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Research Article

Modelling the absolute returns of different stock indices: exploring the forecastability of an alternative measure of risk

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Abstract

Conventional measures of the risk of a financial asset make use of the *unobserved* (conditional) variance or standard deviation of its return. In this paper, we treat the *observed* absolute return as a measure of risk and explore its forecastability. Two simple models are considered. One is a new *AR-like* model which is applied to the absolute return. The other is an *ARCH-like* model called Asymmetric Power ARCH. The forecastability is evaluated with the average log-likelihood of absolute return, instead of that of return itself. While the absolute return is interpreted as 'volatility', some quantities of its entire distribution, such as the 95th quantiles, can be interpreted as 'volatility of volatility'. We apply both models to three stock indices, namely the Hang Seng Index, the Nikkei 225 Index and the Standard and Poors 500 Index. The new model by and large outperforms the ARCH-like model in both in-sample goodness of fit and post-sample forecastability. It performs exceptionally well in the post-sample period after the outbreak of the Asian financial crisis. Copyright © 2000 John Wiley & Sons, Ltd.

REFERENCES

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Bollerslev T, Engle RF, Nelson DB. 1994. ARCH model. In *Handbook of Econometrics*, **IV**, RF Engle, DC McFadden (eds). Elsevier Science: Amsterdam; 2959–3038.

Google Scholar

Cao CQ, Tsay RS. 1992. Nonlinear time series analysis of stock volatilities. *Journal of Applied Econometrics* **7**: S165–S185.

Web of Science® | Google Scholar

Diebold FX, Gunther TA, Tay AS. 1998. Evaluating density forecasts with applications to financial risk management. *International Economic Review* **39**: 863–883.

Web of Science® | Google Scholar

Ding Z, Granger CWJ, Engle RF. 1993. A long memory property of stock market returns and a new model. *Journal of Empirical Finance* **1**: 83–106.

Web of Science® | Google Scholar

Efron B. 1991. Regression percentiles using asymmetric squared error loss. *Statistica Sinica* **1**: 93–126.

Web of Science® | Google Scholar

Ellis SP. 1998. Instability of least squares, least absolute deviation and least median of squares linear regression (with Comments and Rejoinder). *Statistical Science* **13**: 337–350.

Web of Science® | Google Scholar

Granger CWJ, Ding Z. 1995. Some properties of absolute return, an alternative measure of risk. *Annales d'Economie et de Statistique* **40**: 67–91.

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Hogg RV, Craig AT. 1995. *Introduction to Mathematical Statistics*. Prentice Hall: Englewood Cliffs, NJ.

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Kariya T, Tsukuda Y, Maru J. 1990. Testing the random walk hypothesis for Japanese stock prices in S. Taylor's model. Hitotsubashi University Discussion Paper.

Google Scholar

Koenker R. 1992 When are expectiles percentiles? *Econometric Theory* 8: Problems: 423–424; Solutions: 526–527.

Google Scholar

Koenker R, Bassett G. 1978. Regression quantiles. *Econometrica* **46**: 33–55.

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Lee S-W, Hansen BE. 1994. Asymptotic theory for GARCH(1,1) quasi-maximum likelihood estimator. *Econometric Theory* **10**: 29–52.

Web of Science® Google Scholar

Lumsdaine RL. 1996. Consistency and asymptotic normality of the quasi-maximum likelihood estimator in IGARCH(1,1) and covariance stationary GARCH(1,1) models. *Econometrica* **64**: 575–596.

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Newey WK, Powell JL. 1987. Asymmetric least squares estimation and testing. *Econometrica* **55**: 819–847.

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Newey WK, West KD. 1987. A simple, positive semi-definite, heteroskedasticity and autocorrelation consistent

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Robinson PM, Zaffaroni P. 1997. Modelling nonlinearity and long memory in time series. In *Nonlinear Dynamics and Time Series (Fields Institute Communications 11)*, CD Cutler, DT Kaplan (eds).

Google Scholar

Sin C-Y, Granger CWJ. 1999. Estimating and forecasting quantiles with asymmetric least squares. *Journal of Econometrics*.

Google Scholar

Taylor S. 1986. *Modelling Financial Time Series*. John Wiley: New York.

Google Scholar

Vuong QH. 1989. Likelihood ratio tests for model selection and non-nested hypothesis. *Econometrica* **57**: 307–333.

Web of Science® Google Scholar

Wooldridge JM. 1991. On the application of robust regression-based diagnostics to models of conditional means and conditional variances. *Journal of Econometrics* **47**: 5–46.

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Yao Q, Tong H. 1996. Asymmetric least squares regression estimation: a nonparametric approach. *Journal of Nonparametric Statistics* **6**: 273–292.

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