Smart Quant Reference Guide

Version 2015. 6

CONFIDENTIAL

Table of Contents

Chapter 1. Smart Quant Install

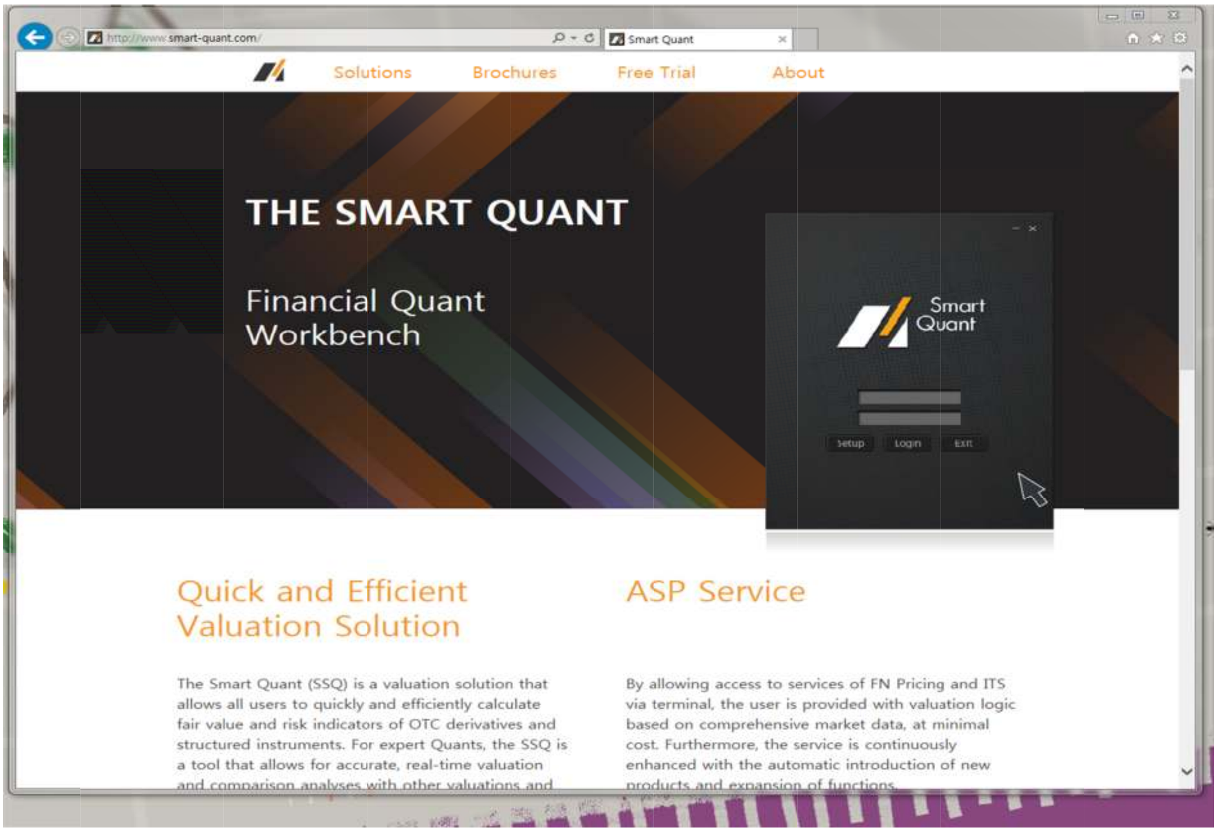
- To access Smart Quant (SSQ), the user must register and receive a temporary ID and password at www.smart-quant.com.

1.1 SSQ Install Specifications

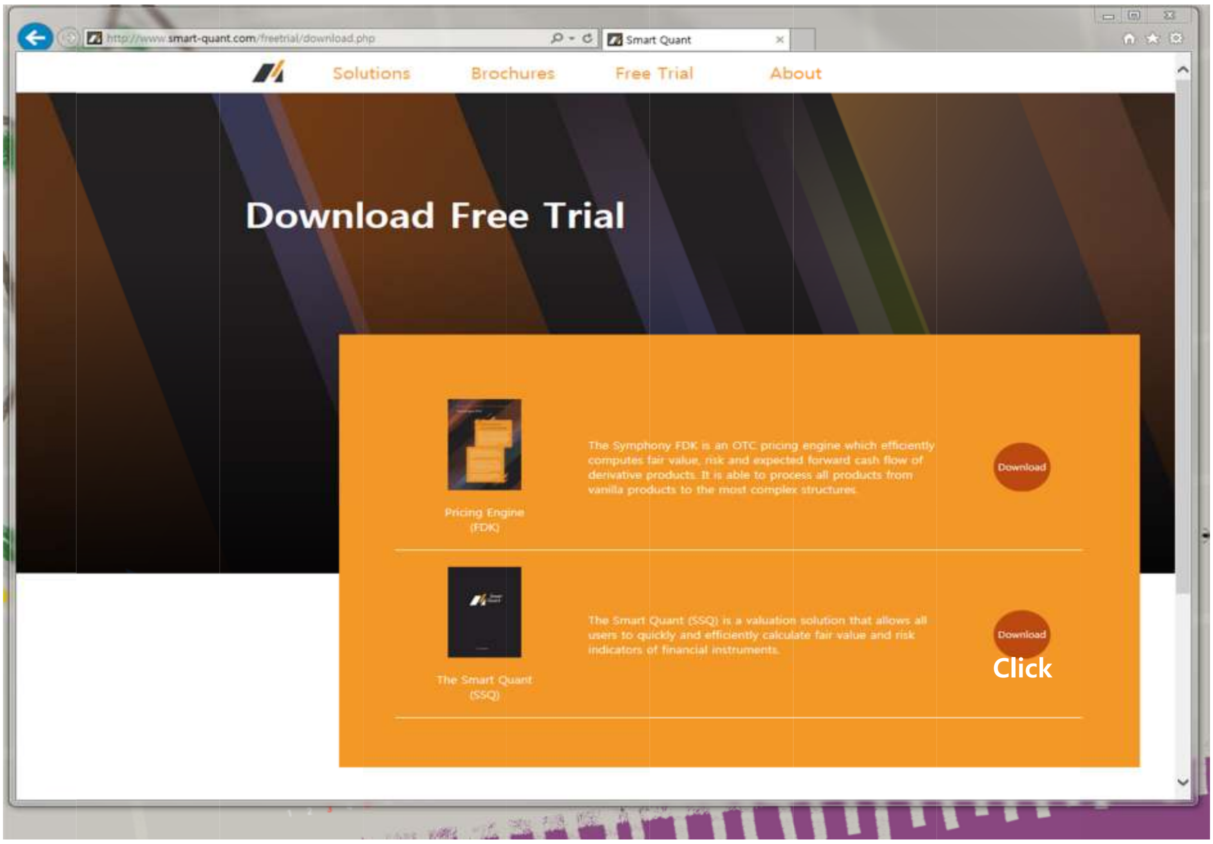
Item	Specification
OS	• Windows Net 4.0 and higher / Windows XP and higher
Memory	• 4GB and above
Hard Disk	• SSQ 50MB and above / 100MB if Window .Net Framework install needed

1.2 SSQ Install Program Download

- Smart Quant Homepage



- Click the Free Trial



1.3 SSQ Install

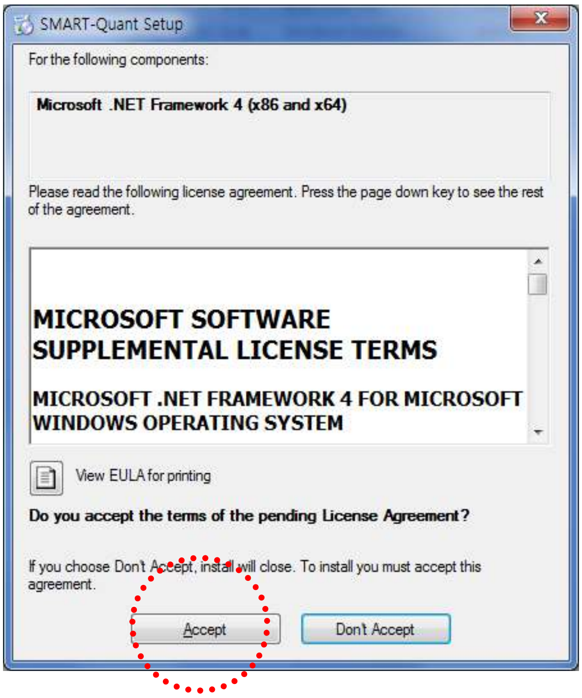
- Double-click the setup.exe file.

1. The SSQ install program is composed of the setup.exe and SMART-Quant.msi files.

2. When a user control alert pops up, click Yes to continue.

- Install the Microsoft.Net Framework 4.0 (Optional).

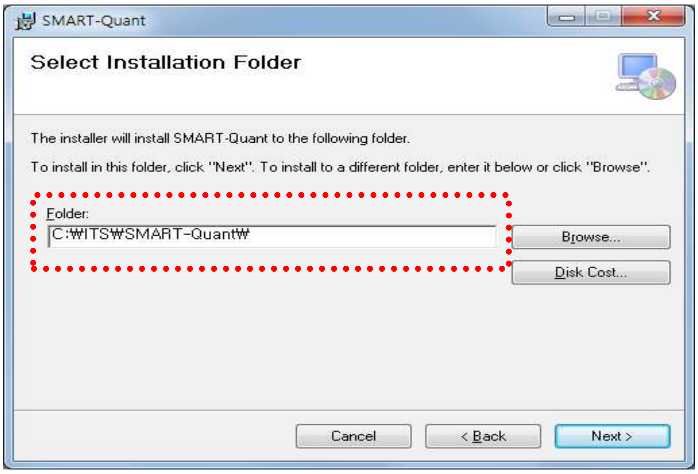
1. If the user's PC does not have the .Net Framework 4.0 installed, its install is prompted before the SSQ is installed. Click Accept to continue.



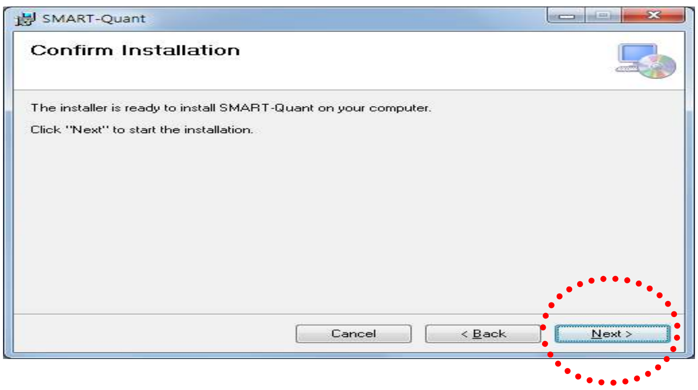
■ Install the SSQ.

1. When the SMART-Quant Setup window appears, click Next.

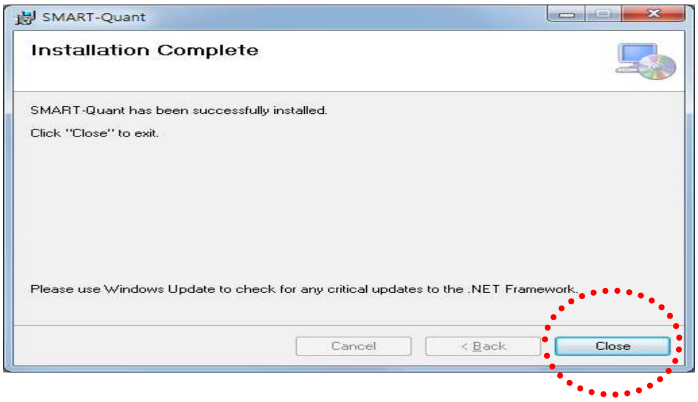
2. Select the installation folder and click Next. (We recommend folder "C:₩ITS₩SmartQuant" to avoid any user authority issues upon installation).



3. Click Next to confirm and start the installation.



4. Click Close once the Installation Complete message appears.



5. Upon installation, the SSQ icon appears on the desktop. Double-click to open.

Chapter 2. Smart Quant Getting Start

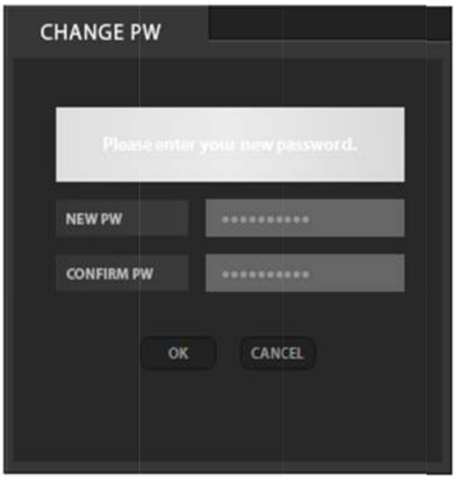
2.1 SSQ Login

- Double-click the SSQ icon on the desktop.

- To log in, enter the User ID and Password and click the LOGIN button.

- If the User ID or Password is incorrect, an error message appears as shown below. Click OK enter the correct information.

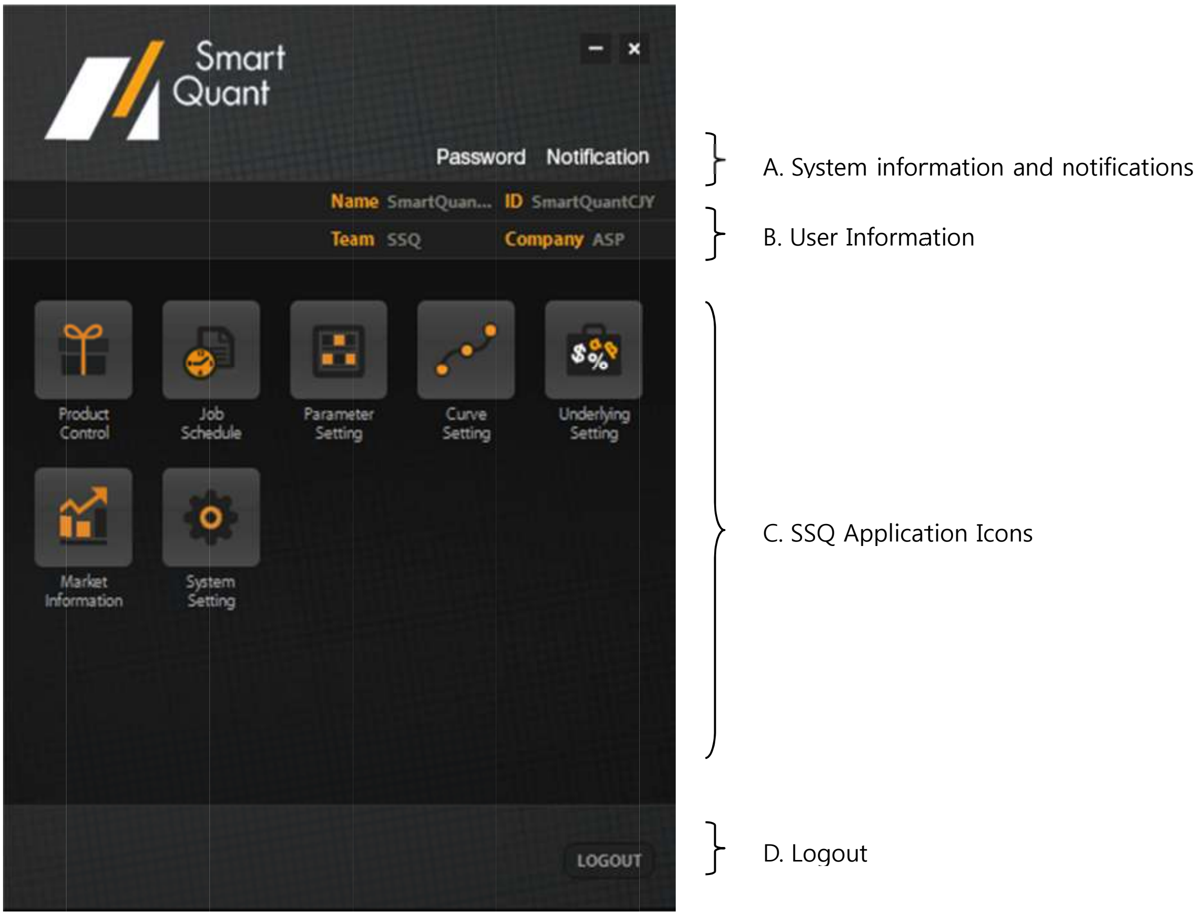
- For first-time logins, the user must enter the User ID and temporary Password sent via E-mail.
  (It is impossible to change the User ID received)
- After the first login, the user will automatically be prompted to register a new Password. A new Password is mandatory.


CHANGE PW
Please enter your new password.
NEW PW
CONFIRM PW
OK
CANCEL


Information
Password is changed successfully
OK

2.2 SSQ Task Panel

- Upon login, the SSQ Task Panel appears as shown below.



A. System information and notifications	• Info: Smart Quant system access information • Password: Change password • Notification: User notifications
B. User information	• Name: User Name • ID: User ID • Group: User Group Name
C. SSQ application icons	• Product Control: "Product Control" Application Icon • Parameter Setting: "Parameter Setting" Application Icon • Curve Setting: "Curve Setting" Application Icon • Underlying Setting: "Underlying Setting" Application Icon • Market Information: "Market Information" Application Icon
D. Logout	• Exit SSQ

- A password change is possible after first logging in.

1. Click the Password link on the SSQ Task Panel.

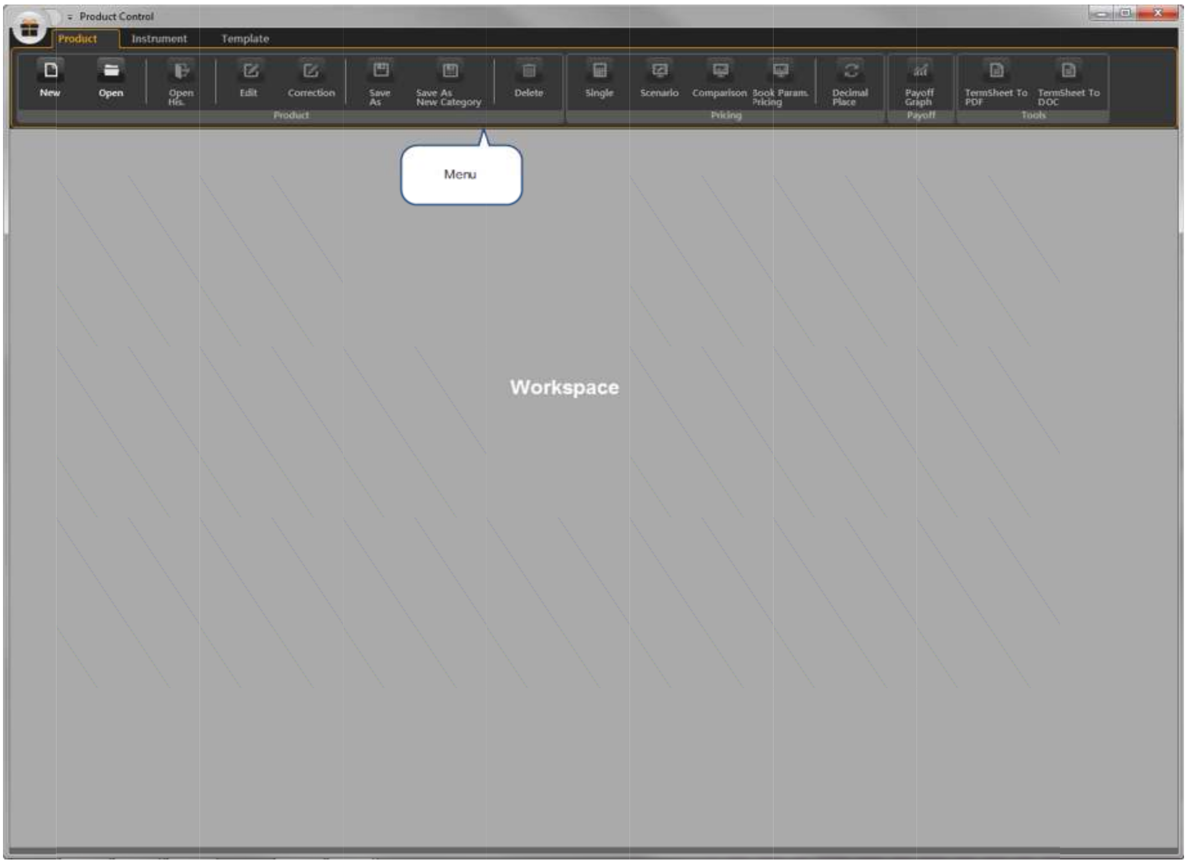
2. On the CHANGE PW tab, enter the current password and enter the new password in both of the NEW PW and CONFIRM PW fields. Click OK.

2.3 Smart Quant Applications

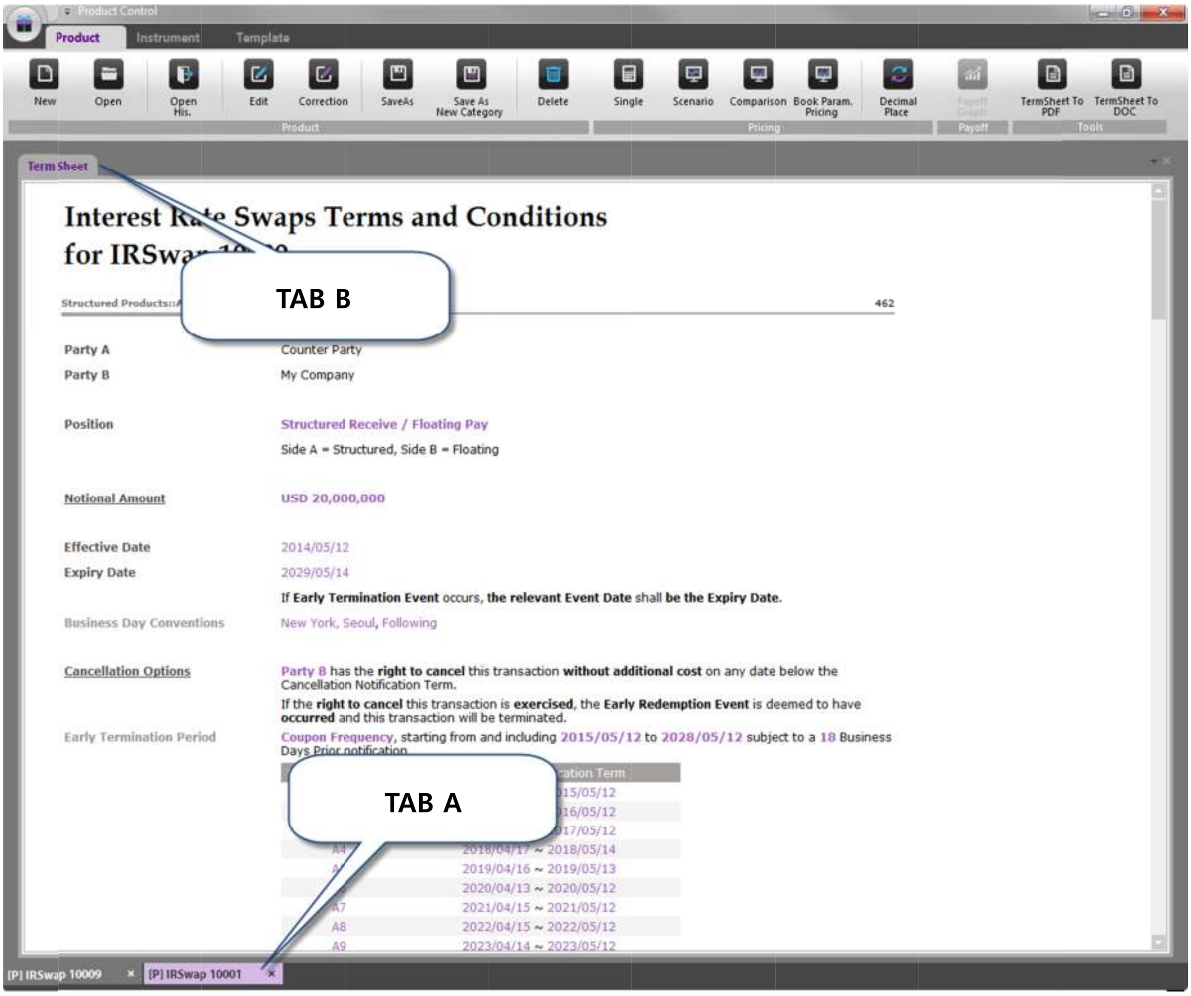
- Five SSQ Applications and Functions

Applications	Functions
Product Control	• Product and product template design • Product management (registration/edit/delete), term sheet and payoff chart generation • Product valuation (fair value/risk measure/cash flow estimation) • Scenario and comparison pricing simulation
Parameter Setting	• Pricing parameter details, user parameter registration and management
Curve Setting	• Curve details, user curve registration and management
Underlying Setting	• Underlying details, user underlying registration and management
Market Information	• Market data search, various analyses

- A maximum of 12 applications may run simultaneously on the SSQ. The user may also launch an application that is already open.
- With the launching of an application, the window is displays the top menu bar and workspace below.



- The workspace generates tabs at the bottom of the objects to which the user may apply any actions (Tab A), and tabs at the top to display the results of the completed action (Tab B).



Tab A	• Tabs of objects (individual or groups) to apply actions (E.g. For the Product Control icon, separate tabs are generated for each Product, Instrument, and Template.) • Tabs labelled by the name of the Product, Instrument or Template that is open • For the Curve Setting icon, separate tabs are generated for each group: Rate Curves, Volatility Curves, Coefficient Correlation Matrix, etc. • Tabs labelled as: Curves (Rate Curves), Curves (Volatility Curves), Curves (Corr. Matrix)

Tab B	• Tabs of results of the completed action • For each Tab A (object), one or more Tab B’s (results) are generated (E.g. Applying the Product Control icon, tabs generated are: Term Sheet/Pricing 1, 2, …/ Scenario Pricing 1, 2, …/ Payoff Windows etc.) • Applying the New or Open icon, the Term Sheet tab is generated (one tab only) • Applying the Pricing Menu icon, pricing results tabs are generated (multiple tabs possible) • Applying the Payoff Chart icon, the Payoff Chart tab is generated (one tab only)

Chapter 3. Product Control

- The Product Control Application is used for product design, product registration, term sheet and payoff graph generation, as well as computation of fair value, sensitivity, scenario analyses, etc.
- Financial instruments are distinguished as a "Product" or "Instrument" within the Product Control Application.
  - For "Instruments", the user is able to design new instruments and apply them to pre-trade analyses.

    [Instrument Categories]

Asset Group	Instrument Group	Payoff Pattern
Interest Rate	Caps/Floors	Standard, Asian, Barrier, Digital, Range, Standard Strategy
	Forwards	Forward Rate Agreement
	Notes	Vanilla Floating, Floater, Custom Floater Accrual, Accrual Floater, Custom Accrual, Volatility, Combination
	Swaps	Vanilla Swap, Basis Swap, Structured Swap, IR Swap Currency Fixed Swap, Currency Vanilla Swap, Currency Basis Swap Currency Structured Swap, Currency Swap
	Swaptions	Vanilla
Fixed Income	Notes	Zero Coupon, Simple Coupon, Compounding Coupon Simple & Compounding Coupon, Compounding & Simple Coupon Fixed Coupon, Fixed Coupon with Simple Grace Coupon Fixed Coupon with Compounding Grace Coupon
Foreign Exchange	Forwards	Cash, Standard, Asian, Barrier, Forward Start, Ratchet, Accrual
	Options	Standard, Asian, Barrier, Binary, Touch, Forward Start, Ladder, Lookback, Ratchet, Accrual, Accrual Binary
Equity	Options	Standard, Asian, Barrier, Binary, Touch, Forward Start, Ladder, Lookback, Ratchet, Accrual, Accrual Binary, Rainbow, Warrants
	Notes	Star, Periodic Star, Dispersion, Options Combinations
	Swaps	Star, Periodic Star, Dispersion, Options Combinations
Hybrid	Notes	Hybrid Floater, Hybrid Accrual, Hybrid Combinations Hybrid Star, Hybrid IrStar, Hybrid Options Combinations
	Swaps	Hybrid Floater, Hybrid Accrual, Hybrid Combinations Hybrid Star, Hybrid IrStar, Hybrid Options Combinations
Credit	Notes	Credit Fixed, Credit Floater
	Swaps	Credit Default Swap, Credit Linked Swap

  - "Products" are standardized financial instruments and the user is able to apply them to pre/pro-trade analyses.
  - The "Template" is used to input and register the specifications of financial instruments. (The user may also fix certain input fields to generate standardized templates to speed up future registrations. This practice also optimizes ease of use and minimizes errors in entering inputs.)

Product Control Application Menu

Menu			Description
Tab	Group	Menu	
(3.1) Instrument	(3.1.1) Instrument	(3.1.1.1) New	• Instrument New Registration
		(3.1.1.2) Open	• Instrument Open
		(3.1.1.3) Edit	• Instrument Edit
		(3.1.1.4) Save As	• Instrument Save As New Instrument
		(3.1.1.5) Save As New Category	• Instrument Save As New Category
		(3.1.1.6) Delete	• Instrument Delete
	(3.1.2) Pricing	(3.1.2.1) Single	• Single Pricing
		(3.1.2.2) Scenario	• Scenario Pricing
		(3.1.2.3) Comparison	• Comparison Pricing
		(3.1.2) Decimal Place	• Decimal Place
	(3.1.3) Payoff	(3.1.3.1) Payoff Graph	• Payoff Graph
	(3.1.4) Tools	(3.1.4.1) Term Sheet to PDF	• Term Sheet to PDF
		(3.1.4.2) Term Sheet to DOC	• Term Sheet to M/S Word
(3.2) Product	(3.2.1) Product	(3.2.1.1) New	• Product New Registration
		(3.2.1.2) Open	• Product Open
		Edit	Reference (3.1.1.3)
		(3.2.1.3) Correction	• Product Correction
		(3.2.1.4) Save As	• Product Save As Registration
		(3.2.1.5) Save As New Category	• Product Save As New Category
		Delete	Reference (3.1.1.6)
	Pricing	Single	Reference (3.1.2.1)
		Scenario	Reference (3.1.2.2)
		Comparison	Reference (3.1.2.3)
		(3.2.1.6) Book.Param. Pricing	• Book Parameter Pricing
		Decimal Place	Reference (3.1.2)
	Payoff	Payoff Graph	Reference (3.1.3.1)
	Tools	Term Sheet to PDF	Reference (3.1.4.1)
		Term Sheet to DOC	Reference (3.1.4.2)
(3.3) Template	(3.3.1) Product	(3.3.1.1) New	• Template New Registration
		(3.3.1.2) Open	• Template Open
		Edit	Reference (3.1.1.3)
		Save As	Reference (3.1.1.4)
		Save As New Category	Reference (3.1.1.5)

		Delete	Reference (3.1.1.6)
	Payoff	Payoff Graph	Reference (3.1.3.1)
	(3.3.2) Tools	(3.3.2.1) Market Group	• Market Group Registration
		(3.3.2.2) Product Group	• Product Group Registration
		(3.3.2.3) Product Type	• Product Type Registration
	Tools	Term Sheet to PDF	Reference (3.1.4.1)
		Term Sheet to DOC	Reference (3.1.4.2)

3.1 Instrument

- The Instrument Menu is used for product design, registration, edit and delete functions.

3.1.1 Instrument

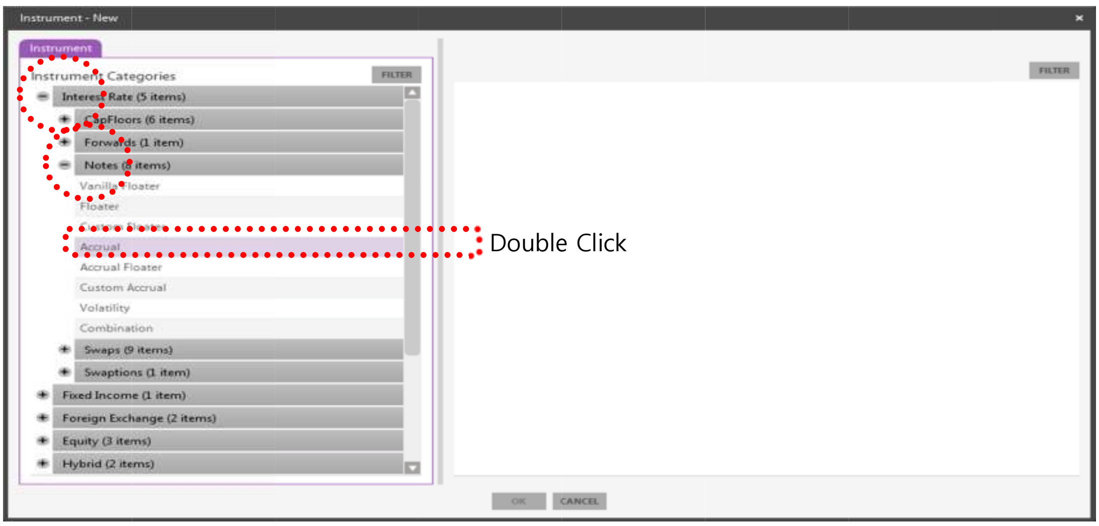
- [SSQ Task Panel] ▶ [Product Control] ▶ [Instrument]

3.1.1.1 New

1. Select product type.

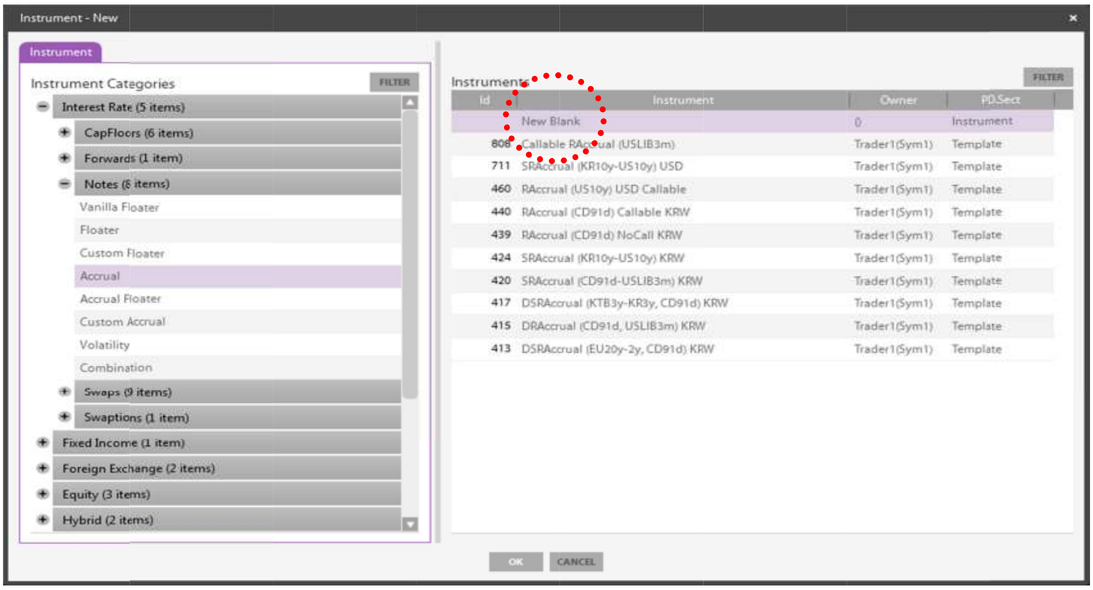
- Click the New icon to open the Instrument – New pop-up window.

- From the drop down menu under Instrument Categories, select the desired asset group, instrument group and double click the payoff pattern of the new instrument.

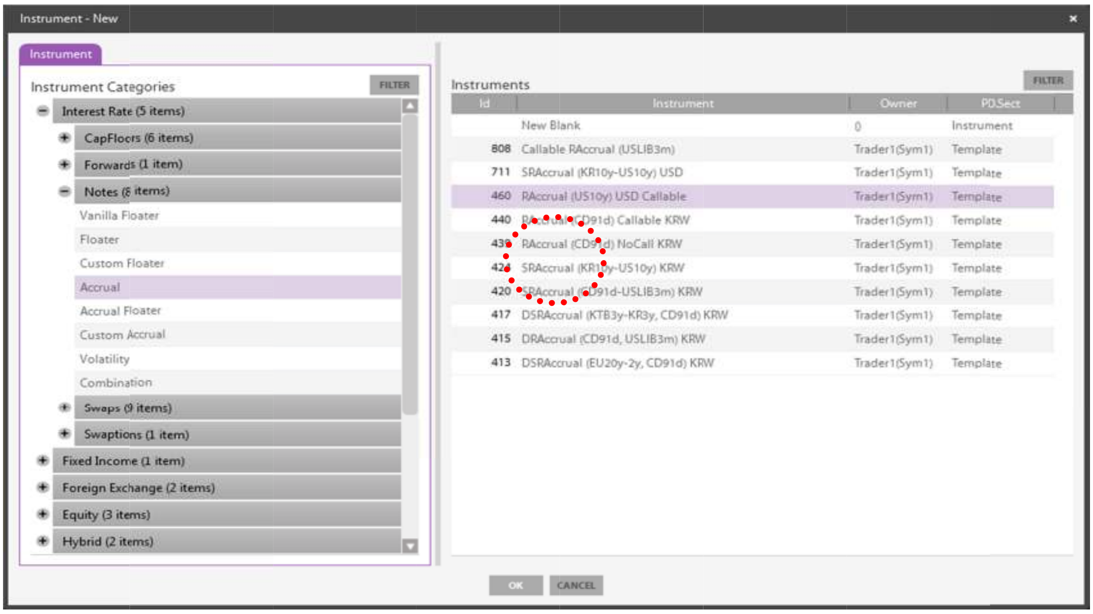


- Once the template list appears on the right, there are two methods to register the instrument: 1) through New Blank (blank template) or 2) by an existing template.

  1) Select New Blank at the top of the list and click OK.

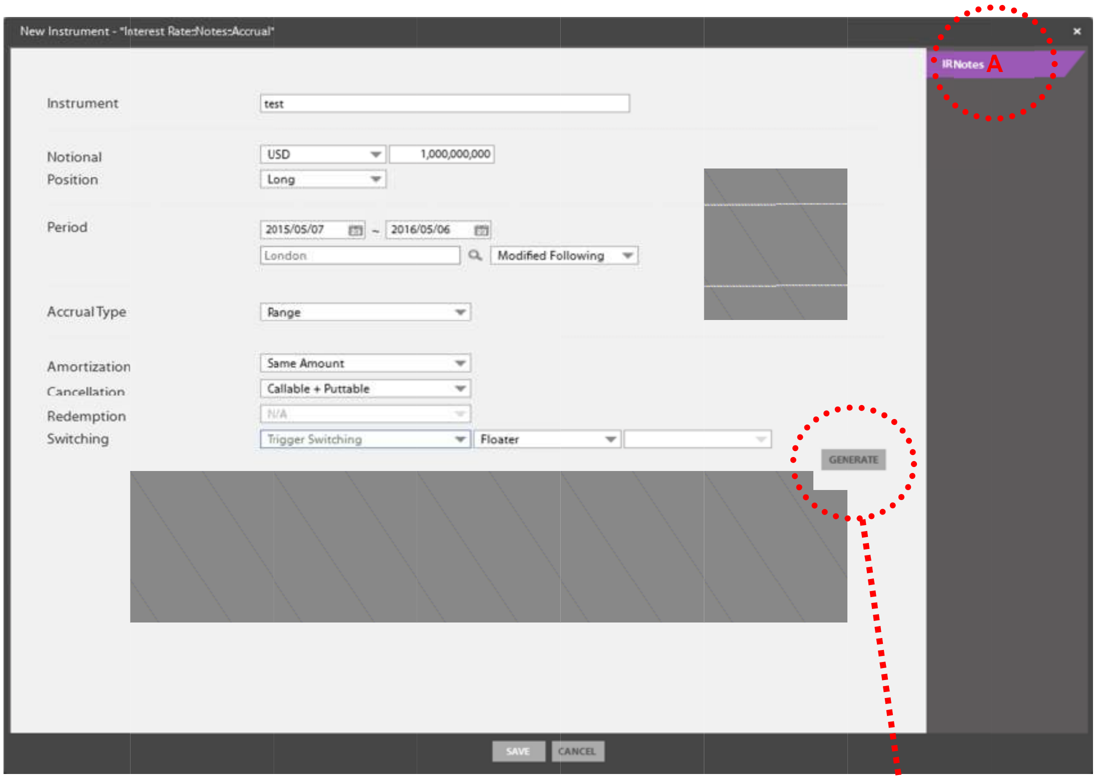


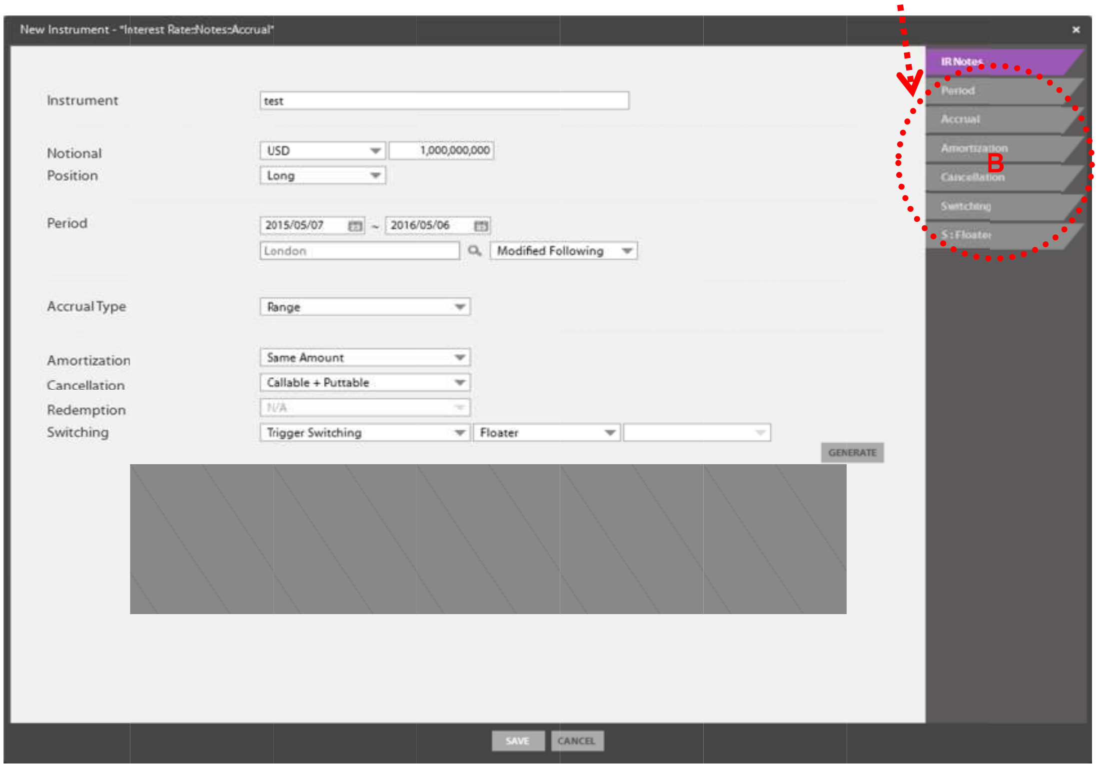
  2) Select an existing template as desired from the list and click OK.



2. Input the instrument details.

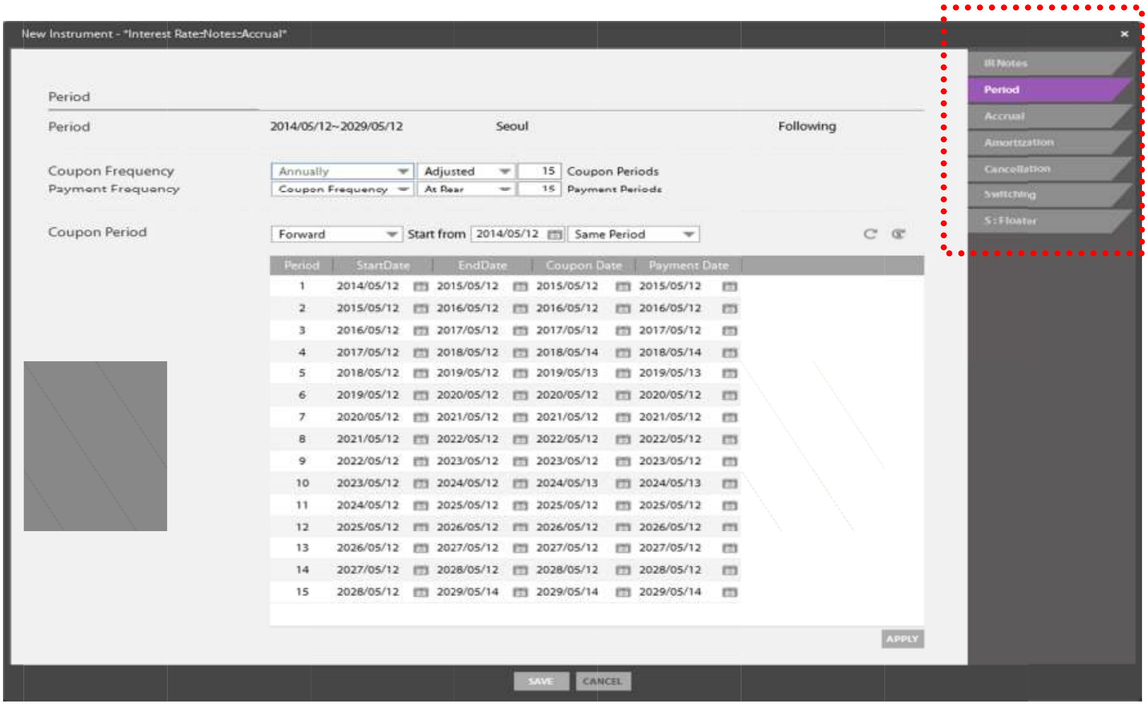
- In the new form (shown below as Tab A), enter the basic information of the new instrument.
- Click Generate to create additional forms (Tab B).



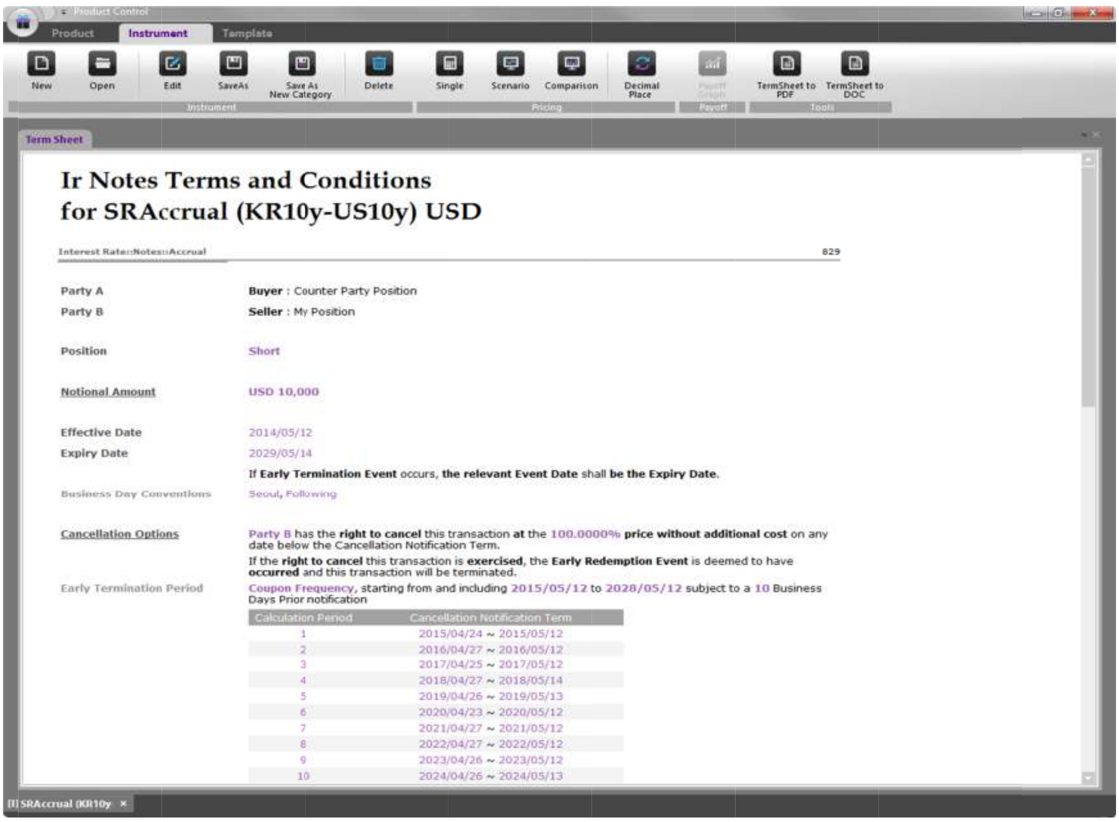


- Please note: If Tab A values are revised after generating the additional forms, click GENERATE again to reflect the revision in all forms.

3. Select each tab and enter instrument details in all forms.



4. Click SAVE to view the term sheet of the new instrument.

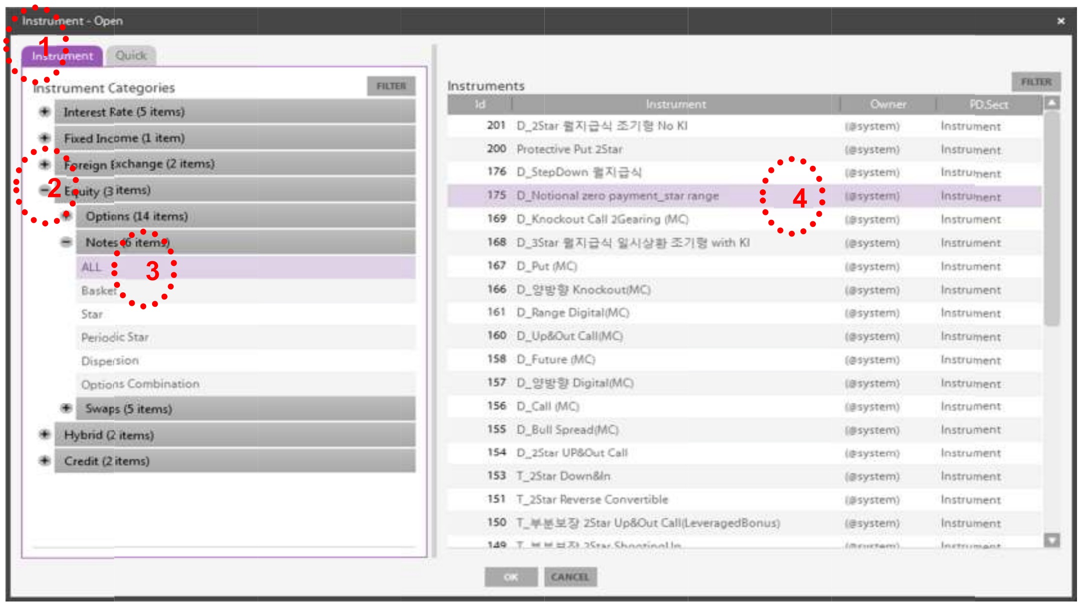


3.1.1.2 Open

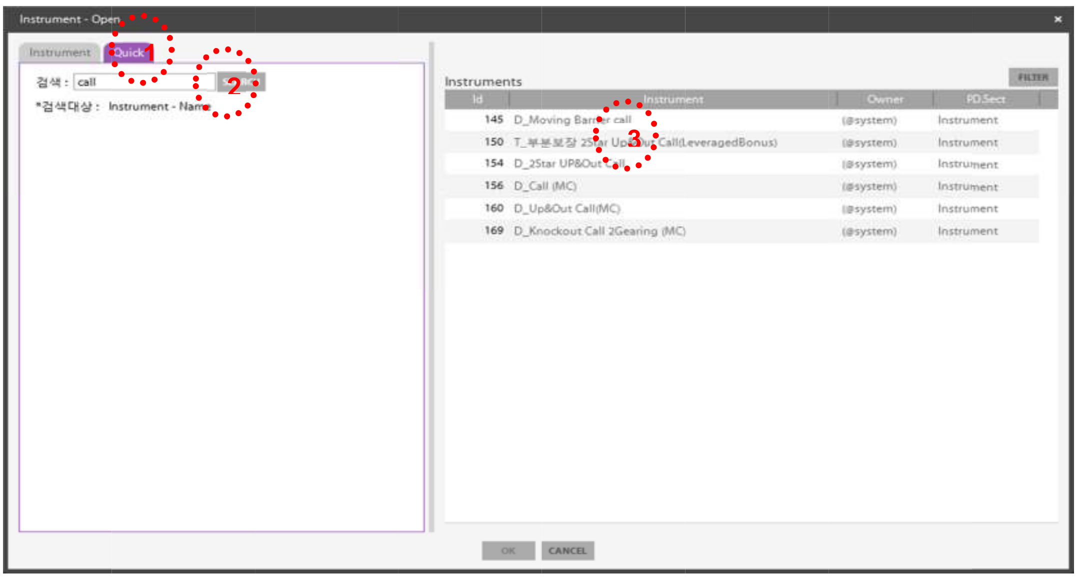
1. To view a pre-registered instrument:

- Click the Open icon to open the Instrument – Open pop-up window.
- There are two methods to open a product: 1) by selecting the product from its category list and 2) by running a Quick search.

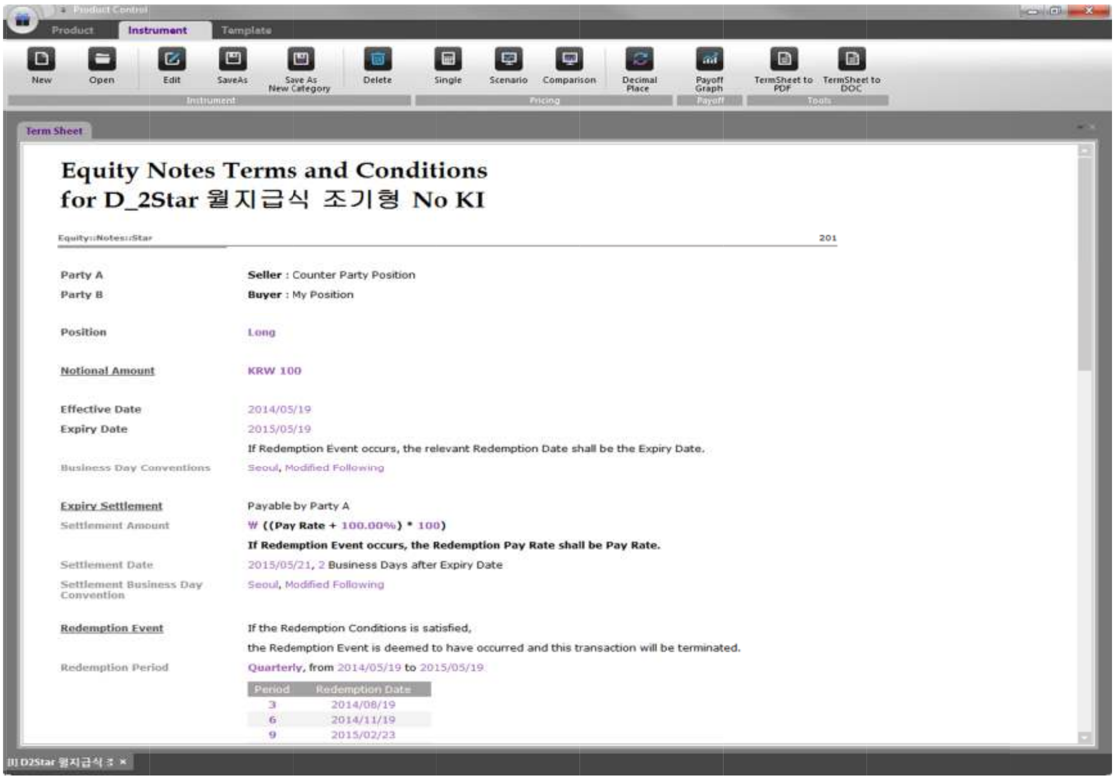
1) From the Instrument tab, select through the applicable instrument categories and [double-] click the desired instrument from the list on the right.



2) From the Quick tab, enter a keyword included in the instrument name and click SEARCH. Double-click on the desired product from the search results that appear on the right.



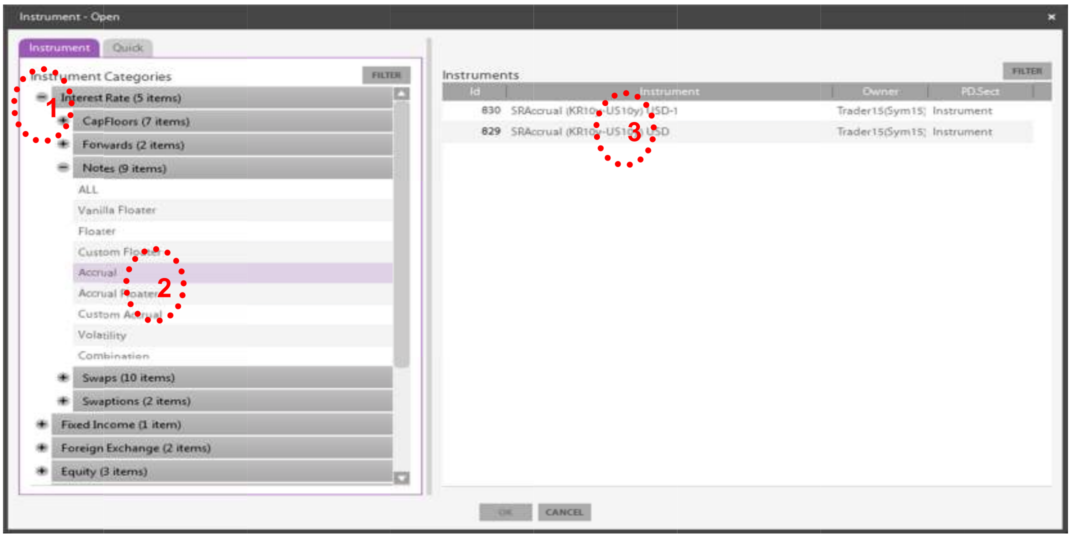
2. The term sheet of the selected instrument appears as below.

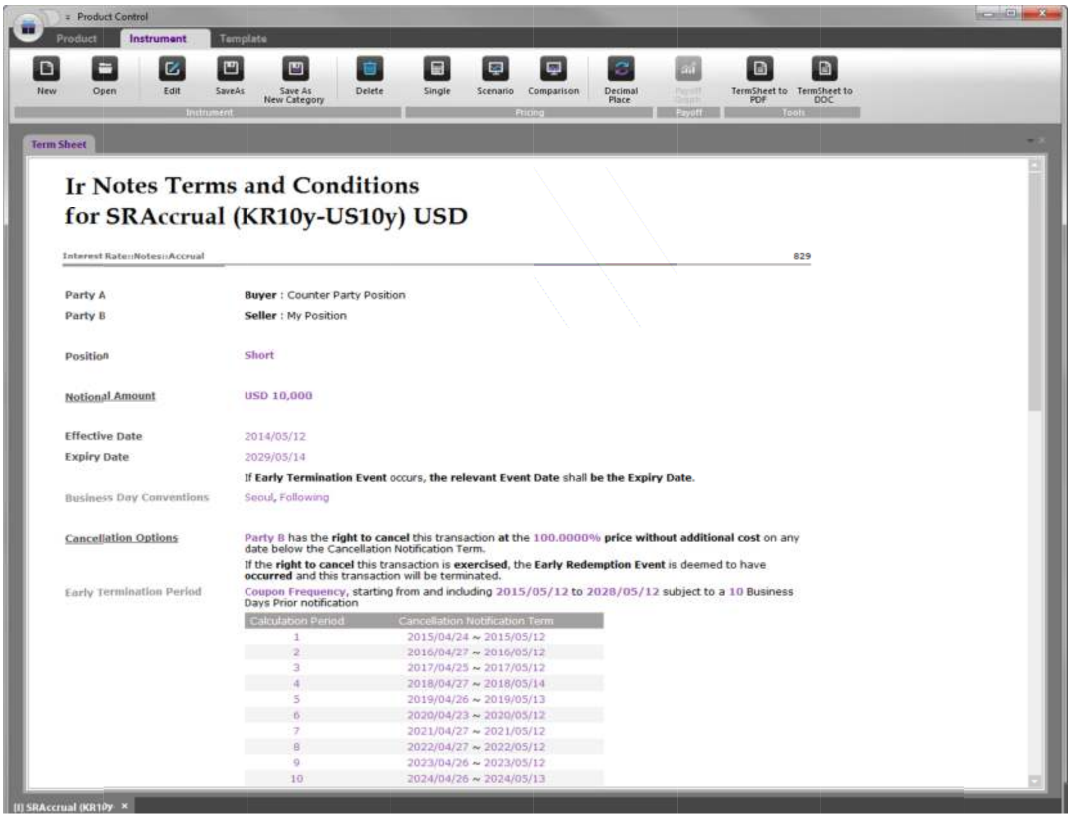


3.1.1.3 Edit

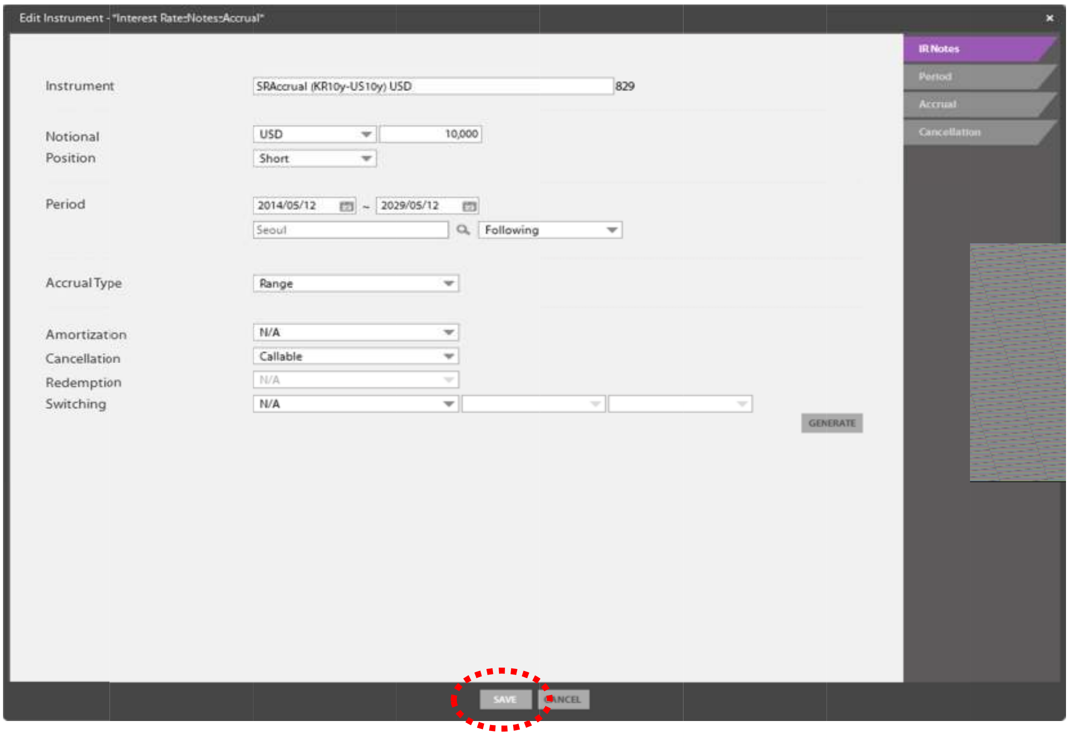
1. Edit details of a pre-registered instrument.

- The Edit icon is enabled for the instrument that is opened in the workspace.

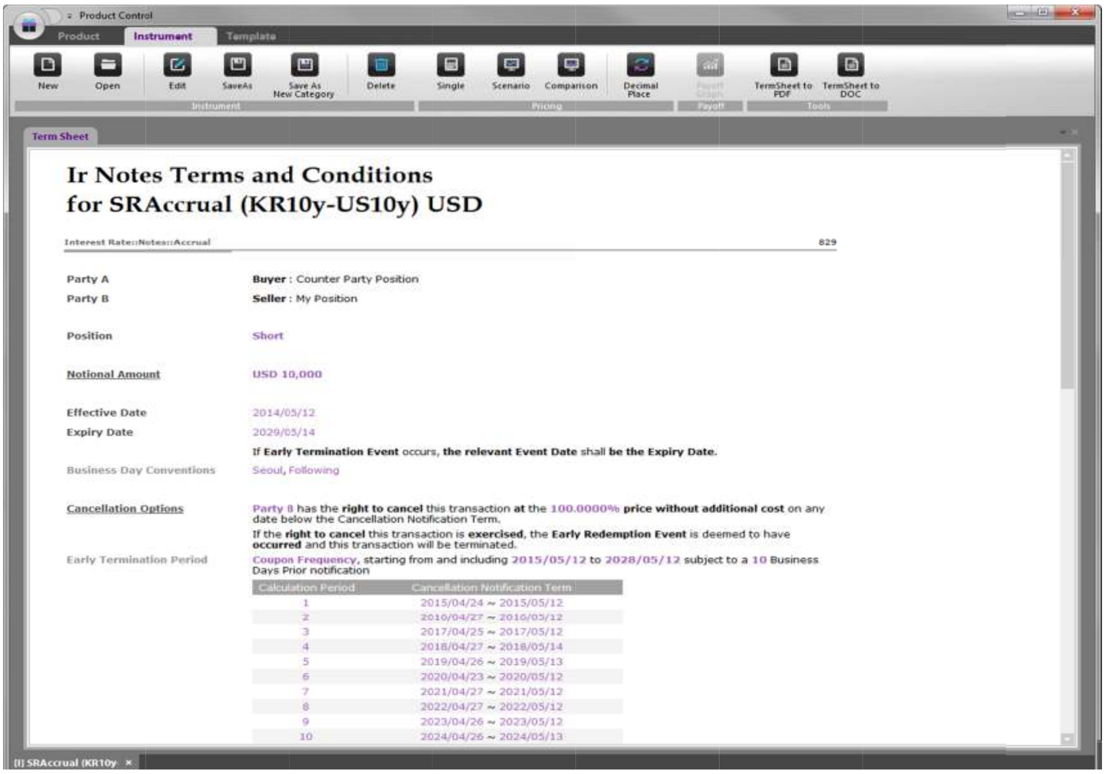




- Click the Edit icon to open the input form in a pop-up window and enter or revise the desired inputs. Click SAVE upon completion.



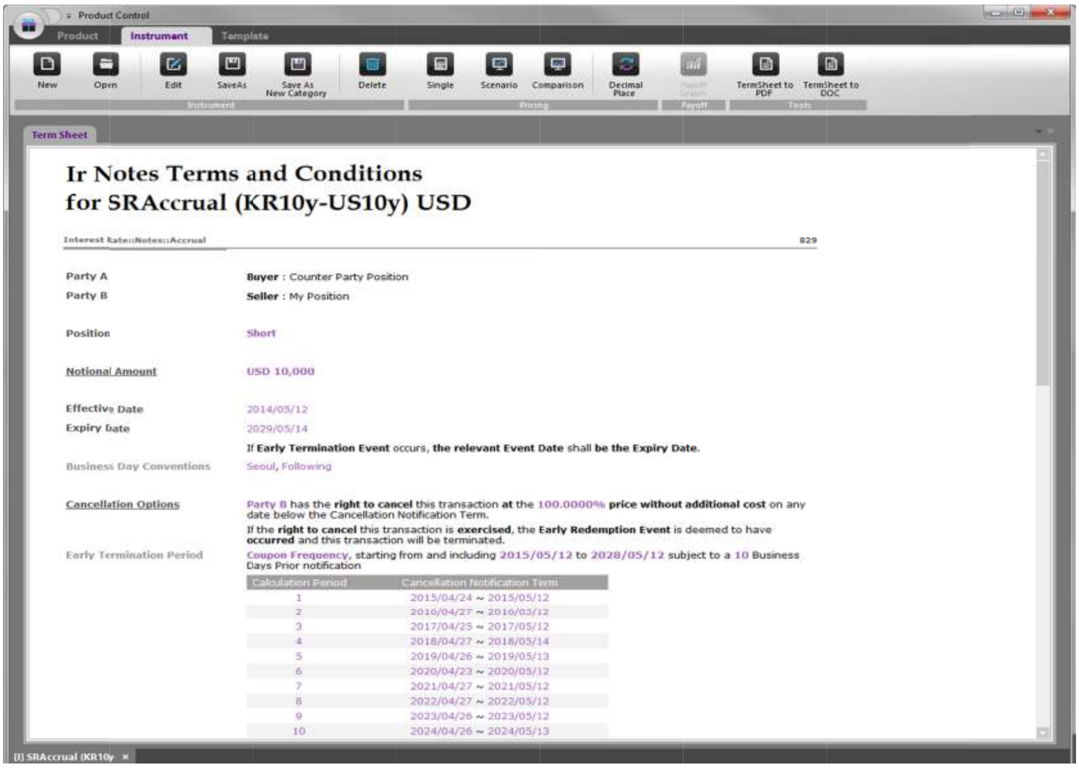
2. The term sheet of the revised instrument appears as below.



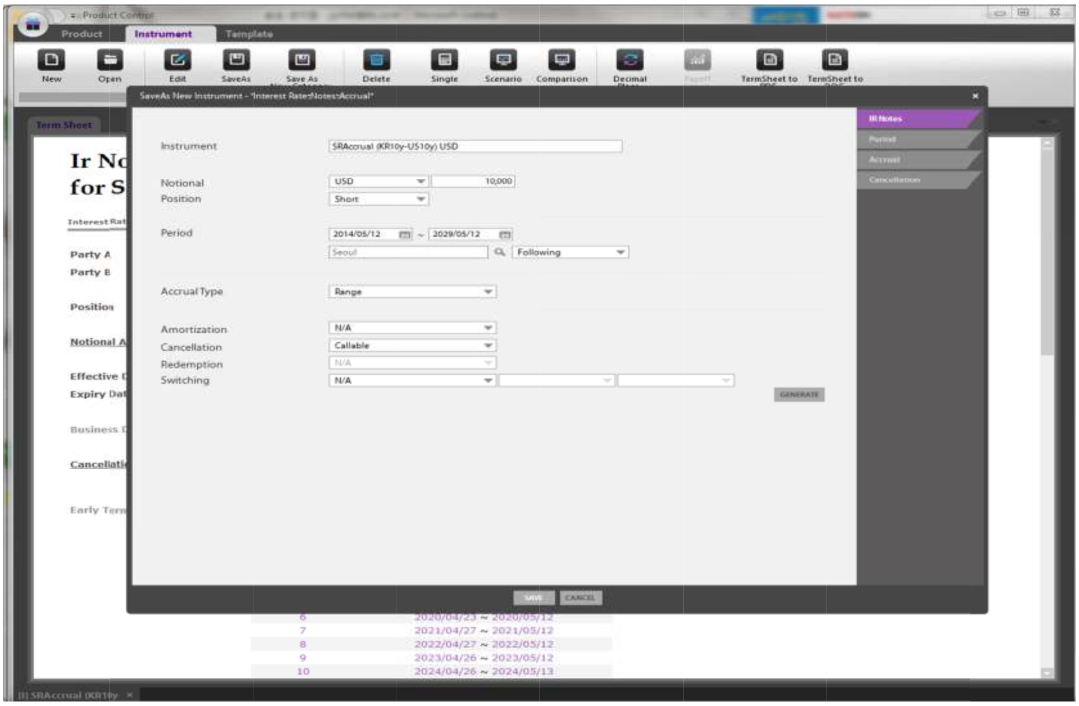
3.1.1.4 Save As New

1. Input the details of the instrument to be newly saved.

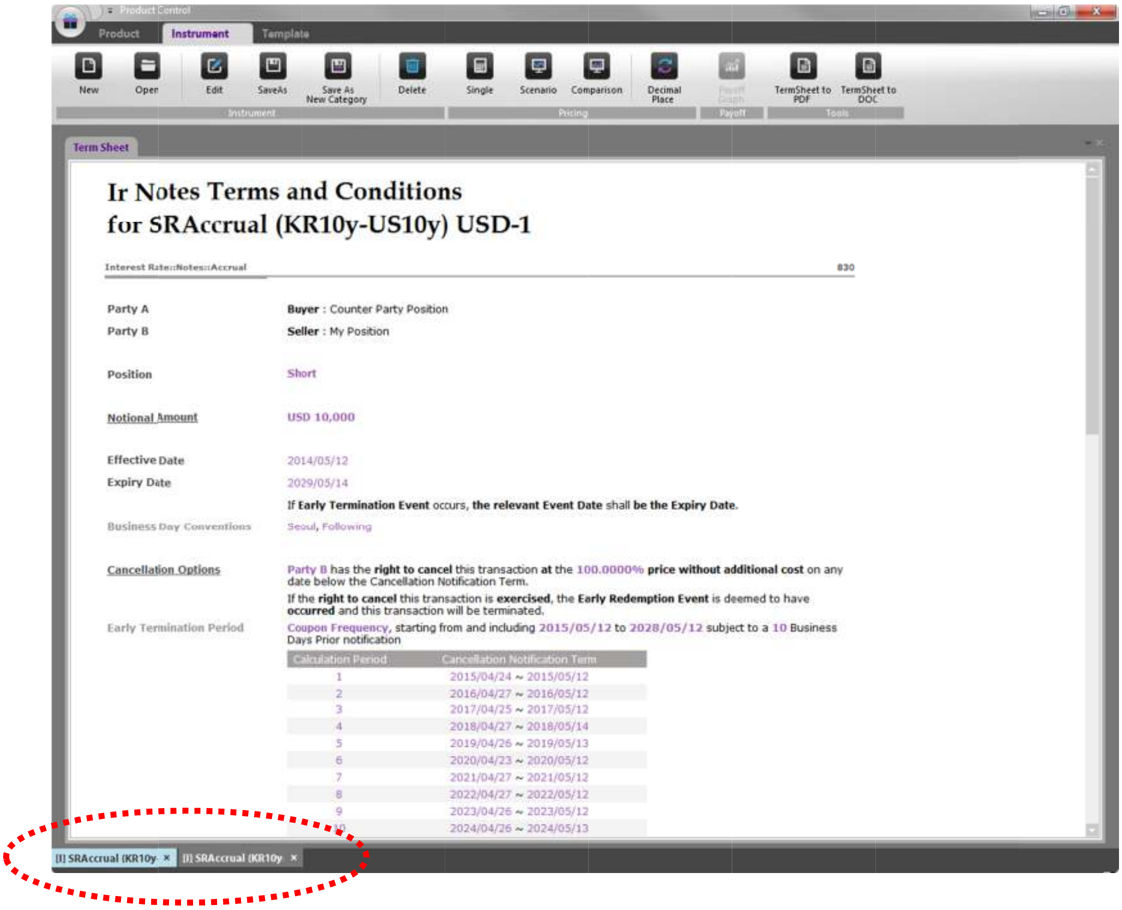
- The Save As icon is enabled for the instrument that is opened in the workspace.



- Click the Save As icon and open the Save As New Instrument pop-up window. Make desired inputs or revisions and click SAVE.



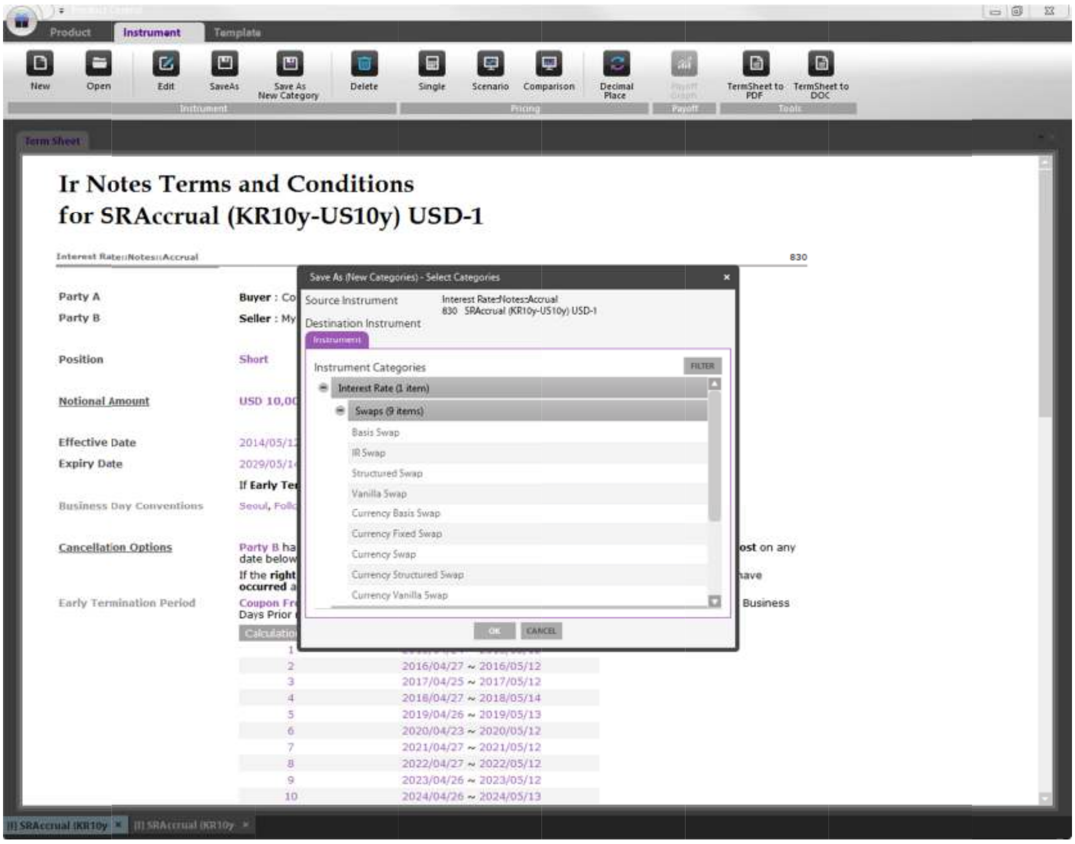
2. The newly saved instrument term sheet appears on a new tab as shown below.



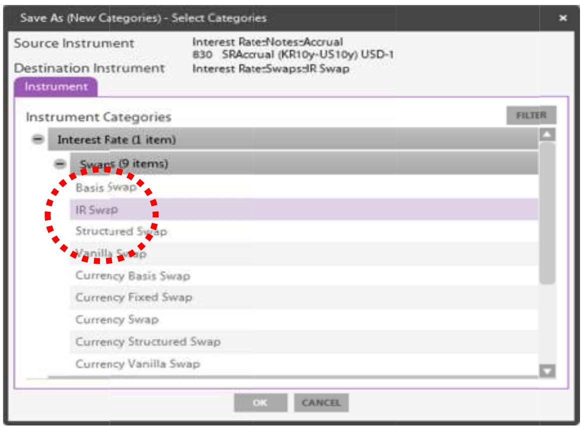
3.1.1.5 Save As New Category

1. Set a Set a new category for an instrument.

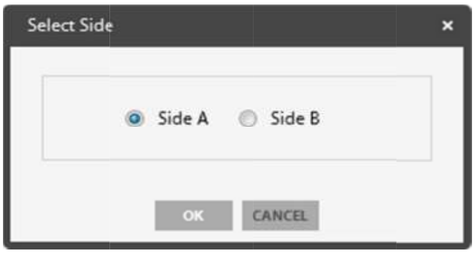
- The Save As New Category icon is enabled for the instrument that is opened in the workspace.
- Click the Save As New Category icon and open the Save As New Category pop-up window.



- Of the Instrument Groups, the user may change the product from a Note to a Swap or from a Swap to a Note.
- To change from a Note to a Swap, select the desired payoff pattern from the list as shown.



- To change from a Swap to a Note, select from Side A or Side B to be applied to the Note.

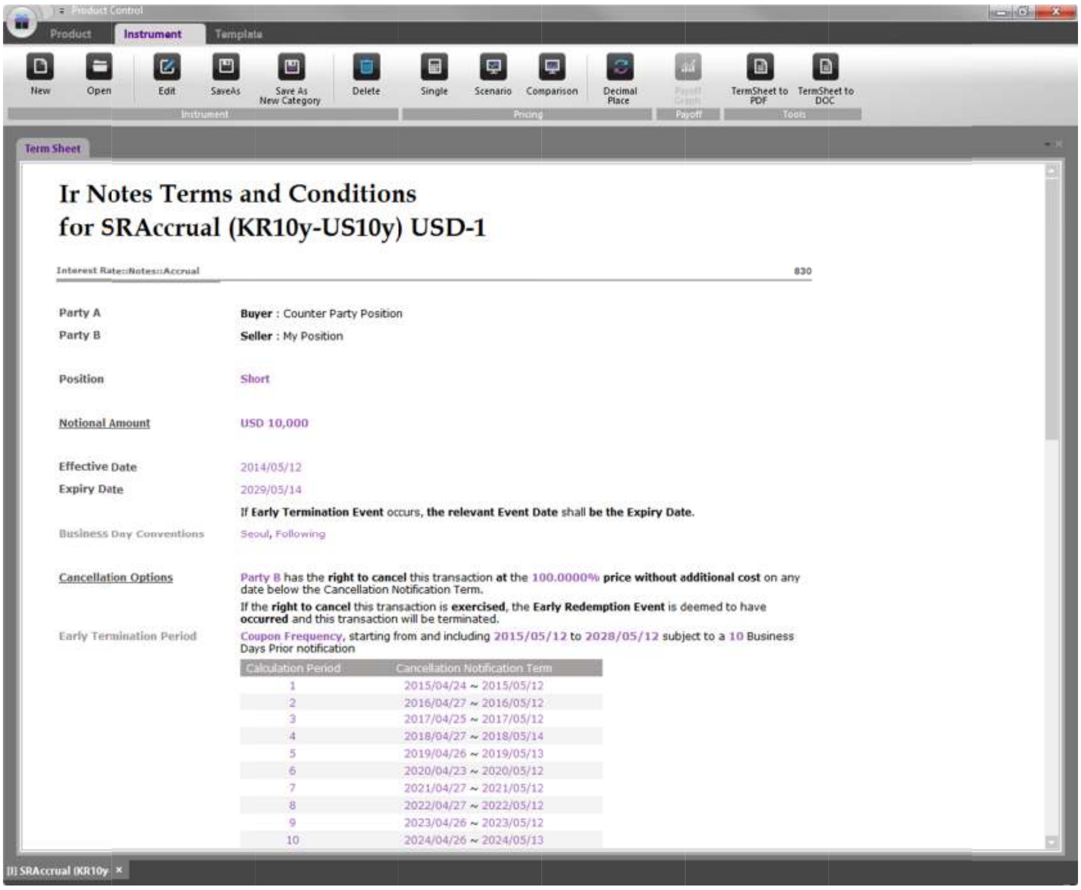


2. Input the details of the instrument to be newly saved.
   - Once the new category is selected, the pop-up window for inputting product details is opened.
   - Revise inputs and click SAVE.
3. The newly saved instrument term sheet appears on a new tab as shown below.

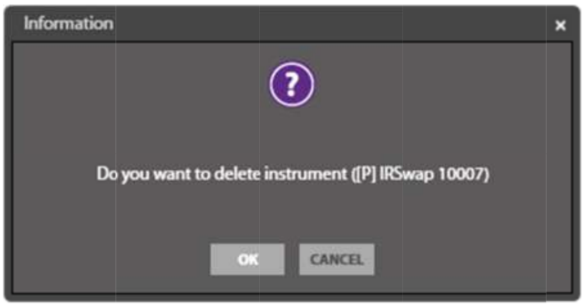
3.1.1.6 Delete

1. Delete an instrument.

   - The Delete icon is enabled for the instrument that is opened in the workspace.
   - Click the Delete icon to delete the instrument that is currently open.



   - In the pop-up alert, confirm the name of the product to be deleted and click OK to delete permanently.



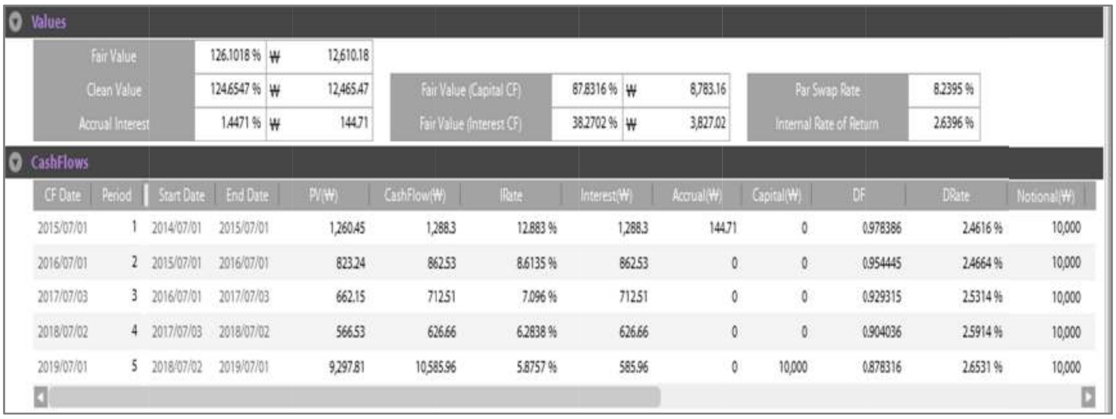
3.1.2 Pricing

- The Pricing Menu is used for computations and running simulations on fair value and indicators including sensitivity, IRR, YTM, Par Swap Rate, etc.

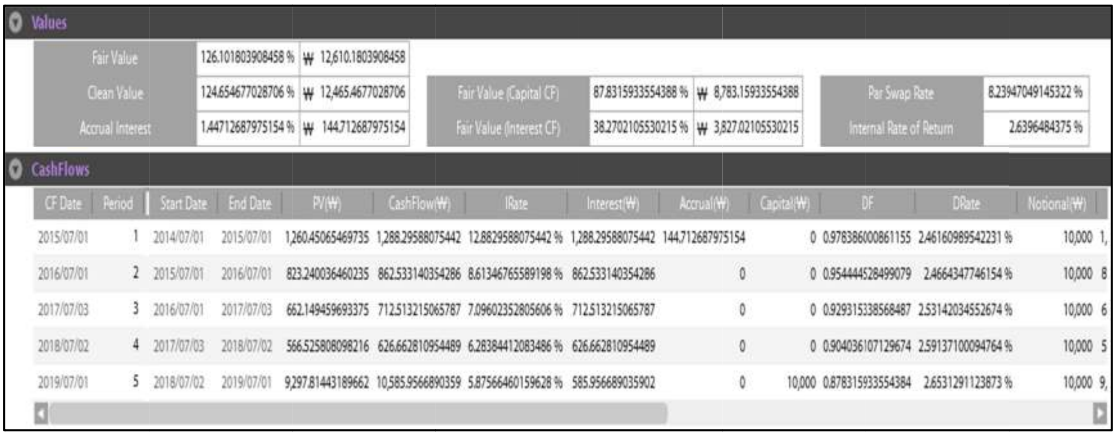
Single	• Fair value, sensitivity, indicators (IRR, Par Rate, etc.)
Scenario	• Comparison pricing applied to set scenarios (price/IR/FX/Index/volatility etc.)
Comparison	• Comparison pricing applied to parameters (price/IR/FX/Index/volatility/date/model/parameter sets etc.)

- The Decimal Place ON/OFF icon allows the user to view results with all decimal places (ON) or rounded to set decimal places (OFF). The set decimal places are 4 decimals for percentages, 6 decimals for prices, and 2 decimals for sums.

1. Decimal Place ON



2. Decimal Place OFF



3.1.2.1 Single Pricing

1. Input pricing conditions and run single pricing.

- Click the Single Pricing icon and open the Singe Pricing pop-up window. The pricing is applied on the instrument that is currently open.
- Input the desired conditions and click OK.

Model	• Select from the drop-down list of models provided The list is automatically filtered according to compatibility with the open product.
Greeks	• Select sensitivity method from the drop-down list provided • The list is automatically filtered according to compatibility with the product. (Please see the table of Models and Greeks below). • Select N/A to exclude sensitivity calculations
Parameter Set	• Select Pricing Parameters managed by the Parameter Setting Application
Calc. Date	• Date of the calculation.
Market Ref. Date	• Reference date of the market data applied in the calculation

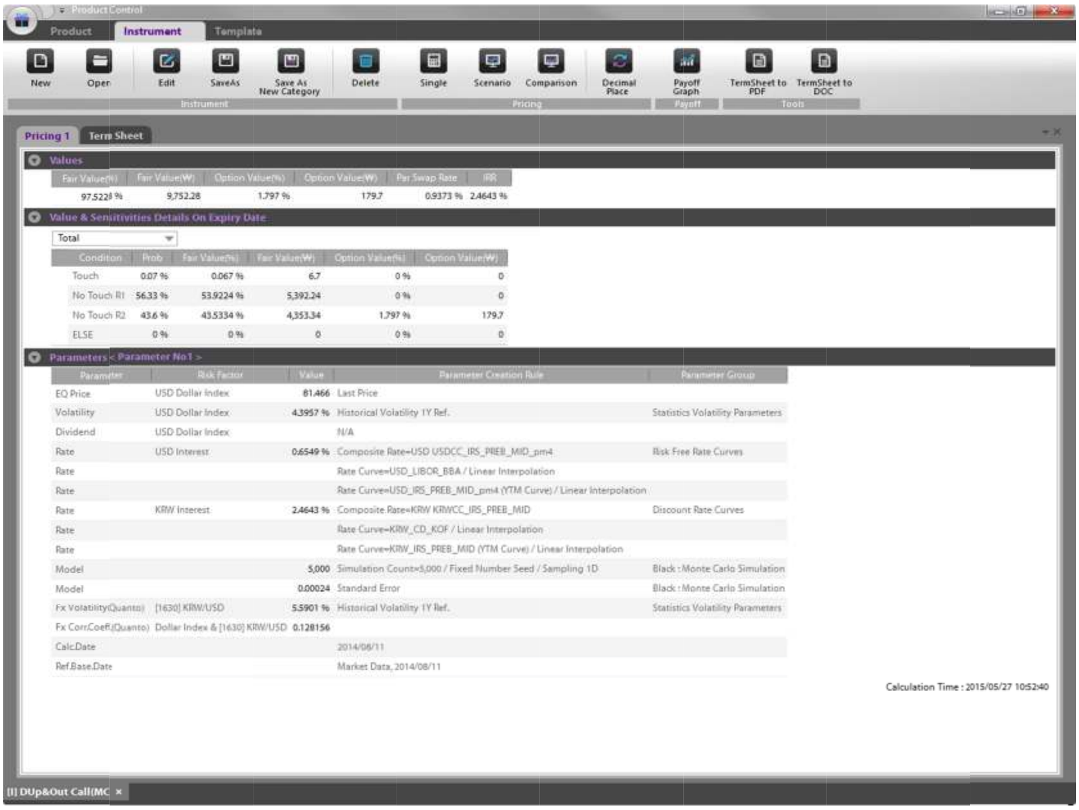
[Models and Greeks]

Product Group	Model	Greeks
Interest Rate	Forecast	Differential Greeks, Effective Greeks(①②③④)
	Black	Differential Greeks
	HW, BDT	Effective Greeks(①②③④)
Fixed Income	Discount	Differential Greeks, Effective Greeks(①②③④)
	Forecast	Differential Greeks, Effective Greeks(①②③④)
	HW, BDT	Effective Greeks(①②③④)
Foreign Exchange	Black	Differential Greeks, Effective Greeks
Equity	Black	Differential Greeks, Effective Greeks
Hybrid	Black, HW/BDT	Effective Greeks(①②③④)
Credit	Gaussian, HW/BDT	Effective Greeks(①②③④)

- IR/FI Effective Greeks
  - Effective Greeks: Upon computation of the Delta/Gamma, sensitivity calculated by Interest Rate parameter type (Spot/YTM).
  - Effective Greeks (Spot Delta): Upon computation of the Delta/Gamma, sensitivity calculated after all Interest Rate parameter types (Spot/YTM) are converted to Spots.
  - Effective Greeks (Accumulation Delta): Identical computation as (1) with accumulation accrual delta calculation in addition.
  - Effective Greeks (Spot: Accumulation Delta): Identical computation as (2) with accumulation delta calculation in addition.
- IR/FI Differential Greeks : Duration, Convexity, Modified Duration, Basis Point
- IR/FI Effective Greeks : Delta, Gamma, Vega, Theta
- IR/FI (2) Effective Greeks : Delta, Gamma, Theta (Forecast, Discount Model)
- EQ Differential/Effective Greeks : Delta, Gamma, Vega, Theta, Rho
- FX Differential/Effective Greeks : Spot Delta, Forward Delta, Gamma, Vega, Theta, Rho, Phi
- HB Effective Greeks : Delta, Gamma, Vega, Theta, Rho
- CR Effective Greeks : Delta (Rate, Credit Spread), Theta
- CR (2) Effective Greeks : IR Delta, IR Gamma, IR Vega, Theta (CLS)

2. Confirm the pricing results.

- Depending on the product and model, pricing computations may take up to several minutes.
- Results appear as shown below.



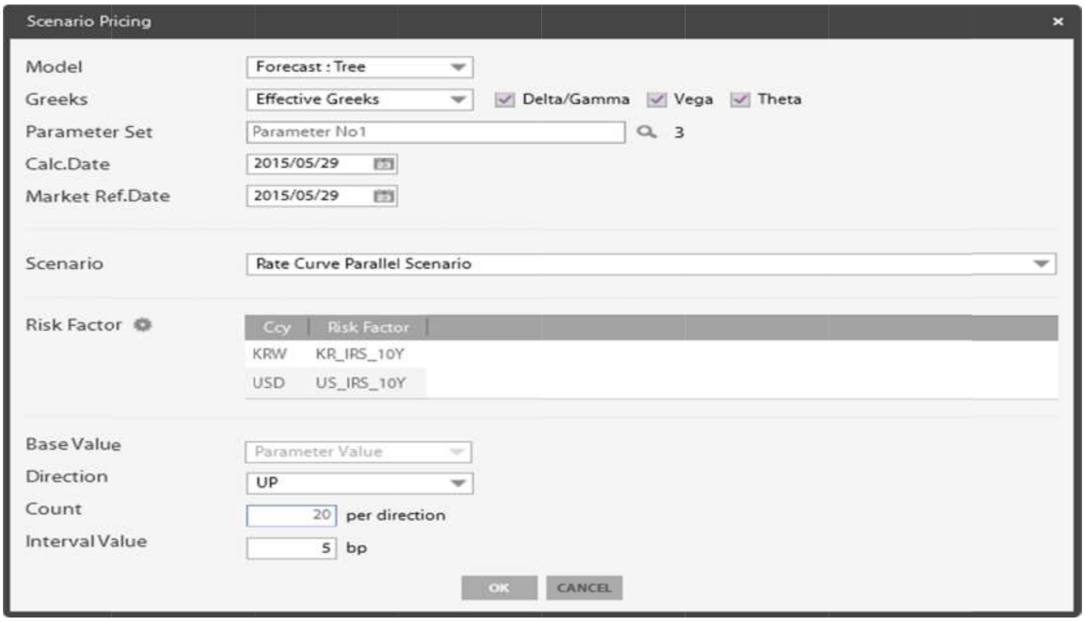
Results	Explanation	Related Product Category
Values	• Fair value and other details.	All
Values Per Series	• Fair value and other details by FX Series	FX
Swap Values	• Underlying asset of Swaption • Swap fair value and other details	IR: Swaption
Values & Sensitivities Details Per Redemption & Coupon Periods	• Fair value and Delta/Gamma sensitivity calculations by redemption and coupon periods	EQ, HB
Value & Sensitivities Details On Expiry Date	• Fair value and Delta/Gamma sensitivity calculations by profit conditions upon maturity.	EQ, HB
Values & Sensitivities Detail for Combination Options	• Fair value and Delta/Gamma sensitivity calculations by product composition options	EQ, HB

Performance Per Fixing Periods	● Details by fixed periods of underlying assets	EQ
Sensitivities	● Delta/Gamma sensitivity calculations	All
Sensitivities (Duration/Convexity)	● Duration/Convexity sensitivity calculations	IR, FI
Sensitivities Per Cap/Floors Let	● Cap/Floors sensitivity calculations	IR:Caps/Floors
Sensitivities Per Series	● Delta/Gamma sensitivity calculations by FX series	FX
Cash Flows	● Cash flow by interest rates	IR, FI, HB, CR
Cash Flows (Pay, Receive)	● Cash flow by Pay/Receive and by interest rates	IR, FI, HB, CR
Parameters	● Information on parameters and model applied to the computation	All

3.1.2.2 Scenario Pricing

1. Input conditions and run scenario pricing.

- Click the Scenario icon and open the Scenario Pricing pop-up window. The pricing is applied on the instrument that is currently open.
- Input the desired conditions and click OK.



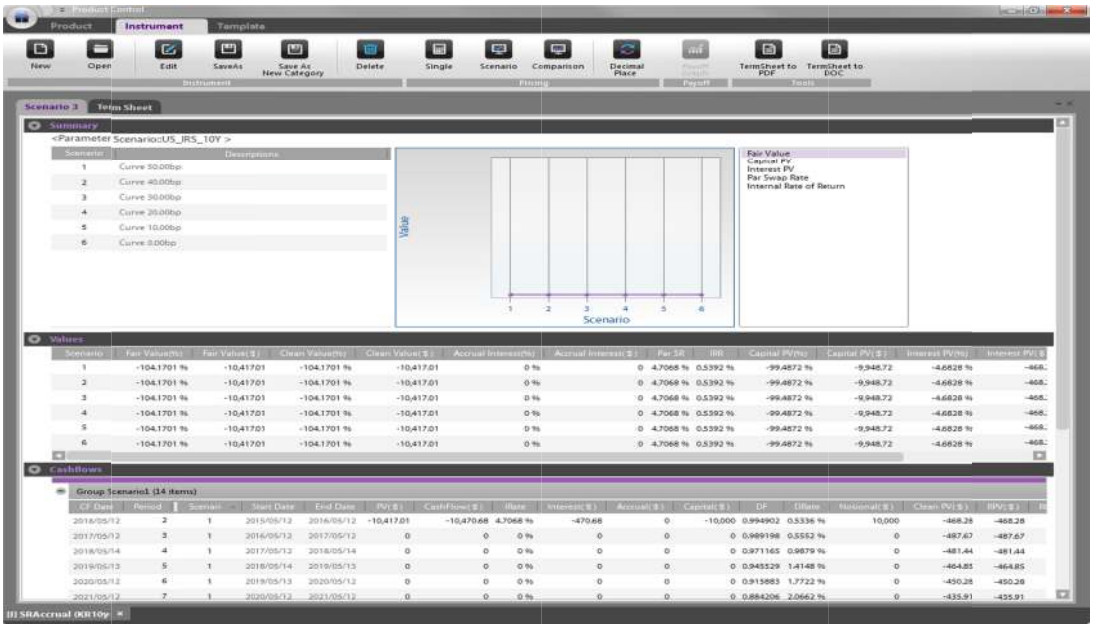
Model Greeks Parameter Set Calc. Date Market Ref.Date	• Same as the information provided in the Single Pricing section above.
Scenario	• Selection of market parameter scenario from those applicable according to product type. (Please see the table of scenarios below).
Risk Factor	• Factors for which to apply selected scenario. (May not be available depending on the selected scenario. Please see the table of scenarios below).
Base Value	• Selection of the scenario base price value: parameter value or manually inputted by the user.
Direction	• Selection of the scenario direction: UP, DOWN, UP/DOWN.
Count	• Number of computations by direction.
Interval Value	• Inputting of the interval value applied to the scenario.

※ The above Scenario Pricing input window shows a base value set to a parameter value of the S&P200 to compute the prices for scenarios in which the parameter value changes by + 1%, + 2%, + 3%, +4%, + 5%.

Scenario	Risk Factors	Related Product Category
Rate Curve Parallel Scenario	Rate Index (Underlying) Rate for Currency Pair Primary Currency Rate for Currency Pair Secondary Currency HW Calibration Rate Discount Rate	IR, FI, FX, CR, HB
Rate Curve Scenario		
Volatility Scenario	HW Volatility	IR, FI, FX, CR, HB
Volatility Curve Parallel Scenario		
Volatility Curve Scenario		
Yield Scenario	N/A	FI
Bond Price Scenario		
Stock Price Scenario	Underlying	EQ, FI, HB
Stock Volatility Scenario		
Rate Scenario	Risk Free Rate for Underlying Discount Rate	EQ, HB
FX Rate Scenario	Underlying (Currency Pair)	FX
FX Rate Volatility Scenario		
CDS Curve Parallel Scenario	Reference Asset	CR
CDS Curve Scenario		
Time Scenario	N/A	All

2. Confirm the scenario pricing results.

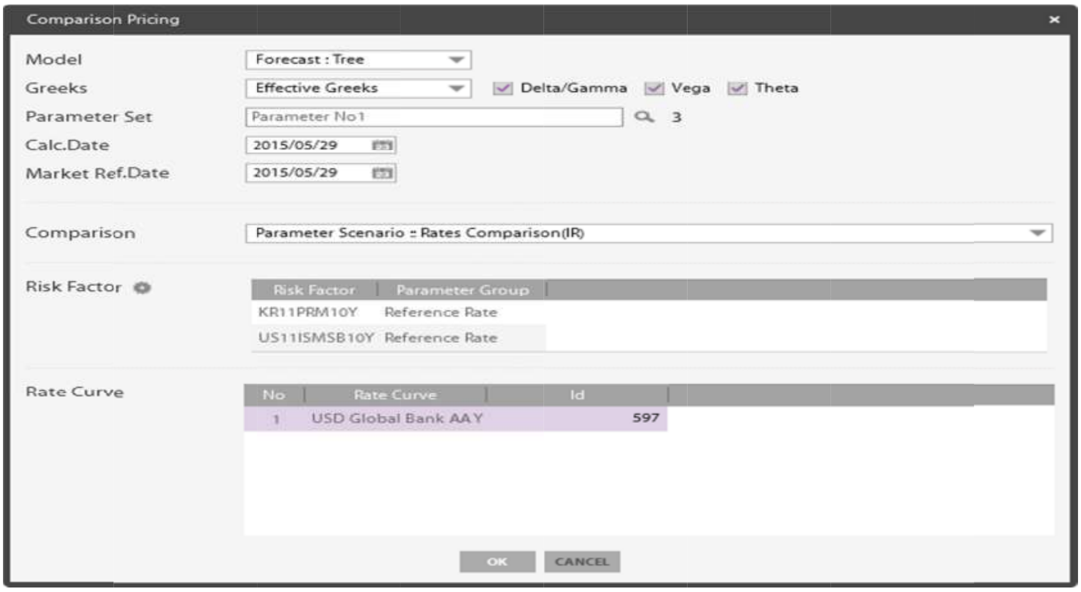
- The results of scenario pricing are displayed in the same format as single pricing, in multiple scenarios.



3.1.2.3 Comparison Pricing

1. Input conditions and run comparison pricing.

- Click the Comparison icon and open the Comparison Pricing pop-up window. The pricing is applied on the product that is currently open.
- Input the desired conditions and click OK.



<table>
<tr><td colspan="2">Model</td><td rowspan="5">• Same as the information provided in the Single Pricing section above.</td></tr>
<tr><td colspan="2">Greeks</td></tr>
<tr><td colspan="2">Parameter Set</td></tr>
<tr><td colspan="2">Calc. Date</td></tr>
<tr><td colspan="2">Market Ref.Date</td></tr>
<tr><td colspan="2">Comparison</td><td>• Selection of parameters for comparison from those applicable according to product type. (Please see the table of comparison scenarios below).</td></tr>
<tr><td colspan="2">Risk Factor</td><td>• Factors for which to apply selected scenario. (May not be available depending on the selected comparison. Please see the table of comparison types below).</td></tr>
<tr><td rowspan="4">Spot Price</td><td>Initial Value</td><td>• Selection of the comparison base price value: parameter value or manually inputted by the user.</td></tr>
<tr><td>Direction</td><td>• Selection of the scenario direction: UP, DOWN, UP/DOWN</td></tr>
<tr><td>Interval Value</td><td>• Inputting of the interval value applied to the comparison.</td></tr>
<tr><td>Count</td><td>• Number of computations by direction.</td></tr>
</table>

※ The above comparison pricing input window shows a base value set to a parameter value of the S&P200 to compute the price with respect to changes in the parameter value by + 1%, + 2%, + 3%, +4%, + 5%.

※ Unlike the Scenario Pricing input form, the Comparison Pricing input fields differ according to the selected comparison type.

Comparison	Risk Factors	Related Product Category
Rates Comparison (IR)	Rate Index (Underlying) Rate for Currency Pair Primary Currency Rate for Currency Pair Secondary Currency Discount Rate	IR, FI, FX CR, HB
Rates Comparison (FI)	N/A	FI, HB
Rates Comparison	Risk Free Rate for Underlying (Rate for Currency Pair Primary Currency Rate for Currency Pair Secondary Currency) Discount Rate	EQ, HB, FX
Spot Prices Comparison	Underlying	EQ, FI, HB, FX
Spot Ladder Analysis	N/A	EQ
Volatilities Comparison	Underlying	EQ, FI, HB, FX
CDS Comparison	Reference Asset	CR
Models Comparison	N/A	All
Dates Comparison		
Time Scenario		

2. Confirm the comparison pricing results.

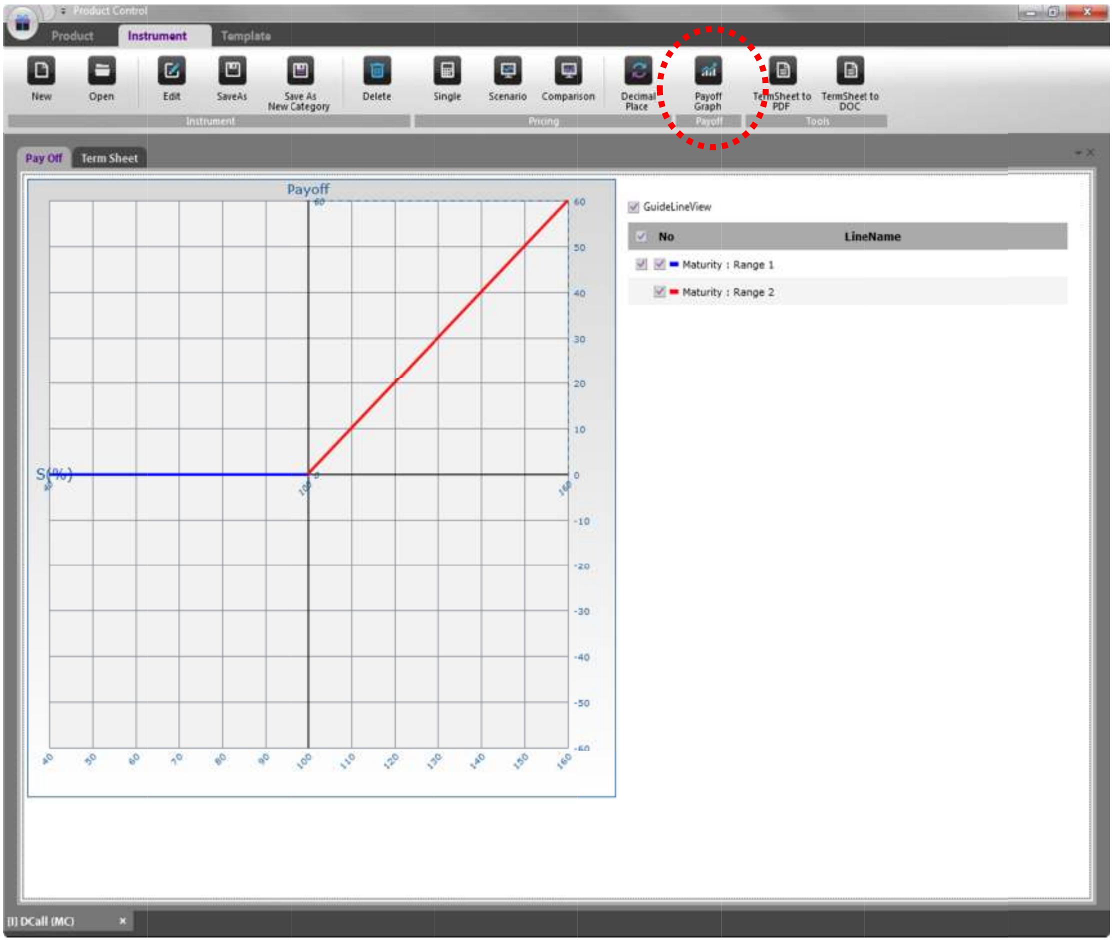
- The results of comparison pricing are shown in the same format as scenario pricing.

3.1.3 Payoff Graph

- The Payoff Graph icon is used to generate a chart view of the payoff structure to maturity.

3.1.3.1 Payoff Graph

1. Click the Payoff Graph icon. The resulting chart is displayed in the workspace.
2. A payoff graph is not generated for all products. (Products without a payoff structure like that of coupon payments to maturity are excluded.)
3. The Payoff Graph icon is enabled when a product has been opened.

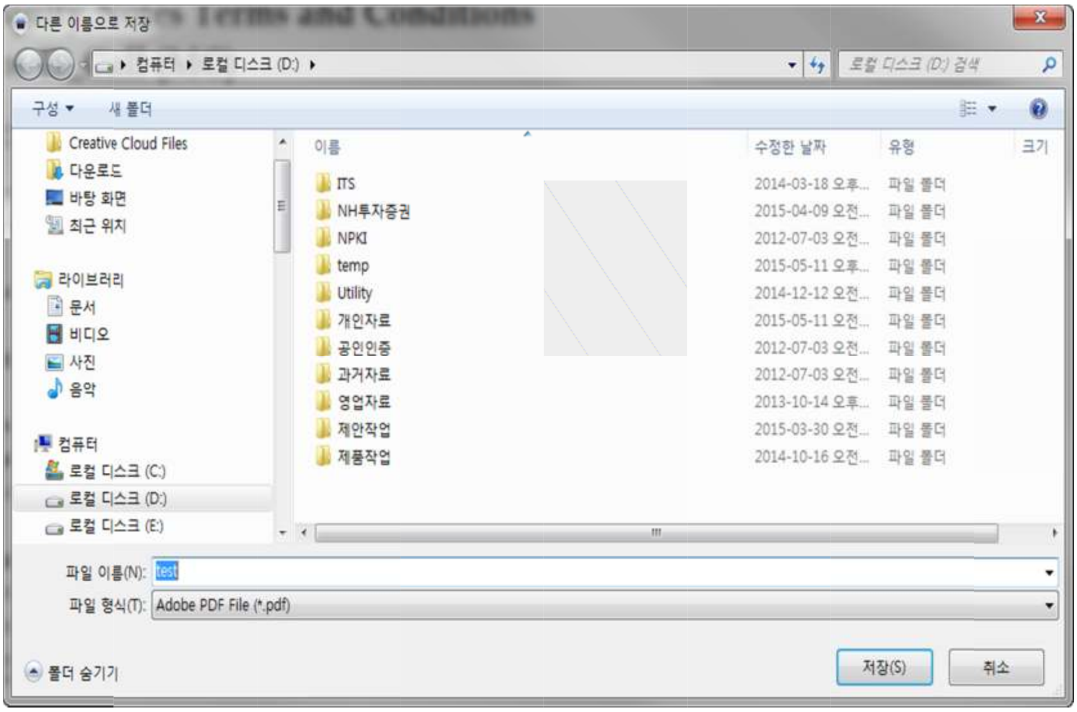


3.1.4 Tools

- The Tools menu allows the user to extract and save the product term sheets.

3.1.4.1 Term Sheet to PDF

1. Select the desired location and input file name.
   - Click the Term Sheet to PDF icon to open the Save As window.
   - Select the desired location and input the file name. Click Save.
   - The Term Sheet to PDF icon is enabled when a product has been opened.



2. The PDF opens automatically once the term sheet has been saved.

3.1.4.2 Term Sheet to DOC

1. Select the desired location and input file name.
   - Click the Term Sheet to DOC icon to open the Save As window.
   - Select the desired location and input the file name. Click Save.
2. The MS Word document opens automatically once the term sheet has been saved.

3.2 Product

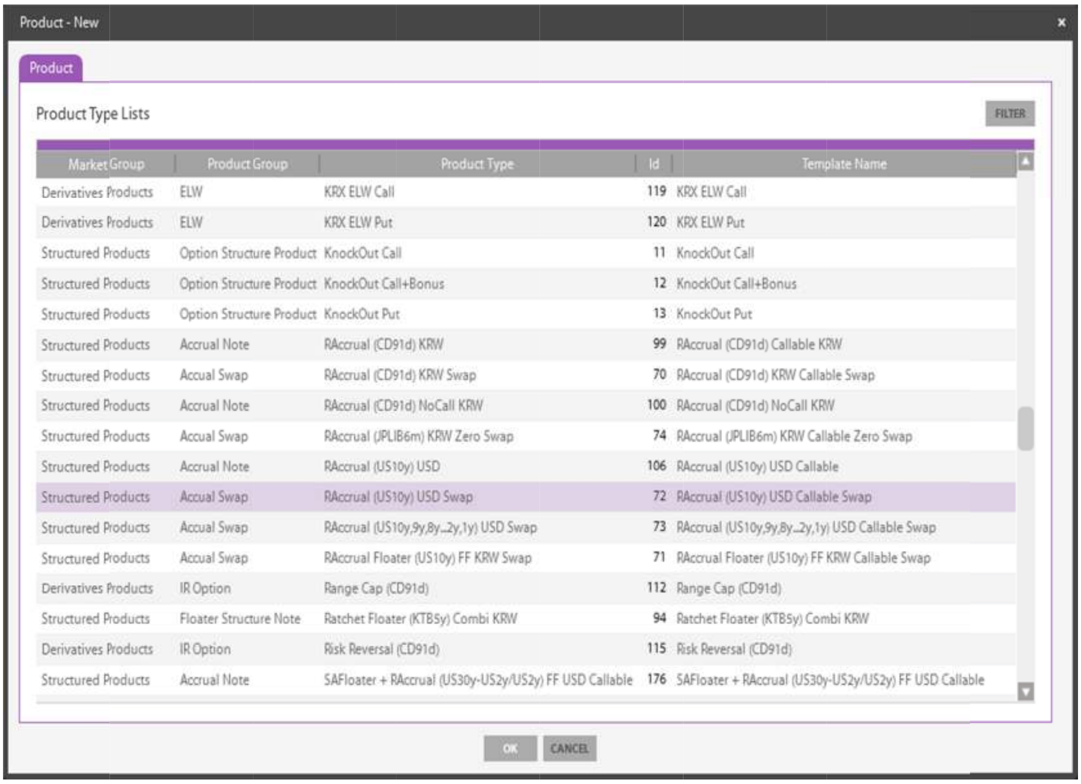
- The Product Tab icons allow the user to register, edit, and delete product information as well as compute fair value and pre/pro-trade risk analyses.

3.2.1 Product

3.2.1.1 New

1. Select product type.

   - Click the New icon to open the Product-New pop-up window.
   - From the list of product types, select and click OK or double-click the desired type to open the product details input window.



Product - New

Product

Product Type Lists

FILTER

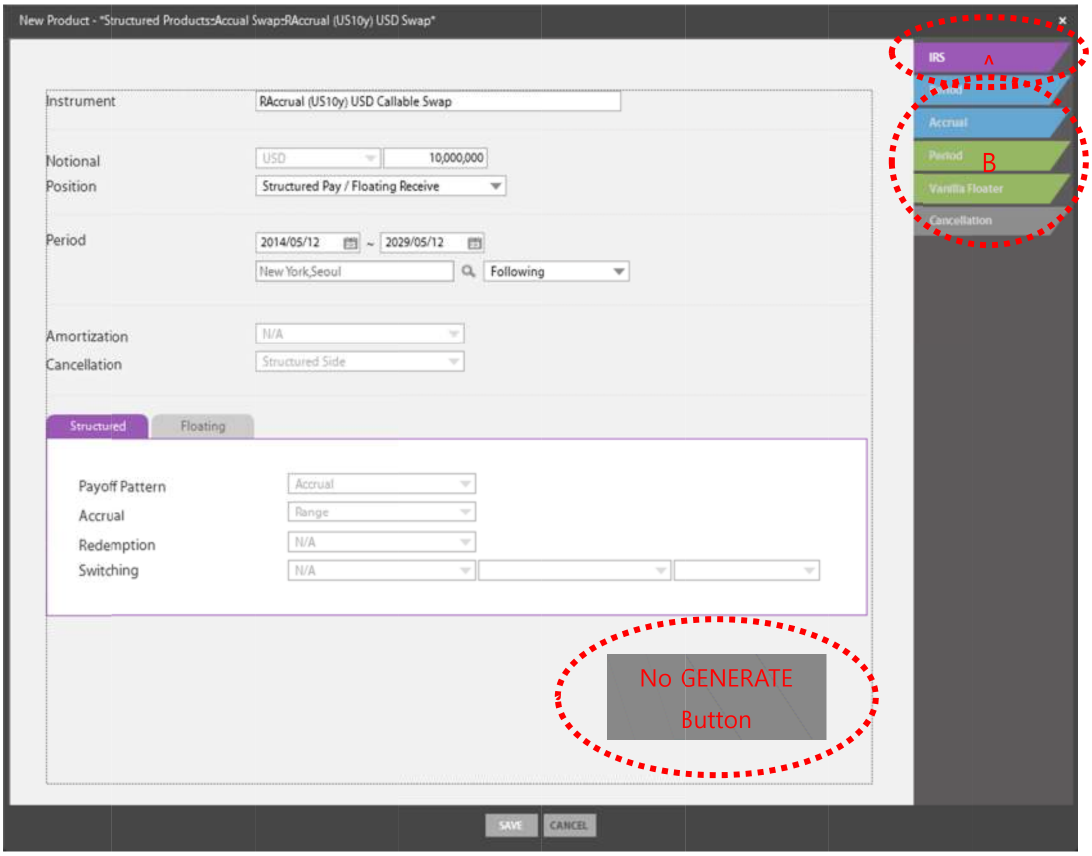
Market Group	Product Group	Product Type	Id	Template Name
Derivatives Products	ELW	KRX ELW Call	119	KRX ELW Call
Derivatives Products	ELW	KRX ELW Put	120	KRX ELW Put
Structured Products	Option Structure Product	KnockOut Call	11	KnockOut Call
Structured Products	Option Structure Product	KnockOut Call+Bonus	12	KnockOut Call+Bonus
Structured Products	Option Structure Product	KnockOut Put	13	KnockOut Put
Structured Products	Accrual Note	RAccrual (CD91d) KRW	99	RAccrual (CD91d) Callable KRW
Structured Products	Accual Swap	RAccrual (CD91d) KRW Swap	70	RAccrual (CD91d) KRW Callable Swap
Structured Products	Accrual Note	RAccrual (CD91d) NoCall KRW	100	RAccrual (CD91d) NoCall KRW
Structured Products	Accual Swap	RAccrual (JPLIB6m) KRW Zero Swap	74	RAccrual (JPLIB6m) KRW Callable Zero Swap
Structured Products	Accrual Note	RAccrual (US10y) USD	106	RAccrual (US10y) USD Callable
Structured Products	Accual Swap	RAccrual (US10y) USD Swap	72	RAccrual (US10y) USD Callable Swap
Structured Products	Accual Swap	RAccrual (US10y,9y,8y..2y,1y) USD Swap	73	RAccrual (US10y,9y,8y..2y,1y) USD Callable Swap
Structured Products	Accual Swap	RAccrual Floater (US10y) FF KRW Swap	71	RAccrual Floater (US10y) FF KRW Callable Swap
Derivatives Products	IR Option	Range Cap (CD91d)	112	Range Cap (CD91d)
Structured Products	Floater Structure Note	Ratchet Floater (KTB5y) Combi KRW	94	Ratchet Floater (KTB5y) Combi KRW
Derivatives Products	IR Option	Risk Reversal (CD91d)	115	Risk Reversal (CD91d)
Structured Products	Accrual Note	SAFloater + RAccrual (US30y-US2y/US2y) FF USD Callable	176	SAFloater + RAccrual (US30y-US2y/US2y) FF USD Callable

OK CANCEL

   - In the case that the desired product type is not listed, the user must create a new product template and register the product type in order to proceed. (See section 3-3 Template.)

2. Input product details.

- Input instructions are the same as those in section 3.1.1.2 Instrument New. However, fields for determining the product structure are fixed and the GENERATE button does not exist, as all additional tabs (Tab B) are ready.



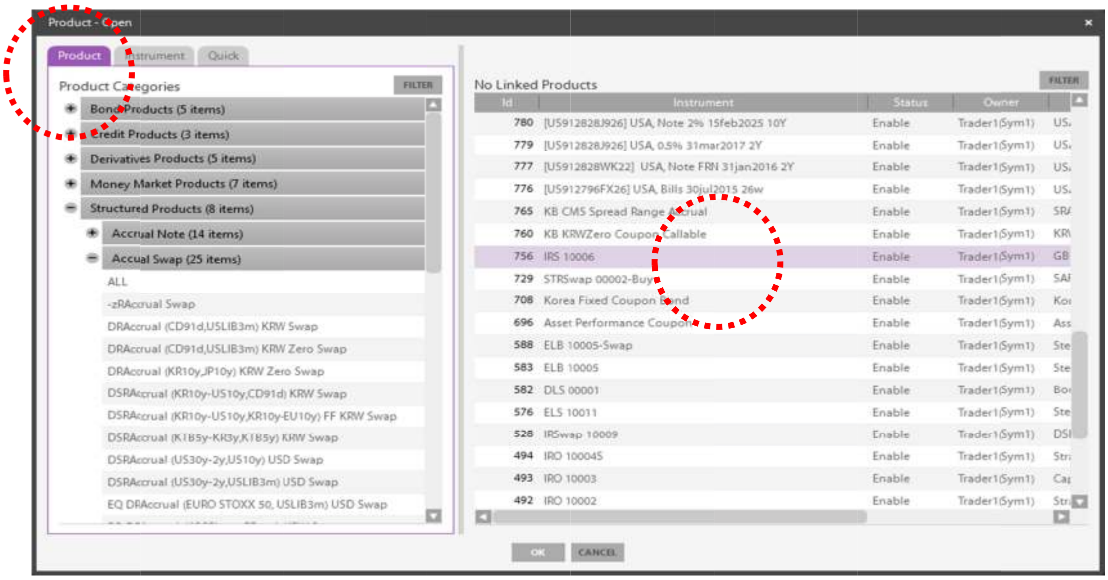
3. Confirm the product details.

3.2.1.2 Open

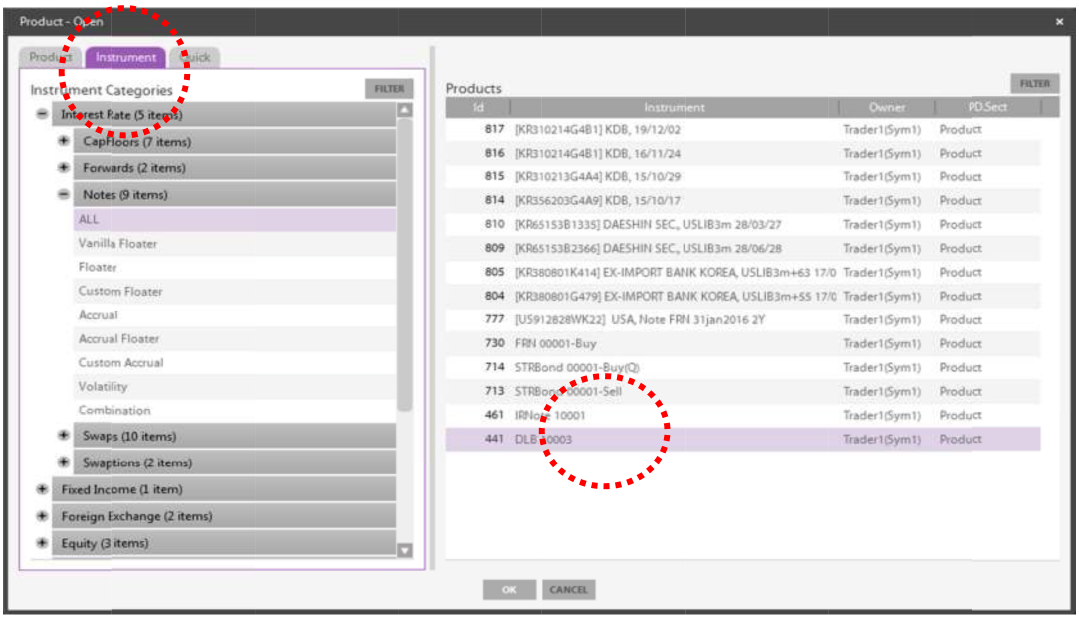
1. To view a pre-registered product:

   - Click the Open icon to open the Product-Open Pop-up window.
   - There are three methods to open a product: 1) by selecting the product from Product Categories, 2) by selecting from Instrument Categories and 3) by running a Quick search.

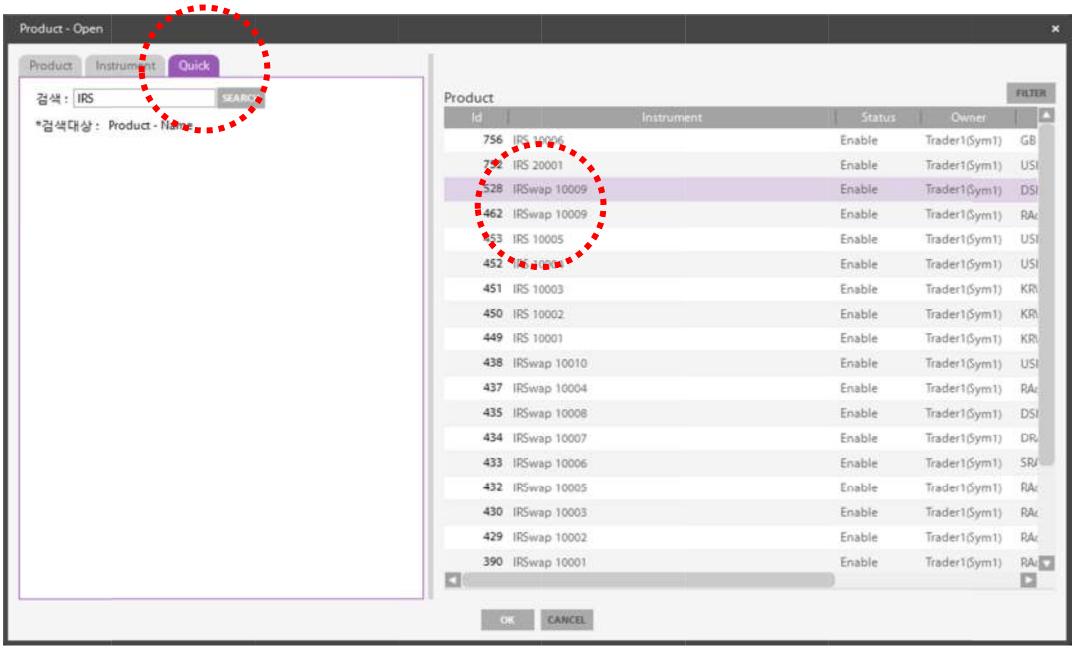
     1) From the Product tab, select through the applicable product categories and double-click the desired product from the list on the right.



     2) For the list of instrument categories, first select the Instrument tab. Select through the applicable instrument categories and double-click the desired product from the list on the right.



3) From the Quick tab, enter a keyword included in the product name and click SEARCH. Double-click on the desired product from the search results that appear on the right.

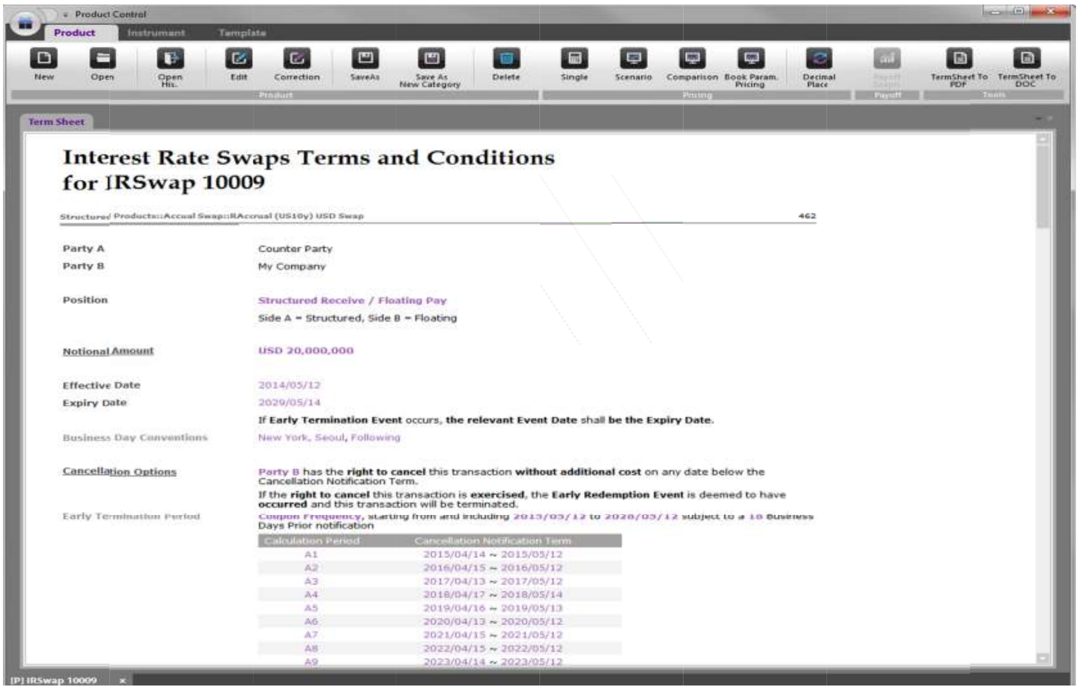


2. The term sheet of the selected product appears.

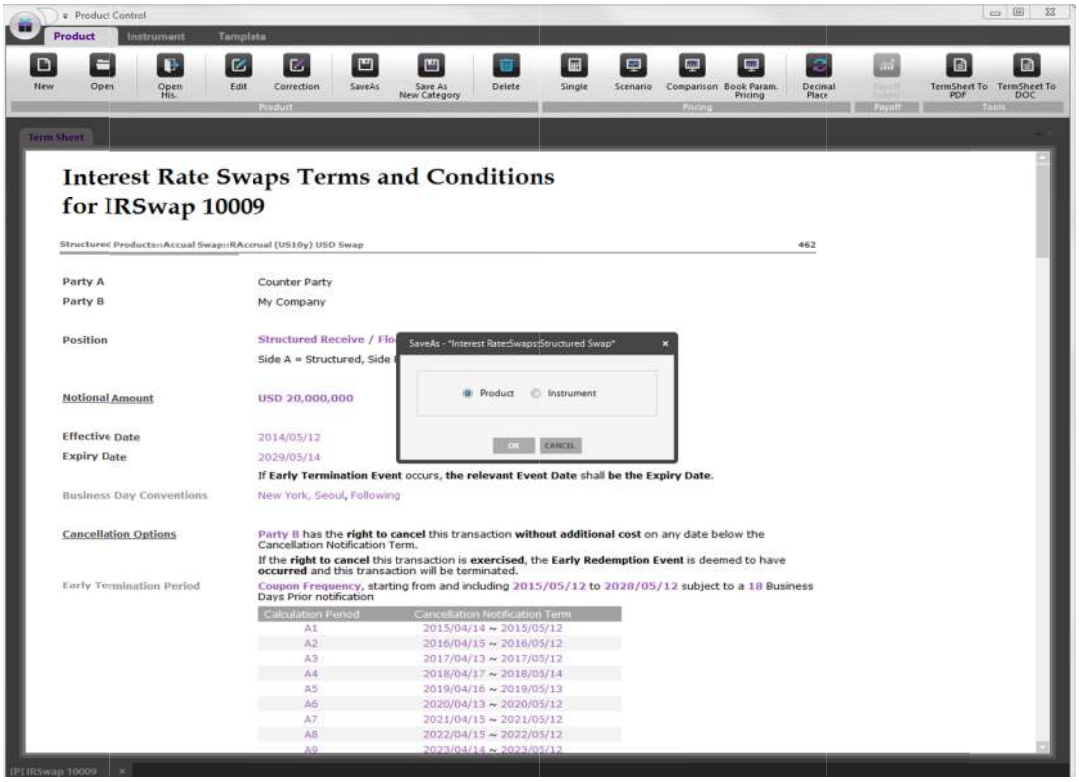
3.2.1.3 Save As (New Product or Instrument)

1. Input the details of the product to be newly saved.

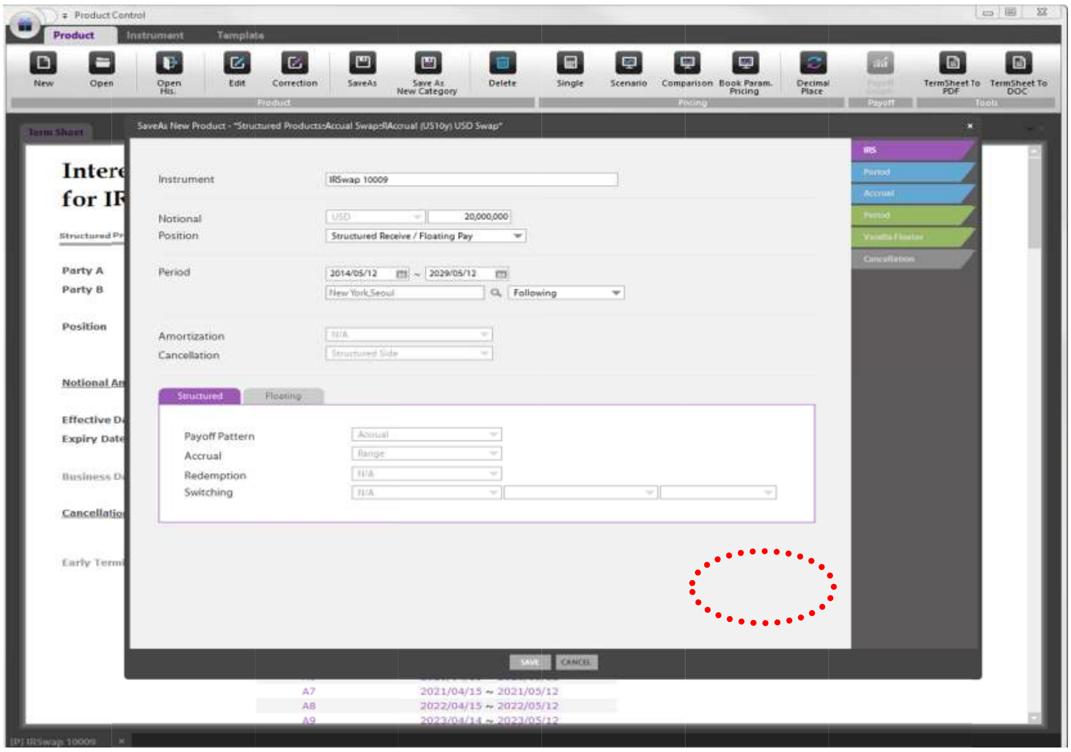
- The Save As icon is enabled for the product that is opened in the workspace.



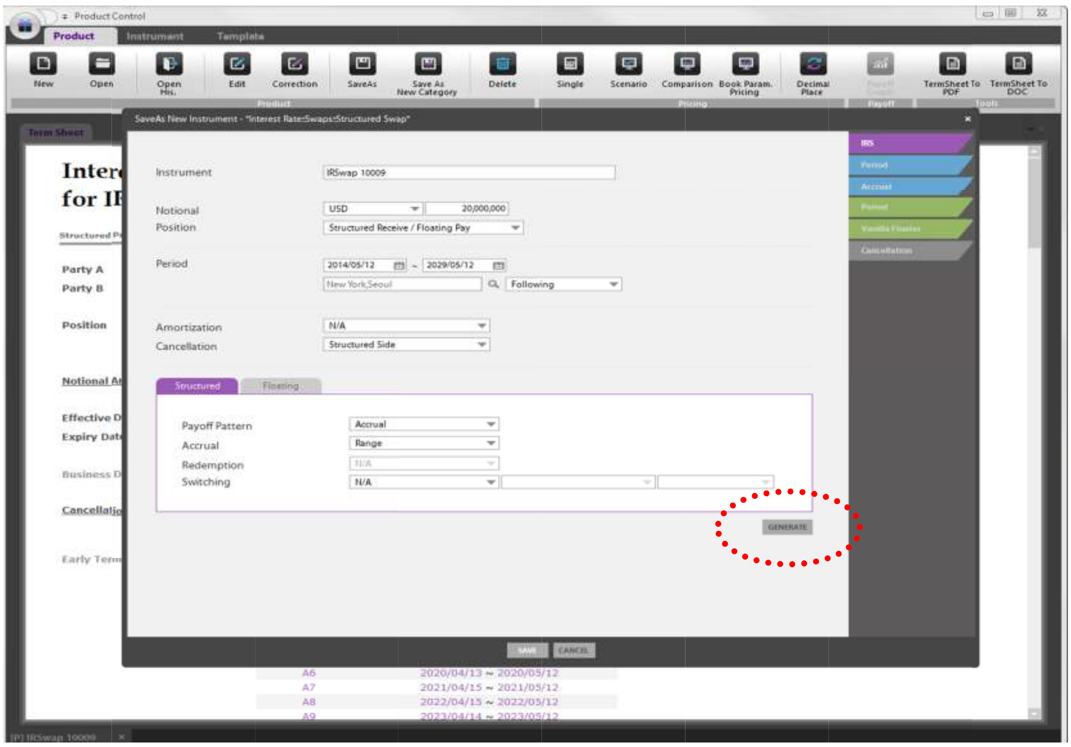
- Click the Save As icon and open the Save As New pop-up window. Confirm to save as a product or instrument.



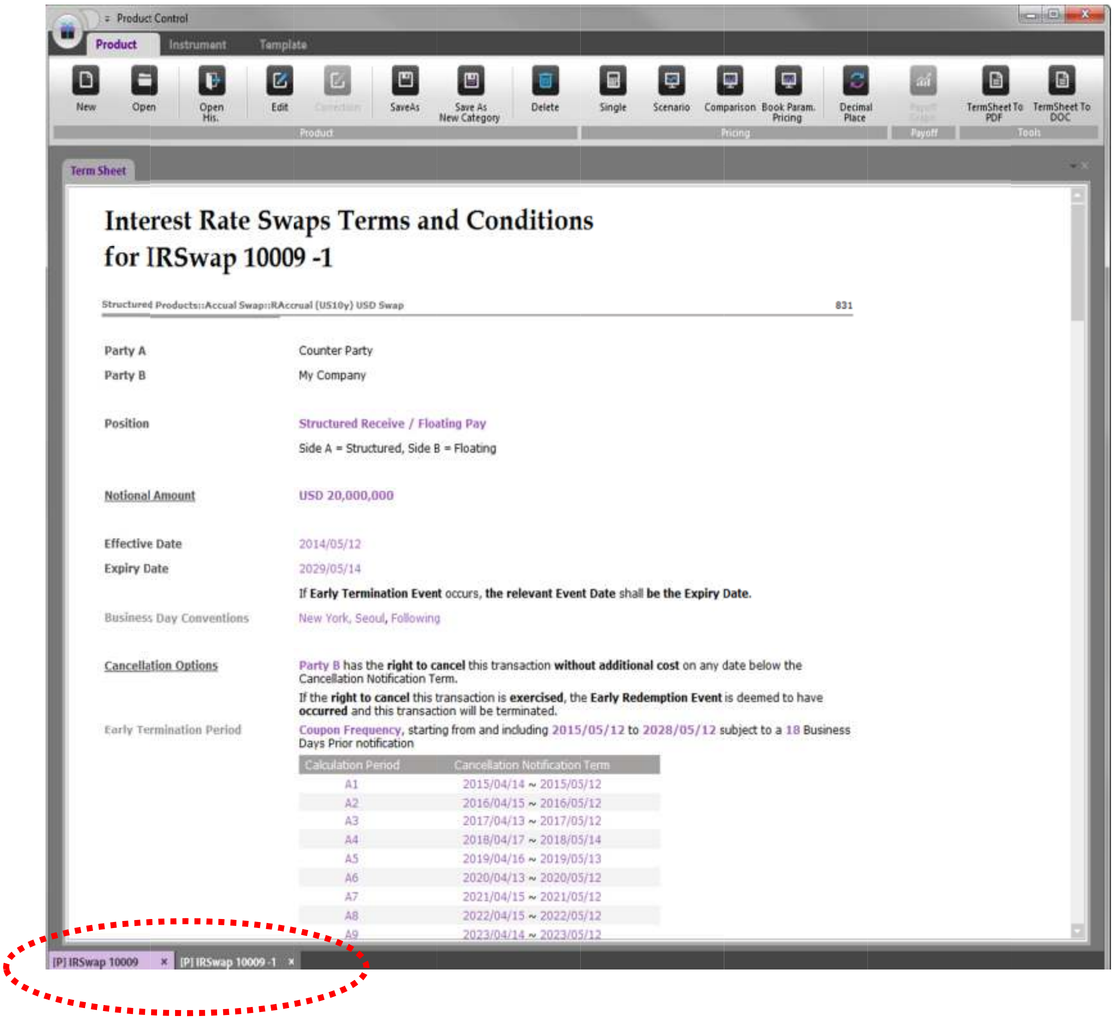
* When saving as a product, in the same form as registering a new product, make desired inputs or revisions and click SAVE.



* When saving as an instrument, in the same form as registering a new instrument, make desired inputs or revisions and click SAVE.



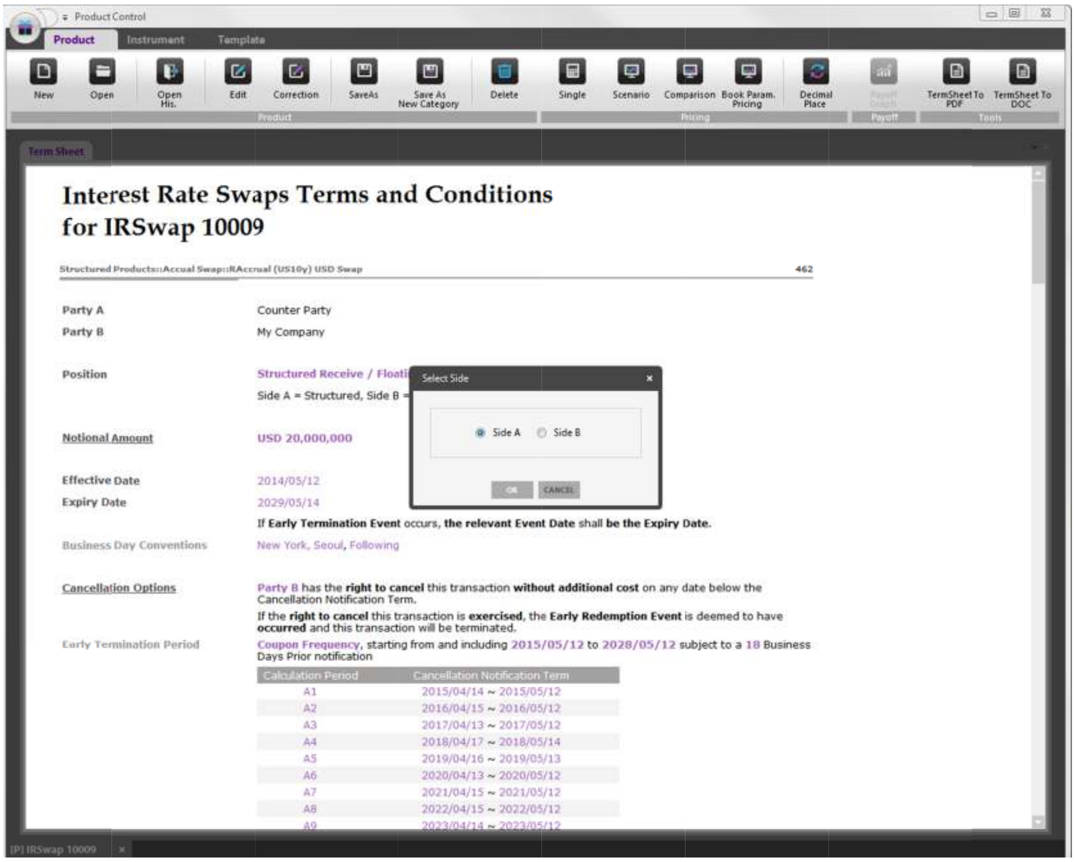
- The newly saved product/instrument term sheet appears on a new tab as shown below.



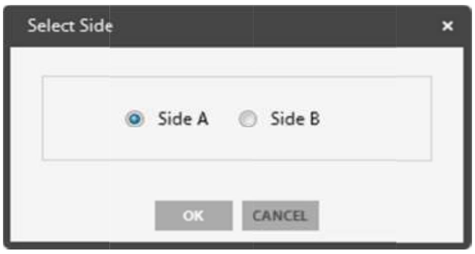
3.2.1.4 Save As New Category

1. Set a new category for a product.

- The Save As New Category icon is enabled for the product that is opened in the workspace.
- Click the Save As New Category icon and open the Save As New Category pop-up window.



- To save as a different product type, the user may change a Swap to a Note.
- Select from Side A or Side B to be applied to the Note.



2. Input the details of the product to be newly saved.

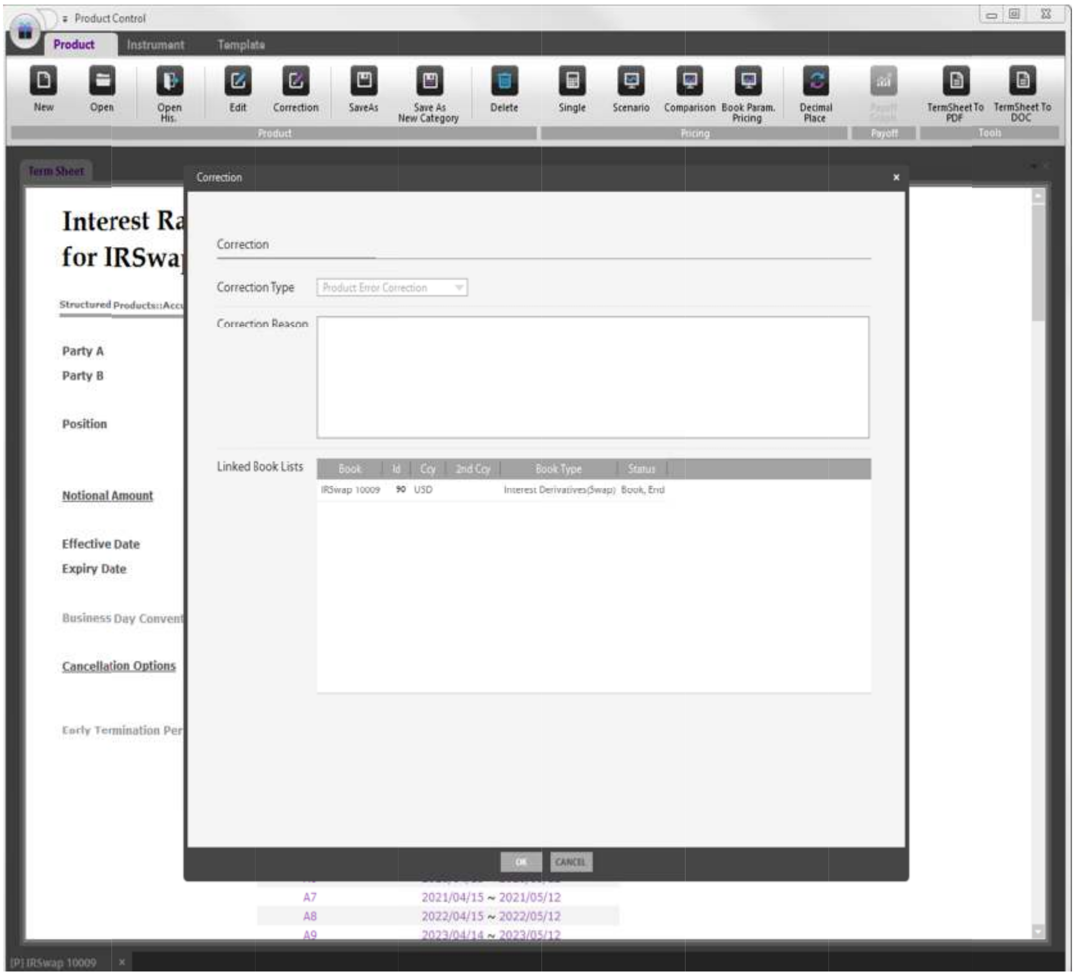
- Once the new category is selected, the pop-up window for inputting product details is opened.
- Revise inputs and click SAVE.

3. Confirm new save.

    - The newly saved product term sheet appears on a new tab.

3.2.1.5 Correction

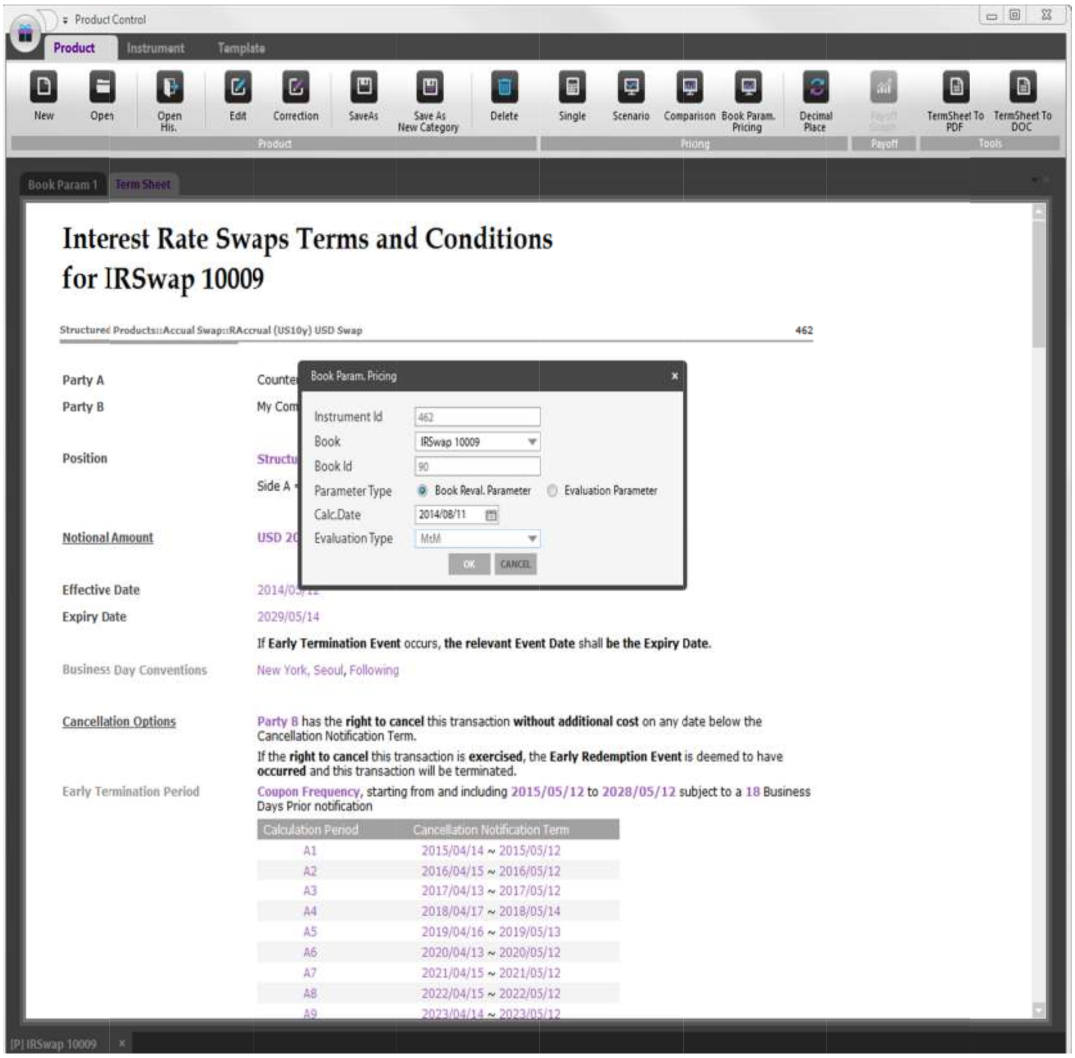
1. The Edit function is applied before the trade and Correction is applied after trade.
2. Changes are made to pre-registered products by the Edit or Correction functions.
3. Apply the Correction function.
   - The Correction icon is enabled for the product that is opened in the workspace.
   - Click the Correction icon to open the Correction pop-up window.



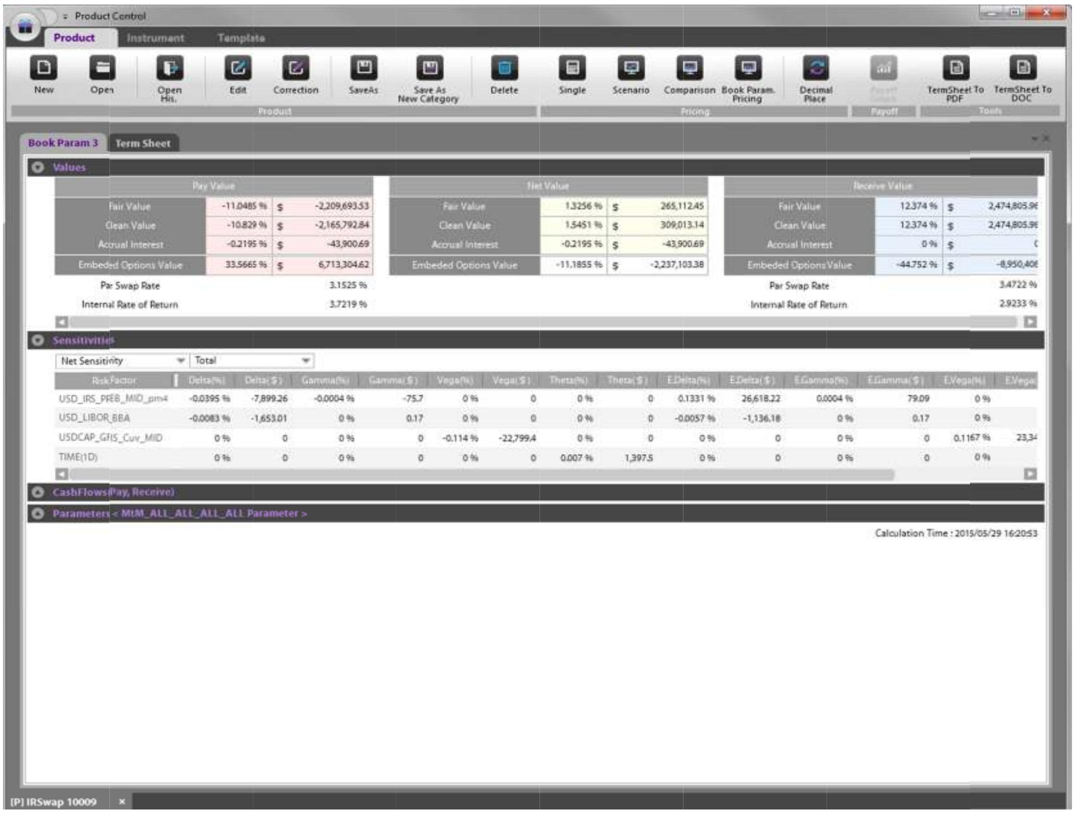
   - Confirm the product details to correct and enter the reason for making the correction. Click OK to open the Edit pop-up window.
   - Enter or revise the desired inputs. Click SAVE upon completion and the term sheet of the revised product appears.

3.2.1.6 Book Param. Pricing

1. The Book Parameter Pricing is the re-pricing of a product that has been traded, using a previously applied parameter.
2. The Book Param. Pricing icon is enabled for the product that is opened in the workspace.
   - Click the Book Param. Icon to open the Book Param. Pricing pop-up window.



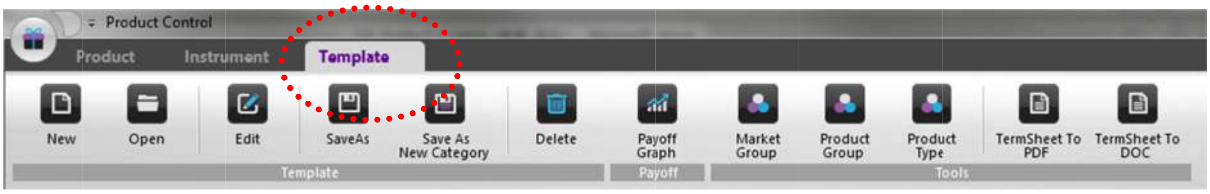
- For the Parameter Type, the Book Reval. Parameter option applies the parameters that were applied to the book on the Calculation Date for pricing. The Evaluation Parameter option applies the evaluation parameter of the Calculation Date for pricing.
- Select a past date for the Calculation Date.
- For the Evaluation Type, select MtM (Mark to Market) or Front evaluation parameters.
- Complete all inputs and click OK to view pricing results as shown below.


Product Control
Product
Instrument
Template
New
Open
Open His.
Edit
Correction
SaveAs
Save As New Category
Delete
Single
Scenario
Comparison
Book Param. Pricing
Decimal Place
TermSheet To PDF
TermSheet To DOC
Product
Pricing
Payoff
Tools
Book Param 3
Term Sheet
Values
Pay Value
Net Value
Receive Value
Fair Value
Clean Value
Accrual Interest
Embeded Options Value
Par Swap Rate
Internal Rate of Return
Sensitivities
Net Sensitivity
Total
Risk Factor
USD_IRS_PREB_MID_pm4
USD_LIBOR_BBA
USDCAP_GFIS_Cuv_MID
TIME(1D)
CashFlows(Pay, Receive)
Parameters < MtM_ALL_ALL_ALL_ALL Parameter >
Calculation Time : 2015/05/29 16:20:53
[P] IRSwap 10009

3.3 Template

- The Template Tab icons allow the user to create new, edit or delete product registration Templates.
- Register a Template to a specific Product Category (Product Type).
- Register, edit or delete a Market Group/Product Group within the Product Categories.

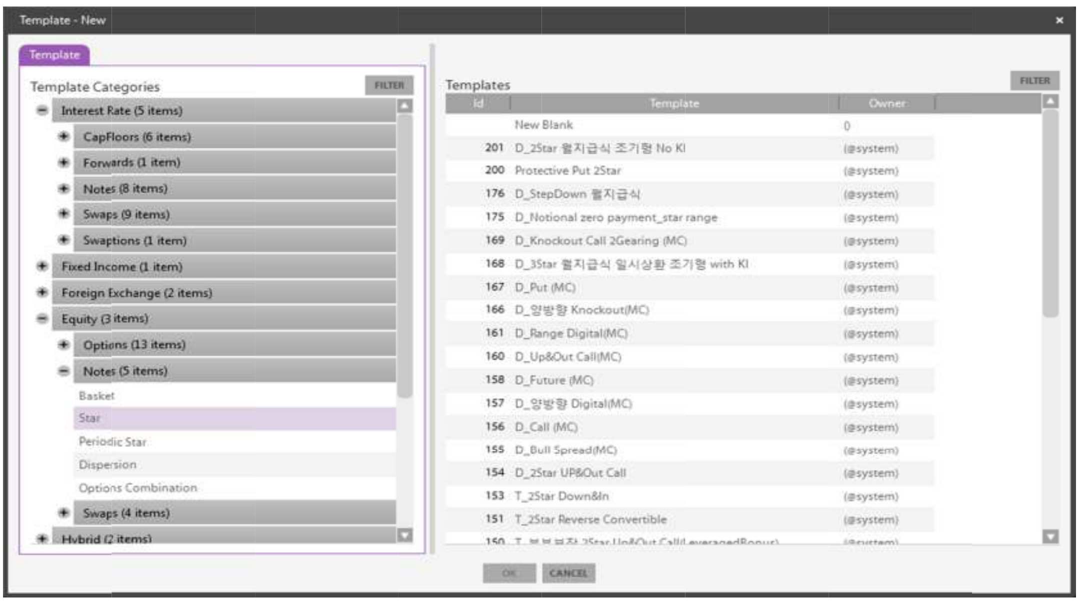
3.3.1 Template



3.3.1.1 New

1. Select product type.

- Click the New icon to open the Template – New pop-up window.
- From the list of Template Categories on the left, select the desired Asset Group, Instrument Group and Payoff Pattern. (Template Categories are identical to the Instrument Categories).



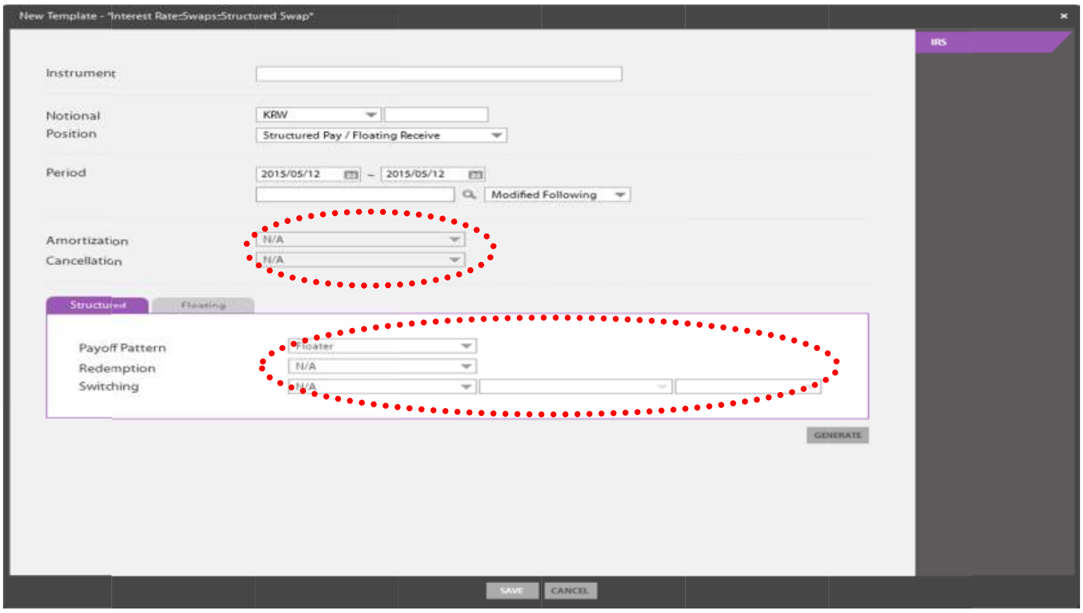
- Once the list of templates appears on the right, there are two methods to register a new template: 1) through New Blank or 2) by an existing template.

2. Input product details.

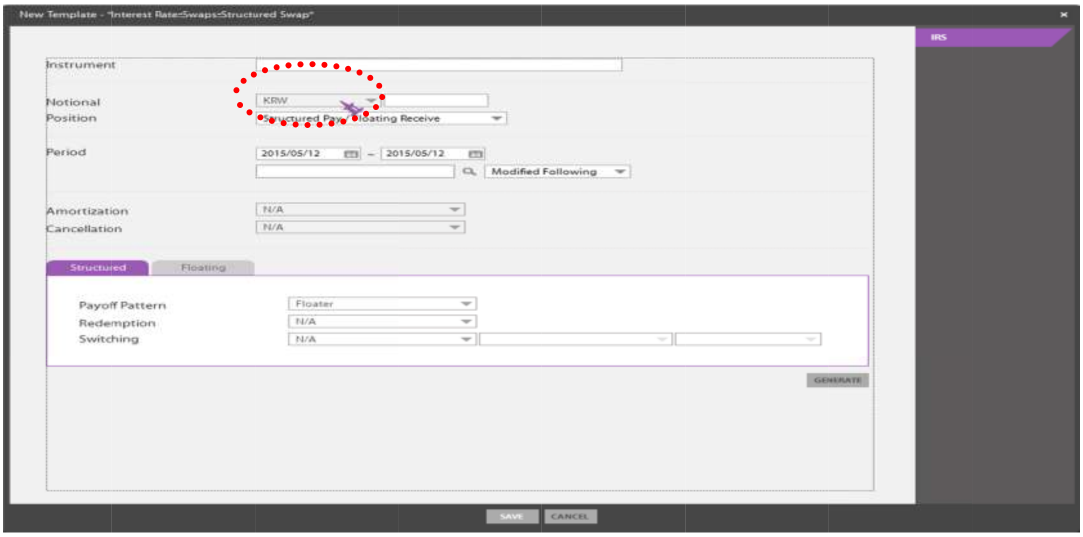
- In the new form (shown below as Tab A), enter the product details. (Same steps as the 3.1.1.1 New Instrument section).

3. Fix product detail inputs to the desired Product Type.

- As shown below, the fixed inputs are in gray and cannot be adjusted.



- To fix an input field, press the Ctrl key and the pointer will turn into a pin. Holding down the Ctrl key, click the desired field(s) to fix. The fixed inputs will turn gray. To cancel fixing, re-click the input with the pin pointer.



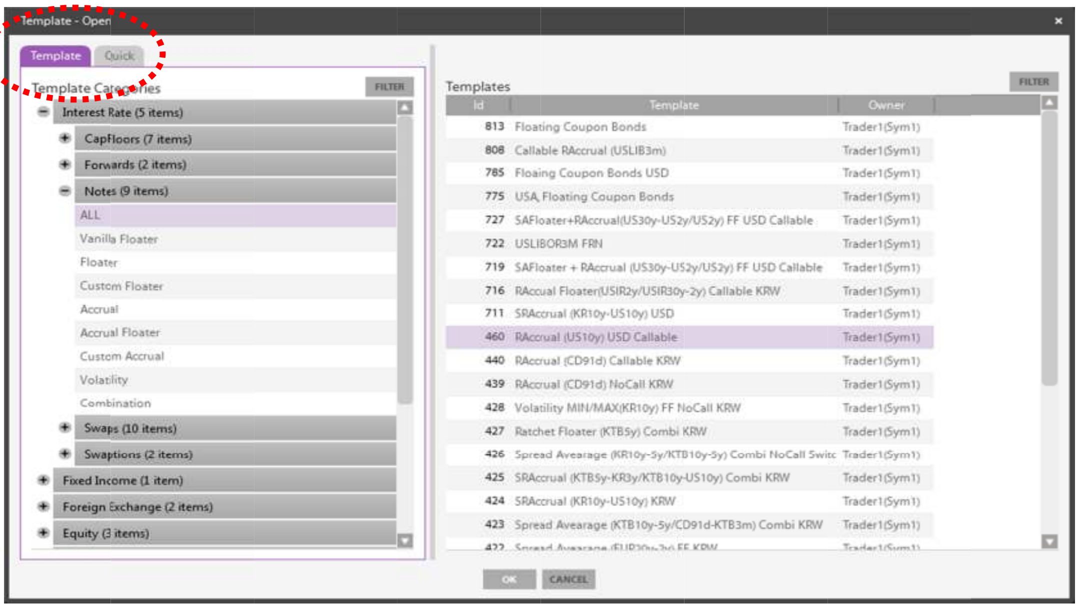
- The user may fix any field that is not already fixed by the system.
- Click SAVE to view the term sheet.

3.3.1.2 <u>Open</u>

1. Find the desired template to open.

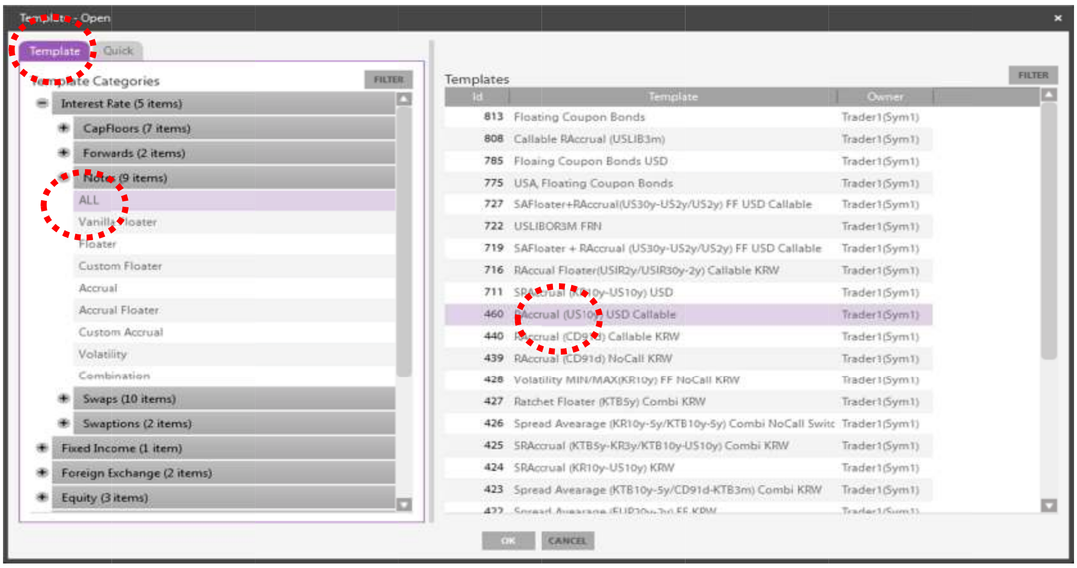
   - Click the New icon to open the Template – Open pop-up window.

   - There are two methods to open a template: by selecting the template from its category list or by running a Quick search.

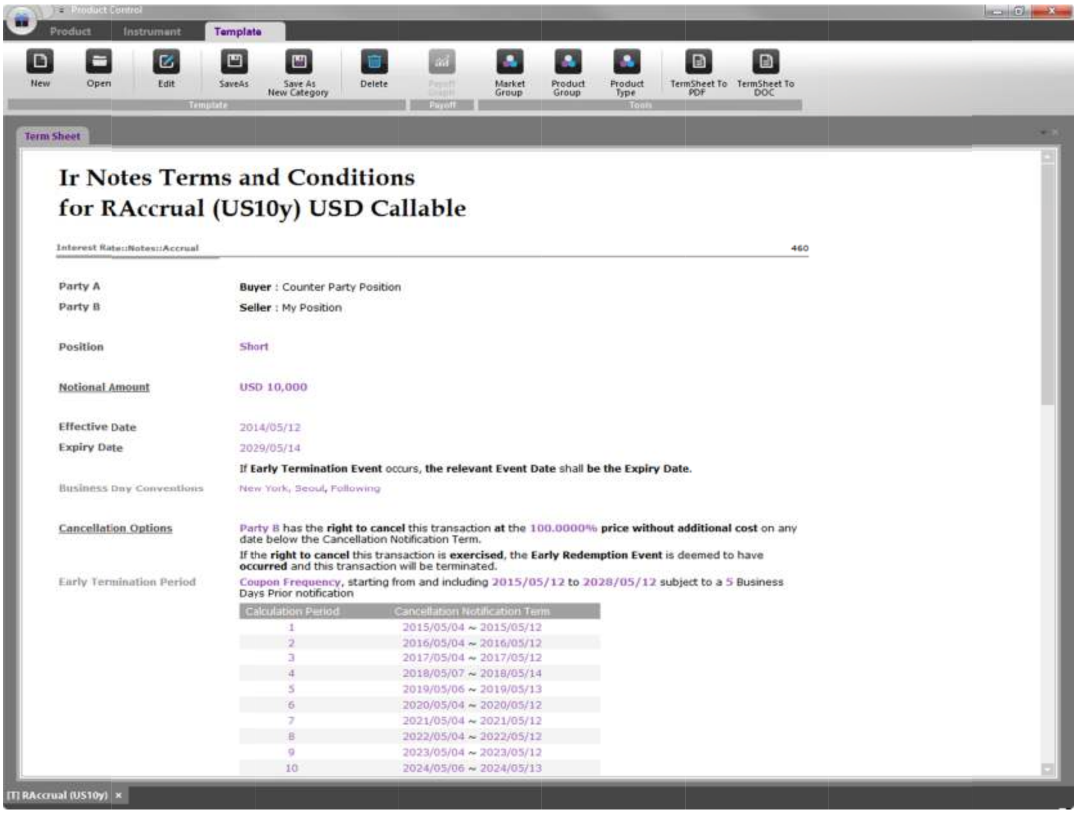


2. Open the term sheet of the desired template.

   - Select the desired template by either of the two methods mentioned above.



● Select the desired template (double-click or click OK) to view the term sheet.

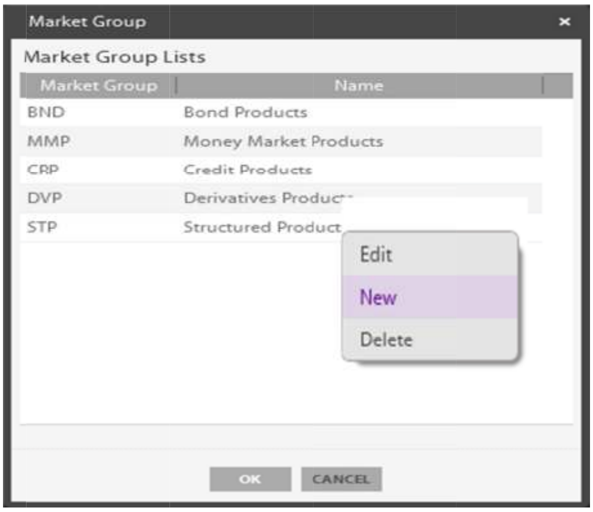


3.3.2 Tools (Product Categories Management)

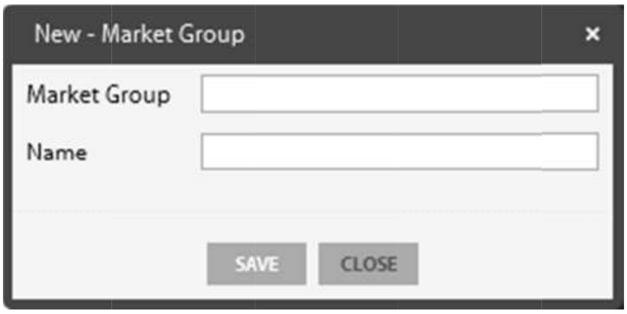
- The Tools Menu allows the user to register, edit or delete Product Categories.
- Product Categories are composed of three tiers: Market Group, Product Group, and Product Type.

3.3.3.1 Market Group

1. Click the Market Group icon to open the Market Group pop-up window.
2. Right-click on the list for Edit, New, and Delete options.



3. New Market Group
   - Right-click and select New to open the New- Market Group pop-up window.
   - Enter the Market Group Code (3 characters) and name and click SAVE.



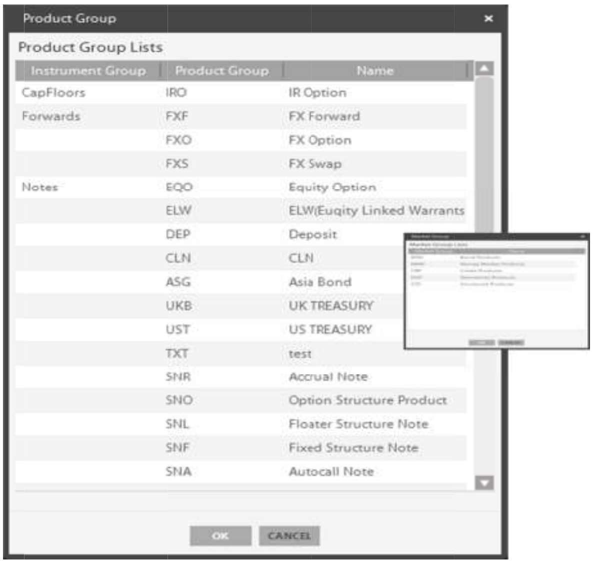
   - The Market Group window is updated to display the newly saved Market Group.
4. Edit Market Group
   - Right-click and select Edit to open the Market Group – Edit pop-up window.
   - The Market Group Code cannot be edited. Enter the Market Group name and click SAVE.
   - The Market Group window is updated to display the updated Market Group.

5. Delete Market Group

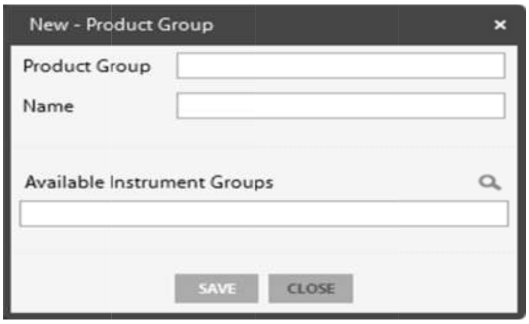
- Select the Market Group to delete. Right-click and select Delete.
- Deleting a Market Group is possible only when there are no Product Groups or Product Types registered in the group.
- The Market Group window is updated the deleted Market Group is not displayed.

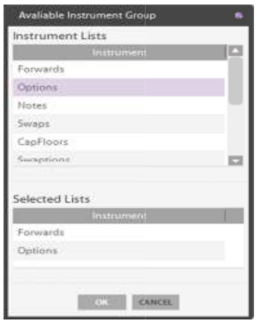
3.3.3.2 Product Group

1. Click the Product Group icon to open the Product Group pop-up window.
2. Right-click on the list for Edit, New, and Delete options.



3. New Product Group
   - Right-click and select New to open the New - Product Group pop-up window.
   - Enter the Product Group Code (3 characters), name, and select Available Instrument Groups.
   - The selected Available Instruments Groups will be used to determine the trade type upon entering the trade. Click SAVE.

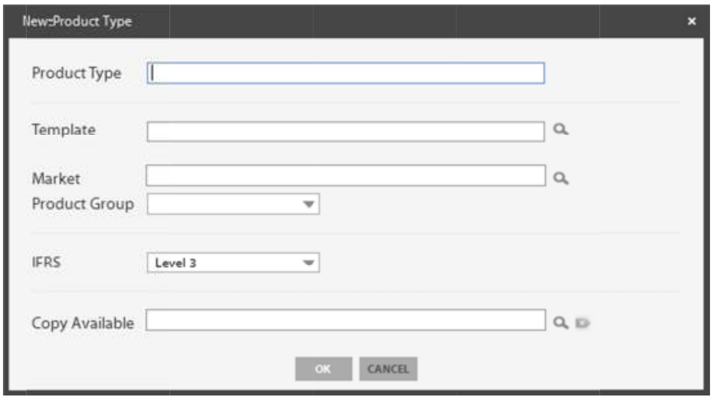




4. Edit Product Group
   - Steps are identical to the Edit Market Group instructions above.
5. Delete Product Group
   - Steps are identical to the Delete Market Group instructions above.

3.3.3.3 Product Type Registration

1. Click the Product Type icon to open the New – Product Type pop-up window.



2. A Product Type is registered by adding the name of the product type to a registered template.
3. Click the magnifying glass at each field to select the template to be registered, as well as the Market Group and Product Group to which the new Product Type will belong.
4. Enter the IFRS Level (1, 2, 3) to be used as the base price when processing trades.
5. In the Copy Available field, select the Product Types to be connected to when applying the Save As New Categories function to a product.

Chapter 4. Market Data Information & Configuration Setting

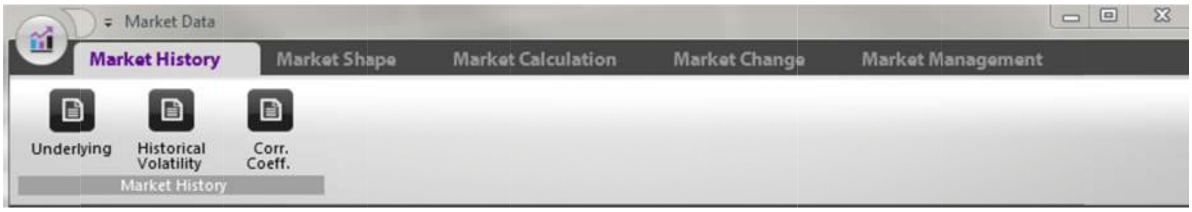
4.1 Market Information

- The Market Information menu provides market data including the base asset price, credit, FX, etc. as well as historical volatility and time-series analysis of correlation coefficients, etc.

Link	Market Data Analysis	Function
Market History	• Underlying • Historical Volatility • Correlation Coefficient	View historical market data
Market Shape	• Rate Curve • Volatility Curve • GARCH Volatility • Dividend Table • Custody Cost Table • Credit Curve	Market data analysis
Market Calculation	• Historical Volatility • GARCH Volatility • Correlation Coefficient • Interpolation Rate • Mean Reversion • Default Rate	Volatility and other computations
Market Change	• Underlying Instrument • Rate Curve • Cap Volatility • Swaption Volatility • Volatility Surface • CDS Curve	Net change comparison analysis

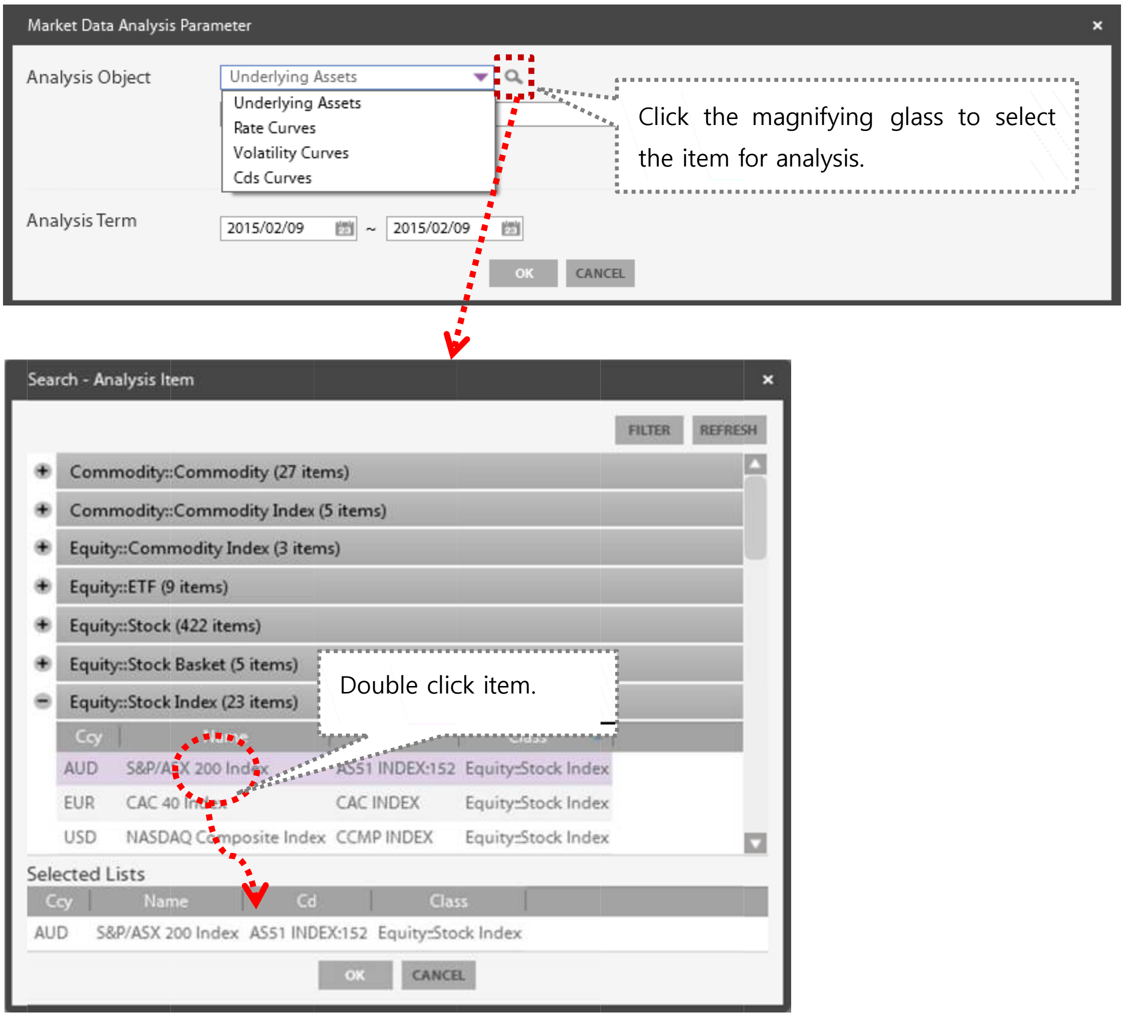
4.1.1 Market History

- Select [SSQ Task Panel] ▶ [Market Information] ▶ [Market History]

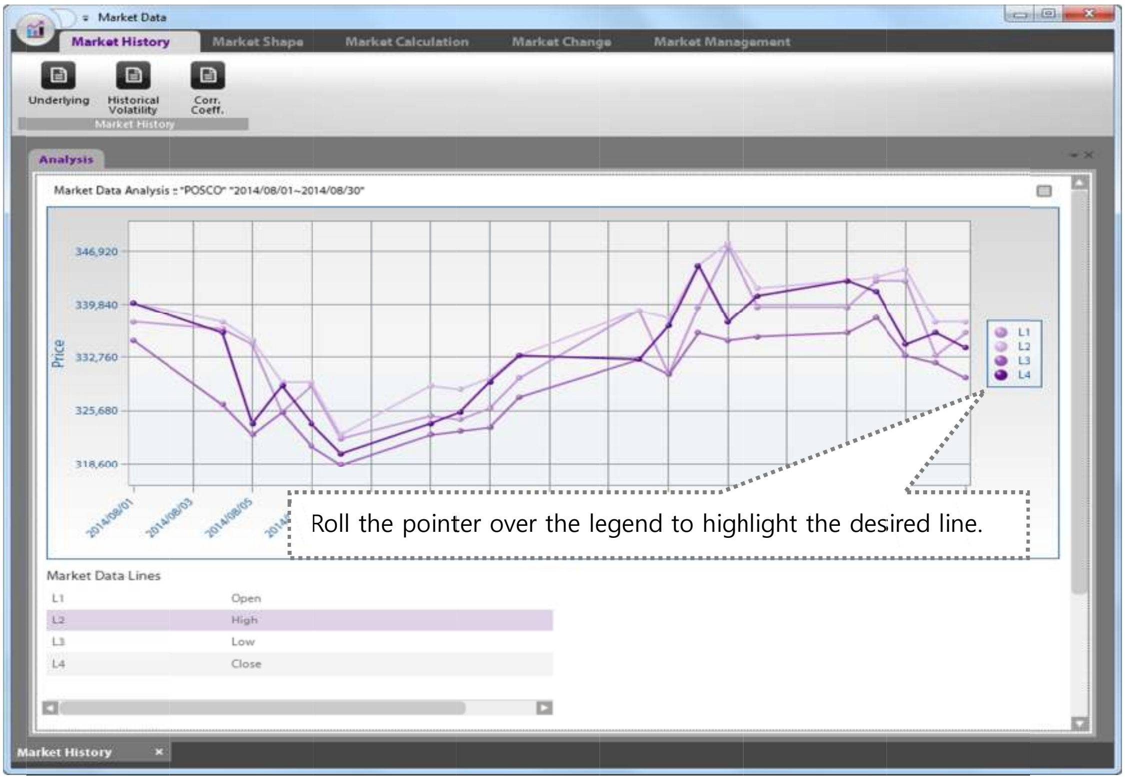


4.1.1.1 Underlying

1. Click the Underlying icon to open the Market Data Analysis Parameter pop-up window.
2. From the Analysis Object drop down menu, select from Underlying Assets, Rate Curves, Volatility Curves, or CDS Curves and click the magnifying glass (search button). The Search – Analysis Item window appears. Select the desired item to analyze.
3. Enter or select the start and end dates to apply the analysis and click OK.

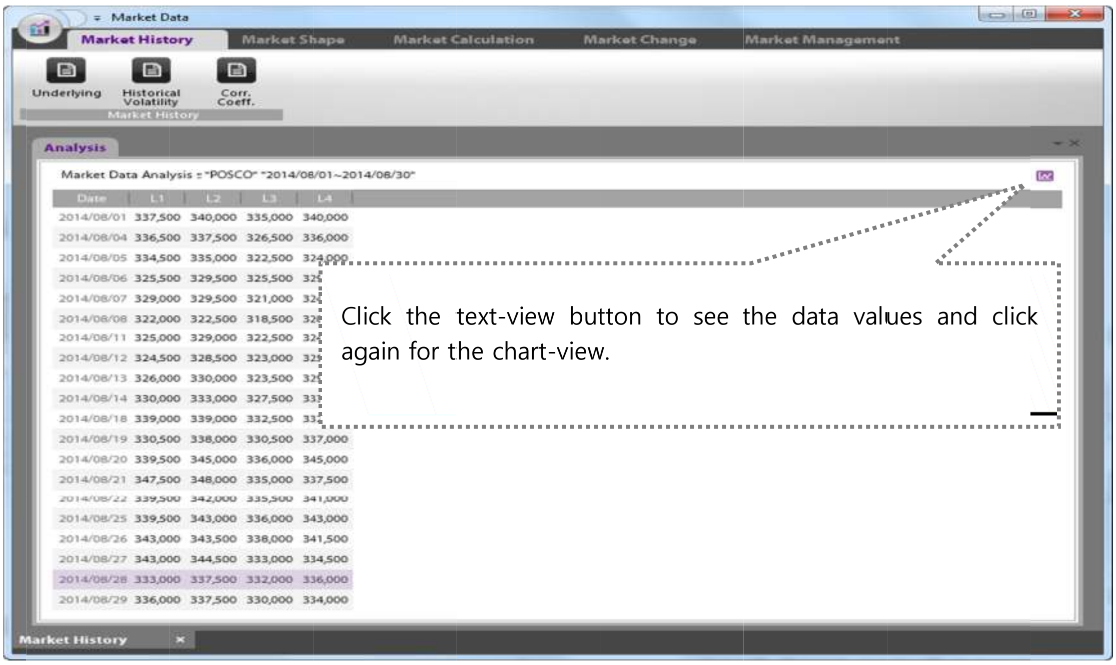


4. The analysis results for the selected item appear as shown below.



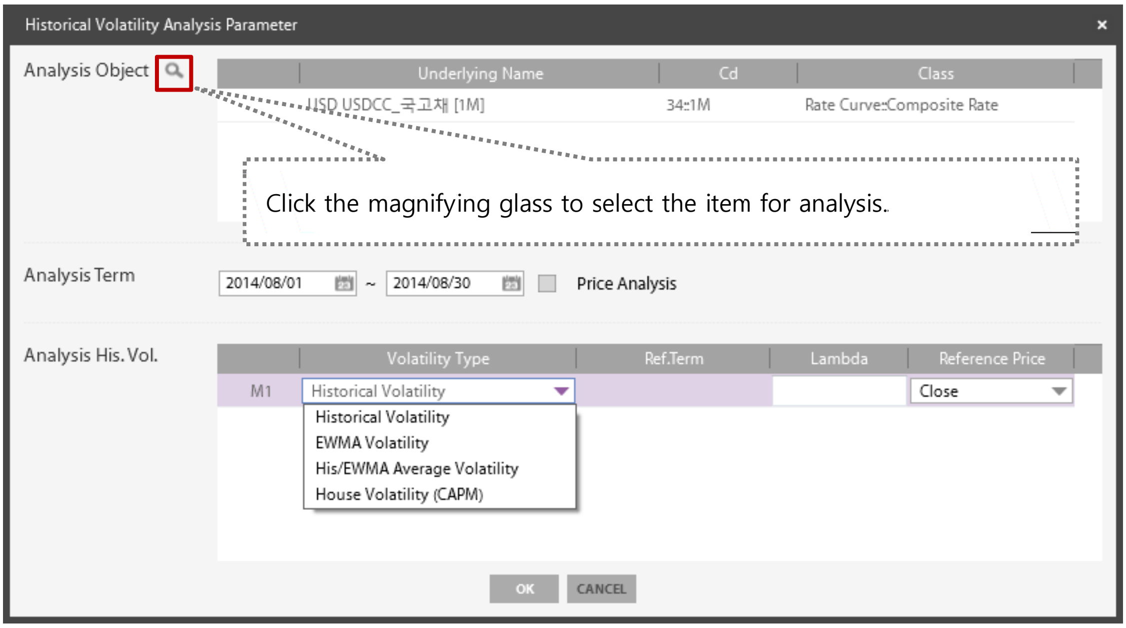
5. You may also see the chart values by text.

Results may also be displayed in text/numerical form.

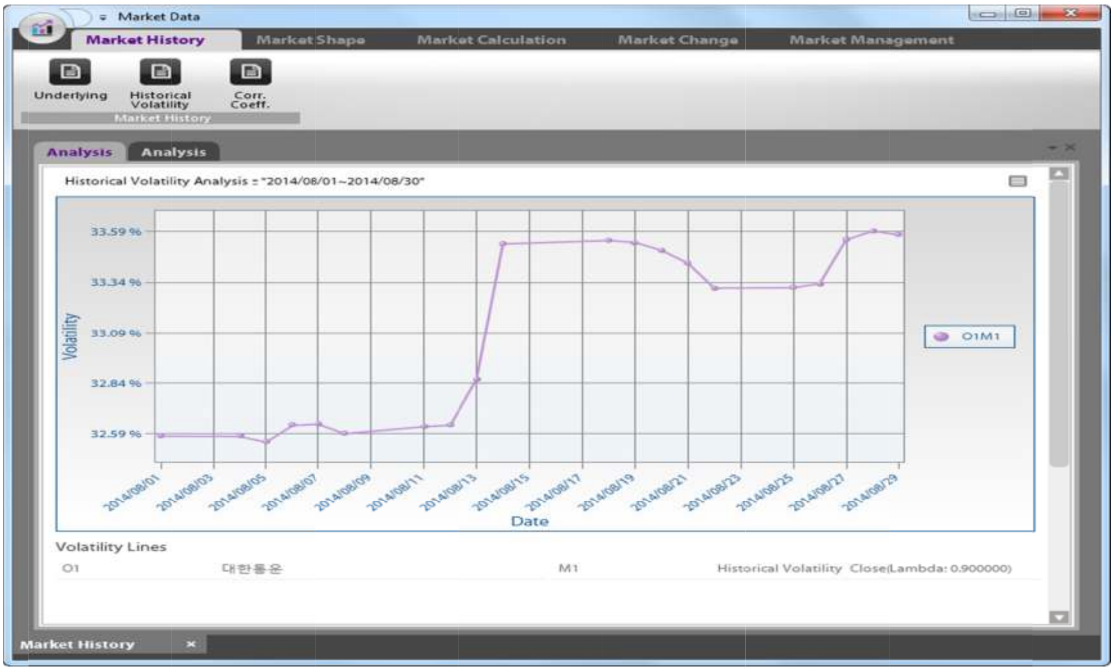


4.1.1.2 Historical Volatility

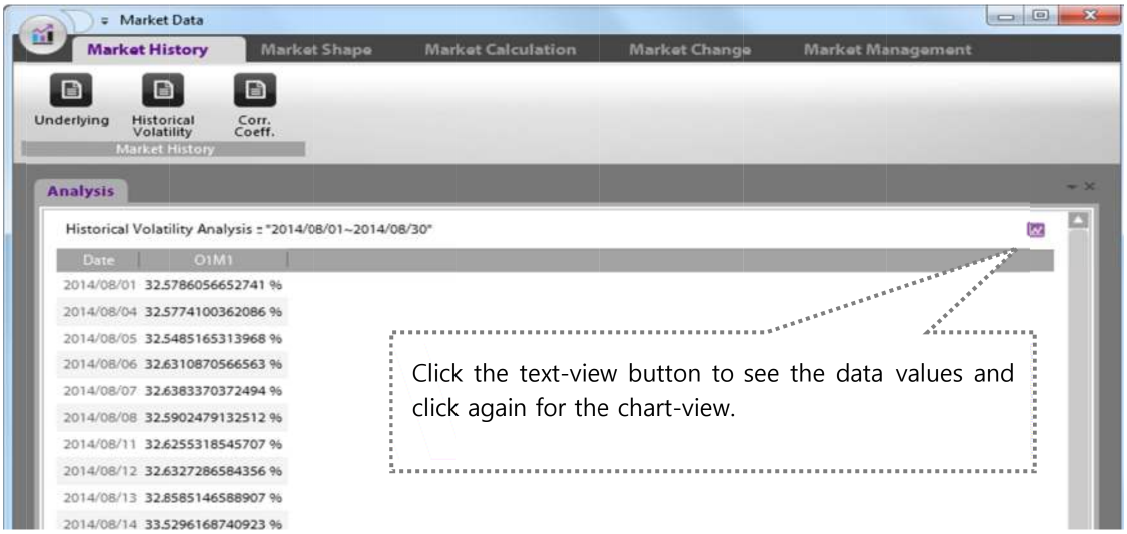
1. Click the Historical Volatility icon to open the Historical Volatility Analysis Parameter pop-up window.
2. Click the Analysis Object search button and select the desired item for analysis.
3. Enter or select the start and end dates to apply the analysis and click OK.
4. In the Analysis Historical Volatility field, right-click the blank section under the labelled cells and select Add Row.
5. Enter analysis conditions in the new row and click OK.



6. The analysis results for the selected item appear as below.

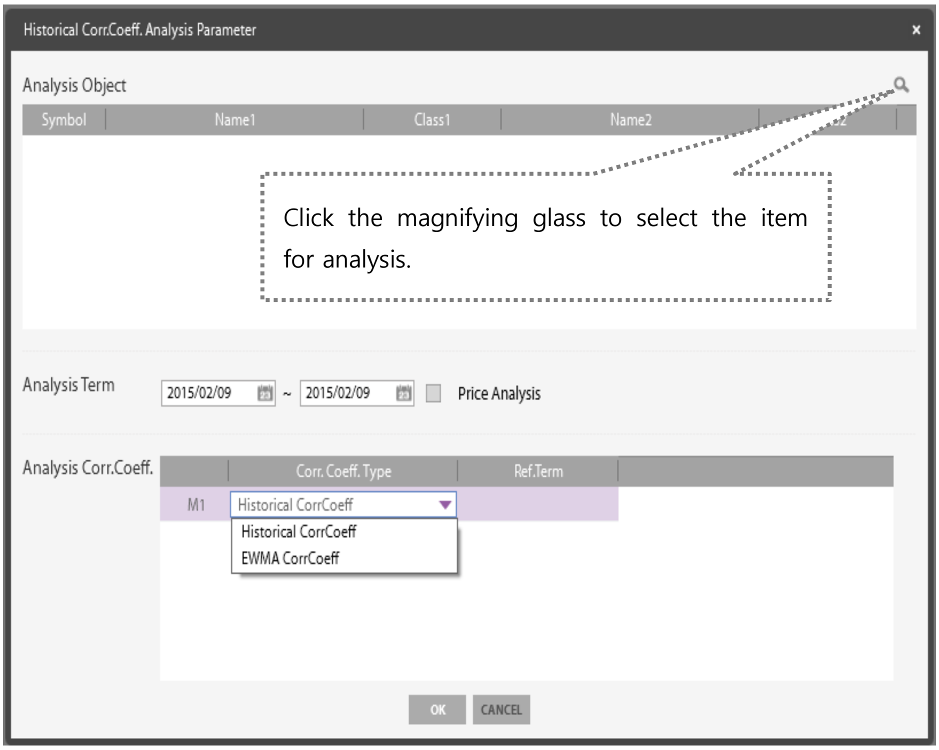


7. Results may also be displayed in text/numerical form.



4.1.1.3 Correlation Coefficient

1. Click the Correl.Coeff icon to open the Historical Corr.Coeff. Analysis Parameter pop-up window.
2. Click the magnifying glass (search button) beside the Analysis Object field and select the desired item for analysis.
3. Enter or select the analysis start and end dates.
4. In the Analysis Corr.Coeff. field, right-click the blank section under the labelled cells and select Add Row.
5. Enter analysis conditions in the new row and click OK.

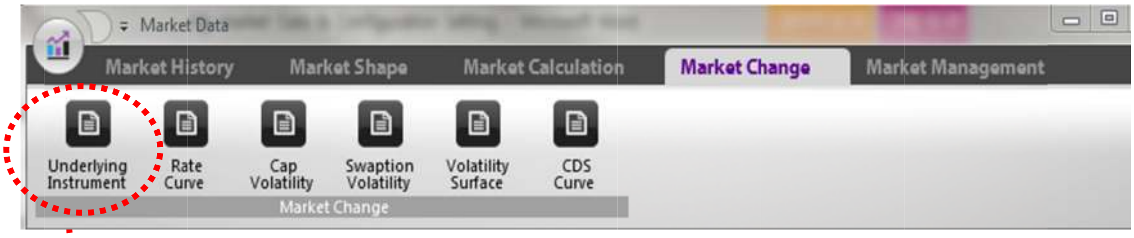


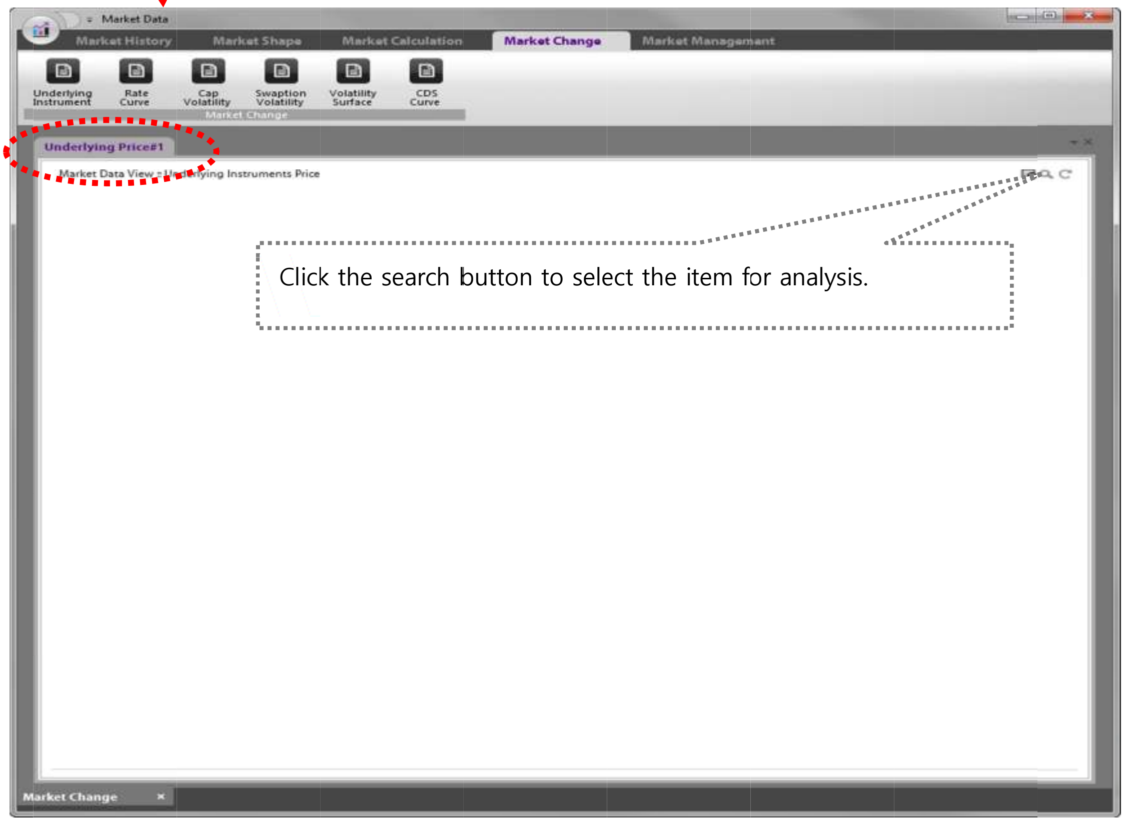
6. Results may also be displayed in text/numerical form.

4.1.2 Market Change

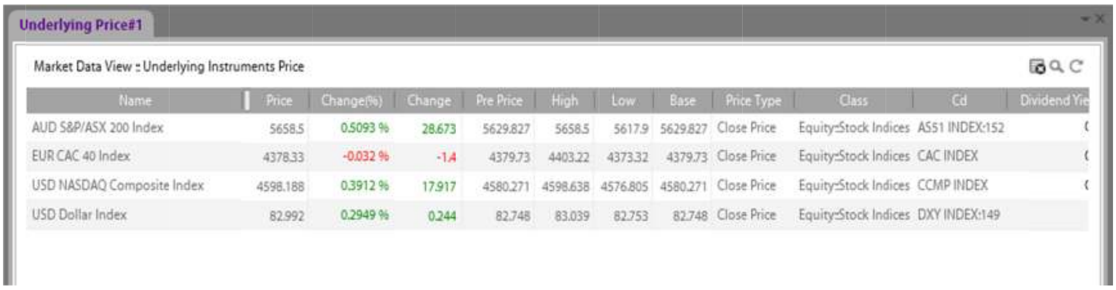
4.1.2.1 Underlying Instrument

1. The Market Change menu contains the Underlying Instrument, Rate Curve, Cap Volatility, Swaption Volatility, Volatility Surface, and CDS Curve icons. As user instructions for all six are the same, below is a demonstration of Underlying Instrument icon only.
2. Click the Underlying Instrument icon to open the Underlying Price #1 tab. (The number increases as more are opened).





3. The analysis results appear in the tab as shown below.



Underlying Price#1

Market Data View :: Underlying Instruments Price

Name	Price	Change(%)	Change	Pre Price	High	Low	Base	Price Type	Class	Cd	Dividend Yie
AUD S&P/ASX 200 Index	5658.5	0.5093 %	28.673	5629.827	5658.5	5617.9	5629.827	Close Price	Equity::Stock Indices	AS51 INDEX:152	(
EUR CAC 40 Index	4378.33	-0.032 %	-1.4	4379.73	4403.22	4373.32	4379.73	Close Price	Equity::Stock Indices	CAC INDEX	(
USD NASDAQ Composite Index	4598.188	0.3912 %	17.917	4580.271	4598.638	4576.805	4580.271	Close Price	Equity::Stock Indices	CCMP INDEX	(
USD Dollar Index	82.992	0.2949 %	0.244	82.748	83.039	82.753	82.748	Close Price	Equity::Stock Indices	DXY INDEX:149	

4. To delete results, click the exit button.

4.2 Underlying Setting

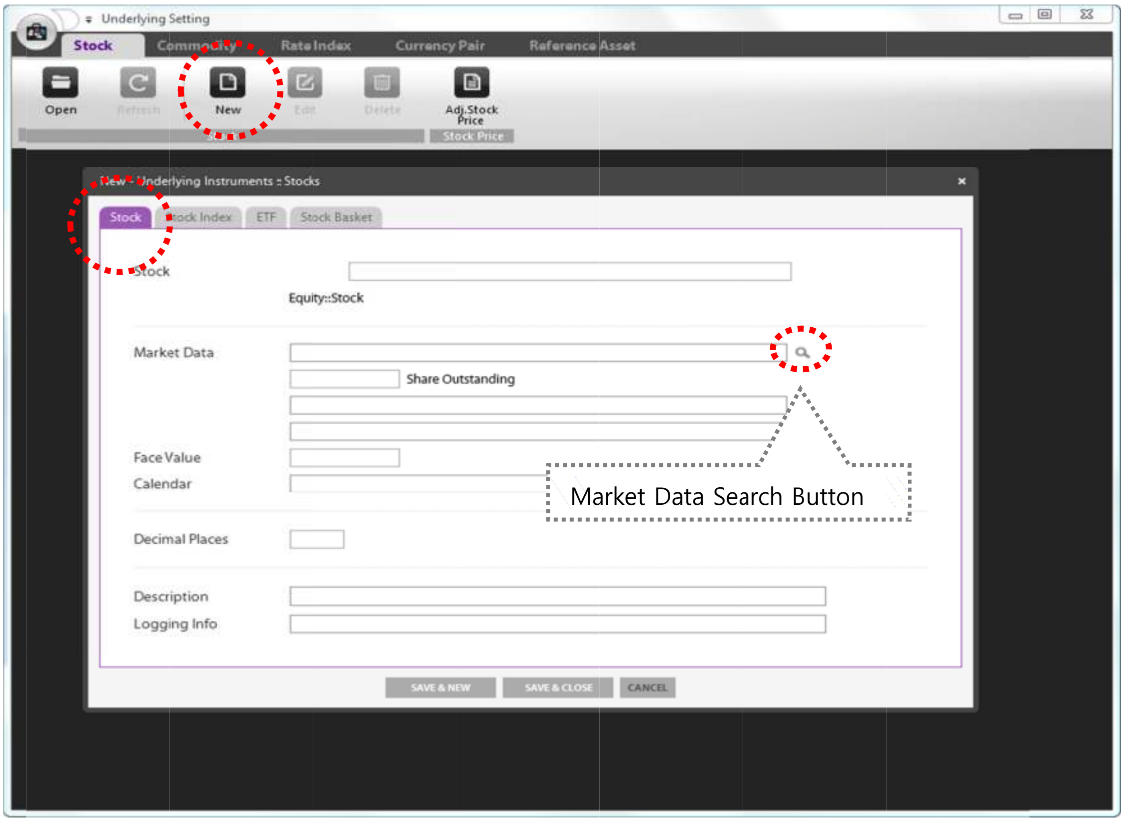
- Managed through the Underlying Setting are: Stock, Commodity, Rate Index, Currency Pair, and Reference Asset. The user is able to apply search, register, revise, and delete functions to each Underlying type.
- All users may apply the Underlying Setting. However, the revise and delete functions may only be applied to the user's own registered Underlying Setting.
- The Underlying Setting is further divided in Underlying Group 2 for more detailed Underlying Settings as outlined in the table below.

Underlying Group 1	Underlying Group 2	Details
Stock	• Stock • Stock Index • ETF • Stock Basket	
Commodity	• Commodity • Commodity Index	
Rate Index	• Rate Index	
Currency	• Currency Pair	
Reference Asset	• Single • Basket	

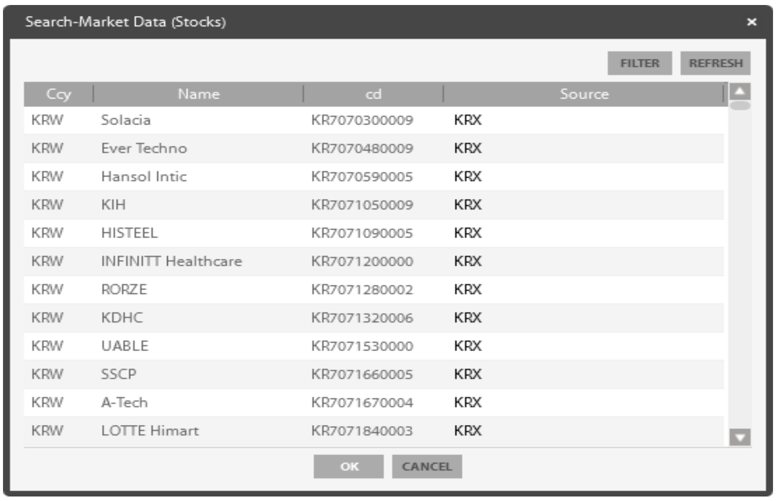
4.2.1 Underlying Setting

4.2.1.1 Stock - Registration

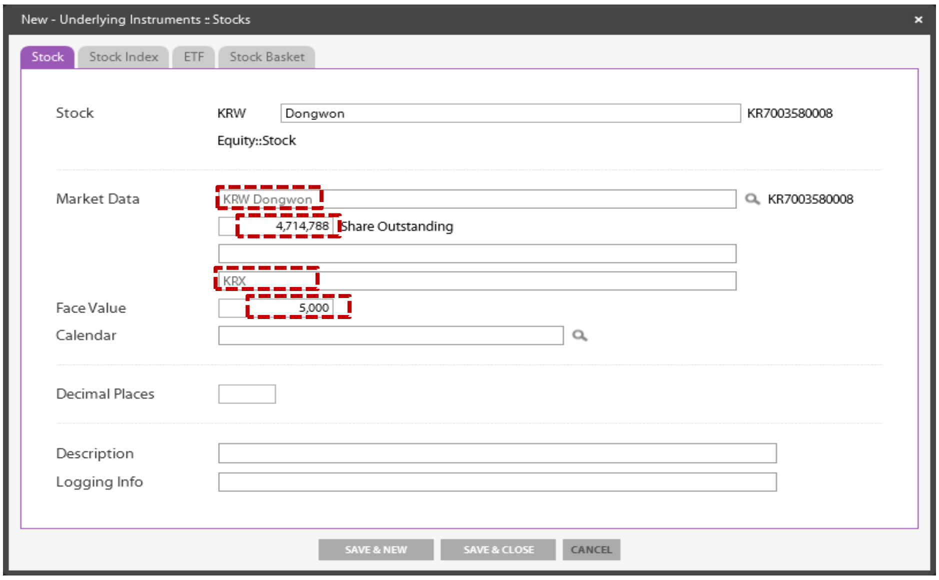
1. Select [Stock] ▶ [New] ▶ [Stock]
2. The Stock Underlying is composed of Stock, Stock Index, ETF, and Stock Basket as shown in the four tabs below. Select the desired underlying to register. (This manual outlines steps for registering the Stock Underlying.)



3. Click the magnifying glass (search button) beside the Market Data field.



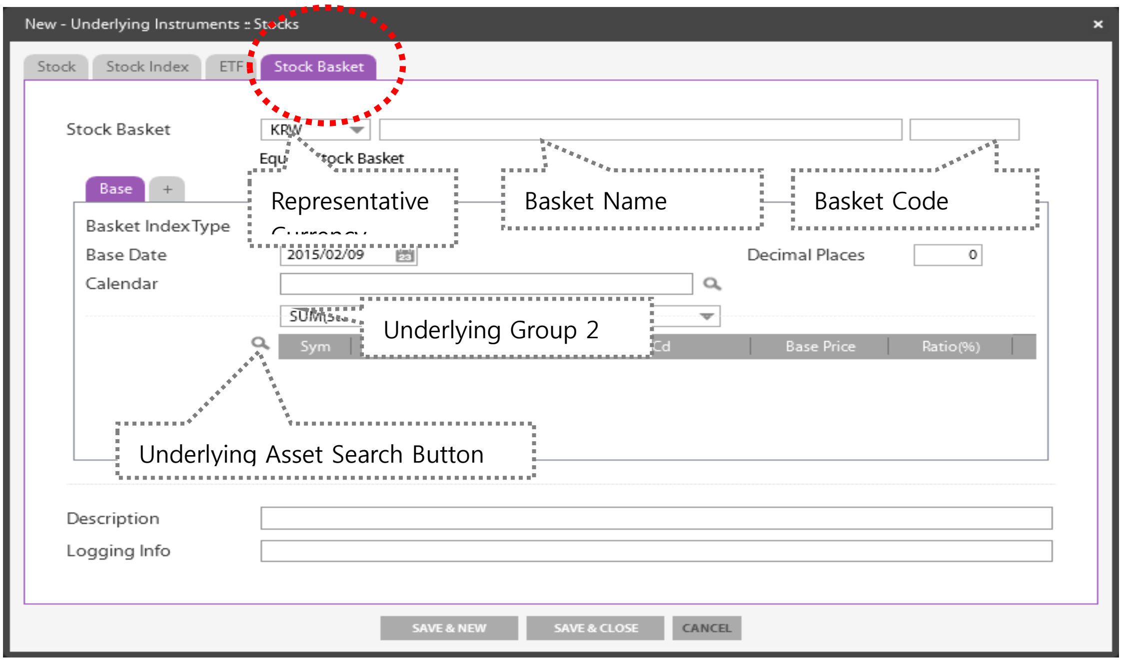
4. Select the desired Market Data and click OK to view details such as the Stock Name, Market Data, and Face Value.
5. Enter required inputs as shown below



6. Market data will be filled in automatically and may be adjusted by the user. If the required market data has not been registered previously, fields appear empty and are manually entered by the user.
7. Click SAVE & NEW (save current registration and begin new) or SAVE & CLOSE (save current registration and exit) to complete the underlying registration.
8. Please note: for fields with a magnifying glass (search button), the user must make a selection through the search.
9. The Logging Info field indicates the registration date and registering user.
10. The instructions for the Underlying Setting of the Stock Index and ETF are the same as the Stock Underlying Setting as demonstrated. The Stock Basket Underlying Setting is outlined below.

4.2.1.2 Stock Basket - Registration

1. Select [Stock] ▶ [New] ▶ [Stock Basket]

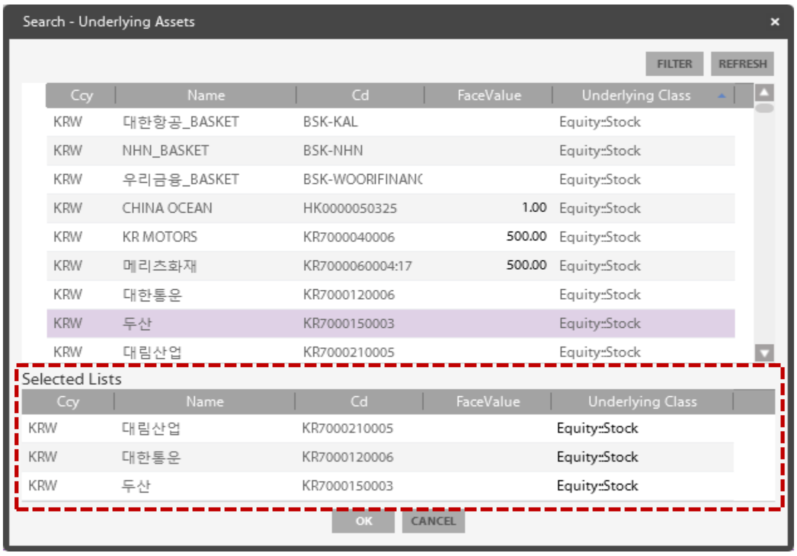


2. In the case that the Stock Basket includes underlying assets of more than one currency, a representative currency must be selected, as the Basket Index computation can only run with a single currency.

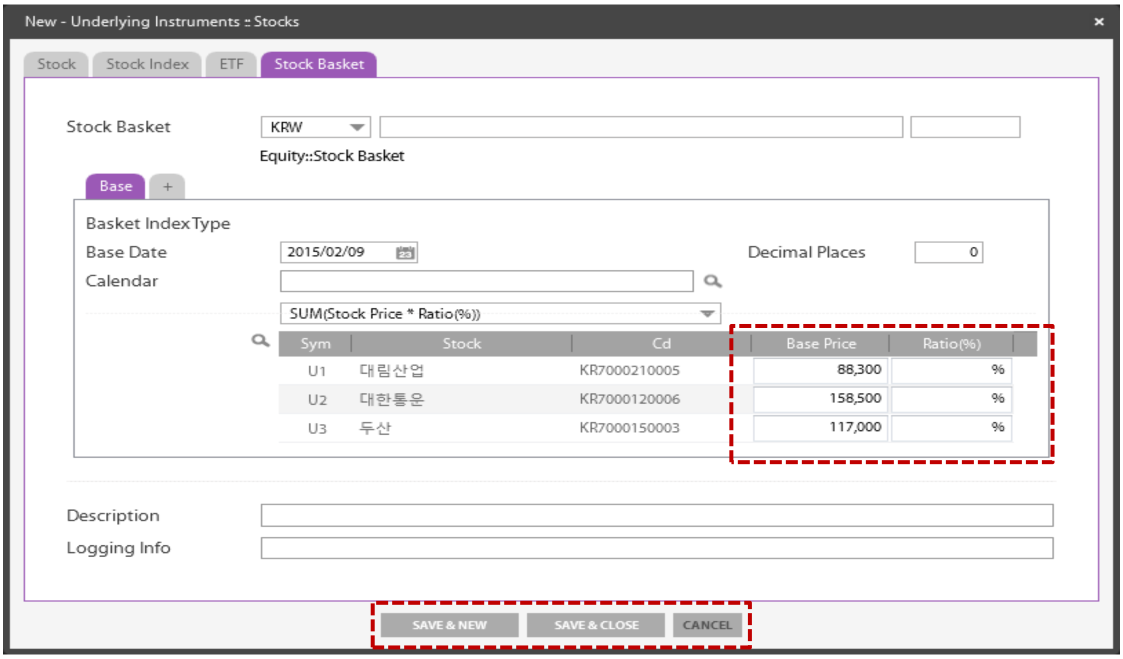
3. The Stock Basket Code is set as desired by the user.

4. Click the magnifying glass (search button) to view the list of underlying assets for building the stock basket.

5. Double-click the desired underlying assets. They will appear under Selected Lists as shown below and click OK.



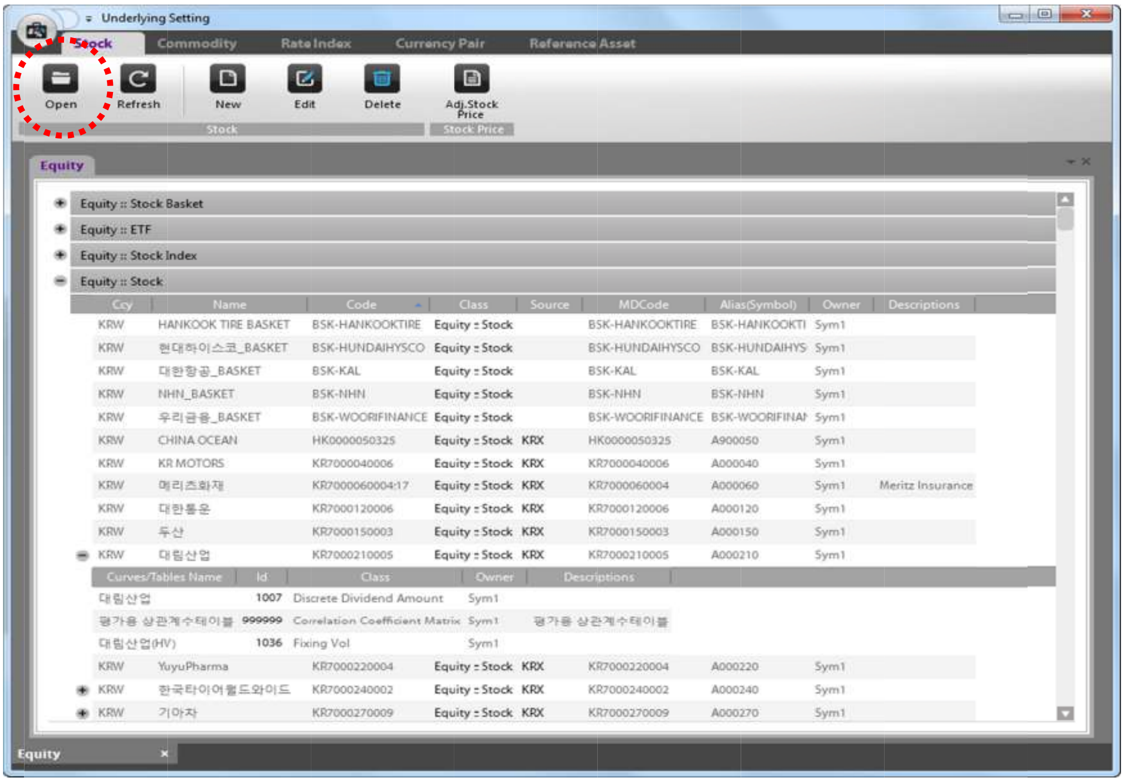
6. Enter or adjust values in the Base Price and Ratio cells and click the Save to complete the Stock Basket registration.



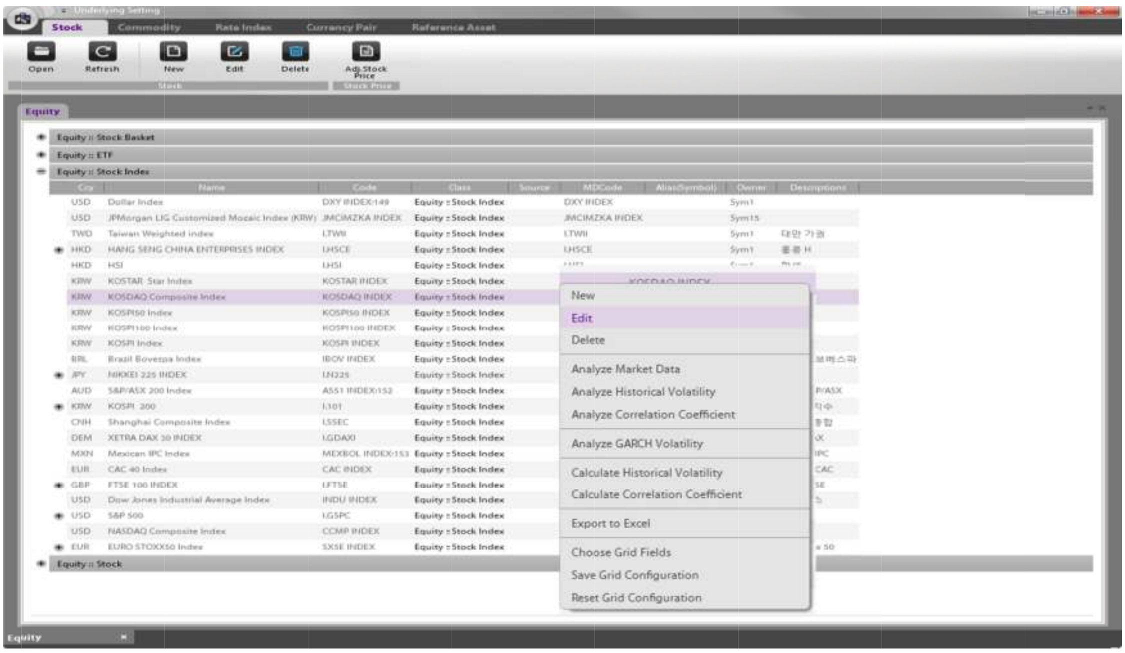
4.2.2 Underlying Setting - Open

- The user is able to search and open and view five types of details on Underlying Setting.

1. Select [Stock] ▶ [Open]

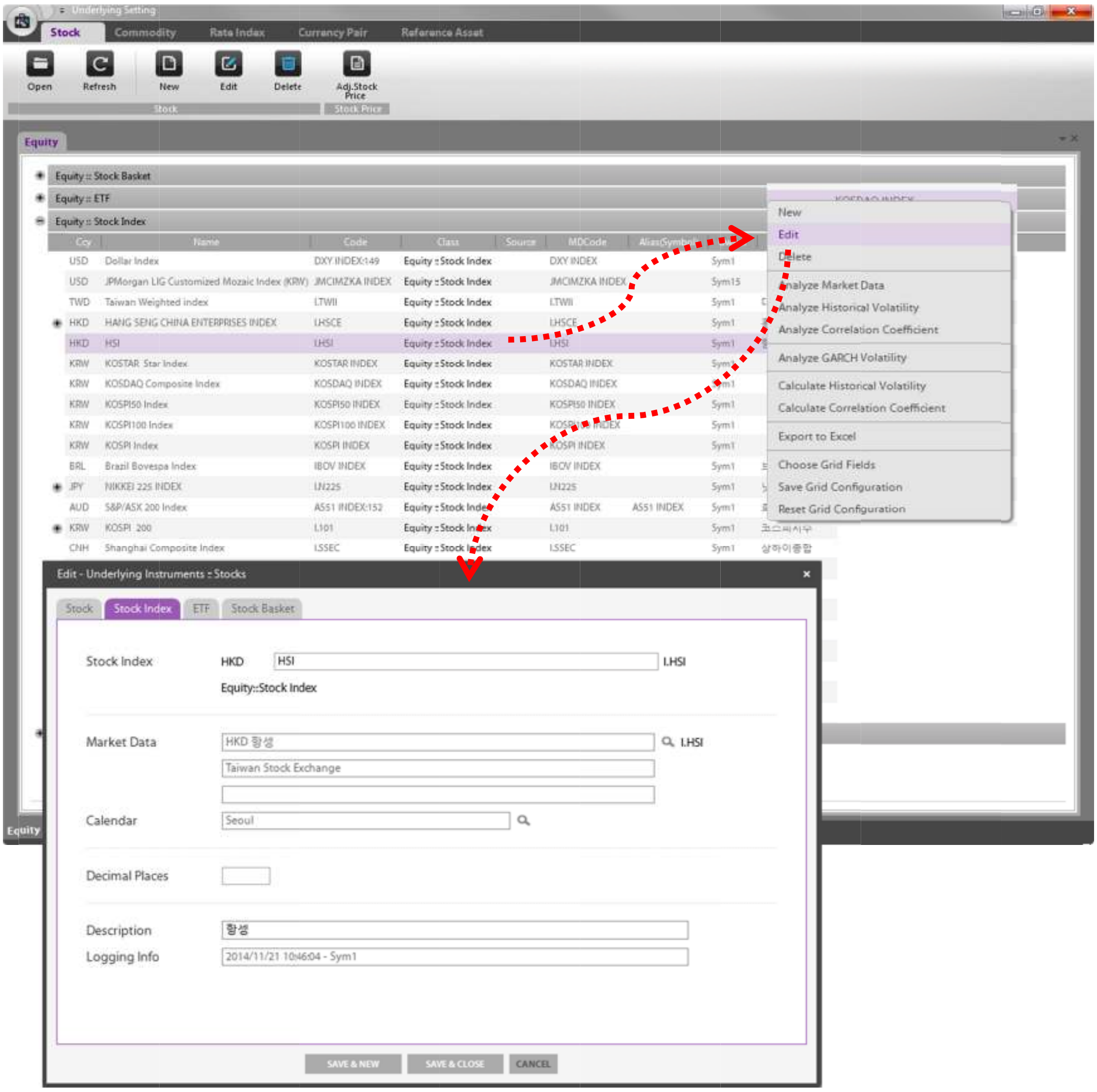


2. Select desired underlying asset and right-click for menu options.



Cell label	Description
Ccy	Currency Code
Name	Underlying Name
Code	Country Code
Class	Underlying Hierarchy
Source	Source of Market Data
MDCode	Market Data Code
Alias(Symbol)	Short Code
Descriptions	Reference

3. Right-click and select Edit to open the Edit pop-up window and view the details.

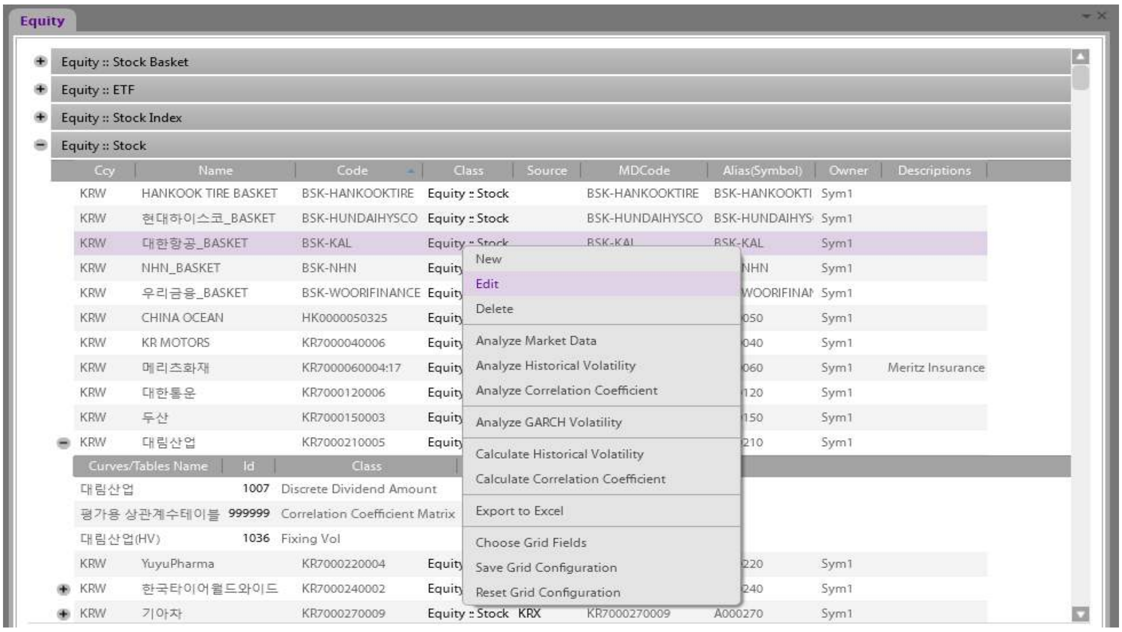


4.2.3 Underlying Setting - Edit

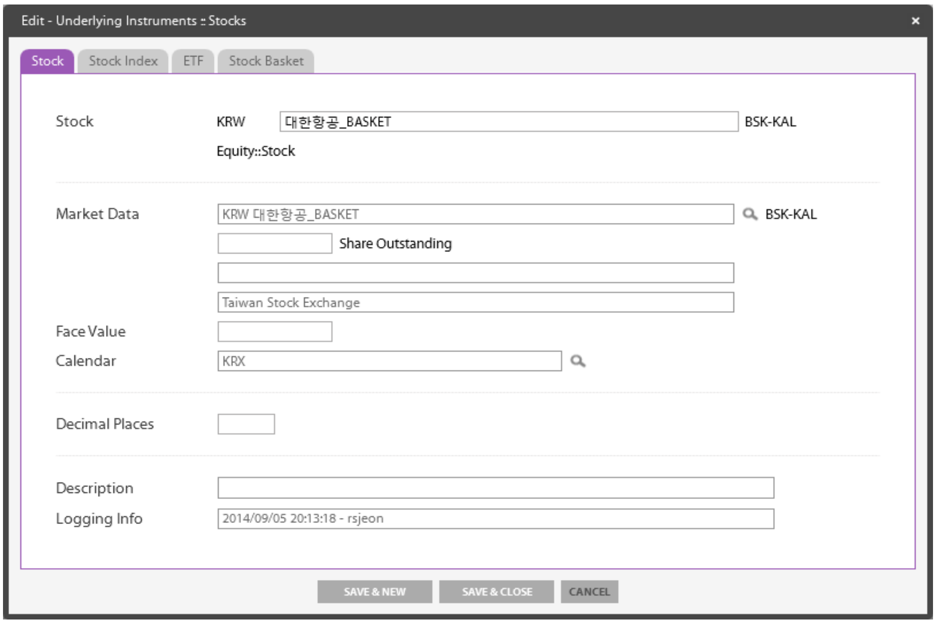
- Use the search function to open the desired underlying asset to edit. The edit function is only possible for the assets registered by the user that is logged in.

  1. Select [Stock] ▶ [Open]

  2. Select and right-click the desired underlying asset and click Edit.



  3. The Edit pop-up window opens as shown below.



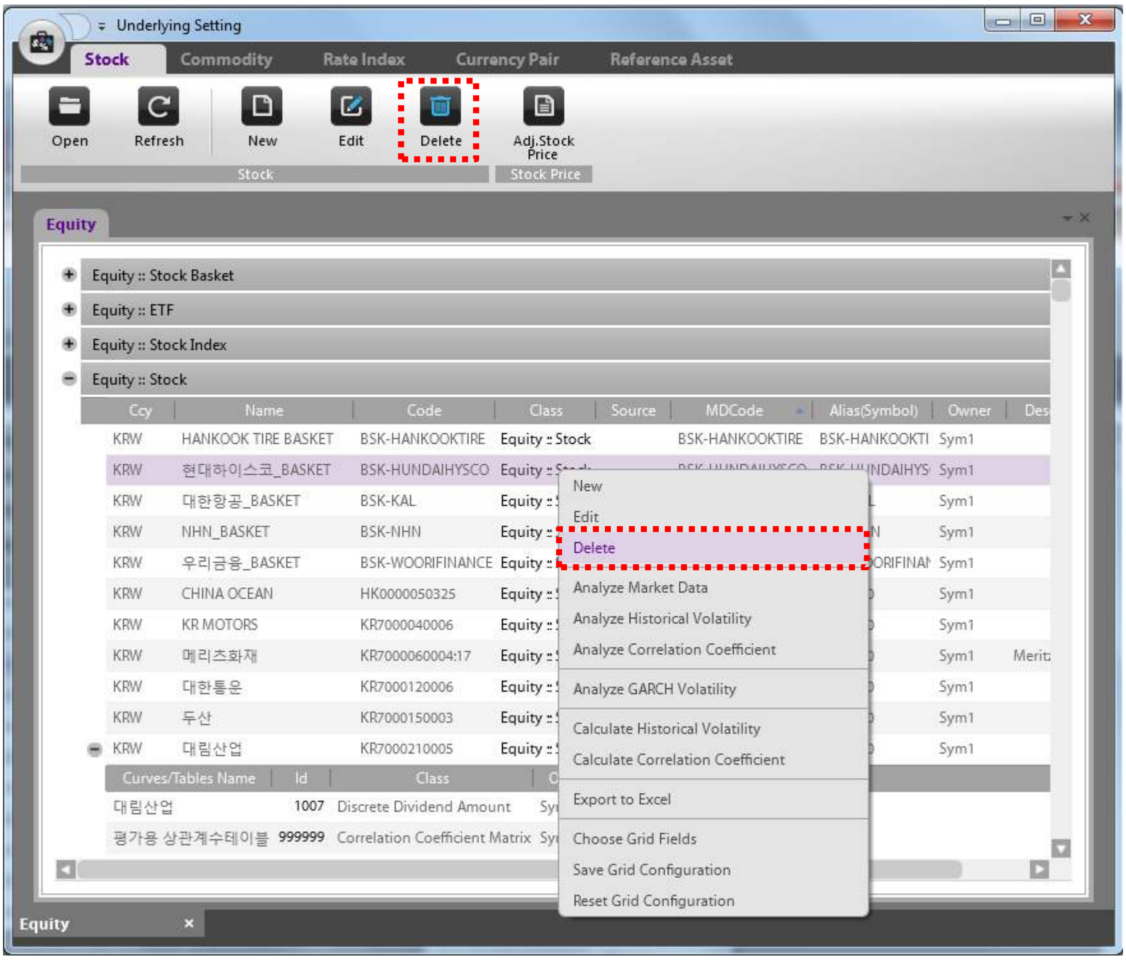
  4. Revise inputs and click SAVE.

4.2.4 Underlying Setting - Delete

- Use the search function to open the desired underlying asset to delete. The delete function is only possible for the assets registered by the user that is logged in.

1. Select [Stock] ▶ [Open]

2. Select and right-click the desired underlying asset and click Delete.

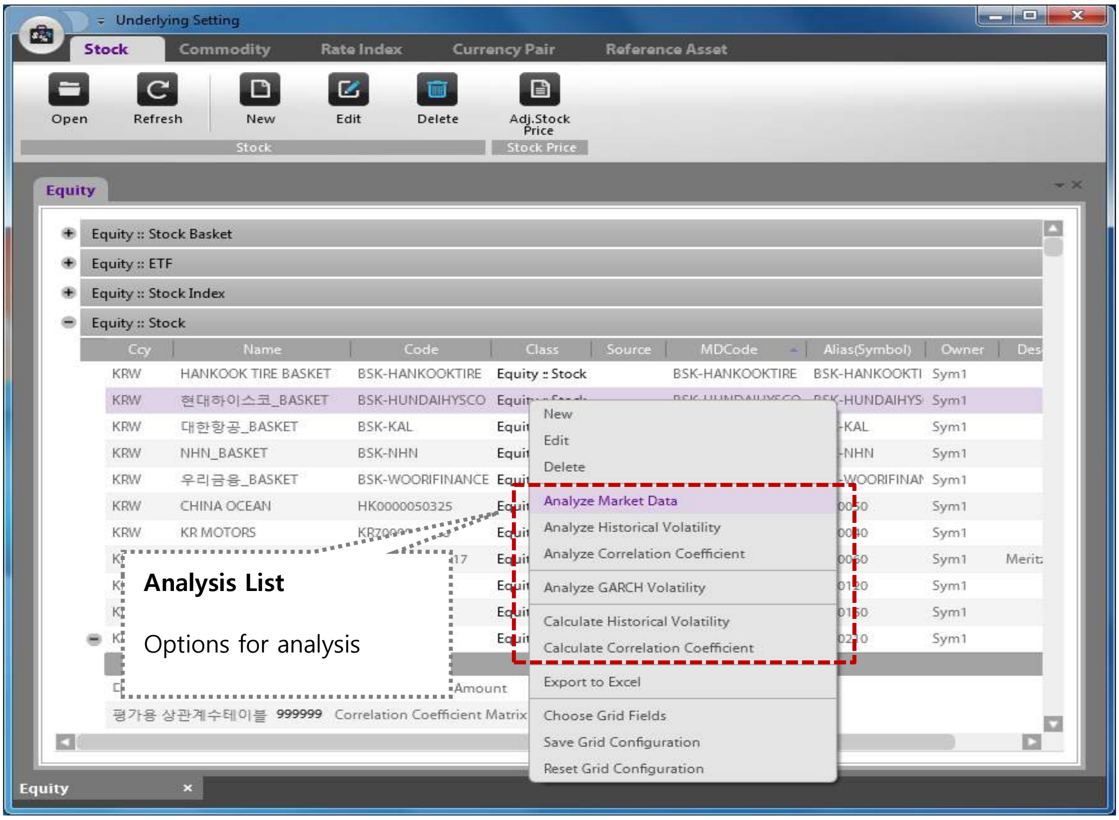


3. The deleted Underlying Setting no longer appears on the list.

4.2.5 Underlying Setting – Other Functions

- Running the Market Information/Analysis functions directly from the Underlying Setting.

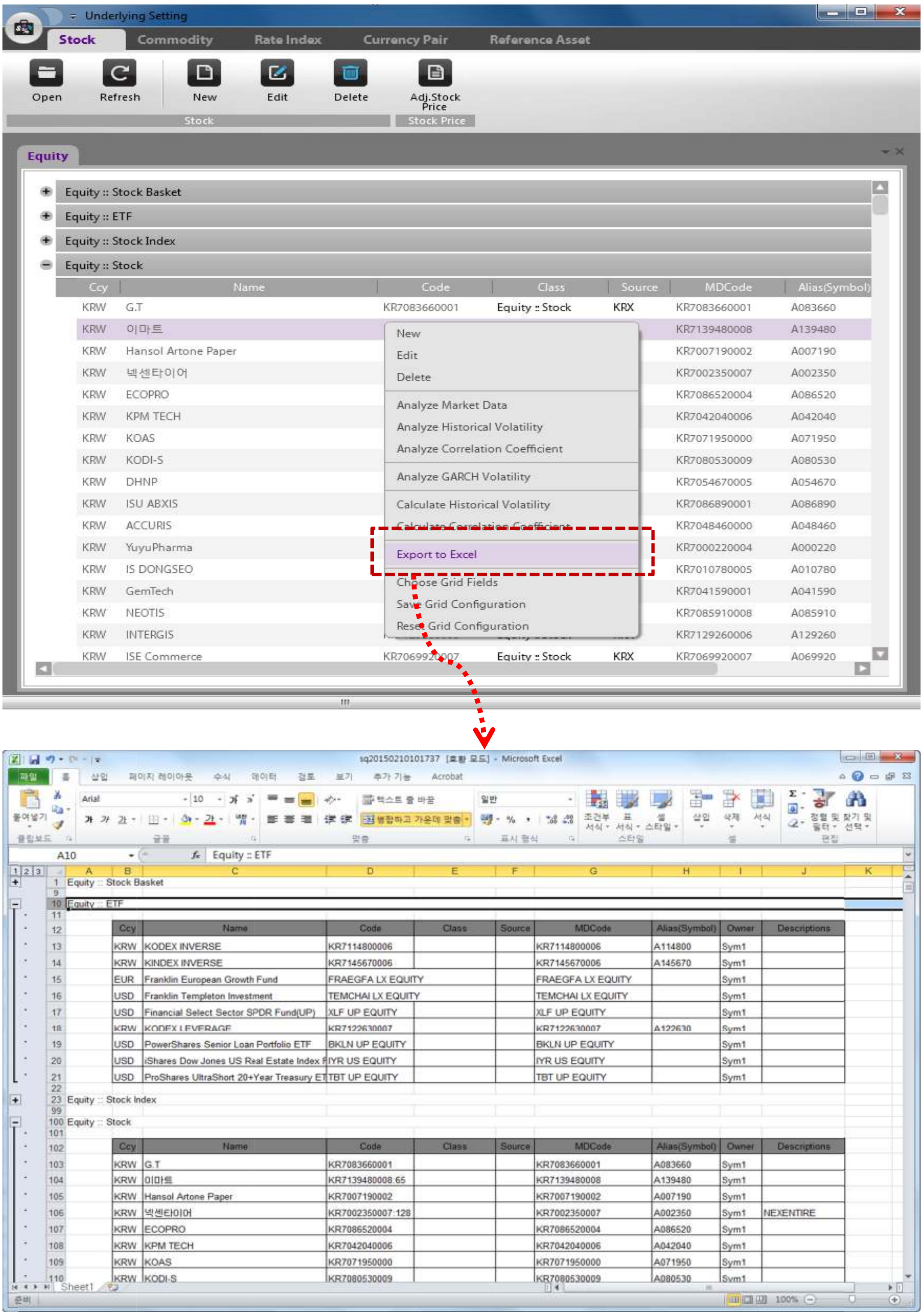
1. Market Data analysis options are available from the Underlying Setting page. Right-click the desired underlying asset to view analysis options.



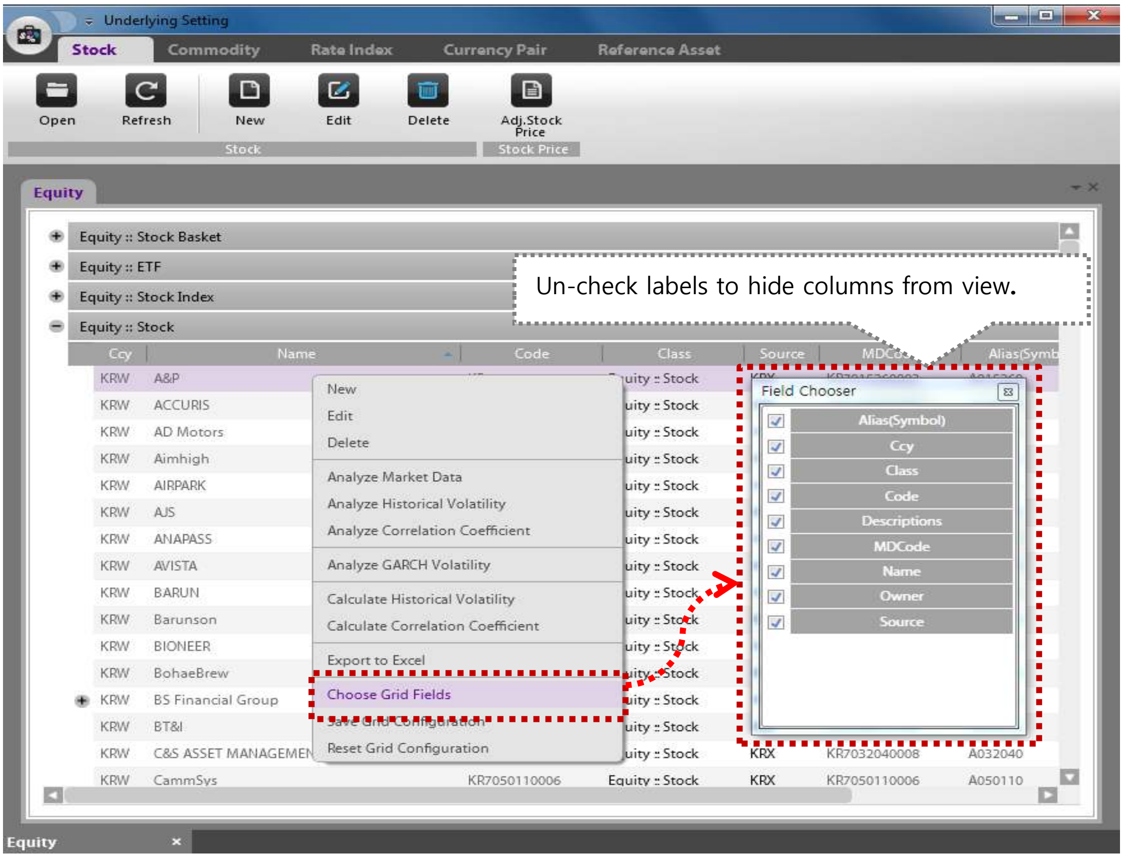
2. Select the desired analysis option to run.

- Export Data to Excel

  1. Open and select the desired Underlying Setting. Right-click and select Export to Excel. The data will open in Excel as shown below.



- Choose Grid Fields (Customize columns to view.)



- Save Grid Configuration (Format cells)
  - Format the cells of the selection (order, width, etc.)
  - Format as desired and click Save Grid Configuration to fix for future viewing.

- The Reset Grid Configuration reverts any cell formatting to original settings.

4.3 Curve Setting

- Managed through the Curve Setting are: Rate Curve, Volatility Curve, Correlation Matrix, Dividend Table, Credit Curve, Credit Table, and FX Point. The user is able to apply search, register, revise, and delete functions to each curve type.
- All users may apply the Curve Setting. However, the revise and delete functions may only be applied to the user's own registered Curve Setting.
- Curve types are further divided in Group 2 for more detailed Curve Settings as outlined in the table below.

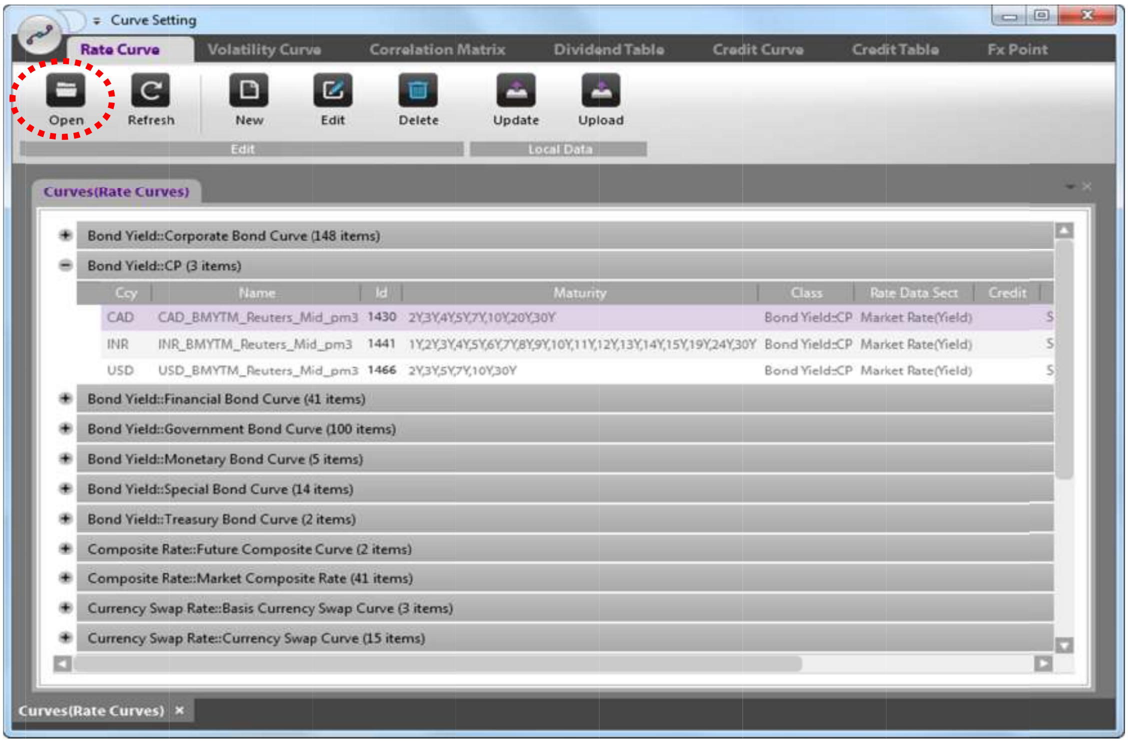
Group 1	Group 2	Description
Rate Curve	Money Market Rate Curve	Money Market Rate Curve sourced from data vendors
	Swap Rate Curve	Swap Rate Curve sourced from data vendors
	Synthetic Swap Rate Curve	Swap Rate Curve composed of several Swap Rate Curves with a new term and maturity
	Bond Yield	Bond Yields of the same type sourced from data vendors
	Market Composite Curve	Market Data Curve composed of user-set interest rates as well as interest rate curves sourced from data vendors
	Entry Composite Curve	Interest Rate Curve composed of user-set interest rates only, unassociated with market rates (continuous updating of rates required)
	Future Composite Curve	Composite Curve composed of national Futures rates
	Spread Composite Curve	Spread Curve of the Interest Rate Curves sourced from data vendors.
Volatility Curve	Market Volatility Curve	Volatility Curve sourced from data vendors
	Internal Volatility Curve	Volatility Curve composed of user-set volatility data only, unassociated with market data
Correlation Matrix		Correlation Coefficients of various Underlying Assets
Dividend Table	Dividend Tables	Stock Dividend Tables (periodic dividends, continuous dividends, dividend return rate, etc.)
	Custody Cost Tables	Carry Cost of (mainly) commodity-based products
Credit Curve	CDS Curve	Credit Spread Curve sourced from data vendors
	Synthetic CDS Curve	Credit Spread Curve composed of risk-free interest rate curves.
	Entry CDS Curve	Credit Spread Curve composed of user-set spreads only, unassociated with market rates (continuous updating of rates required)
Credit	Recovery Rate Table	Credit-related Recovery Rate Table

Table	Factor Correlation Coefficient Table	Non-payment Correlation Coefficient Table of Reference Assets
FX Point	Market FX Point	FX Point sourced from data vendors
	Internal FX Point	User-set FX Point, unassociated with market FX Point (continuous updating of rates required)

4.3.1 Rate Curve

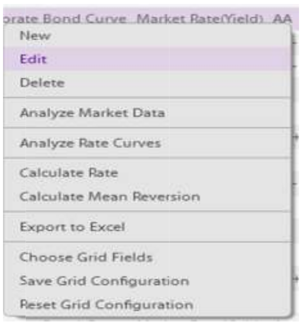
4.3.1.1 Rate Curve - Open

1. Select [Rate Curve] ▶ [Open]



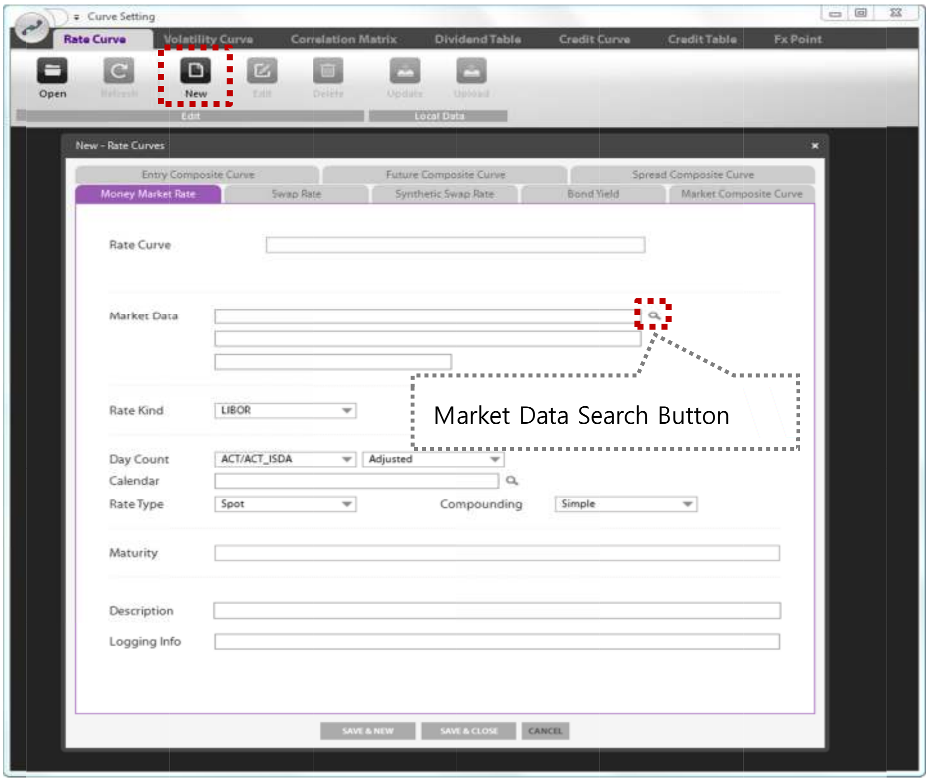
Cell label	Description
Ccy	Currency Code
Name	User Curve Name
ID	System-generated Code ID
Maturity	Maturity
Class	Curve Class Hierarchy
Rate Data Sect	Interest Rate Data Sectioning
Owner	User ID linked to curve registration
Source	Source of Market Data
MDCode	Market Data Code
Descriptions	Reference

2. Select the desired curve and right-click to view menu options.



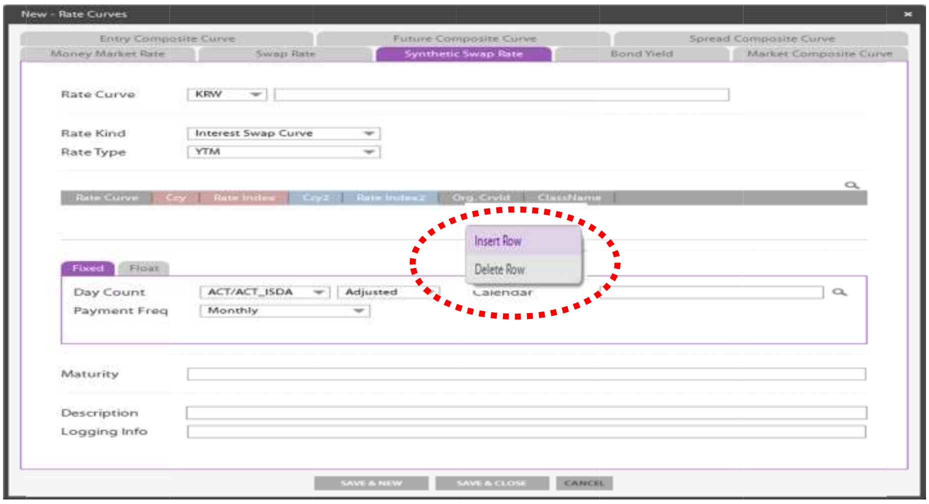
4.3.1.2 Rate Curve - Registration

1. Select [Rate Curve] ▶ [New]



2. The user must manually input market data to generate the Entry Composite Curve. For all other curves, click the magnifying glass (search button) beside the Market Data field to select the desired market data.

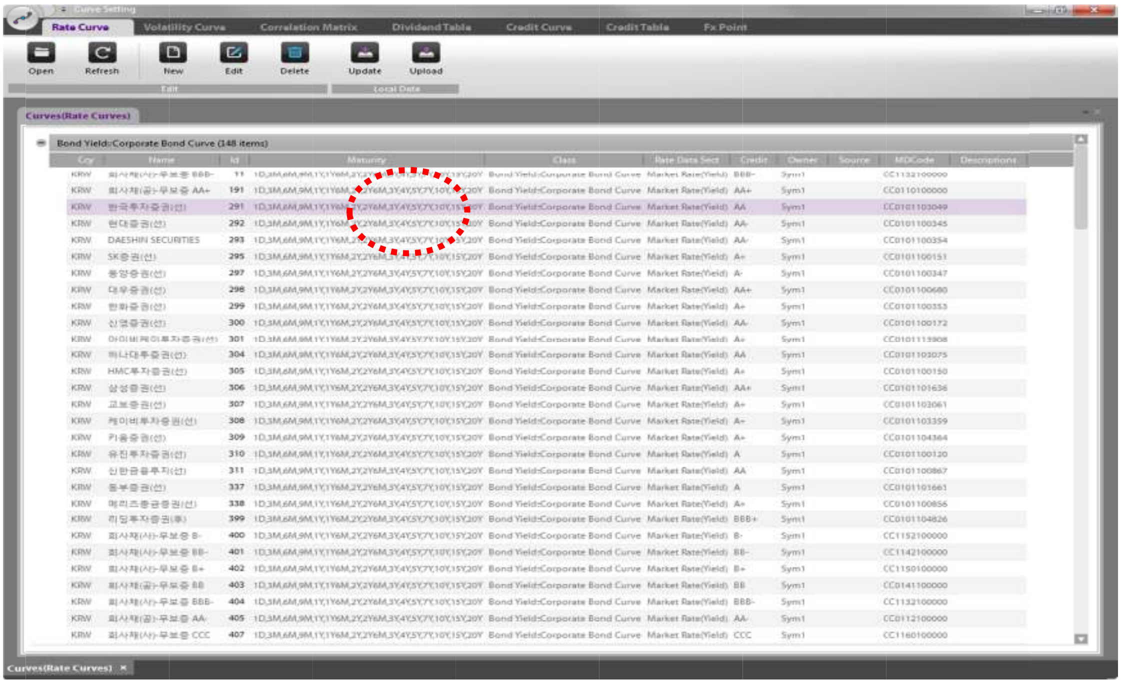
3. To enter values in multiple rows, right-click the blank section under the labelled cells and click Insert Row or Delete Row as needed.



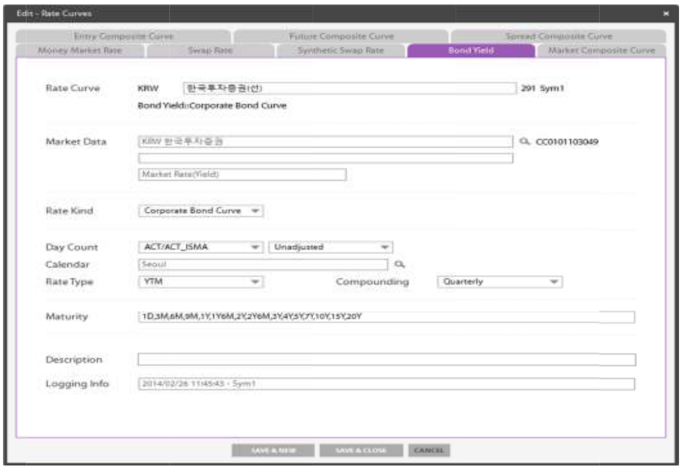
4. After entering all inputs, click SAVE & NEW (save current registration and begin new) or SAVE & CLOSE (save current registration and exit) to complete curve registration.

4.3.1.3 Rate Curve – Edit / Delete

1. Select [Rate Curve] ▶ [Open]



2. Select the curve to edit. Right-click and select Edit to open the Edit – Rate Curve pop-up window.



3. Revise curve details and click SAVE.

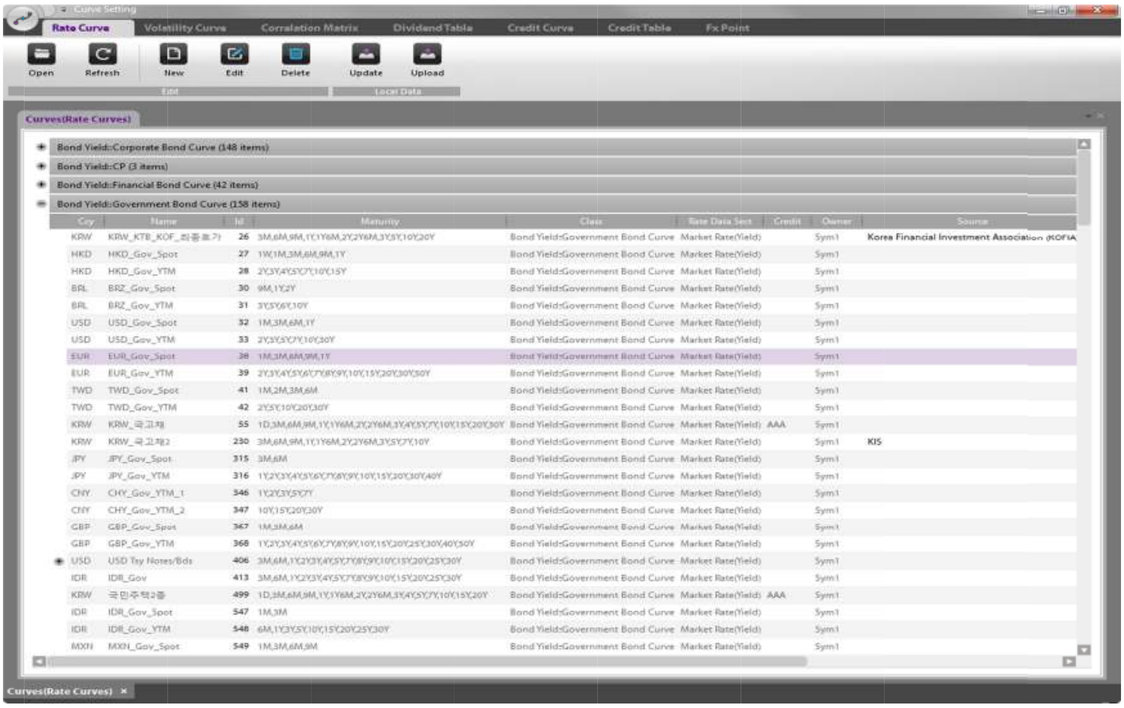
4. To delete selected curve, right-click and choose Delete.

4.3.1.4 Curve - Update

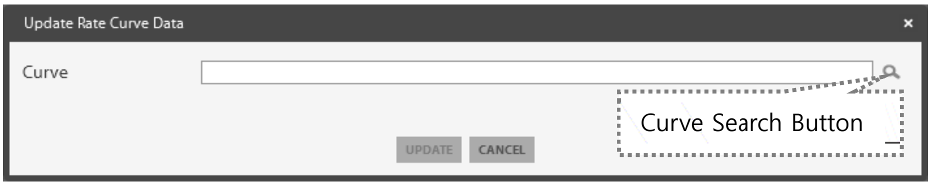
1. User-set curves are not automatically updated by the SSQ market data and the user must manually enter updated market data.

2. This Update function is applicable to the seven curve types including Rate, Volatility, Correlation Matrix, Dividend Table, and FX Point.

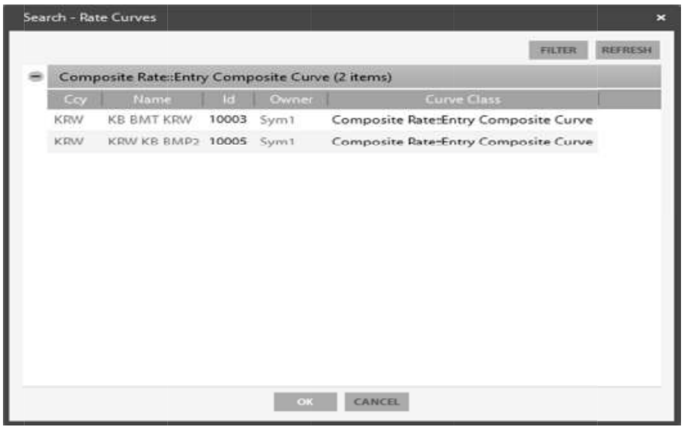
3. Select [Rate Curve] ▶ [Open]



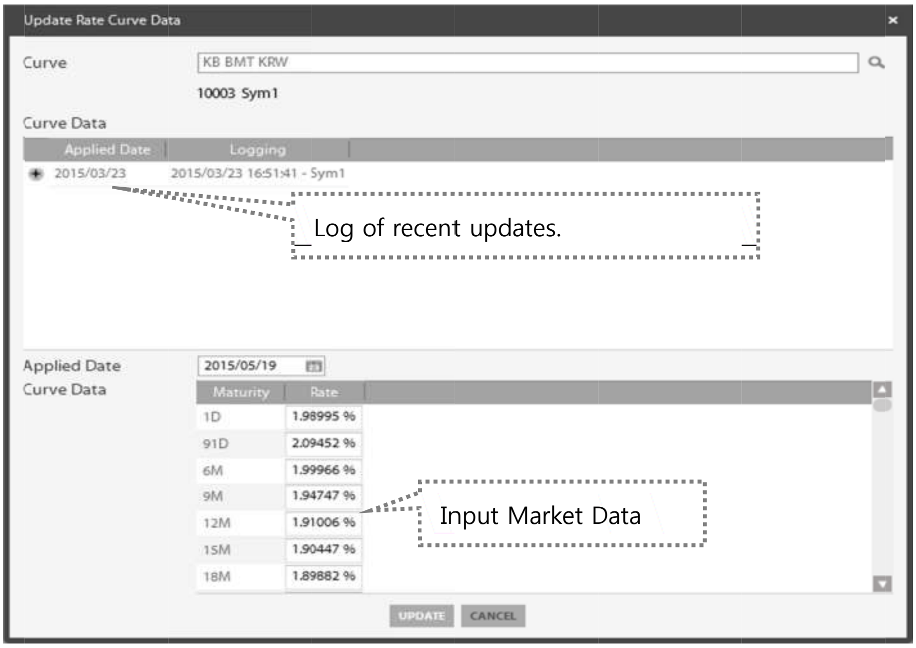
4. Select the desired curve to update and click the Update icon to open the Update Rate Curve – Data pop-up window.



5. Click the magnifying class (search button) and select the desired curve.



6. Double-click the desired curve to open the Update Rate Curve Data pop-up window.



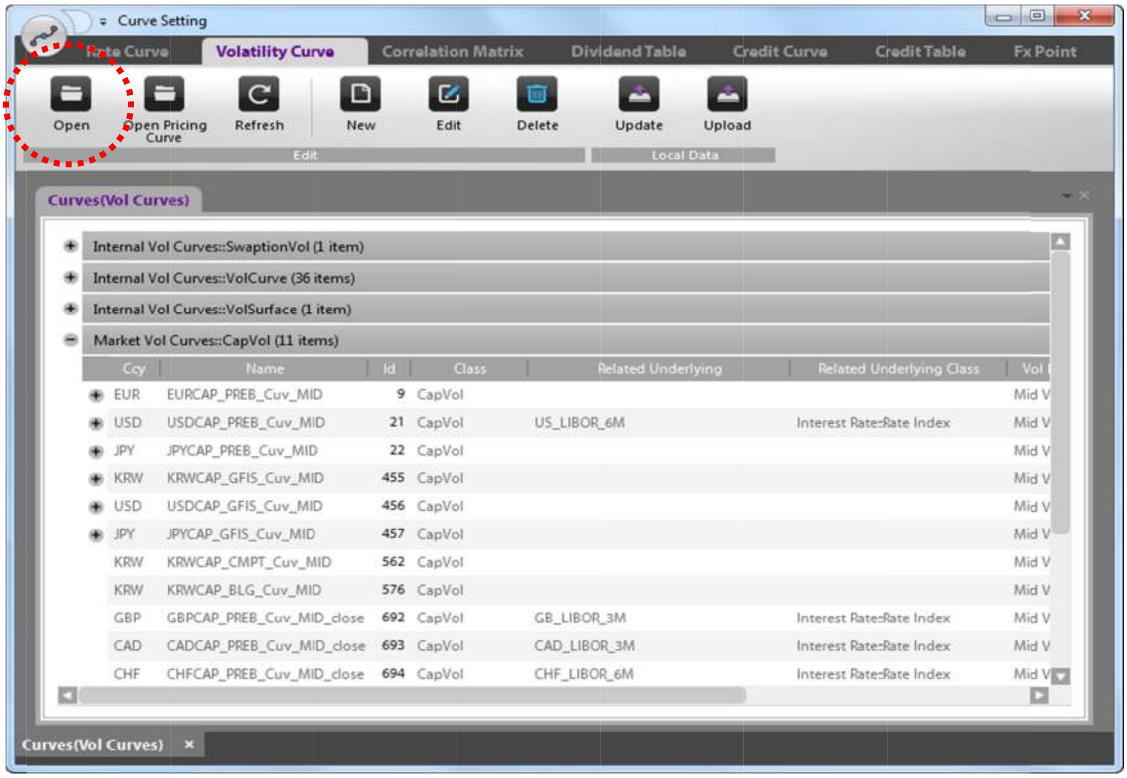
7. Input market data values and click UPDATE. The window will be refreshed to show the update information on the log of recent updates.

8. This form allows the updating of market data of multiple user-set Rate Curves.

4.3.2 Volatility Curve

4.3.2.1 Volatility Curve - Open

1. Select [Volatility Curve] ▶ [Open]

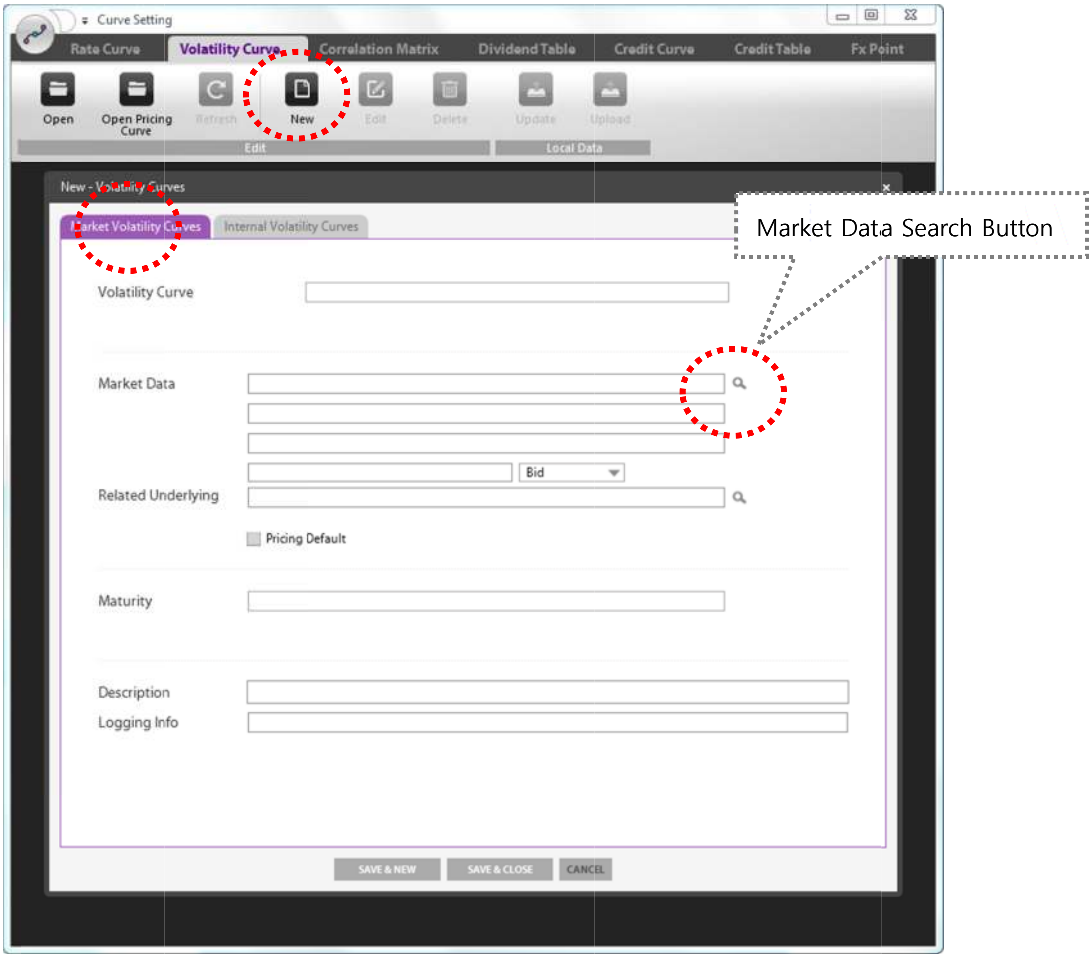


Cell label	Description
Ccy	Currency Code
Name	User Curve Name
ID	System-generated Code ID
Class	Curve Class Hierarchy
Related Underlying	Volatility-Related Underlying Asset
Related Underlying Class	Volatility-Related Underlying Asset Class Hierarchy
Vol Data Sect	Volatility Data Sectioning
Owner	User ID linked to curve registration
Source	Source of Market Data
MDcode	Market Data Code
Descriptions	Reference

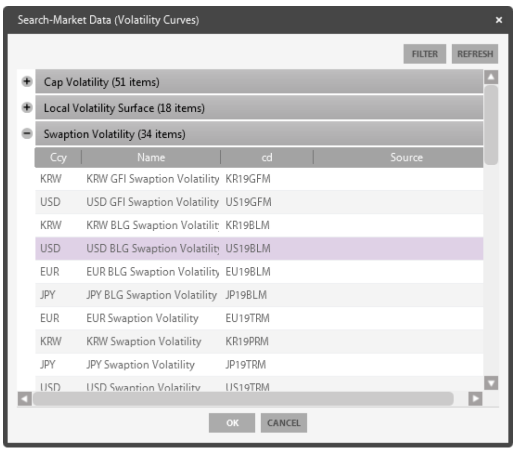
2. To view curve details, select desired curve, right-click and select Edit.

4.3.2.2 Volatility Curve - Registration

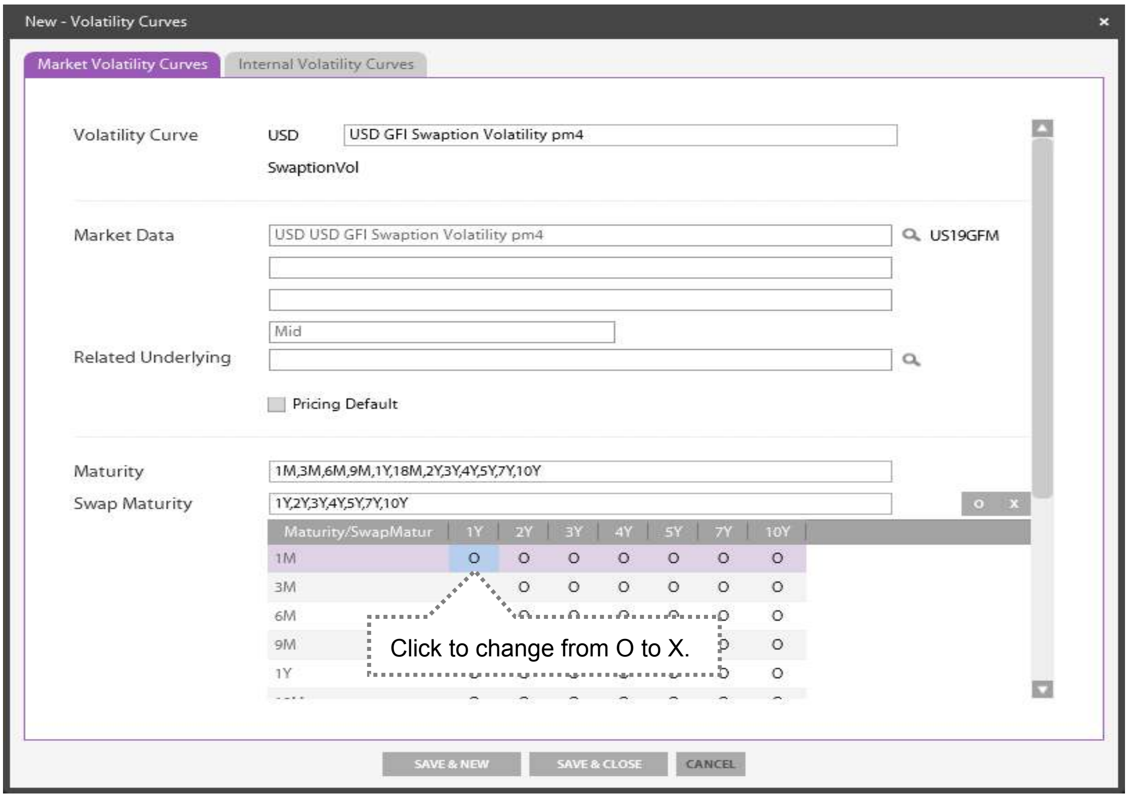
1. The Volatility Curve registration method is different for the Market Volatility Curve and the Internal Volatility Curve.
2. The Market Volatility Curve registration requires the user to select market curve data.



3. Click the magnifying glass (search button) beside the Market Data field to select the volatility curve.

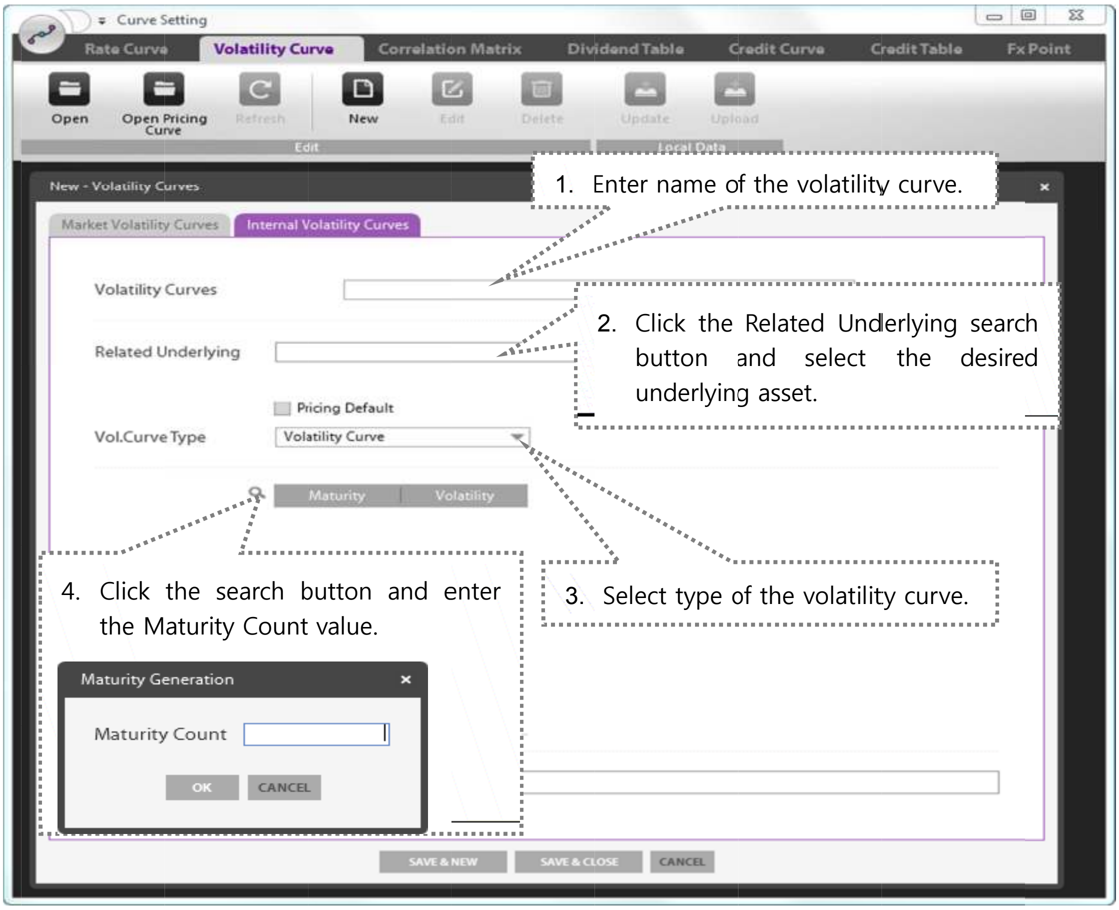


4. The selected Market Data Curve information will automatically appear in the Market Data field.
5. Select/input required details of the curve to be registered.

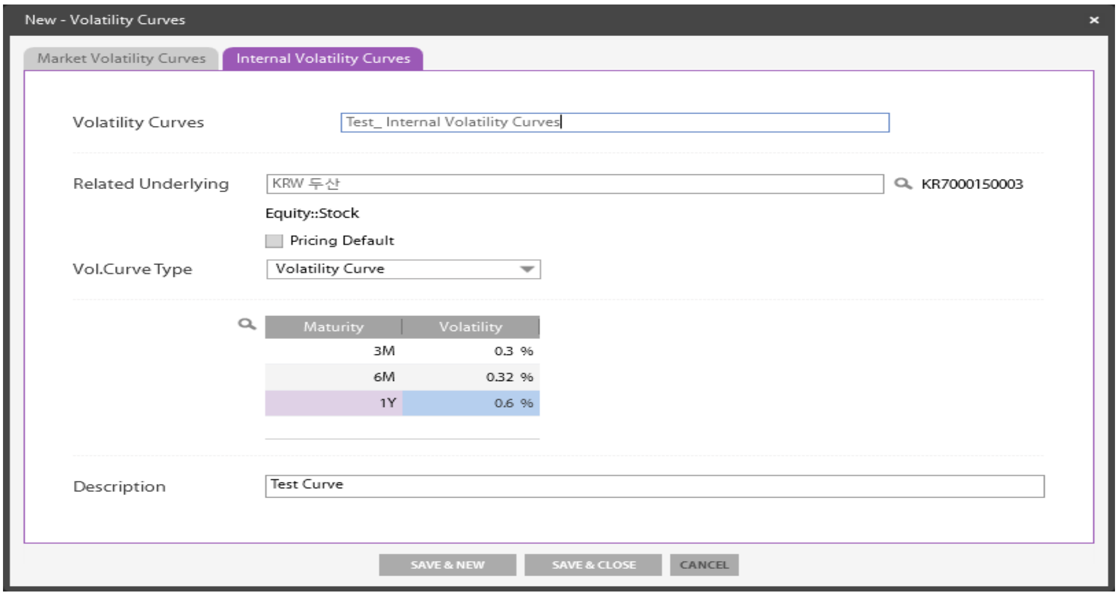


Field	Description
Volatility Curve	Filled in automatically with Market Data selection, may be manually revised by user.
Market Data	Click the search button to select curve to be registered.
Maturity	Maturity information filled in automatically with Market Data selection.
Swap Maturity	Select the Day Count method to apply to the bond coupon/yield rate calculation.
Description	Reference

6. After entering all inputs, click SAVE to complete the Market Volatility Curve registration.
7. To register the Internal Volatility Curve, click the Internal Volatility Curve tab. The user must manually enter the curve data.



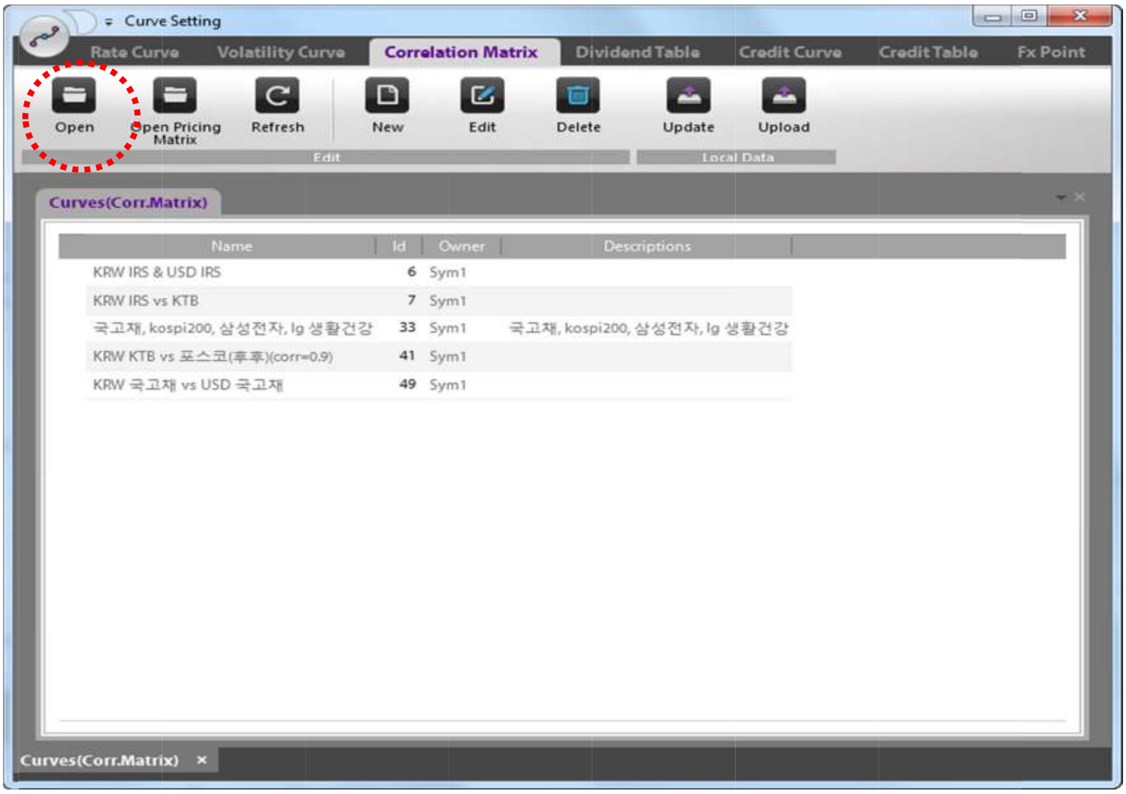
8. After entering all inputs, click SAVE to complete the Internal Volatility Curve registration.



4.3.3 Correlation Matrix

4.3.3.1 Correlation Matrix - Open

1. Select [Correlation Matrix] ▶ [Open]

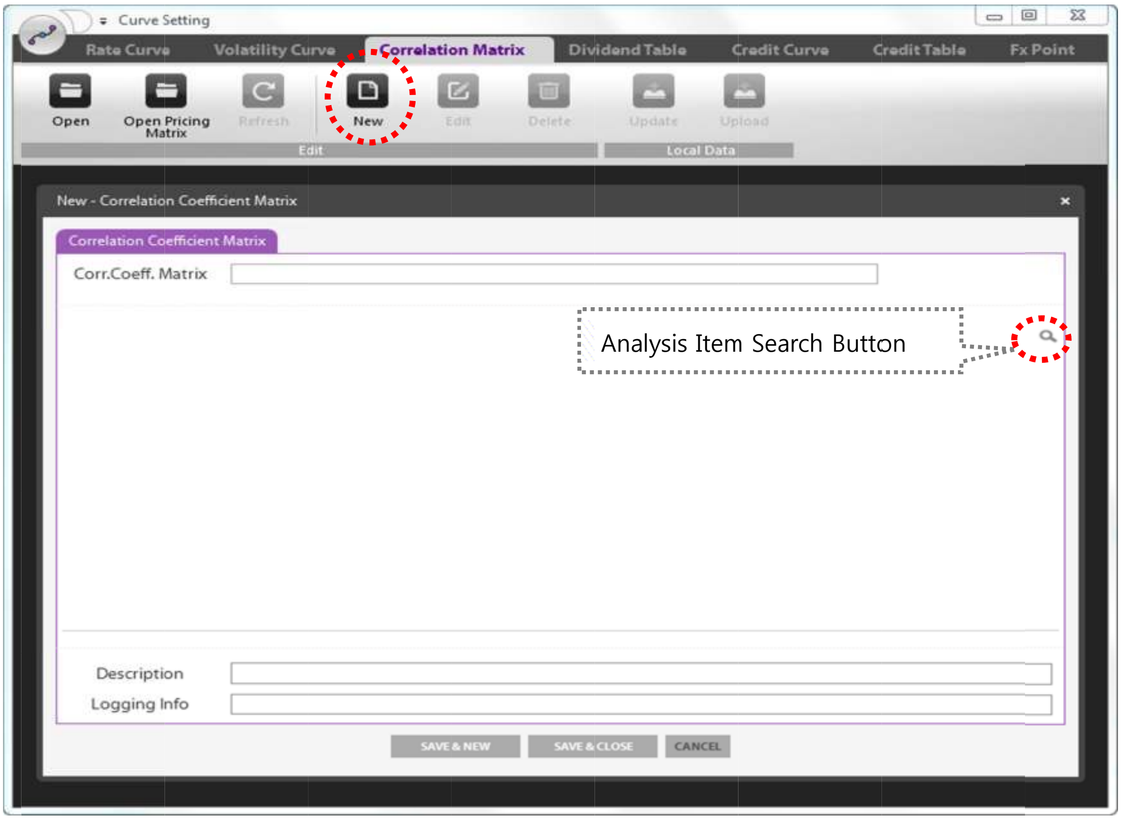


Cell Label	Description
Name	User Curve Name
ID	System-generated Code ID
Owner	User ID linked to curve registration
Descriptions	참조 Reference

2. To view curve details, select desired curve, right-click and select Edit.

4.3.3.2 Correlation Matrix - Registration

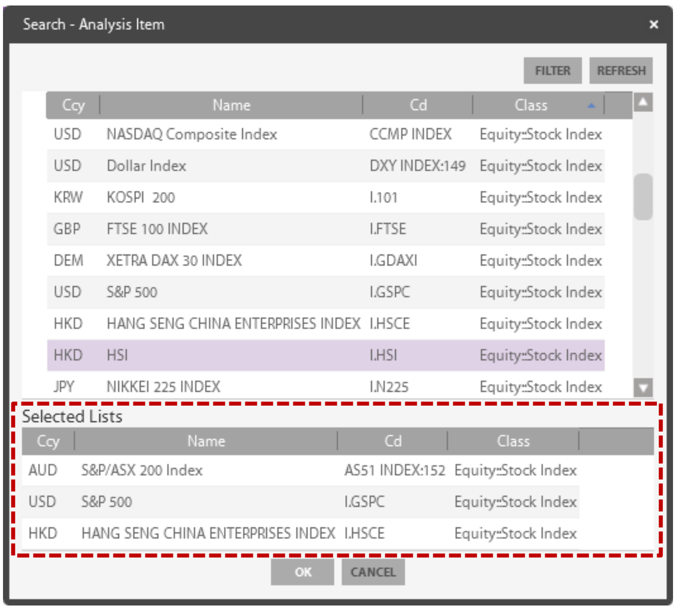
1. Select [Correlation Matrix] ▶ [New]



2. Enter the name of the Correlation Coefficient Matrix to register.

3. Click the magnifying glass (search button) to select the desired Analysis Items.

4. Select two or more Analysis Items and click OK.

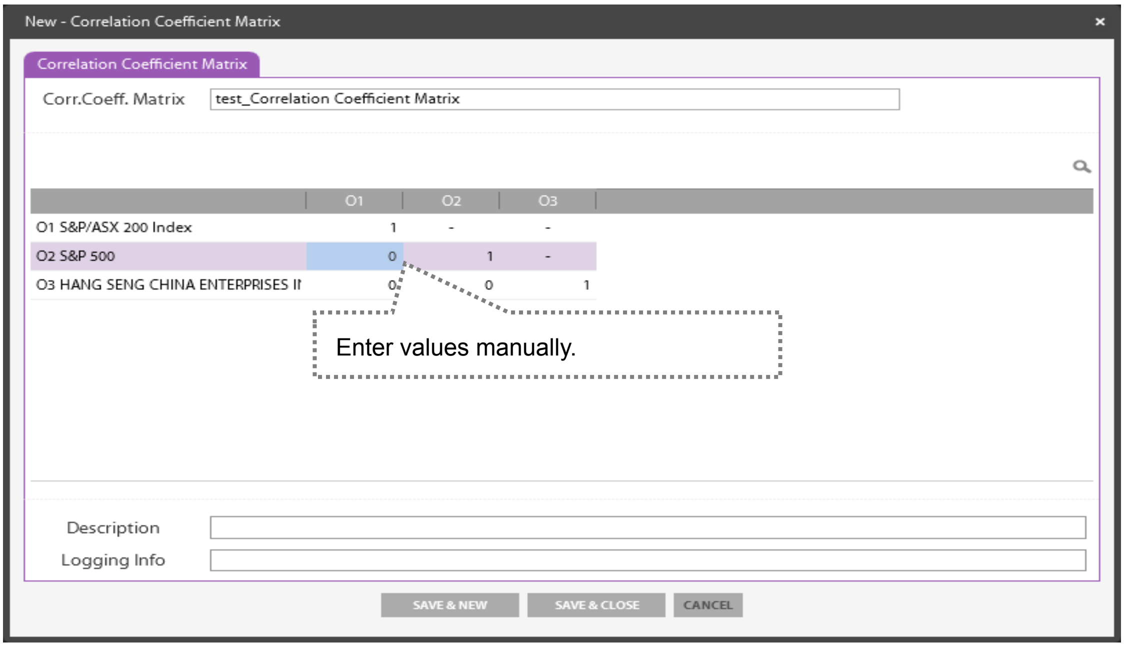


Ccy	Name	Cd	Class
USD	NASDAQ Composite Index	CCMP INDEX	Equity:Stock Index
USD	Dollar Index	DXY INDEX:149	Equity:Stock Index
KRW	KOSPI 200	I.101	Equity:Stock Index
GBP	FTSE 100 INDEX	I.FTSE	Equity:Stock Index
DEM	XETRA DAX 30 INDEX	I.GDAXI	Equity:Stock Index
USD	S&P 500	I.GSPC	Equity:Stock Index
HKD	HANG SENG CHINA ENTERPRISES INDEX	I.HSCE	Equity:Stock Index
HKD	HSI	I.HSI	Equity:Stock Index
JPY	NIKKEI 225 INDEX	I.N225	Equity:Stock Index

Selected Lists

Ccy	Name	Cd	Class
AUD	S&P/ASX 200 Index	AS51 INDEX:152	Equity:Stock Index
USD	S&P 500	I.GSPC	Equity:Stock Index
HKD	HANG SENG CHINA ENTERPRISES INDEX	I.HSCE	Equity:Stock Index

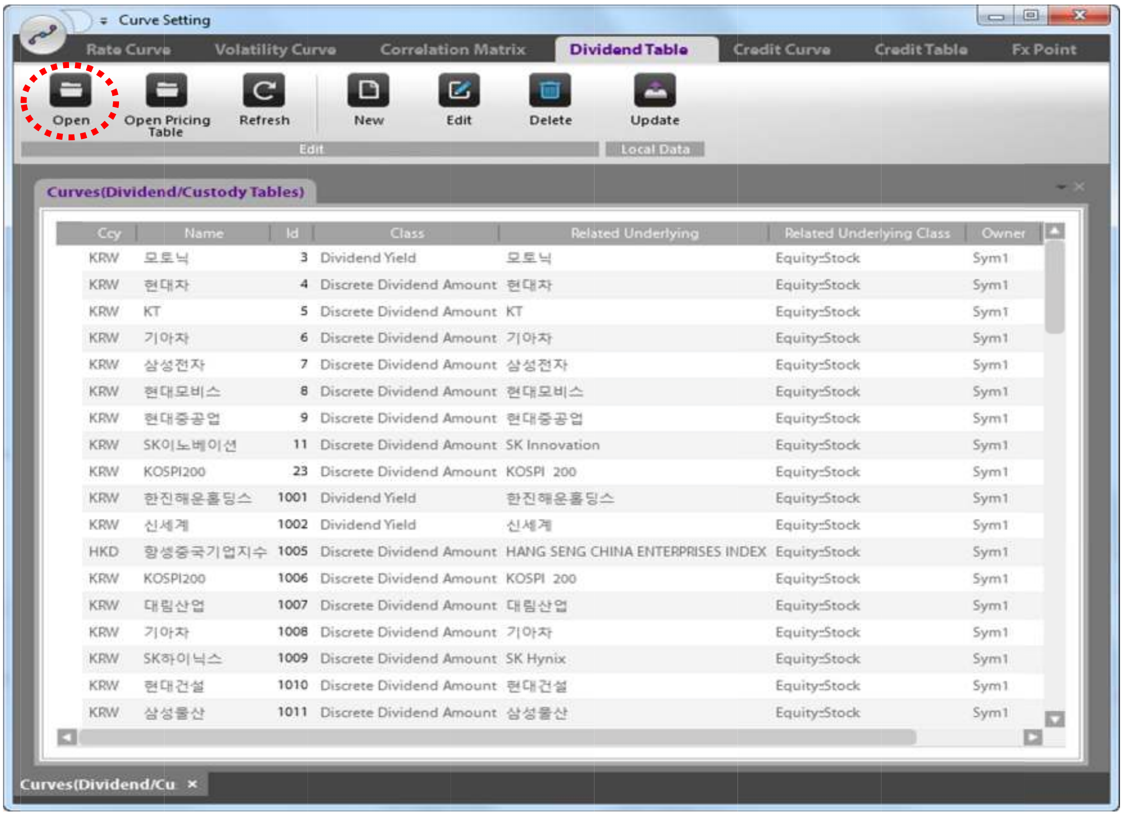
5. Enter correlation coefficient values and click SAVE to complete the Correlation Coefficient Matrix registration.



4.3.4 Dividend Table & Custody Cost Table

4.3.4.1 Dividend 및 Custody Cost Table - Open

1. Select [Dividend Table] ▶ [Open]

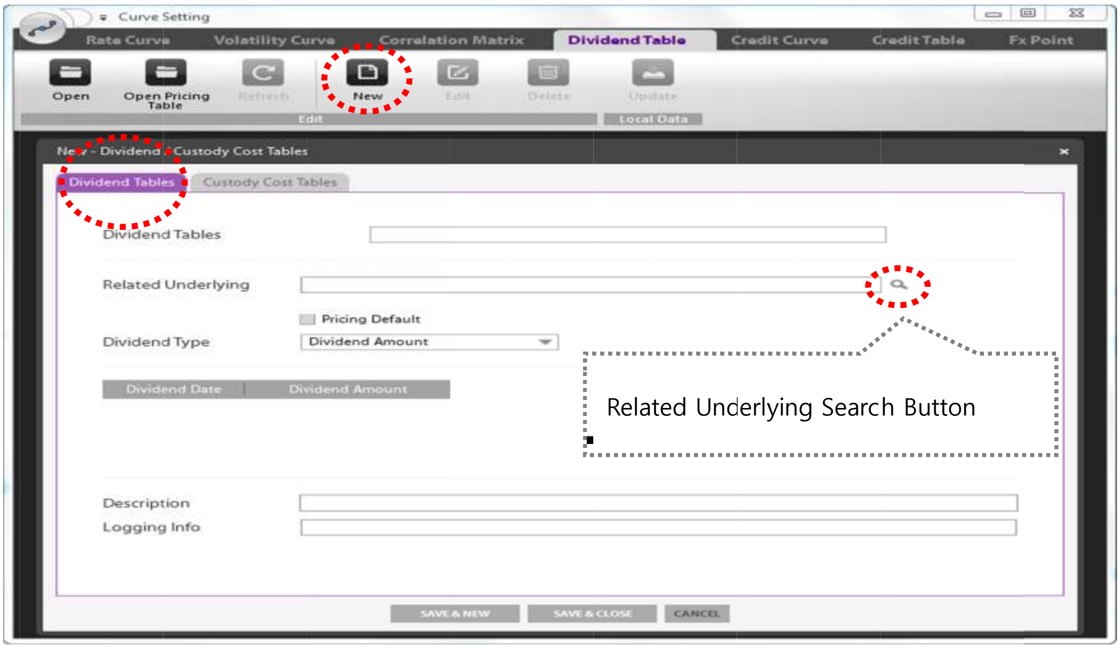


Cell label	Description
Ccy	Currency Code
Name	User Dividend Table Name & User Custody Cost Table Name
ID	System-generated Code ID
Class	Dividend & Custody Cost Class Hierarchy
Related Underlying	Dividend/Carry Cost-Related Underlying Asset
Related Underlying Class	Dividend/Carry Cost-Related Underlying Asset Class Hierarchy
Owner	User ID linked to registration
Descriptions	Reference

2. To view details, select desired market data, right-click and select Edit.

4.3.4.2 Dividend Table - Registration

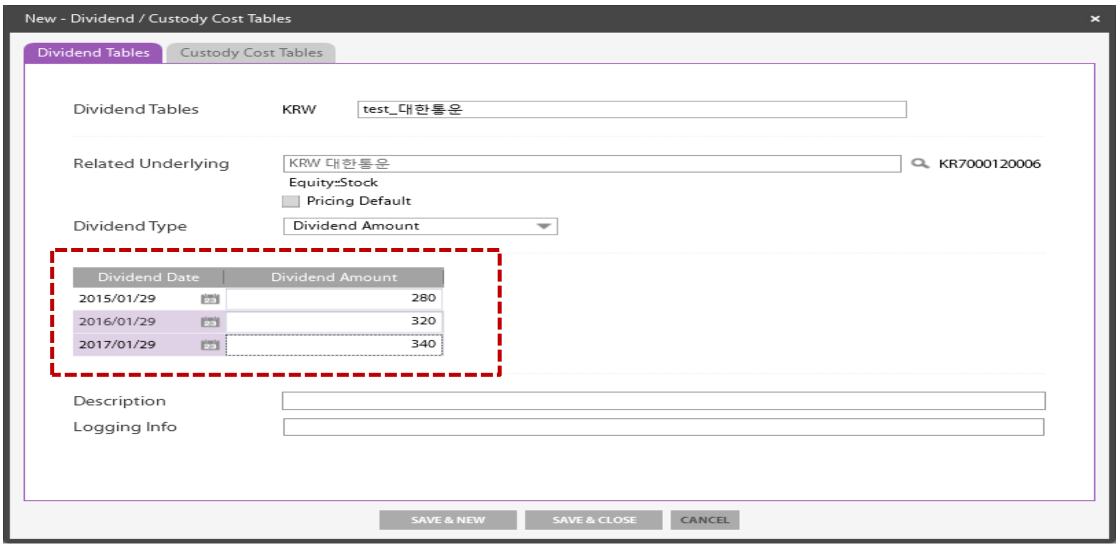
1. Select [Dividend Table] ▶ [New] ▶ [Dividend Table]



2. Enter the User Dividend Table Name and click the magnifying glass (search button) to select the related underlying asset.

3. Select Dividend Type: Dividend Amount/Rate/Yield, Discrete Dividend Amount.

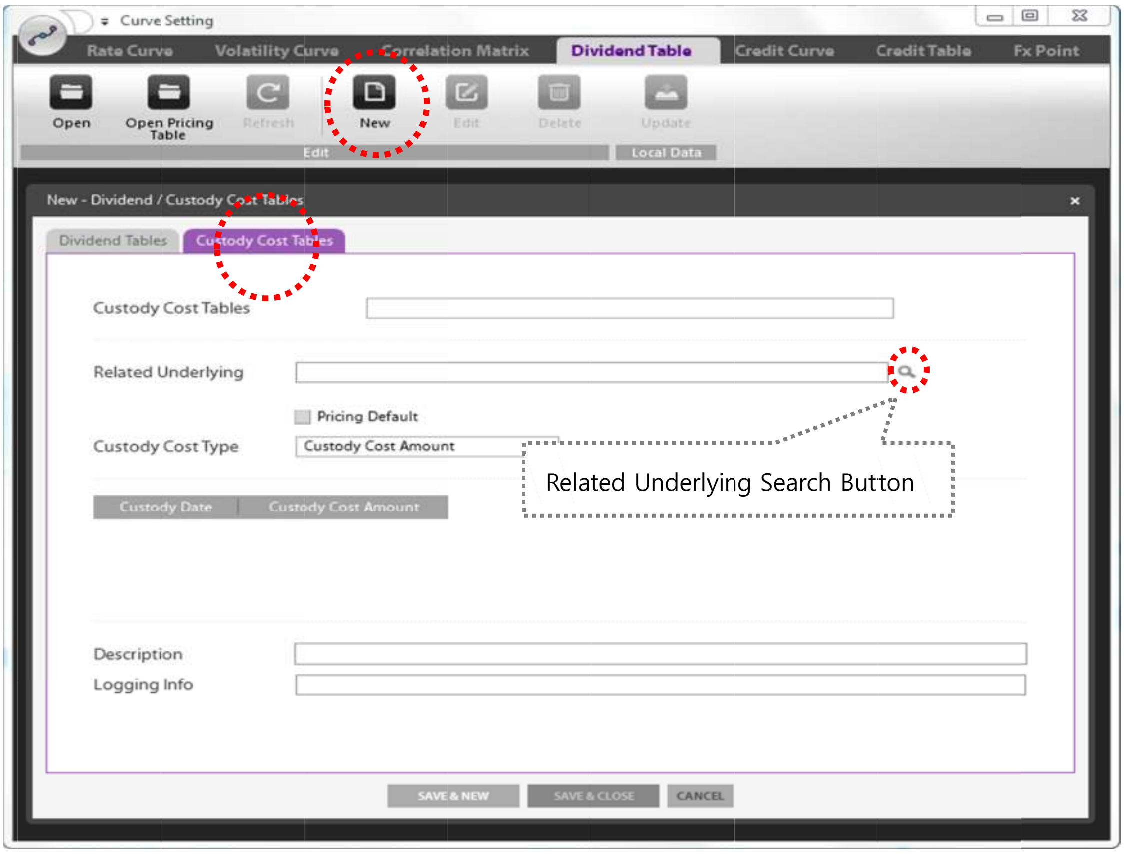
4. Right-click the blank section under the labelled cells and select Add Row. Enter the date and the Amount/Rate/Yield values.



5. Click SAVE to complete the Dividend Table registration.

4.3.4.3 Custody Cost Table - Registration

1. Select [Dividend Table] ▶ [New] ▶ [Custody Cost Table]

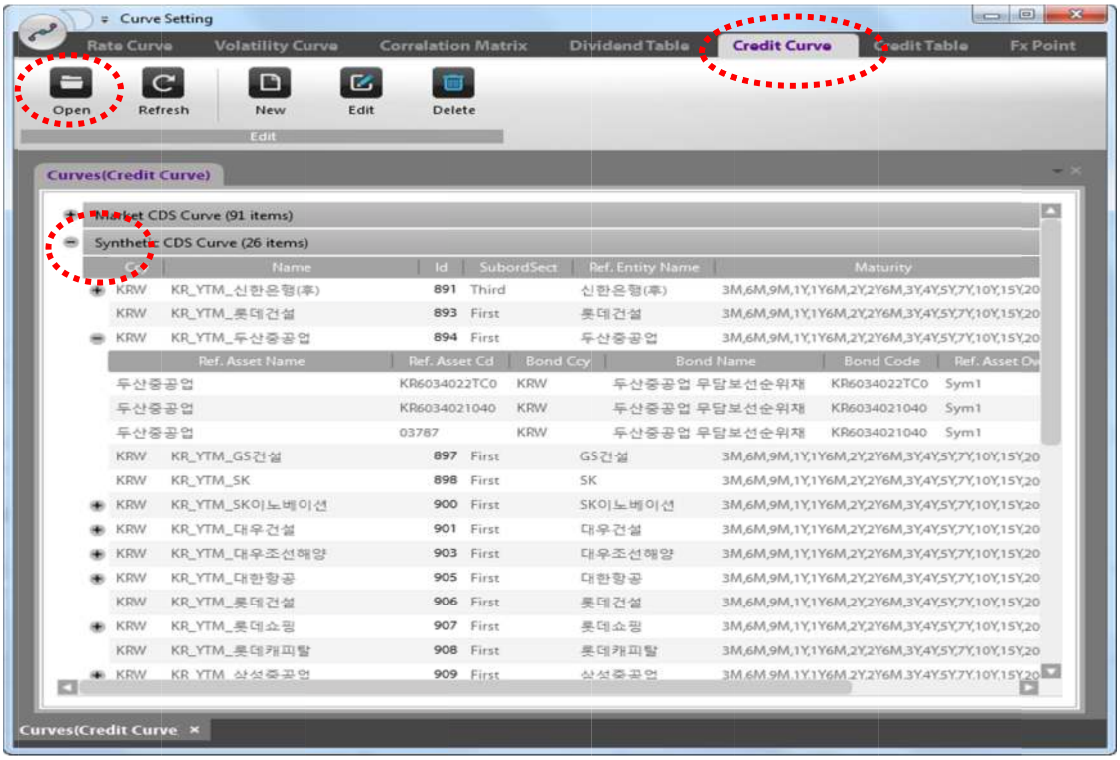


2. Enter the User Custody Cost Tables Name and click the magnifying glass (search button) to select the related underlying asset.
3. Select Custody Cost Type: Custody Cost Amount/Rate, Discrete Custody Cost Amount
4. Right-click the blank section under the labelled cells and select Add Row. Enter the date and the Amount/Rate values.
5. Click SAVE to complete the Custody Cost Table registration.

4.3.5 Credit Curve

4.3.5.1 Credit Curve - Open

1. Select [Credit Curve] ▶ [Open]

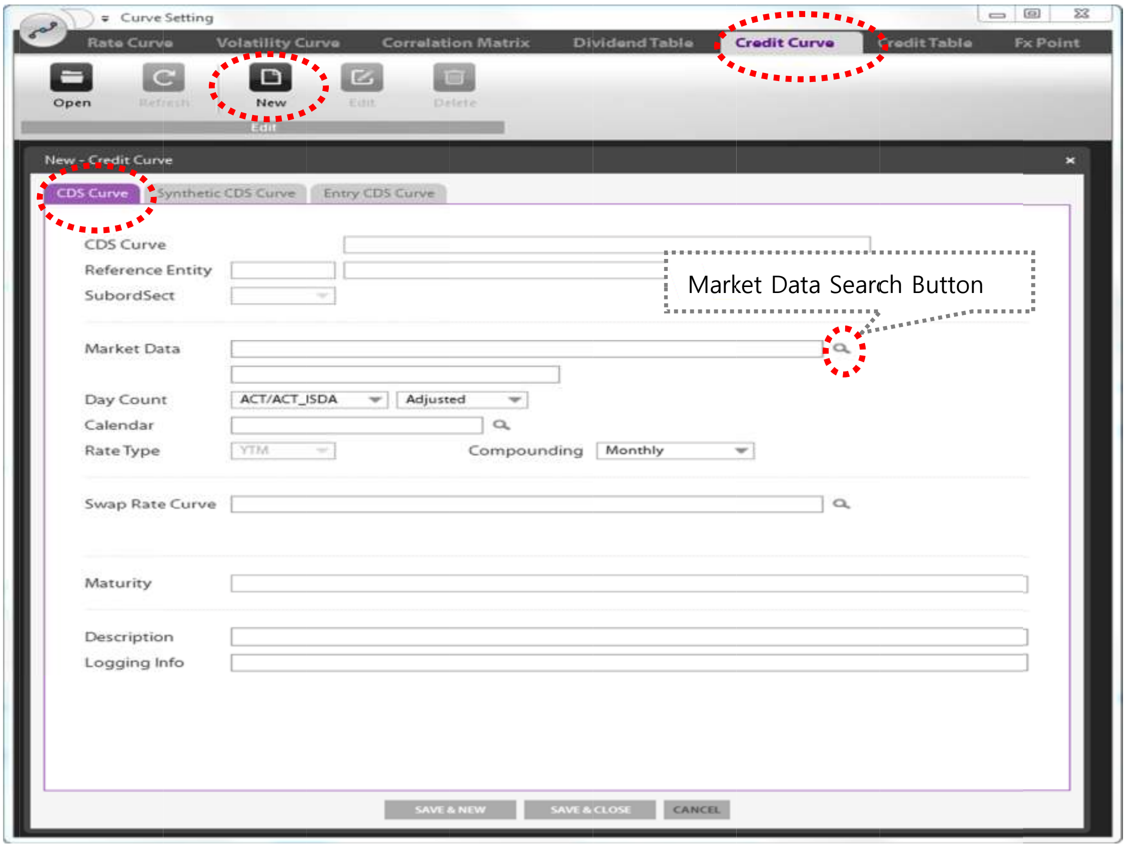


Cell label	Description
Ccy	Currency Code
Name	User Curve Name
ID	System-generated Code ID
Subord Sect	Rank Sectioning
Ref.Entity Name	Issuer of the Bond
Maturity	Maturity
Recovery Rate	Recovery Rate
Owner	User ID linked to registration
Ref.Asset Name	Name of the Reference Asset
Ref.Asset Cd	Code ID of the Reference Asset
Bond Ccy	Bond Currency
Bond Name	Name of the Bond
Bond Code	Code ID of the Bond
Ref.Asset Own	User ID linked to the Reference Asset
Descriptions	Reference

2. To view curve details, right-click the desired curve and select Edit.

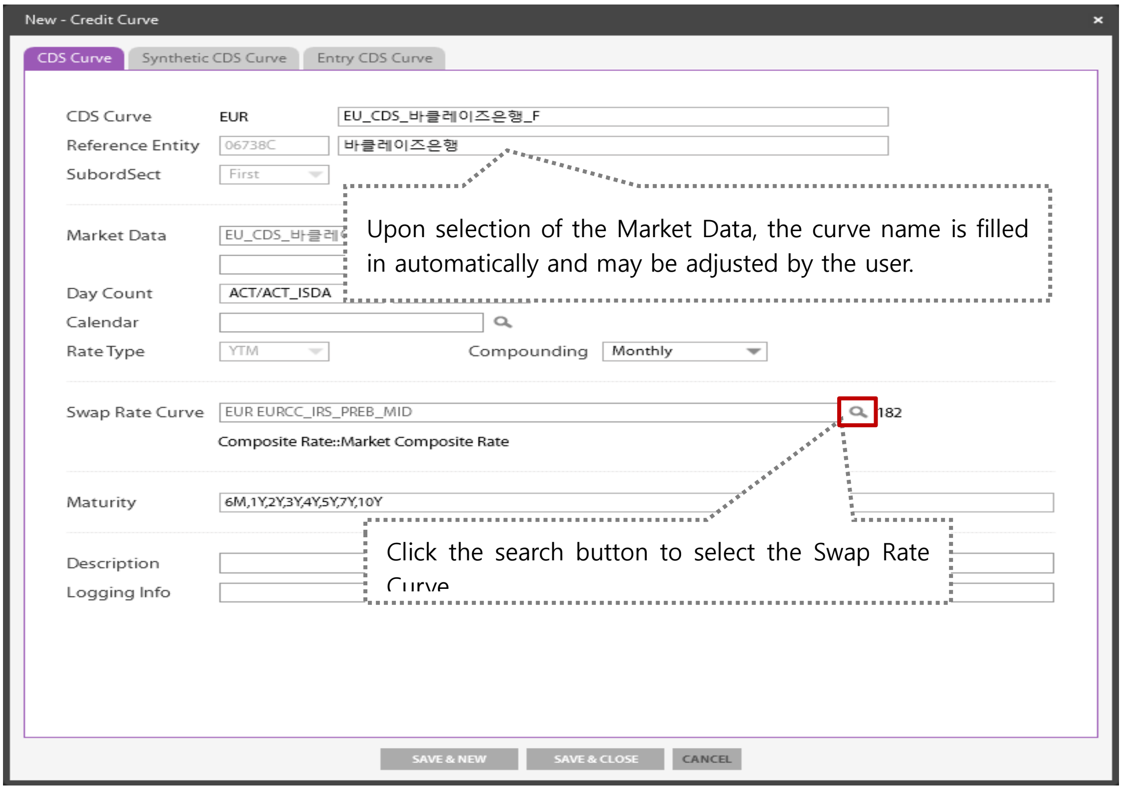
4.3.5.2 CDS Curve - Registration

1. Select the Market Data Credit Spread Curve to register the CDS Curve.
2. Select [Credit Curve] ▶ [New] ▶ [CDS Curve]



3. Click the magnifying glass (search button) beside the Market Data field to select the CDS Curve.
4. Basic details of the selected Market Data Curve such as the CDS Curve Name, Reference Entity, SubordSect and Maturity are filled in automatically.

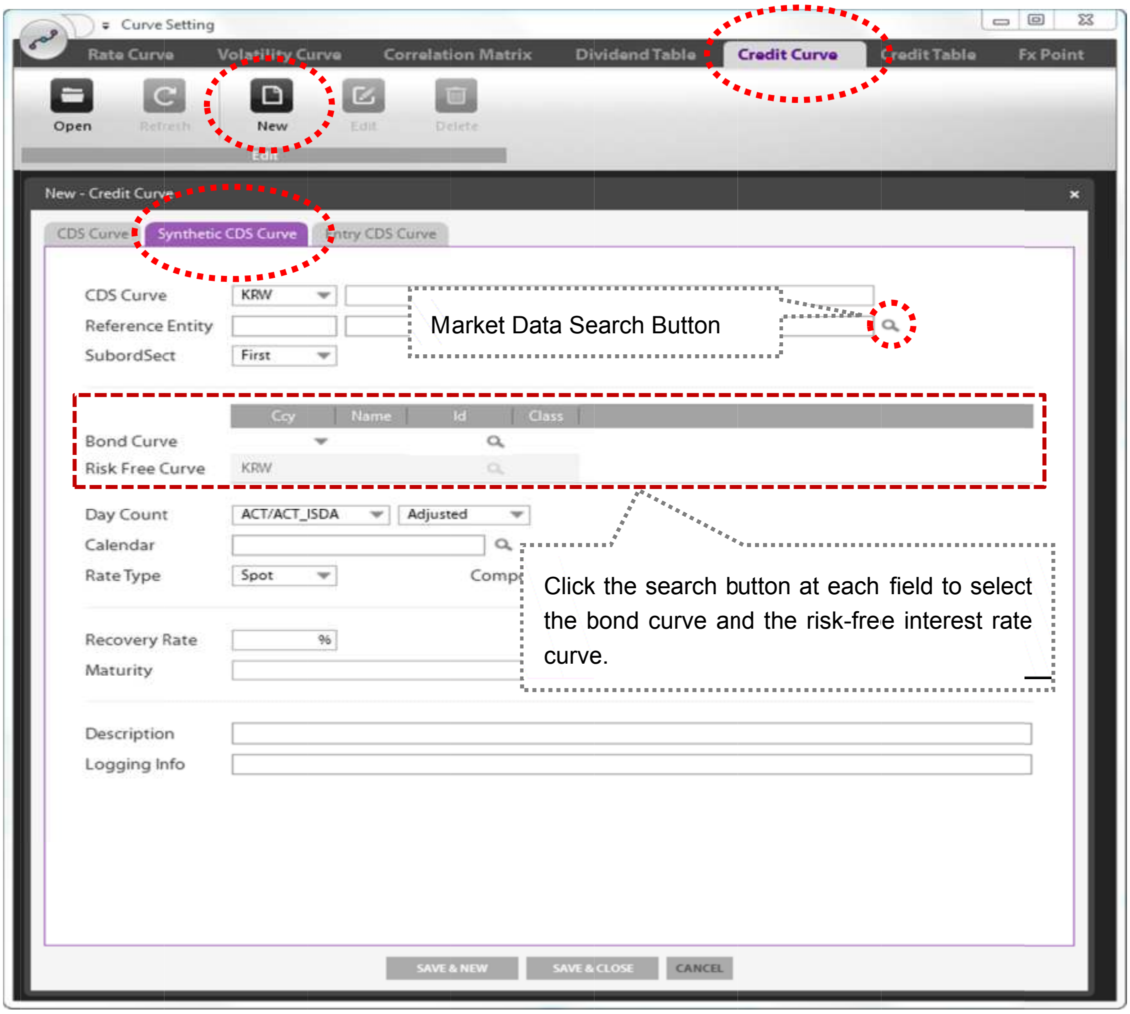
5. Select/input required curved details.



6. Click SAVE to complete the CDS Curve registration.

4.3.5.3 Synthetic CDS Curve - Registration

1. The Synthetic CDS Curve is the registration of a credit spread curve using the risk-free interest rate curve.
2. Select [Credit Curve] ▶ [New] ▶ [Synthetic CDS Curve]
3. Click the magnifying glass (search button) to select the Reference Entity with which to generate the credit spread curve.



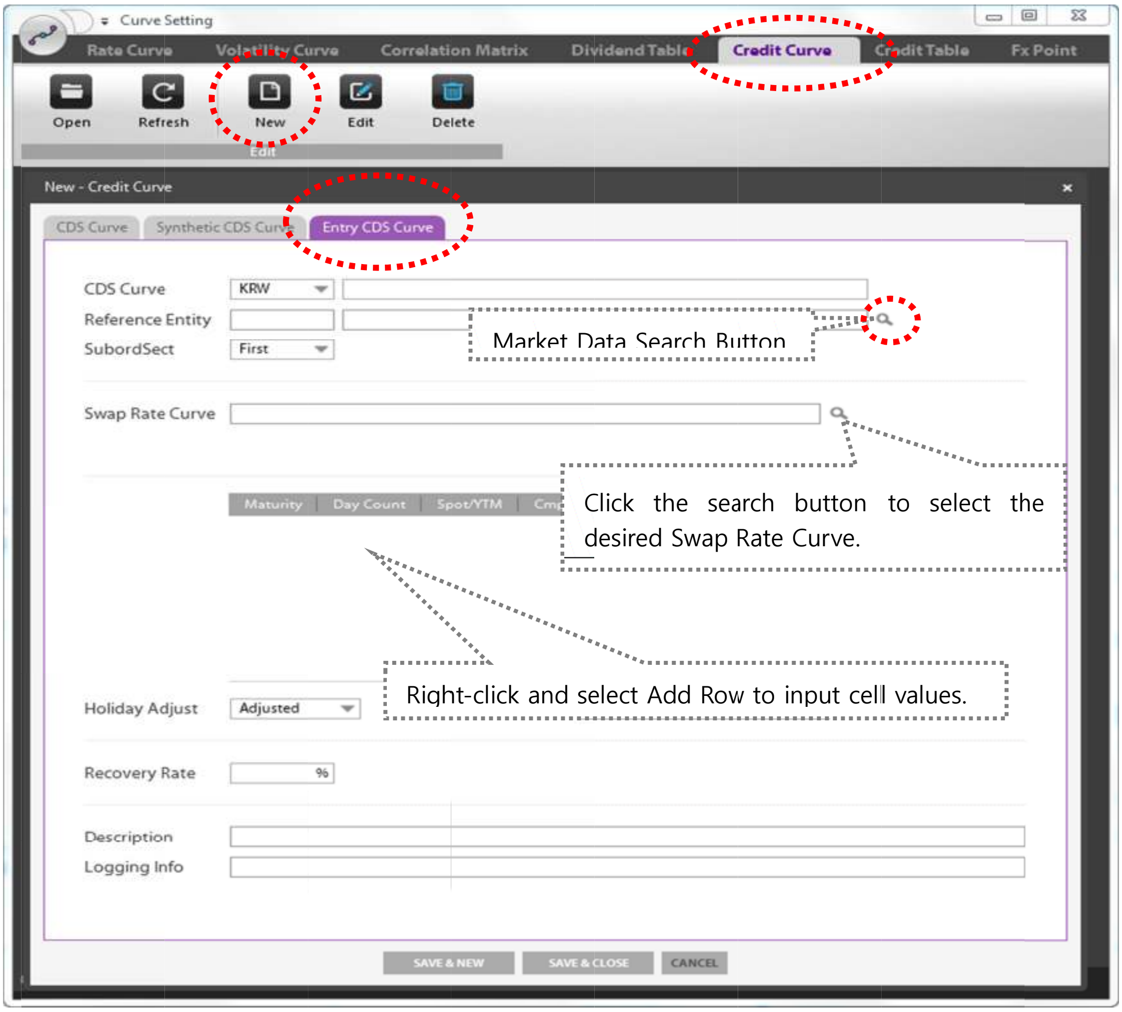
4. Select/input required details of the curve to be registered.
5. Click SAVE to complete the CDS Curve registration.

4.3.5.4 Entry CDS Curve - Registration

1. The Entry CDS Curve is composed of user-set credit spreads. As a result, manual updating of rates are required.

2. Select [Credit Curve] ▶ [New] ▶ [Entry CDS Curve]

3. Click the magnifying glass (search button) to select the Reference Entity with which to generate the credit spread curve.



4. Select/input required details of the curve to be registered.

5. Click SAVE to complete the Entry CDS Curve registration.

4.3.6 Credit Table

- The Credit Table tab manges the open and registration functions of Recovery Rate Tables and the Factor Correlation Coefficient Tables.
- As user instructions for the registration of both tables are the same, below is a demonstration of the Recovery Rate Table registration only.

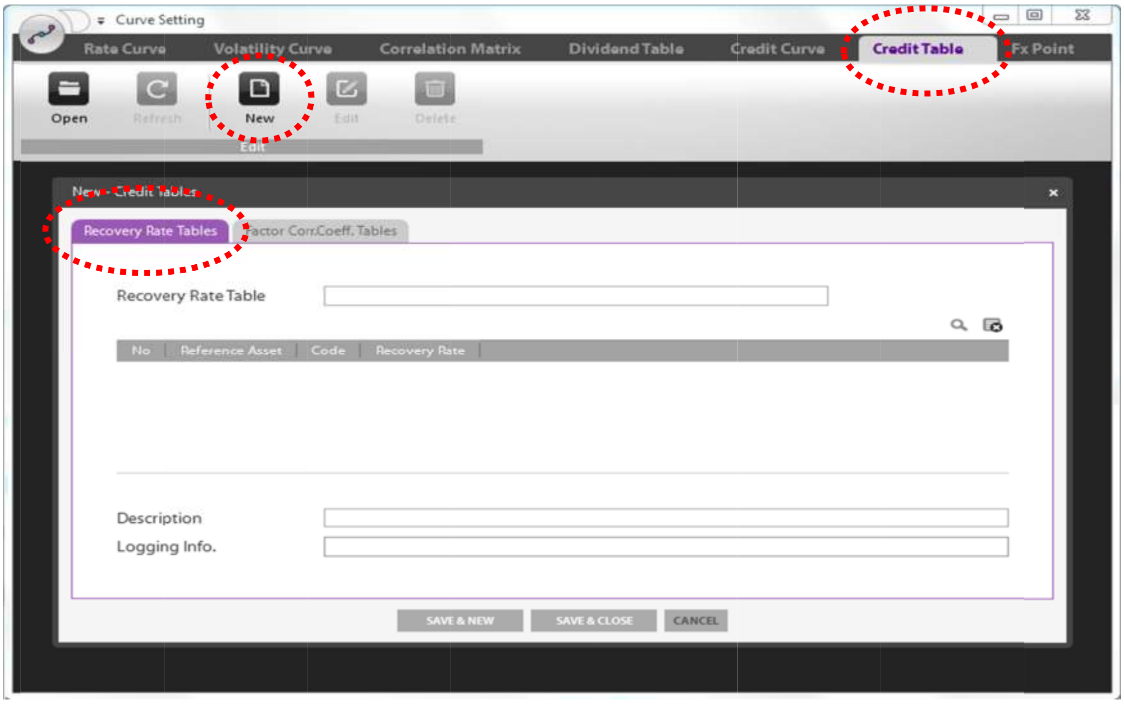
4.3.6.1 Credit Table - Open

1. Select [Credit Table] ▶ [Open]

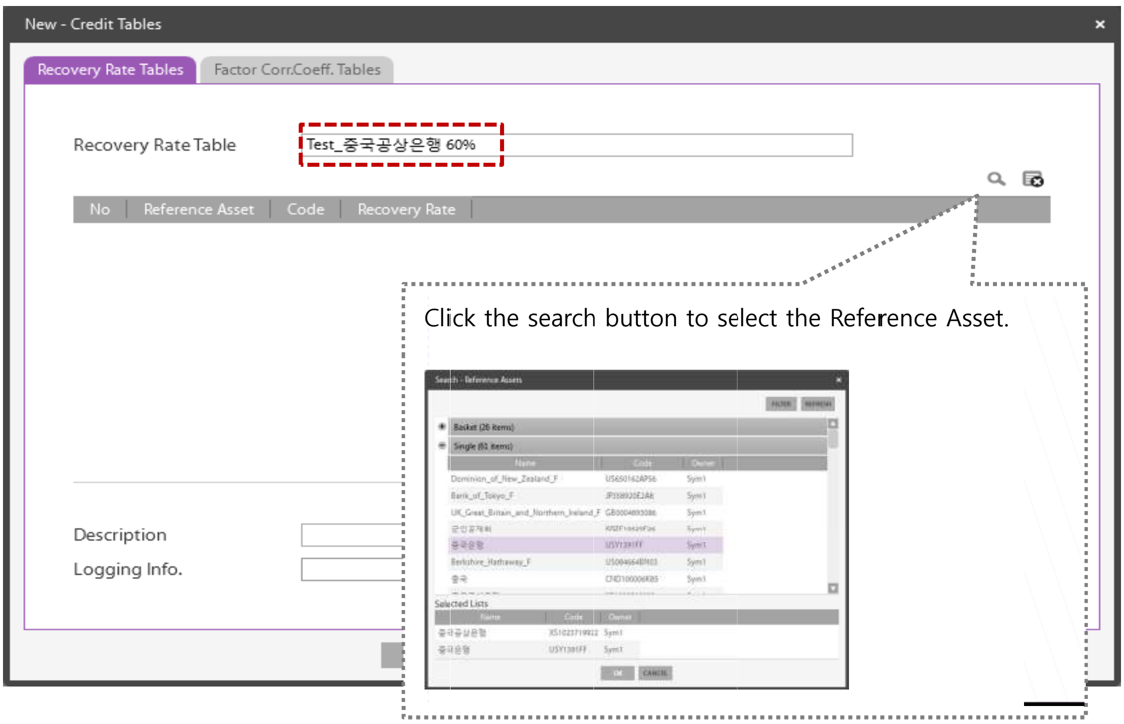
2. To view the details, select the market data, right-click and select Edit.

4.3.6.2 Credit Table - Registration

1. Select [Credit Table] ▶ [New] ▶ [Recovery Rate Table]



2. Enter the User Recovery Table Name and click the magnifying glass (search button) to select the desired underlying asset.



3. Double-click the Recovery Rate cell of the selected Reference Asset to enter the value.

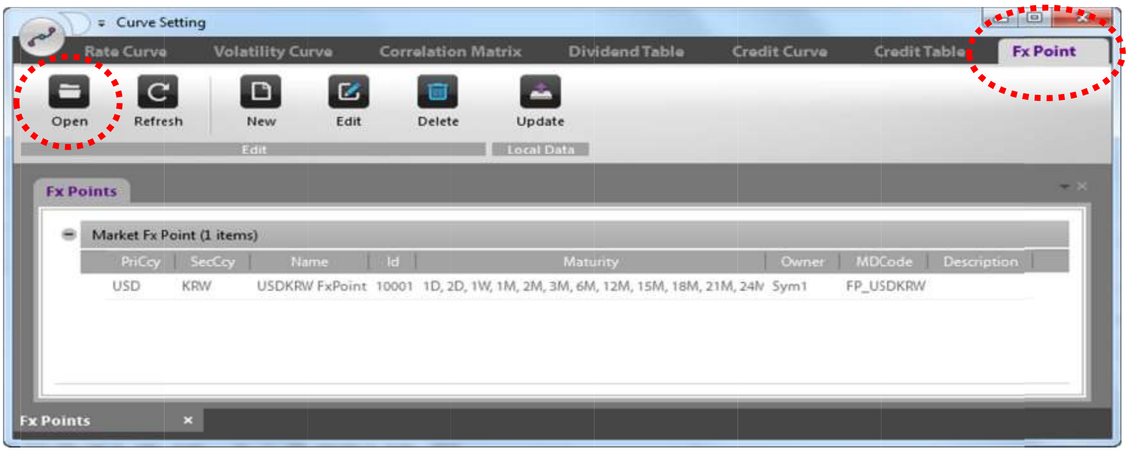
No	Reference Asset	Code	Recovery Rate
1	중국공상은행	XS1023719922	60 %

4. Click SAVE to complete the Credit Table registration.

4.3.7 FX Point

4.3.7.1 FX Point - Open

1. Select [FX Point] ▶ [Open]



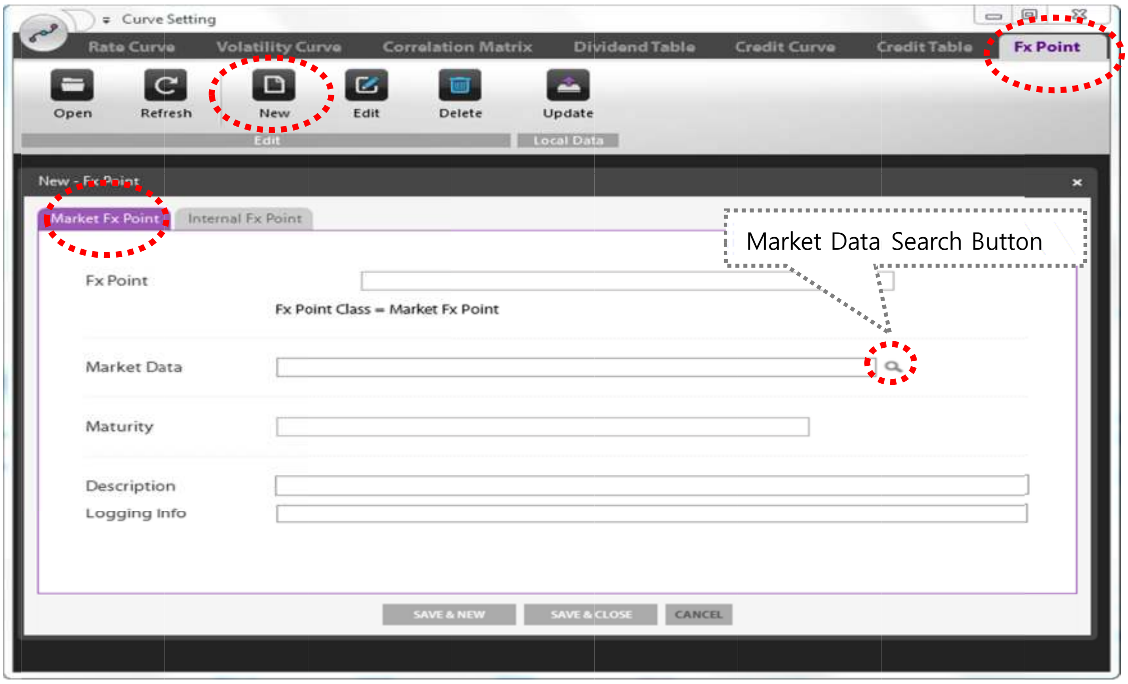
2. To view details, select desired market data, right-click and select Edit.

4.3.7.2 <u>Market FX Point - Registration</u>

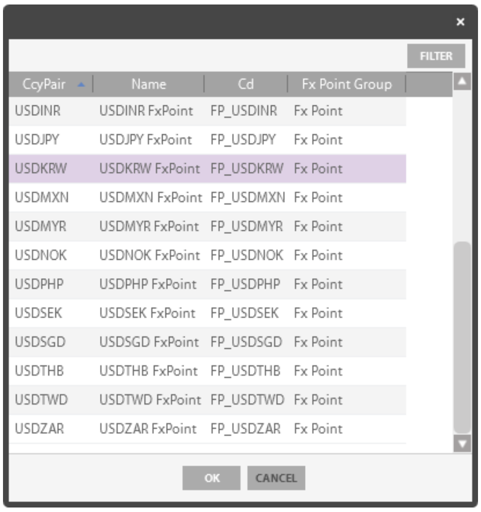
1. Select [FX Point] ▶ [New]

   (Please note: there are two tabs, one for the Market FX Point and the other for the Internal FX point.)

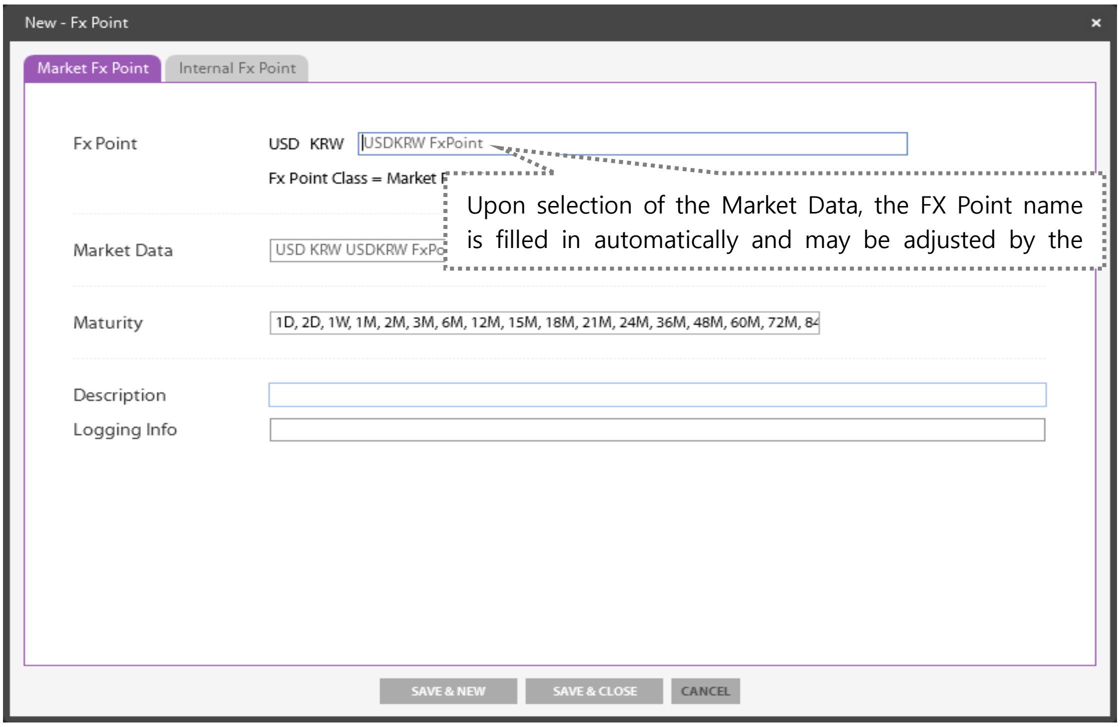
2. As user instructions for the registration of both the FX Points are the same, below is a demonstration of the Market FX Point only.



3. Click the magnifying glass (search button) to select the desired market data.



4. The basic details of the selection including the FX Point name and maturity are automatically filled in.



5. Click SAVE to complete the registration of the Market XF Point.

4.4 Parameter Setting

- Parameter Setting is divided into three parts as outlined in the table below.

Parameter	Description
Pricing Parameter	• Parameter set by the user and applied to Ad-Hoc Pricing
Eval Parameter	• Parameter set only by authorized users • Parameter applied by teams, from the Mark-to-Market Revaluation & Front Office • Parameter applied to Batch Pricing for Batch Jobs
Eval Model	• Pricing Model set only by authorized users • Parameter applied by teams, from the Mark-to-Market Revaluation & Front Office • Parameter applied to Batch Pricing for Batch Jobs

- Manage Parameters applied to Ad-Hoc Pricing and Mark-to-Market Revaluations.
- Manage settings of the Reference Interest Rate, Risk Free Interest Rate, Discount Rate, as well as Credit Spread Curves and Volatility Curves, Surface Correlation and Dividend Tables, applied to valuations.
- Manage parameter settings applied to Algorithms including currencies and Pricing Models.
- For Pricing Parameters that are not defined by the user, the registered Parameter Creations Rule is applied.
- The Base Parameter is generated by the Smart Quant system and the user is not able to register or revise the Base Parameter.
- Pricing Parameter Sets may be registered by the user and applied to Instrument Pricing. The user may revise or delete the sets they have registered.

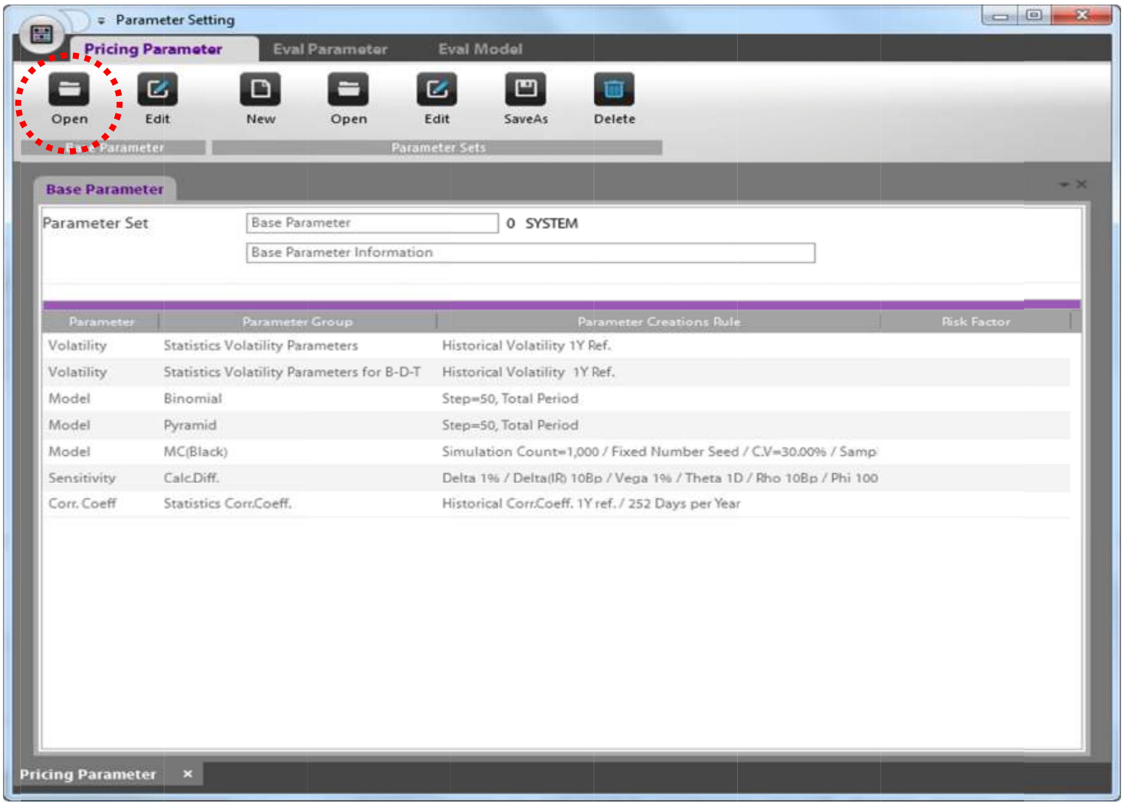
Parameter	Parameter Group	Description
Rate & Currency	Risk Free Rate Curve	Risk-free Interest Rate Curve (usually the national bond curve)
	Reference Rate Curve	Estimated Interest Rate Volatility Curve
	Foreign Exchange Rate	FX or Exchange Rate
	Discount Rate Curve	Discount Rate Curve
Credit	CDS Curve	Credit Spread Curve
	Recovery Rate Tables	Credit-related Recovery Rate Table
	Factor Correlation Coefficient Tables	Non-payment Correlation Coefficient Table of Reference Assets
Volatility	Statistics Volatility Parameters	Statistics Volatility Parameter
	Volatility Curve	Volatility Curve
Dividend / Custody	Dividend Tables	Dividend Tables
	Custody Cost Tables	Carry Costs
Correlation	Statistics Correlation	Statistical Correlation Coefficient Parameter

Coefficient	Coefficient Parameters	
	Correlation Coefficient Matrix	Correlation Coefficient Matrix
Model & Sensitivity	Algorithm Parameters	Algorithm Model Parameter
	H-W Model Parameters	H-W Model Parameter
	Sensitivity Parameters	Sensitivity Yield Reference Parameter

4.4.1 Pricing Parameter

4.4.1.1 Base Parameter - Open

1. Select [Pricing Parameter] ▶ [Base Parameter] ▶ [Open]

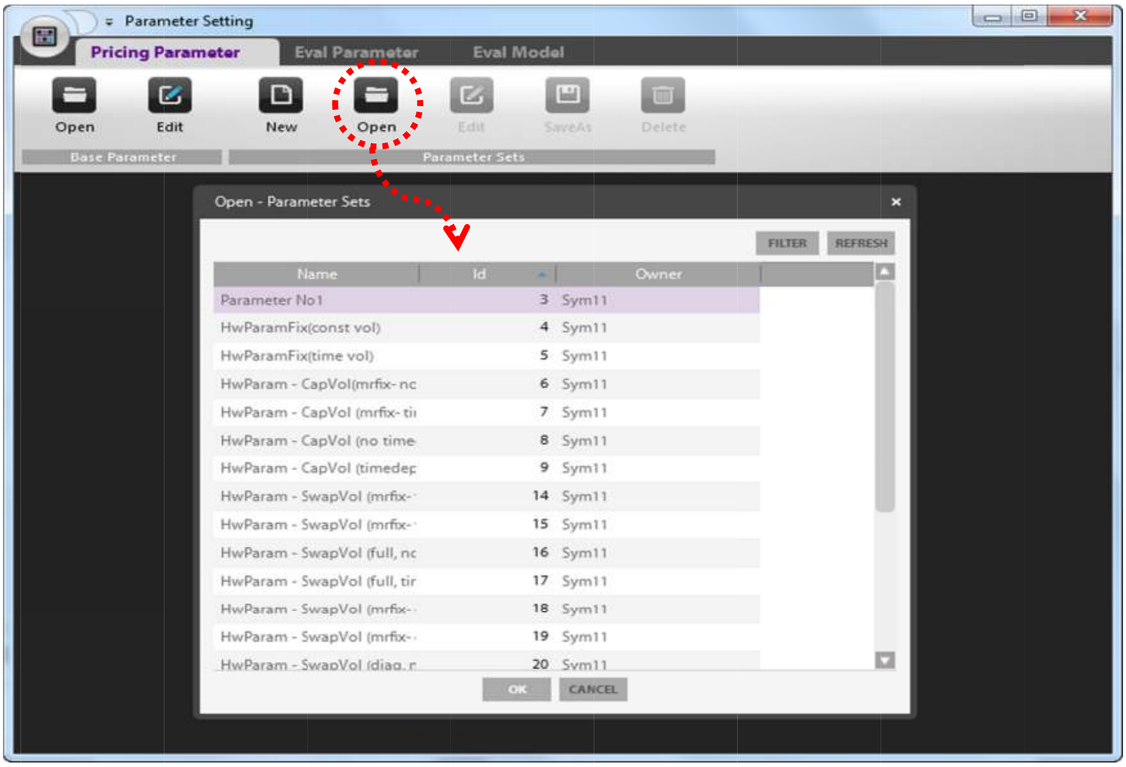


2. The Base parameter cannot be revised by the user.

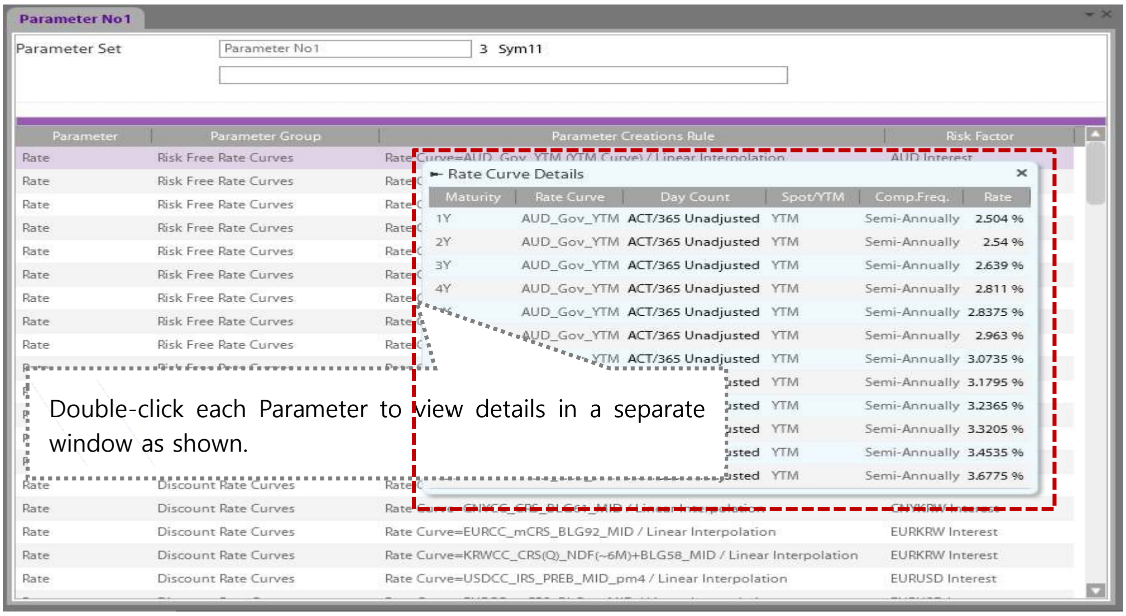
3. For Parameter Sets that the user does not set upon pricing, the SSQ applies the base Parameter Rule to set parameters and process the pricing.

4.4.1.2 Parameter Sets - Open

1. Select [Pricing Parameter] ▶ [Parameter Sets] ▶ [Open]
2. Select the desired Parameter Set from the list.

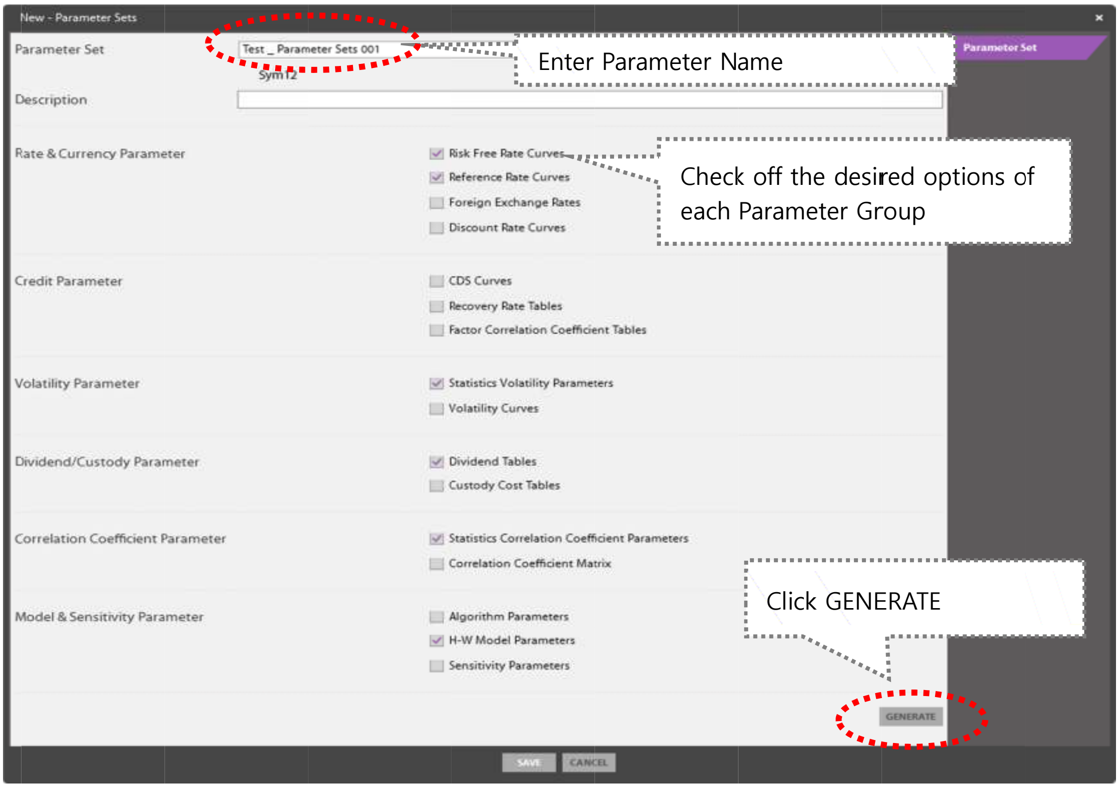


3. Double-click the desired Parameter for details.

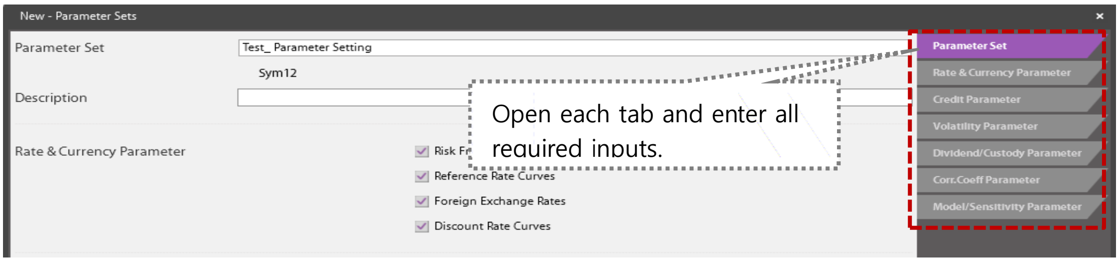


4.4.1.3 Pricing Parameter Sets – Registration (Basic Settings)

1. Select [Pricing Parameter] ▶ [Parameter Sets] ▶ [New]
2. Enter the Parameter Set name. Check off the desired options of each Parameter Group and click GENERATE.



3. Once the GENERATE button is clicked, the tabs for each Parameter Group appears on the right.
4. Open each tab and enter all required inputs in the Parameter Group forms.

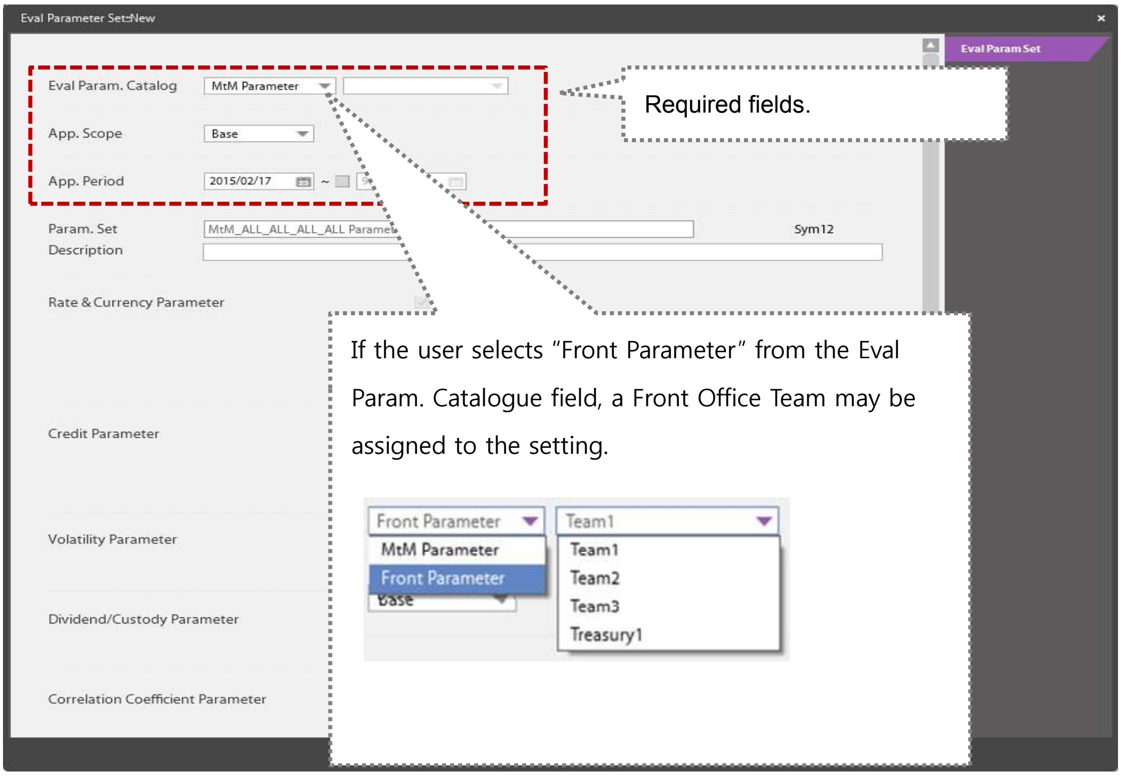


5. Click SAVE to complete the registration of the Parameter Setting.
6. To speed up registrations, use the Save As function. Open a previously registered Parameter Set and click the Save As icon. Adjust the desired fields and click SAVE.

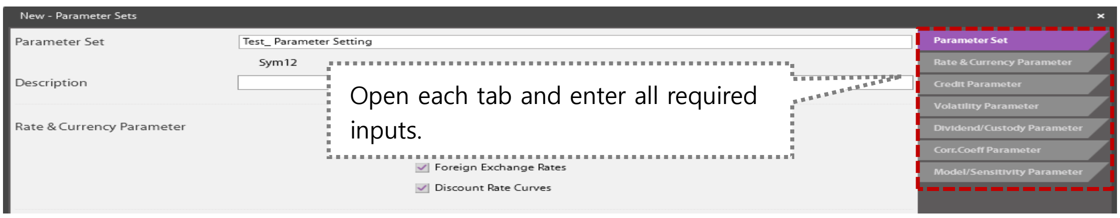
4.4.2 Eval Parameter

4.4.2.1 Eval Parameter Sets – Registration (Basic Setting)

1. To register Eval Parameter Sets, a Parameter set must be opened.
2. Select [Eval Parameter] ▶ [New]
3. Enter all required inputs on the Eval Parameter Set – New form.



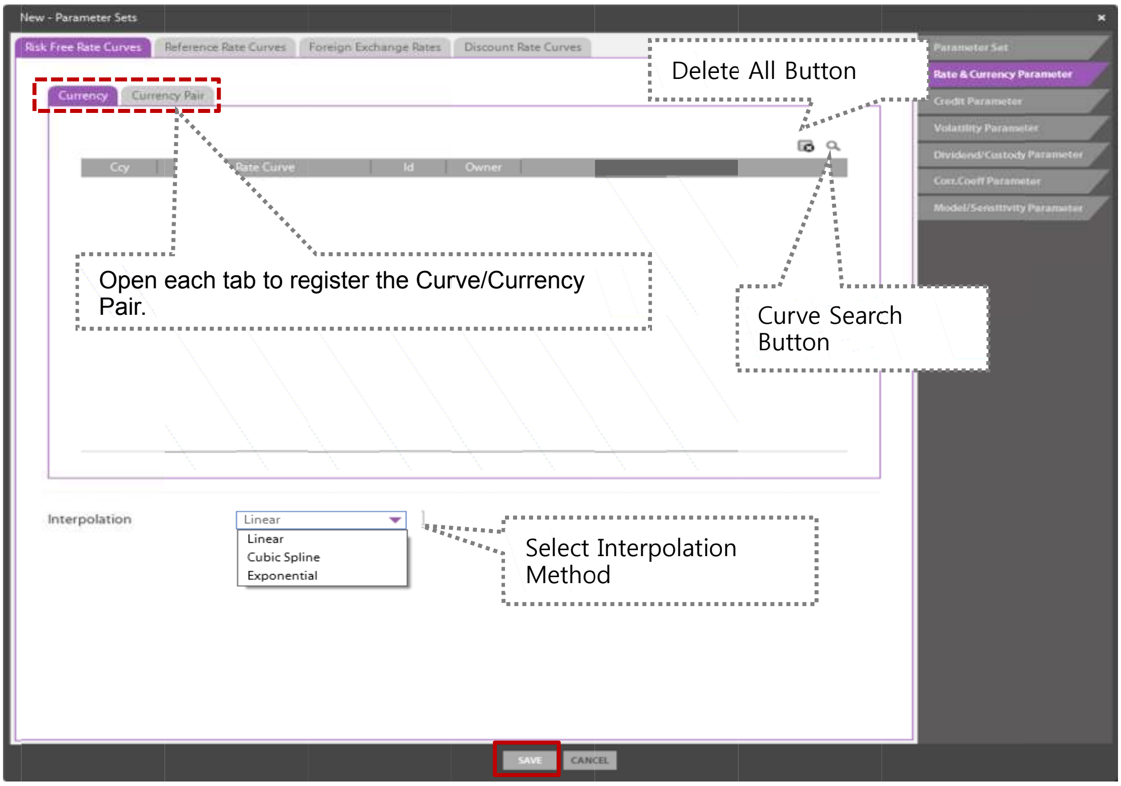
4. In the Parameter Set field, enter the Parameter name. Check off the desired Parameter Groups and click GENERATE.
5. Once the GENERATE button is clicked, the tabs for each Parameter Group appears on the right.
6. Open each tab and enter all required inputs in the Parameter Group forms



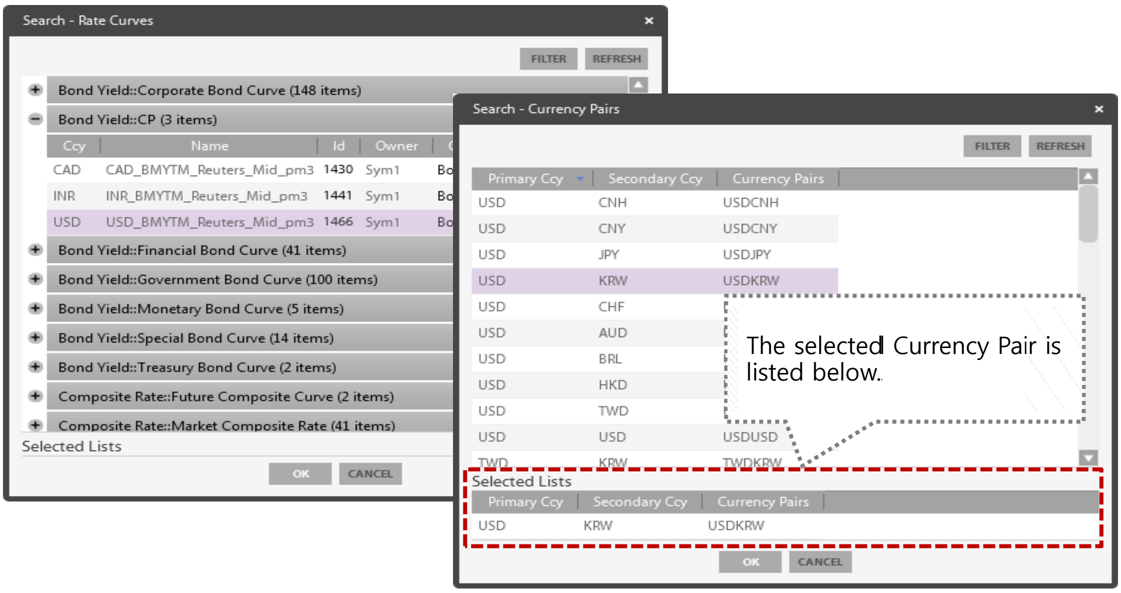
7. Click SAVE to complete the registration of the Parameter Setting.
8. The registration method of each Parameter (tab) is the same as the Pricing Parameter Setting.

4.4.2.2 Rate & Currency Parameter - Registration

1. The Rate & Currency Parameter Setting manages the registration of the Risk Free Rate Curve, Reference Rate Curve, Foreign Exchange Rate Curve and the Discount Rate Curve.

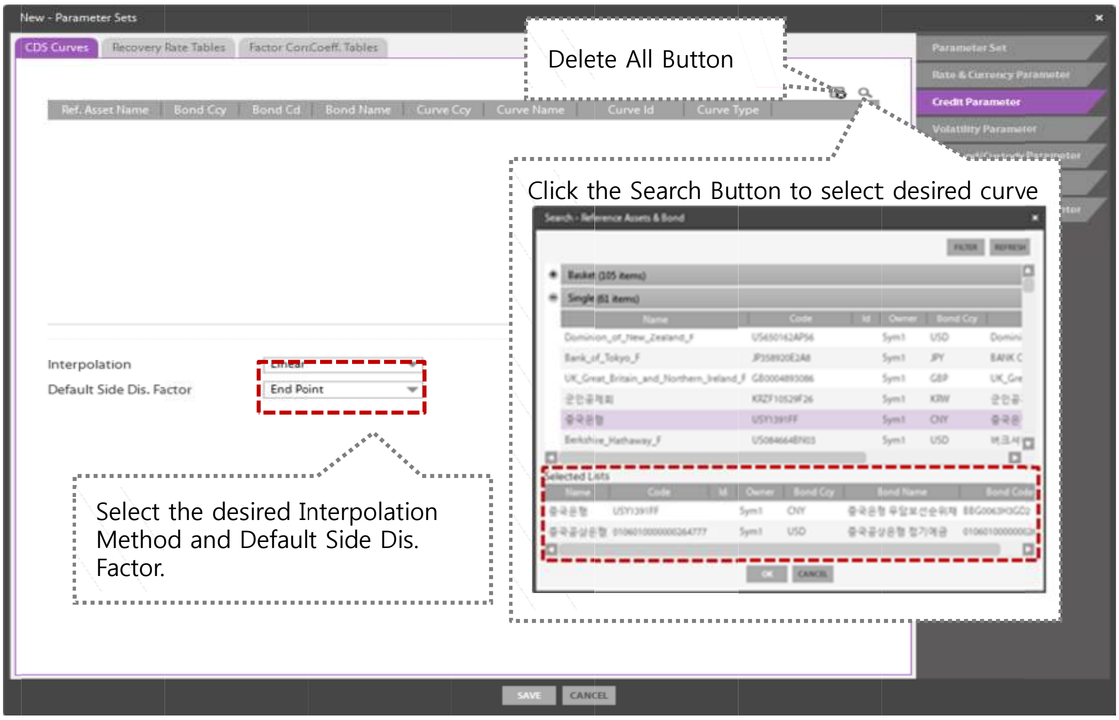


2. Click the magnifying glass (search button) to select the Curve/Currency pair.

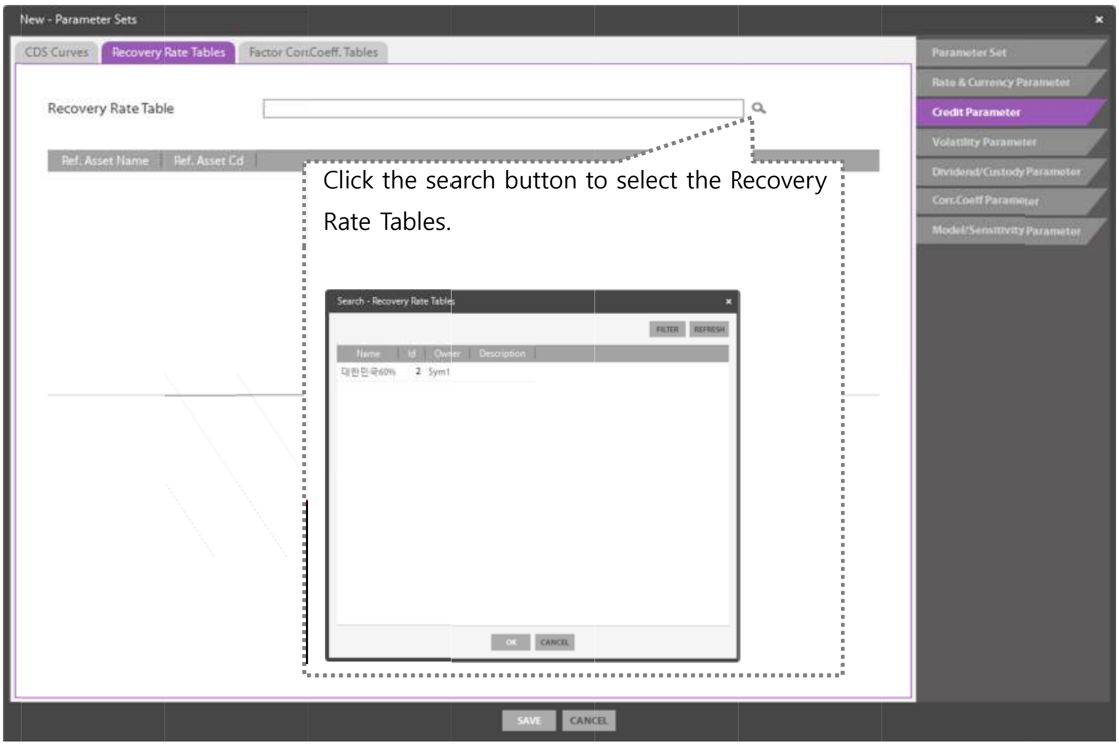


4.4.2.3 Credit Parameter - Registration

1. The Credit Parameter Setting manages the registration of the CDS Curve, Recovery Rate Table, and the Factor Correlation Coefficient Table.

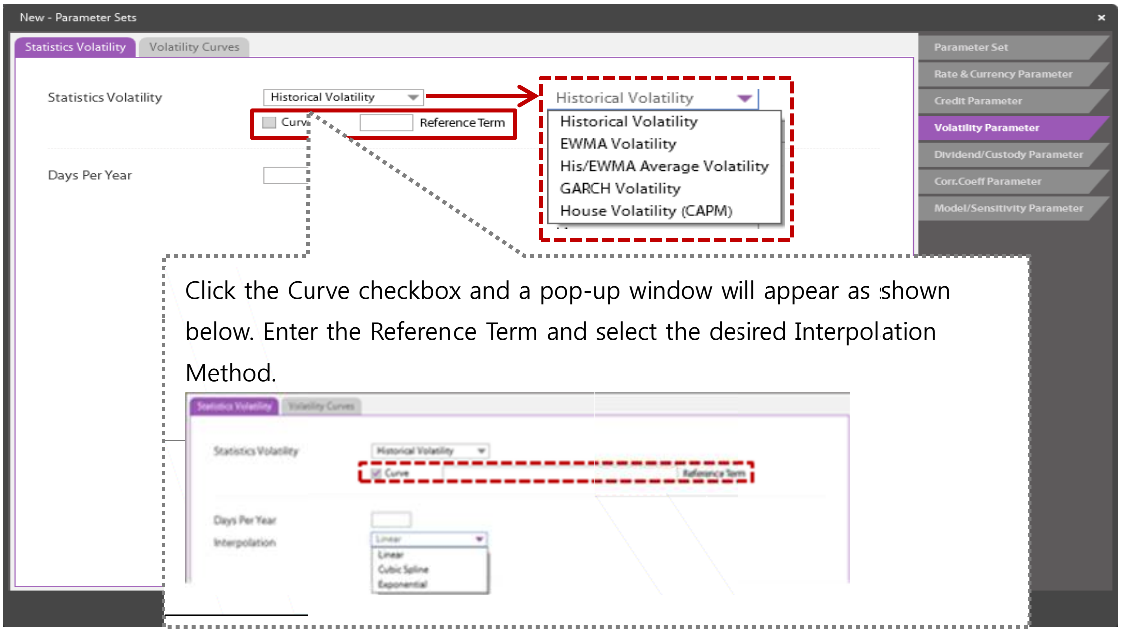


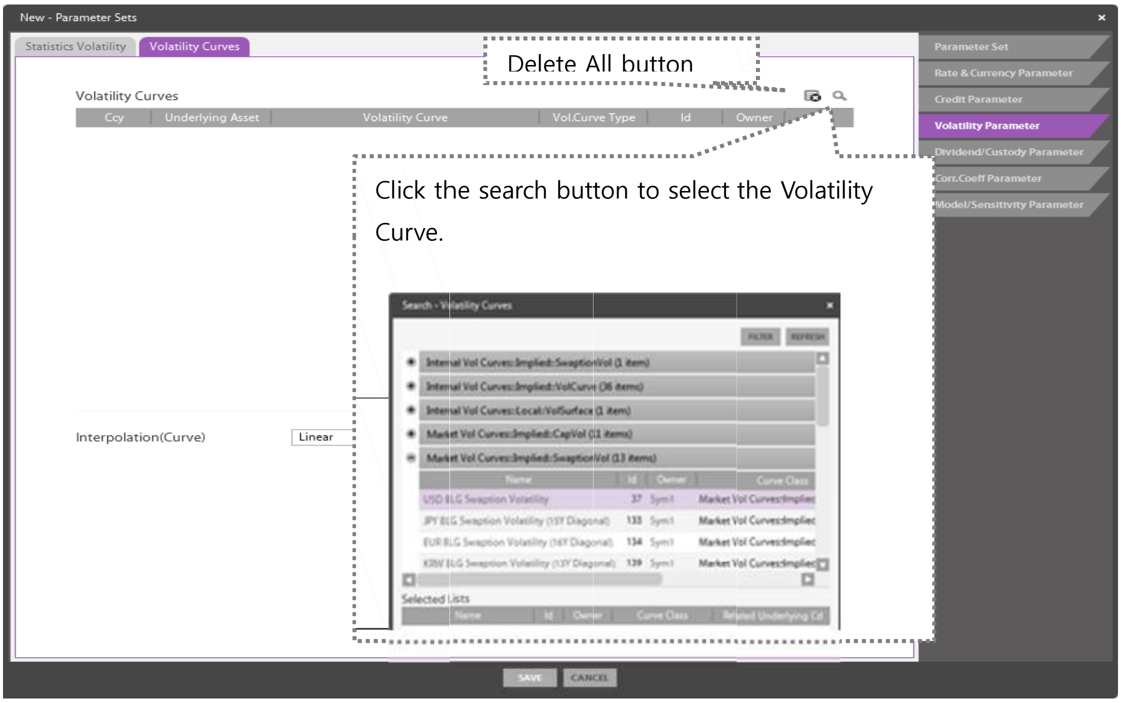
2. As user instructions for the registration of both Recovery Rate Tables and Factor Correlation Coefficient Tables are the same, below is a demonstration of the Recovery Rate Tables only.



4.4.2.4 Volatility Parameter - Registration

1. The Volatility Parameter Setting manages the registration of the Statistics Volatility and Volatility Curve.

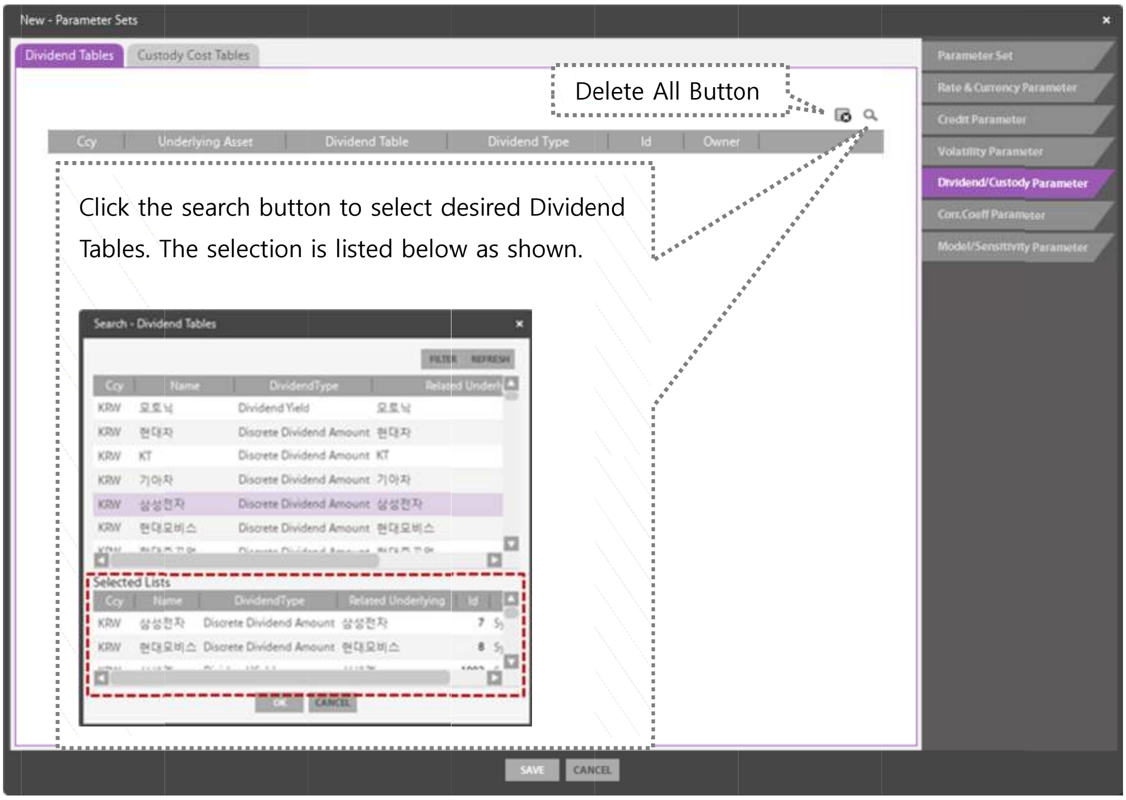




Field	Description
Statistics Volatility	Statistically-computed Volatility
Statistics Vol.(B-D-T)	Statistically-computed Volatility applied to the B-D-T Model
Days Per Year	Period of days out of the year
Interpolation	Interpolation Method

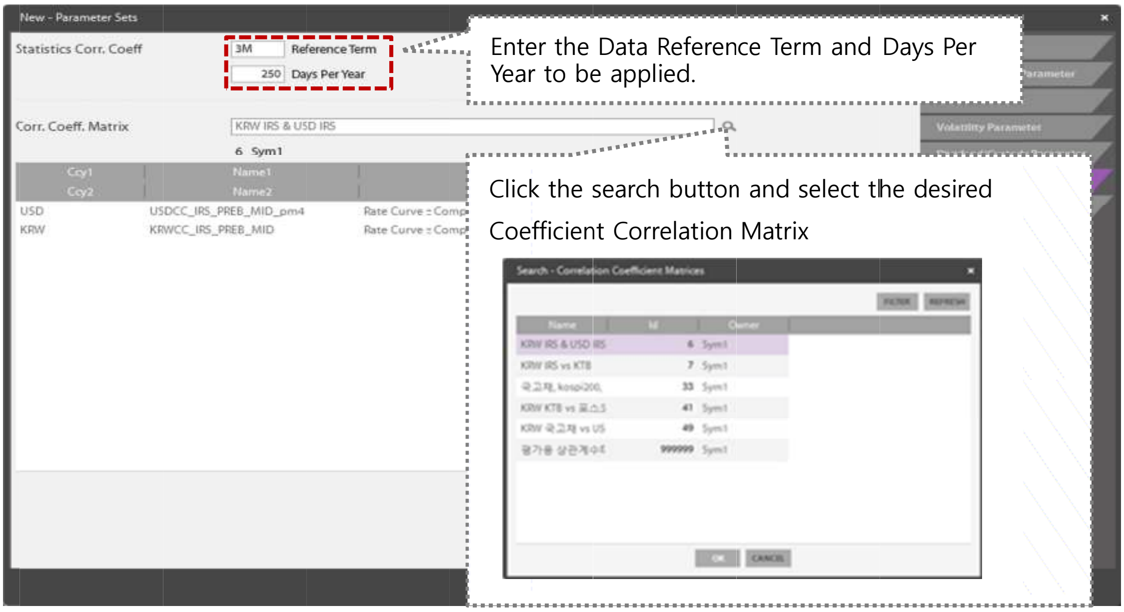
4.4.2.5 Dividend / Custody Parameter - Registration

1. The Dividend/Custody Parameter Setting manages the registration of the Dividend Tables and Custody Cost Tables.
2. As user instructions for the registration of both Dividend Tables and Custody Cost Tables are the same, below is a demonstration of the Dividend Tables only.



4.4.2.6 Correlation Coefficient Parameter - Registration

1. The Correlation Coefficient Parameter Setting manages the registration of the Statistics Correlation Coefficient and the Correlation Coefficient Matrix.



4.4.2.7 Model / Sensitivity - Registration

1. The Model/Sensitivity Parameter Setting manages the registration of the Algorithm, H-W Model and Sensitivity.