

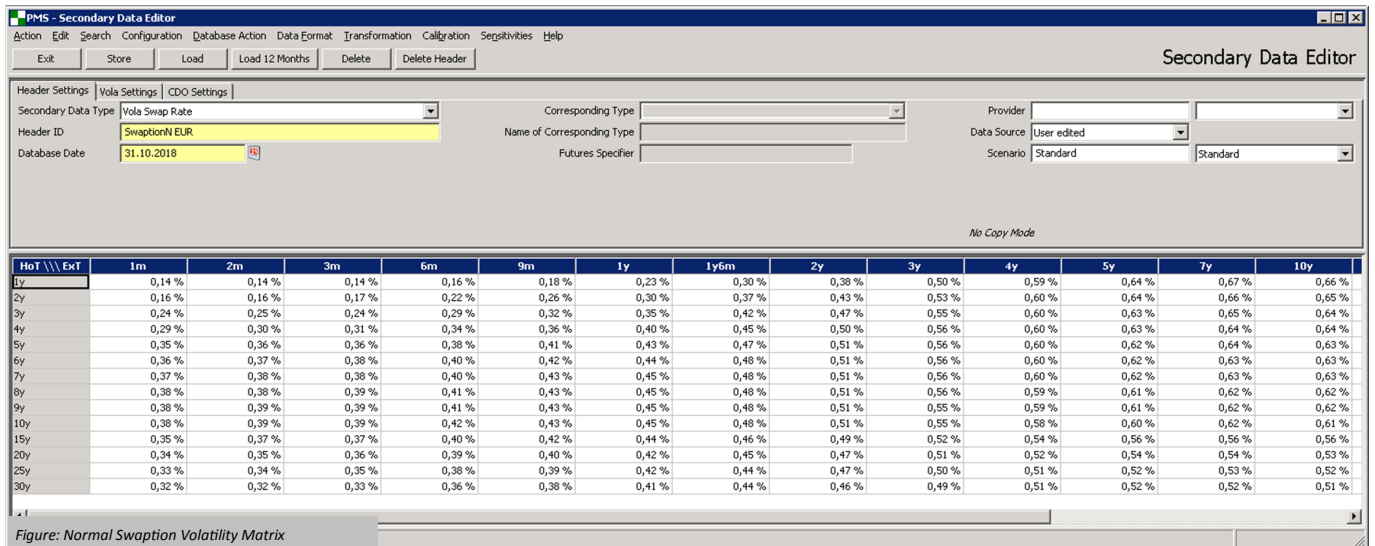
# PMS Bachelier Model

PMS provides extensive support for negative interest rates.

If an interest rate curve involves negative interest rates, the Black model can no longer be used for the calibration of the Hull-White and the Libor Market model parameters. In this case, it is advisable to apply the so-called Bachelier model that performs a calibration using so-called “normal ATM swap rate volatilities” (ATM = At-the-money).

for the valuation of Caps, Floors, Swaptions as well as for the calibration of interest rate models such as Hull-White One-Factor, Hull-White Two-Factor, Extended Vasicek, Hybrid Hull-White, Libor Market Model.

The Bachelier model uses analytical formulas to estimate sensitivities such as Delta, Theta, Vega. Lognormal models such as Black-Scholes or the Libor Market Model do not provide any general solu-



The Bachelier Model in PMS supports market data for normally distributed interest rates, which can be viewed as a comprehensive solution for the problem of negative interest rates in the context of valuations.

In the context of negative interest, based on normal volatilities, the Bachelier Model in PMS can be used

## BENEFITS

- ◆ Solution for the negative interest context
- ◆ Valuation of Caps, Floors, Swaptions
- ◆ Calibration of interest rate models
- ◆ Volatilities: normal instead of lognormal

tion for the problem of negative interest, and providers are unable to supply lognormal market data (cap and swaption prices) completely or maybe even not at all.

## DATA BASIS

- ◆ Volatility structures supplied by data providers including annualised normal (instead of lognormal) Cap/Floor/Swaption volatilities (Bachelier volatilities)
- ◆ Alternatively, SABR parameters for volatility structures. Dimensions: Time Till Exercise, Holding Time, Strike. Strikes in absolute or relative format.