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Small sample properties of GARCH estimates and persistence

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Notes

¹See Drost and Nijman ([1993](#)) for further discussion of this topic.

²The general properties of small sample estimates in GARCH models are known in econometrics—Engle et al. ([1985](#)), Bollerslev ([1988](#)), Diebold and Pauly ([1989](#)), and Baillie and Chung ([2001](#)). However, they are not well known in applied areas such as finance and economics. In addition, the effects of Bollerslev's ([1986](#)) non-negativity conditions on bias and convergence errors in small samples are rarely investigated. Many variations of GARCH models (IGARCH, EGARCH, GARCH with t-distribution, etc.) could be used. However, we believe that the estimates of these variations would show similar p

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⁸This is a reason why unit root tests are affected by the presence of MA components; see the simulation results of Phillips and Perron ([1988](#)) and Schwert ([1989](#)).

⁹The same experiments as those for GARCH models were carried out for SV models for the S&P500 index log-squared returns. The results are consistent with what we found in [table 2](#) and can be obtained from authors by request.

¹⁰Andersen and Bollerslev ([1998](#)) calculate the population R^2 of the ex-post squared return - GARCH(1,1) volatility regression which is $\alpha^2/(1 - \beta^2 - 2\alpha\beta)$. Their results are not different from Theorem 1 in the sense that for realistic parameter values of α and β , R^2 is very low and GARCH(1,1) does not explain squared returns well.

¹¹See Equation 4 in the previous section for the autocorrelations of ARCH(1) and GARCH(1,1) models.

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