VOLADYNAMICS

The Volatility Company

Analytics for Options Trading

Flexible and Intuitive

Trade any equity, ETF, future or index options off auto-fitted Vola curves and/or easily create your own.

Robust and Fast

Based on modern Bayesian ideas, superior numerics, and 30 years worth of research and trading.
Stable valuations for automated trading even around high volatility/opportunity events and periods.

Cost-Effective Easy Integration

Drop-in replacement for the critical pricer and fitter components of your infrastructure (C++, python, etc).

Vola Pricer

- Super-fast and robust pricing of European and American vanillas, with accurate handling of cash dividends.
- Prices the whole US options universe on one box in a fraction of a second (without table method!).
- Choice of several dividend pricing models that make sense and are actually used by the most successful options trading firms.
- Covers options on stocks, ETFs, futures, and indices.
- Handles large borrow costs and any number of cash dividends.
- Full set of smooth greeks: delta, gamma, vega, volga, vanna, rho, rhoBorrow, theta, fugit.
- "Smart" delta and gamma taking spot-vol dynamics into acount.
- Fast and accurate implied vol calculation for any dividend model.

Vola Fitter

- Super-fast and robust fitting of European and American vanillas.
- Fits the whole US options universe on one box in a second.
- Uses unique set of curves (see Curves), allowing smooth and sensible fits of all observed skews in the market.
- Based on modern Bayesian ideas, superior numerics, and 30 years of research and trading.
- Robustness is achieved by transferring information across strikes, expiries and time (smart filtering) from liquid to illiquid.
- Adjust vol surfaces between fits using realistic spot-vol dynamics.
- The Vola fitter can produce arbitrage-free volatiliy surfaces even in the far wings, beyond the range of listed options, as required for the calibration of the various "SLVJ" models used for exotics.

Vola Curves

- Easily create and manipulate vol curves/surfaces to fit any market.
- Intuitive and flexible family of nested parametric curves, way beyond standard curves like SVI and SSVI (which we also offer).
- Our unique curves allow fitting of even the most liquid underliers (SPX-complex), incl. W-shaped curves around earnings (AMZN, AAPL).
- Easily manipulate vol level and curve shape (skew, curvature, wings), and create realistic (incl. catastrophic) risk scenarios.
- Easily switch between different Vola curve types.
- Sensible book-level sensitivities to all parameters, across curve types.
- Curve parameters are optimal input for signal research & idea generation.

Vola Vol Derivatives

- Fast pricing of var and vol swaps with optional caps, and options on var and vol.
- Consistently price and hedge var/vol options with vanillas, under the same spot-vol dynamics assumption (alternatively, greeks can be calculated under the "sticky-strike" assumption).
- Use a default auto-calibrated model or provide a vol surface for future variance explicitly to consistently price and risk-manage all vol derivatives.

Libraries are standard C++11. Wrappers for Python, Java. All platforms supported.

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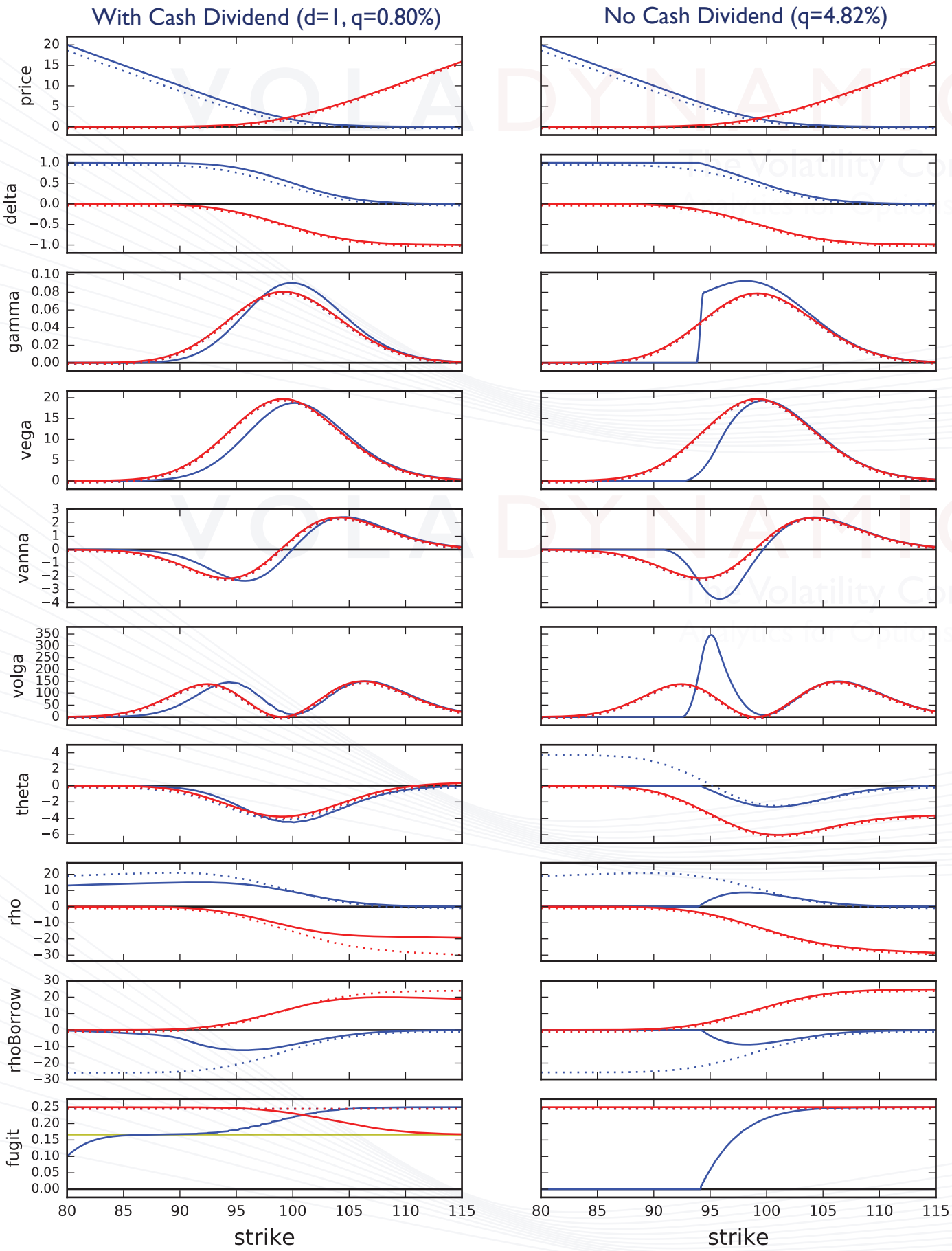
Greeks as Function of Strike



Greeks as a function of strike for spot=100, r=1.00%, σ=10%, T=3 months with forward F_T=99.05. On the left there is a cash dividend of d=1 at t_d=2 months with a borrow of q=0.80%. On the right the same forward is achieved by d=0, q=4.82%. Calls and puts are shown in blue resp. red. American (European) options are shown in solid(dotted) lines. The yellow line shows the dividend time.

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