

Accepted Manuscript

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PII: S0165-1889(17)30203-8
DOI: [10.1016/j.jedc.2017.09.008](https://doi.org/10.1016/j.jedc.2017.09.008)
Reference: DYNCON 3477

To appear in: *Journal of Economic Dynamics & Control*

Received date: 23 December 2016
Revised date: 27 September 2017
Accepted date: 30 September 2017

Please cite this article as: Nicole Branger, Matthias Muck, Frank Thomas Seifried, Stefan Weisheit, Optimal Portfolios when Variances and Covariances can Jump, *Journal of Economic Dynamics & Control* (2017), doi: [10.1016/j.jedc.2017.09.008](https://doi.org/10.1016/j.jedc.2017.09.008)



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Optimal Portfolios when Variances and Covariances can Jump

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This version: October 6, 2017

Abstract

We analyze the optimal portfolio choice in a multi-asset Wishart-model in which return variances and correlations are stochastic and subject to jump risk. The optimal portfolio is characterized by the positions in stock diffusion risk, variance-covariance diffusion risk, and jump risk. We find that including jumps in the second moments changes the optimal positions and particularly variance-covariance hedging demands significantly. Erroneously omitting these jumps gives rise to substantial model risk. Furthermore, variance-covariance jump risk can have a significant impact on potential utility gains when the market is completed by adding derivatives. As a robustness check, we compare our results to those obtained for other parametrizations of Wishart-models from the literature as well as to various single-asset models.

KEYWORDS: Optimal portfolio choice, stochastic correlation, Wishart process, derivatives, jump risk, covariance jumps

JEL CLASSIFICATION: G11, G13

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