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ERRATUM

Erratum to: Extremal indices, geometric ergodicity of Markov chains, and MCMC

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In the beginning of the proof of Theorem 4.1, the first inequality in the first display is invalid. Here is the correct argument:

$$\begin{aligned}\Pr(X_k > u \mid X_0 > u) &= \int_u^{x_+} P^k(x, (u, \infty)) \frac{\pi(\mathrm{d}x)}{\pi(u, \infty)} \\ &\overset{\text{(A)}}{\le} \int_u^{x_+} \int_u^{x_+} \frac{V(y)}{V(u)} P^k(x, \mathrm{d}y) \frac{\pi(\mathrm{d}x)}{\pi(u, \infty)}\end{aligned}$$

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$$\stackrel{\text{(B)}}{\leq} \int_u^{x_+} \frac{1}{V(u)} \left(\int_u^{x_+} V(y)\pi(\mathrm{d}y) + V(x)R\rho^k \right) \frac{\pi(\mathrm{d}x)}{\pi(u,\infty)}$$
$$= \int_u^{x_+} \frac{V(y)}{V(u)}\pi(\mathrm{d}y) + R\rho^k \int_u^{x_+} \frac{V(x)}{V(u)} \frac{\pi(\mathrm{d}x)}{\pi(u,\infty)}$$
$$= \left\{ \Pr(X > U) + R\rho^k \right\} \mathrm{E}\left[\frac{V(X)}{V(u)} \middle| X > u \right].$$

Explanation: (A) since $u \leq y$ and since V is positive and non-decreasing; (B) by equation (2.5) in the paper, for certain constants $R > 0$ and $0 < \rho < 1$. Now denote

$$C = \limsup_{u\to\infty} \mathrm{E}\left[\frac{V(X)}{V(u)} \middle| X > u \right].$$

Let k be sufficiently large such that

$$R \sum_{i=k}^{\infty} \rho^i < \frac{1}{2C}.$$

The rest of the proof now is as in the paper.

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