

Applied Economics Letters >

Volume 14, 2007 - [Issue 7](#)

1,441 Views | 247 CrossRef citations to date | 3 Altmetric

Original Articles

# On the application of the dynamic conditional correlation model in estimating optimal time-varying hedge ratios

Yuan-Hung Hsu Ku ✉, Ho-Chyuan Chen & Kuang-Hua Chen

Pages 503-509 | Published online: 18 Jun 2007

🗨️ Cite this article 🔗 <https://doi.org/10.1080/13504850500447331>

Sample our  
Economics, Finance,  
Business & Industry Journals  
>> [Sign in here](#) to start your access  
to the latest two volumes for 14 days

📄 Full Article   📊 Figures & data   📖 References   🗨️ Citations   📊 Metrics

📄 Reprints & Permissions

Read this article

🔗 Share

## Abstract

This article applies the dynamic conditional correlation model of Engle (2002) with error correction terms in order to investigate the optimal hedge ratios of British and Japanese currency futures markets. For a comparison, the estimates of three other models -- traditional generalized autoregressive conditional heteroskedasticity (GARCH), ordinary least square (OLS) and error correction model (ECM) -- are also reported. Results show that the dynamic conditional correlation model yields the best hedging performance in both futures markets. Nonetheless, the traditional multivariate GARCH model (which exhibits constant conditional correlations and time-varying hedge ratios) performs the worst hedging effectiveness, even inferior to the time-invariant hedging methods (OLS and ECM). The inclusion of dynamic conditional correlations in the GARCH model can therefore better capture the frequent fluctuations in futures markets.

# Notes

<sup>1</sup> Bautista ([2003](#)) uses the DCC of Engle to obtain the dynamic correlation between the interest rate and the exchange rate in the Philippines in order to observe its structural changes. Recognizing the dynamic conditional correlation, we instead use this approach, incorporated with ECM, to obtain the variance matrix so as to analyse the hedging effectiveness of foreign currency futures, which is then compared with OLS and other multivariate GARCH hedges.

<sup>2</sup> The hedge ratio is calculated as the ratio of the covariance between spot and futures prices to the variance of the futures price.

<sup>3</sup> For discussions of other hedging strategies, readers can refer to Chen et al. ([2003](#)).

<sup>4</sup> Bollerslev ([1990](#)) decomposes the covariances into SDs and correlations and assumes CCCs between financial variables. Engle and Kroner ([1995](#)) instead propose the BEKK (named after Baba, Engle, Kraft and Kroner) multivariate GARCH model to ensure time-varying second moments and a positive-definite conditional-variance matrix. Its disadvantage is that the parameters cannot be easily interpreted.

<sup>5</sup> Kroner and Sultan ([1993](#)), who were the first to introduce an ECM for the first moment into a multivariate GARCH, studied the hedging effectiveness in five foreign exchange futures markets, which again are examined by Lien and Luo ([1994](#)).

<sup>6</sup> The minimum risk hedge ratio minimizes the variance of the hedge portfolio,  $+ +$  according to Johnson ([1960](#)), where  $\sigma_s^2$  and  $\sigma_f^2$  are the variance of the spot and futures prices, respectively; and  $X_s$  and  $X_f$  are the spot and futures positions, respectively. By the first-order condition, the optimal hedge ratio can be obtained  $h = -\frac{\sigma_{sf}}{\sigma_f^2}$ , where  $h$  and the negative sign represents shorting a futures contract.

Related Research Data

[Dynamic Conditional Correlation](#)

Source: Journal of Business and Economic Statistics

Hedge period length and Ex-ante futures hedging effectiveness: The case of foreign-exchange risk cross hedges

Source: Journal of Futures Markets

Time-varying distributions and the optimal hedge ratios for stock index futures

Source: Applied Financial Economics

Hedging with stock index futures: Theory and application in a new market

Source: Journal of Futures Markets

Market efficiency and cointegration: an application to the sterling and deutschemark exchange markets

Source: Journal of International Money and Finance

Correlated ARCH (CorrARCH): Modelling the time-varying conditional correlation between financial asset returns

Source: European Journal of Operational Research

## Related research

People also read

Recommended articles

Cited by  
247

[Dynamic Conditional Correlation: A Simple Class of Multivariate Generalized Autoregressive Conditional Heteroskedasticity Models](#) >

Robert Engle

Journal of Business & Economic Statistics

Published online: 1 Jan 2012

[Analysing spillovers between green cryptocurrencies and US equity sectors: measurements, spillover networks and driving factors](#) >

Imran Yousaf et al.

Applied Economics

Published online: 8 Jan 2026

[A Generalized Dynamic Conditional Correlation Model: Simulation and Application to Many Assets](#) >

Christian M. Hafner et al.

Econometric Reviews

Published online: 17 Aug 2009

[View more](#)

## Information for

[Authors](#)

[R&D professionals](#)

[Editors](#)

[Librarians](#)

[Societies](#)

## Opportunities

[Reprints and e-prints](#)

[Advertising solutions](#)

[Accelerated publication](#)

[Corporate access solutions](#)

## Open access

[Overview](#)

[Open journals](#)

[Open Select](#)

[Dove Medical Press](#)

[F1000Research](#)

## Help and information

[Help and contact](#)

[Newsroom](#)

[All journals](#)

[Books](#)

## Keep up to date

Register to receive personalised research and resources by email



Sign me up



Copyright © 2026 Informa UK Limited [Privacy policy](#)

[Cookies](#) [Terms & conditions](#) [Accessibility](#)

Registered in England & Wales No. 01072954  
5 Howick Place | London | SW1P 1WG



**Taylor & Francis**  
by informa