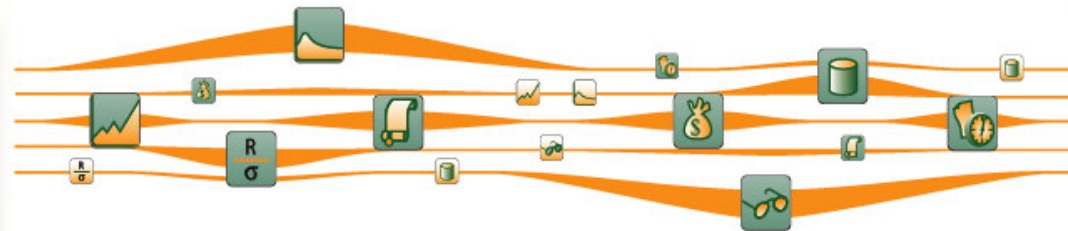




FINALYSE

Composing Solutions for Finance



trading volATiLiTy in commodities

péter dobránszky

25th march 2009, new york

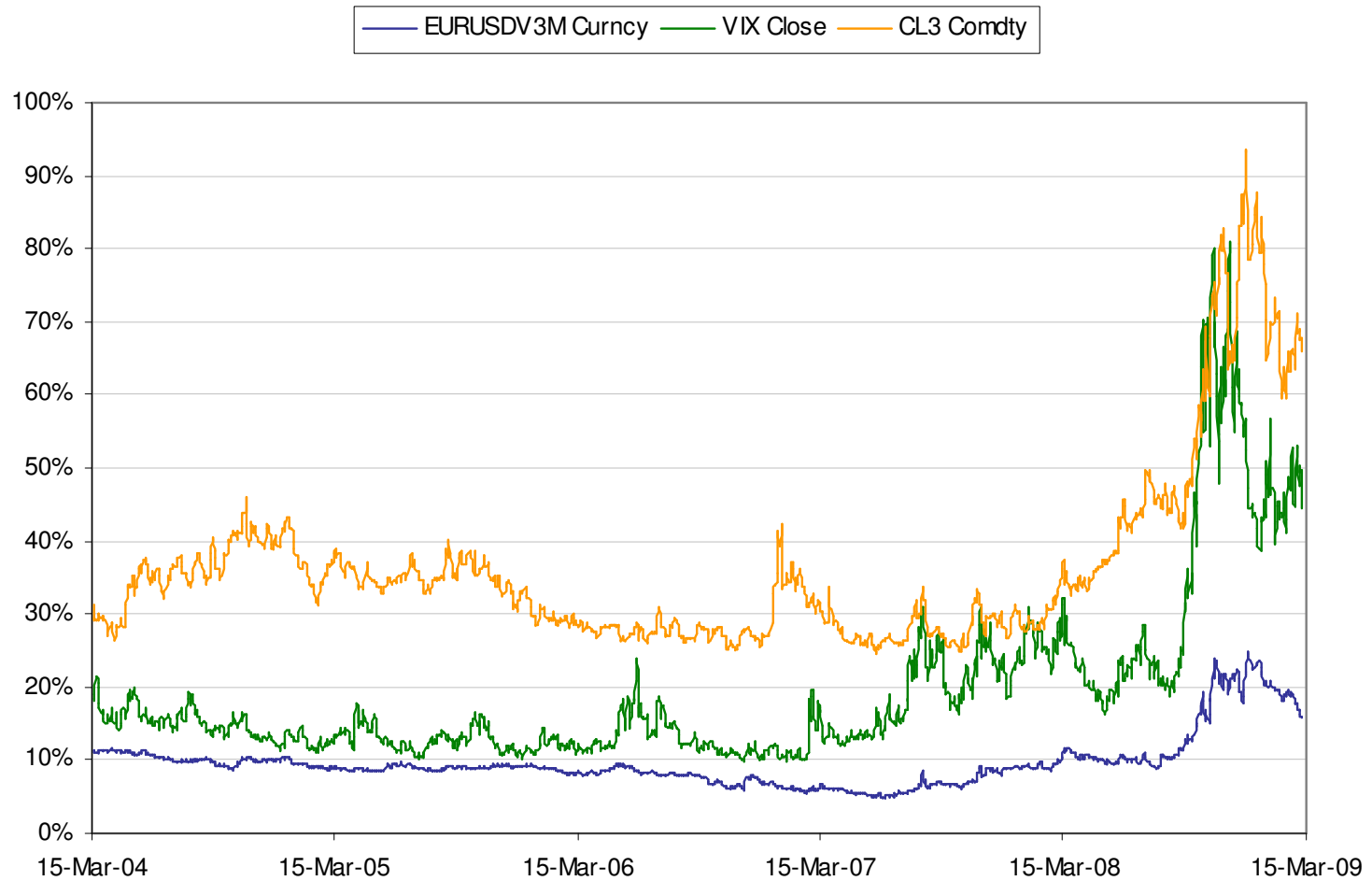


Introduction

- Assessing which commodity trading models thrive in volatility
- Getting new focus because of the underperformance showed by other markets
- Commodity derivatives market is not so advanced as equity or FX derivatives markets
- Smaller market, lower volume
- No best practice for quotation conventions
- Products and quotation conventions closest to equities and FX
- Approach the modelling problem through yield curve models
- Data providers with intra- and extrapolated market data that are not necessarily in line with each other

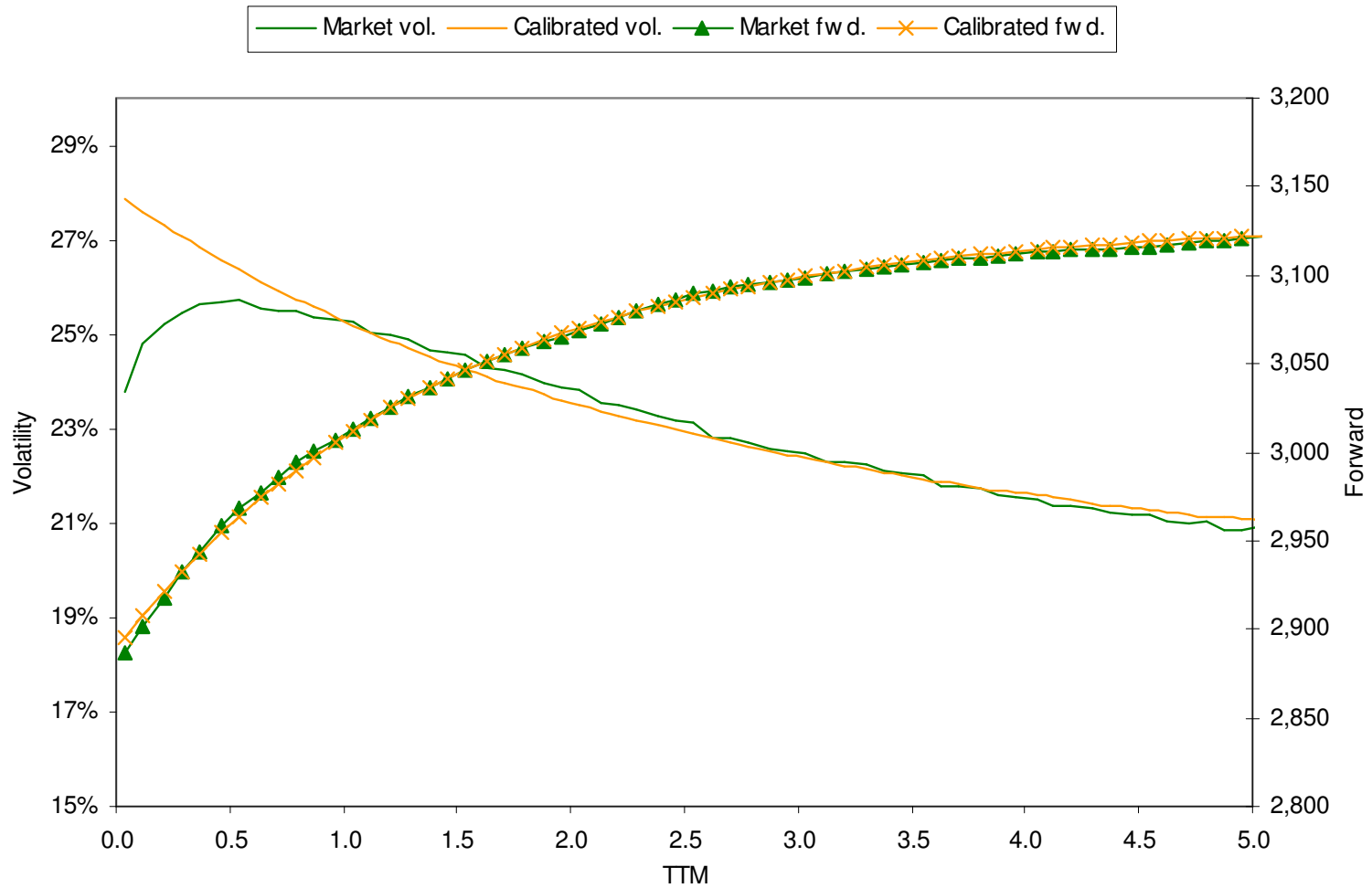


Asset classes



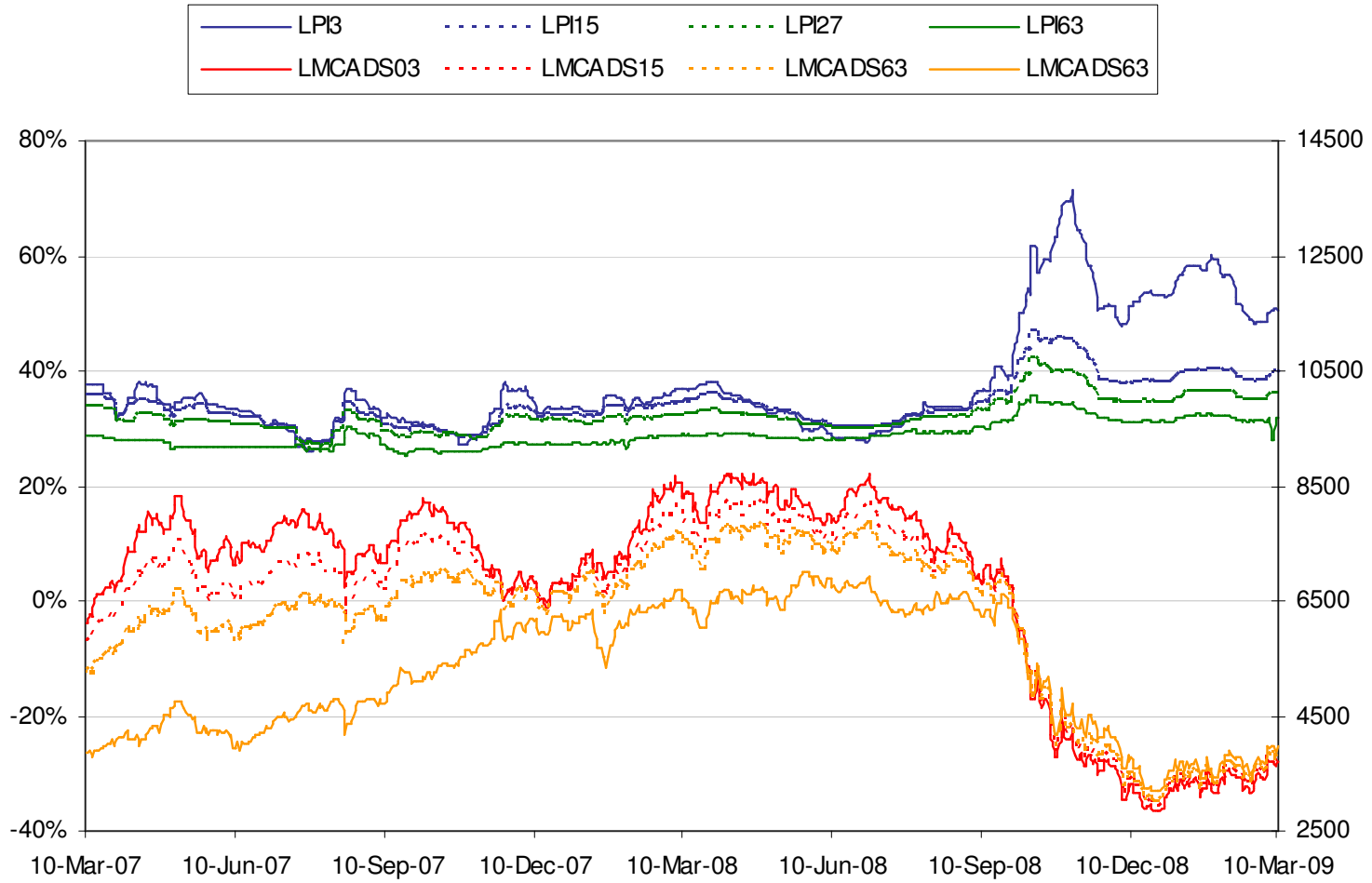


Schwartz-Smith calibrated to AHD on 03-Jun-08



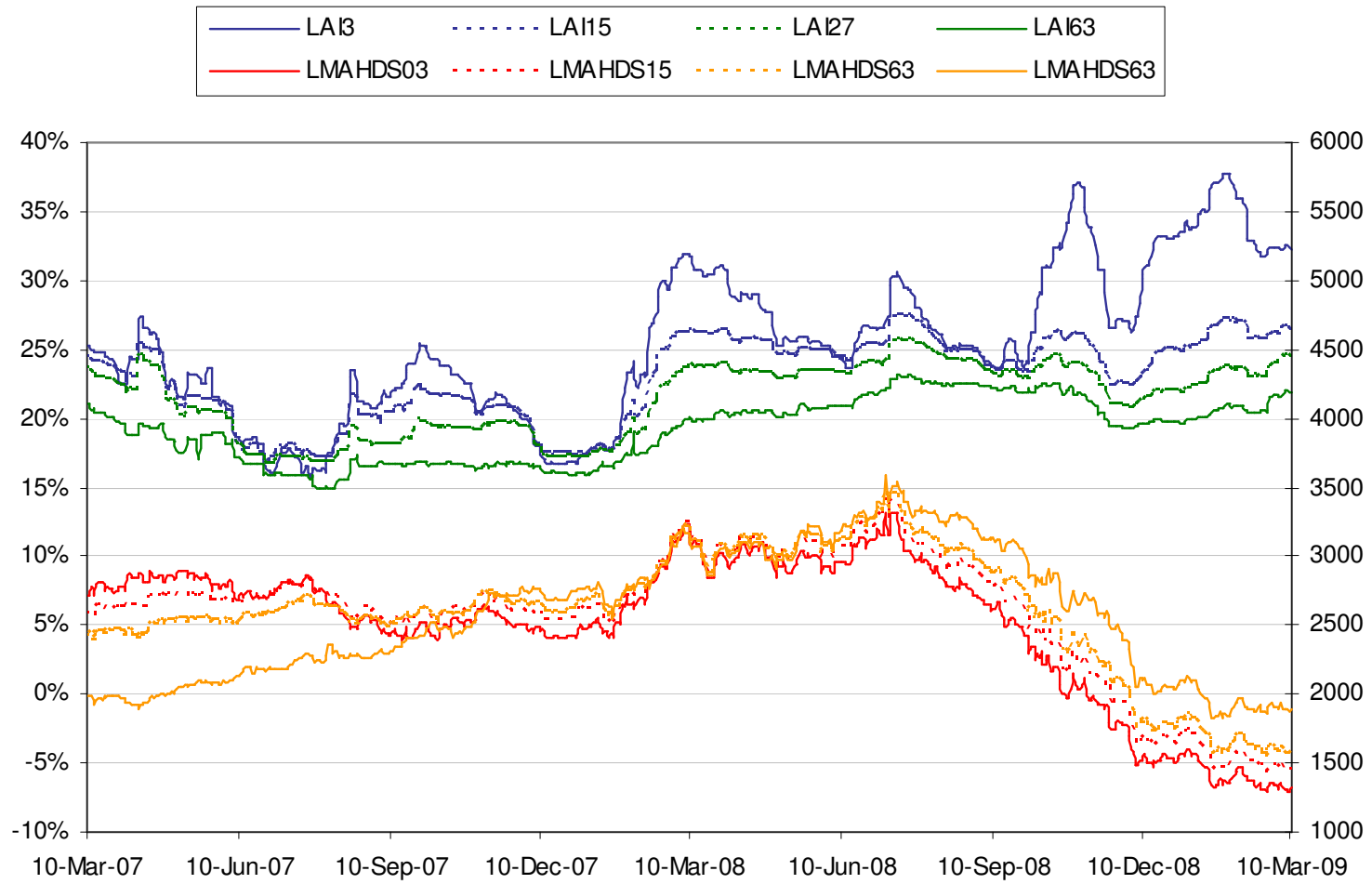


Copper (CAD) futures and IVs



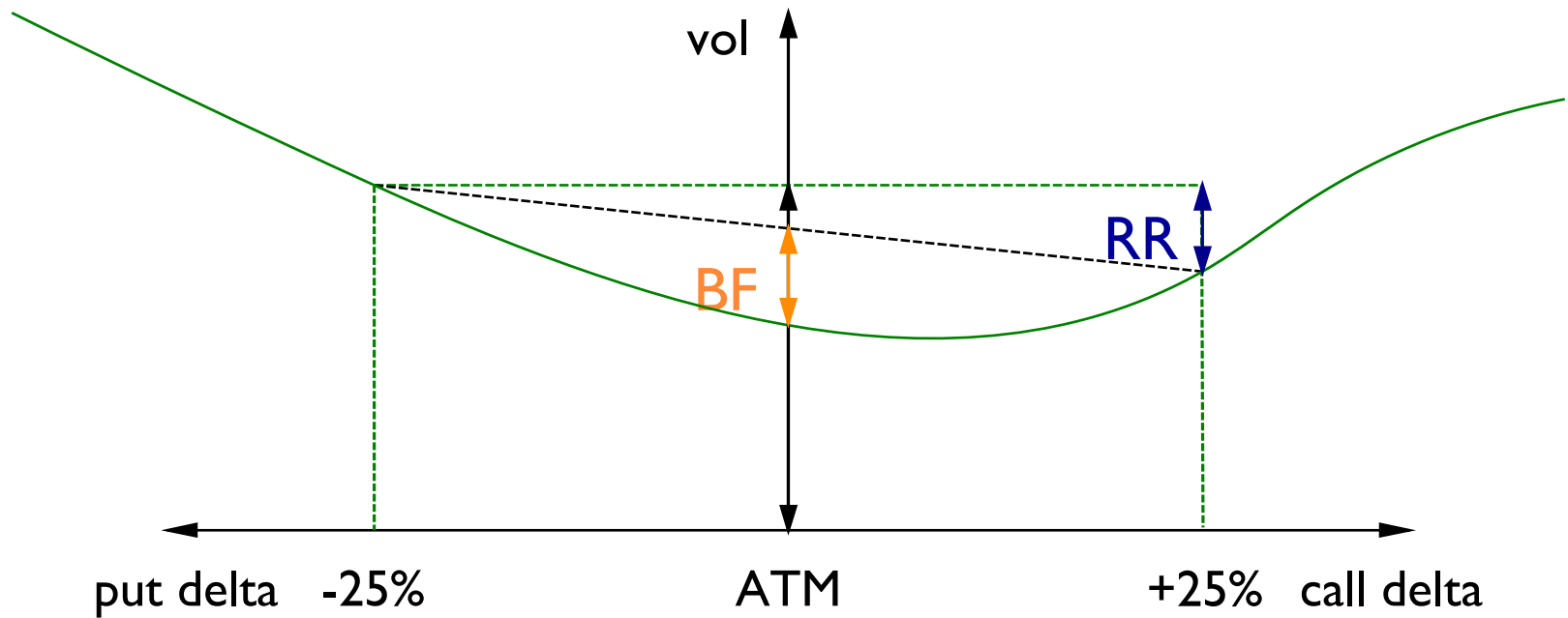


Primary aluminium (AHD) futures and IVs



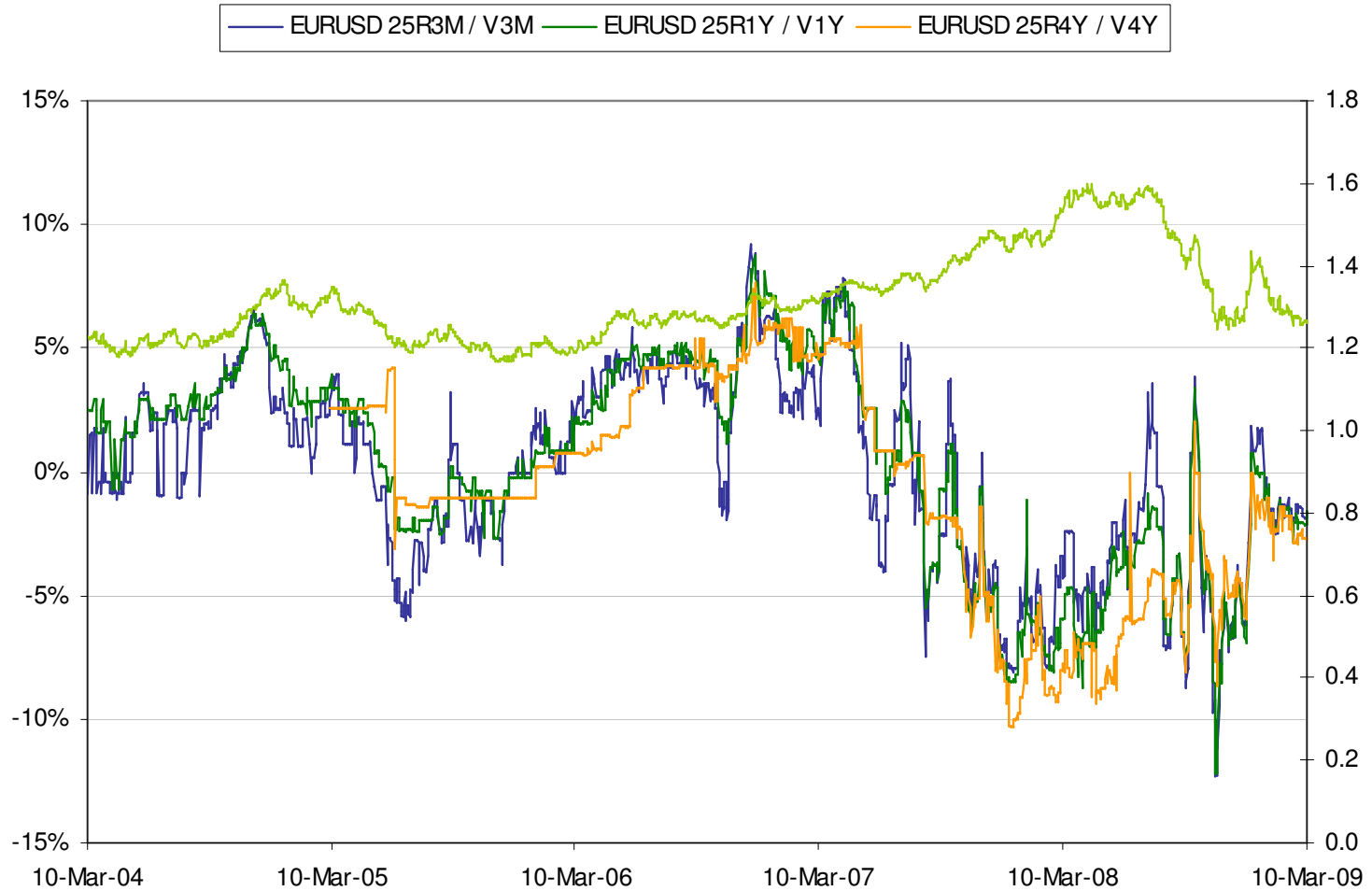


Quoting the smile by delta



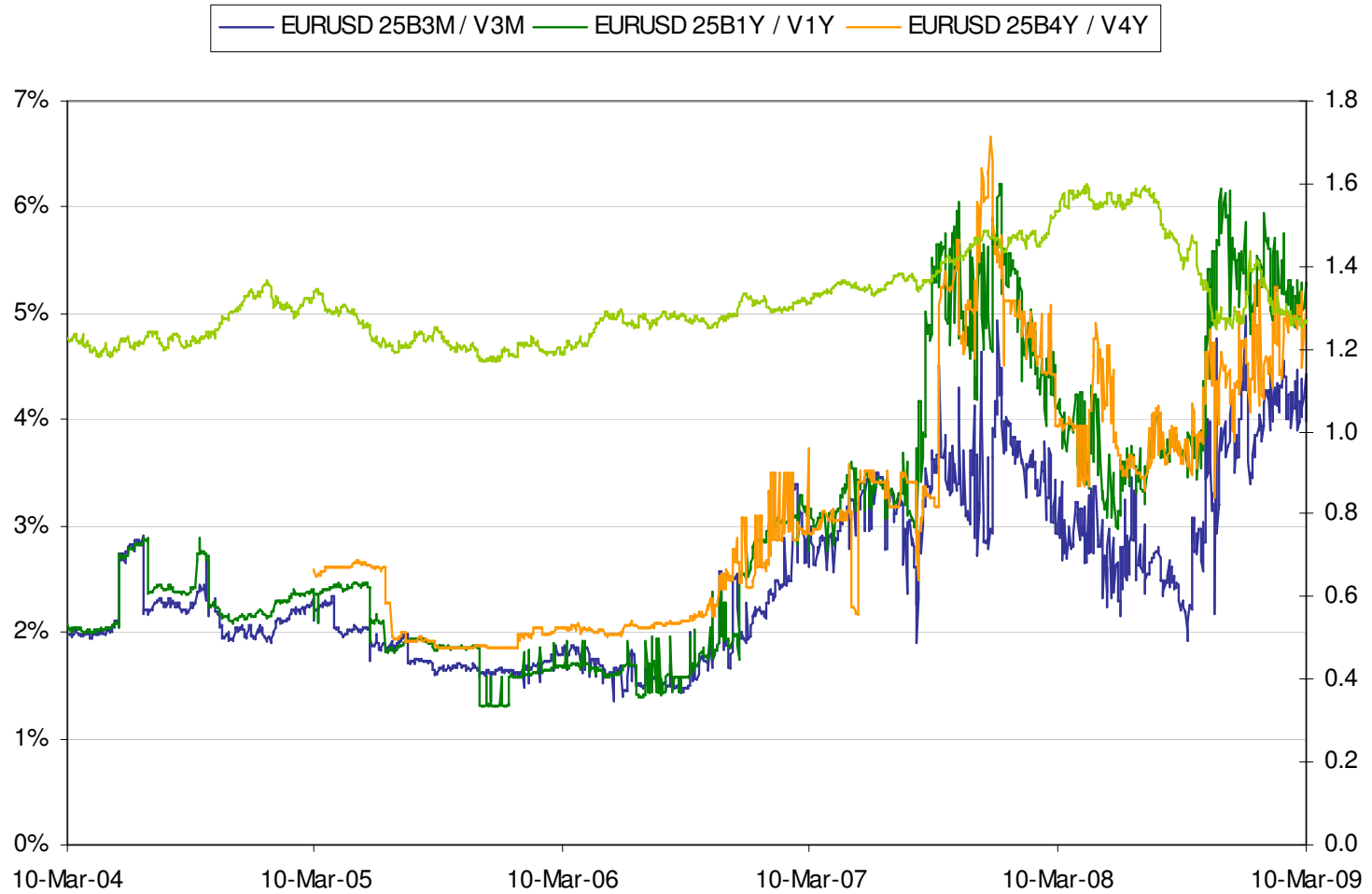


FX relative risk reversals



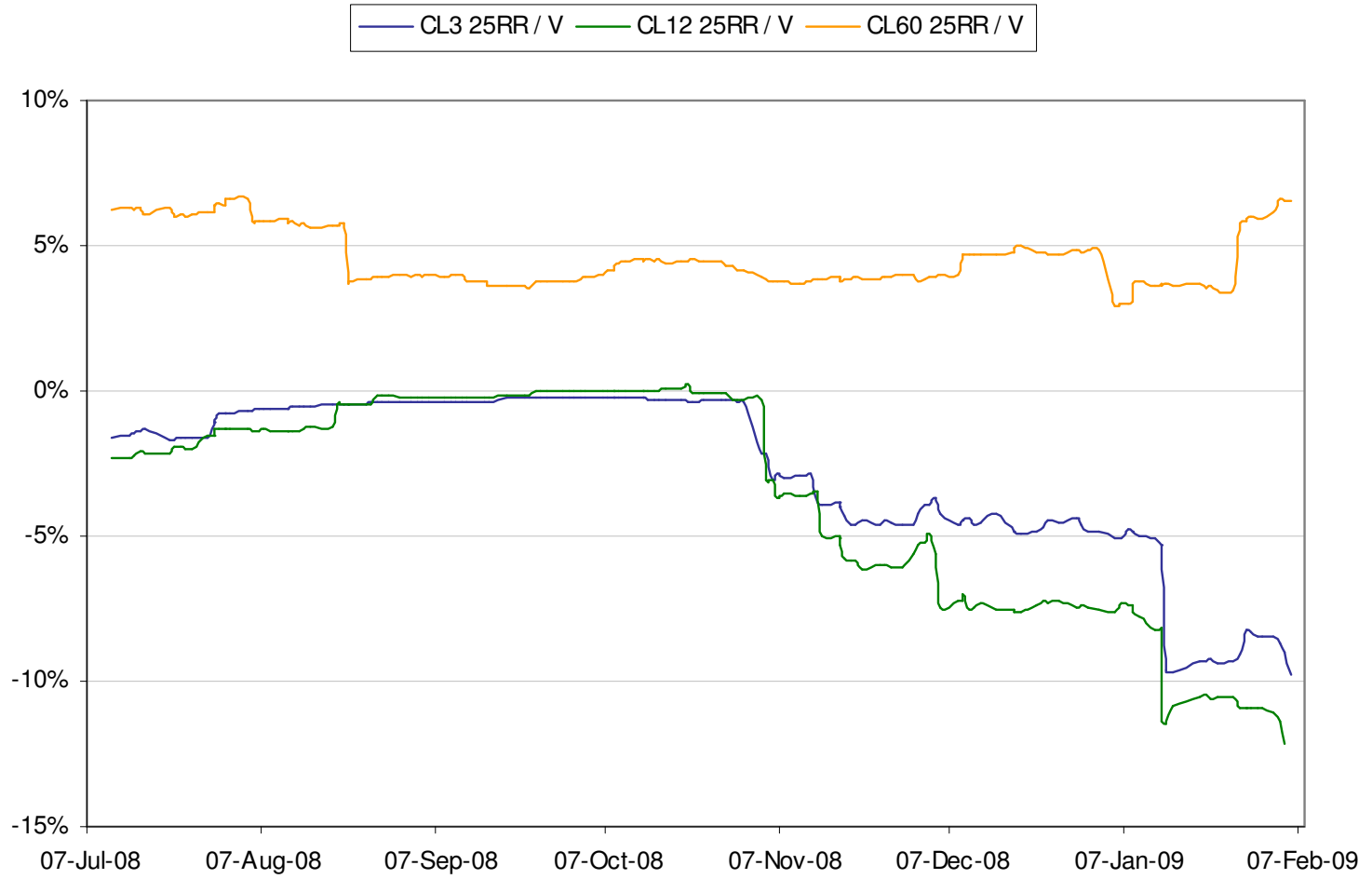


FX relative butterflies



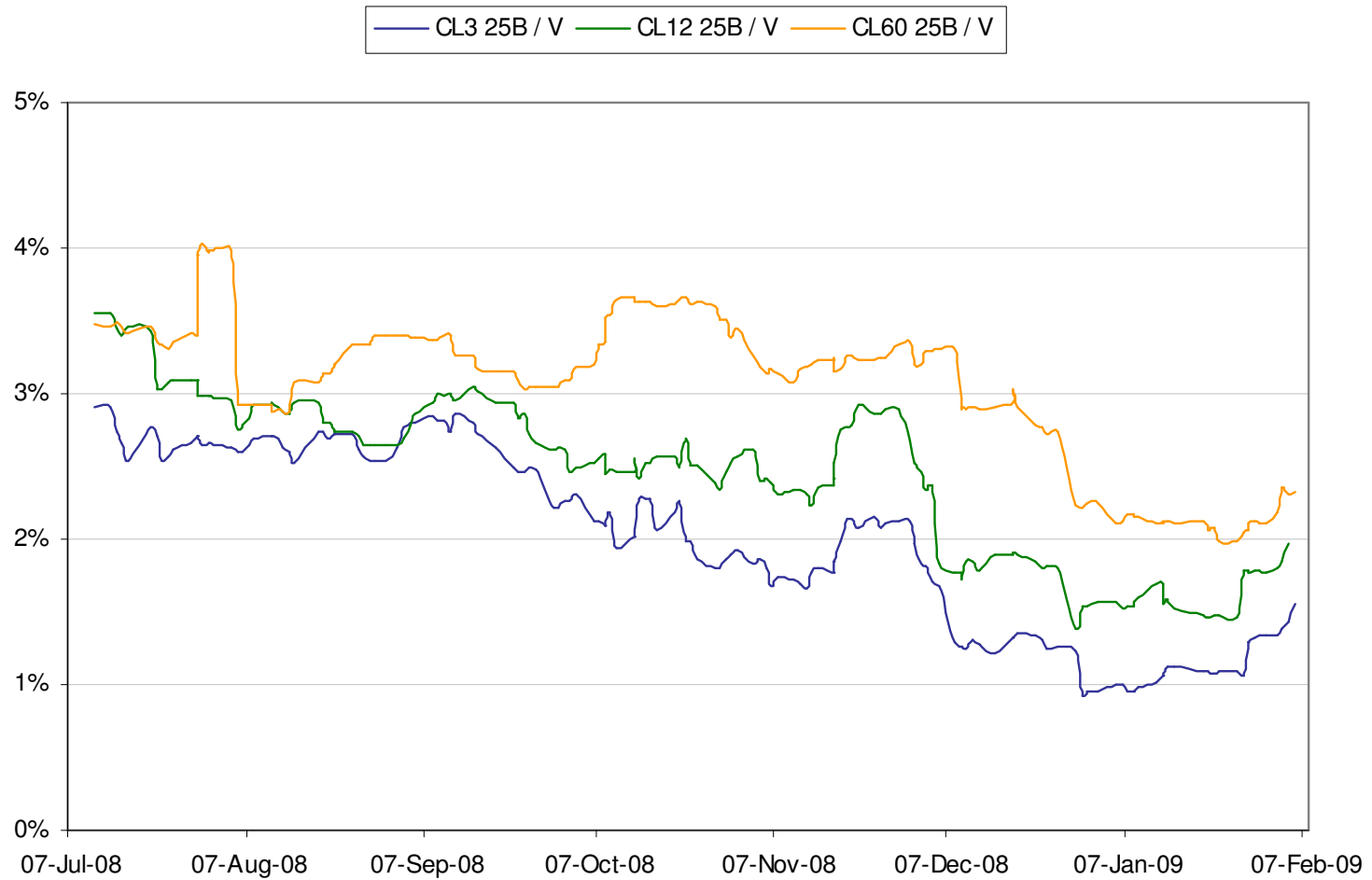


WTI oil relative risk reversals



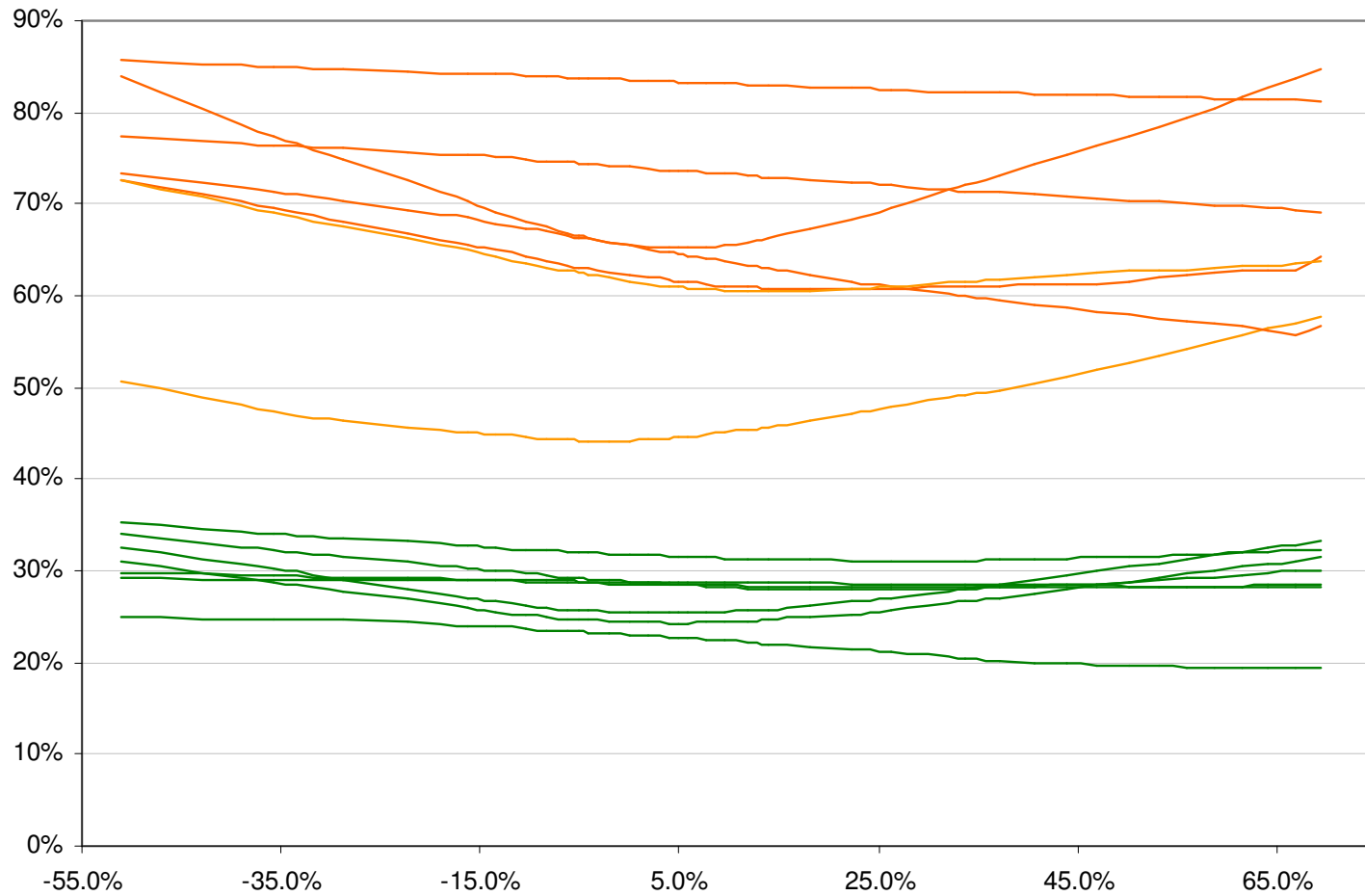


WTI oil relative butterflies



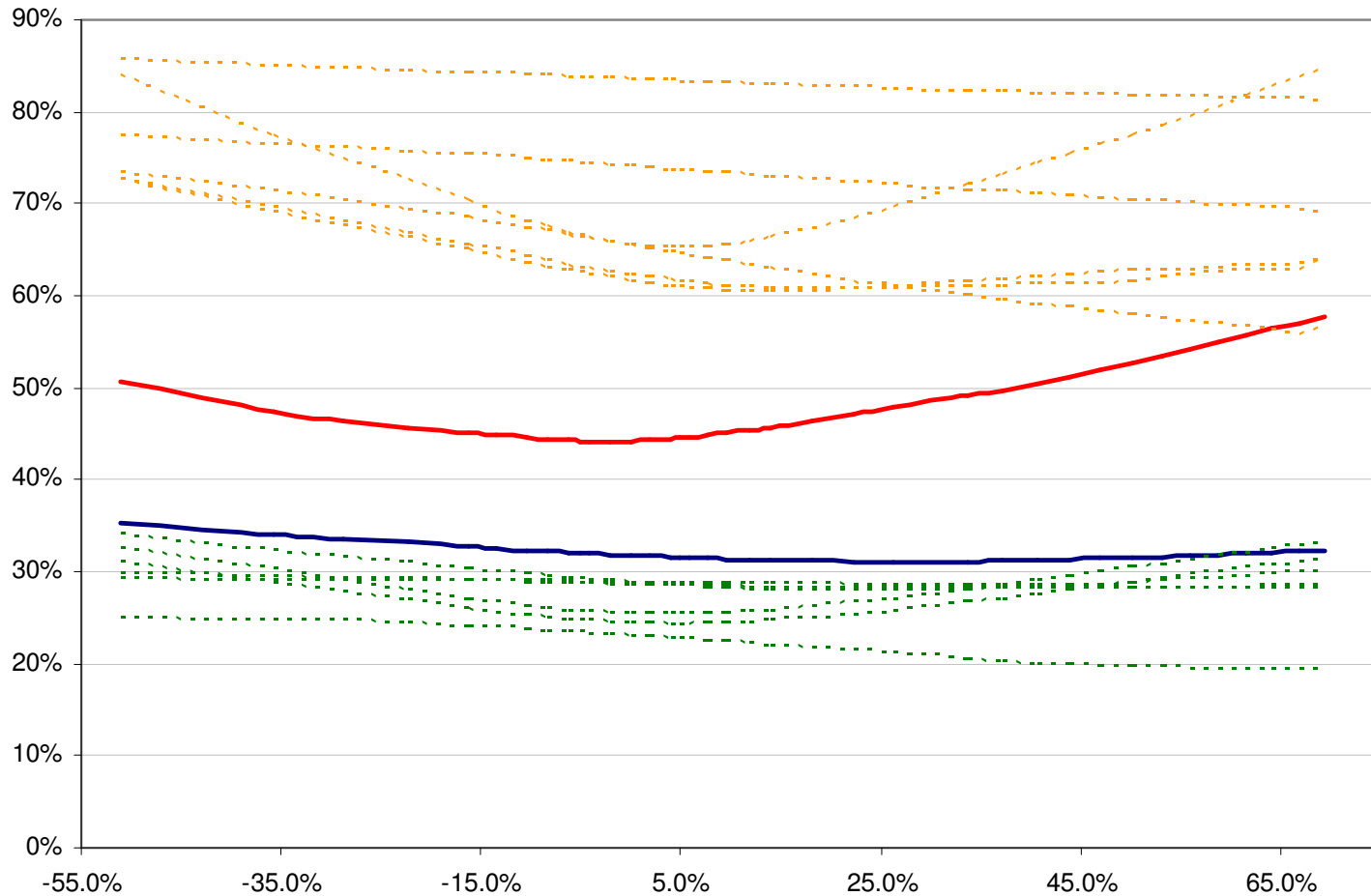


LCO oil 3M and 63M IV smiles in the last half year



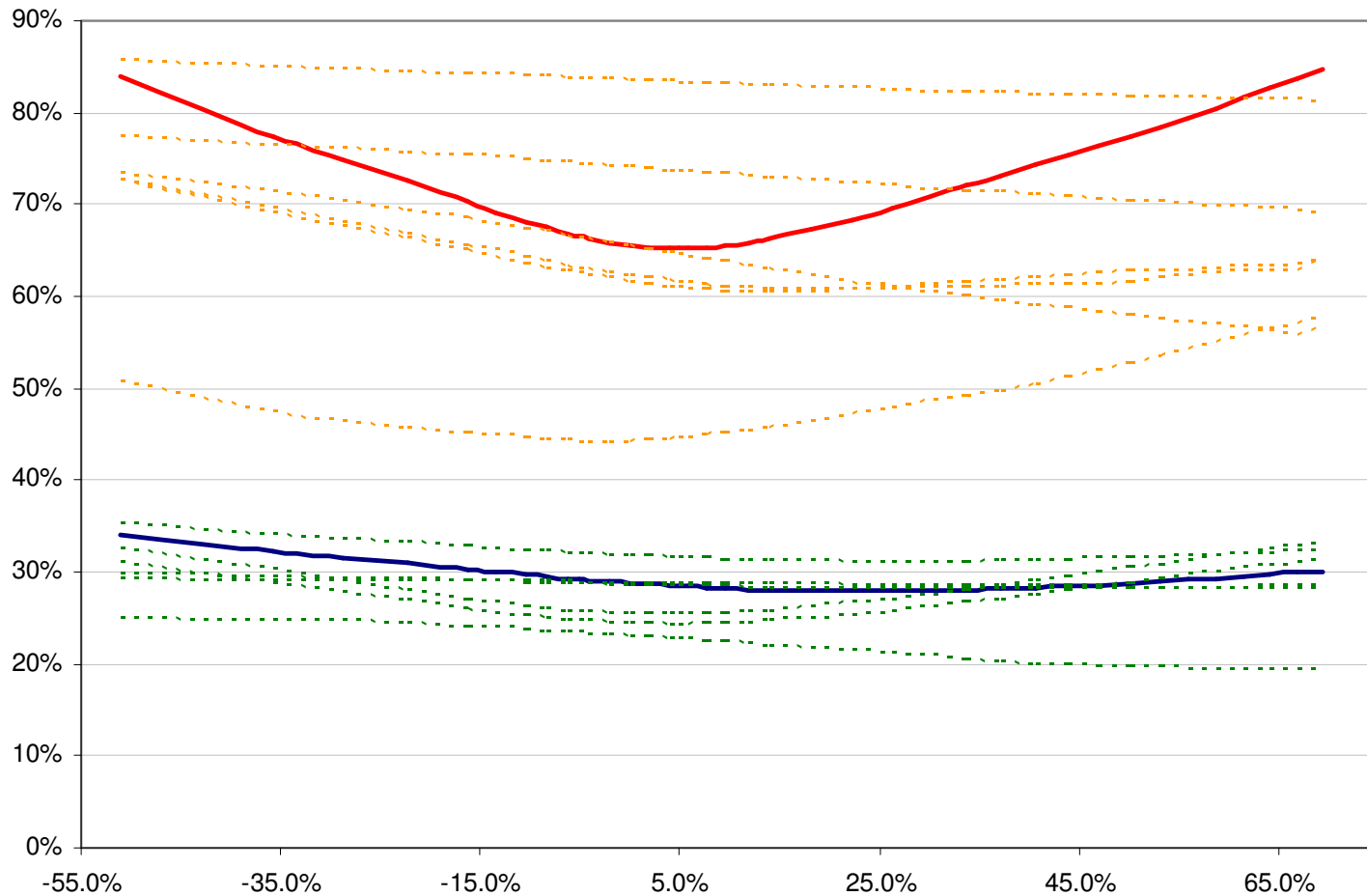


19/09/08: strong short smile, skew to right, light long smile, skew to left



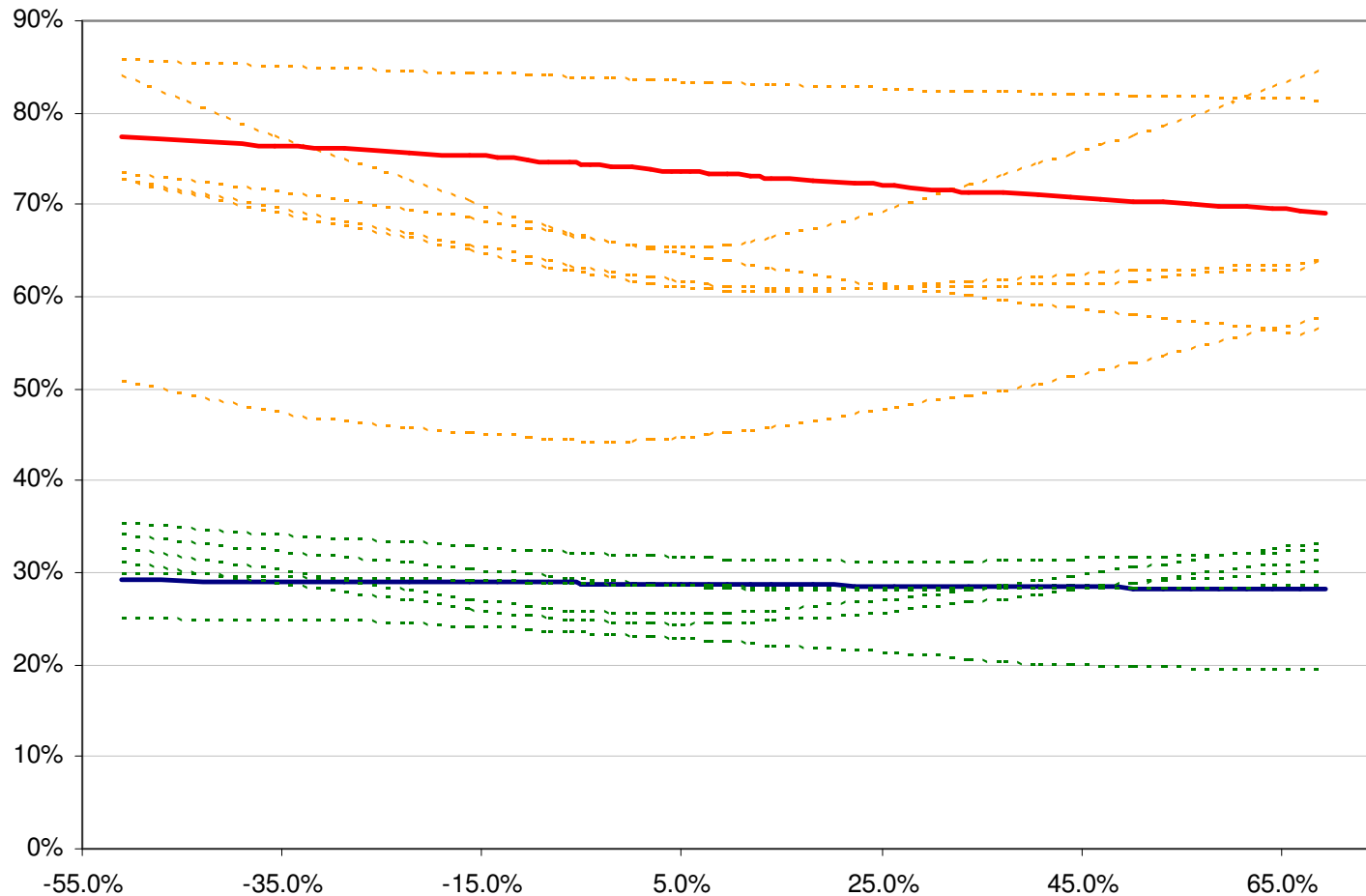


20/10/08: high short vol, stronger short smile, no short skew, unchanged long skew



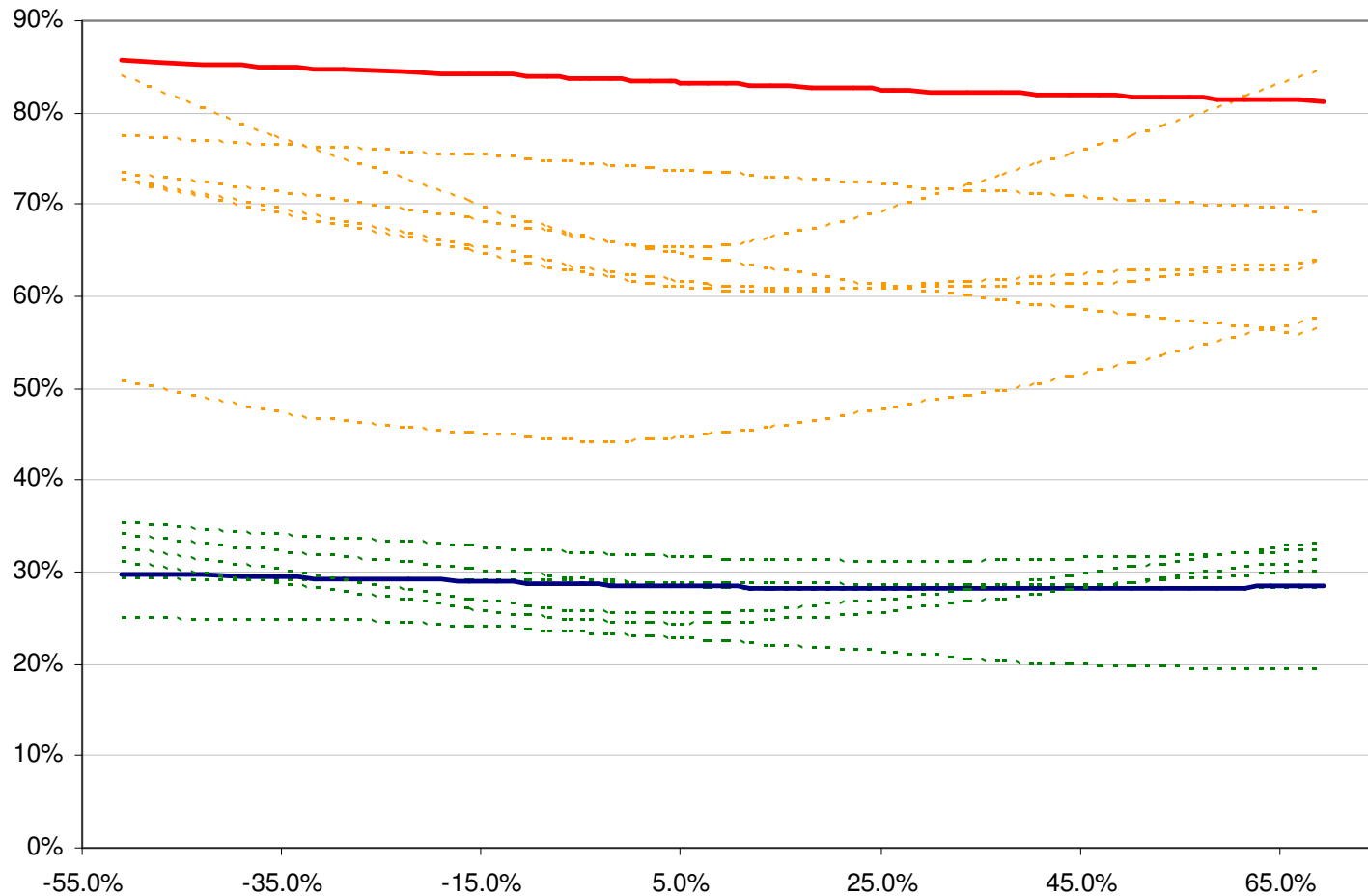


19/11/08: no short smile, clear skew to left, no long smile, curve is rather flat



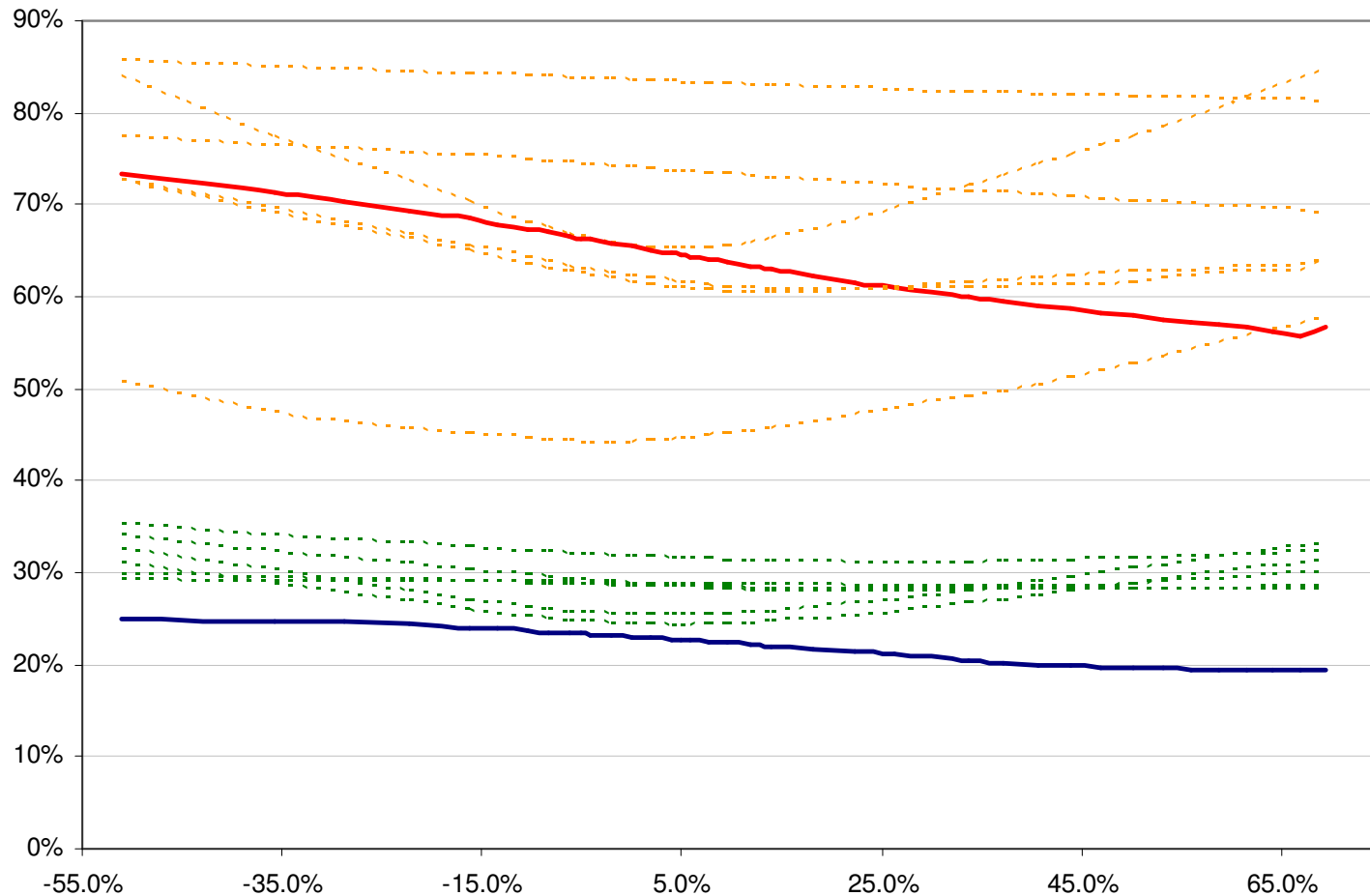


19/12/08: further vol increase on short, no change on long



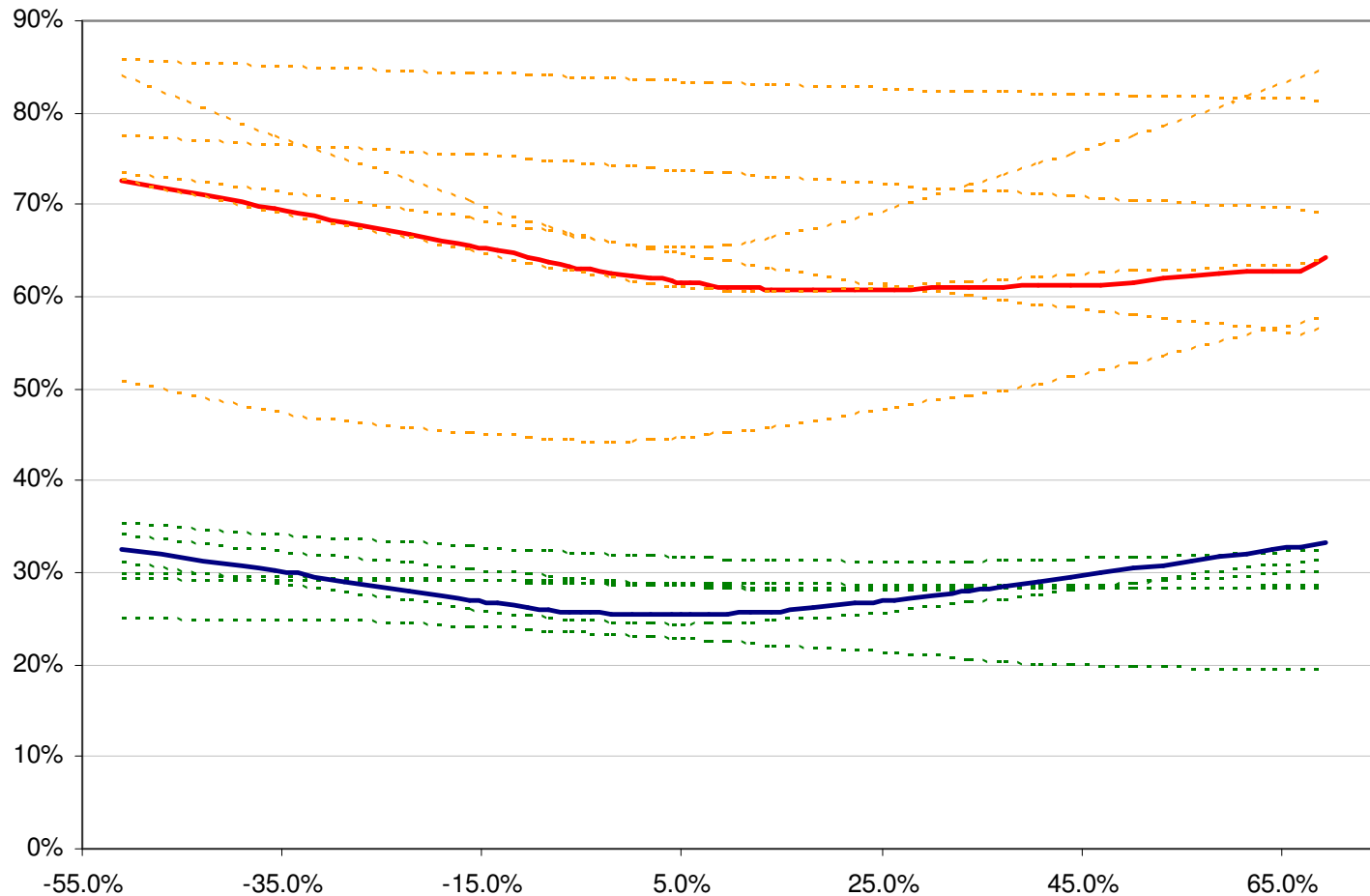


20/01/09: both short term and long-term volatilities are lower, skews are stronger



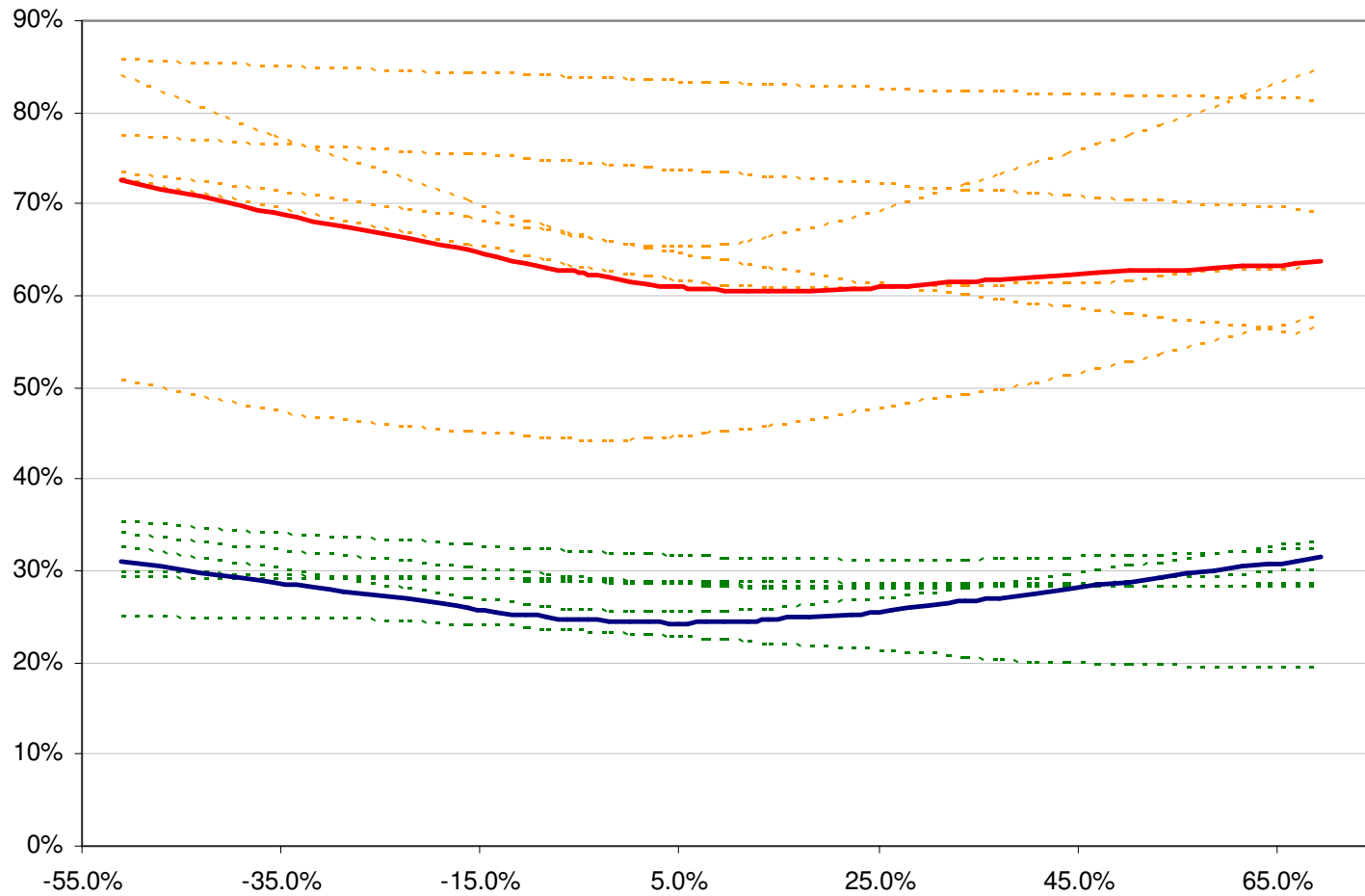


20/02/09: short smile back, long smile back, very strong long smile on right



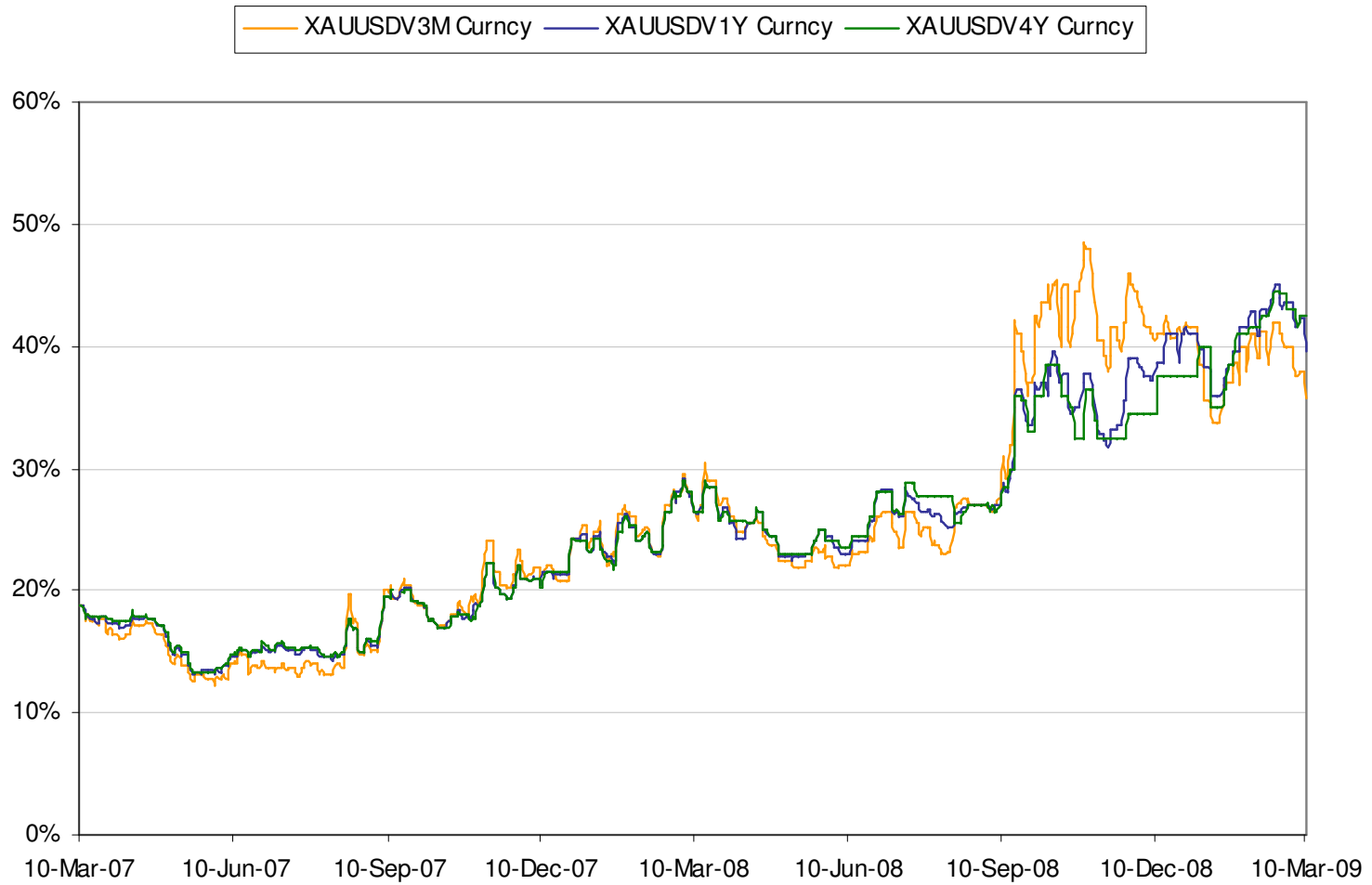


20/03/09: no changes



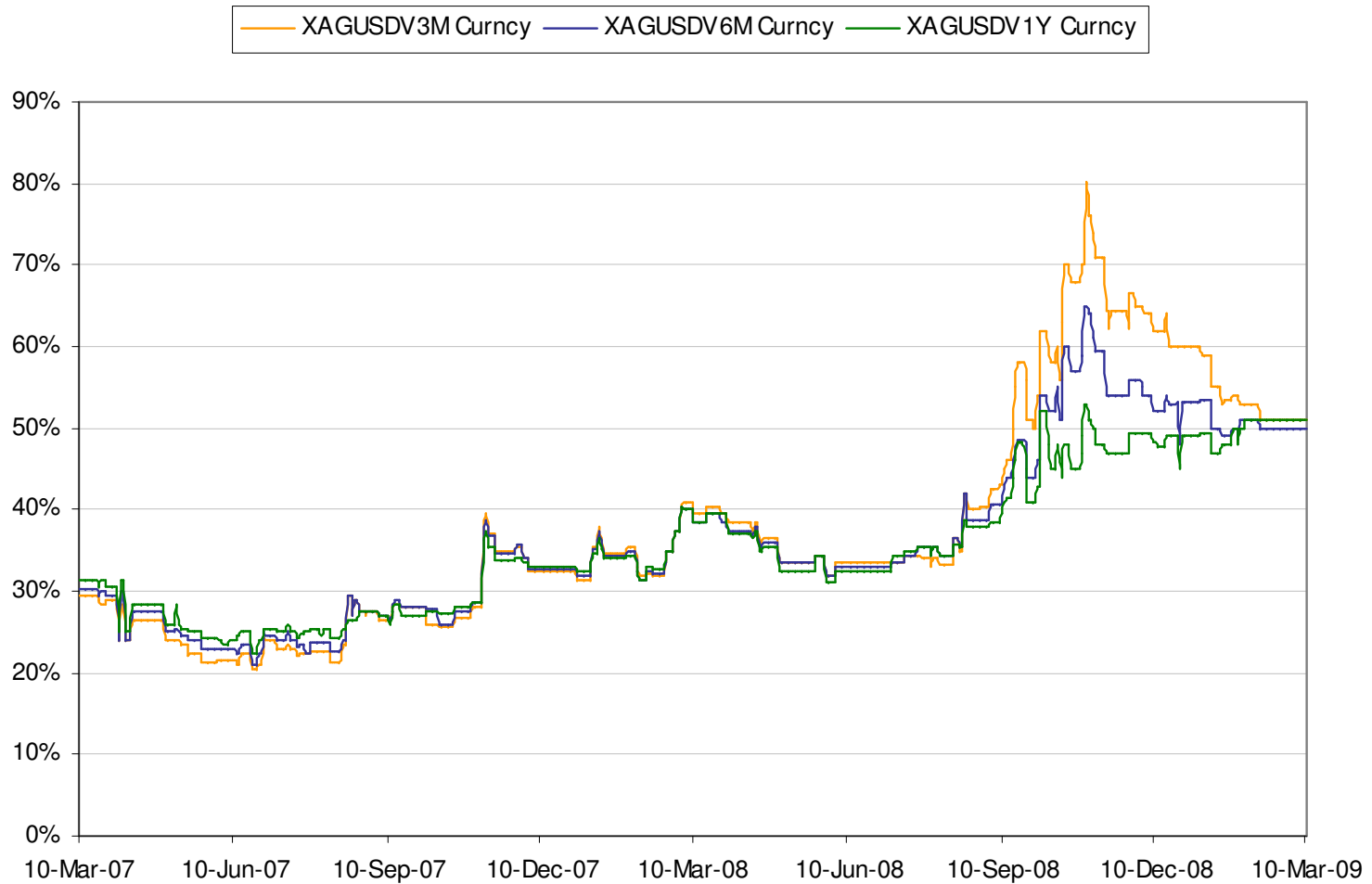


Gold IV term structure dynamics





Silver IV term structure dynamics





Commodity modelling requirements

- Mean-reversion in asset prices – short-term, long-term
 - Stochastic convenience yield
 - Decreasing volatility term structure
- Multi-factor stochastic volatility – short-term, long-term
 - Volatility smile also on long-term
 - Unspanned stochastic volatility (cannot model the skew)
 - Equilibrium volatility level is stochastic also
- Jumps
 - Discontinuous asset path
 - Closer futures jump larger than longer futures
- Stochastic mean-reverting jump frequency
 - Stochastic implied volatility skew
 - Reduce the need for stochastic volatility



Agenda workshop

1. Modelling Financial Asset Price Dynamics
2. Affine Jump-Diffusion Processes and the Fourier Inversion
3. Modelling the Dynamics of Commodity Curves
4. Pricing Volatility and Jump Derivatives
5. Hedging and Risk Management
6. Questions



Questions

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