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Michael Bauer, Xiaowen Chang and Michael Conway* (mbconwa@emory.edu). *Quantifying Option Implications*. Preliminary report.

We introduce relevant financial concepts, and describe how mathematical tools can be used to extract information about the market's expectations and risk preferences from daily, observable options market prices on the S&P 500. This information takes the form of a probability density function, known as the Risk-Neutral Density (RND). This project investigated parametric and non-parametric methods for extracting these RNDs. While neither method proved to be superior, we found that the non-parametric method could be improved. Assuming no prior knowledge, we introduce our major tools, including splines and the Generalized Extreme Value (GEV) Distributions, and show how they can be used in a financial context. Our results are based on the daily implied risk neutral densities that we derived for 3800 days. We used the density curves to analyze various market crashes and events during the past two decades. Using regression, we tried to predict option prices for very short periods, which is new to the literature. We also tried to understand how expectation and risk preferences are incorporated into U.S. stock prices. (Received August 25, 2014)