

NDK_SARIMA_SIM

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- C/C++
- .Net

```
int __stdcall NDK_SARIMA_SIM(double mean,
                             double sigma,
                             WORD nIntegral,
                             double *phis,
                             size_t p,
                             double *thetas,
                             size_t q,
                             WORD nSIntegral,
                             WORD nSPeriod,
                             double *sPhis,
                             size_t sP,
                             double *sThetas,
                             size_t sQ,
                             double *pData,
                             size_t nSize,
                             size_t nSeed,
                             double *retVal,
                             size_t nStep
                             )
```

Returns an array of cells for the initial (non-optimal), optimal or standard errors of the model's parameters.

Returns

status code of the operation

Return values

NDK_SUCCESS Operation successful

NDK_FAILED Operation unsuccessful. See [Macros](#) for full list.

Parameters

- [in] **mean** is the model mean (i.e. μ).
- [in] **sigma** is the standard deviation of the model's residuals/innovations.
- [in] **nIntegral** is the non-seasonal difference order
- [in] **phis** are the coefficients's values of the non-seasonal AR component
- [in] **p** is the order of the non-seasonal AR component
- [in] **thetas** are the coefficients's values of the non-seasonal MA component
- [in] **q** is the order of the non-seasonal MA component
- [in] **nSIntegral** is the seasonal difference

- [in] **nSPeriod** is the number of observations per one period (e.g. 12=Annual, 4=Quarter)
- [in] **sPhis** are the coefficients's values of the seasonal AR component
- [in] **sP** is the order of the seasonal AR component
- [in] **sThetas** are the coefficients's values of the seasonal MA component
- [in] **sQ** is the order of the seasonal MA component
- [in] **pData** is the univariate time series data (a one dimensional array).
- [in] **nSize** is the number of observations in pData.
- [in] **nSeed** is an unsigned integer for setting up the random number generators
- [out] **retVal** is the simulated value
- [in] **nStep** is the simulation time/horizon (expressed in terms of steps beyond end of the time series).

Remarks

1. The underlying model is described [here](#).
2. The time series is homogeneous or equally spaced
3. The time series may include missing values (e.g. NaN) at either end.
4. NDK_SARIMA_SIM returns an array of one simulation path starting from the end of the input data.
5. The input data argument (i.e. latest observations) is optional. If omitted, an array of zeroes is assumed.
6. The time series is homogeneous or equally spaced.
7. The time series may include missing values (e.g. #N/A) at either end.
8. The long-run mean argument (mean) can take any value or be omitted, in which case a zero value is assumed.
9. The residuals/innovations standard deviation (sigma) must be greater than zero.
10. For the input argument - phi (parameters of the non-seasonal AR component):
 - The input argument is optional and can be omitted, in which case no non-seasonal AR component is included.
 - The order of the parameters starts with the lowest lag.
 - The order of the non-seasonal AR component model is solely determined by the order of the last value in the array with a numeric value (vs. missing or error).
11. For the input argument - theta (parameters of the non-seasonal MA component):
 - The input argument is optional and can be omitted, in which case no non-seasonal MA component is included.
 - The order of the parameters starts with the lowest lag.
 - One or more values in the input argument can be missing or an error code (i.e. #NUM!, #VALUE!, etc.).
 - The order of the non-seasonal MA component model is solely determined by the order of the last value in the array with a numeric value (vs. missing or error).
12. For the input argument - sPhi (parameters of the seasonal AR component):
 - The input argument is optional and can be omitted, in which case no seasonal AR component is included.
 - The order of the parameters starts with the lowest lag.

- The order of the seasonal AR component model is solely determined by the order of the last value in the array with a numeric value (vs. missing or error).
13. For the input argument - sTheta (parameters of the seasonal MA component):
 - The input argument is optional and can be omitted, in which case no seasonal MA component is included.
 - The order of the parameters starts with the lowest lag.
 - The order of the seasonal MA component model is solely determined by the order of the last value in the array with a numeric value (vs. missing or error).
 14. The non-seasonal integration order - d - is optional and can be omitted, in which case d is assumed to be zero.
 15. The seasonal integration order - sD - is optional and can be omitted, in which case sD is assumed to be zero.
 16. The season length - s - is optional and can be omitted, in which case s is assumed to be zero (i.e. Plain ARIMA).

Requirements

Header	SFSDK.H
Library	SFSDK.LIB
DLL	SFSDK.DLL

Examples

```
int NDK_SARIMA_SIM(double mean,
                  double sigma,
                  short nIntegral,
                  double[] phis,
                  UIntPtr p,
                  double[] thetas,
                  UIntPtr q,
                  short nSIntegral,
                  double[] sPhis,
                  UIntPtr sP,
                  double[] sThetas,
                  UIntPtr sQ,
```

```
Namespace: NumXLAPI
Class: SFSDK
Scope: Public
Lifetime: Static
```

```
double[] pData,  
UIntPtr nSize,  
UIntPtr nSeed,  
double[] retVal,  
UIntPtr nStep  
)
```

Returns an array of cells for the initial (non-optimal), optimal or standard errors of the model's parameters.

Return Value

a value from **NDK_RETCODE** enumeration for the status of the call.

NDK_SUCCESS operation successful

Error Error Code

Parameters

- [in] **mean** is the model mean (i.e. mu).
- [in] **sigma** is the standard deviation of the model's residuals/innovations.
- [in] **nIntegral** is the non-seasonal difference order
- [in] **phis** are the coefficients's values of the non-seasonal AR component
- [in] **p** is the order of the non-seasonal AR component
- [in] **thetas** are the coefficients's values of the non-seasonal MA component
- [in] **q** is the order of the non-seasonal MA component
- [in] **nSIntegral** is the seasonal difference
- [in] **sPhis** are the coefficients's values of the seasonal AR component
- [in] **sP** is the order of the seasonal AR component
- [in] **sThetas** are the coefficients's values of the seasonal MA component
- [in] **sQ** is the order of the seasonal MA component
- [in] **pData** is the univariate time series data (a one dimensional array).
- [in] **nSize** is the number of observations in pData.
- [in] **nSeed** is an unsigned integer for setting up the random number generators
- [out] **retVal** is the simulated value
- [in] **nStep** is the simulation time/horizon (expressed in terms of steps beyond end of the time series).

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8. The long-run mean argument (mean) can take any value or be omitted, in which case a zero value is assumed.
9. The residuals/innovations standard deviation (sigma) must be greater than zero.
10. For the input argument - phi (parameters of the non-seasonal AR component):
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 - The order of the parameters starts with the lowest lag.
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 - The input argument is optional and can be omitted, in which case no non-seasonal MA component is included.
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15. The seasonal integration order - sD - is optional and can be omitted, in which case sD is assumed to be zero.
16. The season length - s - is optional and can be omitted, in which case s is assumed to be zero (i.e. Plain ARIMA).

Exceptions

Exception Type	Condition
None	N/A

Requirements

Namespace	NumXLAPI
Class	SFSDK
Scope	Public
Lifetime	Static
Package	NumXLAPI.DLL

Examples

References

- Hamilton, J .D.; [Time Series Analysis](#) , Princeton University Press (1994), ISBN 0-691-04289-6
- Tsay, Ruey S.; [Analysis of Financial Time Series](#) John Wiley & SONS. (2005), ISBN 0-471-690740

See Also

[template("related")]
