

Paper: Bollerslev, T. (1986) Generalized autoregressive conditional heteroskedasticity. *Journal of Econometrics* 31, 307–327.

Abstract:

When Engle introduced autoregressive conditionally heteroscedastic (ARCH) models in an article published in *Econometrica* (Engle, 1982), the focus of the article was on macroeconomic data. However, one could not imagine, at that time, that the main field of application for these models would be finance. Since the introduction of generalized ARCH (or GARCH) models (Bollerslev, 1986), these models have become extremely popular among both academics and practitioners. GARCH models led to a fundamental change to the approaches used in finance, through an efficient modeling of volatility (or variability) of the prices of financial assets. In 2003, the Nobel Prize for Economics was jointly awarded to Robert F. Engle and Clive W.J. Granger 'for methods of analyzing economic time series with time-varying volatility (ARCH)'. Since the late 1980s, numerous extensions of the initial ARCH models have been published; see, e.g., Bollerslev (2008) and Francq & Zakoïan (2010). Along with their development in econometrics and finance, GARCH models and their extensions have given rise to new directions for research in probability and statistics.

We will discuss the main idea of the (G)ARCH model, its extensions and related models, and some recent advances.

References:

Engle, R.F. (1982) Autoregressive conditional heteroskedasticity with estimates of the variance of U.K. inflation. *Econometrica* 50, 987–1008.

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Bollerslev, T. (2008) Glossary to ARCH (GARCH). In T. Bollerslev, J.R. Russell and M. Watson (eds), *Volatility and Time Series Econometrics: Essays in Honor of Robert F. Engle*. Oxford: Oxford University Press.

Francq, C. & Zakoïan, J.-M. (2010). *GARCH Models: Structure, Statistical Inference and Financial Applications*. Chichester: John Wiley & Sons.