Package ‘butterflyOptions’

November 24, 2022

Type    Package
Title   Trading Butterfly Options Strategies
Version 1.0.1
Author  MaheshP Kumar [aut, cre]
Maintainer  MaheshP Kumar <maheshparamjitkumar@gmail.com>
Imports ggplot2, dplyr, magrittr, tibble
Description
  Trading of Butterfly Options Strategies is represented here through their Graphs. The graphic indicators, strategies, calculations, functions and all the discussions are for academic, research, and educational purposes only and should not be construed as investment advice and come with absolutely no Liability.
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longCallbutterfly  
*Calculates per share Profit and Loss (PnL) at expiration for Long Call Butterfly Option Strategy and draws its Bar Plot displaying PnL in the Plots tab.*

**Description**

This is a volatility strategy consisting of a long position in an ITM (in the money) call option with a strike price $X_{1L}$, short positions in two ATM (at the money) call options with a strike price $X$, and a long position in an OTM (out of the money) call option with a strike price $X_{3H}$. The strikes are equidistant: $X_{3H}$ minus $X$ equals to $X$ minus $X_{1L}$ (Kakushadze & Serur, 2018).

**Usage**

```r
longCallbutterfly(
    ST, 
    X, 
    X1L, 
    X3H, 
    C, 
    C1L, 
    C3H, 
    hl = 0, 
    hu = 2, 
    spot = spot, 
    pl = pl, 
    myData = myData, 
    myTibble = myTibble, 
    PnL = PnL)
```

**Arguments**

- **ST**: Spot Price at time T.
- **X**: Strike Price or Exercise price for two ATM sold Calls.
- **X1L**: Lower Strike Price or Exercise price for one ITM long Call.
- **X3H**: Higher Strike Price or Exercise price for one OTM long Call.
- **C**: Call Premium or Call Price received for the two ATM sold Calls.
- **C1L**: Call Premium or Call Price paid for the first ITM long Call.
- **C3H**: Call Premium or Call Price paid for the one OTM long Call.
- **hl**: lower bound value for setting lower-limit of x-axis displaying spot price.
- **hu**: upper bound value for setting upper-limit of x-axis displaying spot price.
- **spot**: Spot Price
- **pl**: Profit and Loss column of the data frame
According to conceptual details given by Cohen (2015), and a closed form solution provided by Kakushadze and Serur (2018), this method is developed, and the given examples are created, to compute per share Profit and Loss at expiration for Long Call Butterfly Option Strategy and draw its graph in the Plots tab.

Value

graph of the strategy

Author(s)

MaheshP Kumar, <maheshparamjitkumar@gmail.com>

References


Examples

longCallbutterfly(100,100,80,120,8,24,1,hl=0.55,hu=1.45)

longPutButterfly

Calculates per share Profit and Loss (PnL) at expiration for Long Put Butterfly Option Strategy and draws its Bar Plot displaying PnL in the Plots tab.

Description

This consists of a long position in an OTM (out of the money) put option with a strike price $X1L, short positions in two ATM (at the money) put options with a strike price $X, and a long position in an ITM (in the money) put option with a strike price $X3H. The strikes are equidistant: $X3H minus $X equals to $X minus $X1L (Kakushadze & Serur, 2018).
longPutButterfly

Usage

longPutButterfly(
    ST,
    X,
    X1L,
    X3H,
    P,
    P1L,
    P3H,
    hl = 0,
    hu = 2,
    spot = spot,
    pl = pl,
    myData = myData,
    myTibble = myTibble,
    PnL = PnL
)

Arguments

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST</td>
<td>Spot Price at time T.</td>
</tr>
<tr>
<td>X</td>
<td>Strike Price or Exercise price for two ATM sold puts.</td>
</tr>
<tr>
<td>X1L</td>
<td>Lower Strike Price or Exercise price for one OTM long put.</td>
</tr>
<tr>
<td>X3H</td>
<td>Higher Strike Price or Exercise price for one ITM long put.</td>
</tr>
<tr>
<td>P</td>
<td>put Premium or put Price received for the two ATM sold puts.</td>
</tr>
<tr>
<td>P1L</td>
<td>put Premium or put Price paid for the first OTM long put.</td>
</tr>
<tr>
<td>P3H</td>
<td>put Premium or put Price paid for the one ITM long put.</td>
</tr>
<tr>
<td>hl</td>
<td>lower bound value for setting lower-limit of x-axis displaying spot price.</td>
</tr>
<tr>
<td>hu</td>
<td>upper bound value for setting upper-limit of x-axis displaying spot price.</td>
</tr>
<tr>
<td>spot</td>
<td>Spot Price</td>
</tr>
<tr>
<td>pl</td>
<td>Profit and Loss column of the data frame</td>
</tr>
<tr>
<td>myData</td>
<td>Data frame</td>
</tr>
<tr>
<td>myTibble</td>
<td>Tibble</td>
</tr>
<tr>
<td>PnL</td>
<td>Profit and Loss</td>
</tr>
</tbody>
</table>

Details

According to conceptual details given by Cohen (2015), and a closed form solution provided by Kakushadze and Serur (2018), this method is developed, and the given examples are created, to compute per share Profit and Loss at expiration for Long put Butterfly Option Strategy and draw its graph in the Plots tab.

Value

graph of the strategy
Author(s)

MaheshP Kumar, <maheshparamjitkumar@gmail.com>

References


Examples

longPutButterfly(100,100,80,120,6,1,20,hl=0.55,hu=1.45)

shortCallbutterfly  Calculates per share Profit and Loss (PnL) at expiration for Short Call Butterfly Option Strategy and draws its Bar Plot displaying PnL in the Plots tab.

Description

This is a volatility strategy consisting of a short position in an ITM (in the money) call option with a strike price X1L, a long position in two ATM (at the money) call options with a strike price X, and a short position in an OTM (out of the money) call option with a strike price X3H. The strikes are equidistant: X3H minus X equals to X minus X1L. This is a net credit trade. In this sense, this is an income strategy. The trader or investor has neutral outlook (Kakushadze & Serur, 2018).

Usage

shortCallbutterfly(
  ST,  
  X,  
  X1L,  
  X3H,  
  C,  
  C1L,  
  C3H,  
  hl = 0,  
  hu = 2,  
  spot = spot,  
  pl = pl,  
  myData = myData,  
  myTibble = myTibble,  
  PnL = PnL
)
shortCallbutterfly

Arguments

\begin{itemize}
\item \texttt{ST} \hspace{1.5cm} \text{Spot Price at time T.}
\item \texttt{X} \hspace{1.5cm} \text{Strike Price or \textit{eX}ercise price for two \textit{ATM} bought Calls.}
\item \texttt{X1L} \hspace{1.5cm} \text{Lower \textit{Strike Price} or \textit{eX}ercise price for one \textit{ITM} shorted Call.}
\item \texttt{X3H} \hspace{1.5cm} \text{Higher \textit{Strike Price} or \textit{eX}ercise price for one \textit{OTM} shorted Call.}
\item \texttt{C} \hspace{1.5cm} \text{Call Premium or Call Price paid for the two \textit{ATM} bought Calls.}
\item \texttt{C1L} \hspace{1.5cm} \text{Call Premium or Call Price received for the first \textit{ITM} shorted Call.}
\item \texttt{C3H} \hspace{1.5cm} \text{Call Premium or Call Price received for the one \textit{OTM} shorted Call.}
\item \texttt{hl} \hspace{1.5cm} \text{lower bound value for setting lower-limit of x-axis displaying spot price.}
\item \texttt{hu} \hspace{1.5cm} \text{upper bound value for setting upper-limit of x-axis displaying spot price.}
\item \texttt{spot} \hspace{1.5cm} \text{Spot Price}
\item \texttt{pl} \hspace{1.5cm} \text{Profit and Loss}
\item \texttt{myData} \hspace{1.5cm} \text{Data frame}
\item \texttt{myTibble} \hspace{1.5cm} \text{tibble}
\item \texttt{PnL} \hspace{1.5cm} \text{Profit and Loss}
\end{itemize}

Details

According to conceptual details given by Cohen (2015), and a closed form solution provided by Kakushadze and Serur (2018), this method is developed, and the given examples are created, to compute per share Profit and Loss at expiration for Short Call Butterfly Option Strategy and draw its graph in the Plots tab.

Value

\text{graph of the strategy}

Author(s)

MaheshP Kumar, <maheshparamjiktumar@gmail.com>

References


Examples

\begin{verbatim}
shortCallbutterfly(400, 400, 375, 425, 6, 17.5, 7.5, hl=0.9, hu=1.1)
\end{verbatim}
**shortPutButterfly**

*Calculates per share Profit and Loss (PnL) at expiration for Short Put Butterfly Option Strategy and draws its Bar Plot displaying PnL in the Plots tab.*

**Description**

This strategy consists of a short position in an OTM (out of the money) put option with a strike price $X1L$, a long position in two ATM (at the money) put options with a strike price $X$, and a short position in an ITM (in the money) put option with a strike price $X3H$. The strikes are equidistant: $X3H$ minus $X$ equals to $X$ minus $X1L$ (Kakushadze & Serur, 2018).

**Usage**

```r
shortPutButterfly(
    ST,
    X,
    X1L,
    X3H,
    P,
    P1L,
    P3H,
    hl = 0,
    hu = 2,
    spot = spot,
    pl = pl,
    myData = myData,
    myTibble = myTibble,
    PnL = PnL
)
```

**Arguments**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST</td>
<td>Spot Price at time T.</td>
</tr>
<tr>
<td>X</td>
<td>Strike Price or eXercise price for two ATM bought puts.</td>
</tr>
<tr>
<td>X1L</td>
<td>Lower Strike Price or eXercise price for one OTM shorted put.</td>
</tr>
<tr>
<td>X3H</td>
<td>Higher Strike Price or eXercise price for one ITM shorted put.</td>
</tr>
<tr>
<td>P</td>
<td>put Premium or put Price paid for the two ATM bought puts.</td>
</tr>
<tr>
<td>P1L</td>
<td>put Premium or put Price received for the first OTM shorted put.</td>
</tr>
<tr>
<td>P3H</td>
<td>put Premium or put Price received for the one ITM shorted put.</td>
</tr>
<tr>
<td>hl</td>
<td>lower bound value for setting lower-limit of x-axis displaying spot price.</td>
</tr>
<tr>
<td>hu</td>
<td>upper bound value for setting upper-limit of x-axis displaying spot price.</td>
</tr>
<tr>
<td>spot</td>
<td>Spot Price</td>
</tr>
<tr>
<td>pl</td>
<td>Profit and Loss column of the data frame</td>
</tr>
</tbody>
</table>
According to conceptual details given by Cohen (2015), and a closed form solution provided by Kakushadze and Serur (2018), this method is developed, and the given examples are created, to compute per share Profit and Loss at expiration for Short put butterfly Options Strategy and draw its graph in the Plots tab.

Value

graph of the strategy

Author(s)

MaheshP Kumar, <maheshparamjikumar@gmail.com>

References


Examples

shortPutButterfly(400,400,375,425,7,5,18,hl=0.9,hu=1.1)
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