

# Synthetic Market Data

## Synthetic Market Data

Synthetic market data is price data that has been derived from historical market data using an algorithm to replicate important features of the price series.

## Why is Synthetic Data Needed?

Real historical price data represents a single path evolution of the underlying asset. Because it is a random process, prices could have evolved along a different path. Synthetic data enables the user to test the performance of trading strategies, pricing models and risk management procedures in an environment not previously encountered in historical data.

## Applications

Synthetic market data has important applications in quantitative research, such as:

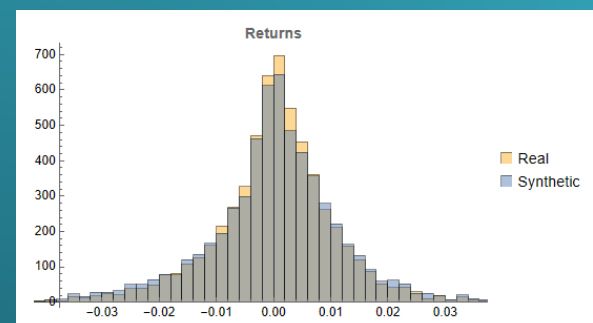
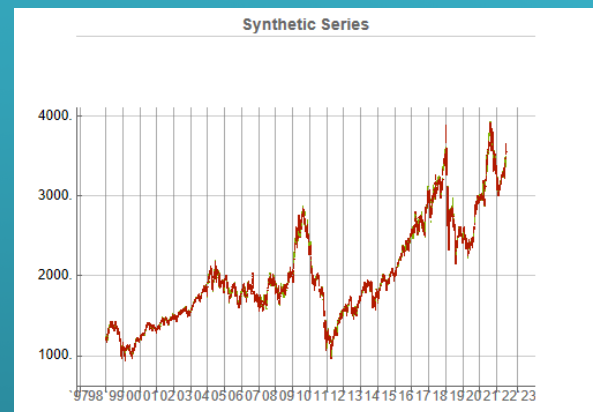
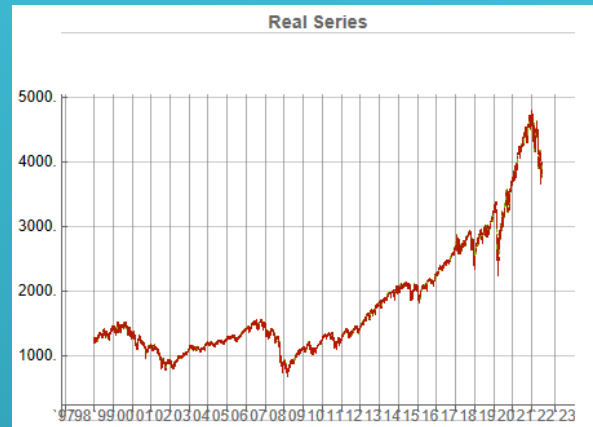
- Portfolio construction
- Trading strategy development
- Strategy robustness testing
- Value-at-Risk, Expected Shortfall
- Derivatives valuation
- Monte Carlo simulation and stress testing

## High Fidelity Synthetic Data

Synthetic data that conserves important properties of the original data series is referred to as high fidelity. Such properties may include:

- Correlation to the original price series.
- Cointegration in the O/H/L/C price series.
- "Fat tails" in the returns distribution.
- Autocorrelation in the series, including at long lags (long memory effects).
- Dependency in the squared returns series, referred to as GARCH effects.

## Replicating the S&P 500 Index



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## Market Coverage

Our standard product provides 100 synthetic series comprising daily open/high/low/close price data for each security. By default, the synthetic series are date-stamped with the same dates as the original historical data series. Synthetic series are updated monthly.

### Equities

NYSE and NASDAQ listed equities with a minimum of five years of historical price data.

### ETFs & Indices

NYSE and NASDAQ listed ETFs and Indices with a minimum of five years of historical price data.

### Futures

Continuous futures contracts for agricultural, energy, metals, and financial futures listed on the CME, CBOT, GLOBEX, ICE and COMEX exchanges.

### Options

Option chains for equities, ETFs and Indices. The default pricing model is Black-Scholes, applied to the underlying synthetic series.

## Disclaimer

#### 1. No offer, exclusion of liability

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#### 3. No guarantee of the functionality of data and other services

Accordingly, Algorithmic Sciences LLC assumes no liability as to the functional capability of its data services. This includes the completeness, correctness and reliability of market data and other services.

## Data Formats

Data can be provided in the following formats:

- CSV file
- Python DataFrames
- SQL database

## Additional Services

- Up to 10,000 synthetic series per symbol.
- Pre- or post-dated synthetic data (synthetic data for periods preceding the start, or following the end, of the historical series).
- Synthetic data series for non-US equity or futures symbols.
- Custom database design.
- Analytics packages in Python, Matlab or Mathematica.
- Strategy development & testing with synthetic data.
- Risk analytics with synthetic data.
- Pricing & model risk using synthetic data.

## Contact Algorithmic Sciences

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