

NDK_ARIMA_GOF

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- C/C++
- .Net

```
int __stdcall NDK_ARIMA_GOF(double * X,
                             size_t nSize,
                             double mean,
                             double sigma,
                             WORD nIntegral,
                             double * phis,
                             size_t p,
                             double * thetas,
                             size_t q,
                             GOODNESS_OF_FIT_FUNC retType,
                             double * retVal
                             )
```

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

Returns

status code of the operation

Return values

NDK_SUCCESS Operation successful

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

Parameters

- [in] **X** is the univariate time series data (a one dimensional array).
- [in] **nSize** is the number of observations in X.
- [in] **mean** is the ARMA model mean (i.e. mu).
- [in] **sigma** is the standard deviation of the model's residuals/innovations.
- [in] **nIntegral** is the model's integration order.
- [in] **phis** are the parameters of the AR(p) component model (starting with the lowest lag).
- [in] **p** is the number of elements in phis (order of AR component)
- [in] **thetas** are the parameters of the MA(q) component model (starting with the lowest lag).
- [in] **q** is the number of elements in thetas (order of MA component)
- [in] **retType** is a switch to select a fitness measure

Order Description

- | 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 GOF return 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: $[\ln L^* = -T \left(\ln 2\pi \hat{\sigma}^2 + 1 \right) / 2]$ Where:
 - $\hat{\sigma}$ is the standard deviation of the residuals.
6. The maximum likelihood estimation (MLE) is a statistical method for fitting a model to the data and providing estimates for the model's parameters.
7. The integration order argument (d) must be a positive integer.
8. The long-run mean can take any value or may 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):
 - The input argument is optional and can be omitted, in which case no AR component is included.
 - The order of the parameters starts with the lowest lag.
 - One or more parameters can be missing or an error code (i.e. #NUM!, #VALUE!, etc.).
 - The order of the 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):
 - The input argument is optional and can be omitted, in which case no 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 MA component model is solely determined by the order of the last value in the array with a numeric value (vs. missing or error).

Requirements

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

Examples

```

NDK_ARIMA_GOF(double[]
    UIntPtr
    double
    double
    short
    double[]
    UIntPtr
    double[]
    UIntPtr
    GOODNESS_OF_FIT_FUNC retType,
    ref double
    )
    pData,
    nSize,
    mean,
    sigma,
    nIntegral,
    phis,
    p,
    thetas,
    q,
    retVal

```

```

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

```

Computes the log-likelihood ((LLF), Akaike Information Criterion (AIC) or other goodness of fit function of the ARIMA 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 ARMA model mean (i.e. mu).
- [in] **sigma** is the standard deviation of the model's residuals/innovations.
- [in] **nIntegral** is the model's integration order.
- [in] **phis** are the parameters of the AR(p) component model (starting with the lowest lag).
- [in] **p** is the number of elements in phis (order of AR component)
- [in] **thetas** are the parameters of the MA(q) component model (starting with the lowest lag).
- [in] **q** is the number of elements in thetas (order of MA component)
- [in] **retType** is a switch to select a fitness measure

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11. For the input argument (theta):
 - The input argument is optional and can be omitted, in which case no 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 MA component model is solely determined by the order of the last value in the array with a numeric value (vs. missing or error).

Exceptions

Exception Type	Condition
None	N/A

Requirements

Namespace	NumXLAPI
Class	SFSDK

Scope	Public
Lifetime	Static
Package	NumXLAPI.DLL

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")]
