

New closed-form approximation in multi-asset market making

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The job of market makers is to provide liquidity to other market participants. The main source of risk for market makers is holding inventory and the uncertainty of future price variation. In many cases, the market makers are in charge of a large range of assets. Hence, managing the risk in the multiple asset cases is an important task. Here, we address closed-form approximations for optimal quotes in multi-asset market making. We base our work on the companion paper "Optimal market making" by Guéant. Our model gives rise to the interesting feature of exploiting the correlation between the assets for risk management. Moreover, our method is based on an approximation of a system of ordinary differential equation through a parabolic partial differential equation. First, we consider the case of symmetric and asymmetric market order arrival rate intensities. Finally, we extend our model to consider drift and adverse selection in the asset reference price.