Morita, T.
Osaka J. Math.
30 (1993), 611-612

CORRECTION TO "A GENERALIZED LOCAL LIMIT THEOREM FOR LASOTA-YORKE TRANSFORMATIONS"

TAKEHIKO MORITA

(Received October 12, 1991)

Definition 1.1 of a Lasota-Yorke transformation in [1, p. 580] is incomplete because it is not consistent with the assertion of Remark 1.1. Therefore we have to change the condition (iii) of (1) as follows:

(iii) The set of the images $\{T(\mathrm{Int}\, I_j)\}_j$ consists of only a finite number of distinct kinds of intervals.

In virtue of this improvement, Proposition 1.2 in p. 582 and its proof will be changed as follows.

Proposition 1.2. (Lasota-Yorke type inequality). *Let T be an L-Y transformation which satisfies the expanding condition* (1.2) *for* $N=1$. *Let $\mathcal{L}$ be the P-F operator of T with respect to m. Then for any $n\in N$ and $f_0, f_1, \cdots, f_{n-1}\in BV(I\to S^1)$, we have*

$$(1.5)\qquad V(\mathcal{L}^n((\prod_{k=0}^{n-1} f_k\circ T^k)g))\leq(2+\sum_{k=0}^{n-1} Vf_k)[c^n Vg+2(l_n^{-1}+R_n(T))\|g\|_{1,m}],$$

where $l_n=\min\{m(T^n J_j); J_j$ is the element of a defining partition of $T^n\}$ and

$$R_n(T)=\sup_x \frac{|(T^n)''(x)|}{|(T^n)'(x)|^2}.$$

Sketch of Proof: Noting that $S_j=T^n|\mathrm{Int}\, J_j$ is a homeomorphism from $\mathrm{Int}\, J_j$ onto its image for each j, we have, for any right continuous version of $g\in BV$,

$$\begin{aligned}&V(\mathcal{L}^n((\prod_{k=0}^{n-1} f_k\circ T^k)g))\\ &\leq \sum_j V_j[|(T^n)'|^{-1}(\prod_{k=0}^{n-1} f_k\circ T^k)g]+\sum_j \sup_{(j)}|(T^n)'|^{-1}[|g(a_j)|+|g(b_j)|]\\ &=\sum_j I_j+\sum_j II_j,\end{aligned}$$

where $J_j=(a_j, b_j)$, V_j denotes the total variation on J_j, and $\sup_{(j)}$ is the supremum which is taken over all $x \in \mathrm{Int}\, J_j$. Since we have

$$|(T^n)'(x)|^{-1} \leq ||(T^n)'(x)|^{-1} - |(T^n)'(y)|^{-1}| + |(T^n)'(y)|^{-1}$$
$$\leq R_n(T) m(J_j) + |(T^n)'(y)|^{-1}$$

for any $x, y \in \mathrm{Int}\, J_j$ and

$$m(T^n(\mathrm{Int}\, J_j)) \leq (\inf_{(j)} |(T^n)'|^{-1})^{-1} m(J_j),$$

we conclude that $\sup_j |(T^n)'|^{-1} m(J_j)^{-1} \leq l_n^{-1} + R_n(T)$, where $\inf_{(j)}$ denotes the infimum which is taken over all $x \in \mathrm{Int}\, J_j$. By using this fact the estimates of I_j and II_j are carried out in the same way as in [1]. One may notice that the proof become simpler than it was because we do not need to classify the indices j. //

References

[1] T. Morita, *A generalized local limit theorem for Lasota-Yorke transformations*, Osaka J. Math **26** (1989), 579–595.

Department of Mathematics
Faculty of Science
Osaka University
Toyonaka, Osaka 560
Japan