Erratum to: “New Methods in the Arbitrage Theory of Financial Markets with Transaction Costs”, in Séminaire XLI

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Unfortunately, the proof of Lemma 4.6 in [1] needs an additional assumption.

For a closed cone $C \subset \mathbb{R}^d$ let C^* denote its positive dual cone (see [1]). It is erroneously claimed in the last line of page 460 that $(G^*_{T-l} \cap X)^* = G_{T-l} + X^*$ where $G_{T-l} = G_{T-l}(\omega)$ is a random closed cone in $\mathbb{R}^d$ and $X^*(\omega) = \{\alpha\xi(\omega) : \alpha \leq 0\}$ with some $\mathbb{R}^d$-valued random variable ξ (i.e. X^* is a random ray in $\mathbb{R}^d$).

The claimed identity holds if and only if $G_{T-l} + X^*$ is a *closed* cone in $\mathbb{R}^d$ a.s., see Corollary 16.4.2 of [2]. Hence the following hypothesis must be added to the statements of Lemma 4.6 and the main Theorem 3.1 in [1]:

Assumption. For all $0 \leq t \leq T$ and for almost all ω the cone $G_t(\omega)$ is such that $G_t(\omega) + \{\alpha x : \alpha \geq 0\}$ is closed in $\mathbb{R}^d$ for each $x \in \mathbb{R}^d$.

The above Assumption is trivially satisfied when G_t is a (random) *polyhedral* cone: a ray is, in particular, a polyhedral cone and the sum of two polyhedral cones is polyhedral and hence closed.

Although restricted in generality by the Assumption given above, Theorem 3.1 of [1] still covers the cases which are relevant to financial markets with proportional transaction costs. In those models G_t are assumed to be polyhedral, see the references of [1].

References

1. Rásonyi, M. (2008) New methods in the arbitrage theory of financial markets with transaction costs. *Séminaire de Probabilités XLI*, Lecture Notes in Mathematics **1934**, 455–462, Springer, Berlin.
2. Rockafellar, R. T. (1970) *Convex analysis.* Princeton University Press, Princeton, N. J.

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