Discussion: *Implied Volatility Spreads, Skewness and Expected Market Returns* Atilgan, Bali, Demirtas

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Reaction

- Interesting: predicts stock returns from option volatilities.
- Looks at implied volatility spread $VS = \sigma_{OOM,Put} - \sigma_{ATM,Call}$.
- Used VS to proxy for skewness a la Xing, Zhang, Zhao (2009).
- They find higher VS associated with lower future returns.
- Future returns controlled for various macroeconomic variables.
- Then test two hypotheses:
  - *Informational*: effect is driven by information events;
  - *Skewness*: effect is driven by skewness (κ_3).
- Information proxy: earnings announcement season dummy.
- They conclude effect is driven by information events.

Motivational, Writing Suggestions

- Other causes: kurtosis (κ_4), liquidity, stock bid-ask?
- For info spillover from options, should also mention:
  - Hasbrouck (1995) = information share; and,
  - Recent work by Pearson *et al*, Sinha *et al*.
- Other work which might better motivate the paper:
  - Bondarenko (2003) on why put options are more expensive.
  - May also want to discuss work by Sinha on news and momentum.
- For skewed-t: show skew, kurtosis in terms of σ, λ, ν.
- A few typos (doubled words); but, overall:
  - Very nicely written; like the flow of ideas.

Theoretical Suggestions

- Differences of volatilities are theoretically troublesome.
  - Robustness check: look at spread between implied variances.
- Xing, Zhang, and Zhao (2009): *VS* is skew; I don't buy it.
  - Think about vol curve meaning: bends log-normal tails.
  - If $\kappa_3 = 0, \kappa_4 > 3$: vol curve symmetric about K.
  - However, in that case $VS > 0$; *VS* cannot be just skew.
  - Centered difference is more sensible:

$$\sigma_{OOM,Put} - \sigma_{ATM,Call} - \sigma_{ATM,Put} + \sigma_{ITM,Call} \tag{1}$$

- Also look at kurtosis measure:

$$\frac{\sigma_{OOM,Put} - \sigma_{ATM,Call} + \sigma_{ATM,Put} - \sigma_{ITM,Call}}{2} \tag{2}$$

- Robustness check: look at commodities (very strange vol!)

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Theoretical Corrections

- High kurtosis: not just fat tails; also more returns near 0.
- Ranges are not robust to microstructure noise.
  - Low, high likely from sell, buy $\Rightarrow$ range includes bid-ask.
  - See working paper by Corwin and Schultz, Roll (1984).
- Estimators of κ_3, κ_4 (sections 3.2, 3.3):
  - Efficient estimators under log-normality: old stats result.
  - Physical kurtosis estimator should be

$$e^{r\tau}X - 4e^{r\tau}\mu W - 3e^{r\tau}V^2 + 12e^{r\tau}V\mu^2 - 6\mu^4 \qquad (3)$$

Data Suggestions

- Also control for TED spread (flight to quality/liquidity).
- Robustness check: What if you look at changes in sentiment?
- Would these results hold if using intraday data?
  - Not clear; information flow happens very quickly.
  - EOD measures may differ from times around news events.
- Skewness is due to rare, asymmetric surprises beyond σ.
  - I doubt subsetting information events rules out skewness.
  - Skewness should be even harder to infer in quiet periods.

Conclusion

- Interesting use of options market data to explain underlying.
- I really like the possibilities for such analysis.
- However, I doubt the skewness hypothesis is disproven here.
  - More care is needed since skewness comes from rare events.
  - Separate out skewness from kurtosis.
- Can they theorize proper penalty for skewness, kurtosis?
  - No penalty for either would be odd.
  - A few possible ideas that might be worth examining.