Abstract: The Meixner process is a special type of Lévy process which originates from the theory of orthogonal polynomials. It is related to the Meixner-Pollaczek polynomials by a martingale relation. We discuss several properties of the Meixner process. We apply the Meixner process to financial data. First, we show that the Normal distribution is a very poor model to fit log-returns of financial assets like stocks or indices. In order to achieve a better fit we replace the Normal distribution by the more sophisticated Meixner distribution, taking into account, skewness and excess kurtosis. We show that the underlying Meixner distribution allows a much better fit to the data by performing a number of statistical tests. Secondly, we introduce stock price models based on the Meixner process in order to price financial derivatives. A first significant improvement can be achieved with respect to the famous Black-Scholes model (BS-model) by replacing its Brownian motion by the more flexible Meixner process. However, there still is a discrepancy between market and theoretical prices. The main feature which these Lévy models are missing is the fact that volatility or more generally the environment is changing stochastically over time. By making business time stochastic, an idea which was developed in [?], one can incorporate these stochastic volatility effects. The resulting option prices can be calibrated almost perfectly to empirical prices.