NDK_TREND

Last Modified on 07/07/2016 11:50 am CDT

- C/C++
- .Net

```
int __stdcall NDK_TREND(double * pData,
                        size_t   nSize,
                        BOOL     bAscending,
                        WORD     nTrendType,
                        WORD     argPolyOrder,
                        BOOL     AllowIntercep,
                        double   InterceptVal,
                        int      nHorizon,
                        WORD     retType,
                        double   argAlpha,
                        double * retVal
                       )
```

Returns values along a trend curve (e.g. linear, quadratic, exponential, etc.) at time T+m.

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 univariate time series data (a one dimensional array).

[in] **nSize** is the number of elements in pData.

[in] **bAscending** is the time order in the data series (i.e. the first data point's corresponding date (earliest date=1 (default), latest date=0)).

[in] **nTrendType** is the model description flag for the trend function:

Order	Description
1	Linear (default)
2	Polynomial
3	Exponential
4	Logarithmic
5	Power

[in] **argPolyOrder** is the polynomial order. This is only relevant for a polynomial trend type and is ignored for all others. If missing, POrder = 1.

[in] **AllowIntercep** is a switch to include or exclude an intercept in the regression.

[in] **InterceptVal** is the constant or the intercept value to fix (e.g. zero). If missing (i.e. NaN), an intercept will not be fixed and is computed normally.

[in] **nHorizon** is the forecast time horizon beyond the end of pData. If missing, a default value of 0 (latest or end of pData) is assumed.

[in] **retType** is a switch to select the return output:

Method	Description
1	Forecast value (default)
2	C.I. Upper limit
3	C.I. Lower limit
4	R-Squared

[in] **argAlpha** is the statistical significance or confidence level (i.e. alpha). If missing or omitted, an alpha value of 5% is assumed.

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

Remarks

1. NDK_TREND supports the following trend functions: \[\begin{cases} \mathrm{Linear} & Y_t=\alpha + \beta \times t \\ \mathrm{Polynomial} & Y_t=\alpha + \beta_1 \times t + \beta_2 \times t^2 + \cdots + \beta_N \times t^N \\ \mathrm{Exponential:} & Y_t= \alpha \times e^{\beta \times t} \\ \mathrm{Logarithm:} & Y_t= \alpha + \beta \times \ln(t) \\ \mathrm{Power:} & Y_t= \alpha \times t^{\beta} \\ \end{cases} \]
2. For exponential and logarithmic trend in Excel functions, the intercept value is not permitted be fixed, and thus is ignored.
3. The polynomial order argument must be a positive integer.
4. The time series may include missing values (NaN) at either end.

Requirements

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

Examples

```
int NDK_TREND(double[] pData,
              int      nSize,
              BOOL     bAscending,
              short    nTrendType,
```

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

```
    short     argPolyOrder,
    BOOL      AllowIntercep,
    double    InterceptVal,
    int       nHorizon,
    short     argRetType,
    double    argAlpha,
    ref double retVal
)
```

Returns values along a trend curve (e.g. linear, quadratic, exponential, etc.) at time T+m.

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 univariate time series data (a one dimensional array).

[in] **nSize** is the number of elements in pData.

[in] **bAscending** is the time order in the data series (i.e. the first data point's corresponding date (earliest date=1 (default), latest date=0)).

[in] **nTrendType** is the model description flag for the trend function:

Order	Description
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[in] **argPolyOrder** is the polynomial order. This is only relevant for a polynomial trend type and is ignored for all others. If missing, POrder = 1.

[in] **AllowIntercep** is a switch to include or exclude an intercept in the regression.

[in] **InterceptVal** is the constant or the intercept value to fix (e.g. zero). If missing (i.e. NaN), an intercept will not be fixed and is computed normally.

[in] **nHorizon** is the forecast time horizon beyond the end of pData. If missing, a default value of 0 (latest or end of pData) is assumed.

[in] **argRetType** is a switch to select the return output:

Method	Description
1	Forecast value (default)
2	C.I. Upper limit
3	C.I. Lower limit
4	R-Squared

[in] **argAlpha** is the statistical significance or confidence level (i.e. alpha). If missing or omitted, an alpha value of 5% is assumed.

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

Remarks

1. NDK_TREND supports the following trend functions: \[\begin{cases} \mathrm{Linear} & Y_t=\alpha + \beta \times t \\ \mathrm{Polynomial} & Y_t=\alpha + \beta_1 \times t + \beta_2 \times t^2 + \cdots + \beta_N \times t^N \\ \mathrm{Exponential:} & Y_t= \alpha \times e^{\beta \times t} \\ \mathrm{Logarithm:} & Y_t= \alpha + \beta \times \ln(t) \\ \mathrm{Power:} & Y_t= \alpha \times t^{\beta} \\ \end{cases} \]
2. For exponential and logarithmic trend in Excel functions, the intercept value is not permitted be fixed, and thus is ignored.
3. The polynomial order argument must be a positive integer.
4. The time series may include missing values (NaN) at either end.

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")]