ASX 24 User Defined Combinations

Version 1.05 | October 2023

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1. Introduction

User Defined Combination (UDC) functionality provides for the execution of multi-legged strategies that are not offered as exchange defined combinations. A UDC can be created with 2 to 6 unique legs. UDCs can be price as a total net premium, or the user may fix the price of one leg of the strategy.

Customers should ensure they have read and understood the procedures for the creation and execution of UDCs as part of the Trading Rules.

1.1. Purpose

This document aims to provide insight and market examples of how UDCs behave; specifically with regard to the following:

- Net price calculation with a ratio 1:1
- Net price calculation with a variable ratio
- The use of a fixed price leg
- The pricing of a UDC with a fixed leg

1.2. Audience

This document is intended to provide ASX 24 Participants and Software Vendors with sufficient information to help them implement logic and to understand how different strategies can be created and traded using the UDC functionality.

1.3. Document History

This document has been through the following iterations:

Version	Date	Description
V1.01	June 2016	First release
V1.02	February 2017	Including section 2: Creating UDC's
V1.03	June 2017	Refinement and inclusion of examples across product types
V1.04	September 2017	Service Release 1 functionality inclusions
V1.05	October 2023	Updated naming conventions

2. Creating UDCs

To create a UDC the Trading Participant must consider:

- The underlying instrument legs; up to 6 futures and/or option instruments may be included in a UDC.
- Where appropriate, the ratios between the legs; UDC ratios will always be reduced to the lowest common denominator, the maximum ratio available is 1:150.
- The pricing model:
  - o Net price between legs; or
  - o Fixed leg pricing
  - o For combination strategies including both futures and options, fixed leg price. Where the option component of such a strategy has multiple option strikes, the remaining price will be at a net price. **The fixed leg price is not included in the net price of the strategy** – only the legs traded as a net price should be taken into account when considering the price when entering an order for the strategy.
- The underlying legs are quoted in the same currency, are in the same trade date and at least one of the non-fixed legs has a prior settlement price.
- Outright futures and/or options legs only, i.e. a UDC cannot reference another UDC nor reference another Exchange Defined Combination, these include: Strips, Packs, Bundles, Intra and Inter-Commodity Spreads.
- Different underlying legs, a user cannot buy and sell the same contract leg of a UDC as part of the strategy.

> **Note**
> Users of software applications that mass release UDC requests should be cognisant of market openings and other busy periods to avoid bystander impact to other users of the market.

3. Trading Protection Limits for UDCs

All market segments appear for selection in TPL setting groups however limits are only effective for single instruments and exchange defined spreads. TPL settings will **not** affect order entry on UDCs.

4. Leg Price Allocation

The matching engine uses a set of complex and iterative pricing rules to determine the leg prices when a combination order is matched against other combination orders. The algorithm is attached as an appendix to this user guide.

4.1. Example

The following example is an executed Strangle where both the underlying legs have had previous traded prices in their outright markets in the same session:

Let's consider the example strategy, **XTM7 96.900 Put / 97.100 Call Strangle.**

Let's assume that the options contract are liquid and have a last trade price in the XTM70097100C of 0.040, and the XTM70096900P of 0.035.

In this scenario, the UDC has a NET bid of 0.075 in the book and a NET offer at 0.075 which will create a trade in the strangle at 0.075. The allocated leg prices would be 1 XTM7 97.100 Call option @ 0.040 and 1 XTM7 96.900 Put option at @ 0.035, to give a net price of 0.075. Since the contracts are liquid and have a last traded price in the session, the allocated leg prices would be reflective of the current underlying market.

Consider another scenario for the same Strangle strategy where the underlying options contract are less liquid and have no relevant market data in the outright market for the session.

Let's assume that:

- The call and put option contracts are illiquid, with no Last Trade Price and no current bid/ask in the outright market at the time of the UDC's execution.

The prior settlement prices for these option contracts are stale and do not reflect fair market value.

The prior settlement price for the contracts are: XTM7 = 97.000, XTM70097100C = 0.020, and XTM70096900P = 0.020 respectively.

If the underlying market moves and the strangle is now worth a net price of 0.070 – Buy 1 XTM7 96.900 Put option and Buy 1 XTM7 97.100 Call option, upon execution the put will be allocated a price of 0.020 and the call would be allocated a price of 0.050.

To ensure the allocated leg prices are closer to fair value, participants can create a UDC with one leg at a fixed price.

Consider the example of a Strangle with a Fixed leg price strategy below:

We want to trade this strategy at 0.075 points in total and we want the Call leg to trade at 0.035 points, to create this UDC, the user must enter the following:

Step 1 – create UDC

- Leg 1 Buy 1 XTM7 97.100 Call option – **Fixed Leg** price of 0.035
- Leg 2 Buy 1 XTM7 96.900 Put option (create UDC)

To enter a Bid with an effective price of 0.075 in the strangle, the user must now enter a bid of 0.040 in the order book …… this is reflective of the non-fixed leg price which will be quoted as 0.040 in the onscreen UDC market.

Upon execution, the trade in the fixed price UDC at 0.040 provides a leg allocation of 1 XTM7 97.100 Call option **@ 0.035** (fixed price) and 1 XTM7 96.900 Put option at **@ 0.040.**

Alternatively, the user could fix the put leg at 0.040 points and keep the floating leg of the call at 0.035 points which would effectively give the same leg price allocation.

5. Treatment of leg ratios for Fixed Leg Price UDCs

Fixed leg price UDCs are generally used for futures and options (F/O) strategies, where the futures contract has the fixed leg price, with one to five non-fixed legs. The UDC price is the net price for the non-fixed legs.

The fixed leg would be filled at or better than the fixed price, and will not be included in the calculation of the overall net price of the strategy.

The trade price algorithm deems all leg ratios being 1:1 when calculating the net price of the non-fixed legs of the strategy.

⚠️ **Attention**
- It is advised that where a user wants to execute a ratio spread strategy where there are more than 2 non-fixed legs that the user does **NOT** execute as a fixed leg combination, but executes the strategy as a total net premium strategy.

5.1. Example

To illustrate how leg ratios for Fixed Leg Price UDCs are treated, let's consider a strategy with the following ratios:

- IRU7 future is fixed at 97.000, Buy LegRatio = 51
- IRU70097000C, Ask LegRatio = 100

Given the above scenario, the F/O strategy is created with IRU7 51 @ 97.000 hedging against IRU70097000C 100 @ 0.200. Effectively an F/O with a 51 delta.

The price of the future leg is fixed at 97.000, so it would trade at the locked-in, or better price.

The non-fixed option component of the strategy will look at the net price of the non-fixed leg being 0.200 and this will be the price displayed for the strategy in the UDC book.

ⓘ **Note**
- The fixed leg price is not included in the net price of the strategy – only the legs traded as net should be taken into account for price calculation when placing the order. For strategies with a fixed leg and one or more legs with leg ratios greater than one, the pricing of the strategy no longer multiplies leg prices by their leg ratios in ASX 24 Service Release 1.
- Also, in this instance as the ratio between the fixed leg and non-fixed leg's lowest common denominator is the ratio of 51:100, the minimum volume increment per trade is 51 futures vs 100 options.

6. Order Entry and Leg/Strategy Pricing

The following examples illustrate the price that would be displayed for similar strategies, at-the-money options basis futures, with a slightly different hedge. These orders, whilst similar will have their own unique order book.

For example, let's consider XT futures are trading between 96.980 and 97.020 over the course of the day.

1. ATM F/O with a **Delta of 0.50**

The UDC strategy we are looking to do is:

- Buy 50 XT futures @ 97.000 (fixed leg priced at 97.000)
- Buy 100 XT 97.000 Puts at 0.200

The leg ratio is not at the lowest common denomination, and is reduced by the matching engine to a ratio of 1:2.

The net price displayed on screen in this strategy is 0.200 (actual price) and the smallest tradeable volume parcel is 1 future vs 2 options.

2. ATM F/O with a **Delta of 0.49**

The UDC strategy we are looking to do is:

- Buy 49 XT futures @ 97.010 (fixed leg priced at 97.010)
- Buy 100 XT 97.000 Puts at 0.195

The leg ratio is already at the lowest common denomination, and remains as is.

The net price displayed on screen in the strategy is 0.195 (actual price) and the smallest tradeable volume parcel is 49 futures vs 100 options.

3. ATM F/O with a **Delta of 0.48**

The UDC strategy we are looking to do is:

- Buy 48 XT futures @ 97.020 (fixed leg priced at 97.020)
- Buy 100 XT 97.000 Puts at 0.190

The leg ratio is not at the lowest common denomination, and is reduced by the matching engine to a ratio of 12:25.

The net price displayed on screen in the strategy is 0.190 (actual price) and the smallest tradeable volume parcel is 12 futures vs 25 options.

4.   ATM F/O with a Delta of 0.51

The UDC strategy we are looking to do is:

- Buy 51 XT futures @ 96.990 (fixed leg priced at 96.990)
- Buy 100 XT 97.000 Puts at 0.205

The leg ratio is already at the lowest common denomination and remains as is.

The net price displayed on screen in the strategy is 0.205 (actual price) and the smallest tradeable volume parcel is 51 futures vs 100 options.

5.   ATM F/O with a Delta of 0.52

The UDC strategy we are looking to do is:

- Buy 52 XT futures @ 96.980 (fixed leg priced at 96.980)
- Buy 100 XT 97.000 Puts at 0.210

The leg ratio is not at the lowest common denomination and is reduced by the matching engine to a ratio of 13:25.

The net price displayed on screen in the strategy is 0.210 (actual price) and the smallest tradeable volume parcel is 13 futures vs 25 options.

The prices displayed for similar strategies will fall into different UDC order books as the price of the fixed leg differs and the volume ratios differ between each order.

ⓘ   **Note**
The fixed leg price is not included in the net price of the strategy – only the legs traded as net should be taken into account for price calculation when placing the order. For strategies with a fixed leg and one or more legs with leg ratios greater than one, the pricing of the strategy should no longer multiplies leg prices by their leg ratios in ASX 24 Service Release 1.

7. Treatment of Negative prices for a Strategy with Differential

When a strategy involves both buy and sell legs, the calculated net price may be displayed as a negative value. Depending on the leg ratios and current market level in the underlying legs, the calculated net price can be a negative value but the allocated trade prices for each leg are always positive.

Net price for the UDC is calculated as follows:

Net price = Sum of Buy side (leg ratio * leg price) **- Sum of Sell side** (leg ratio * leg price)

7.1. Example

To illustrate treatment of negative prices for a strategy with a differential, let's consider the following Butterfly spread.

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1.   Options Butterfly Strategy

Current market level in YTU7 is at 98.000

- YTU70097800C, Buy LegRatio =1 (current market is: 0.710 bid – 0.760 offer)
- YTU70098000C, Sell LegRatio = 2 (current market is: 0.550 bid – 0.560 offer)
- YTU70098200C, Buy LegRatio =1 (current market is: 0.320 bid – 0.350 offer)

If the current market level, the strategy generates a bid and offer between a negative and positive price range:

The current market in the outright options would create an implied market in the UDC butterfly spread with a negative price of -0.090 on the BID side (0.710 * 1 + 0.320 * 1 – 0.560 * 2) and 0.010 on the SELL side (0.760 * 1 + 0.350 * 1 – 0.550 * 2).

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2.   Bank Bills (IR) Futures Butterfly Strategy

- IRM8, Buy LegRatio =1 (current market is: 98.240 – 98.250)
- IRU8, Sell LegRatio = 2 (current market is: 98.140 – 98.150)
- IRZ8, Buy LegRatio =1 (current market is: 98.040 – 98.050)

At the current market level, the strategy generates a bid and offer between a negative and positive price range:

The current market in the outright Futures would create an implied market in the UDC butterfly spread with a negative price of -0.020 on the BID side (98.240 * 1 + 98.040 * 1 – 98.150 * 2) and 0.020 on the SELL side (98.250 * 1 + 98.050 * 1 – 98.140 * 2).

8. Treatment of Strategy with only Sell legs

The matching engine limits the creation of a strategy with sell only legs for a net price UDC or where there are sell only legs for the non-fixed component of a fixed price leg strategy. This is to ensure that a positive price is displayed for the UDC.

The system will create a UDC with sides inversed for all the legs if the request to create a strategy includes sell legs only for a net price UDC or sell legs only for the non-fixed component of the fixed price leg. The user will be advised to use the UDC with inversed leg sides instead.

8.1. Example

To illustrate treatment of strategy with sell leg only, let's consider the following example:

1.   Options basis Futures Strategy

The options basis futures strategy is IRZ7 Buy 49 @ 98.100 hedging against IRZ70098100C Sell 100 @ 0.200

Users requests to create an options basis futures strategy as below:

- IRZ7 is fixed at 98.100, Buy LegRatio = 49
- IRZ70098100C, Ask LegRatio = 100

[Buy order in the strategy would Buy IRZ7 and sell IRZ70098100C. Sell order in the strategy would Sell IRZ7 and Buy IRZ70098100C]

Given that the non-fixed component includes sell leg only, the matching engine will flip the legs around and create the UDC as:

- IRZ7 is fixed at 98.100, Sell LegRatio = 49
- IRZ70098100C, Buy LegRatio = 100

[Buy order in the strategy would Sell IRZ7 and Buy IRZ70098100C. Sell order in the strategy would Buy IRZ7 and Sell IRZ70098100C.]

2.   Net price strategy

A net price short-straddle strategy is YTZ7 98.000 Call Sell 1 and YTZ7 98.000 Put Sell 1

Users requests to create the strategy as:

- YTZ7 98.000 Call Sell 1

- YTZ7 98.000 Put Sell 1

[Buy order in the strategy would sell YTZ7 98.000 Call and sell YTZ7 98.000 Put. Sell order in the strategy would Buy YTZ7 98.000 Call and Buy YTZ7 98.000 Put]

Since the strategy include sell legs only, the matching engine will flip the legs around and create an UDC as:

- YTZ7 98.000 Call Buy 1
- YTZ7 98.000 Put Buy 1

[Buy order in the strategy would Buy YTZ7 98.000 Call and Buy YTZ7 98.000 Put. Sell order in the strategy would Sell YTZ7 98.000 Call and Sell YTZ7 98.000 Put]

9. Rounding leg prices due to tick size

Combinations with leg ratios greater than one may result in leg price allocations that are rounded to a valid tick increment and cannot add to the net strategy price entered by the user. Furthermore, combinations of instruments on different tick increments and leg ratios greater than one may not have a mathematical solution to price the legs to a valid tick increment and total to the net price. This means some strategy prices are impossible to facilitate without breaking the leg ratios.

8.1 Examples

1.   **Net price strategy[1]**
A net price for a long future short option strategy is APH8 Buy 1 and APH8 5000.0 Call Sell 2

Users A requests to create the strategy as:

- APH8 Future Buy LegRatio = 1
- APH8 5000.0 Call Sell LegRatio = 2

The tick size for APH8 futures is 1.0 index point and for the AP Options the tick size is 0.5 index points. The tick size for the strategy is 0.5 index points, being the narrowest of the leg tick sizes.

User A enters a Buy order into UDC at 5004.5 as a net premium

User B enters a Sell order into UDC at 5004.5 as a net premium

APH8 last traded at 5008.0 points

- UDC execution traded at 5004.5 as a net premium
- APH8 Future leg allocated at 5008.0
- APH8 5000 Call leg allocated at 2.0

Adding up the leg executions results in a net price of 5008.0 - 2.0 * 2 = 5004.0. Due to the leg ratios and minimum price tick increments of the strategy, there is no combination of leg prices pAPH8 and pAPH850000C that can solve the equation pAPH8 * 1 – pAPH850000C * 2 = 5004.5.

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[1] The strategy in this example is provided for illustrative purposes and generally FO strategies should be traded as fixed leg UDCs.

Note

ASX Trading Operations will monitor UDC executions. ASX will contact affected Trading Participants to advise a price error has occurred and offer to re-price any or all the UDC leg prices to equalise the net price of the executed strategy.

10. Strategies with legs that have a zero prior settlement price

There is a system limitation with leg pricing for strategies consisting of contracts with a zero prior settlement price. The zero PSP can be used to set preliminary leg prices and can cause pricing errors when leg prices are subsequently adjusted to the minimum price increment. It is strongly recommended that out-of-the-money options are fixed in strategies such as Strangles.

1.	Out-of-the money options strategies

Users A requests to create the Strangle as:

- YTZ70097500P Buy 1
- YTZ70098500C Buy 1

   PSP, Adjusted Close and LTP is __zero__ for the put option. PSP is 0.015 for the Call option. The minimum tick size for both options is 0.005

User A enters a Buy order into the UDC at 0.030

User B enters a Sell order into the UDC at 0.030

- UDC execution is printed at 0.030
- YTZ70097500P 1 @ 0.005
- YTZ70098500C 1 @ 0.030

Adding up the leg executions results in a net price of 0.005 + 0.030 = 0.035. In this case the YTZ70097500P option is picked as the anchoring leg due to sorting with the preliminary price set to the PSP of 0. The put option is priced at 0.030 to equal the net price, however the put option price is subsequently rounded up to the minimum tick, which causes the net pricing error. This issue will be fixed in an upcoming service release.

ⓘ **Note**
ASX Trading Operations will monitor UDC executions. ASX will contact affected Trading Participants to advise a price error has occurred and offer to re-price any UDC leg prices to equal the net price of the strategy.

11. Further Trade Examples

1.   **Electricity Options Collar**

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the higher valued option.

In this Instance I want to trade the BNM8 100.00 / 130.00 collar at $1.00 buying the 100.00 put and selling the 130.00 call.

- Buy 1 BNM80010000P @ $10.50 (fixed leg priced at $10.50)
- Sell 1 BNM80013000C

       UDC Created.

- In Order to achieve a price of $1.00 in the collar I enter an offer of $9.50 in the call leg. As the Fixed leg UDC function only prices the non-fixed legs my price of $9.50 will be offset by the fixed leg of 10.50 giving me a filled net price of $1.00 in the strategy. The Price displayed in the UDC will be $9.50.
- Leg fills 1 BNM80010000P @ $10.50 and 1 BNM80013000C @ $9.50 for each single lot traded

2.   Electricity Ratio Put Spread

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the higher valued option although this is not a requirement you can Fix either leg.

In this Instance I want to trade the BNM8 80.00 / 70.00 1 x 2 put spread at $2.00 buying the 80.00 put and selling 2 of the 70.00 puts.

- Buy 1 BNM80008000P @ 14.00 (fixed leg priced at 14.00)
- Sell 2 BNM80007000P

    UDC Created.

- In Order to achieve a price of $2.00 in the ratio put spread I enter an offer of $6.00 in the 70.00 put.
- As the Fixed leg function only prices the non-fixed leg my price of $6.00 will be offset by the fixed leg of $14.00 bearing in mind the ratio is 1:2 (effectively I'm trading the 70.00 put at $12.00 giving me a filled net price of $2.00 in the strategy. The Price displayed in the UDC will be $6.00.
- Leg fills 1 BNM80008000P @ $14.00 and 2 BNM80007000P @ $6.00 for each single lot traded

3.   Electricity Options Strangle

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the higher valued option although this is not a requirement you can Fix either leg.

In this Instance I want to trade the BNM8 90.00 / 120.00 strangle at $19.00 buying the 90.00 put and buying the 120.00 call.

- Buy 1 BNM80009000P @ $10.25 (fixed leg priced at $10.25)
- Buy 1 BNM80012000C

    UDC Created.

- In Order to achieve a price of $19.00 in the strangle I enter a bid of $8.75 in the call leg. As the Fixed leg UDC function only prices the non-fixed legs my price of $8.75 will be combined with the fixed leg of $10.25 giving me a filled net price of $19.00 in the strategy. The Price displayed in the UDC will be $8.75.
- Leg fills 1 BNM80009000P @ $10.25 and 1 BNM80012000C @ $8.75 for each single lot traded

4. Electricity Options Straddle

Similar to the strangle the UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the higher valued option although this is not a requirement you can Fix either leg.

In this Instance I want to trade the BNM8 100.00 straddle at $24.50 buying the 100.00 put and buying the 100.00 call.

- Buy 1 BNM80010000P @ $13.50 (fixed leg priced at $13.50)
- Buy 1 BNM80010000C

     UDC Created.

- In Order to achieve a price of $24.50 in the straddle I enter a bid of $11.00 for the call leg. As the Fixed leg UDC function only prices the non-fixed legs my price of $11.00 will be combined with the fixed leg of $13.50 giving me a filled net price of $24.50 in the strategy. The Price displayed in the UDC will be $11.00.
- Leg fills 1 BNM80010000P @ $13.50 and 1 BNM80010000C @ $11.00 for each single lot traded

5. Electricity Delta Neutral F/O example 1

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the futures leg of the strategy.

In this Instance I want to trade the BNM8 100.00 put at $12.75 basis 100.00 in the futures buying the 100.00 put and buying BNM8 futures, the delta on this is 50% so the ratio in this instance is 1:2 futures to options.

- Buy 1 BNM8 futures @ 100.00 (fixed leg priced at $100.00)
- Buy 2 BNM80010000P

     UDC Created.

- In Order to achieve a price of 12.75 in the put I enter a bid of $12.75 for the put leg. As the Fixed leg UDC function only prices the non-fixed legs my price of $12.75 will only relate to the options leg.
- Leg fills 1 BNM8 @ $100.00 and 2 BNM80010000P @ $12.75 for each single lot traded

6. Electricity Delta Neutral F/0 example 2

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the futures leg of the strategy.

In this Instance I want to trade the BNM8 100.00 put at $8.50 basis 120.00 in the futures buying the 100.00 put and buying BNM8 futures, the delta on this is 25% so the ratio in this instance is 1:4 futures to options.

- Buy 1 BNM8 futures @ 120.00 (fixed leg priced at $120.00)
- Buy 4 BNM80010000P

    UDC Created.

- In Order to achieve a price of $8.50 in the put I enter a bid of $8.50 for the put leg. As the Fixed leg UDC function only prices the non-fixed legs my price of $8.50 will only relate to the options leg.
- Leg fills 1 BNM8 @ $120.00 and 4 BNM80010000P @ $8.50 for each single lot traded

7. Electricity Delta Neutral F/0 example 3

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the futures leg of the strategy.

In this Instance I want to trade the BNM8 100.00 put at $7.00 basis 122.50 in the futures buying the 100.00 put and buying BNM8 futures, the delta on this is 17% so the ratio in this instance is 17:100 futures to options.

- Buy 17 BNM8 futures @ 122.50 (fixed leg priced at $122.50)
- Buy 100 BNM80010000P

    UDC Created.

- In Order to achieve a price of $7.00 in the put I enter a bid of $7.00 for the put leg. As the Fixed leg UDC function only prices the non-fixed legs my price of $7.00 will only relate to the options leg.
- Leg fills 17 BNM8 @ $122.50 and 100 BNM80010000P @ $7.00 for each single lot traded

8. Electricity Delta Neutral F/0 example 4

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the futures leg of the strategy.

In this Instance I want to trade the BNM8 100.00 put at $4.50 basis 127.00 in the futures buying the 100.00 put and buying BNM8 futures, the delta on this is 12% so the ratio in this instance is 3:25 futures to options.

- Buy 3 BNM8 futures @ 127.00 (fixed leg priced at $127.00)

- Buy 25 BNM80010000P

    UDC Created.

- In Order to achieve a price of $4.50 in the put I enter a bid of $4.50 for the put leg. As the Fixed leg UDC function only prices the non-fixed legs my price of $4.50 will only relate to the options leg.
- Leg fills 3 BNM8 @ $127.00 and 25 BNM80010000P @ $4.50 for each single lot traded

9.   Electricity Call Spread

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the higher valued option although this is not a requirement you can Fix either leg.

In this Instance I want to trade the BNM8 100.00 / 120.00 call spread at $6.50 buying the 100.00 call and selling the 120.00 call.

- Buy 1 BNM80010000C @ $14.75 (fixed leg priced at $14.75)
- Sell 1 BNM80012000C

    UDC Created.

- In Order to achieve a price of $6.50 in the call spread I enter an offer of $8.25 for the 120.00 call leg. As the Fixed leg UDC function only prices the non-fixed legs my price of $8.25 will be offset by the fixed leg of $14.75 giving me a filled net price of $6.50 in the strategy. The Price displayed in the UDC will be $8.25.
- Leg fills 1 BNM80010000C @ $14.75 and 1 BNM80012000C @ $8.25 for each single lot traded

10.   Electricity Straddle Basis Futures

- The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the futures leg of the strategy.
- In this Instance I want to trade the BNM8 100.00 straddle at $20.00 basis $99.50 in the futures buying the 100.00 put and call and buying BNM8 futures, the delta on this is 2% so the ratio in this instance is 1:50 futures to options legs.
- Buy 1 BNM8 futures @ 99.50 (fixed leg priced at $99.50)
- Buy 50 BNM80010000P
- Buy 50 BNM80010000C
- UDC Created.
- In Order to achieve a price of $20.00 in the straddle I enter a bid of $20.00 as the net price of the strategy. As the Fixed leg UDC function only prices the non-fixed legs my price of $20.00 will only relate to the options legs.
- My fair value in the 100.00 put is $10.50 and the fair value in the 100.00 call is $9.50. The Price displayed in the UDC will be $20.00.

- Leg fills 1 BNM8 @ $99.50 and 50 BNM80010000P and BNM80010000C at a net price of $20.00 for each single lot traded. Leg prices for the options are determined in this instance on market data and or prior settlements.

11.   Electricity Strangle Basis Futures

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the futures leg of the strategy.

In this Instance I want to trade the BNM8 100.00 / 120.00 strangle at $12.50 basis $105.00 in the futures (buying the 100.00 put and 120.00 call and buying BNM8 futures, the delta on this is 10% so the ratio in this instance is 1:10 futures to options legs.

- Buy 1 BNM8 futures @ 105.00 (fixed leg priced at $105.00)
- Buy 10 BNM80010000P
- Buy 10 BNM80012000C

  UDC Created.

- In Order to achieve a price of 12.50 in the strangle I enter a bid of $12.50 as the net price of the strategy. As the Fixed leg UDC function only prices the non-fixed legs my price of $12.50 will only relate to the options legs.
- My fair value in the 100.00 put is $8.00 and the fair value in the 100.00 call is $4.50. The Price displayed in the UDC will be $12.50.
- Leg fills 1 BNM8 @ $105.00 and 10 BNM80010000P and 10 BNM80012000C at a net price of $12.50 for each single lot traded. Leg prices for the options are determined in this instance on market data and or prior settlements.

12.   Electricity Put spread Basis Futures

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the futures leg of the strategy.

In this Instance I want to trade the BNM8 100.00 / 120.00 put spread at $10.50 basis $130.00 in the futures buying the 120.00 put and selling the 100.00 put and buying BNM8 futures, the delta on this is 10% so the ratio in this instance is 1:10 futures to options legs.

- Buy 1 BNM8 futures @ 130.00 (fixed leg priced at $130.00)
- Buy 10 BNM80012000P
- Sell 10 BNM80010000P

  UDC Created.

- In Order to achieve a price of $10.50 in the put spread I enter a bid of $10.50 as the net price of the strategy. As the Fixed leg UDC function only prices the non-fixed legs my price of $10.50 will only relate to the options legs.
- My fair value in the 120.00 put is $23.00 and the fair value in the 100.00 put is $12.50. The Price displayed in the UDC will be $10.50.
- Leg fills 1 BNM8 @ $130.00 and 10 BNM80012000P and 10 BNM80010000P at a net price of $10.50 for each single lot traded. Leg prices for the options are determined in this instance on market data and or prior settlements.

13.   Electricity Put Butterfly

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the Sell "guts" leg of the strategy where the ratio of this leg is the highest.

In this Instance I want to trade the BNM8 100.00 / 110.00 / 120.00 put butterfly buying 1 100.00 put, selling 2 110.00 puts and buying 1 120.00 put at $1.00.

- Sell 2 BNM80011000P @ 15.00 (fixed leg priced at $15.00)
- Buy 1 BNM80010000P
- Buy 1 BNM80012000P

     UDC Created.

- In Order to achieve a price of $1.00 in the put butterfly I enter a bid of $31.00 as the net price of the strategy. As the Fixed leg UDC function only prices the non-fixed legs my price of $31.00 will only relate to the non-fixed legs.
- My fair value in the 120.00 put is $21.00 and the fair value in the 100.00 put is $10.00, however we need to aggregate the two prices against the fixed leg price, in this instance the gut portion of the butterfly equates to $30.00 (ratio of 2 * $15.00) as the algorithm only includes the non-fixed legs, our bid in this strategy is $31.00.
- Leg fills 2 BNM80011000P @ $15.00 and the 1 BNM80012000P and 1 BNM80010000P at a net price of $31.00 for each single lot traded. Leg prices for the options that are not fixed are determined in this instance on market data and or prior settlements.

14.   SPI Options Collar

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the higher valued option.

In this Instance I want to trade the APM8 5200.0 / 5600.0 collar at 40.0 buying the 5200.0 put and selling the 5600.0 call.

- Buy 1 APM80052000P @ 100.0 (fixed leg priced at 100.0)
- Sell 1 APM80056000C

    UDC Created.

- In Order to achieve a price of 40.0 in the collar I enter an offer of 60.0 for the call leg. As the Fixed leg UDC function only prices the non-fixed legs my price of 60.0 will be offset by the fixed leg of 100.0 giving me a filled net price of 40.0 in the strategy. The Price displayed in the UDC will be 60.0.
- Leg fills 1 APM80052000P @ 100.0 and 1 APM80056000C @ 60.0 for each single lot traded

15. SPI Ratio Put Spread

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the higher valued option although this is not a requirement you can Fix either leg.

In this Instance I want to trade the APM8 5600 / 5500 1 x 2 put spread at 30.0 buying the 5600 put and selling 2 of the 5500 puts.

- Buy 1 APM80056000P @ 120.0 (fixed leg priced at 120.0)
- Sell 2 APM80055000P

    UDC Created.

- In Order to achieve a price of 30.0 in the ratio put spread I enter an offer of 45.0 in the 5500 put.
- As the Fixed leg function only prices the non-fixed leg my price of 45.0 will be offset by the fixed leg of 120.0 bearing in mind the ratio is 1:2 (effectively I'm trading the 5500 put at 90.0 points giving me a filled net price of 30.0 in the strategy. The Price displayed in the UDC will be 45.0.
- Leg fills 1 APM80056000P @ 120.0 and 2 APM80055000P @ 45.0 for each single lot traded

16. SPI Options Strangle

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the higher valued option although this is not a requirement you can Fix either leg.

In this Instance I want to trade the APM8 5400 / 5600 strangle at 220.0 buying the 5400 put and buying the 5600 call.

- Buy 1 APM80054000P @ 125.0 (fixed leg priced at 125.0)
- Buy 1 APM80056000C

UDC Created.

- In Order to achieve a price of 220.0 in the strangle I enter a bid of 95.0 in the call leg. As the Fixed leg UDC function only prices the non-fixed legs my price of 95.0 will be combined with the fixed leg of 125.0 giving me a filled net price of 220.0 in the strategy. The Price displayed in the UDC will be 95.0.
- Leg fills 1 APM8005400P @ 125.0 and 1 APM80056000C @ 95.0 for each single lot traded

17. SPI Options Straddle

Similar to the strangle the UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the higher valued option although this is not a requirement you can Fix either leg.

In this Instance I want to trade the APM8 5500 straddle at 250.0 buying the 5500 put and buying the 5500 call.

- Buy 1 APM80055000P @ 135.0 (fixed leg priced at 135.0)
- Buy 1 APM80055000C.

      UDC Created.

- In Order to achieve a price of 250.0 in the straddle I enter a bid of 115.0 for the call leg. As the Fixed leg UDC function only prices the non-fixed legs my price of 115.0 will be combined with the fixed leg of $135.0 giving me a filled net price of 250.0 in the strategy. The Price displayed in the UDC will be 115.0.
- Leg fills 1 APM80055000P @ 135.0 and 1 APM80055000C @ 115.0 for each single lot traded

18. SPI Delta Neutral F/0 example 1

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the futures leg of the strategy.

In this Instance I want to trade the APM8 5500 put at 145.0 basis 5500.0 in the futures buying the 5500 put and buying APM8 futures, the delta on this is 50% so the ratio in this instance is 1:2 futures to options.

- Buy 1 APM8 futures @ 5500.0 (fixed leg priced at 5500.0)
- Buy 2 APM80055000P

UDC Created.

- In Order to achieve a price of 145.0 in the put I enter a bid of 145.0 for the put leg. As the Fixed leg UDC function only prices the non-fixed legs my price of 145.0 will only relate to the options leg.
- Leg fills 1 APM8 @ 5500.0 and 2 APM80055000P @ 145.0 for each single lot traded

19. SPI Delta Neutral F/0 example 2

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the futures leg of the strategy.

In this Instance I want to trade the APM8 5500.0 put at 90.0 basis 5625.0 in the futures buying the 5500.0 put and buying APM8 futures, the delta on this is 25% so the ratio in this instance is 1:4 futures to options.

- Buy 1 APM8 futures @ 5625.0 (fixed leg priced at 5625.0)
- Buy 4 APM80055000P

UDC Created.

In Order to achieve a price of 90.0 in the put I enter a bid of 90.0 for the put leg. As the Fixed leg UDC function only prices the non-fixed legs my price of 90.0 will only relate to the options leg.

Leg fills 1 APM8 @ 5625.0 and 4 APM80055000P @ 90.0 for each single lot traded

20. SPI Delta Neutral F/0 example 3

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the futures leg of the strategy.

In this Instance I want to trade the APM8 5500 put at 65.0 basis 5675.0 in the futures buying the 5500 put and buying APM8 futures, the delta on this is 17% so the ratio in this instance is 17:100 futures to options.

- Buy 17 APM8 futures @ 5675.0 (fixed leg priced at 5675.0)
- Buy 100 APM80055000P

UDC Created.

In Order to achieve a price of 65.0 in the put I enter a bid of 65.0 for the put leg. As the Fixed leg UDC function only prices the non-fixed legs my price of 65.0 will only relate to the options leg.

Leg fills 17 APM8 @ 5675.0 and 100 APM80055000P @ 65.0 for each single lot traded

21. SPI Delta Neutral F/0 example 4

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the futures leg of the strategy.

In this Instance I want to trade the APM8 5500.0 put at 30.0 basis 5700.0 in the futures buying the 5500.0 put and buying APM8 futures, the delta on this is 12% so the ratio in this instance is 3:25 futures to options.

- Buy 3 APM8 futures @ 5700.0 (fixed leg priced at 5700.0)
- Buy 25 APM80055000P

    UDC Created.

In Order to achieve a price of 30.0 in the put I enter a bid of 30.0 for the put leg. As the Fixed leg UDC function only prices the non-fixed legs my price of 30.0 will only relate to the options leg.

Leg fills 3 APM8 @ 5700.0 and 25 APM80055000P @ 30.0 for each single lot traded

22.   SPI Call Spread

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the higher valued option although this is not a requirement you can Fix either leg.

In this Instance I want to trade the APM8 5600 / 5700 call spread at 45.0 buying the 5600 call and selling the 5700 call.

- Buy 1 APM80056000C @ 125.0 (fixed leg priced at 125.0)
- Sell 1 APM80057000C

    UDC Created.

- In Order to achieve a price of 45.0 in the call spread I enter an offer of 80.0 for the 5700 call leg. As the Fixed leg UDC function only prices the non-fixed legs my price of 80.0 will be offset by the fixed leg of 125.0 giving me a filled net price of 45.0 in the strategy. The Price displayed in the UDC will be 80.0.
- Leg fills 1 APM80056000C @ 125.0 and 1 APM80057000C @ 80.0 for each single lot traded

23.   SPI Straddle Basis Futures

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the futures leg of the strategy.

In this Instance I want to trade the APM8 5600 straddle at 260.0 basis 5595 in the futures buying the 5600 put and call and buying APM8 futures, the delta on this is 2% so the ratio in this instance is 1:50 futures to options legs.

- Buy 1 APM8 futures @ 5595.0 (fixed leg priced at 5595.0)
- Buy 50 APM80056000P

- Buy 50 APM80056000C

    UDC Created.

- In Order to achieve a price of 260.0 in the straddle I enter a bid of 260.0 as the net price of the strategy. As the Fixed leg UDC function only prices the non-fixed legs my price of 260.0 will only relate to the options legs.
- My fair value in the 5600 put is 135.0 and the fair value in the 5600 call is 125.0.The Price displayed in the UDC will be 260.0.
- Leg fills 1 APM8 @ 5595 and 50 APM80056000P and APM80056000C at a net price of 260.0 for each single lot traded. Leg prices for the options are determined in this instance on market data and or prior settlements.

24. SPI Strangle Basis Futures

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the futures leg of the strategy.

In this Instance I want to trade the APM8 5500 / 5700 strangle at 180.0 basis 5595.0 in the futures buying the 5500 put and 5700 call and buying APM8 futures, the delta on this is 10% so the ratio in this instance is 1:10 futures to options legs.

- Buy 1 APM8 futures @ 5595.0 (fixed leg priced at 5595.0)
- Buy 10 APM80055000P
- Buy 10 APM80057000C

    UDC Created.

- In Order to achieve a price of 180.0 in the strangle I enter a bid of 180.0 as the net price of the strategy. As the Fixed leg UDC function only prices the non-fixed legs my price of 180.0 will only relate to the options legs.
- My fair value in the 5500 put is 95.0 and the fair value in the 5700 call is 85.0.The Price displayed in the UDC will be 180.0.
- Leg fills 1 APM8 @ 5595 and 10 APM80055000P and 10 APM80057000C at a net price of 125.0 for each single lot traded. Leg prices for the options are determined in this instance on market data and or prior settlements.

25. SPI Put spread Basis Futures

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the futures leg of the strategy.

In this Instance I want to trade the APM8 5650.0 / 5600.0 put spread at 26.0 basis 5700.0 in the futures (buying the 5650.0 put and selling the 5600.0 put and buying APM8 futures, the delta on this is 10% so the ratio in this instance is 1:10 futures to options legs.

- Buy 1 APM8 futures @ 5700.0 (fixed leg priced at 5700.0)
- Buy 10 APM80056500P
- Sell 10 APM80056000P

   UDC Created.

- In Order to achieve a price of 26.0 in the put spread I enter a bid of 26.0 as the net price of the strategy. As the Fixed leg UDC function only prices the non-fixed legs my price of 26.0 will only relate to the options legs.
- My fair value in the 5650.0 put is 76.0 and the fair value in the 5600.0 put is 50.0. The Price displayed in the UDC will be 26.0.
- Leg fills 1 APM8 @ 5700.0 and 10 APM80056500P and 10 APM80056000P at a net price of 0.260 for each single lot traded. Leg prices for the options are determined in this instance on market data and or prior settlements.

26.   SPI Put Butterfly

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the Sell "guts" leg of the strategy where the ratio of this leg is the highest.

In this Instance I want to trade the APM8 5650.0 / 5625.0 / 5600.0 put butterfly buying 1 5650.0 put, selling 2 5625.0 puts and buying 1 5600.0 put at 5.0.

- Sell 2 APM80056250P @ 60.0 (fixed leg priced at 60.0)
- Buy 1 APM80056500P
- Buy 1 APM80056000P

   UDC Created.

- In Order to achieve a price of 5.0 in the put butterfly I enter a bid of 125.0 as the net price of the strategy. As the Fixed leg UDC function only prices the non-fixed legs my price of 125.0 will only relate to the non-fixed legs.
- My fair value in the 5650.0 put is 100.0 and the fair value in the 5600.0 put is 25.0, however we need to aggregate the two prices against the fixed leg price, in this instance the gut portion of the butterfly equates to 120.0 (ratio of 2 * 60.0) as the algorithm only includes the non-fixed legs, our bid in this strategy is $125.0.
- Leg fills 2 APM80056250P @ 60.0 and the 1 APM80056500P and 1 APM80056250P at a net price of 125.0 for each single lot traded. Leg prices for the options that are not fixed are determined in this instance on market data and or prior settlements.

27.   Debt Options Collar

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the higher valued option.

In this Instance I want to trade the YTZ7 9780.0 / 9820.0 collar at 0.040 buying the put and selling the call.

- Buy 1 YTZ70097800P @ 0.220 (fixed leg priced at 0.220)
- Sell 1 YTZ70098200C

    UDC Created.

- In Order to achieve a price of 0.040 in the collar I enter an offer of 0.180 in the call leg. As the Fixed leg UDC function only prices the non-fixed legs my price of 0.180 will be offset by the fixed leg of 0.220 giving me a filled net price of 0.040 in the strategy. The Price displayed in the UDC will be 0.180.
- Leg fills 1 YTZ70097800P @ 0.220 and 1 YTZ70098200C @ 0.180 for each single lot traded

28.   Debt Ratio Put Spread

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the higher valued option although this is not a requirement you can Fix either leg.

In this Instance I want to trade the YTZ7 98.000 / 97.800 1 x 2 put spread at 0.060 buying the 98.000 put and selling 2 of the 97.800 puts.

- Buy 1 YTZ70098000P @ 0.200 (fixed leg priced at 0.200)
- Sell 2 YTZ70097800P

    UDC Created.

- In Order to achieve a price of 0.060 in the ratio put spread I enter an offer of 0.070 for the 97.800 put.
- As the Fixed leg function only prices the non-fixed leg my price of 0.070 will be offset by the fixed leg of 0.200 bearing in mind the ratio is 1:2 (effectively I'm trading the 97.800 put at 0.140 points giving me a filled net price of 0.060 in the strategy. The Price displayed in the UDC will be 0.070.
- Leg fills 1 YTZ70098000P @ 0.200 and 2 YTZ70097800P @ 0.070 for each single lot traded

29.   Debt Options Strangle

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the higher valued option although this is not a requirement you can Fix either leg.

In this Instance I want to trade the YTZ7 97800/ 98200 strangle at 0.380 buying the 97800 put and buying the 98200 call.

- Buy 1 YTZ70097800P @ 0.210 (fixed leg priced at 0.210)
- Buy 1 YTZ70098200C

    UDC Created.

- In Order to achieve a price of 0.380 in the strangle I enter a bid of 0.170 for the call leg. As the Fixed leg UDC function only prices the non-fixed legs my price of 0.170 will be combined with the fixed leg of 0.210 giving me a filled net price of 0.380 in the strategy. The Price displayed in the UDC will be 0.170.
- Leg fills 1 YTZ70097800P @ 0.210 and 1 YTZ70098200C @ 0.170 for each single lot traded

30.   Debt Options Straddle

Similar to the strangle the UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the higher valued option although this is not a requirement you can Fix either leg.

In this Instance I want to trade the YTZ7 98.000 straddle at 0.420 buying the 98.000 put and buying the 98.000 call.

- Buy 1 YTZ70098000P @ 0.220 (fixed leg priced at 0.220)
- Buy 1 YTZ70098000C.

    UDC Created.

- In Order to achieve a price of 0.420 in the straddle I enter a bid of 0.200 for the call leg. As the Fixed leg UDC function only prices the non-fixed legs my price of 0.200 will be combined with the fixed leg of 0.220 giving me a filled net price of 0.420 in the strategy. The Price displayed in the UDC will be 0.200.
- Leg fills 1 YTZ70098000P @ 0.220 and 1 YTZ70098000C @ 0.200 for each single lot traded

31.   Debt Delta Neutral F/0 example 1

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the futures leg of the strategy.

In this Instance I want to trade the YTZ7 98.000 put at 0.250 basis 98.000 in the futures buying the 98.000 put and buying YTZ7 futures, the delta on this is 50% so the ratio in this instance is 1:2 futures to options.

- Buy 1 YTZ7 futures @ 98.000 (fixed leg priced at 98.000)
- Buy 2 YTZ70098000P

UDC Created.

- In Order to achieve a price of 0.250 in the put I enter a bid of 0.250 for the put leg. As the Fixed leg UDC function only prices the non-fixed legs my price of 0.250 will only relate to the options leg.
- Leg fills 1 YTZ7 @ 98.000 and 2 YTZ70098000P @ 0.250 for each single lot traded

32. Debt Delta Neutral F/0 example 2

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the futures leg of the strategy.

In this Instance I want to trade the YTZ7 98.000 put at 0.140 basis 98.250 in the futures buying the 98.000 put and buying YTZ7 futures, the delta on this is 25% so the ratio in this instance is 1:4 futures to options.

- Buy 1 YTZ7 futures @ 98.250 (fixed leg priced at 98.250)
- Buy 4 YTZ70098000P

    UDC Created.

- In Order to achieve a price of 0.140 in the put I enter a bid of 0.140 for the put leg. As the Fixed leg UDC function only prices the non-fixed legs my price of 0.140 will only relate to the options leg.
- Leg fills 1 YTZ7 @ 98.250 and 4 YTZ70098000P @ 0.140 for each single lot traded

33. Debt Delta Neutral F/0 example 3

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the futures leg of the strategy.

In this Instance I want to trade the YTZ7 98.000 put at 0.090 basis 98.350 in the futures buying the 98.000 put and buying YTZ7 futures, the delta on this is 17% so the ratio in this instance is 17:100 futures to options.

- Buy 17 YTZ7 futures @ 98.350 (fixed leg priced at 98.350)
- Buy 100 YTZ70098000P

    UDC Created.

- In Order to achieve a price of 0.090 in the put I enter a bid of 0.090 for the put leg. As the Fixed leg UDC function only prices the non-fixed legs my price of 0.090 will only relate to the options leg.
- Leg fills 17 YTZ7 @ 98.350 and 100 YTZ70098000P @ 0.090 for each single lot traded

34.   Debt Delta Neutral F/0 example 4

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the futures leg of the strategy.

In this Instance I want to trade the YTZ7 98.000 put at 0.060 basis 98.400 in the futures buying the 98.000 put and buying YTZ7 futures, the delta on this is 12% so the ratio in this instance is 3:25 futures to options.

- Buy 3 YTZ7 futures @ 98.400 (fixed leg priced at 98.400)
- Buy 25 YTZ70098000P

    UDC Created.

- In Order to achieve a price of 0.060 in the put I enter a bid of 0.060 for the put leg. As the Fixed leg UDC function only prices the non-fixed legs my price of 0.060 will only relate to the options leg.
- Leg fills 3 YTZ7 @ 98.400 and 25 YTZ70098000P @ 0.060 for each single lot traded

35.   Debt Call Spread

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the higher valued option although this is not a requirement you can Fix either leg.

In this Instance I want to trade the YTZ7 98.000 / 98.200 call spread at 0.100 buying the 98.000 call and selling the 98.200 call.

- Buy 1 YTZ70098000C @ 0.220 (fixed leg priced at 0.220)
- Sell 1 YTZ70098200C

    UDC Created.

- In Order to achieve a price of 0.100 in the call spread I enter an offer of 0.120 for the 98.200 call leg. As the Fixed leg UDC function only prices the non-fixed legs my price of 0.120 will be offset by the fixed leg of 0.220 giving me a filled net price of 0.100 in the strategy. The Price displayed in the UDC will be 0.120.
- Leg fills 1 YTZ70098000C @ 0.220 and 1 YTZ70098200C @ 0.120 for each single lot traded

36.   Debt Straddle Basis Futures

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the futures leg of the strategy.

In this Instance I want to trade the YTZ7 98.000 straddle at 0.460 basis 97.960 in the futures buying the 98.000 put and call and buying YTZ7 futures, the delta on this is 2% so the ratio in this instance is 1:50 futures to options legs.

- Buy 1 YTZ7 futures @ 97.960 (fixed leg priced at 97.960)
- Buy 50 YTZ70098000P
- Buy 50 YTZ70098000C

    UDC Created.

- In Order to achieve a price of 0.460 in the straddle I enter a bid of 0.460 as the net price of the strategy. As the Fixed leg UDC function only prices the non-fixed legs my price of 0.460 will only relate to the options legs.
- My fair value in the 98.000 put is 0.250 and the fair value in the 98.000 call is 0.210. The Price displayed in the UDC will be 0.460.
- Leg fills 1 YTZ7 @ 97.960 and 50 YTZ70098000P and 50 YTZ70098000C at a net price of 0.460 for each single lot traded. Leg prices for the options are determined in this instance on market data and or prior settlements.

37.   Debt Strangle Basis Futures

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the futures leg of the strategy.

In this Instance I want to trade the YTZ7 97.800 / 98.200 strangle at 0.260 basis 97.950 in the futures buying the 97.800 put and 98.200 call and buying YTZ7 futures, the delta on this is 10% so the ratio in this instance is 1:10 futures to options legs.

- Buy 1 YTZ7 futures @ 97.950 (fixed leg priced at 97.950)
- Buy 10 YTZ70097800P
- Buy 10 YTZ70098200C

    UDC Created.

- In Order to achieve a price of 0.260 in the strangle I enter a bid of 0.260 as the net price of the strategy. As the Fixed leg UDC function only prices the non-fixed legs my price of 0.260 will only relate to the options legs.
- My fair value in the 97.800 put is 0.150 and the fair value in the 98.200 call is 0.110. The Price displayed in the UDC will be 0.260.
- Leg fills 1 YTZ7 @ 97.950 and 10 YTZ70097800P and 10 YTZ70098200C at a net price of 0.260 for each single lot traded. Leg prices for the options are determined in this instance on market data and or prior settlements.

38.   Debt Put spread Basis Futures

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the futures leg of the strategy.

In this Instance I want to trade the YTZ7 98.200 / 98.000 put spread at 0.170 basis 98.300 in the futures buying the 98.200 put and selling the 98.000 put and buying YTZ7 futures, the delta on this is 10% so the ratio in this instance is 1:10 futures to options legs.

- Buy 1 YTZ7 futures @ 98.300 (fixed leg priced at 98.300)
- Buy 10 YTZ70098200P
- Sell 10 YTZ70098000P

       UDC Created.

- In Order to achieve a price of 0.170 in the put spread I enter a bid of 0.170 as the net price of the strategy. As the Fixed leg UDC function only prices the non-fixed legs my price of 0.170 will only relate to the options legs.
- My fair value in the 98.200 put is 0.280 and the fair value in the 98.000 put is 0.110. The Price displayed in the UDC will be 0.170.
- Leg fills 1 YTZ7 @ 98.300 and 10 YTZ70098200P and 10 YT70098000P at a net price of 0.170 for each single lot traded. Leg prices for the options are determined in this instance on market data and or prior settlements.

39.   Debt Put Butterfly

The UDC strategy is constructed as follows, it is suggested that the most secure way to ensure leg pricing is to use a Fixed leg UDC on the Sell "guts" leg of the strategy where the ratio of this leg is the highest.

In this Instance I want to trade the YTZ7 98.200 / 98.100 / 98.000 put butterfly buying 1 98.200 put, selling 2 98.100 puts and buying 1 98.000 put at 0.020

- Sell 2 YTZ70098100P @ 0.140 (fixed leg priced at 0.140)
- Buy 1 YTZ70098200P
- Buy 1 YTZ70098000P

       UDC Created.

- In Order to achieve a price of 0.020 in the put butterfly I enter a bid of 0.300 as the net price of the strategy. As the Fixed leg UDC function only prices the non-fixed legs my price of 0.300 will only relate to the non-fixed legs.
- My fair value in the 98.200 put is 0.210 and the fair value in the 98.000 put is 0.090, however we need to aggregate the two prices against the fixed leg price, in this instance the gut portion of the butterfly

equates to 0.280 (ratio of 2 * 0.140) as the algorithm only includes the non-fixed legs, our bid in this strategy is 0.300.

- Leg fills 2 YTZ70098100P @ 0.140 and the 1 YTZ70098200P and 1 YTZ70098000P at a net price of 0.300 for each single lot traded. Leg prices for the options that are not-fixed are determined in this instance on market data and or prior settlements.

12. Appendix A: Trade Price Algorithm

This section describes the algorithm used to determine leg prices for combination-to-combination trades.

ⓘ **Note**
For fixed leg price strategies, this algorithm disregards the fixed leg due to its locked-in price. It will always match at, or better than the locked-in price.

12.1.   Define Anchoring Sequence

12.1.1. Leg Sorting

The anchoring sequence is determined by sorting all legs as follows:

1.   The anchoring leg, see 'Define Anchoring Leg and its Preliminary Price'.
2.   Futures with Last Trade Price (LTP), followed by futures without LTP
3.   Options with LTP, followed by Options without LTP

If undefined, leg order is determined by the system's internal processing order of the reference data.

12.1.2. Define the Anchoring Leg and its Preliminary Price

This algorithm defines the steps required to determine the anchoring leg and its preliminary price.

From the set of possible anchoring legs, select a leg with the newest reference price in the following order:

1.   Last Trade Price (LTP)
2.   Anomalous Order Threshold (AOT)
3.   Adjusted closing price for a dual session contract
4.   Prior settlement price

If none of the legs has a reference price, the first leg in the anchoring sequence is selected as the anchoring leg and a preliminary price of min tick.

If one or more legs have a reference price (*), define the anchoring leg and set its preliminary price, as per steps in 6.1.3, and no further steps are processed.

12.1.3. Legs with a Reference Price

From the set of possible legs with a reference price, select the anchoring leg. Search based on the following priority order, and set the preliminary price accordingly. When a match is found, omit any further steps.

1.   Pick the leg which has reference price within ">=<" spread*, and set preliminary price to its reference price. (**)
2.   Pick the leg which has reference price outside of "<>" spread*, and set preliminary price to reference price (**) adjusted to bid/ask (select bid/ask if it potentially improves the market).
3.   Pick the leg which has reference price, and a bid or ask, and set preliminary price to the bid (or ask) if it improves market, else set to reference price.

4. Pick the leg which has reference price but no spread*, and set preliminary price to reference price. (**)

12.1.4. Trade Price Algorithm

This algorithm sets a preliminary price for all the legs. Except the anchor leg, the preliminary price for each leg order book is set per the following priority rule:

1. If reference price** exists within the spread*, set preliminary price to this reference price.
2. If reference price** exists but is now outside the spread*, the preliminary price is moved onto the spread* (meaning set to closest of best bid/ask, if it improves the market).
3. If reference price** and a bid (or ask) exists but no spread* is available, preliminary price is set to the bid (or ask) if it improves market, otherwise set to reference price**.
4. If reference price** exists but no bid and ask exists, preliminary price is set to the reference price**.
5. If reference price** does not exist, but a spread* exists, preliminary price is set to the midpoint of the spread*.
6. If the order book has bid prices but no ask prices, the preliminary price is set to the best bid price.
7. If the order book has ask prices but no bid prices, the preliminary price is set to the best ask price.
8. If the leg is completely empty, the preliminary price is set to min tick.

*Spread is the tightest interval of Price bands (AOT) and Best Bid-Offer (BBO), where BBO includes both real order and visible baits.

**Reference price is defined as:

1. Last Trade Price [LTP trades that update trade statistics]

2. If AOT is set, use AOT price

3. Adjusted closing price (for a dual session contract)

4. Prior Settlement Price

12.1.5. Adjustment of Leg Prices

Once the preliminary price has been determined for each leg, it's adjusted (if required) until it adds up to the correct net price of the strategy. For each leg, the preliminary price is modified according to the iterative algorithm below.

The modification of preliminary price is completed in four iterations at a maximum. In each iteration, in reverse "Anchoring sequence" order, the legs are adjusted one at a time, starting from the preliminary prices

every time. For each iteration, if the calculated prices fulfill the net price, the following iterations are omitted.

There is a limit to how much the preliminary prices are allowed to be adjusted for each leg and for each iteration. This limit is defined by the effective spread, and the effective spread is defined somewhat differently for each iteration.

1st Iteration	The effective spread is determined by the most generous (tightest interval) of baits, orders, price bands, and 0. If the resulting net price equals the trade price after the first iteration, all further steps are omitted.
2nd Iteration	The effective spread is determined by the most generous (tightest interval) of orders, price bands, and 0. If the resulting net price equals the trade price after the second iteration, all further steps are omitted.
3rd Iteration	The effective spread is determined by orders and 0. If the resulting net price equals the trade price after the third iteration, all further steps are omitted.
4th Iteration	The effective spread is one-sided with a bid price of 1 tick (to prohibit a price of zero and negative prices).

The following adjustments are made, in each of the four iterations described above, based on the effective spread for each iteration.

1. **The net price, resulting from the preliminary leg prices, is calculated by iterating over all the legs.**

- If the leg is a buy leg in the combination definition, the leg price multiplied by the leg ratio is added.
- If the leg is a sell leg in the combination definition, the leg price multiplied by the leg ratio is subtracted.

   The overall net price of the strategy is calculated as:

   Sum of BUY *(leg ratio * leg price) **- Sum of SELL** (leg ratio * leg price)*

2. **If the resulting net price equals the trade net price, there is no need for further calculations and the remaining steps are omitted.**

- If the resulting net price is too high and the current leg is a buy leg, or if the resulting net price is too low and the current leg is a sell leg, the leg price must be decreased to get closer to the desired net price.
- The preliminary leg price is decreased by the net price difference divided by the leg ratio, but is not allowed to go outside the effective spread.

- This means that if the preliminary price adjusted by the net price difference goes outside of the effective spread limit, the adjusted preliminary price is set to the price of the limit (using maximum allowed adjustment within effective spread).
- If the resulting net price is too low and the current leg is a buy leg, or if the resulting net price is too high and the current leg is a sell leg, the leg price needs to be increased to get closer to the desired net price.
- The preliminary leg price is increased by the net price difference divided by the leg ratio, but is not allowed to go outside the effective spread.
- This means that if preliminary price adjusted by net price difference goes beyond the effective spread limit, the adjusted preliminary price is set to the price of the limit (maximum adjustment allowed).

3. **The system rounds the price to the nearest tick (round half up). If the preliminary price happens to land right between two ticks the higher is taken.**

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