

NDK_SARIMA_GOF

Last Modified on 07/11/2016 11:06 am CDT

- C/C++
- .Net

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

Computes the log-likelihood (LLF), Akaike Information Criterion (AIC) or other goodness of fit function of the SARIMA model.

Returns

status code of the operation

Return values

NDK_SUCCESS Operation successful

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

Parameters

- [in] **pData** is the univariate time series data (a one dimensional array).
- [in] **nSize** is the number of observations in pData.
- [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] **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] **retType** is a switch to select a fitness measure:

Order	Description
1	Log-Likelihood Function (LLF) (default)
2	Akaike Information Criterion (AIC)
3	Schwarz/Bayesian Information Criterion (SIC/BIC)
4	Hannan-Quinn information criterion (HQC)

[out] **retVal** is the calculated goodness of fit value.

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. The residuals/innovations standard deviation (i.e. $\hat{\sigma}$) should be greater than zero.
5. The ARMA model has independent and normally distributed residuals with constant variance. The ARMA log-likelihood function becomes: $-\ln L^* = -T \left(\ln 2\pi + \frac{\hat{\sigma}^2}{2} \right)$ Where:
 - $\hat{\sigma}$ is the standard deviation of the residuals.
6. The value of the input argument - period - must be greater than one, or the function returns #VALUE!.
7. The value of the seasonal difference argument - sD - must be greater than one, or the function returns #VALUE!.
8. The maximum likelihood estimation (MLE) is a statistical method for fitting a model to the data and provides estimates for the model's parameters.
9. The long-run mean argument (mean) can take any value or be omitted, in which case a zero value is assumed.
10. The residuals/innovations standard deviation (sigma) must be greater than zero.
11. 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).
12. 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.
 - 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).

13. 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).
14. 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).
15. The non-seasonal integration order - d - is optional and can be omitted, in which case d is assumed to be zero.
16. The seasonal integration order - sD - is optional and can be omitted, in which case sD is assumed to be zero.
17. 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_GOF(double[]
    UIntPtr
    double
    double
    short
    double[]
    UIntPtr
```

```
pData,
nSize,
mean,
sigma,
nIntegral,
phis,
p,
```

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

```

double[]          thetas,
UIntPtr          q,
short            nSIntegral,
double[]         sPhis,
UIntPtr          sP,
double[]         sThetas,
UIntPtr          sQ,
GOODNESS_OF_FIT_FUNC retType,
ref double       retVal
)

```

Computes the log-likelihood ((LLF), Akaike Information Criterion (AIC) or other goodness of fit function of the SARIMA model.

Return Value

a value from [NDK_RETCODE](#) enumeration for the status of the call.

NDK_SUCCESS operation successful

Error Error Code

Parameters

- [in] **pData** is the univariate time series data (a one dimensional array).
- [in] **nSize** is the number of observations in pData.
- [in] **mean** is the model mean (i.e. mu).
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- [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] **retType** is a switch to select a fitness measure:

Order Description

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- 4 Hannan-Quinn information criterion (HQC)

[out] **retVal** is the calculated goodness of fit value.

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 - $\hat{\sigma}$ is the standard deviation of the residuals.
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10. The residuals/innovations standard deviation (sigma) must be greater than zero.
11. For the input argument - phi (parameters of the non-seasonal AR component):
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 - The input argument is optional and can be omitted, in which case no seasonal AR component is included.
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16. The seasonal integration order - sD - is optional and can be omitted, in which case sD is assumed to be zero.
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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")]
