

# Modelling Volatility

## ARCH and GARCH Processes

In conventional econometrics, the variance of the disturbance term is assumed to be constant. - Many economic time series exhibit periods of unusually large volatility followed by periods of relative tranquility. - Common examples of such series include stock prices, foreign exchange rates and other prices determined in financial markets (i.e. exchange rates and other prices determined in financial markets (i.e. where volatility seems to vary over time)). - In such circumstances the assumption of constant variance (homoscedasticity) is inappropriate. - ARCH and GARCH models are methods of modelling such volatility

## Why Volatility

There are a number of reasons that you may wish to model and/or forecast the conditional variance of a series. - Variance forecasts may be of direct interest. For example, asset holders may be interested in forecasting not only the rate of return of an asset but also its volatility to assess the assets risk. - While the optimal forecast is the conditional mean of a series, volatility is relevant for forecasting confidence intervals. The variance of volatility is relevant for forecasting confidence intervals. The variances of the conditional distributions are needed for setting up forecast intervals. More accurate forecast intervals can be obtained by modelling the variance of the errors therefore. - The volatility in a market and therefore the risk of an investment may affect the expectations of market participants and thus have a feedback effect on the original series of interest. - More efficient estimators can be obtained if heteroscedasticity in the errors is handled properly.