Jim Gatheral: "Further Developments in Volatility Derivatives Modeling"

After reviewing previous work on the Double Heston model, the Double Lognormal model and their extension, the Double CEV model, we carefully estimate the parameters of the latter model by fitting it to market prices of SPX and VIX options. In particular, we present a technique for accurately estimating the CEV exponent in the volatility process. We proceed to investigate the stability over time of the fitted parameters, finding that although it is true that prices of VIX options are roughly consistent with lognormal volatility dynamics, volatility of volatility is not stable. We also investigate how well the model reproduces market prices of options on realized variance. We conclude by summarizing the pros and cons of the Double CEV model, suggesting in the process how a better model might look.