NDK_SARIMAX_GOF

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- C/C++
- .Net

```
int __stdcall NDK_SARIMAX_GOF ( double *                pData,
                                double **               pFactors,
                                size_t                  nSize,
                                size_t                  nFactors,
                                double *                fBetas,
                                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,
                                GOODNESS_OF_FIT_FUNC    retType,
                                double *                retVal
                              )
```

Computes the log-likelihood ((LLF), Akaike Information Criterion (AIC) or other goodness of fit function of the SARIMA-X 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 response univariate time series data (a one dimensional array).

[in]	**pFactors**	is the exogneous factors time series data (each column is a separate factor, and each row is an observation).
[in]	**nSize**	is the number of observations.
[in]	**nFactors**	is the number of exognous factors
[in]	**fBetas**	is the weights or loading of the exogneous factors
[in]	**mean**	is the ARIMA/SARIMA model's long-run mean/trend (i.e. mu). If missing (i.e. NaN), then it is assumed zero.
[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. Each column in the explanatory factors input matrix (i.e. X) corresponds to a separate variable.
5. Each row in the explanatory factors input matrix (i.e. X) corresponds to an observation.
6. Observations (i.e. rows) with missing values in X or Y are assumed missing.
7. The number of rows of the explanatory variable (X) must be at equal to the number of rows of the response variable (Y).
8. The residuals/innovations standard deviation (i.e. \(\sigma\)) should be greater than zero.
9. 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.
10. The value of the input argument - period - must be greater than one, or the function returns #VALUE!.
11. The value of the seasonal difference argument - sD - must be greater than one, or the function returns #VALUE!.
12. The maximum likelihood estimation (MLE) is a statistical method for fitting a model to the data and provides estimates for the model's parameters.
13. The intercept or the regression constant term input argument is optional. If omitted, a zero value is assumed.
14. For the input argument - Beta:
    - The input argument is optional and can be omitted, in which case no regression component is included (i.e. plain SARIMA).
    - The order of the parameters defines how the exogenous factor input arguments are passed.
15. The long-run mean argumen (mean) of the differenced regression residuals can take any value. If ommitted, a zero value is assumed.
16. The residuals/innovations standard deviation (sigma) must greater than zero.
17. 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).
18. 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).
19. 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).
20. 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).
21. The non-seasonal integration order - d - is optional and can be omitted, in which case d is assumed zero.
22. The seasonal integration order - sD - is optional and can be omitted, in which case sD is assumed zero.

23. The season length - s - is optional and can be omitted, in which case s is assumed zero (i.e. Plain ARIMA).

Requirements

Header

SFSDK.H

Library

SFSDK.LIB

DLL

SFSDK.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")]