

77. Use case / exercises

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1 Introduction

The exercises described below are for participants of the course. The exercises or use case contain practical examples on the usage of the system, allowing the user not only to use functionality of the system but also get a better understanding of the use of the system in a live environment.

The use cases all have an explanation and difficulty. The difficulty is not only determined by the complexity of the use case but also by the amount of explanation done.

2 FX and Future Hedging

This exercise allows the user to get more understanding on how hedging is done. It allows the user to enter different contracts and see what details create the relation to contracts from a hedging / portfolio and period perspective. It also allows the user to get a better understanding how market prices feed in to the position, how market prices affect each individual contract and position and how opposite position net out when market prices are changing.

2.1 Create Physical Sales Contract

- Physical sales contract with one delivery line in December
- Contract price in USD (2310), Price in EUR (2100), exchange rate 1,10000
- Item: SMP, Volume: 25 TM
- Portfolio = HUS

Sales Contract - HINT - Sales Contract Hint Maintenance Personal Form (No Personalization)

Form Bow Tools

Basic Item Characteristics Contract Lines Conditions Relations Add'l. Info PreCal

Physical Sales Contract

General	Pricing	Category Codes
Entity date: 26-09-2019 Purchase or sale: S Sale External number: 227 Line number: 1 Entity status: 200 Second Approval Counter party: 101887 Malaysia Dairy Industries Pte Counter party contact: 10 Malaysia Dairy Industries Pte Ltd Counter party reference: Test training scenario 1	Type of pricing: F Fixed Per: TM Metric Ton Price: 2,100,000 Conv. to item UOM: 1,000 UOM: TM Differential: D Curr: EUR Total price: 2,100,000 Contract exchange rate: 1,100000 Divide / multiply: Y Use multi-currency acct-multi. Contract price: 2,310,000 Curr: USD Total goods value: 57,750,00 Valuation Market: 1000EEX	Portfolio: HUS HUS Option Type: FREE Trade Type: FREE Government Program: Government Program Broker/Bank Account: FREE
Item: SMP Skimmed Milk Powder <input type="checkbox"/> Optional Item Bulk or Packed: B SMP Quantity: 25,000.00 UOM: KG Kilograms Number of packages: UOM Quantity in primary UOM: 25000.00 UOM: KG Kilograms Quality condition: Count instr.: N/A	Price fixation Pricing Rule: DEFEUR Pricing Rule Desc:	Hedging <input type="checkbox"/> Future Hedge Required <input type="checkbox"/> Forex Hedge Required
Terms Delivery Place: MY Malaysia <input type="checkbox"/> Optional Destination: MY Malaysia <input type="checkbox"/> Optional Delivery Type: 10 Delivery Delivery date from/through: 01-12-2019 31-12-2019 Del. period: 19/1219/12 Delivery terms: CFR Cost and Freight <input type="checkbox"/> Optional Weight condition:		

2.2 Create Future Hedge

- Purchase of a Future
- Portfolio = HUS
- Futures Delivery period is DEC19
- Price is 2100 (EUR)
- Quantity is 5 Contracts (= 25 TM)

Future Contracts - Futures Contract Hint Maintenance

Form Row Tools

Save Cancel As Of Date Position 26-09-2019 Change reason Entity number 6843 20534 01000

Basic Conditions Relations Add'l . Info PreCal

Futures Contract

General

Entity date * 26-09-2019

Purchase or sale * P Purchase

External number

Entity status * 100 Entered

Counter party * 103683 FC Stone Dublin

Counter party reference * Test training scenario 1

Category Codes

Portfolio HUS HUS

Option Type EXT

Trade Type OPTION

Government Program 2

Broker/Bank Account FC 44328

Item

Item * EEX-SMP SMP future - EEX Tradeable Commodity

Exchange F... 1000EEX

Futures delivery period * DEC19 dec-2019 Delivery period 19121912

Last trading day * 18-12-2019 Currency Period 201912

Price and Quantity

Price * 2,100,0000 EUR Per * TM Metric Ton

Quantity * 5,00 UOM... 5T 5 MT

Quantity in primary UOM 25000,00 UOM... KG Kilograms

Total goods value 52,500,00 Forex Hedge Required

Type of pricing Pricing Rule

2.3 Create FX Hedge

- Create FX Contract Buy EUR, sell USD
- Currency date is 18-12-2019, (Last Trading Day Future)
- Exchange Rate is 1,1000 (See physical Contract)
- Portfolio is HUS

Form Row Tools

Save Cancel As Of Date Position 26-09-2019 Change reason Entity number 6812 20542 01000

Basic Conditions Add'l . Info PreCal

Forex Contract

General

Entity date * 25-09-2018

External number 229

Entity status * 100 Entered

Counter party * 60006 HINT ABNA CZK 410629421

Counter party reference * Test training scenario 1

Category Codes

Portfolio HUS

Option Type

Trade Type

Government Program

Broker/Bank Account ABN USD

Currency

Currency Date * 18-12-2019

Currency Buy EUR Amount buy 52,500,00 Buy Deliverable

Currency Sell USD Amount sell 57,750,00 Sell Deliverable

Exchange rate contract 1,1000000 Y Use multi-currency acct-multi.

2.4 Position

2.4.1 Price Upload

Work with Daily Market Prices

Records 1 - 1

	Daily Close	Daily High	Daily Low	Daily Open	Trading Commodity	Trad Comm Short Item	Exchange F.	Trans Date	Currency Per Description
Futures delivery per DEC19	2,200,0000	,0000	,0000	,0000	EEX-SMP	30002	1000EEX	26-09-2019	dec-2019

2.4.2 FX rate upload

Daily exchange rates

Entity Company: * Trans Date: 26-09-2019

Buttons: Create missing periods, Copy to company

Records 1 - 1

Trans Date	Entity Company	Cur Basis	Counter Curr.	Currency Period	CC	Closing Rate	Current rate	Forex (dis)agio	S E	Date Exchange Rate
26-09-2019	01000	EUR	USD	201912	Z	1,2000000	1,2000000		1	18-12-2019

2.4.3 Upload to position and calculate M2M

- RQ09CPA4
- RQ09CPA5
- RQ09CPU

2.4.4 Position shows

Position

Position Date: 26-09-2019 Company: *

Records 1 - 4

Key Position	Position Date	Total goods value	Outright Price	Valuation Market	Mark to Market	Pos type	Entity number	Closing Rate	Trading Commodity	Q pos. UCM Comm	UM Pos. Comm	Quantity	Cr UCM	Cr cur	Daily Close Val Period	Daily Close	Delivery period	Del. date through	Exchange period	M2M Calc	Val Cur	Valuation difference	Valuation Futures delivery period
114137	26-09-2019	57,750,00	,0000	48,125,0000	KA	6812	1,2000000					,00	USD		,8333	,0000	201912		1	EUR	,0000		
114143	26-09-2019	52,500,00	,0000	52,500,0000	KA	6812	1,0000000					,00	EUR		1,0000	,0000	201912		0	EUR	,0000		
114139	26-09-2019	52,500,00	2,100,0000	1000EEX	2,500,0000	1A	6843	1,0000000	EEX-SMP	25,00	TH	5,00	ST	EUR	1,0000	2,200,0000	19121912	DEC19	0	EUR	,0000	DEC19	
114138	26-09-2019	57,750,00	2,310,0000	1000EEX	6,875,0000	BA	6844	1,2000000	EEX-SMP	25,00	TH	25,0000	KG	USD	1,0000	2,200,0000	19121912	31-12-2019	1	EUR	,0000	DEC19	

2.5 Exercise

Proof / Show that for any Daily Close / FX rate combination Mark to Market will always be zero "0"

Mark to Market
-48125
52500
2500
-6875
0

2.6 Use Linking of Contracts to link these contracts

2.7 Variations

- Use Multiple delivery lines in multiple periods on the physical contract. meaning also multiple FX and Future contracts
- Include a Physical Contract with Q pricing: what does this do to the hedging required?

3 Delta Hedging

Delta Hedging is a trading strategy referring to the "delta" volume of the option(s). The strategy is as follows:

- The trader sells Call Options on an underlying asset he owns: Inventory
- The trader receives the option premium (Profit)
- He needs to hedge the risk that market goes up and Options will be exercised
- The amount he needs to hedge is the "Delta" of the option position

The easy way to create inventory is to do a Purchase to Stock Scenario. Or use what is already available:

Lot Split Change Lot Charact. - Inventory - Co. 1000 Inquiry

Entity Company: 01000 Hoogwegt International
 Entity code: IN Inventory

Records: 201 - 354 of 354

Entity number	Entity status	Status description	Entity Company	Item	Quantity	Entity branch
341	260	Available stock free	01000	SMP	750,00	1000INTRANS
328	260	Available stock free	01000	SMP	1.000,00	1000INTRANS
309	300	Available stock free	01000	SMP	1.000,00	1000INTRANS
229	300	Available stock free	01000	SMP	,00	1000INTRANS
213	260	Available stock free	01000	SMP	4.000,00	1000DEBORB...
212	300	Available stock free	01000	SMP	,00	1000INTRANS
175	100	Lot created	01000	SMP	1.925,00	1000NLZEMKLO
174	100	Lot created	01000	SMP	24.275,00	1000NLZEMKLO
173	100	Lot created	01000	SMP	25,00	1000NLZEMKLO
172	260	Lot created	01000	SMP	1.475,00	1000NLVEEDOC
171	300	Lot created	01000	SMP	1.000,00	1000INTRANS
170	300	Available stock free	01000	SMP	8.200,00	1000DENEUVOI
169	260	Lot created	01000	SMP	5.000,00	1000BEZWLBS
82	999	Remove in Table Trigger	01000	SMP	,00	1000INTRANS
69	300	Available stock free	01000	SMP	48.000,00	1000INTRANS
62	300	Available stock free	01000	SMP	25.060,00	1000INTRANS
40	300	Available stock free	01000	SMP	20.000,00	1000INTRANS
38	300	Available stock free	01000	SMP	20.000,00	1000INTRANS
Σ					2.229.082,00	

On the total volume 2229 TM we are going to sell 200 TM of options. Current market price is 2050 and we expect the possibility that the market price before FEB20 will rise above 2150 is small.

3.1 Sell Call option contract (10% of total inventory)

Future Options - Futures Options Hint Maintenance

Form Row Tools

Entity date *	27-09-2019		Portfolio	HOPO
Purchase or sale *	S	Sale	Option Type	
External number	231		Trade Type	
Entity status *	100	Contract Entered	Government Program	2
Counter party *	103683	FC Stone Dublin	Broker/Bank Account	FC 44328
Counter party reference *	Delta Hedging example Training			

Item

Item *	EEX-SMP	SMP future - EEX	<input checked="" type="checkbox"/> Tradeable Commodity
Exchange F...	1000EEX		
Futures delivery period *	FEB20	feb-2020	Delivery period
Last trading day *	26-02-2020		Currency Period

Future Option

Call or Put option	C	Call
Option premium	34,0000	
Premium currency	EUR	Euro
Option premium moment	C	Contract date + 1 days
Option expiry date	27-02-2020 08:16:55 UTC+01:	
Option Style	A	American

Price and Quantity

Strike price *	2.150,0000	EUR	Per *	TM	Metric Ton
Quantity *	40,00		UOM...	5T	5 MT
Quantity in primary UOM	200000,00		UOM...	KG	Kilograms
Total goods value	6.800,00				

3.2 Receive Option Premium

Reveice the option premium using RQ09CAL

RQ09CAL (v1.0) Version NLIN001 Hoogwegt Group User ID AME 27-09-2019 9:27:46
 (Final Mode) Process Future Options Page - 1 of 1
 Option Premium Booking = Contract Date +1

Entity		P C	New Entity		Error Message	
Number	Comp Stat Item	S P	Option premium	Quantity	UM Full Premium	Cur M Exp Dt Stat Description
6868	01000 100 EEX-SMP	S C	34,0000	40,00	5T 6.800,00	EURC 27-02-2020 113C

*** End of Report ***

Total Records Processed : 1
 Total Records with Errors : 1
 Total Records Completed :

3.3 Enter Market price (Both spot and forward) below Strike price

Market price entered = 2076. This needs to be done both for SPOT and FEB20 for EEX-SMP

Maintain Daily Market Prices

✓ Tools

Trading Commodity: EEX-SMP
 Trans Date: 27-09-2019 Exchange F.: 1000EE

Records 1 - 3

<input type="checkbox"/>	Futures delivery per	Daily Close	Daily High	Daily Low	Daily Open	Currency Period Description	Per Trad Status
<input type="radio"/>	FEB20	2.076,0000				feb-2020	T
<input type="radio"/>	SPOT	2.076,0000				Spot Price	P
<input checked="" type="radio"/>							

3.3.1 Greeks:

- Interest rate 2% (maturity date 27-02-2019)

Maintain CTRM Interest Rates

✓ Tools

Records 1 - 2

<input type="checkbox"/>	Entity Company	Trans Date	Interest Currency Code	Maturity Date	Interest Rate
<input type="checkbox"/>	01000	27-09-2019	EUR	27-02-2020	2,0000%
<input type="checkbox"/>					

- Volatility 17% (maturity date 27-02-2019)

Maintain CTRM Volatility Percentage

✓ Tools

Records 1 - 2

<input type="checkbox"/>	Entity Company	Trans Date	Trad Comm Short Item	Trading Commodity	Trad Comm 3th Item	Exchange F.	Maturity Date	Strike Price	Volatility Rate
<input type="checkbox"/>	01000	27-09-2019	30002	EEX-SMP	EEX SMP	1000EEX	27-02-2020	2.150,0000	17,0000%
<input type="checkbox"/>									

- No FX

3.4 Calculate Delta of Option(s) and Value / M2M on Inventory and option(s)

- Run RQ09CPT

RQ09CPT Reporting UOM: TM Metric Ton Hoogwegt Group 27-09-2019 09:49:17
 Update Greeks for Options Page - 1

Position Date	Key Position	Company	Entity Number	Trading Commodity Short Item and Description	Exchange	Outright price	Daily Close	Mark to Market	Error Message	Error Description
27-09-2019	114193	01000	6868	30002 SMP future - EEX	1000EEX	2.150,0000	2.076,0000	,0000		Successfully Processed

Position Date: = 27-09-2019
 Key Position: = *

Records 1 - 1

Position Date	Key Position	Entity number	Delta - Price Sensitivity	Vega - Volatility Sensitivity	Gamma - 2nd Price Sensitivity	Rho - Interest Rate Sensitivity	Theta - Time Sensitivity
27-09-2019	114193	6868	-79,9077	-1044,6390	-3,401	,0000	57,3682

The delta is 79,9077 TM

- Run RQ09CPU

Key Position	Position Date	Total goods value	Outright Price	Daily Close	Desc. Differential option period desc	Mark to Market	Valuation differential	Option premium	Pos type	Entity number	Trading Commodity	Q pos UOM Comm	UM Pos. Comm.	Quantity	Ctr UOM	Ctr cur	Daily Close Val Period	C or P	Deliv peric
114193	27-09-2019	6.800,00	2.150,0000	2.076,0000	feb-2020	5.176,1192	59,8806	34,0000	JA	6868	EEX-SMP	200,00-	TM	40,00-	ST	EUR	,0000	C	2002

There is a loss on the option position (-5176,12) because the value of the option has gone up to 59,88 (option premium) times 200 TM is 11976,12 EUR.

For the strategy this doesn't really impact because the underlying asset 200 TM has gone up with 26 EUR per TM is 5200 EUR compensating the loss on the Option

3.5 Hedge Delta (buy Future contracts)

The trader can decide to lock the profit on the premium to buy a hedge at size the Delta of the option (about..)

Future Contracts - Futures Contract Hint Maintenance

Form Row Tools
 Save Cancel As Of Date Position 27-09-2019 Change reason Entity number 6875 20808 01000

Basic Conditions Relations Add'l. Info PreCal

Futures Contract

General

Entity date * 27-09-2019
 Purchase or sale * P Purchase
 External number 232
 Entity status * 100 Entered
 Counter party * 103683 FC Stone Dublin
 Counter party reference * Training Delta Hedging

Category Codes

Portfolio HOPO
 Option Type EXT
 Trade Type OPTION
 Government Program 2
 Broker/Bank Account FC 44325

Item

Item * EEX-SMP SMP future - EEX Tradeable Commodity
 Exchange F... 1000EEX
 Futures delivery period * FEB20 feb-2020 Delivery period 20022002
 Last trading day * 26-02-2020 Currency Period 202002

Future Option

Price and Quantity

Price * 2.076.0000 EUR Per * TM Metric Ton
 Quantity * 16,00 UOM... 5T 5 MT
 Quantity in primary UOM 80000,00 UOM... KG Kilograms
 Total goods value 166.080,00 Forex Hedge Required

Buying 80 TM at 2076 and M2M of Zero ("0") on the Future Contract

Position

Position Date: 27-09-2019

Records 1 - 2

Key Position	Position Date	Total goods value	Outright Price	Daily Close	Desc. Differential option period desc	Mark to Market	Valuation differential	Option premium	Pos type	Entity number	Trading Commodity	Q pos. UOM Comm	UM Pos. Comm.	Quantity	Ctr UOM	Cur
114207	27-09-2019	166,080,00-	2,076,0000	2,076,0000	feb-2020	,0000	,0000	,0000	IA	6875	EEEX-SMP	80,00	TM	16,00	ST	EUR
114193	27-09-2019	6,800,00	2,150,0000	2,076,0000	feb-2020	5,176,1192-	59,8806	34,0000	JA	6868	EEEX-SMP	200,00-	TM	40,00-	ST	EUR

3.6 Enter Market price (Both spot and forward) above Strike price

Work with Daily Market Prices

Records 1 - 2

Futures delivery per	Daily Close	Daily High	Daily Low	Daily Open	Trading Commodity	Trad Comm Short Item	Exchange F.	Trans Date	Currency Period Description
FEB20	2,189,0000	,0000	,0000	,0000	EEEX-SMP	30002	1000EEEX	27-09-2019	feb-2020
SPOT	2,189,0000	,0000	,0000	,0000	EEEX-SMP	30002	1000EEEX	27-09-2019	Spot Price

3.7 Calculate Delta and M2M of Option(s), Future Contract and Inventory

Position

Position Date: 27-09-2019

Records 1 - 2

Key Position	Position Date	Total goods value	Outright Price	Daily Close	Desc. Differential option period desc	Mark to Market	Valuation differential	Option premium	Pos type	Entity number	Trading Commodity	Q pos. UOM Comm	UM Pos. Comm.	Quantity	Ctr UOM
114207	27-09-2019	166,080,00-	2,076,0000	2,189,0000	feb-2020	9,040,0000	,0000	,0000	IA	6875	EEEX-SMP	80,00	TM	16,00	ST
114193	27-09-2019	6,800,00	2,150,0000	2,189,0000	feb-2020	16,202,1939-	115,0110	34,0000	JA	6868	EEEX-SMP	200,00-	TM	40,00-	ST

The Loss on the option has grwon: -16202,20 EUR but a part of that loss is now compensated with the "Delta" hedge with the future contract: Profit of 9040. Leaving a negative position of: -16202,20 + 9040 + 6800 = -362,20 EUR, a small minus on the strategy. But since the spot price to valuate the inventory has gone up as well, the inventory gained 113 per TM the profit is 22.600 EUR

3.8 Hedge Delta (buy Future contracts)

Since the Option is in the money, the trader would be advised to hedge again the Delta of the option. The Delta of the option is also increased to 118,28 TM so the trader needs to buy an additional 40 TM to hedge the delta.

Data Browser - FQ09CPT [Trade - Position Greeks Tag Table]

Position Date: 27-09-2019

Records 1 - 1

Position Date	Key Position	Entity number	Delta - Price Sensitivity	Vega - Volatility	Gamma - 2nd Price Sensitivity	Rho - Interest Rate Sensitivity	Theta - Time Sensitivity	Interest Rate Greeks	Volatility % Greeks
27-09-2019	114193	6868	-118,2728	-1113,4531	-3261	96,4202	60,5768	,0200	

3.9 Exercise

Create own contracts and Inventory and simulate market movements. Use Position report (CPA) to monitor P&L