Applied Economics Letters ›
Volume 16, 2009 - Issue 7

Original Articles

The impact of sudden changes on the persistence of volatility: evidence from the BRIC countries

Adnan Kasman

Pages 759-764 | Published online: 20 Apr 2009

Cite this article https://doi.org/10.1080/17446540802277138

Full Article | Figures & data | References | Citations | Metrics
Reprints & Permissions | Read this article | Share

Abstract

This article analyses sudden changes of volatility in the stock markets of the BRIC countries (Brazil, Russia, India and China) using the iterated cumulative sums of squares algorithm for the period 1990 to 2007 and examines their impacts on the persistence of volatility. The results show that when endogenously determined sudden shifts in variance are taken into account in the Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model, the estimated persistence in return volatility is reduced significantly in every return series. These results suggest that the findings of previous studies could have overestimated the degree of the persistence of volatility existing in the financial time series. These results have important policy implications for the financial market participants and policy makers.

Notes

[1]This phenomenon is called volatility clustering, where in the situation of high volatility followed by higher volatility.

[2]See Purushothaman and Wilson (2003).

[3]See for example, Malik (2003), Malik and Ewing (2005), Fernandez (2006), Wang and Moore (2009) and Hammoudeh and Li (2008).

[4]To save space, we do not report the estimated dates of sudden changes in each market. The results are available from the author upon request. 36 change points were detected for the Brazilian stock market. The dates of sudden changes are mostly clustered around 1997 and 1998. The Asian and Russian financial crises occurred in 1997 and 1998, respectively. Hence, the results indicate that most of the changes in volatility in the Brazilian stock market were related to the occurrence of major economic events in Asia and Russia. The terrorist attack on 11 September 2001 also caused sudden changes in volatility. The rest of the changes in volatility are related to the local economic and political events. For the Russian stock market, 27 change points were detected. The dates of sudden changes are clustered around 1998, 2003 and 2004. The Russian market seems to be affected mostly by the local economic and political events. We also see the impact of the September 11th attack in 2001 on the volatility. As for the Indian stock market, 43 change points were detected. The break dates mostly fall into the period between 1991–1992 and 1995–1997. There is also a sudden change in volatility in September 2001. Similar analysis can be made for the Chinese stock market. Volatility in this market also seems to be affected mostly by the major global economic and political events. Overall, our results are in the line of the findings of Hammoudeh and Li (2008), Wang and Moore (2009) and Fernandez (2008).

[5]Following Wang and Moore (2009) and Hammoudeh and Li (2008), to determine which breakpoints are statistically significant and how these sudden changes can affect persistence in volatility, the standard GARCH model is estimated three times: once without points of sudden change, once with all of the sudden changes identified by the ICSS process and finally once by taking only significant breakpoints in variance into account. Because the degrees of persistence in volatility in both models (with all

breakpoints and with only significant ones) are very similar, we only report the results of the GARCH model with all breakpoints.

[6] ARCH–LM tests were performed on the standardized residuals from the both GARCH models. The results of tests suggest no ARCH effects in the residual series from the models. The Ljung–Box statistics also reveal that there is no autocorrelation in the residual series.

People also read | Recommended articles | Cited by 9

Stock Return Volatility Effect: Study of BRICS >

Nawal Kishor et al.
Transnational Corporations Review
Published online: 15 Dec 2015