Re-balancing hedge position with statistics of hedge ratios: concepts and applications *

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Abstract

In a recent article (2022, *The Journal of Derivatives*), Fabozzi and Fabozzi conclude "...... there is strong evidence that these models (advanced econometric models) do not improve hedge efficiency significantly, if at all". As a matter of fact, dynamic hedging attempts to strike the balance between hedging effectiveness and transactions costs. In this paper, using the Garch asymptotic theories developed by Ling and McAleer (2003, *Econometric Theory*), Francq and Zakoïan (2012, *Econometric Theory*) and Zhang, Sin and Ling (2015, *Stochastic Processes and their Applications*), we derive the asymptotic properties of the hedge ratio. As a result, we construct a natural and simple statistic of re-balancing, namely, the (asymptotic) standard deviation of hedge ratio. We apply our method to a number of paired variables such as WTI Crude Oil Futures and Spot Price. Empirical results are compared with those obtained in Tsuji (2018, *Economic Modelling*), Choudhry, Hasan and Zhang (2019, *International Journal of Banking, Accounting and Finance*), and Wang, Lin, Lin and Lai (2020, *Journal of Risk*).

Keywords and phrases: Dynamic hedging; Garch; model complexity; statistics of hedge ratios; transaction costs

JEL Classification C14, C22, C58, G11

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