

# Data simulation as effective method for the simulation of future market scenarios

*“...If these market conditions would present themselves predominantly invariably, the system simulation method would be perfectly sufficient, in order to analyze the chances and risks of a mechanical trading system. But in reality these market conditions aren't stable. Markets change...”*

*(by Volker Butzlaff „Monte Carlo Simulation and System Trading“, Chapter 5: Validation of Mechanical Trading Systems)*

The main problem of mechanical trading systems is that most systems do not function in the foreseen way (as the original systematic test with the historical original data has suggested) after a certain time span.

There are the following possibilities in order to test an independence of the system from the data:

## 1. „Out-of-Sample“ test

The allocation of the available data set to a system development and testing time span and an additional testing time span, which have no effect on the system development (out-of-sample), is the classical setup.

Advantage: over optimization concerning the complete test data period will be avoided

Disadvantage: the additional data testing time span is too small and represents only one market scenario (lying after the actual systematical test)

## 2. „Multi market“ test

Using this method the system is tested in different, if possible not correlating markets.

Advantage: if the system can be traded successfully in several markets this shows the general validity and robustness of the system setup

Disadvantage: although the tests in several markets take place, the testing time span remains the same. I.e. really different temporal market conditions thus cannot be tested.

### **3. „Random Walk“**

Here understood as a systematical test with totally random data.

Advantage: if there should be a system that can be traded successfully with each kind of data, that must be the so-called „Holy grail system “...

Disadvantage: the produced data do not correspond usually to the material conditions concerning the market behaviour. Imho this method is useless!

### **4. „Data Simulation (Data scrambling)“**

Here synthetic data time series on basis of the original historical data are generated. I.e. basic characteristics of the historical time series remain, the temporal distribution of the price bars however is mixed new using random components and additionally there is the possibility to affect the generation of alternative market scenarios by optional parameters (volatility, price patterns etc.).

Advantage: it is possible to simulate many alternative close-to-reality future market scenarios

Disadvantage: since there are infinite possibilities, it is not possible to simulate all market scenarios. A residual risk remains.

### **Result:**

**The data simulation is according to the opinion of the author the only useful method at present to simulate future market scenarios and is thus a substantial development basis for the validation of mechanical trading systems.**

**With the possibility to simulate many different market scenarios, the software product „Zen Monte Carlo Simulator “ offers currently a worldwide unique selling proposition!**