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Estimating Risk Neutral Distributions

WHEN
May, 11th, 2021
2:00 PM, CDT

WHERE
Via ZOOM
ZOOM information will be provided in the email announcement for this seminar.

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Option prices contain the market's expectations of probability distributions for asset prices at future dates—these distributions are often referred to as risk neutral distributions. Because one of the most important factors of option trading is thinking about the distribution of what can happen in the future, extracting these distributions is important for trading strategies. In this paper, I devise two complementary methods of extracting risk neutral distributions from market prices using minimal assumptions. The first method is nonparametric which allows us to obtain flexible estimates of the probability distributions. The second method is parametric and allows us to focus on extracting the important multimodal characteristics of risk neutral distributions that are often present around large events such as earnings and during extremely chaotic market conditions such as the 2020 pandemic sell-off. The two methods are constructed from techniques in statistics and convex optimization and appear to be robust to pathological high noise data.

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