NDK_EWMA

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- C/C++
- .Net

```
int __stdcall NDK_EWMA(double * X,
                       size_t   N,
                       double   lambda,
                       size_t   step,
                       double * retVal
                      )
```

Calculates the estimated value of the exponential-weighted volatility (EWV).

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 univariate time series data (a one dimensional array).

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

[in] **lambda** is the smoothing parameter used for the exponential-weighting scheme. If missing, a default value of 0.94 is assumed

[in] **step** is the forecast time/horizon (expressed in terms of steps beyond the end of the time series X). If missing, a default value of 0 is assumed.

[out] **retVal** is the estimated value of the exponential-weighted volatility.

Remarks

1. The time series is homogeneous or equally spaced.
2. The time series may include missing values (NaN) at either end.
3. The EWMA function assumes that the time series has an average equal to zero.
4. The exponential-weighted moving average is calculated as:
   - $\sigma_t^2=\lambda \sigma_{t-1}^2+(1-\lambda)x_{t-1}^2$, where:
     - x_t is the value of the time series value at time t.
     - λ is the smoothing parameter (i.e. a non-negative constant between 0 and 1).
5. The size of the EWMA time series is equal to the input time series, but with the first observation (or last, if the original series is reversed) set to missing (NaN).

Requirements

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

Examples

```
int NDK_EWMA(double[]   pData,
             UIntPtr    nSize,
             double     lambda,
             UIntPtr    nStep,
             out double retVal
            )
```

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

Calculates the estimated value of the exponential-weighted volatility (EWV).

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 univariate time series data (a one dimensional array).
[in] **nSize** is the number of observations in pData.
[in] **lambda** is the smoothing parameter used for the exponential-weighting scheme. If missing, a default value of 0.94 is assumed
[in] **nStep** is the forecast time/horizon (expressed in terms of steps beyond the end of the time series pData). If missing, a default value of 0 is assumed.
[out] **retVal** is the estimated value of the exponential-weighted volatility.

Remarks

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- $\sigma_t^2=\lambda \sigma_{t-1}^2+(1-\lambda)x_{t-1}^2$, where:
  - x_t is the value of the time series value at time t.
  - λ is the smoothing parameter (i.e. a non-negative constant between 0 and 1).

5. The size of the EWMA time series is equal to the input time series, but with the first observation (or last, if the original series is reversed) set to missing (NaN).

Remarks

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")]