Advertisement

Journal of Futures Markets / Volume 31, Issue 1 / pp. 55-80

Research Article

Return distributions and volatility forecasting in metal futures markets: Evidence from gold, silver, and copper

Ahmed A. A. Khalifa, Hong Miao, Sanjay Ramchander

First published: 02 November 2010

https://doi.org/10.1002/fut.20459

PDF

Abstract

The characterization of return distributions and forecast of asset-price variability play a critical role in the study of financial markets. This study estimates four measures of integrated volatility—daily absolute returns, realized volatility, realized bipower volatility, and integrated volatility via Fourier transformation (IVFT)—for gold, silver, and copper by using high-frequency data for the period 1999 through 2008. The distributional properties are investigated by applying recently developed jump detection procedures and by constructing financial-time return series. The predictive ability of a GARCH (1,1) forecasting model that uses various volatility measures is also examined. Three important findings are reported. First, the magnitude of the IVFT volatility estimate is the greatest among the four volatility measures. Second, the return distributions of the three markets are not normal. However, when returns are standardized by IVFT and realized volatility, the corresponding return distributions bear closer resemblance to a normal distribution. Notably, the application of financial-time sampling technique is helpful in obtaining a normal distribution. Finally, the IVFT and realized volatility proxies produce the smallest forecasting errors, and increasing the time frequency of estimating integrated volatility does not necessarily improve forecast accuracy. © 2010 Wiley Periodicals, Inc. Jrl Fut Mark 31:55–80, 2011

This website utilizes technologies such as cookies to enable essential site functionality, as well as for analytics, personalization, and targeted advertising. You may change your settings at any time or accept the default settings. You may close this banner to continue with only essential cookies. Privacy Policy

Manage Preferences

Accept All

Reject Non-Essential

Aggarwal, R., & Soenen, L. A. (1991). The nature and efficiency of the gold market. *The Journal of Portfolio Management*, **14**, 18–21.

Web of Science® | Google Scholar

Akgiray, V., Booth, G., Hatem, J., & Chowdary, M. (1991). Conditional dependence in precious metal prices. *The Financial Review*, **26**, 367–386.

Google Scholar

Andersen, T., & Bollerslev, T. (1998a). DM-Dollar intraday volatility: Activity pattern, macroeconomic announcemnets, and longer run dependences. *Journal of Finance*, **53**, 219–265.

Web of Science® | Google Scholar

Andersen, T., & Bollerslev, T. (1998b). Answering the skeptics. *International Economic Review*, **39**, 885–905.

Web of Science® | Google Scholar

Andersen, T., Bollerslev, T., & Diebold, F. (2005). Parametric and nonparametric volatility measurement. In Y. Aot-Sahalia, & L. Hansen (Ed.), *Handbook of financial econometrics* (pp. 67–138). Amsterdam: North-Holland.

Web of Science® | Google Scholar

Andersen, T., Bollerslev, T., & Dobrev, D. (2007). No-Arbitrage semi-martingle restrictions for continous-time volatility models subject to leverage effects, jumps and i.i.d. noise: Theory and testable distributional implications. *Journal of Econometrics*, **138**, 125–180.

Web of Science® | Google Scholar

Andersen, T., Bollerslev, T., Frederiksen, P., & Nielsen, M. Ø. (2010). Continuous-time models, realized volatilities, and testable distributional implications for daily stock returns. *Journal of Applied Econometrics; Forthcoming*, **25**, 233–261.

Web of Science® | Google Scholar

This website utilizes technologies such as cookies to enable essential site functionality, as well as for analytics, personalization, and targeted advertising. You may change your settings at any time or accept the default settings. You may close this banner to continue with only essential cookies. Privacy Policy

Manage Preferences

Accept All

Reject Non-Essential

Web of Science® | Google Scholar

Baillie, R., & Bollerslev, T. (1992). Prediction in dynamic models with time-dependent conditional variances. *Journal of Econometrics*, **52**, 91–113.

Web of Science® | Google Scholar

Barndoff-Nielsen, O. E., & Shepard, N. (2001). Non-Gaussian OU based models and some of their uses in financial economics. *Journal of the Royal Statistical Society*, Series B **63**, 167–241.

Web of Science® | Google Scholar

Barndoff-Nielsen, O. E., & Shephard, N. (2004). Power and bipower variation with stochastic volatility and jumps. *Journal of Financial Econometrics*, **2**, 1–48.

Google Scholar

Ciner, C. (2001). On the long run relationship between gold and silver rrices: A note. *Global Finance Journal*, **12**, 299–303.

Google Scholar

Cumby, R., Figlewski, S., & Hasbrouk, J. (1993). Forecasting volatility and autocorrelation in the EGARCH models. *Journal of Derivative*, **1**, 51–75.

Google Scholar

Figlewski, S. (1997). Volatility forecasting. *Journal of Financial Markets, Institutions and Instruments*, **6**, 1–88.

Google Scholar

Hansen, P. R., & Lunde, A. (2005). A realized variance for the whole day based on intermittent high-frequency data. *Journal of Financial Econometrics*, **3**, 525–554.

This website utilizes technologies such as cookies to enable essential site functionality, as well as for analytics, personalization, and targeted advertising. You may change your settings at any time or accept the default settings. You may close this banner to continue with only essential cookies. Privacy Policy

Manage Preferences

Accept All

Reject Non-Essential

Kocagil, A. (1997). Does futures speculation stabilize spot prices? Evidence from metal markets. *Applied Financial Economics*, **7**, 113–125.

Google Scholar

Koopman, S. J., Jungbacker, B., & Hol, E. (2005). Forecasting daily variability of the S&P100 stock index using historical, realised and implied volatility measurement. *Journal of Empirical Finance*, **12**, 445–475.

Google Scholar

Krehbiel, T., & Adkins, L. C. (1993). Cointegration tests of the unbiased expectation hypothesis in metals markets. *The Journal of Futures Markets*, **13**, 753–763.

Web of Science® Google Scholar

Lucey, B., & Tully, E. (2006). Seasonality, risk and return in daily COMEX gold and silver data 1982–2002. *Applied Financial Economics*, **16**, 48–59.

Google Scholar

Malliavin, P., & Mancino, M. E. (2002). Fourier series method for measurement of multivariate volatility. *Finance and Stochastics*, **6**, 49–61.

Web of Science® Google Scholar

Mancino, M. E., & Sanfelici, S. (2009). Robustness of Fourier estimator of integrated volatility in the presence of microstrucuture noise. *Computational Statisitics & Data Analysis*, **51**, 2966–2989.

Google Scholar

Nielsen, M., & Frederiksen, P. (2008). Finite sample accuracy and choice of sampling frequency in integrated volatility estimation. *Journal of Empirical Finance*, **15**, 265–286.

Web of Science® Google Scholar

This website utilizes technologies such as cookies to enable essential site functionality, as well as for analytics, personalization, and targeted advertising. You may change your settings at any time or accept the default settings. You may close this banner to continue with only essential cookies. Privacy Policy

Manage Preferences

Accept All

Reject Non-Essential

Web of Science® | Google Scholar

Reno, R., & Barucci, E. (2002). On measuring volatility and the GARCH forecasting performance. *Journal of International Financial Markets, Institutions and Money*, **12**, 183–200.

Google Scholar

West, K., & Cho, D. (1995). The predictive ability of several models of exchange rate volatility. *Journal of Econometrics*, **69**, 367–391.

Web of Science® | Google Scholar

Citing Literature

Download PDF

ABOUT WILEY ONLINE LIBRARY

Privacy Policy
Terms of Use
About Cookies
Manage Cookies
Accessibility
Wiley Research DE&I Statement and Publishing Policies

HELP & SUPPORT

Contact Us
Training and Support
DMCA & Reporting Piracy
Sitemap

OPPORTUNITIES

This website utilizes technologies such as cookies to enable essential site functionality, as well as for analytics, personalization, and targeted advertising. You may change your settings at any time or accept the default settings. You may close this banner to continue with only essential cookies. Privacy Policy

Manage Preferences
Accept All
Reject Non-Essential

Copyright © 1999-2026 John Wiley & Sons, Inc or related companies. All rights reserved, including rights for text and data mining and training of artificial intelligence technologies or similar technologies.

WILEY

This website utilizes technologies such as cookies to enable essential site functionality, as well as for analytics, personalization, and targeted advertising. You may change your settings at any time or accept the default settings. You may close this banner to continue with only essential cookies. Privacy Policy

Manage Preferences

Accept All

Reject Non-Essential