

# NDK\_JOHANSENTEST

Last Modified on 01/02/2017 9:00 pm CST

- [C/C++](#)
- [.Net](#)

```
int __stdcall NDK_JOHANSENTEST(double **XX,
                                size_t  N,
                                size_t  M,
                                size_t  K,
                                short   nPolyOrder,
                                BOOL     tracetest,
                                WORD     R,
                                double   alpha,
                                double * retStat,
                                double * retCV
                                )
```

Returns the Johansen (cointegration) test statistics for two or more time series.

## Returns

status code of the operation

## Return values

**NDK\_SUCCESS** Operation successful

**NDK\_FAILED** Operation unsuccessful. See [Macros](#) for full list.

## Parameters

- [in] **XX** is the multivariate time series matrix data (two dimensional).
- [in] **N** is the number of observations in XX.
- [in] **M** is the number of variables in XX.
- [in] **K** is the number of lagged difference terms used when computing the estimator.
- [in] **nPolyOrder** is the order of the polynomial: (-1=no constant, 0=constant-only (default), 1=constant and trend).
- [in] **tracetest** is a flag to select test: TRUE=trace, FALSE=maximal eigenvalue test.
- [in] **R** is the assumed number of cointegrating relationships between the variables (if missing, r=1).
- [in] **alpha** is the statistical significance level. If missing, a default of 5% is assumed.
- [out] **retStat** is the calculated test statistics score.
- [out] **retCV** is the calculated test critical value.

## Remarks

1. Each column in the input matrix corresponds to a separate time series variable.
2. The input matrix can have no more than twelve (12) columns (or variables).

3. Each row in the input matrix corresponds to an observation.
4. The number of cointegrating relationships should be no greater than the number of input variables.
5. The time series data are homogeneous or equally spaced.
6. The time series may include missing values (e.g. NaN) at either end.
7. There are two types of Johansen tests - with trace or with eigenvalue - and the inferences might be a bit different for each.
  - The null hypothesis for the trace test is the number of cointegration vectors  $(r = 0)$
  - The null hypothesis for the eigenvalue test is  $(r = m)$

## Requirements

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

## Examples

```

const double NAN = std::numeric_limits::quiet_NaN();

// We have 173 observations for 8 different factors
double US_MINING_EMPLOYMENT[173][8];

WORD wMaxOrder= 9;           // nlag = 9;
short nPolyOrder = 0;        // Only constant
BOOL  traceTest = TRUE;     // if traceTest = FALSE, then eignvalue based test
WORD  nNoRelations = 0;     // nNoRelations can be between 1 and 7
double alpha=0.05f;
double retStat=NAN;
double retCV=NAN;

// (1) Trace test
nRet = NDK_JOHANSENTEST(
    US_MINING_EMPLOYMENT,    // is the multivariate time series matrix data (two d
    imensional)
    173,                     // is the number of observations (rows) US_MINING_EMP
    LOYMENT.
    8 ,                      // is the number of variables (columns) in US MINING

```

```

EMPLOYMENT.
    wMaxOrder,          // is the number of lagged difference terms used when
computing the estimator
    nPolyOrder,        // is the order of the polynomial:
                        // (-1=no constant, 0=contant-only (default), 1=const
ant and trend)
    traceTest,         // is a flag to select test: TRUE=trace, FALSE=maxima
l eignvalue test.
    nNoRelations,      // is the assumed number of cointegrating relationshi
ps between the variables.
    alpha,             // is the statistical significance level (e.g. 5%).
    &retStat,          // is the calculated test statistics score.
    &retCV             // is the calculated test critical value.
);

// (8) Eignvalue test
nNoRelations = 0;
traceTest = FALSE;
retStat=NAN;
retCV=NAN;

nRet = NDK_JOHANSENTEST(
    US_MINING_EMPLOYMENT, // is the multivariate time series matrix data (two d
imensional)
    173,                  // is the number of observations (rows) US_MINING_EMP
LOYMENT.
    8 ,                   // is the number of variables (columns) in US_MINING_
EMPLOYMENT.
    wMaxOrder,          // is the number of lagged difference terms used when
computing the estimator
    nPolyOrder,        // is the order of the polynomial:
                        // (-1=no constant, 0=contant-only (default), 1=const
ant and trend)
    traceTest,         // is a flag to select test: TRUE=trace, FALSE=maxima
l eignvalue test.
    nNoRelations,      // is the assumed number of cointegrating relationshi
ps between the variables.
    alpha,             // is the statistical significance level (e.g. 5%).
    &retStat,          // is the calculated test statistics score.
    &retCV             // is the calculated test critical value.
);

```

Namespace: NumXLAPI

Class: SFSDK

Scope: Public

Lifetime: Static

```
int NDK_JOHANSENTEST(INTPtr    pData,  
                    UIntPtr    nSize,  
                    UIntPtr    nVars,  
                    UIntPtr    maxOrder,  
                    short      nPolyOrder,  
                    BOOL       tracetest,  
                    UInt16     nNoRelations,  
                    double     alpha,  
                    ref double retStat,  
                    ref double retCV  
                    )
```

Returns the Johansen (cointegration) test statistics for two or more time series.

### 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 multivariate time series matrix data (two dimensional).
- [in] **nSize** is the number of observations in pData.
- [in] **nVars** is the number of variables in pData.
- [in] **maxOrder** is the number of lagged difference terms used when computing the estimator.
- [in] **nPolyOrder** is the order of the polynomial: (-1=no constant, 0=constant-only (default), 1=constant and trend).
- [in] **tracetest** is a flag to select test: TRUE=trace, FALSE=maximal eigenvalue test.
- [in] **nNoRelations** is the assumed number of cointegrating relationships between the variables (if missing, r=1).
- [in] **alpha** is the statistical significance level. If missing, a default of 5% is assumed.
- [out] **retStat** is the calculated test statistics score.
- [out] **retCV** is the calculated test critical value.

## Remarks

1. Each column in the input matrix corresponds to a separate time series variable.
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4. The number of cointegrating relationships should be no greater than the number of input variables.
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7. There are two types of Johansen tests - with trace or with eigenvalue - and the inferences might be a bit different for each.
  - The null hypothesis for the trace test is the number of cointegration vectors  $(r = 0)$
  - The null hypothesis for the eigenvalue test is  $(r = m)$

## Exceptions

Exception Type	Condition
None	N/A

## Requirements

<b>Namespace</b>	NumXLAPI
<b>Class</b>	SFSDK
<b>Scope</b>	Public
<b>Lifetime</b>	Static
<b>Package</b>	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")]