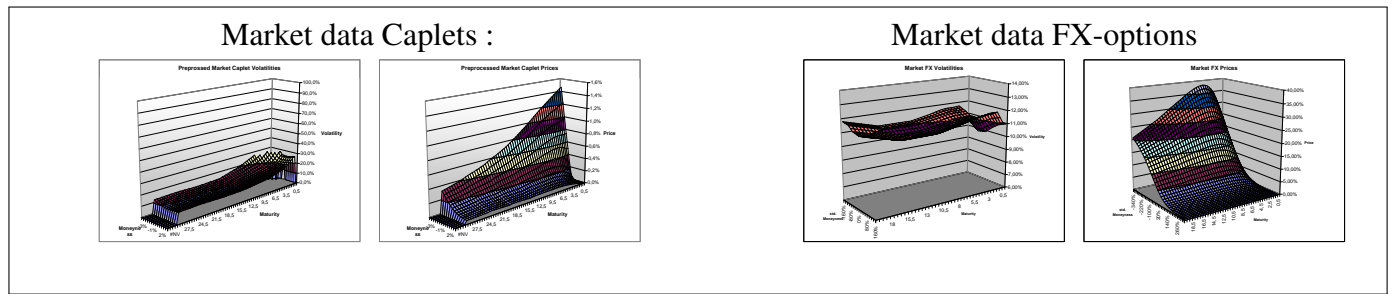


A Hybrid Markov-Functional Model with Simultaneous Calibration to Interest Rate and FX Smile

Objective: A Hybrid Model with Simultaneous Calibration to Interest Rate and FX Smile.



Method: Two dimensional Markov-Functional Model

<p>First dimension (IR):</p> <p>Driving Process:</p> $dX_t = \sigma_t^x dW_t^x$ <p>Functional:</p> $\xi \rightarrow N(T_i, \xi)$ <p>Freely calibrated to market digital caplet prices.</p> <p>Arbitrage-free: by Construction.</p> <p>Parameters:</p> <ul style="list-style-type: none"> • functional - Caplet prices • σ_t^x - Swaptions 	<p>Second dimension (FX):</p> $dY_t = \mu_t^y(x_t, y_t)dt + \sigma_t^y dW_t^y, \\ Cor(W_t^x, W_t^y) = \gamma$ $\eta \rightarrow FX(T_i, \eta)$ $FX(T_i, \eta) = a(T_i) \cdot \exp(b(T_i) \cdot \eta) \\ + d_1(T_i) \cdot \exp(-c_1(T_i) \cdot (\eta - m_1(T_i))^2) \\ + d_2(T_i) \cdot \exp(-c_2(T_i) \cdot (\eta - m_2(T_i))^2)$ <p>by choosing the 'right' drift $\mu_t^y(x_t, y_t)$.</p> <ul style="list-style-type: none"> • $b(t)$ - ATM FX-option • $d(t), m(t)$ - in/out-of-the-money FX-options • σ_t^y - Autocorrelation of FX-products
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Results:

<p>Model output Caplets:</p> <ul style="list-style-type: none"> • perfect fit to caplet prices • good fit to Swaption prices 	<p>Model output FX-options:</p> <ul style="list-style-type: none"> • very good fit to FX-option prices
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Further details can be found on:
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