References

The first to mention that changes of speculative markets are **not normally distributed** was

BENOIT MANDELBROT, The Variation of Certain Speculative Prices, *Journal of Business* 36 (1963), pp. 394 – 419.

In this context, he discussed Pareto distributions. The **ARCH model** was developed by

ROBERT F. ENGLE, Autoregressive Conditional Heteroskedasticity With Estimates of the Variance of U.K. Inflation, *Econometrica* 50 (1982), pp. 987 – 1008.

In 2003, R.F. ENGLE received the Nobel prize for this important paper. The **GARCH model** was introduced by

TIM BOLLERSLEV, Generalized Autoregressive Conditional Heteroskedasticity, *Journal of Econometrics* 31 (1986), pp. 307 – 327, and

STEPHEN J. TAYLOR, *Modelling Financial Time Series*, John Wiley, Chichester (U.K.) 1986,

independently of each other. The **IGARCH** approach was discussed by

ROBERT F. ENGLE and TIM BOLLERSLEV, Modelling the persistence of Conditional Variances, *Econometric Reviews* 5 (1986), pp. 1 – 87.

The **TARCH model** was developed by

LAWRENCE R.GLOSTEN, RAVI JAGANNATHAN and DAVID E. RUNKLE, On the Relation between the Expected Value and the Volatility of the Nominal Excess Return of Stocks, *Journal of Finance* 48 (1993), pp. 1779 – 1801,

while the **EGARCH model** goes back to

DANIEL B. NELSON, Conditional Heteroskedasticity in Asset Returns: A New Approach, *Econometrica* 59 (1991), pp. 347 – 370,

and the **ARCH-M model** to

ROBERT F. ENGLE, DAVID M. LILIEN and RASSEL P. ROBINS, Estimating Time Varying Risk Premia in the Term Structure: The ARCH-M Model, *Econometrica* 55 (1987), pp. 391 – 407.

The **multiplicative model** which guarantees the non-negativity of the estimated conditional variances was proposed by

JOHN GEWEKE, Modelling the Persistence of Conditional Variances: Comment, *Econometric Reviews* 5 (1986), pp. 57 – 61.

Surveys are, for example, given by

ANIL K. BERA and MATTHEW L. HIGGINS, ARCH Models: Properties, Estimation and Testing, *Journal of Economic Surveys* 7 (1993), pp. 305 – 366, and

TIM BOLLERSLEV, ROBERT F. ENGLE and DANIEL B. NELSON, ARCH Models, in: R.F. ENGLE and D.L. MCFADDEN (eds.), *Handbook of Econometrics*, volume IV, Elsevier, Amsterdam et al. 1994, S. 2959 – 3038,

as well as, for example, in the textbook of

JAMES D. HAMILTON, *Time Series Analysis*, Princeton University Press, Princeton 1994.

The **t distribution** to model leptokurtic behaviour was proposed by

TIM BOLLERSLEV, A Conditionally Heteroskedastic Time Series Model for Speculative Prices and Rates of Return, *Review of Economics and Statistics* 69 (1987), pp. 542 – 547.

The effects of **temporal aggregation** are discussed in

FRANCIS X. DIEBOLD, *Empirical Modeling of Exchange Rate Dynamics*, Springer, New York et al. 1988, as well as in

FEIKE C. DROST and THEO E. NIJMAN, Temporal Aggregation of GARCH Processes, *Econometrica* 61 (1993), pp. 909 – 927.

Multivariate GARCH models are discussed in

ROBERT F. ENGLE and KENNETH F. KRONER, Multivariate Simultaneous Generalized GARCH, *Econometric Theory* 11 (1995), pp. 122 – 150,

CHRIS BROOKS, SIMON P. BURKE and GITA PERSAND, Multivariate GARCH Models: Software Choice and Estimation Issues, *Journal of Applied Econometrics* 18 (2003), pp. 725 – 734, and

LUC BAUWENS, SÉBASTIEN LAURENT and JEROEN V.K. ROMBOUTS, Multivariate GARCH Models: A Survey, *Journal of Applied Econometrics* 21 (2006), pp. 79 – 109.

The modern **analysis of option prices** was founded by

FISCHER BLACK and MYRON S. SCHOLES, The Pricing of Options and Corporate Liabilities, *Journal of Political Economy* 81 (1973), pp. 637 – 659.

The **Value at Risk** was discussed extensively by

PHILIPPE JORION, Value at Risk: *The New Benchmark for Managing Financial Risk,* McGraw Hill Trade, 2nd edition 2001.

How the value at risk of an asset can be calculated using a GARCH(1,1) model is described in

ROBERT F. ENGLE, GARCH 101: The Use of ARCH/GARCH Models in Applied Econometrics, *Journal of Economic Perspectives* 15 (2001), pp. 157 – 168.

See for this also

JAMES CHONG, Value at Risk from Econometric Models and Implied from Currency Options, *Journal of Forecasting* 23 (2004), pp. 603 – 620.

Generally, for the **econometric analysis of financial market data** see

ADRIAN PAGAN, The Econometrics of Financial Markets, *Journal of Empirical Finance* 3 (1996), pp. 15 – 102,

TIM BOLLERSLEV, RAY Y. CHOU and KENNETH F. KRONER, ARCH Modelling in Finance: A Review of the Theory and Empirical Evidence, *Journal of Econometrics* 52 (1992), pp. 5 – 59,

TERENCE C. MILLS, *The Econometric Modelling of Financial Time Series*, Cambridge University Press, Cambridge (U.K.), 2nd edition 1999, or

JÜRGEN FRANKE, WOLFGANG HÄRDLE and CHRISTIAN HAFNER, *Einführung in die Statistik der Finanzmärkte*, Springer, Berlin et al., 2nd edition 2004.