

ON PARAMETER ESTIMATION FOR CRITICAL AFFINE PROCESSES

MÁTYÁS BARCZY (JOINT WORK WITH LEIF DÖRING, ZENGHU LI AND GYULA PAP)

First, we provide a simple set of sufficient conditions for the weak convergence of scaled affine processes with state space $\mathbb{R}_+ \times \mathbb{R}^d$. We specialize our result to one-dimensional continuous state branching processes with immigration.

Then, as an application, we study the asymptotic behaviour of (conditional) least squares estimators of some parameters of a two-dimensional critical affine diffusion process. Namely, let us consider the affine diffusion process given by the SDE

$$\begin{cases} dY_t = (a - bY_t) dt + \sqrt{Y_t} dW_t, \\ dX_t = (m - \theta X_t) dt + \sqrt{Y_t} dB_t, \end{cases} \quad t \geq 0, \quad (1)$$

where $a > 0$, $b, \theta, m \in \mathbb{R}$, and $(W_t)_{t \geq 0}$ and $(B_t)_{t \geq 0}$ are independent standard Wiener processes. In the critical case $b = 0$, $\theta = 0$, we study the asymptotic behaviour of the (conditional) least squares estimators of m and θ based on discrete time observations of the process X .

The full presentation of our results can be found in [1]. Similar analysis of the asymptotic behaviour of the least squares estimators of m and θ in the subcritical case $b > 0$, $\theta > 0$ can be found in [2].

REFERENCES

- [1] M. Barczy, L. Döring, Z. Li and G. Pap. *On parameter estimation for critical affine processes*. Electronic Journal of Statistics, Volume 7 (2013), 647-696. <http://projecteuclid.org/DPubS?service=UI&version=1.0&verb=Display&handle=euclid.ejs/1363268500>
- [2] M. Barczy, L. Döring, Z. Li and G. Pap. *Parameter estimation for an affine two factor model*. ArXiv (2013). <http://arxiv.org/abs/1302.3451>