NDK_SKEWTEST

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- C/C++
- .Net

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

Calculates the p-value of the statistical test for the population skew (i.e. 3rd 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, the 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 (NaN).
2. The test hypothesis for the population distribution skewness: $$H_{o}: S=0$$ $$H_{1}: S\neq 0$$
   Where:
   - H_{o} is the null hypothesis.
   - H_{1} is the alternate hypothesis.
   - S is the population skew.
3. For the case in which the underlying population distribution is normal, the sample skew also has a

normal sampling distribution: $$\hat S \sim N(0,\frac{6}{T})$$ Where:

- $\hat S$ is the sample skew (i.e. 3rd moment).
- T is the number of non-missing values in the data sample.
- $N(.)$ is the normal (i.e. Gaussian) probability distribution function.

4. The sample data skew is calculated as: $$\hat S(x)= \frac{\sum_{t=1}^T(x_t-\bar x)^3}{(T-1)\times \hat \sigma^3}$$ Where:
   - $\hat S$ is the sample skew (i.e. 3rd moment)
   - 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 data sample standard deviation.
5. In the case where the population skew is not zero, the mean is farther out than the median in the long tail. The underlying distribution is referred to as skewed, unbalanced, or lopsided.
6. The underlying population distribution is assumed normal (Gaussian).
7. This is a two-sides (i.e. two-tails) test, so the computed p-value should be compared with half of the significance level ($\alpha/2$).

Requirements

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

Examples

```
int NDK_SKEWTEST(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 skew (i.e. 3rd 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, the 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.

retType values:

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 (NaN).
2. The test hypothesis for the population distribution skewness: $$H_{o}: S=0$$ $$H_{1}: S\neq 0$$ Where:
   - H_{o} is the null hypothesis.
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   - S is the population skew.
3. For the case in which the underlying population distribution is normal, the sample skew also has a normal sampling distribution: $$\hat S \sim N(0,\frac{6}{T})$$ Where:
   - $\hat S$ is the sample skew (i.e. 3rd 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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   - $\hat S$ is the sample skew (i.e. 3rd moment)
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Exceptions

Exception Type	Condition
None	N/A

Requirements

Namespace	NumXLAPI
Class	SFSDK
Scope	Public
Lifetime	Static
Package	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")]