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ERRATUM

Strateg -proof cardinal decision schemes

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As was first pointed out to us by John Hegeman,[1] the proof of Claim 3, Theorem 1, in Dutta et al. (2007) is not correct, since it is based on interchanging two limits which is not justified without, for instance, a continuity assumption.

In this note we first give an alternative proof of $\lambda_j \leq \lambda'_j$ (notations as in Dutta et al. (2007)).

To show this assume, to the contrary, $\lambda_j > \lambda'_j$. By Claim 2 we can take u_1 with $\tau(u_1) = a_j$ and—for simplicity—$u_1(a) = 0$ for all $a \neq a_j$. Let $0 < \varepsilon < \frac{1}{2}(\lambda_j - \lambda'_j)$ and let η_2 be so small that $|\varphi_j(u_1, u_{kj}^{\eta_2}) - \lambda'_j| < \varepsilon$. Observe that agent 1's utility in this profile is equal to $\varphi_j(u_1, u_{kj}^{\eta_2})$.

[1] Stanford University.

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Next, take η_1 so small that $|\varphi_j(u^{\eta_1}_{jk}, u^{\eta_2}_{kj}) - \lambda_j| < \varepsilon$. This is possible in view of Claim 2 (with the roles of the agents there reversed). Then according to u_1 agent 1's utility is now $\varphi_j(u^{\eta_1}_{jk}, u^{\eta_2}_{kj})$, but $\varphi_j(u^{\eta_1}_{jk}, u^{\eta_2}_{kj}) > \varphi_j(u_1, u^{\eta_2}_{kj})$. This violates strategy-proofness.

Unfortunately, at this moment we do not know how to prove the reverse inequality $\lambda_j \geq \lambda'_j$ and, thus, Claim 3, without making additional assumptions. One possibility would be to extend the set of admissible utility functions by dropping the requirement that there be a unique top alternative and assume continuity of the **CDS** φ. Another possibility is to strengthen the unanimity condition by requiring that if every agent in a preference profile has the same two top alternatives, then all other alternatives should receive zero probability. A third possibility is to impose, additionally, the following requirement on φ, which is a kind of unanimity:

($*$) For all admissible profiles u and all $a_j \in A$, if $u_i(a_k) \geq u_i(a_j)$ for all $a_k \in A \backslash \{a_i\}$ and $i \in N$, then $\varphi_j(u) = 0$.

In other words, if the agents have a common bottom alternative, then that alternative should receive zero probability. We will prove $\lambda_j \geq \lambda'_j$ under this additional assumption ($*$). To the contrary, assume $\lambda_j < \lambda'_j$. Let $0 < \varepsilon < \frac{1}{2}(\lambda'_j - \lambda_j)$. By Claim 2, we may assume that the utility functions under consideration have a common bottom alternative b. Also by Claim 2, we may assume that $u^{\eta_1}_{jk}$ satisfies $u^{\eta_1}_{jk}(a) = 1 - \eta_1 - \alpha(\eta_1)$ for all (if any) $a \neq a_j, a_k, b$, with $\alpha(\eta_)$