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Jeff Hamrick* (jhamrick@usfca.edu), University of San Francisco, School of Management, 2130
Fulton Street, San Francisco, CA 94117. *Calibration of Stable Distributions to Option
Prices*. Preliminary report.

Equity call and put option prices clearly encode the market's opinion about the distribution of future returns on the underlying. In a seminal paper from earlier this last decade, Jackwerth and Rubinstein use a nonparametric technique to obtain an estimate of this probability distribution. Unfortunately, their technique generates return distributions that are bounded from above and below. This feature is not especially realistic. Stock returns, after all, are well-known to be heavy-tailed and exhibit negative skewness.

We adopt the perspective that stock returns have a stable distribution. We use the associated risk-neutral probability distribution required to price equity call and put options in an arbitrage-free way, and develop a program of optimization for obtaining parameters that govern the stable distribution.

We find that, when compared to our technique, traditional numerical maximum likelihood estimation techniques understate the tail heaviness and left-skewness of the return distributions implied by equity call and put option prices. As a result, derivative traders and portfolio managers concerned about fat tails and left-skewed returns may prefer our technique to the more traditional approach. (Received September 18, 2013)