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REJOINDER

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I would like to thank the discussants for their thoughtful comments, and I would also like to thank the editors of *The Annals of Statistics* for this opportunity to respond. My comments are organized by topics addressed in the discussions.

Irreducibility. For simplicity, I wrote Theorem 1 and other results in my presentation to use as their key assumption that P is irreducible with respect to π. In most applications this is relatively easy to verify, but as Doss points out there are cases where it is not. The theory in Nummelin used to develop these results is actually more general. In particular, it is sufficient to verify irreducibility with respect to *any* σ-finite measure. Thus the following generalization of Theorem 1 is available.

THEOREM 1*. *Suppose P is φ-irreducible for some σ-finite measure φ on E and $\pi P = \pi$. Then φ is absolutely continuous with respect to π, P is π-irreducible, P is positive recurrent and π is the unique invariant distribution of P. If P is also aperiodic, then, for π-almost all x,*

$$\|P^n(x, \cdot) - \pi(\cdot)\| \to 0,$$

with $\|\cdot\|$ denoting the total variation distance. If P is Harris recurrent, then the convergence occurs for all x.

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