



## EQUITIES

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### Forecasting the Distribution of Option Returns

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We propose a method for constructing conditional option return distributions. In our model, uncertainty about the future option return has two sources: Changes in the position and shape of the implied volatility surface that shift option values (holding moneyness and maturity fixed), and changes in the underlying price which alter an option's location on the surface and thus its value (holding the surface fixed). We estimate a joint time series model of the spot price and volatility surface and use this to construct an ex ante characterization of the option return distribution via bootstrap. Our "ORB" (option return bootstrap) model accurately forecasts means, variances, and extreme quantiles of S&P 500 index conditional option return distributions across a wide range of strikes and maturities. We illustrate the value of our approach for practical economic problems such as risk management and portfolio choice. We also use the model to illustrate the risk and return tradeoff throughout the options surface conditional on being in a high or low risk state of the world. Comparing against our less structured but more accurate model predictions helps identify misspecification of risks and risk pricing in traditional no-arbitrage option models with stochastic volatility and jumps.

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