NDK_XKURTTEST

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- C/C++
- .Net

```
int __stdcall NDK_XKURTTEST(double * X,
                            size_t   N,
                            double   alpha,
                            WORD     method,
                            WORD     retType,
                            double * retVal
                           )
```

Calculates the p-value of the statistical test for the population excess kurtosis (4th moment).

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 sample data (a one dimensional array).
[in]	**N**	is the number of observations in X.
[in]	**alpha**	is the statistical significance level. If missing, a default of 5% is assumed.
[in]	**method**	is the statistical test to perform (1=parametric).
[in]	**retType**	is a switch to select the return output:

Method	Value	Description
TEST_PVALUE	1	P-Value
TEST_SCORE	2	Test statistics (aka score)
TEST_CRITICALVALUE	3	Critical value.

[out]	**retVal**	is the calculated test statistics.

Remarks

1. The data sample may include missing values (e.g. #N/A).
2. The test hypothesis for the population excess kurtosis:

\[H_{o}: K=0\]

\[H_{1}: K\neq 0\],

where:

- \(H_{o}\) is the null hypothesis.
- \(H_{1}\) is the alternate hypothesis.

3. For the case in which the underlying population distribution is normal, the sample excess kurtosis also has a normal sampling distribution: $\hat K \sim N(0,\frac{24}{T})$, where: $\hat k$ is the sample excess kurtosis (i.e. 4th moment). T is the number of non-missing values in the data sample. $N(.)$ is the normal (i.e. gaussian) probability distribution function.

4. Using a given data sample, the sample excess kurtosis is calculated as:

$$\hat K (x)= \frac{\sum_{t=1}^T(x_t-\bar x)^4}{(T-1)\hat \sigma^4}-3,$$

where:

- $\hat K(x)$ is the sample excess kurtosis.
- x_i is the i-th non-missing value in the data sample.
- T is the number of non-missing values in the data sample.
- $\hat \sigma$ is the sample standard deviation.

5. The underlying population distribution is assumed normal (gaussian)..

6. This is a two-sides (i.e. two-tails) test, so the computed p-value should be compared with half of the significance level $\frac{\alpha}{2}$.

Requirements

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

Examples

```
int NDK_XKURTTEST(double[]   pData,
                  UIntPtr    nSize,
                  double     alpha,
                  UInt16     argMethod,
                  UInt16     retType,
                  out double retVal
                 )
```

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

Calculates the p-value of the statistical test for the population excess kurtosis (4th moment).

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 sample data (a one dimensional array).
[in]	**nSize**	is the number of observations in pData.
[in]	**alpha**	is the statistical significance level. If missing, a default of 5% is assumed.
[in]	**argMethod**	is the statistical test to perform (1=parametric).
[in]	**retType**	is a switch to select the return output:
[out]	**retVal**	is the calculated test statistics.

Method	Value	Description
TEST_PVALUE	1	P-Value
TEST_SCORE	2	Test statistics (aka score)
TEST_CRITICALVALUE	3	Critical value.

Remarks

1. The data sample may include missing values (e.g. #N/A).
2. The test hypothesis for the population excess kurtosis:

$$H_{o}: K=0$$

$$H_{1}: K\neq 0,$$

where:

- H_{o} is the null hypothesis.
- H_{1} is the alternate hypothesis.

3. For the case in which the underlying population distribution is normal, the sample excess kurtosis also has a normal sampling distribution: $\hat K \sim N(0,\frac{24}{T})$, where: $\hat k$ is the sample excess kurtosis (i.e. 4th moment). T is the number of non-missing values in the data sample. $N(.)$ is the normal (i.e. gaussian) probability distribution function.
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$$\hat K (x)= \frac{\sum_{t=1}^T(x_t-\bar x)^4}{(T-1)\hat \sigma^4}-3,$$

where:

- $\hat K(x)$ is the sample excess kurtosis.
- x_i is the i-th non-missing value in the data sample.
- T is the number of non-missing values in the data sample.
- $\hat \sigma$ is the sample standard deviation.

5. The underlying population distribution is assumed normal (gaussian)..
6. This is a two-sides (i.e. two-tails) test, so the computed p-value should be compared with half of the significance level $\frac{\alpha}{2}$.

Exceptions

Exception Type	Condition
None	N/A

Requirements

Namespace	NumXLAPI
Class	SFSDK
Scope	Public
Lifetime	Static
Package	NumXLAPI.DLL

Examples

References

Hull, John C.; Options, Futures and Other DerivativesFinancial Times/ Prentice Hall (2011), ISBN 978-0132777421

Hans-Peter Deutsch; , Derivatives and Internal Models, Palgrave Macmillan (2002), ISBN 0333977068

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")]