The Relationship Between Implied and Realized Volatilities

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Current Research

- “Variance Risk Premiums” Carr and Wu, 2009
- “Variance Risk-Premium Dynamics: The Role of Jumps” Todorov, 2010
"Variance Risk Premiums"
Carr and Wu, 2009

Variance Swap
- Over-The-Counter contract that pays the difference between an estimate of the realized variance and the fixed variance swap rate
- Can be accurately synthesized by a linear particular combination of option prices

Variance Risk Premium
- Difference between realized variance and the synthetic variance swap rate
“Variance Risk Premiums”
Carr and Wu, 2009

Size of Variance Risk Premiums

- Market only prices the systemic variance risk component into the premiums
- VRP of each equity is proportional to the covariance of the return variance to the market portfolio return variance

Questions:

- Does the VRP change over time?
- If so, how does it change in response to fluctuations or shocks in the market portfolio return variance?
“Variance Risk-Premium Dynamics: The Role of Jumps”

Todorov, 2010

Sources of market variance risk:
- Changes in stochastic volatility over time
- Occurrence of unanticipated market jumps

Role of Jumps:
- Short-lived spike in stochastic volatility
- Longer-lived increase in VRP after a large jump

Question:
- How do the relative size of jumps and the direction of jumps affect their impact on the VRP?
Possible Topics to Pursue

- To what extent do Volatility Risk Premiums change in response to fluctuations of the market portfolio return variance?

- How do the relative size of jumps and the direction of jumps affect their impact on the VRP?