

Correction to
“Local limit theorem and distribution of periodic
orbits of Lasota-Yorke transformations
with infinite Markov partition”

[This JOURNAL, Vol. 46 (1994), 309-343]

By Takehiko MORITA

(Received June 16, 1994)

The proof of Theorem 6.1 in [2] has the following error. The choice of y_J in the 8th line from the bottom of p. 336 is not suitable to estimate $\sup_{(s,t) \in W(s_0,t_0)} |II|$ because

$$(*) \quad \sum_{J \in \mathcal{P}_n, T^k J = J'} G_k(y_J) EY_{J'}(y_J) = L^k EY_{J'}(T^k y_J)$$

does not hold if we put $y_J = x_J$. If we would choose y_J as in Baladi and Keller [1], we could carry out the estimation in the same manner as in [1].

First of all, we give a suitable choice of y_J . Let $\mathcal{K} = \{K_1, \dots, K_p\}$ be the finite set of the intervals appearing as $T \text{Int } J$ for some $J \in \mathcal{P}$ (see (L-Y.1) in [2, p. 313]). We note that $T^n \text{Int } J \in \mathcal{K}$ for any $J \in \mathcal{P}_n$ by the Markov property of T . Choose $a_j \in K_j$ for $j=1, 2, \dots, p$ and we continue our discussion with fixing them. For each $J \in \mathcal{P}_n$, $y_J \in J$ should be chosen so that $T^n y_J = a_j$ if $T^n \text{Int } J = K_j$. Then it is clear that $T y_{J'} = y_J$ holds whenever $J \in \mathcal{P}_n$, $J' \in \mathcal{P}_{n-1}$, and $T \text{Int } J = \text{Int } J'$. Thus the present choice of y_J guarantees the validity of (*).

Next, the author would like to give the estimate of $\sup_{(s,t) \in W(s_0,t_0)} |II|$ by using the correctly chosen y_J for the reader unfamiliar with the argument in [1]. Note that the constants C_8, C_9 , and C_{10} below can be chosen to be independent of $(s,t) \in W(s_0,t_0)$ although they are possibly different from those in [2]. In addition, we write $TJ = J'$ instead of $T \text{Int } J = \text{Int } J'$ and so on for the notational convenience. Now we have

$$\begin{aligned} II &= \sum_{J \in \mathcal{P}_n} E L^n \chi_J(x_J) = \sum_{J \in \mathcal{P}_n, T^n J \supset J} \sum_{k=0}^{n-1} G_k(x_J) EY_{T^k J}(x_J) \\ &= \sum_{J \in \mathcal{P}_n, T^n J \supset J} \sum_{k=0}^{n-1} (G_k(x_J) - G_k(y_J)) EY_{T^k J}(x_J) \end{aligned}$$