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REPLY TO "ON SOME PROBLEMS IN THE ARTICLE *EFFICIENT LIKELIHOOD ESTIMATION IN STATE SPACE MODELS*[1]" BY CHENG-DER FUH [*Ann. Statist.* 34 (2006) 2026–2068]

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The author is grateful for the comments by Dr. Jensen. This note is in reply to his comments.

Problem 2.1. Definition of iterated function system.

$$\mathbf{P}_\theta(\xi_j)h(x) = \int_{y\in\mathcal{X}} p_\theta(y,x) f(\xi_j;\theta|x,\xi_{j-1})h(y)m(dy). \tag{2.6}$$

Define the composition of two random functions as

$$\begin{aligned}&\mathbf{P}_\theta(\xi_{j+1}) \circ \mathbf{P}_\theta(\xi_j)h(x)\\ &\quad = \int_{z\in\mathcal{X}} p_\theta(z,x) f(\xi_{j+1};\theta|x,\xi_j)\\ &\qquad \times \biggl(\int_{y\in\mathcal{X}} p_\theta(y,z) f(\xi_j;\theta|z,\xi_{j-1})h(y)m(dy)\biggr)m(dz).\end{aligned} \tag{2.7}$$

Page 2042. C1. ...for all $s_0, s_1 \in \mathbf{R}^d$, and $\sup_{x\in\mathcal{X}} \int p_\theta(y,x)m(dy) < \infty$. Since m is σ-finite, there exist pairwise disjoint $\mathcal{X}_n$ such that $\mathcal{X} = \bigcup_{n=1}^\infty \mathcal{X}_n$, and $0 < m(\mathcal{X}_n) < \infty$. Assume $E[\sum_{n=1}^\infty \frac{1}{2^n} \sup_{x\in\mathcal{X}_n} f(\xi_1;\theta|x,s_0)] < \infty$ for all $s_0 \in \mathbf{R}^d$. Denote $g_\theta(\xi_0,\xi_1) = \sup_{x\in\mathcal{X}} \int p_\theta(y,x) f(\xi_1;\theta|x,\xi_0)m(dy)$. Furthermore, we assume that there exists $p \geq 1$ as in K2 such that

$$\sup_{(x_0,s_0)\in\mathcal{X}\times\mathbf{R}^d} E^\theta_{(x_0,s_0)}\biggl\{\log\biggl(g_\theta(s_0,\xi_1)\cdots g_\theta(\xi_{p-1},\xi_p)\frac{w(X_p,\xi_p)}{w(x_0,s_0)}\biggr)\biggr\} < 0. \tag{5.2}$$

The example on Page 2044, L12, holds if $\alpha \neq 0$. The original (5.6) was wrong; it should be

$$M_n := \mathbf{P}_\theta(\xi_n) \circ \cdots \circ \mathbf{P}_\theta(\xi_1) \circ \mathbf{P}_\theta(\xi_0)\pi \qquad \text{(page 2045)}. \tag{5.6}$$

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[1]Editors' note: The standard *Annals of Statistics* policy is that brief author responses and corrigenda are only reviewed for style and appropriateness; authors themselves are responsible for their correctness.