## Moment Explosions and Long-Term Behavior of Affine Stochastic Volatility Models

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We consider a class of asset pricing models, where the risk-neutral joint process of log-price and its stochastic variance is an *affine process* in the sense of Duffie, Filipovic and Schachermayer [2003]. We present results on the long-term behavior of the model, including an expression for the stationary distribution of the stochastic variance process. These results can be linked – through a saddlepoint type approximation – to the shape of the implied volatility surface for large time-to-maturity. We also study moment explosions of the price process, and provide explicit expressions for the first time a moment of given order explodes. Again, the results on moment explosions can be used to obtain asymptotics of the implied volatility surface, in this case for extreme strike prices. Our results apply to several well-known stochastic volatility models, such as the Heston model with and without additional jumps, a model of Bates and the Barndorff-Nielsen-Shephard model

[1] D. Duffie, D. Filipovic, and W. Schachermayer. Affine processes and applications in finance. *The Annals of Applied Probability*, 13(3):984–1053, 2003.