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Market Data Challenges for Solvency II

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Agenda

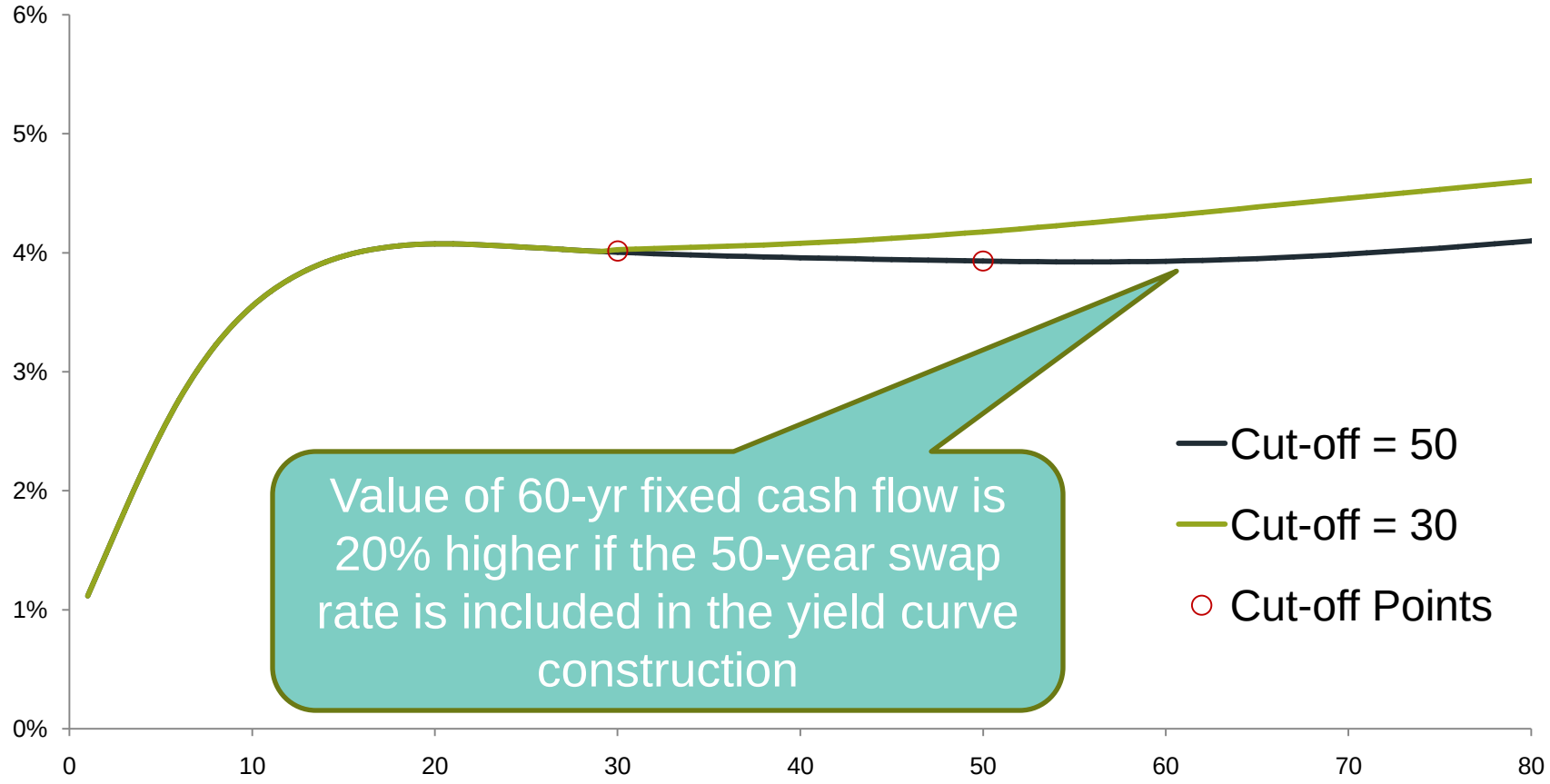
- Why is data important?
- Regulatory and accounting classifications
- Examples of data challenges
- Case Study: Equity Implied Volatilities

Why is Market Data Important?

- Many current and emerging regulatory or reporting regimes use the ideas of *fair* or *market-consistent* value of assets and liabilities
  - Solvency II Technical Provisions, MCEV, IFRS
- The long-term nature of life insurance contracts means that often the relevant instruments for valuation may not traded in 'liquid' markets
  - There may be questions over the price reliability of these assets
- The decision whether-or-not to include these assets can affect the results of a valuation exercise

Why is price reliability important?

Example: EUR Swap Curve Zero Rates



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Regulatory and Accounting Classifications

Market Data Challenges for Solvency II

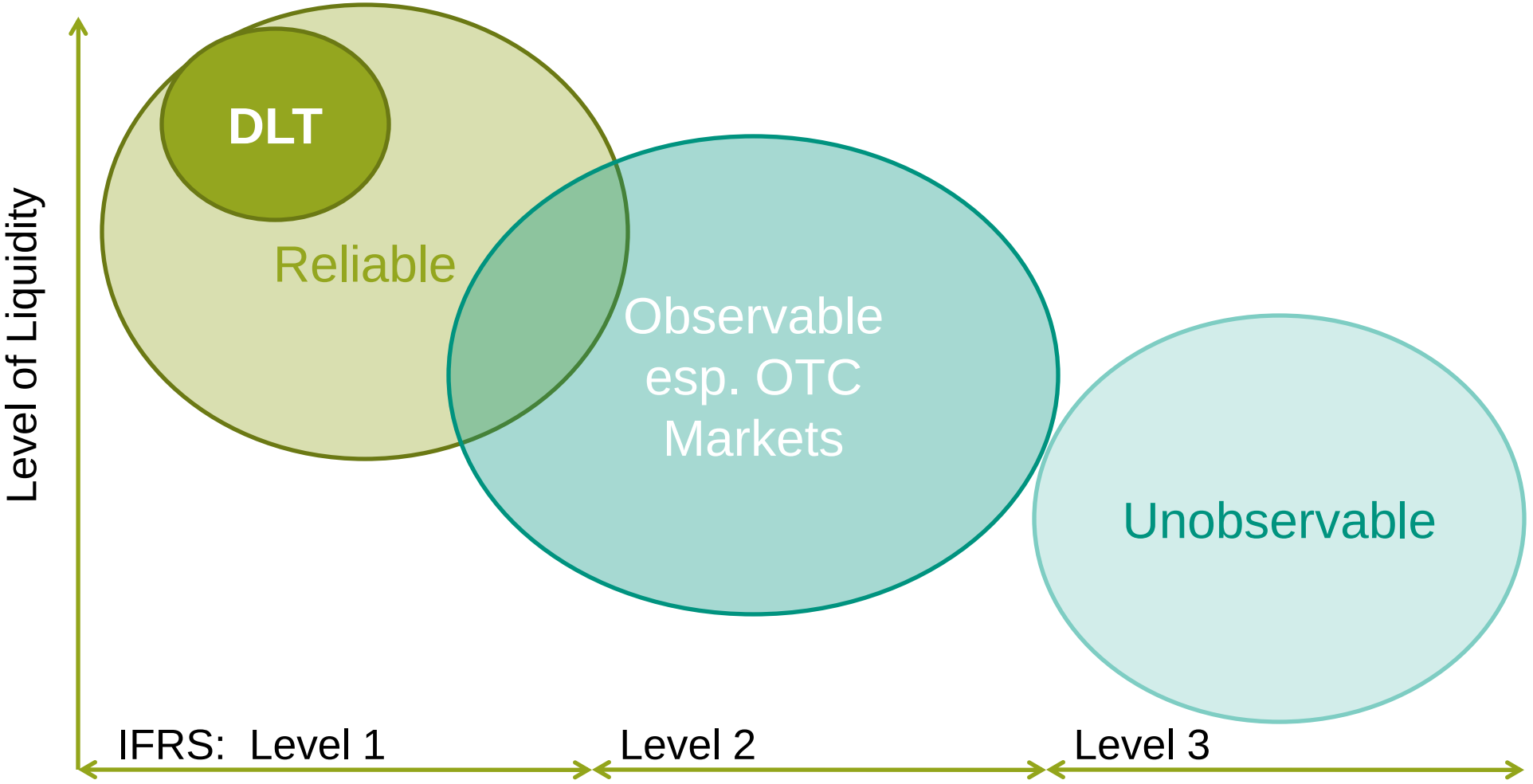
Solvency II – Deep, Liquid & Transparent Markets

- *"A deep market is a market in which a large number of assets can be transacted without affecting the price of the financial instruments used in the replications*
- *A liquid market is a market where assets can be easily converted through an act of buying or selling without causing a significant movement in the price*
- *A transparent market is a market in which current trade and price information is readily available to the public"*
- Many of the OTC derivates currently used in market-consistent valuations don't satisfy this definition – what impact will this have?

IFRS Fair Value Hierarchy

- Level 1
  - Input is a quoted price in an active market for identical assets and liabilities
- Level 2
  - Input is observable for the asset or liability, either directly or indirectly
- Level 3
  - Input is unobservable

Comparison of Definitions



Board for Actuarial Standards: 'TAS-D'

- Reliability objective: *"users for whom a piece of actuarial information was created should be able to place a high degree of reliance on the information's relevance, transparency of assumptions, completeness and comprehensibility, including the communication of any uncertainty inherent in the information."*
- Documentation
  - Data requirements
  - Data definitions
  - Validation
  - Incomplete of inaccurate data

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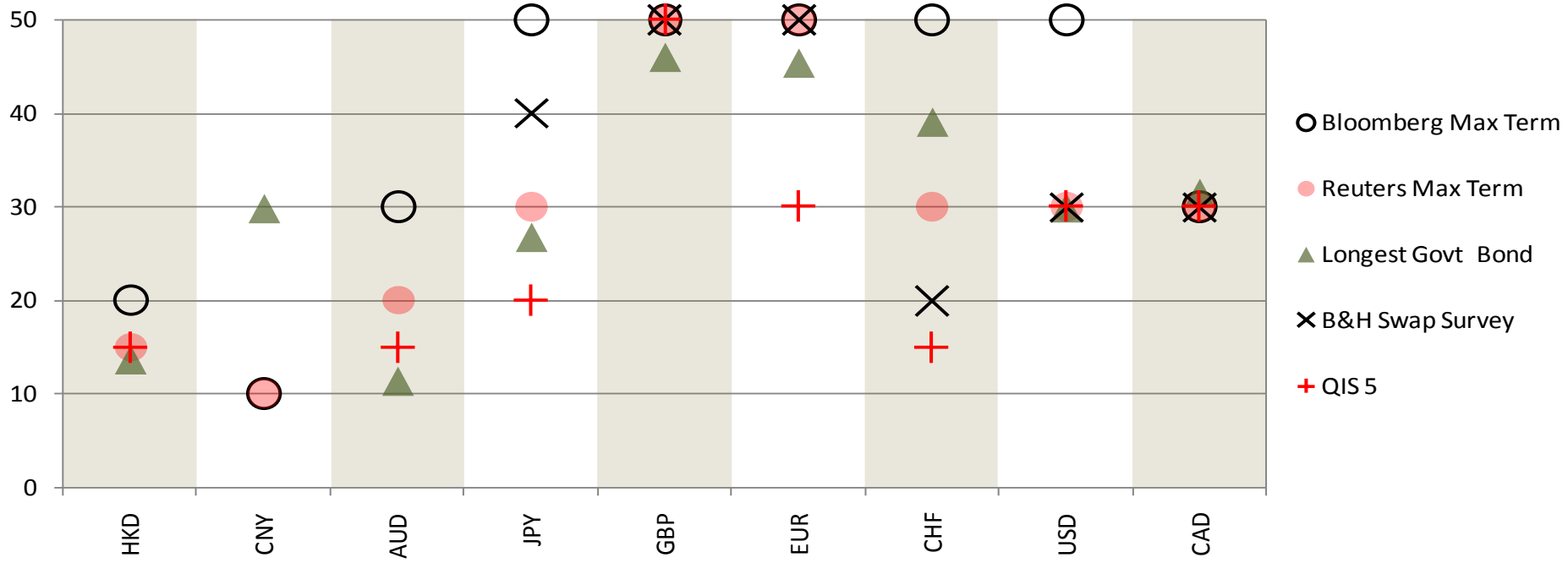
Examples of Data Challenges

Market Data Challenges for Solvency II

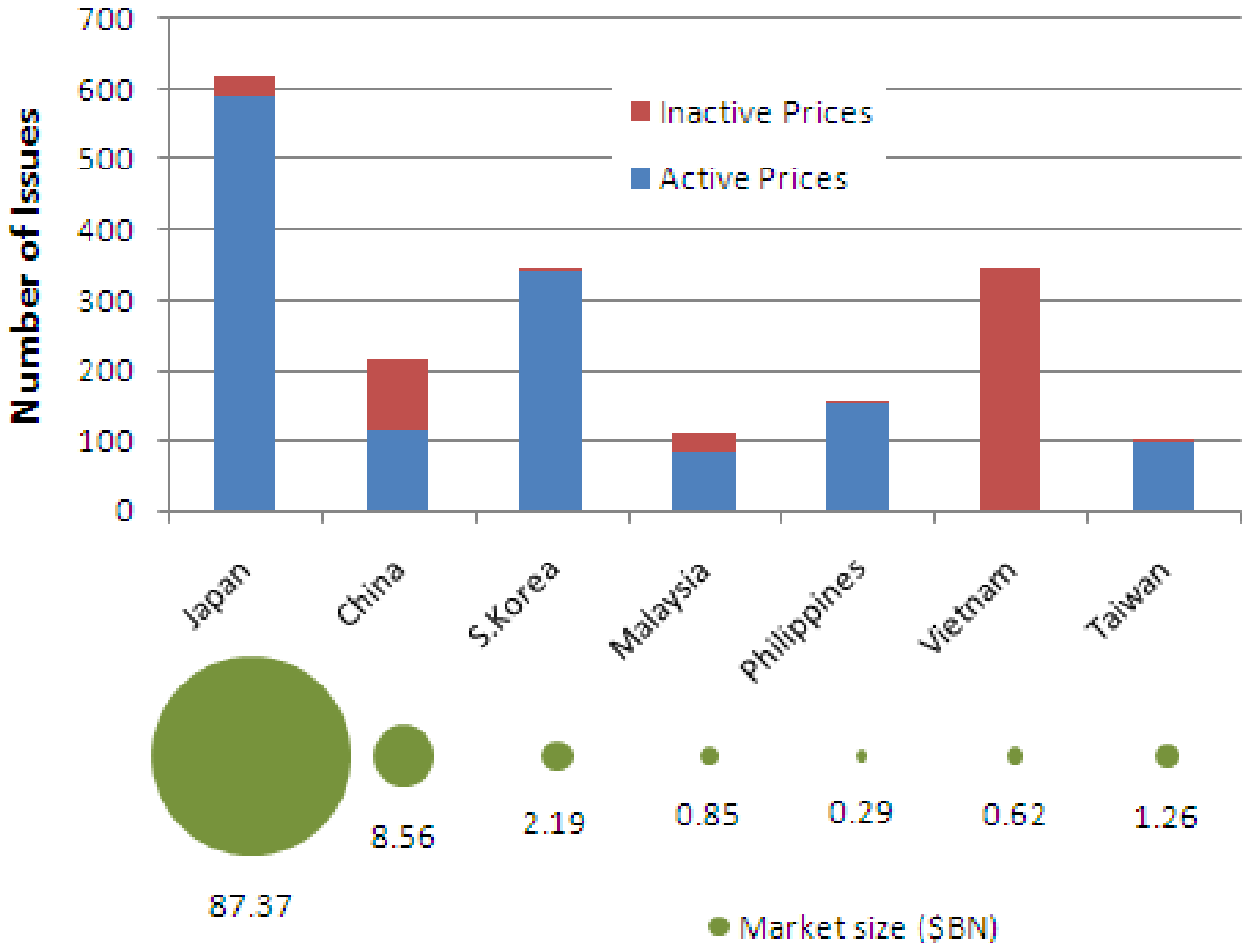
Example I: Where are the longest observable maturities for swap markets?



Example I: Comments

- QIS 5 view influenced by need for industry to hedge on a large scale without moving price
  - Strong interpretation of DLT and many ‘reliable’ prices may excluded
- Data vendor cut-off determined by number of quotes received and willingness to supplement with ‘evaluated’ prices

Example II: Asian Bond Markets



Example II: Comments

- Evaluation criteria include
  - Bid-offer spread
  - Issue size
  - Number of trades/Volume
  - Last trade date

- It can be difficult to source this information – especially for OTC markets

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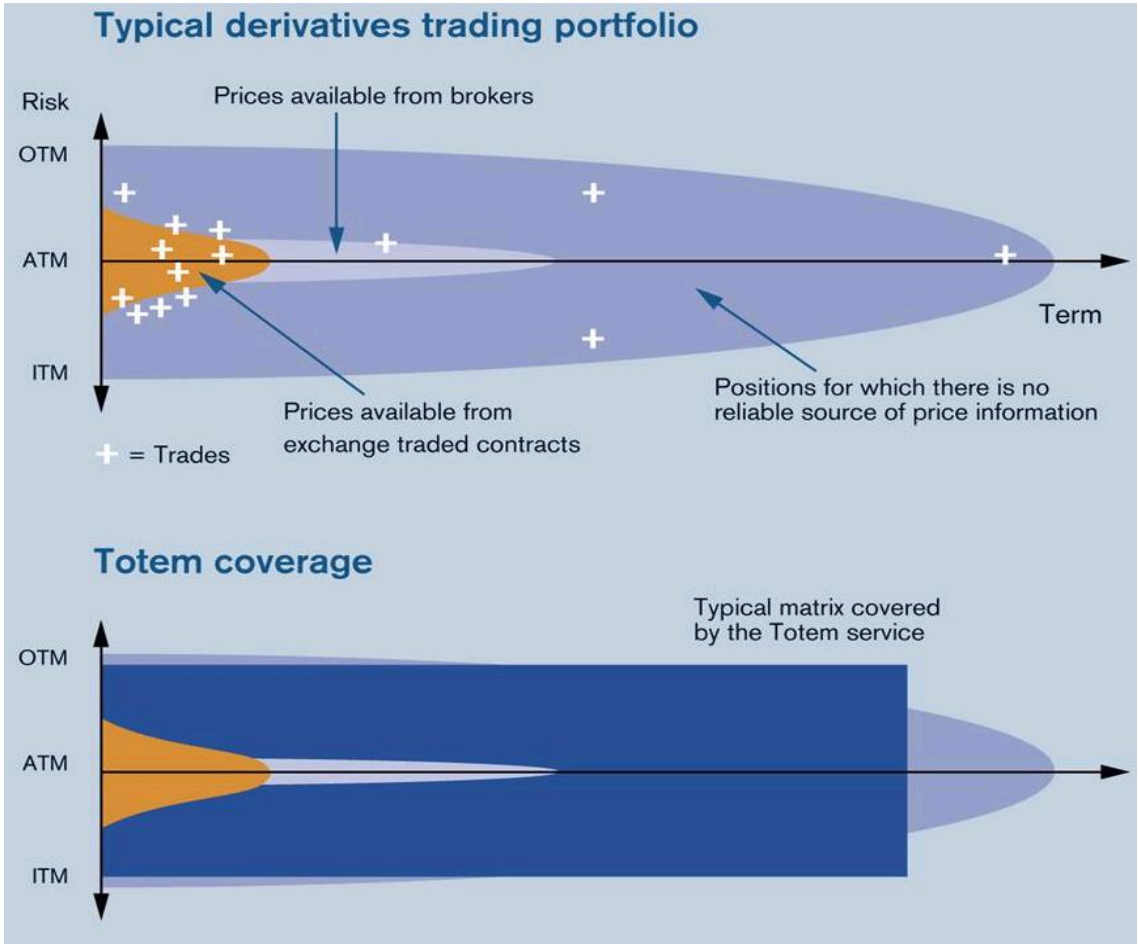
Case Study: Equity Implied Volatilities

Market Data Challenges for Solvency II

Equity Implied Volatility Data Availability



Traditional Data Sources

- Traditional sources of ‘independent’ data are flawed
- Brokers, Exchanges, Data Vendors, Counter Party Valuations
- Do not undertake the rigorous checking and benchmarking
- Danger in accepting a model price
- Multiple vendors and sources are not consistent with the goal of a single source of Fair Value

Traditional Data Sources

- Brokers
  - Can be unreliable
  - Reported bid-offers can be skewed by market makers
  - Not available in illiquid markets
  - May be “indicative” only
  - Ideally quotes should be sourced from more than one broker
  - Ideally quotes should be sourced via a medium that is available to many traders

Traditional Data Sources

- Exchanges
  - Excellent source of information if good turnover
  - Typically limited to short dated near ATM
  - Each exchange may have a different method to settle contracts
  - Last trade may be manipulated
  - Settlements can have model based assumptions
  - In illiquid markets, settlements can be stale
  - Quote size may be small and not relevant for OTC markets

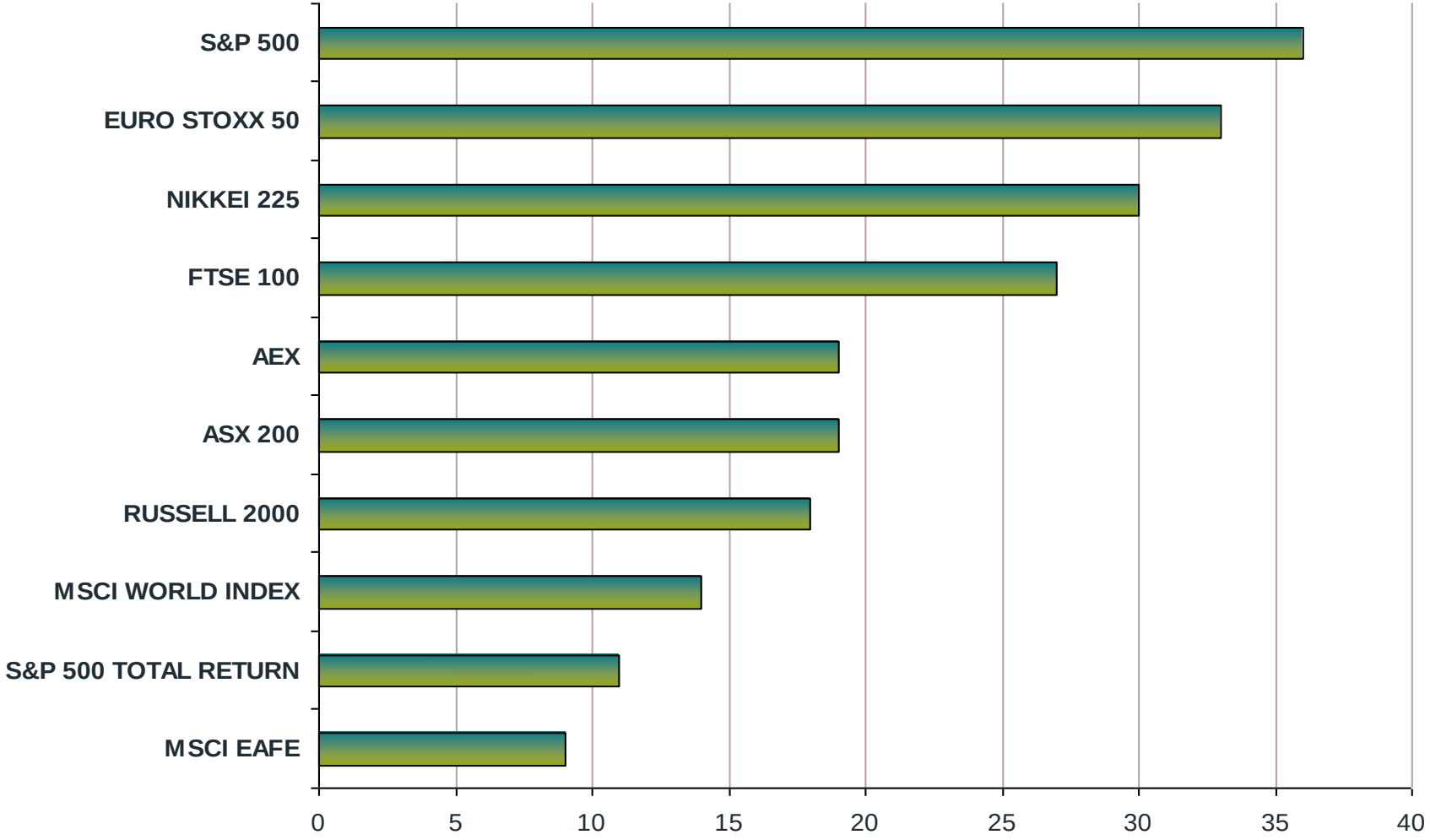
Traditional Data Sources

- Model based pricing services
  - Based on limited publicly available information
  - No benchmark or validation process
  - A single unqualified view of the market
  - “Black Box” approach
  - Automated process and “best fit” curves may be away from actual prices
  - Model assumptions and smoothing techniques may lack transparency

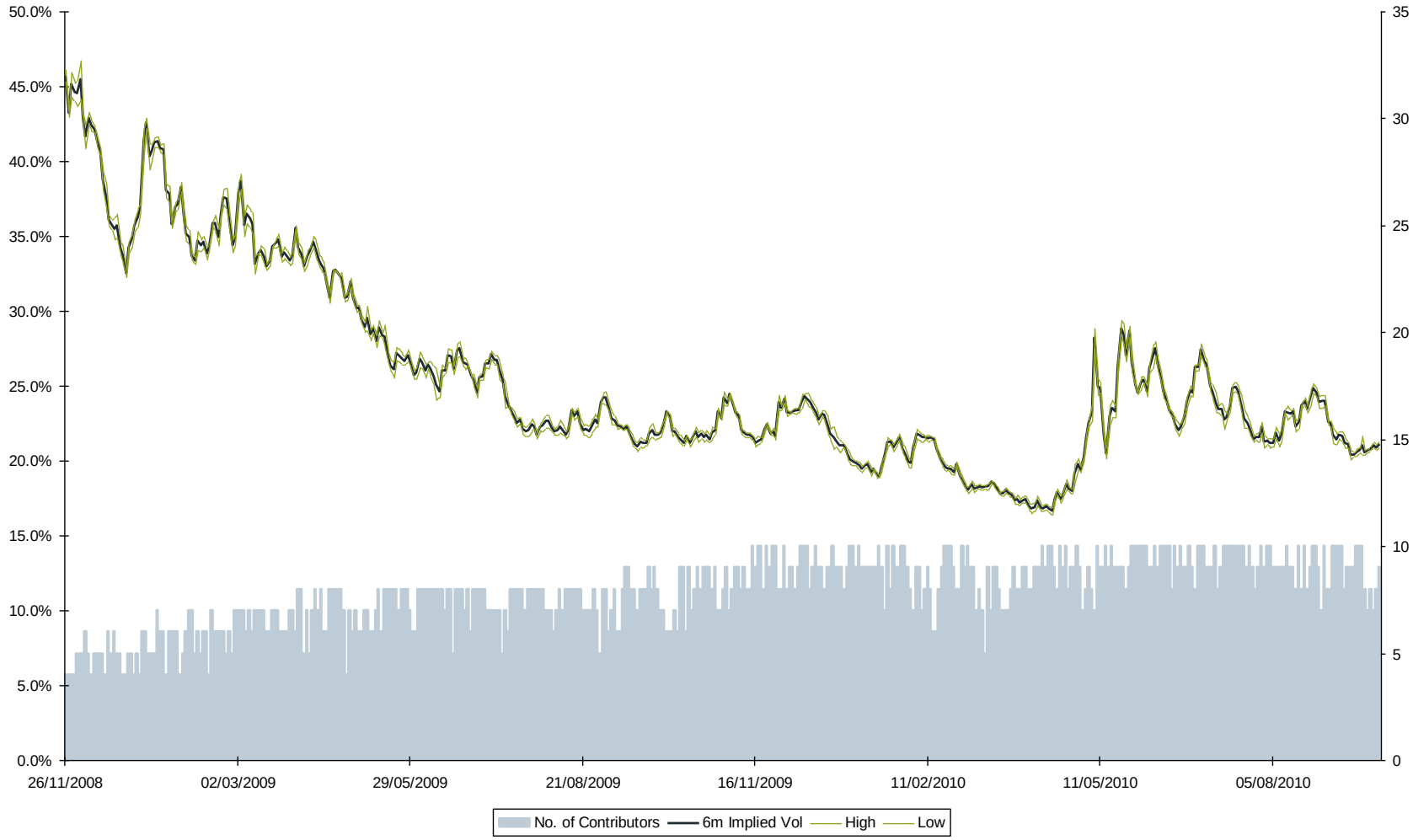
Traditional Data Sources

- Counter party valuations
  - Lack of independence
  - No benchmark or validation process
  - A single view of the market
  - What happens if the counter-party disappears?

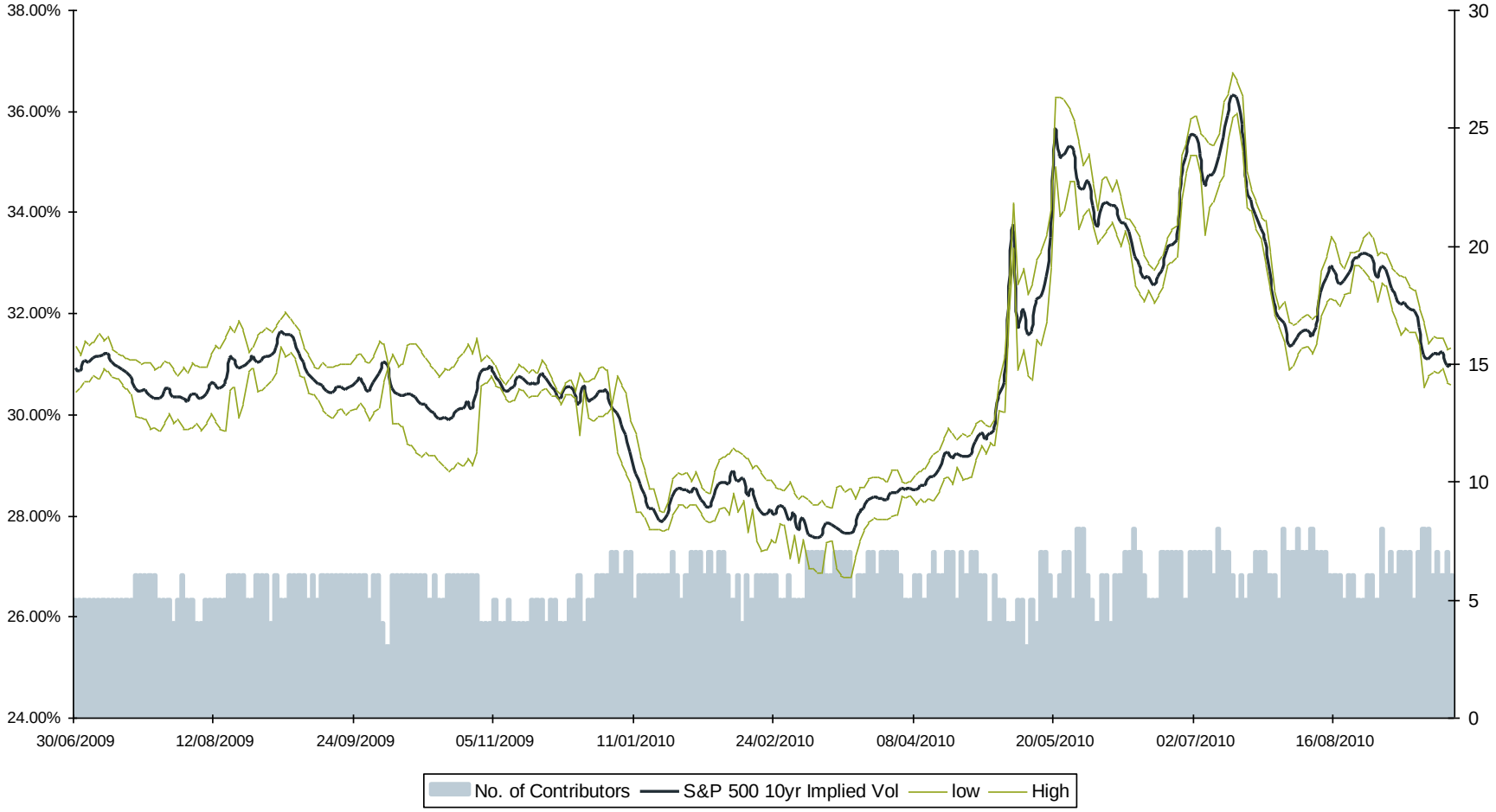
Pricing Source Contributions



6m FTSE 100 Implied Volatility



10yr S&P 500 Implied Volatility



Cleaning metrics

- Price based submissions
- Internal consistency checks are performed on implied vol, forwards, dividend yields and discount factors. Example metrics are:
  - Stale Data Check
  - Distance from consensus
  - Outlier likelihood
  - Curve shape
  - Curve continuity
- Additional factors such as number of contributors, market activity and distribution spread are considered

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Conclusions

Market Data Challenges for Solvency II

Conclusions

- Choices made on data selection and usage can have a first-order effect on valuation results
- Not all prices are equally reliable so it's important to understand how prices are derived
  - You need to have visibility of vendor methods and processes
  - No one source is 100% reliable
- The prices you use and how you use them will ultimately require some subjective judgement
- Therefore, it's important that the characteristics of data and any corresponding judgements are documented

Questions or comments?

Expressions of individual views by members of The Actuarial Profession and its staff are encouraged.

The views expressed in this presentation are those of the presenter.