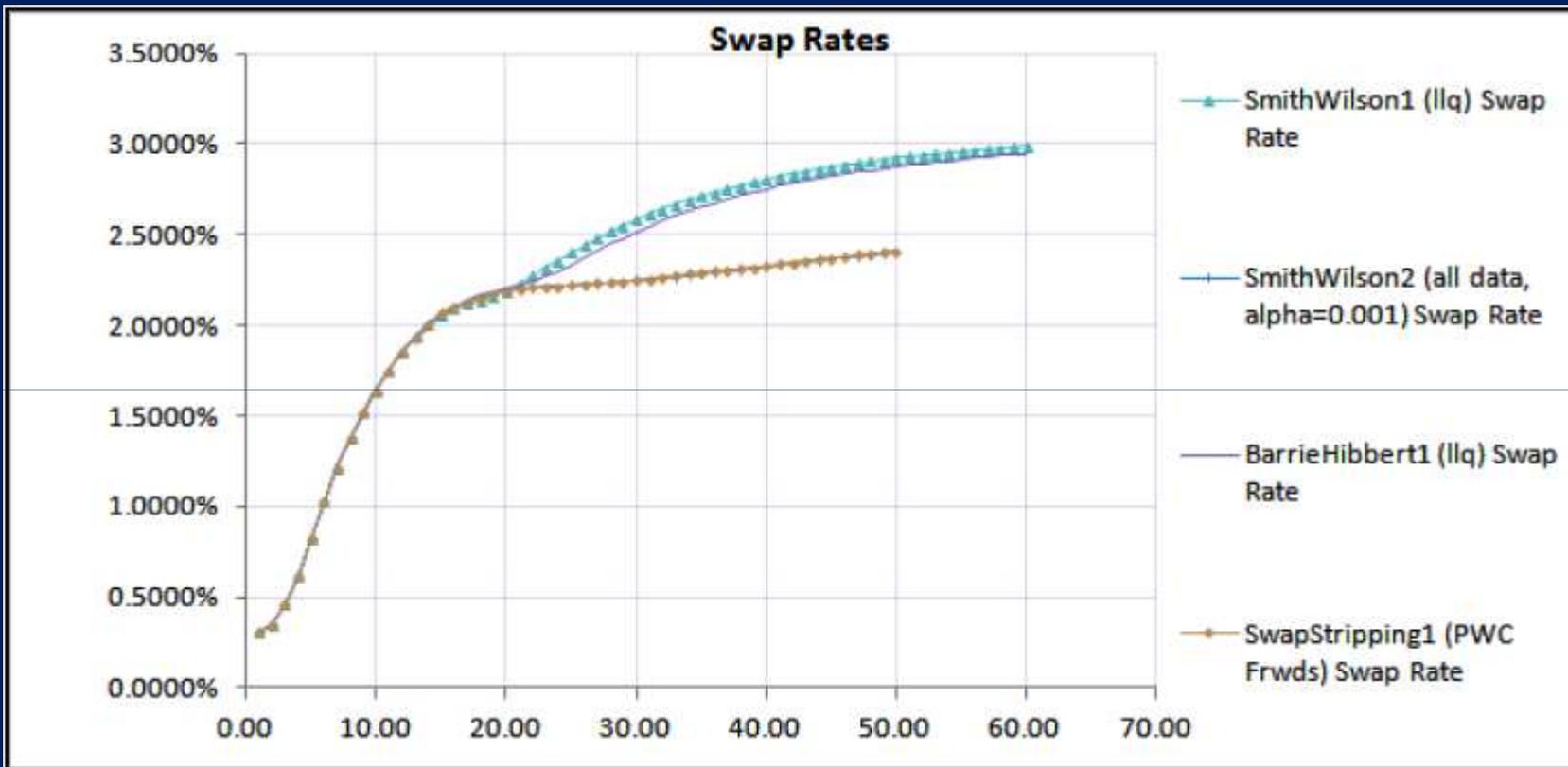
SW1 and NS1 methods: UFR=4.2%, LLP=20,
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Key concept

- Parameters such as
 - UFR,
 - LLP &
 - Time to Convergence (α_{SW})
- Still be subject to regulatory changes, introduces additional regulatory risks that cannot be hedged.
- Regulatory landscape very much a moving target.

SII: Curve Extrapolation Prototype

- On [Sensitivity] page, input asset and liability cashflows on Cell start at C24
Click “Sensitivity Analysis” button near Cell S110
- After calculation is completed, PV of cashflows 1 and 2 for different discount methods are presented on Cells S10:V10 and S36:V36.
- The asset and liability ratio for SmithWilson1 is: $1627.94 / 2454.42 = 0.6633$.
- Note: for cashflow with maturity longer than last available swap data (50y), PV reported by BarrierHibbert2 and SwapStripping methods (Cells W10:Y10, W36:Y36) are incorrect and should not be used.

Cases (cashflow)	4		
Test Result Row Offset	26		
IRR	#DIV/0!	#DIV/0!	-0.0600%
T (payment), no interpolation: integer up to last available swap maturity			
	Cashflow 1	Cashflow 2	Cashflow 3
0	0.00	0.00	0.00
1	50.00	-100.00	-50.00
2	50.00	-99.00	-49.00
3	50.00	-98.00	-48.00
4	50.00	-97.00	-47.00
5	50.00	-96.00	-46.00
6	50.00	-95.00	-45.00

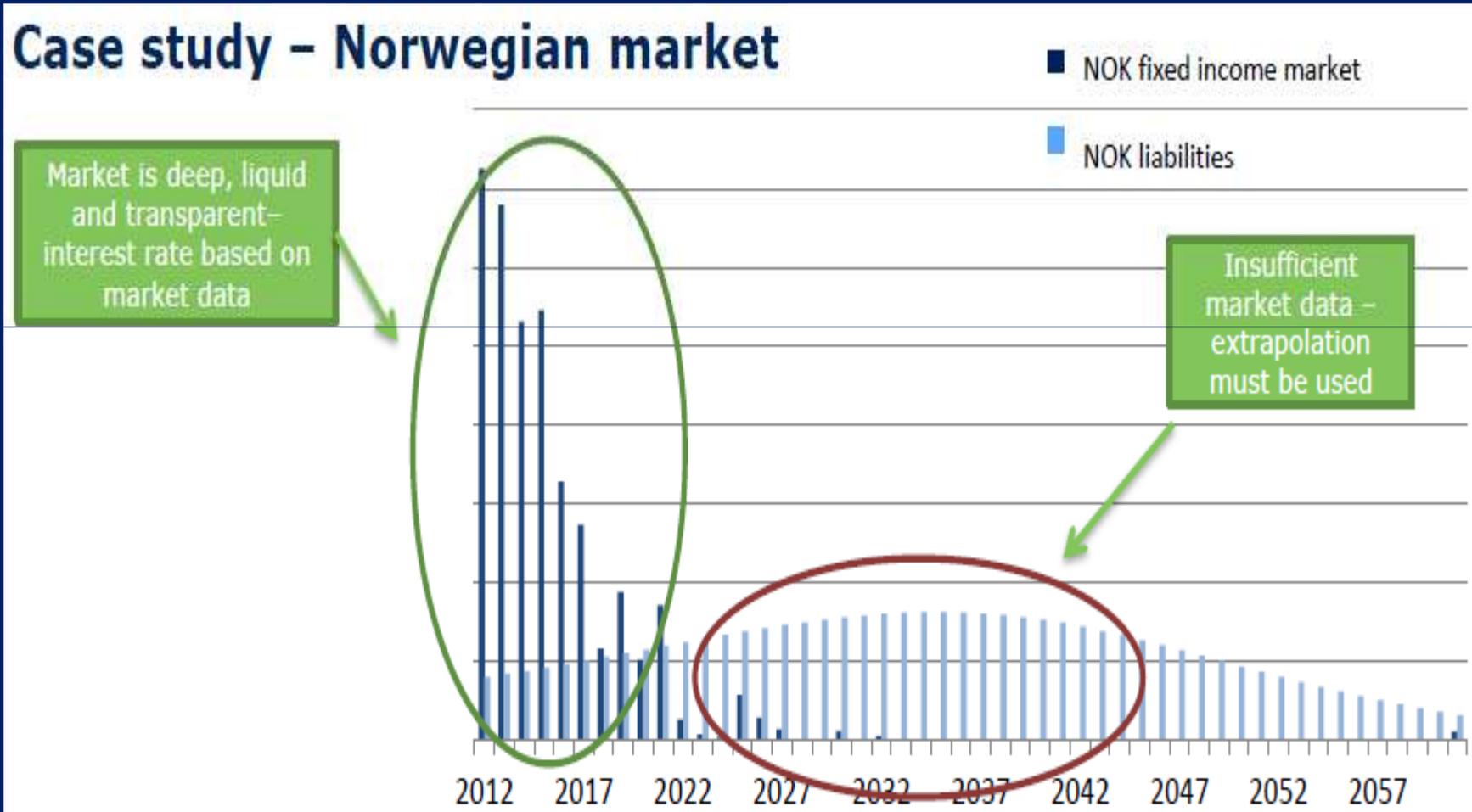
Sensitivity Analysis
(run time: ~ 15 minutes)

Price for Cashflow 1				
Value for different curve bump				
Term of the rate to bump	SmithWilson1 (llp)	SmithWilson2 (all data, alpha=0.001)	SmithWilson Dutch Adj (llp)	BarrieHibbert1 (llp)
no	1,627.9463	1,834.6505	1,650.7896	1,761.5147

Price for Cashflow 2				
Value for different curve bump				
Term of the rate to bump	SmithWilson1 (llp)	SmithWilson2 (all data, alpha=0.001)	SmithWilson Dutch Adj (llp)	BarrieHibbert1 (llp)
no	(2,454.4158)	(2,628.0117)	(2,479.9233)	(2,582.0171)

Why is extrapolation needed?

Case study – Norwegian market



Bloomberg Solutions

Current tools on the Bloomberg Terminal:

- (1) **Pillar 1:** Solvency II Curve Extrapolation Excel Prototype:
- (2) **Pillar 3:** BVAL & BVAL OTC teams working on **Complementary Identification Code** project.
- (3) **Bloomberg BRIEF;** Financial Regulation Newsletter.
Weekly publication; Free to Terminal Clients.

Work in Progress:

Regulation Portal with all the necessary information related to Aifmd, Dodd-Frank, EMIR , Solvency II & UCITS V.

Bloomberg Contacts

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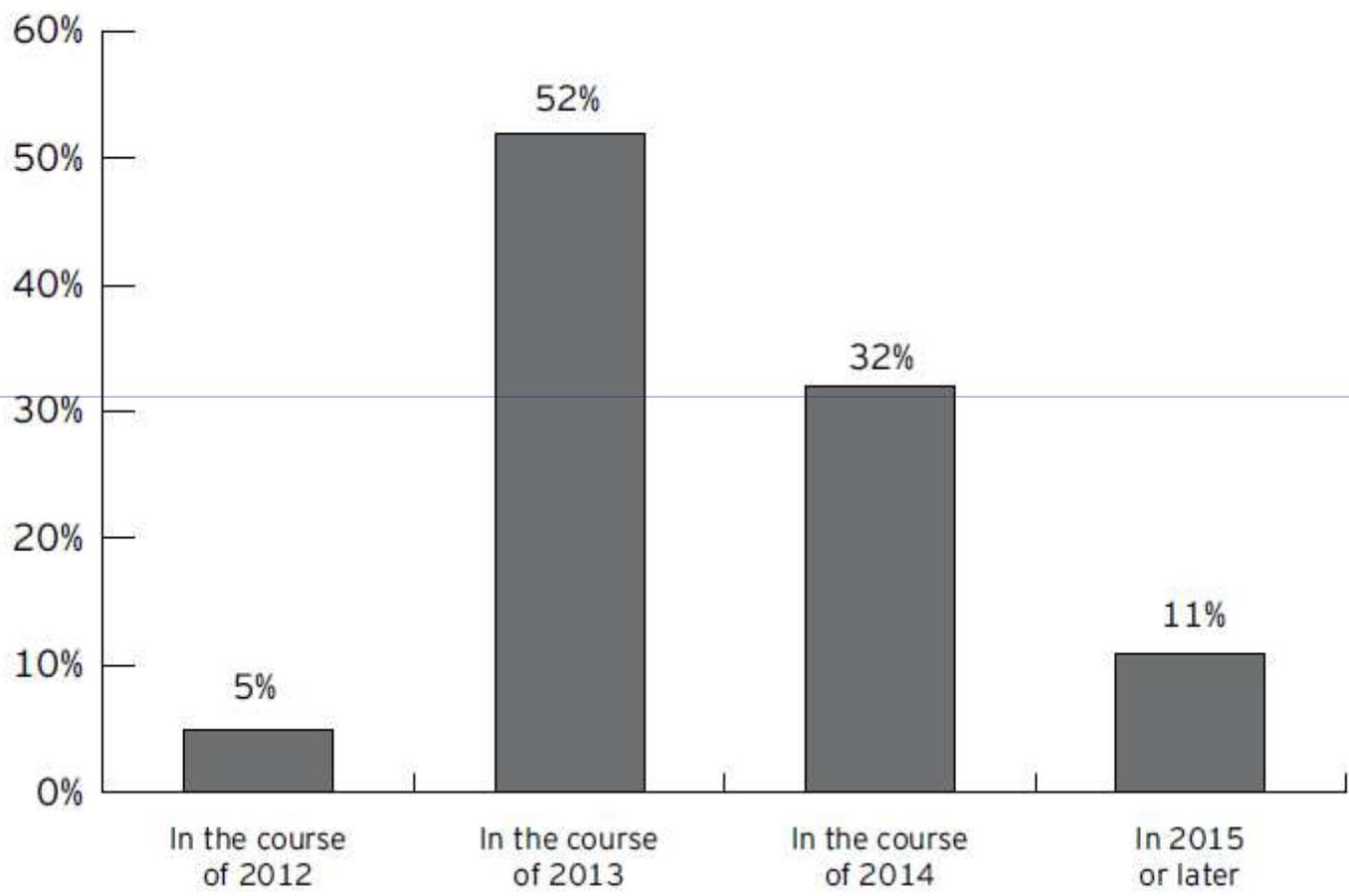
Edmond Christou

ANNEX A

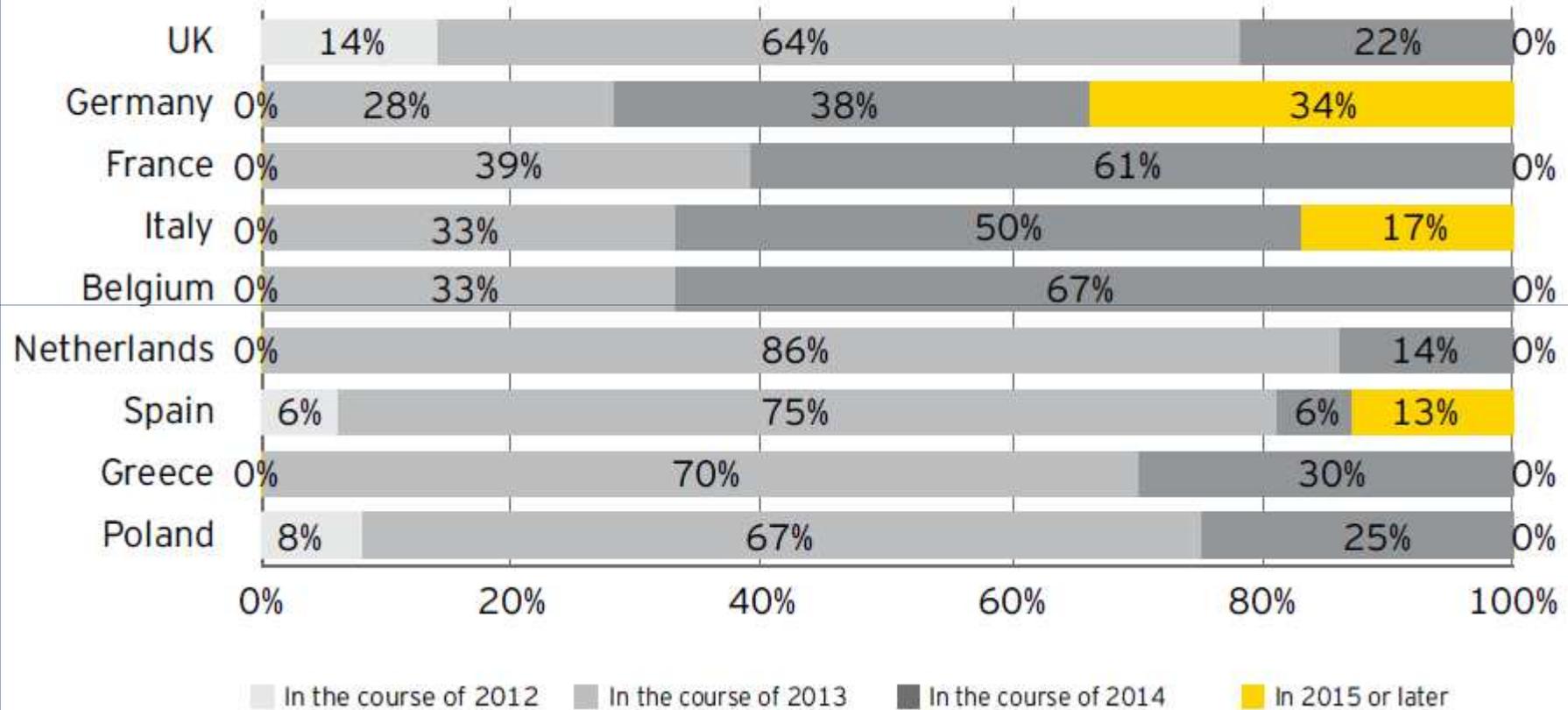
E&Y: Key Findings

- **Best** prepared insurers: UK & Netherlands
- **Least Prepared:** Germany and Italy
- Insurers demonstrating a high state of readiness in implementing a Pillar 1 balance sheet and fulfilling most Pillar 2 requirements
- Pillar 3 presents a major undertaking. 80% yet to meet requirements.

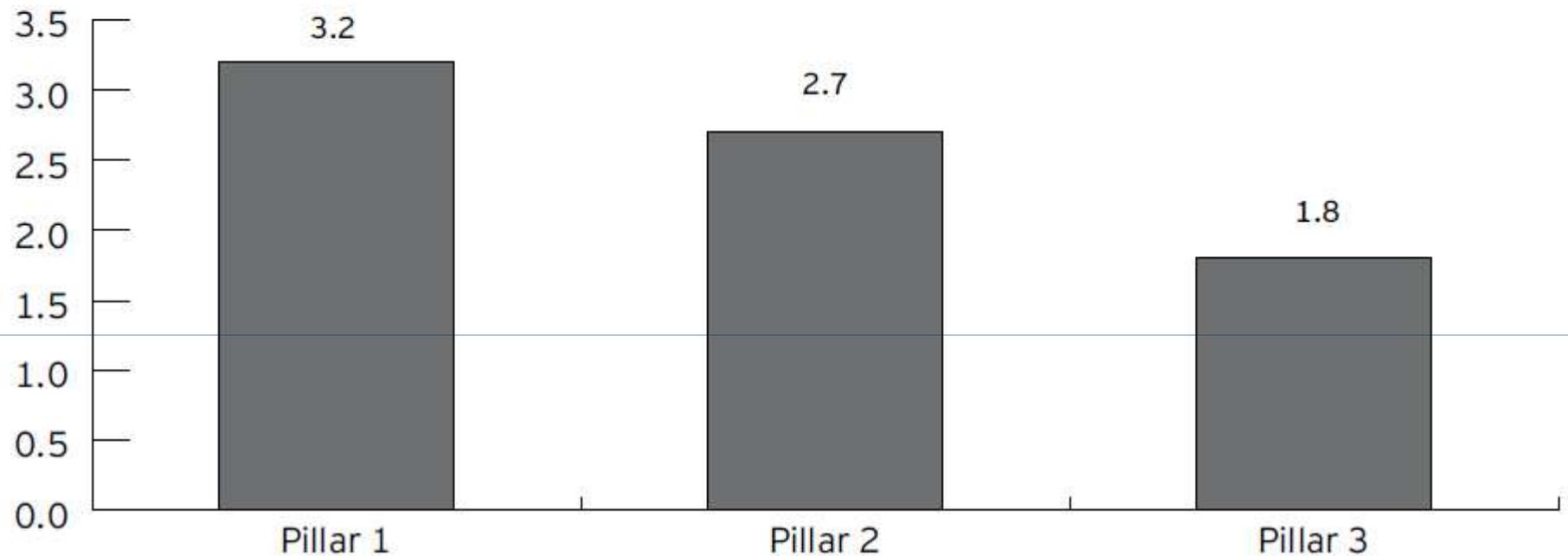
Expectation to fully meet the significant Solvency II requirements



Implementation readiness in country comparison



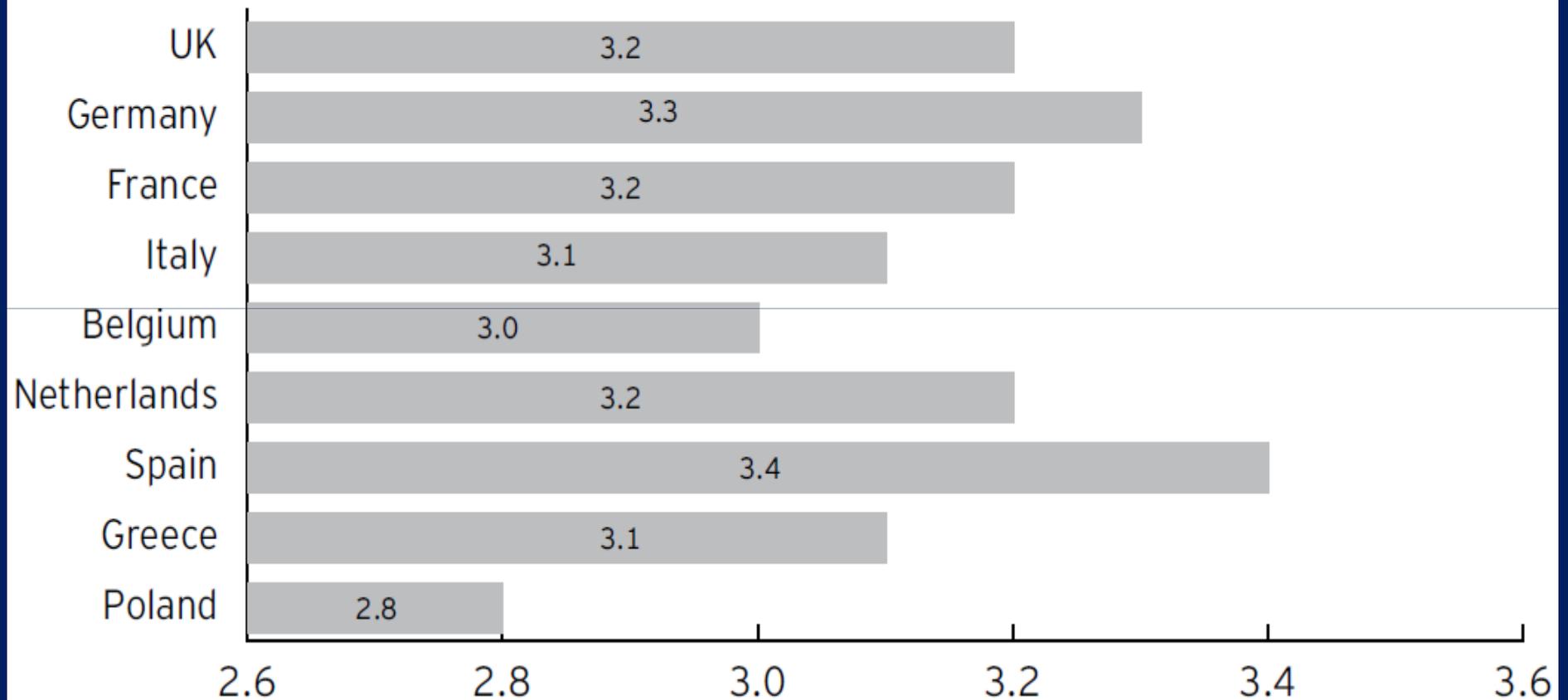
Implementation readiness of Pillar 1, Pillar 2 and Pillar 3



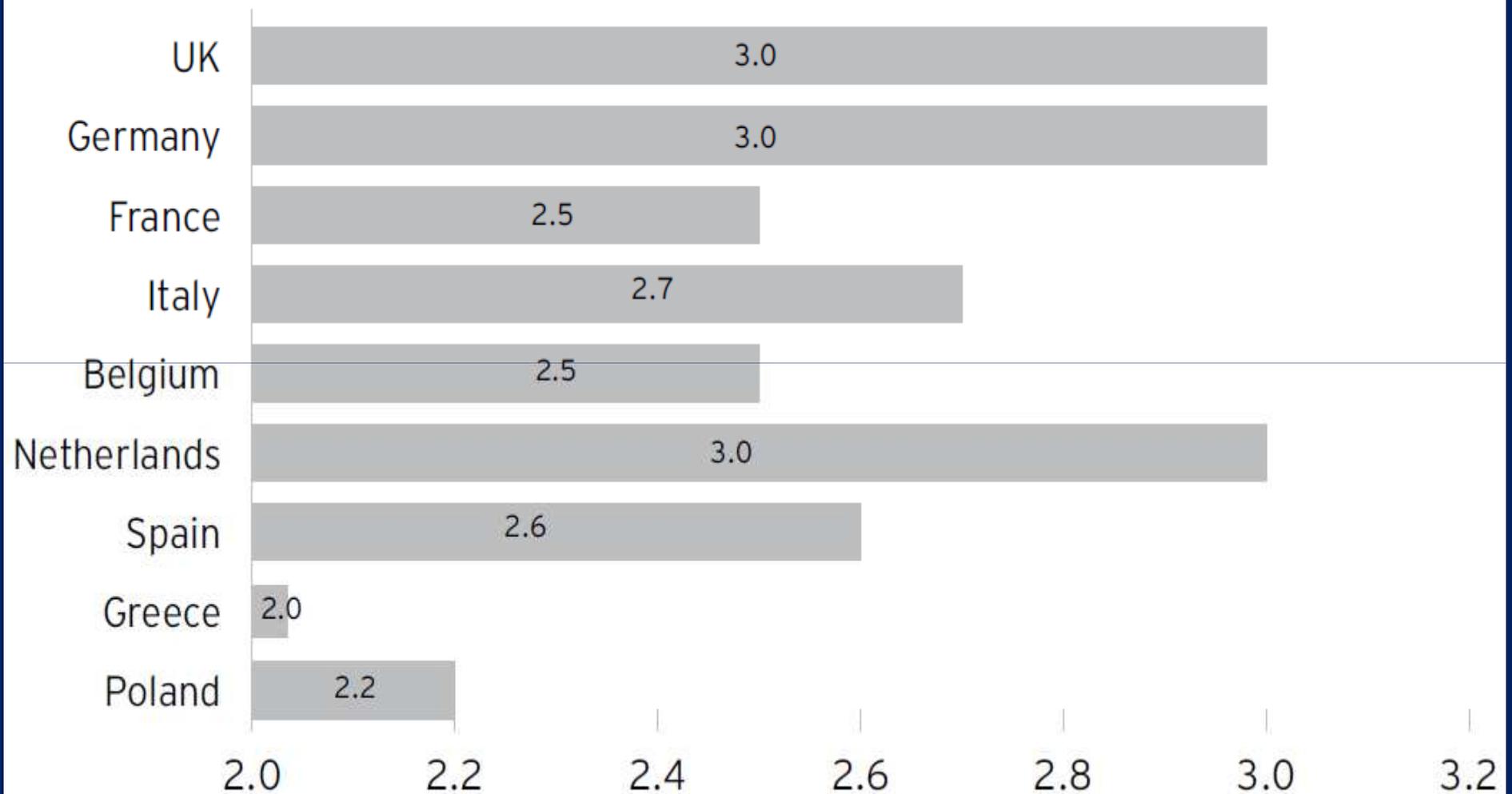
- 1 – Requirements not fulfilled
- 2 – Some requirements fulfilled
- 3 – Most requirements fulfilled

- 4 – All requirements fulfilled
- 5 – Beyond requirements

Implementation readiness for Pillar 1 in country comparison



Implementation readiness for Pillar 2 in country comparison



Implementation readiness for Pillar 3

