FreightMetrics

Fr8Tools: Function Reference Guide

xlAsian_MC

Calculate the fair value for Asian style options on freight using a generic Monte Carlo simulation model.

xlAsian_MC_FM

Calculate the fair value for Asian style options on freight using an extended Monte Carlo simulation model developed by FreightMetrics to account for the full forward curve data.

xlGreeks_Asian_MC

Calculate the risk statistics (delta, gamma, vega...) for Asian style options on freight using a generic Monte Carlo simulation model.

xlGreeks_Asian_MC_FM

Calculate the risk statistics (delta, gamma, vega...) for Asian style options on freight using an extended Monte Carlo simulation model developed by FreightMetrics to account for the full forward curve data.

xlAsian_TurnbullWakeman

Calculate the fair value or risk statistics (delta, gamma, vega...) for Asian style options on freight using the Turnbull & Wakeman approximation model.

xlAsian_TurnbullWakeman_IV

Calculate the implied volatility for Asian style options on freight using the Turnbull & Wakeman approximation model.

xlAsian_TurnbullWakeman_Mod

Calculate the fair value or risk statistics (delta, gamma, vega...) for Asian style options on freight using the Turnbull & Wakeman approximation model which has been modified by FreightMetrics to allow for monthly settlements based on the full forward curve.

xlAsian_TurnbullWakeman_Mod_IV

Calculate the implied volatility for Asian style options on freight using the Turnbull & Wakeman approximation model which has been modified by FreightMetrics to allow for monthly settlements based on the full forward curve.

xlAsian_TurnbullWakeman_ZCC

Calculate the strike price of the 2nd leg in a collar strategy to achieve a zero cost or any other net premium requirement.

xlAsian_TurnbullWakeman_PF

Calculate the strike price of both legs in a participating forward strategy for a given participation level of the 2nd leg.

xlAsian_TurnbullWakeman_SF

Calculate the strike price of both legs in a synthetic forward strategy.

xlFwdCurve_full

Generate the full forward curve from a given set of FFA prices.

xlFwdCurve_point

Calculate the forward rate for a certain date from a given set of FFA prices.

xlFwdRate

Calculate the forward rate for a certain period from a given forward curve.

xlMA_Vol

Calculate historical volatility over a given time period using the standard Moving Average technique.

xlMA_Correl

Calculate historical correlation between two price series over a given time period using the standard Moving Average technique.

xlEWMA_Vol

Calculate historical volatility using the Exponentially Weighted Moving Average technique.

xlEWMA_Correl

Calculate historical correlation between two price series using the Exponentially Weighted Moving Average technique.

---

xlAsian_MC

Overview

This function calculates the fair value for Asian style options on freight using a generic Monte Carlo simulation model. It is based on generating a large number of random price paths using daily time steps. The volatility used to generate these paths (in annualised terms) is given by the argument *vol*. Whilst randomly generated, these price paths are designed to be centered around the corresponding FFA price (or expected average spot price) for the settlement period of the option signified by the argument *FFAprice*. The number of paths generated by the simulation model is specified by the argument *simRuns*. For each price scenario, the function estimates the settlement amount which arises at the end of each month according to the type of the option (argument *optType*) and its strike price (argument *Strike*). Each settlement amount is then discounted to present value terms using the risk-free interest rate (argument *intRate*). The average of the aggregate discounted payoffs produced with the above procedure represents the "fair value" of the option. (For further evaluation of the various option pricing models offered by Fr8Tools, please refer to the document "Option Pricing Model Comparison")

Parameters

xlAsian_MC			
Argument	**Description**	**Sample Data**	**Switch**
keepRandom	Keep previous random numbers	FALSE	TRUE, FALSE
valueDate	Value date	01/09/2005	
avgBeg	Start of average period	01/01/2006	
avgEnd	End of average period	31/03/2006	
optType	Type of option (call/put)	1	1=Call, 2=Put
Strike	Strike price	22000	
FFAprice	Price of the underlying FFA contract	20000	
vol	Volatility (annualised)	40% or 0.40	
intRate	Risk-free interest rate	4% or 0.04	
simRuns	Number of simulation runs	5000	

References

- Glasserman, P. (2004), Monte Carlo Methods in Financial Engineering, Springer.
- Jaeckel, P. (2003), Monte Carlo Methods in Finance, Wiley.
- Tavella, D. (2002), Quantitative Methods in Derivatives Pricing, Wiley.

xlAsian_MC_FM

Overview

This function calculates the fair value for Asian style options on freight using an extended Monte Carlo simulation model developed by FreightMetrics to account for the full forward curve information. The main difference of this function compared to the *xlAsian_MC* function is the fact that *xlAsian_MC_FM* generates random price paths around the full (daily) forward curve of the underlying asset instead of simply taking the corresponding FFA price (or expected average spot price) for the settlement period of the option. In other words, it prices a freight option based not only on the expected average *level* of future spot prices, but also on the expected *path* of the underlying spot price (as implied by the *shape* of the full forward curve). (For further evaluation of the various option pricing models offered by Fr8Tools, please refer to the document "Option Pricing Model Comparison")

Parameters

xlAsian_MC_FM			
Argument	**Description**	**Sample Data**	**Switch**
keepRandom	Keep previous random numbers	FALSE	TRUE, FALSE
valueDate	Value date	01/09/2005	
avgBeg	Start of average period	01/01/2006	
avgEnd	End of average period	31/03/2006	
optType	Type of option (call/put)	1	1=Call, 2=Put
Strike	Strike price	22000	
fwdCurve	Forward curve of the underlying asset	see note below	
Vol	Volatility (annualised)	40% or 0.40	
intRate	Risk-free interest rate	4% or 0.04	
simRuns	Number of simulation runs	5000	

Note: The *fwdCurve* argument is passed on in the form of an Excel range consisting of 2 columns. The first column contains dates and the second column contains the corresponding forward prices. No headings are required at the top row of the range. The range can be generated from the *xlFwdCurve_full* function (with *curveType*=1).

References

- FreightMetrics (2005), "Option Pricing: Mind the Curve", www.freightmetrics.com
- Glasserman, P. (2004), Monte Carlo Methods in Financial Engineering, Springer.
- Jaeckel, P. (2003), Monte Carlo Methods in Finance, Wiley.
- Tavella, D. (2002), Quantitative Methods in Derivatives Pricing, Wiley.

xlGreeks_Asian_MC

Overview

This function calculates the risk statistics (delta, gamma, vega...) for Asian style options on freight using a generic Monte Carlo simulation model. For further information on how the corresponding option premium is obtained for the purpose of estimating the risk sensitivities, please refer to the function *xlAsian_MC*.

Parameters

xlGreeks_Asian_MC			
Argument	**Description**	**Sample Data**	**Switch**
keepRandom	Keep previous random numbers	FALSE	TRUE, FALSE
result	Selection of required risk statistic	2	2=Delta, 3=Gamma 4=Vega 5=Theta 6=Rho
valueDate	Value date	01/09/2005	
avgBeg	Start of average period	01/01/2006	
avgEnd	End of average period	31/03/2006	
optType	Type of option (call/put)	1	1=Call, 2=Put
Strike	Strike price	22000	
FFAprice	Price of the underlying FFA contract	20000	
vol	Volatility (annualised)	40% or 0.40	
intRate	Risk-free interest rate	4% or 0.04	
simRuns	Number of simulation runs	5000	

References

- Glasserman, P. (2004), Monte Carlo Methods in Financial Engineering, Springer.
- Jaeckel, P. (2003), Monte Carlo Methods in Finance, Wiley.
- Tavella, D. (2002), Quantitative Methods in Derivatives Pricing, Wiley.

xlGreeks_Asian_MC_FM

Overview

This function calculates the risk statistics (delta, gamma, vega...) for Asian style options on freight using an extended Monte Carlo simulation model developed by FreightMetrics to account for the full forward curve data. For further information on how the corresponding option premium is obtained for the purpose of estimating the risk sensitivities, please refer to the function *xlAsian_MC_FM*.

Parameters

xlGreeks_Asian_MC_FM			
Argument	**Description**	**Sample Data**	**Switch**
keepRandom	Keep previous random numbers	FALSE	TRUE, FALSE
result	Selection of required risk statistic	2	2=Delta, 3=Gamma 4=Vega 5=Theta 6=Rho
valueDate	Value date	01/09/2005	
avgBeg	Start of average period	01/01/2006	
avgEnd	End of average period	31/03/2006	
optType	Type of option (call/put)	1	1=Call, 2=Put
Strike	Strike price	22000	
fwdCurve	Forward curve of the underlying asset	see note below	
vol	Volatility (annualised)	40% or 0.40	
intRate	Risk-free interest rate	4% or 0.04	
simRuns	Number of simulation runs	5000	

Note: The *fwdCurve* argument is passed on in the form of an Excel range consisting of 2 columns. The first column contains dates and the second column contains the corresponding forward prices. No headings are required at the top row of the range. The range can be generated from the *xlFwdCurve_full* function (with *curveType*=1).

References

- FreightMetrics (2005), “Option Pricing: Mind the Curve”, www.freightmetrics.com
- Glasserman, P. (2004), Monte Carlo Methods in Financial Engineering, Springer.
- Jaeckel, P. (2003), Monte Carlo Methods in Finance, Wiley.
- Tavella, D. (2002), Quantitative Methods in Derivatives Pricing, Wiley.

xlAsian_TurnbullWakeman

Overview

This function calculates the fair value or risk statistics (delta, gamma, vega...) for Asian style options on freight using the Turnbull & Wakeman approximation model. This model is ultimately based on the generalised Black-Scholes model and is widely used as an analytic approximation for pricing geometric average Asian options. (For further evaluation of the various option pricing models offered by Fr8Tools, please refer to the document “Option Pricing Model Comparison”)

Parameters

xlAsian_TurnbullWakeman			
Argument	**Description**	**Sample Data**	**Switch**
optType	Type of option (call/put)	1	1=Call, 2=Put
FFAprice	Price of the underlying FFA contract	20000	
realAvg	Realised average price since the beginning of the average period	0.00	
strike	Strike price	22000	
timeMat1	Original time to maturity (years)	0.50	
timeMat2	Remaining time to maturity (years)	0.25	
timeBegAvg	Time to the beginning of the average period (years)	0.00	
intRate	Risk-free interest rate	4% or 0.04	
costCarry	Cost of carry	2% or 0.02	
vol	Volatility (annualised)	40% or 0.40	
reqResult	Required result	1	1=Price, 2=Delta, 3=Gamma, 4=Vega 5=Theta 6=Rho

References

- Turnbull, S.M., and L.M. Wakeman (1991), “A Quick Algorithm for Pricing European Average Options”, Journal of Financial and Quantitative Analysis, 26, 377-389.

xlAsian_TurnbullWakeman_IV

Overview

This function calculates the implied volatility for Asian style options on freight under the Turnbull & Wakeman approximation model. The function takes the price of the option as given (argument: *Price*) and recovers the volatility parameter which generates this price under the Turnbull & Wakeman model.

Parameters

xlAsian_TurnbullWakeman_IV			
Argument	**Description**	**Sample Data**	**Switch**
optType	Type of option (Call/Put)	1	1=Call, 2=Put
FFAprice	Price of the underlying FFA contract	20000	
realAvg	Realised average price since the beginning of the average period	0.00	
Strike	Strike price	22000	
timeMat1	Original time to maturity	0.50	
timeMat2	Remaining time to maturity	0.25	
timeBegAvg	Time to the beginning of the average period	0.00	
intRate	Risk-free interest rate	4% or 0.04	
costCarry	Cost of carry	2% or 0.02	
Price	Price of the option	2500	

References

- Turnbull, S.M., and L.M. Wakeman (1991), “A Quick Algorithm for Pricing European Average Options”, Journal of Financial and Quantitative Analysis, 26, 377-389.
- Press, W., S. Teukolsky, W. Vetterling, and B. Flannery (1992), Numerical Recipes in C, Cambridge University Press.

xlAsian_TurnbullWakeman_Mod

Overview

This function calculates the fair value or risk statistics (delta, gamma, vega...) for Asian style options on freight based on a modification of the standard Turnbull & Wakeman approximation model (see *xlAsian_TurnbullWakeman*). This modification was developed by FreightMetrics to allow for periodic settlements based on the monthly averages implied by the full forward curve of the underlying asset.

Parameters

xlAsian_TurnbullWakeman_Mod			
Argument	**Description**	**Sample Data**	**Switch**
optType	Type of option (call/put)	1	1=Call, 2=Put
fwdCurve	Forward curve of the underlying asset	see note below	
realAvg	Realised average price since the beginning of the average period	0.00	
strike	Strike price	22000	
valueDate	Value date	01/09/2005	
avgBeg	Start of average period	01/01/2006	
avgEnd	End of average period	31/03/2006	
intRate	Risk-free interest rate	4% or 0.04	
costCarry	Cost of carry	2% or 0.02	
vol	Volatility (annualised)	40% or 0.40	
reqResult	Required result	1	1=Price, 2=Delta, 3=Gamma, 4=Vega 5=Theta 6=Rho

Note: The *fwdCurve* argument is passed on in the form of an Excel range consisting of 2 columns. The first column contains dates and the second column contains the corresponding forward prices. No headings are required at the top row of the range. The range can be generated from the *xlFwdCurve_full* function (with *curveType*=1).

References

- Turnbull, S.M., and L.M. Wakeman (1991), “A Quick Algorithm for Pricing European Average Options”, Journal of Financial and Quantitative Analysis, 26, 377-389.

xlAsian_TurnbullWakeman_Mod_IV

Overview

This function calculates the implied volatility for Asian style options on freight under the modified Turnbull & Wakeman approximation model developed by FreightMetrics (see *xlAsian_TurnbullWakeman_Mod*). The function takes the price of the option as given (argument: *Price*) and recovers the volatility parameter which generates this price under the modified Turnbull & Wakeman model.

Parameters

xlAsian_TurnbullWakeman_Mod_IV			
Argument	**Description**	**Sample Data**	**Switch**
optType	Type of option (Call/Put)	1	1=Call, 2=Put
fwdCurve	Forward curve of the underlying asset	see note below	
realAvg	Realised average price since the beginning of the average period	0.00	
Strike	Strike price	22000	
valueDate	Value date	01/09/2005	
avgBeg	Start of average period	01/01/2006	
avgEnd	End of average period	31/03/2006	
intRate	Risk-free interest rate	4% or 0.04	
costCarry	Cost of carry	2% or 0.02	
Price	Price of the option	2500	

Note: The *fwdCurve* argument is passed on in the form of an Excel range consisting of 2 columns. The first column contains dates and the second column contains the corresponding forward prices. No headings are required at the top row of the range. The range can be generated from the *xlFwdCurve_full* function (with *curveType*=1).

References

- Turnbull, S.M., and L.M. Wakeman (1991), “A Quick Algorithm for Pricing European Average Options”, Journal of Financial and Quantitative Analysis, 26, 377-389.
- Press, W., S. Teukolsky, W. Vetterling, and B. Flannery (1992), Numerical Recipes in C, Cambridge University Press.

xlAsian_TurnbullWakeman_ZCC

Overview

This function retrieves the required strike price of the 2nd leg in a collar strategy to achieve a zero cost premium. In fact, by adding or subtracting a fixed amount from the price of the 1st leg (argument: *Price*), the function can return the required strike price of the 2nd leg for any net premium requirement (i.e. the collar need not be zero cost, but it can entail either a debit or credit payment.) The pricing of both legs is performed using the Turnbull & Wakeman approximation model.

Parameters

xlAsian_TurnbullWakeman_ZCC			
Argument	**Description**	**Sample Data**	**Switch**
optType	Type of option (Call/Put) for the 2nd leg	1	1=Call, 2=Put
FFAprice	Price of the underlying FFA contract	20000	
realAvg	Realised average price since the beginning of the average period	0.00	
vol	Volatility (annualised) for the 2nd leg	40% or 0.40	
timeMat1	Original time to maturity	0.50	
timeMat2	Remaining time to maturity	0.25	
timeBegAvg	Time to the beginning of the average period	0.00	
intRate	Risk-free interest rate	4% or 0.04	
costCarry	Cost of carry	2% or 0.02	
Price	Price of the 1st leg option	2000	
Leg1strike	Strike price of the 1st leg option	19000	

References

- Turnbull, S.M., and L.M. Wakeman (1991), "A Quick Algorithm for Pricing European Average Options", Journal of Financial and Quantitative Analysis, 26, 377-389.
- Press, W., S. Teukolsky, W. Vetterling, and B. Flannery (1992), Numerical Recipes in C, Cambridge University Press.

xlAsian_TurnbullWakeman_PF

Overview

This function retrieves the required strike price of both legs in a participating forward strategy for a given participation level of the 2nd leg. The user can specify a zero-cost or any other net premium requirement for the strategy (using the argument: *netPrice*). The pricing of both legs is performed using the Turnbull & Wakeman approximation model.

Parameters

xlAsian_TurnbullWakeman_PF			
Argument	**Description**	**Sample Data**	**Switch**
optType	Type of option (Call/Put) for the 2nd leg	1	1=Call, 2=Put
FFAprice	Price of the underlying FFA contract	20000	
realAvg	Realised average price since the beginning of the average period	0.00	
Vol1	Volatility (annualised) for the 1st leg	40% or 0.40	
Vol2	Volatility (annualised) for the 2nd leg	50% or 0.50	
timeMat1	Original time to maturity	0.50	
timeMat2	Remaining time to maturity	0.25	
timeBegAvg	Time to the beginning of the average period	0.00	
intRate	Risk-free interest rate	4% or 0.04	
costCarry	Cost of carry	2% or 0.02	
netPrice	Net premium requirement	0 (e.g. zero cost)	
Participation	Participation level of the 2nd leg option	50%	

References

- Turnbull, S.M., and L.M. Wakeman (1991), "A Quick Algorithm for Pricing European Average Options", Journal of Financial and Quantitative Analysis, 26, 377-389.
- Press, W., S. Teukolsky, W. Vetterling, and B. Flannery (1992), Numerical Recipes in C, Cambridge University Press.

xlAsian_TurnbullWakeman_SF

Overview

This function retrieves the required strike price of both legs in a synthetic forward strategy. The user can specify a zero-cost or any other net premium requirement for the strategy (using the argument: *netPrice*). The pricing of both legs is performed using the Turnbull & Wakeman approximation model.

Parameters

xlAsian_TurnbullWakeman_SF			
Argument	**Description**	**Sample Data**	**Switch**
buySell	Purchase or sale of synthetic forward	1	1=Buy, 2=Sell
FFAprice	Price of the underlying FFA contract	20000	
realAvg	Realised average price since the beginning of the average period	0.00	
Vol1	Volatility (annualised) for the 1st leg	40% or 0.40	
Vol2	Volatility (annualised) for the 2nd leg	50% or 0.50	
timeMat1	Original time to maturity	0.50	
timeMat2	Remaining time to maturity	0.25	
timeBegAvg	Time to the beginning of the average period	0.00	
intRate	Risk-free interest rate	4% or 0.04	
costCarry	Cost of carry	2% or 0.02	
netPrice	Net premium requirement	0 (e.g. zero cost)	

References

- Turnbull, S.M., and L.M. Wakeman (1991), “A Quick Algorithm for Pricing European Average Options”, Journal of Financial and Quantitative Analysis, 26, 377-389.
- Press, W., S. Teukolsky, W. Vetterling, and B. Flannery (1992), Numerical Recipes in C, Cambridge University Press.

xlFwdCurve_full

Overview

This function generates the full forward curve for a certain underlying route/index from a given set of FFA prices. For further information on how to interpret and construct freight forward curves, please refer to the paper “Freight Forward Curves: Techniques and Applications”.

Parameters

xlFwdCurve_full			
Argument	**Description**	**Sample Data**	**Switch**
spotPrice	Spot price	30000	
FFAprices	Set of FFA prices	See note below	
Freq	Frequency of interpolation (in days)	1	
curveType	Type of curve	1	1=Forward curve 2=Term structure

Note: The *FFAprices* argument is passed on in the form of an Excel range consisting of 4 columns. The first column contains the name of the FFA contract, the second and the third column contain the starting and ending date, respectively, of the settlement period, and the fourth column contains the corresponding FFA price. No headings are required at the top row of the range.

References

- FreightMetrics (2005), “Freight Forward Curves: Techniques and Applications”, www.freightmetrics.com
- Weber, N., and J. James, (2001), Interest Rate Modelling, Wiley.

xlFwdCurve_point

Overview

This function generates the forward rate for a single point (i.e. for a certain date) of the forward curve from a given set of FFA prices. For further information on how to interpret and construct freight forward curves, please refer to the paper “Freight Forward Curves: Techniques and Applications”.

Parameters

xlFwdCurve_point			
Argument	**Description**	**Sample Data**	**Switch**
spotPrice	Spot price	30000	
FFAprices	Set of FFA prices	See note below	
Freq	Frequency of interpolation (in days)	1	
curveType	Type of curve	1	1=Forward curve 2=Term structure
requiredDate	Required date	15/10/2006	

Note: The *FFAprices* argument is passed on in the form of an Excel range consisting of 4 columns. The first column contains the name of the FFA contract, the second and the third column contain the starting and ending date, respectively, of the settlement period, and the fourth column contains the corresponding FFA price. No headings are required at the top row of the range.

References

- FreightMetrics (2005), “Freight Forward Curves: Techniques and Applications”, www.freightmetrics.com
- James, J., and N. Weber (2001), Interest Rate Modelling, Wiley.

xlFwdRate

Overview

This function calculates the forward rate for a certain period (i.e. the forward rate which applies between two dates) using the term structure of freight rates. For further information on how to interpret and construct freight forward curves, please refer to the paper “Freight Forward Curves: Techniques and Applications”.

Parameters

xlFwdRate			
Argument	**Description**	**Sample Data**	**Switch**
fwdCurve	Forward curve (term structure)	See note below	
begDate	Start of period	15/10/2005	
endDate	End of period	15/08/2006	

Note: The *fwdCurve* argument is passed on in the form of an Excel range consisting of 2 columns. The first column contains maturity dates and the second column contains the corresponding forward rate from the term structure. No headings are required at the top row of the range. The range can be generated from the *xlFwdCurve_full* function (with *curveType*=2).

References

- FreightMetrics (2005), “Freight Forward Curves: Techniques and Applications”, www.freightmetrics.com
- James, J., and N. Weber (2001), Interest Rate Modelling, Wiley.

xlMA_Vol

Overview

This function calculates the historical volatility of a given set of prices using the standard Moving Average technique. Under this technique, all the observations in the data sample are equally weighted. The function is given a sample of historical prices (argument: *priceSample*) and returns the volatility (standard deviation) of continuously-compounded returns calculated over this sample period. The function maintains the time scaling of the raw data (i.e. for daily historical prices, it returns the daily volatility).

Parameters

xlMA_Vol			
Argument	**Description**	**Sample Data**	**Switch**
priceSample	Series of price data	See note below	

Note: The *priceSample* argument is passed on in the form of an Excel range consisting of one column that contains the series of prices for which we want to estimate the volatility.

References

- Dowd, K. (2002), Measuring Market Risk, Wiley.

xlMA_Correl

Overview

This function calculates the correlation between two price series over a given time period using the standard Moving Average technique. Under this technique, all the observations in the data samples are equally weighted. The function is given two separate series of historical prices (arguments: *priceSampleA* and *priceSampleB*) and returns the correlation coefficient between the continuously-compounded returns of the two price series. The function maintains the time scaling of the raw data (i.e. for daily historical prices, it returns the daily correlation).

Parameters

xlMA_Correl			
Argument	**Description**	**Sample Data**	**Switch**
priceSampleA	First series of prices	See note below	
priceSampleB	Second series of prices	See note below	

Note: Each *priceSample* argument is passed on in the form of an Excel range consisting of one column that contains the series of prices for which we want to estimate the correlation with the other series. Both series must be of equal size (i.e. with equal number of observations in each sample).

References

- Dowd, K. (2002), Measuring Market Risk, Wiley.

xlEWMA_Vol

Overview

This function calculates the historical volatility of a given set of prices using the Exponentially Weighted Moving Average (EWMA) technique. Under this technique, the most recent observations are more heavily weighted in the estimation of volatility. The function is given a sample of historical prices (argument: *priceSample*) and returns the volatility of continuously-compounded returns calculated over this sample period for a given decay factor. The function maintains the time scaling of the raw data (i.e. for daily historical prices, it returns the daily volatility). For further information on the EWMA technique, please consult the references mentioned below.

Parameters

xlEWMA_Vol			
Argument	**Description**	**Sample Data**	**Switch**
priceSample	Series of price data	See note below	
decayFactor	Decay factor	0.94	

Note: The *priceSample* argument is passed on in the form of an Excel range consisting of one column that contains the series of prices for which we want to estimate the volatility.

References

- Dowd, K. (2002), Measuring Market Risk, Wiley.

xlEWMA_Correl

Overview

This function calculates the correlation between two price series over a given time period using the Exponentially Weighted Moving Average (EWMA) technique. Under this technique, the most recent observations are more heavily weighted in the estimation of correlation. The function is given two separate series of historical prices (arguments: *priceSampleA* and *priceSampleB*) and returns the correlation coefficient between the continuously-compounded returns of the two price series for a given decay factor. The function maintains the time scaling of the raw data (i.e. for daily historical prices, it returns the daily correlation). For further information on the EWMA technique, please consult the references mentioned below.

Parameters

xlEWMA_Correl			
Argument	**Description**	**Sample Data**	**Switch**
priceSampleA	First series of prices	See note below	
priceSampleB	Second series of prices	See note below	
decayFactor	Decay factor	0.94	

Note: Each *priceSample* argument is passed on in the form of an Excel range consisting of one column that contains the series of prices for which we want to estimate the correlation with the other series. Both series must be of equal size (i.e. with equal number of observations in each sample).

References

- Dowd, K. (2002), Measuring Market Risk, Wiley.