

An empirical index of Knightian uncertainty

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Discussion by:
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What does the paper do?

- Develops a new proxy to capture ambiguity (Knightian uncertainty).
- Computes ambiguity as the divergence between implied distributions of two consecutive days for a stock.
- Examines the impact of ambiguity on stock returns.

Key findings

- Investors receive lower returns on more “ambiguous” stocks.
- Ambiguity negatively correlated with risk and liquidity factors.
- Ambiguity provides explanatory power even in the presence of a wide range of traditional risk and asset pricing measures.
- Cross-sectional regressions (Fama and MacBeth (1973)) suggest a strong relationship between ambiguity and future returns.

What does this proxy capture?

News or ambiguity?

- Investors know or act as if they know the probabilities – EU paradigm.
- Do not know the precise probabilities – ambiguity (Knightian uncertainty).
- Ambiguity proxy: shift in risk neutral density (RND) from date t to $t + 1$.

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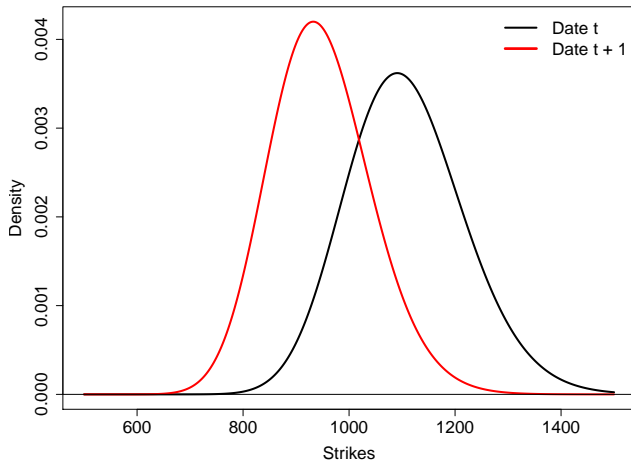
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 - On date t , $S_t=939$, $T_1=60$ days
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- From date t to $t + 1$, RND shifts.

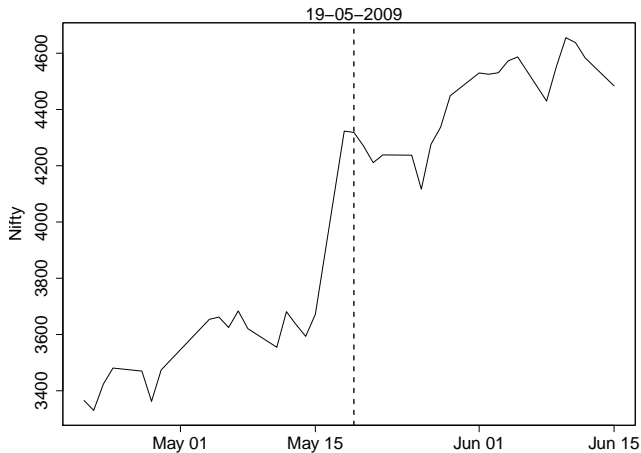
RND extracted from simulated option prices



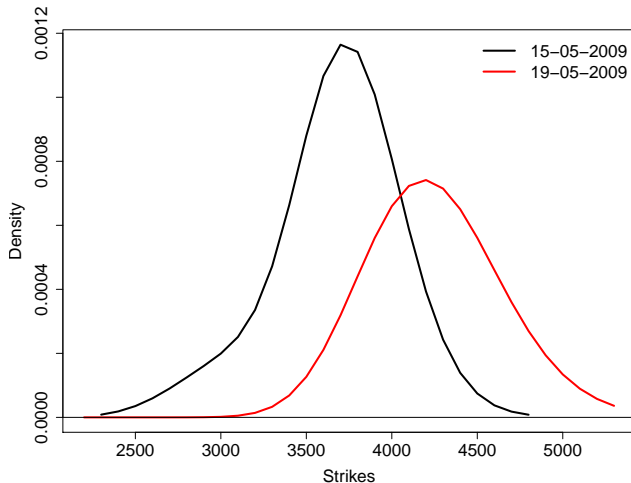
Example: Indian general elections, 2009

- The big move of Nifty post announcement of election results.
- Shift in RND.
- Is this ambiguity?

Event: Announcement of election results, 2009



RND extracted from Nifty option prices



Other proxies for ambiguity

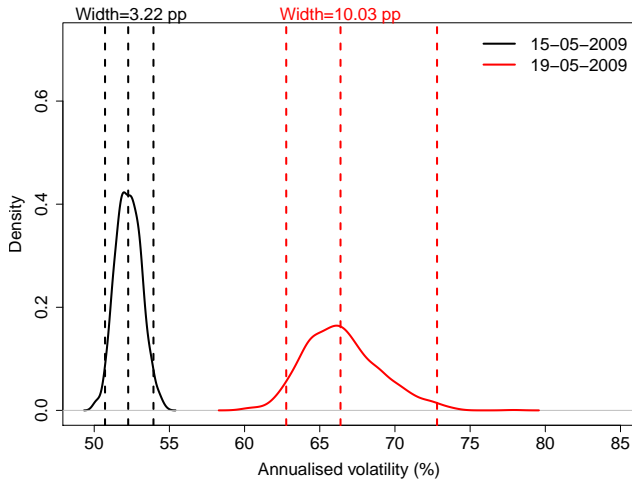
Volatility of volatility

- Variation in the investor's perception of stock return volatility.
- Can be incorporated in two ways: stochastic volatility models and volatility of implied volatility.
- Is this ambiguity?
- Grient et al. (2012) use volatility of VIX as a proxy for ambiguity.
- They also find negative correlation between volatility of VIX and stock returns.
- Brenner and Izhakain (2011) measure ambiguity by the variance of probability of loss or gain.
- They find low correlation between ambiguity and volatility of VIX.
- They conclude that their measure of ambiguity is not a proxy for volatility of volatility.

Imprecision of implied volatility

- Measurement errors in the estimation of VIX render it imprecise.
- VIX – a fuzzy estimator of volatility.
- Grover and Shah (2013) propose a non-parametric methodology to capture this imprecision in VIX.
- Imprecision indicators: width of confidence band and standard deviation of bootstrapped VIX estimates.
- Uncertainty in VIX may be another way to capture ambiguity.

Imprecision in VIX around the 2009 elections



Conclusion

- The paper develops a new proxy for ambiguity.
- The proxy for ambiguity is the mean divergence of probability distributions.
- In a simple Gaussian GBM setting, shift in RND from date t to $t + 1$, is just news.
- How does this proxy capture ambiguity?
- Is it just another proxy for vol of vol?