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**Tim Leung\*** (leung@ieor.columbia.edu), New York, NY 10027, and **Ronnie Sircar**. *Implied Volatility of Leveraged ETF Options*.

This paper studies the problem of understanding implied volatilities from options written on leveraged exchanged-traded funds (LETFs), with an emphasis on the relations between options on LETFs with different leverage ratios. We first examine from empirical data the implied volatility surfaces for LETFs based on the S&P 500 index, and we introduce the concept of moneyness scaling to enhance their comparison with non-leveraged ETF implied volatilities. Under a multiscale stochastic volatility framework, we apply asymptotic techniques to derive an approximation for both the LETF option price and implied volatility. The approximation formula reflects the role of the leverage ratio, and thus allows us to link implied volatilities of options on an ETF and its leveraged counterparts. We apply our result to quantify matches and mismatches in the level and slope of the implied volatility skews for various LETF options using data from the underlying ETF option prices. This reveals some apparent biases in the leverage reflected in the different products, long and short with leverage ratios two and three times. (Received November 10, 2012)