



## A GEOMETRIC APPROACH TO PRICING MULTI-ASSET BARRIER OPTIONS

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**Abstract.** We introduce multi-asset options with barrier of hyperplane type and, for a seminal class of these, closed-form expressions of no-arbitrage prices are obtained. An interesting aspect of such seminal structure is that it boils down to a well exploited financial object: a geometric basket of assets. This unveils the fact that general hyperplane structures naturally represent barrier formats and significantly expand the design possibilities of barrier options. In this work the risky assets evolve independently at first and, in the sequel, results for the dependent case are provided. We also provide an expression for a certain joint density function from which prices for more general barrier options could be obtained numerically.

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