

# NDK\_LRVAR

Last Modified on 07/06/2016 10:56 am CDT

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

```
int __stdcall NDK_LRVAR(double * X,  
                        size_t N,  
                        size_t W,  
                        double * retVal  
                        )
```

Returns the long-run variance using a Bartlett kernel with window size k.

## 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 input data sample (a one/two dimensional array).

[in] **N** is the number of observations in X.

[in] **w** is the input Bartlett kernel window size. If omitted, the default value is the cubic root of the sample data size.

[out] **retVal** is the calculated value of this function.

## Remarks

1. The input time series data may include missing values (NaN), but they will not be included in the calculations.

2. The long-run variance is computed as follows:

$$\sigma^2 = \frac{1}{T} \sum_{t=k}^{T-k} \sum_{i=-k}^k w_i (x_{t-\bar{x}})(x_{t-i-\bar{x}})$$

Where:

- $x_{t-\bar{x}}$  is a value from the input time series data.
- $\bar{x}$  is the mean of the input time series data.
- $w_i$  is the Bartlett kernel weight, and it is defined as follows:
  - $w_i = 1 - \frac{|i|}{k+1}$
- $k$  is the input window size for the Bartlett kernel.

## Requirements

|  |  |
|--|--|
|  |  |
|--|--|

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

## Examples

```
int NDK_LRVAR(double[] pData,
              UIntPtr nSize,
              short argMenthod,
              ref double retVal
              )
```

|                            |
|----------------------------|
| <b>Namespace:</b> NumXLAPI |
| <b>Class:</b> SFSDK        |
| <b>Scope:</b> Public       |
| <b>Lifetime:</b> Static    |

Returns the long-run variance using a Bartlett kernel with window size k.

### 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 input data sample (a one/two dimensional array).
- [in] **nSize**            is the number of observations in pData.
- [in] **argMenthod** is the input Bartlett kernel window size. If omitted, the default value is the cubic root of the sample data size.
- [out] **retVal**        is the calculated value of this function.

### Remarks

1. The input time series data may include missing values (NaN), but they will not be included in the calculations.

2. The long-run variance is computed as follows:

$$\sigma^2 = \frac{1}{T} \sum_{t=k}^{T-k} \sum_{i=-k}^k w_i (x_{t-\bar{x}})(x_{t-i-\bar{x}})$$

Where:

- $x_t$  is a value from the input time series data.
- $\bar{x}$  is the mean of the input time series data.
- $w_i$  is the Bartlett kernel weight, and it is defined as follows:

- $\frac{1}{k+1}$
- $k$  is the input window size for the Bartlett kernel.

### 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

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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

### See Also

[template("related")]

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