

# NDK\_ARIMA\_GOF

Last Modified on 07/08/2016 10:10 am CDT

- 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

|                |           |
|----------------|-----------|
| <b>Header</b>  | SFSDK.H   |
| <b>Library</b> | SFSDK.LIB |
| <b>DLL</b>     | 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    |

|                 |              |
|-----------------|--------------|
| <b>Scope</b>    | Public       |
| <b>Lifetime</b> | Static       |
| <b>Package</b>  | NumXLAPI.DLL |

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## 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

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## See Also

[template("related")]

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