Erratum to: Convex approximations for complete integer recourse models

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This note reports corrections to the results obtained by van der Vlerk [3], in which two errors were discovered by W. Romeijnnders.

The first problem is with Theorem 1 of this reference, which claims that the convex approximation Q_{α^*} yields the convex hull of the integer recourse function Q (in the space of tender variables) in case the recourse matrix is totally unimodular. As detailed in the report [1], this result only holds under very restrictive conditions on the distribution of the random right-hand side vector ω . Essentially, these conditions are only satisfied if the components of ω are independently and uniformly distributed as in Example 2 in van der Vlerk [3]. In general, the polyhedral function Q_{α^*} may not be a lower bound for Q , and the convex hull of Q may be non-polyhedral.

Theorem 2 therefore incorrectly assumes that Q_{α^*} is a lower bound for the integer recourse function Q (in the space of the first-stage variables). The function Q^{LP} , obtained by relaxing the second-stage integrality conditions, is a convex lower bound of Q . It can be shown that under the stated assumptions $Q_{\alpha^*}(x) > Q^{\text{LP}}(x)$ for all $x \in \mathbb{R}^n$ such that $Q_{\alpha^*}(x) > 0$, replacing the erroneous condition $Q(x) > 0$. Thus, if Q_{α^*} is a lower bound for Q , then it is strictly better than Q^{LP} in this sense.

Positive results for the class of TU integer recourse models, giving a uniform bound on the approximation error $\|Q_{\alpha^*} - Q\|_{\infty}$, are reported in Romeijnnders et al. [2].

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