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Asset Growth, Profitability, and Investment Opportunities.

State price densities (SPDs) are an important element in applied quantitative finance. In a Black-Scholes world they are lognormal distributions but in practice volatility changes and the distribution deviates from log-normality. In order to study the degree of this deviation, we estimate SPDs using EUREX option data on the DAX index via a nonparametric estimator of the second derivative of the (European) call pricing function. The estimator is constrained so as to satisfy no-arbitrage constraints and corrects for the intraday covariance structure in option prices. In contrast to existing methods, we do not use any parametric or smoothness assumptions.