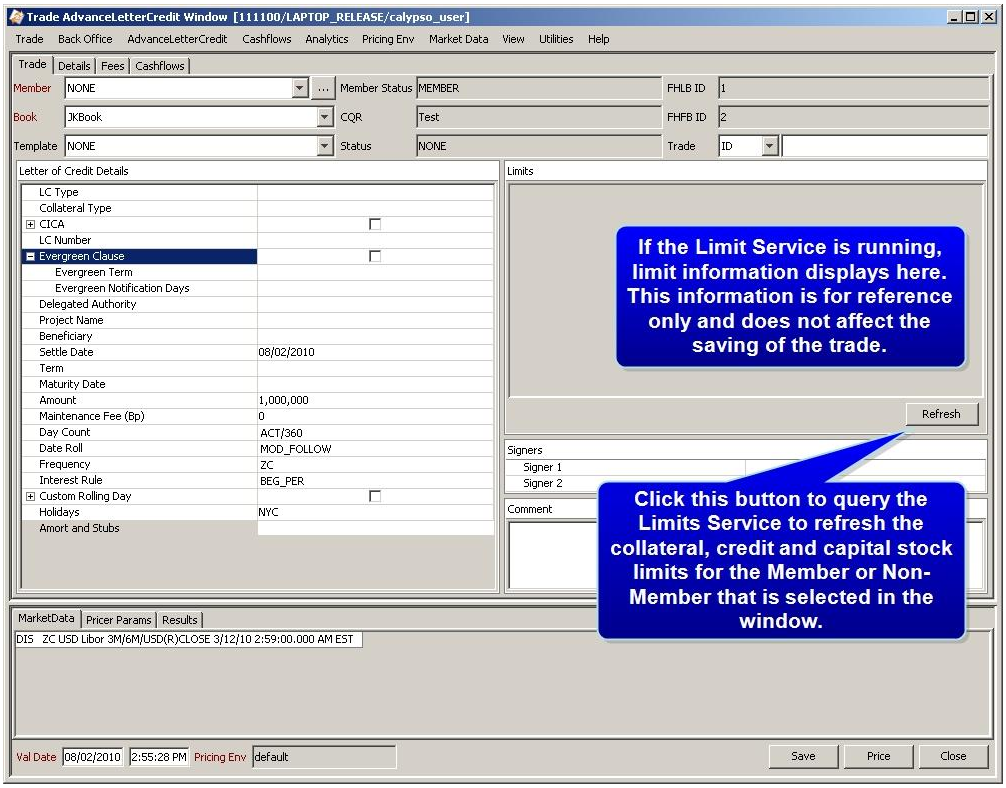
1. CAPTURING LETTER OF CREDIT TRADES

Letters of credit are obligations to make a payment to a third party if the counterparty fails to perform its underlying obligation to that third party. Letters of credit are not cash settled. They represent a facility that enables the beneficiary to receive a payment when a letter of credit drawdown event occurs. Fees, however, are assessed and settled at issuance and throughout the life of the letter of credit.

Below is an example of a basic Letter of Credit window and a description of the fields it contains.

To bring up the Letter of Credit trade window, you need to add a menu item for action "`trading.TradeAdvanceLetterCreditWindow`".



» Enter the trade details in the Trade panel, then choose Trade > Save to save the trade.

» Then proceed to the other panels as needed.

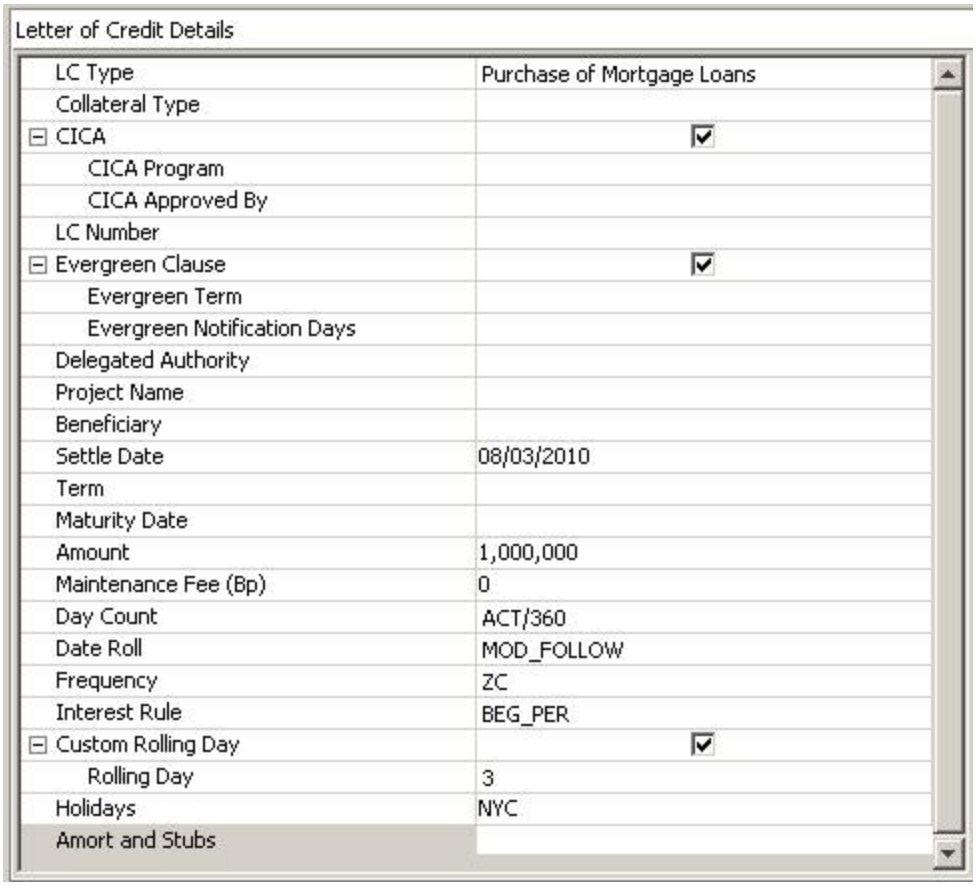
The Details, Fees and Cashflows tabs are common to all trade windows. For more on the information contained in these tabs, refer to the Trading Environment documentation.

Field	Description
Member	Select a member from the drop-down box in this field. The drop-down box is populated by counterparties that are designated as Favorites. (Configuration > Favorites > Counterparties) Click **...** to display the Legal Entity Chooser window to select a member that is not listed among the Favorites.
Member Status	This field displays whether the designated legal entity is a Member or a Non-Member. This is customized in the "tk.util.CustomMemberUtil" class.

Field	Description
FHLB ID	This is a bank generated ID for the member or non-member. This is customized in the "tk.util.CustomMemberUtil" class.
Book	This is the book to which the trade is saved. Click the drop-down arrow to display the list of available books.
CQR	The CQR is the credit rating that the bank has established for the designated member or non-member. This is maintained through the Legal Entity. This is customized in the "tk.util.CustomMemberUtil" class.
Template	Click this drop-down box to load an existing template. Templates are saved via the AdvanceLetterCredit menu option.
Status	This is the trade status given by the system based on the workflow configuration.
Trade	Select from the drop-down box to display the Trade ID, External Reference or Internal Reference. The trade ID is automatically assigned by the system when the trade is saved. You can load an existing trade by typing the trade ID into this field, and pressing [Enter]. You can also display the internal reference or external reference. The default trade reference to be displayed can be set in the User Defaults. The internal reference and external reference can be set in the Details panel of the trade worksheet.

1.1 Letter of Credit Details

Below is a description of the Letter of Credit Details section of the window.



Field	Description
LC Type	Select the letter of credit type from the drop down box in this field. This box is populated based on domain values that are created for the *AdvanceLetterCredit.Subtype* domain. (Configuration > System > Domain Values)
Collateral Type	Select the collateral type from the drop-down box. This box is populated from the *Advance.collateralType* domain value. (Configuration > System > Domain Values)
CICA	Community Investment Cash Advance. This is a discounted advance, offered through the Community Investment Program to fund affordable housing development for low and moderate income households.
CICA Program	Letters of credit are sometimes issued to be associated with a specific housing development program. This field is displayed only when the CICA check box is checked. Select a program name from the drop-down box. The program names are populated from the *Advance.CICAProgram* domain value. (Configuration > System > Domain Values)
CICA Approved by	Enter the name of the person who approved that the letter of credit or advance is CICA.
LC Number	This is a number which identifies the letter of credit. It is in the form *xxxx-xx*.
Evergreen Clause	Select this check box to indicate that the letter of credit has an Evergreen Clause. If it does, the letter of credit is automatically renewed for the Evergreen Term if the issuer of the letter of credit does not cancel the renewal before the Notification Date.
Evergreen Term	This field is displayed when the Evergreen Clause box is checked. Enter the renewable term associated with the Evergreen Clause.
Evergreen Notification Days	This field is displayed when the Evergreen Clause box is checked. Enter the number of days before the maturity that the bank has to cancel the letter of credit or it will be renewed on the maturity date for an extension equal to the Evergreen Term.
Delegated Authority	The Delegated Authority is the internal employee who has the authority to issue a letter of credit. Select an employee from the drop-down box in the field. This box is populated from the *AdvanceLetterCredit.DelegatedAuthority* domain value. (Configuration > System > Domain Values)
Project Name	Enter the name of the project that is supported by the letter of credit.
Beneficiary	Enter the name of a third party beneficiary who will receive the funds if the letter of credit is ever drawn down.
Settle Date	This is the funding date of the trade. This date defaults to the current date.
Term	The full original term of the letter of credit, expressed in days, weeks, months or years. When a term is entered, the Maturity Date changes to reflect the length of the term, based on the Settle Date.
Maturity Date	This is the maturity date of the trade. This field populates automatically when a Term is entered. You can also enter a maturity date directly into this field, but the Term will not be updated in this case.
Amount	This is the notional amount of the letter of credit.
Maintenance Fee (Bp)	This is a fee charged for the trade, calculated in basis points.
Day Count	Select the day count convention to specify the number of days in an interest period.
Date Roll	Specify the date roll convention to roll non-business days.
Frequency	Specify the payment frequency for interest payments.
Interest Rule	Select either Beginning Period or End Period for the interest rule. BEG_PER indicates that the reset occurs at the beginning of the reset period. END_PER indicates that the reset occurs at the end of the reset period.
Custom Rolling Day / Rolling Day	Click this checkbox to designate a custom roll date. Then, select the roll day from the drop-down box in the Rolling Day field.
Holidays	Select the holiday calendar to be used for the trade.
Amort and Stubs	Click in this field to display the AdvanceLetterCredit Details window. In this window you are able to define the amortization schedules and stub periods.

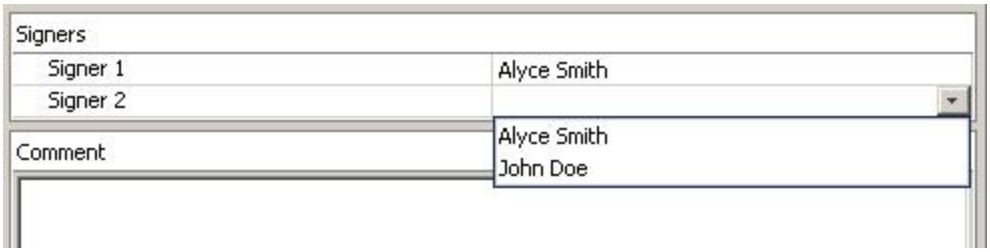
1.2 SIGNERS

This section of the window is used to capture the Member's (or Non-Member's) authorized signers for the letter of credit to be issued. The number of signers required and the list of authorized signers is saved with the legal entity and is based on product type.

For Calypso to retrieve this information, the class "tk.util.CustomMemberUtil" must be created.

Note that this class provides the following information:

- Knowing the number of signers required (1 or 2 typically) for a Legal Entity
- Getting the list of signers for a Legal Entity
- Getting the member status for a Legal Entity (Member / Non-Member, etc)
- Getting the CQR (credit rating) for a Legal Entity
- Getting the FHLB Id for a Legal Entity



1.3 PRICING AREA

This section is common to many Calypso trade windows.

By clicking on any of the tabs, you are able to view either the market data for the trade, the pricing parameters including the pricer being used, as well as the calculation results. Below these tabs, you can view the valuation date, valuation time and pricing environment being used. In this area, you are also able to Save and Price the trade, as well as Close the window.

For more detailed information about this area, refer to Trade Pricing in the Trading Environment documentation.

1.4 TRADE LIFECYCLE

You can terminate a trade using Back Office > Terminate. Help is available from that window.

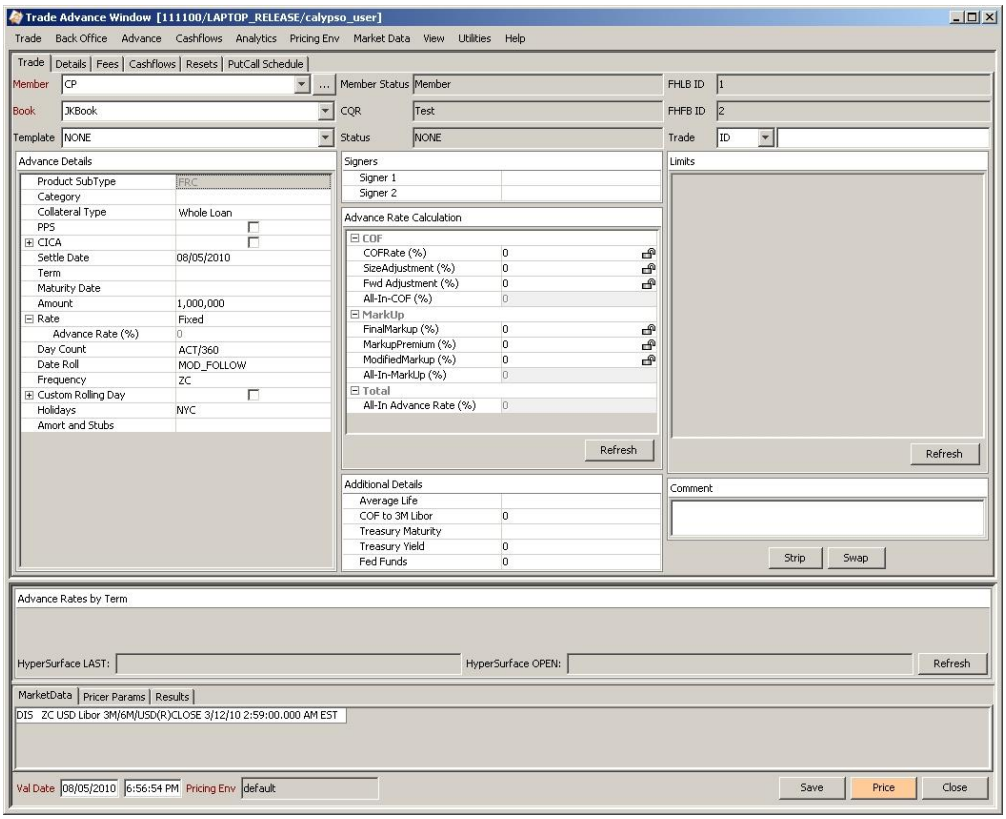
2. CAPTURING ADVANCE TRADES

When a bank issues an advance with a member or a non-member there are many aspects of the trade that are considered to establish an advance rate.

Advances may be a relatively simple structure, or they may be highly structured with embedded options. Advances may only be overnight borrowings, borrowings with open maturities that reset daily or term structures with set maturity dates. Advances may be of a bullet principal payback structure or they may follow an amortization schedule. Interest rates on advances may be fixed rate, adjustable rate with an index and a spread, variable rate or structured.

[**NOTE:** A hypersurface is needed in order to retrieve pricing data for an advance trade. You must define a hypersurface for last values as well as a hypersurface for opening values. For information about setting up a hypersurface for advances, refer to Defining Hypersurfaces for Advances]

To bring up the Advance trade window, you need to add a menu item for action "`trading.TradeAdvanceWindow`"



» Enter the trade details in the Trade panel, load the hypersurface to retrieve pricing data and compute the rates or spreads, then choose Trade > Save to save the trade.

» Then proceed to the other panels as needed.

The Details, Fees and Cashflows tabs are common to all trade windows. For more on the information contained in these tabs, refer to the Trading Environment documentation.

2.1 TRADE DETAILS

The sections of the Advance trade window are described below.

2.1.1 BASIC TRADE INFORMATION

Field	Description
Member	Select a member from the drop-down box in this field. The drop-down box is populated by counterparties that are designated as Favorites. (Configuration > Favorites > Counterparties) Click **...** to display the Legal Entity Chooser window to select a member that is not listed among the Favorites.
Member Status	This field displays whether the designated legal entity is a Member or a Non-Member. This is customized in the "tk.util.CustomMemberUtil" class.
FHLB ID	This is a bank generated ID for the member or non-member. This is customized in the "tk.util.CustomMemberUtil" class.
Book	This is the book to which the trade is saved. Click the drop-down arrow to display the list of available books.
CQR	The CQR is the credit rating that the bank has established for the designated Member or Non-Member. This is maintained through the Legal Entity. This is customized in the "tk.util.CustomMemberUtil" class.
Template	Click this drop-down box to load an existing template. Templates are saved via the Advance menu option.
Status	This is the trade status given by the system based on the workflow configuration.
Trade	Select from the drop-down box to display the Trade ID, External Reference or Internal Reference. The trade ID is automatically assigned by the system when the trade is saved. You can load an existing trade by typing the trade ID into this field, and pressing [Enter]. You can also display the internal reference or external reference. The default trade reference to be displayed can be set in the User Defaults. The internal reference and external reference can be set in the Details panel of the trade worksheet.

2.1.2 ADVANCE DETAILS

Field	Description
Product Sub Type	This field is not editable and is determined by what is chosen in the Rate field of the Advance Details. The possibilities include: • **FRC** (Fixed Rate Credit) – For advances based on a fixed rate. • **ARC** (Adjustable Rate Credit) – For advances based on a floating rate. • **VRC** (Variable Rate Credit) – For overnight advances based on a floating rate. The rate index must have the rate index attribute Advance = VRC. This is set in the Rate Index Definition window (Configuration > Interest Rates > Rate Index Definition) • **Structured** – For advances based on exotic structures. These values come from the domain *Advance.subtype* domain value. (Configuration > System > Domain Values) Examples of each of these trade types are provided below.
Category	This is a field that can be used to further define the advance via a drop-down box. The entries of the box are configured from the *Advance.category* domain value. (Configuration > System > Domain Values)
Collateral Type	Set the Collateral Type from the drop-down box. This box is populated from the *Advance.collateralType* domain value. (Configuration > System > Domain Values)
PPS	This is a checkbox that indicates Partial Prepayment Symmetry.
CICA	When this box is selected, it indicates that the advance is a Community Investment Cash advance.
CICA Program	Advances are sometimes issued to be associated with a specific housing development program. This field is only displayed when the CICA check box is checked. Select a program name from the drop-down box. The program names are populated from the *Advance.CICAProgram* domain value. (Configuration > System > Domain Values)
CICA Approved by	Enter the name of the person who approved that the advance is CICA.
Settle Date	This is the funding date of the trade. The date defaults to the current date.
Term	The full original term of the advance, expressed in days, weeks, months or years. When a term is entered, the Maturity Date changes to reflect the length of the term, based on the Settle Date.
Maturity Date	This is the maturity date of the trade. When a Term is entered, it automatically updates this field. You may also manually input a Maturity Date, but the Term will not be updated.
Amount	This is the notional amount of the advance.
Rate	You can select Float for a floating rate, Fixed for a fixed rate, or you can select an exotic structure. Exotic structures are created using Main Entry > Configuration > Product > Exotic Type Creator A sample exotic structure is shown below, and Help is available from that window for complete details.
Rate Index	(Float) This field defines Currency, Index, Tenor and Source for a floating rate index.
Advance Rate	(Fixed) This is the Total All-In Advance Rate, populated from the Advance Rate Calculation area.
Advance Spread	(Float) This is the spread to the index for a floating rate structure, populated from the Total All-In Advance Spread field in the Advance Rate Calculation area.
Average Reset	(Float) Select this checkbox to designate details about the reset, such as: • **Frequency** • **Weight** – *Equal* - Resets within sampling period are equally weighted). – *Weighted* - Resets are weighted according to the number of days for which they apply. for example, the weight is 1 if it occurs on a Monday and the weight is 3 if it occurs on a Friday which includes Friday, Saturday and

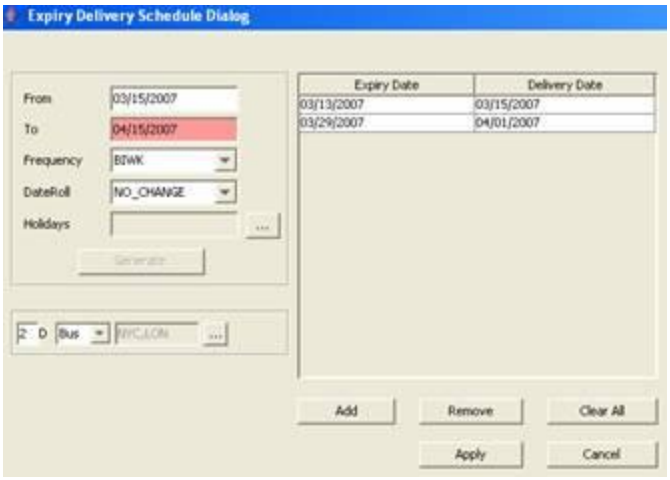
Field	Description
	Sunday. – *Simple* - The reset rate is calculated as the mean rate within the sampling period. – *Cutoff Adj* - Calculates weighting up to the cutoff date. The cutoff date is set as a number of days from the last sample period's end date. • **Align** – *Match* - Rates are sampled over the entire averaging period. – *Custom* - Rates are defined over a user defined period. • **Timing**: Select either BEG_PER or END_PER.
Custom Lag	Select this checkbox if you would like to customize the lag between the actual reset date and the beginning or end of the reset period. The **Reset Lag** field is then displayed and you are able to click in that field to set Offset, Days, Holidays and Roll.
Day Count	Specify the day count convention for the number of days in an interest period.
Date Roll	Specify the date roll convention to roll non -business days
Frequency	Select the payment frequency.
Custom Rolling Day / Rolling Day	Click this checkbox to designate a custom roll date. then, select the roll day from the drop-down box in the Rolling Day field.
Holidays	Select the holiday calendar to be used for the trade.
Amort and Stubs	Click in this field to display the Advance details window, where you are able to define the amortization schedules and stub periods.
PutCall Schedule	You can use this panel to capture cancelable advance trades. See Capturing Cancelable Advance Trades below for details.

2.1.3 CAPTURING CANCELABLE ADVANCE TRADES

» Check the Cancellable checkbox to make the trade cancelable, then specify the cancelable details described below.

Cancelable Details

Fields	Description
Cancellable	Check the Cancellable checkbox to indicate that the trade is cancelable, or uncheck otherwise.
BUY/SELL	Select BUY or SELL, the direction of the trade from the book's perspective.
Call Type	Select the call type: European, American, or Bermudan. ***European*** The trade can only be canceled on the expiration date.  » Enter the expiration date in the Exp Dt field. If you enter a non-business day, it will automatically move to the previous business day. » Click **Expiry Time** to enter the expiration time, and select the corresponding timezone and holiday calendars. » The delivery date defaults to the spot date for the selected currency. You can

Fields	Description
	modify as needed. You can also enter the number of lag days in the adjacent field and select whether the lag days are business days or calendar days. » Enter the fee amount in the Fee field, and select the fee currency from the adjacent field. Or you can enter a percentage to compute the fee - Check the "as percent" checkbox, and enter a percentage in the adjacent field. ***Bermudan*** The trade can be canceled according to a user-defined schedule.  » The Exp Dt and Del Dt fields in the Trade panel are not editable. » Click **Expiry Time** to enter the expiration time, and select the corresponding timezone and holiday calendars. » Click **Exp/Del Schedule** to define the cancellation schedule.  Enter From and To dates, select a frequency, a date roll and holiday calendars. Enter a number of lag days to compute the delivery date based on the actual call date. And select Bus if the lag days are business days, or Cal for calendar days. Then click **Generate** to generate a schedule. You can also click **Add** to add specific dates. Then click **Apply** to save the schedule. » Enter the fee amount in the Fee field, and select the fee currency from the adjacent field. Or you can enter a percentage to compute the fee - Check the "as percent" checkbox, and enter a percentage in the adjacent field. You can also click ...next to the Fee field to define a fee schedule. ***American*** The trade can be canceled within a date range.  » Enter the expiration date in the Exp Dt field. Enter the expiration time and select

Fields	Description
	the timezone from the adjacent fields. » Click **Expiry Time** to enter the expiration time, and select the corresponding timezone and holiday calendars. » Enter the first exercise date in the First Ex Dt field. The trade can be canceled between the first exercise date and the expiration date. » The delivery date defaults to the spot date for the selected currency. You can modify as needed. You can also enter the number of lag days in the adjacent field and select whether the lag days are business days or calendar days. » Click ... next to the Fee field to define a fee schedule.

Fields	Description

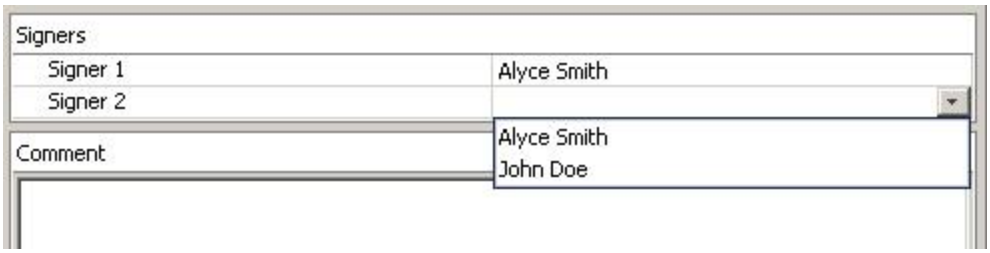
2.1.4 SIGNERS

This section of the window is used to capture the Member's (or Non-Member's) authorized signers for the advance to be issued. The number of signers required and the list of authorized signers is saved with the legal entity and is based on product type.

For Calypso to retrieve this information, the class "tk.util.CustomMemberUtil" must be created.

Note that this class provides the following information:

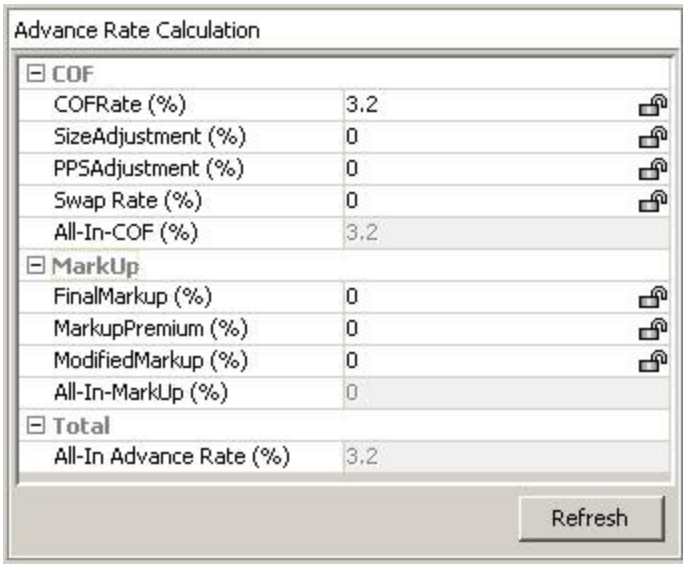
- Knowing the number of signers required (1 or 2 typically) for a Legal Entity
- Getting the list of signers for a Legal Entity
- Getting the member status for a Legal Entity (Member / Non-Member, etc)
- Getting the CQR (credit rating) for a Legal Entity
- Getting the FHLB Id for a Legal Entity



2.1.5 ADVANCE RATE CALCULATION

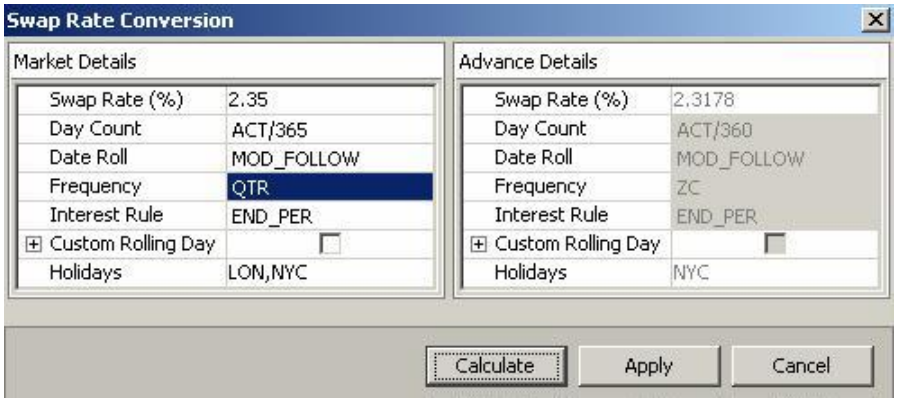
The fields that appear in this section are dependent upon how the trade is structured in the Advance Details area and are populated from the selected hypersurface. For more information on hypersurfaces, refer to Defining Hypersurfaces for Advances.

Clicking the Lock button allows you to lock in a rate. When this is done,upon clicking **Refresh**, only unlocked fields are updated.



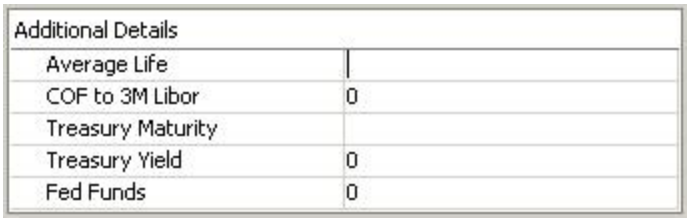
» Click **Refresh** to refresh market data items and re-calculates the advance Rate or Spread. (Only unlocked fields are refreshed.)

Fields Details

Field	Description
COFRate / Spread (%)	This is the base COF (Cost of Funds) rate or spread upon which COF adjustments are made. The COF Rate is automatically converted to the daycount and frequency of the advance.
PPSAdjustment (%)	This is automatically populated with the PPS Adjustment in percent which is calculated for the advance. This field is editable however.
Swap Rate (%)	This is the Swap Par Yield Rate associated with the Term of the advance. It is used in calculating the advance Rate in combination with the COF Spread for certain advances. This is editable. The Swap Rate can be manually converted to a different daycount and frequency using Advance > Swap Rate Conversion.  » Select a daycount / frequency as applicable, and click **Calculate**. » You can then click **Apply** to set the new swap rate on the trade.
SizeAdjustment (%)	This is automatically filled with any size adjustment set on the hypersurface. This field is editable.
Putable Adjustment	This is populated with the putable adjustment calculated for the advance. This field is editable.
All-In-COF (%)	The sum of the COF and all of the COF Adjustments.
FinalMarkup (%)	Automatically filled with the Markup calculated for the advance but it may be overridden.
MarkupPremium (%)	The profit in per cent that the bank adds to either the COF Rate or the COF Spread.
ModifiedMarkup (%)	This is an additional markup that can be entered when the advance is modified. This markup is added to the trade effective from the Settle Date. If you would like to add this markup so that the effective date is a date later than the original trade's Settle Date, the trade must be canceled and rebooked with a new Settle Date.
All-In-MarkUp (%)	This is the Final Markup plus the Markup Premium plus the Modified Markup.
All-In Advance Rate / Spread (%)	This is equal to All-In COF plus All-In Markup.

2.1.6 Additional Details

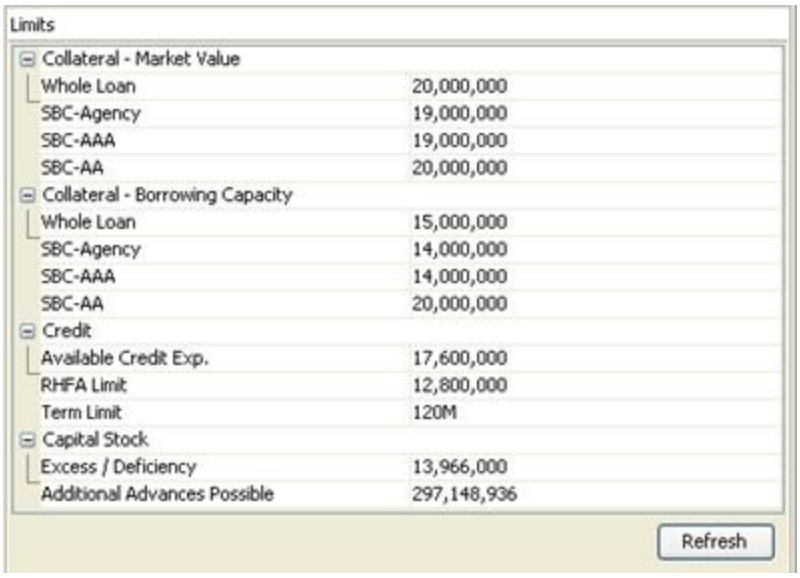
There is an area of the Advance window that allows you to enter additional details pertaining to the trade. These fields are not associated with any type of internal processing, they are merely free-form, user-entered fields.



The input for "Average Life" and "Treasury Maturity" are terms. The input for "COF to 3M Libor", "Treasury Yield" and "Fed Funds" are all rates.

2.1.7 LIMITS

The Limits section of the window integrates limit information from other bank systems that have been consolidated in the Calypso ERS Limits System. The ERS Limits system provides credit, collateral and capital stock information for the Advance window.



Unlike in most other trading windows in Calypso the Limits Panel is permanently visible. This panel has been optimized to show available collateral and limits for the advance trade which are specific to the Federal Home Loan Bank system. To enable the Limits panel to display the appropriate data, the system must be correctly configured. This is described in the document *Configuring Calypso for FHLB Use*.

This panel, when the system is completely configured, displays for a member bank, the value of posted collateral, the borrowing capacity, the contributed capital stock and excess/deficiency for the advance being priced. The values of these are calculated using ERS measures specifically defined for this purpose.

After a trade is entered and borrower name is entered, click **Refresh** to obtain the relevant data to the trade. When you save the trade, the pre-deal limit check results are displayed. The limit checks work the same as for other Calypso trades. See ERS Limits documentation for information specific to the limits process.

Once the advance is approved and a trade ID is assigned, the relevant values for borrowing capacity and other data are updated.

2.1.8 ADVANCE RATES BY TERM

This area displays the hypersurface information pertaining to the advance trade. It also shows the term structure of the advance Rate (or advance Spread for adjustable credits) along with some components of the advance Rate. The display is different depending on whether you have chosen a fixed or floating rate. This section of the window is updated when the advance trade window is first viewed. It may be updated by clicking the **Refresh** button.

If you have clicked **Refresh** after the trade was saved, you can display the data that appeared in this area when the trade was saved by changing the Val Date and Time to the back dated trade date and time and clicking the **Refresh** button.

The column configuration for Fixed rate credit is as follows:

Column	Description
All-In Advance Rate	The advance rate along the term structured for fixed rate advances
All-In COF	The All-In COF expressed as a percentage

Column	Description
All-In Markup	The derivation of the final markup
Open Treas BM	The Treasury Yield curve along the term structure at the start of the day
Live BM	The Treasury Yield curve at the time the trade is saved, when this window is refreshed or the **Price** button is clicked
Opening Adv Rate	The advance rate at the start of the trading day. This is calculated from the opening values in the hypersurface

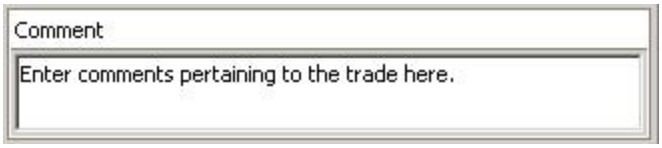
The column configuration for Floating rate credit is as follows:

Column	Description
All-In Advance Spread	The All-In Advance Spread for adjustable rate advances along the term structure
All-In COF Sprd	The All-In COF Spread along the term structure expressed in basis points
All-In Markup	The derivation of the final markup
Open Treas BM	The Treasury Yield curve along the term structure at the start of the day
Live BM	The Treasury Yield curve at the time the trade is saved, when this window is refreshed or when the **Price** button is clicked.
Libor Index	Current fixing rate for the Libor.
Initial Rate	This is equal to the Advance Spread plus the initial Libor Index

For detailed information, see Defining Hypersurfaces for Advances.

2.1.9 COMMENTS

This is a free form area to enter comments about the trade.



2.1.10 PRICING AREA

This section is common to many Calypso trade windows.

By clicking on any of the tabs, you are able to view either the market data for the trade, the pricing parameters including the pricer being used, as well as the calculation results. Below these tabs, you can valuation date, valuation time and pricing environment being used. In this area, you are

also able to Save and Price the trade, and Close the window.

For more detailed information about this area, refer to Trade Pricing in the Trading Environment documentation.

2.2 HEDGING ADVANCE TRADES

In many situations, the bank hedges advances so that only exposure to the floating LIBOR 3M remains. This means, for example, that the bank might enter into a Fixed-Float swap to hedge a Fixed Rate Credit, or enter into a cap transaction to hedge a cap embedded in a structured advance. In some cases the price of the hedge instrument is

required to be included in the rate or spread quoted to the Member. (Please refer to Advance Rate Calculation for more information).

2.2.1 Structured Advance

You can hedge a structured advance using a cap/floor trade, provided you have defined a mapping between the exotic structure and a trade template in the Exotic Type Creator. See FRC - Exotic Structured Trade.and Sample Cap/Florr Exotic Structure Trade for details on defining structures advances.

Open the Advance trade that you would like to hedge. Click the **Strip** button. (Note that you can only hedge saved trades.) The Cap/Floor trade window opens with the selected trade template. You can then save the hedge trade. The ID of the cap/floor trade is saved in the trade keyword *ExternalMirrorId* of the advance trade; and the ID of the advance trade is saved in the *ExternalMirrorId* trade keyword of the cap/floor trade.

[NOTE: If the advance or cap/floor trade is subsequently adjusted, partially terminated or terminated those changes are NOT passed on to the matched trade. The user must update the matched trade manually]

2.2.2 Any Type of Advance

You can hedge a any type of advance trade using a swap trade, provided you have defined a generic swap trade.

You can define a "generic" swap using a swap curve underlying.

You can view all existing swap curve underlyings using Main Entry > Configuration > Market Data > Curve Underlyings. Select an existing underlying or create a new one as needed. Note the ID of the underlying that you would like to use.

Add the underlying's ID to the domain *StandardUnderlyingSwapId*. (Configuration > System > Domain Values)

Open the advance trade that you would like to hedge and click the **Swap** button. (Note that you can only hedge saved trades.) The Swap trade window opens. The leg on the left-hand side is populated with the advance characteristics. The terms of the other leg are determined by the terms of the underlying. You can save the hedge trade. The ID of the swa trade is saved in the trade keyword *ExternalMirrorId* of the advance trade. The ID of the advance trade is saved in the *ExternalMirrorId* keyword of the swap trade.

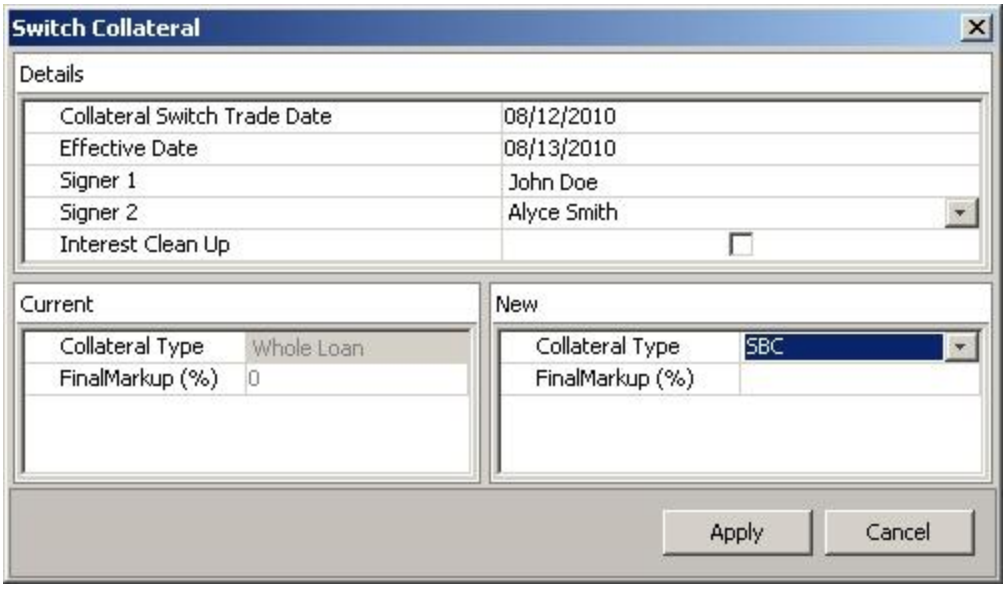
[NOTE: If the advance or swap trade is subsequently adjusted, partially terminated or terminated those changes are NOT passed on to the matched trade. The user must update the matched trade manually]

2.3 Switch Collateral

Members and non-members may request that the pledged collateral on an Advance be switched from time to time. This can be done through the Switch Collateral window (Back Office > Switch Collateral).

- A collateral switch changes 100% of the collateral on an Advance from one collateral type to a different collateral type. This may happen more than once in the lifetime of the Advance.
- When a collateral switch takes place, the Advance is re-priced , which means that the rate or spread (for floating) changes.
- The collateral may be switched from a higher grade to a lower grade collateral or from a lower grade to a higher grade collateral.
- A collateral switch requires a second set of Authorized Signers.
- The Final Markup changes based on the collateral in use.The Final Markup adds to the Markup Premium and thus potentially changes the Advance Rate.

The fields and function of the Collateral Switch window are described below.



Details Area

Field	Description
Collateral Switch Trade Date	This defaults to the current date but it is editable. Upon a collateral switch, the Final Markup is changed to the markup that is in effect for the new collateral type at the time of this date.
Effective Date	This defaults to the next business day from the Collateral Switch Trade Date.
Signer 1 / Signer 2	Select signers for the new trade.
Interest Clean Up	If the Effective date of the collateral switch is in the middle of an accrual period for the Advance, you can select this option to have an interest payment due and payable on the Effective date for the first part of the accrual period, based on the original Advance Rate. The interest payable on the next scheduled interest payment date for the Advance is an amount calculated for the remaining days in the period at the new Advance rate. If this option is not selected, the interest due on the Advance on the next scheduled interest payment date is a blended rate for the entire accrual period based on the original Advance Rate and the current Advance Rate, prorated by the number of days that the individual rates were in effect.

Current / New Area

Field	Description
Collateral Type	The Collateral Type for the current Advance trade is indicated in the Current area. Select the Collateral Type for the collateral switch trade in the New area.
FinalMarkup(%)	The Final Markup for the current Advance trade is indicated in the Current area. In the New area, the Final Markup changes to reflect the newly selected Collateral Type. If a final markup is not populated in the Hypersurface for the selected Collateral Type on the trade date, then the final markup is set to the value that exists for the collateral type at the most recent date previous to the trade date. This field is not editable. If you wish to change this value, you must change the value in the Hypersurface on the trade date.

After you enter all of the information pertaining to the collateral switch, click **Apply**.

» At this point, the old trade is terminated and the new trade is saved with the new collateral. This appears to be the same trade, as it has the same Trade ID as the old trade.

» The Advance trade screen is populated with the new trade information.

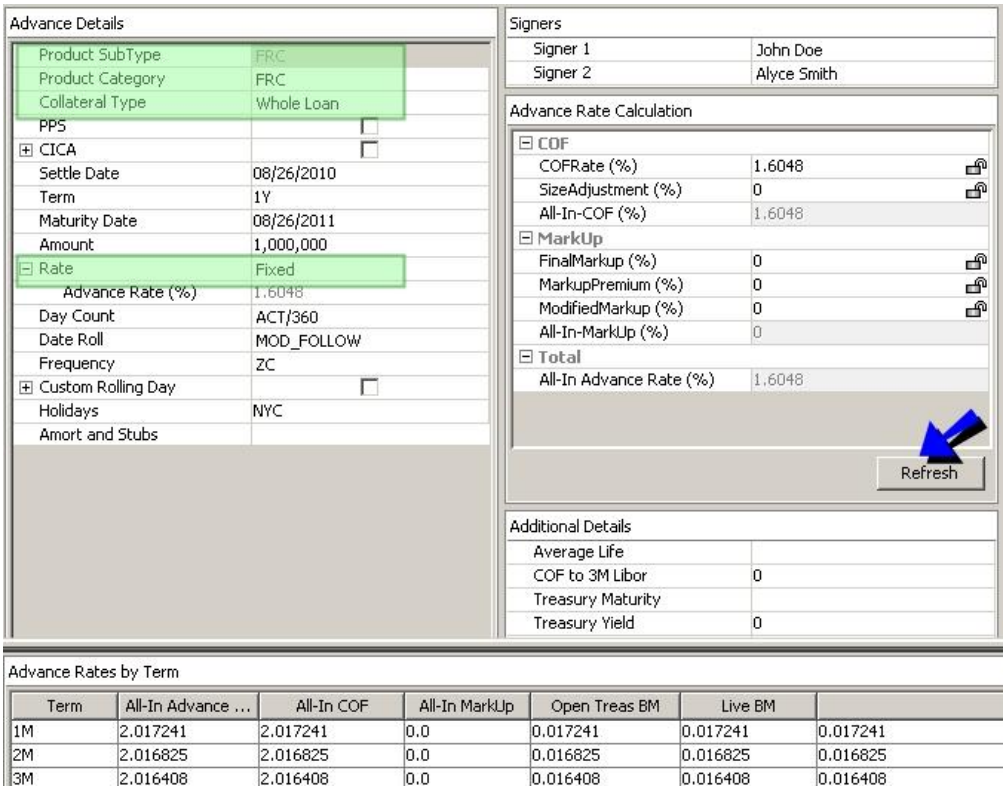
- ERS Limits is invoked to check limits for the new trade and release the collateral utilization from the old trade.
- The Term on the new trade remains the same as it was on the old trade, even though the Settlement Date and Maturity Date on the new trade will no longer agree with the Term. (The reason for this is because the Term is used as an axis into the hypersurface and the axis must remain the same as the original.)
- The new trade that is saved is basically identical to the old trade except for the following changes:
  - the Collateral Type
  - the possible derived change in the Advance Rate (or Spread)
  - the new Trade and Settlement Dates
  - if the you have changed any other values on the trade, those changes will not be saved to the new trade
- The history of collateral changes for a trade appears on the History tab.

2.4 Sample Trades

Below are sample trades for each type of Advance trade.

2.4.1 FRC - Fixed Rate

When FRC (Fixed Rate Credit) is chosen as the Product Category and a Fixed Rate is chosen, the Product SubType will automatically populate and the appropriate fields will be available for entry in the Advance Details and Advance Rate Calculation areas. When you click **Refresh** in the Advance Rate Calculation area, the pricing data is retrieved from the hypersurface for product index "FRC_NONE_NONE", Collateral Type "Whole Loan", Member, and CICA "NO".

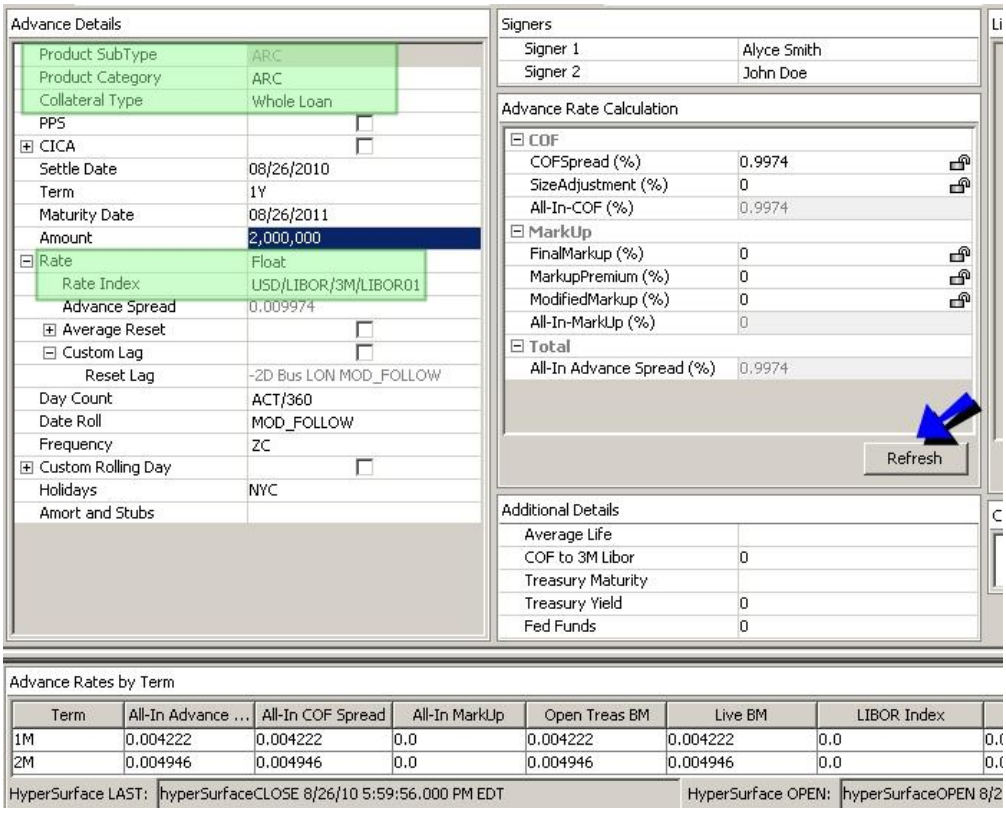


2.4.2 ARC - Floating Libor 3M

To construct an ARC Floating LIBOR 3M Advance trade, select ARC from the Product Category, Float from the Rate field and USD/LIBOR/3M/LIBOR01 from the Rate Index field. Click **Refresh** in the Advance Rate Calculation area to retrieve

pricing data from the Hypersurface based on the designated information.

[**NOTE:** In this example, the rate is defined as LIBOR 3M. The source is LIBOR01. This is user-defined through the Rate Index Window]

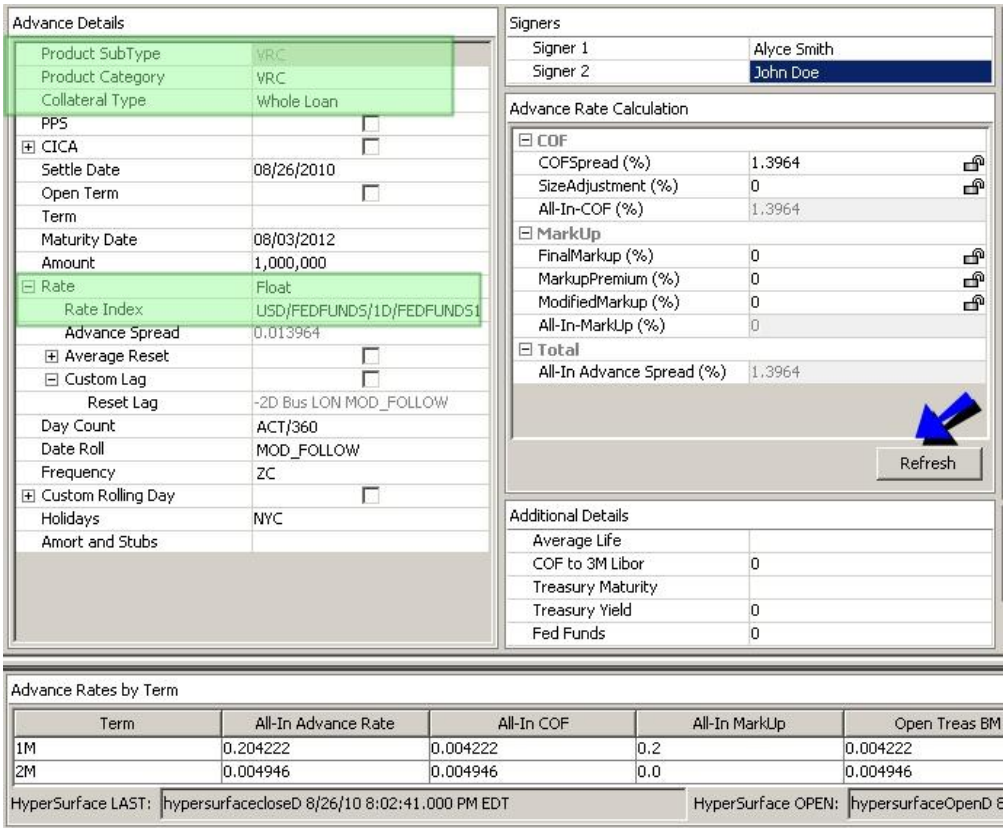


2.4.3 VRC - Floating Fedfunds 1D

A VRC Advance trade is an overnight floating rate index for which the Advance index attribute is set to VRC for the index that you are using. . (Configuration > Interest Rates > Rate Index Definitions) When the Refresh button in the Advance Rate Calculation area is clicked, pricing information is retrieved from the hypersurface for the product index "VRC_FEDFUNDS_1D", collateral type "Whole Loan", Member and CICA "NO".

[**NOTE:** For this type of trade, the rate index must have the rate index attribute Advance = VRC. This is set in the Rate Index Definition window (Configuration > Interest Rates > Rate Index Definition)]

In this example, the Fed Funds index has been defined through the Rate Index Window as FEDFUNDS 1D term and the source is FEDFUNDS1. These are user configured naming conventions.



2.4.4 FRC - EXOTIC STRUCTURED TRADE

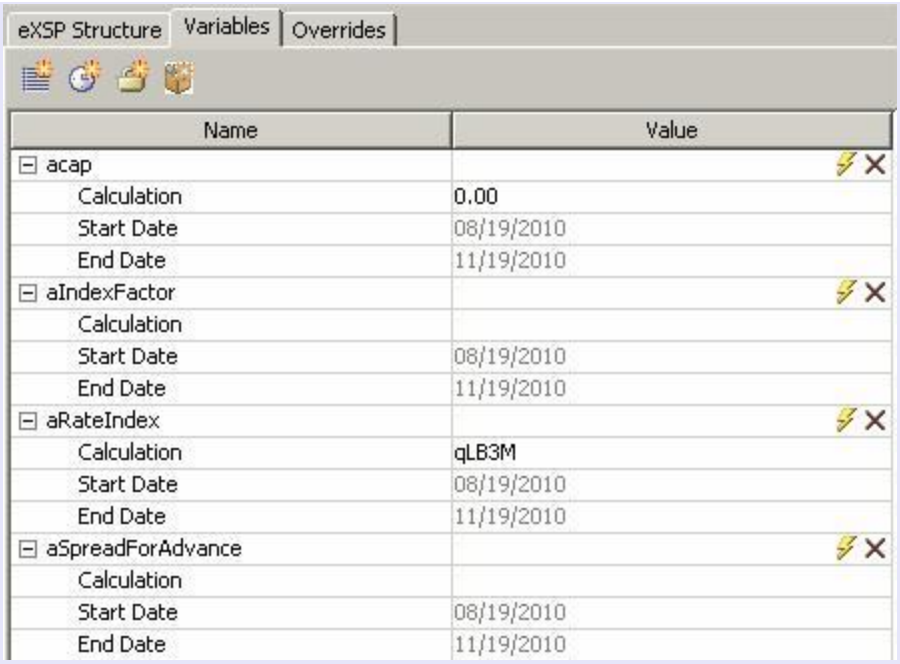
Choose Main Entry > Configuration > Product > Exotic Type Creator to create an exotic structure.

You may want to create an FRC exotic structure so that you can take advantage of the cap/floor hedge capability.

In this example, we create a fixed rate structure that can be hedged against a cap trade.

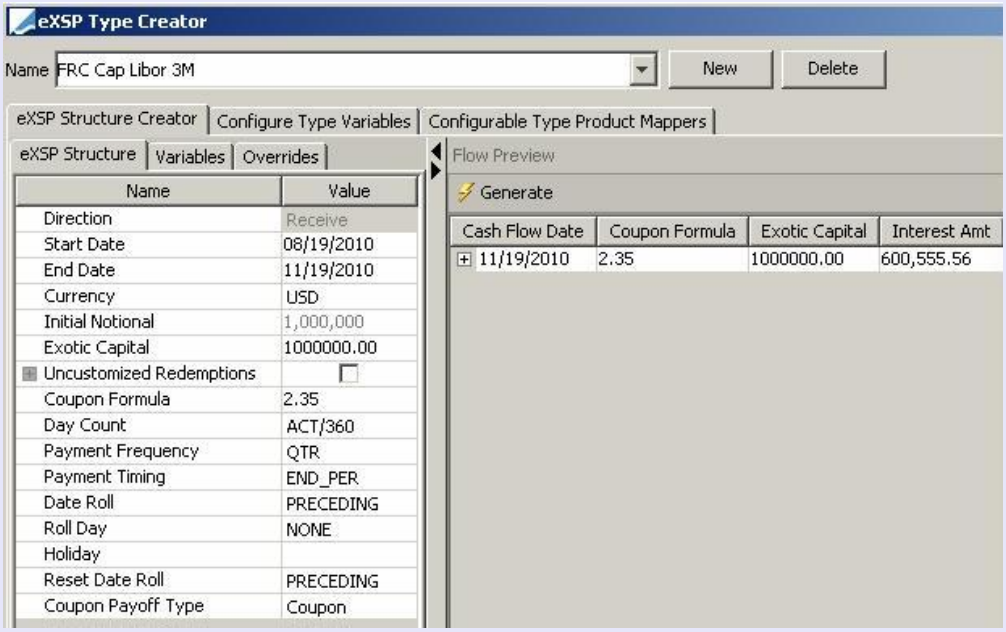
1. In the "Variables" panel, create an array variable for the cap rate, for the rate index, and for the index factor. Those will be applied to the hedge trade.

   You also need to create an empty array variable for the Advance Spread that will be retrieved from the hypersurface. It has to be called "aSpreadForAdvance". This variable is mandatory.



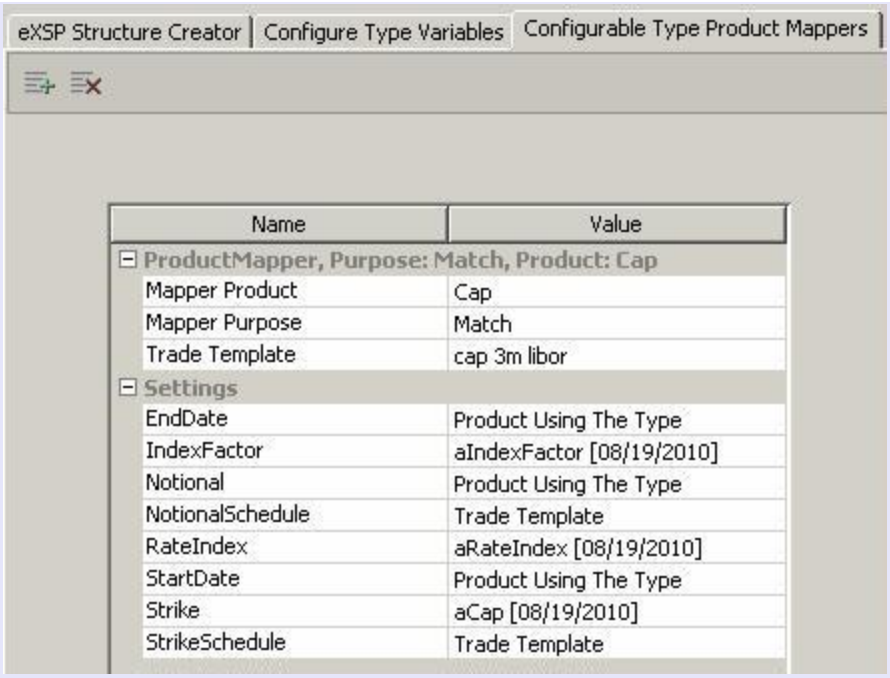
2 In the "eXSP Structure" panel, set the end date to **3M**, the exotic capital to **1M**, and the coupon formula to a fixed rate, **2.35%** for example.

Then click **Generate** to generate the cashflows.



3 Select the "Configurable Type Product Mappers" panel and map the exotic structure to a cap trade template.

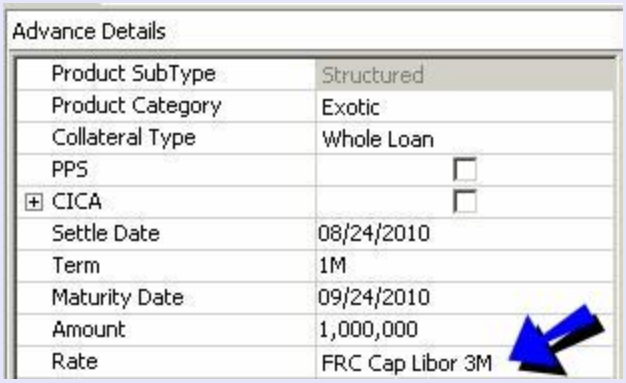
[NOTE: Make sure that you have saved a trade template from the Cap/Floor Trade window using CapFloor > Save As Template]



- Click to add a mapping.
- Select the product type and the trade template, then map all the fields to the Exotic Structure or to an array variable when available.

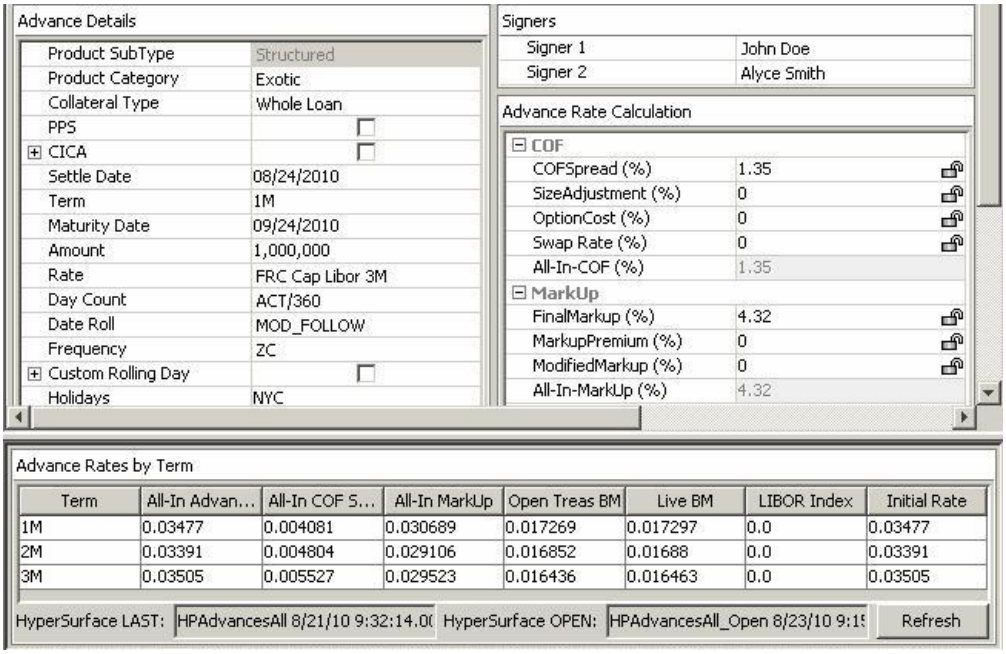
4 Save the exotic structure. You will be prompted to give it a name, for example "FRC Cap Libor 3M". This name will be available for selection in the Rate field of the Advance Trade window.

[NOTE: For an FRC exotic structure, the name MUST contain the letters "FRC"]



When you hedge the advance trade using the Strip function, a cap trade is created with the characteristics of the selected trade template.

Sample FRC Exotic Trade



When you click **Refresh** in the Advance Rates by Term area, the pricing data are retrieved from the hypersurface for product index "Structured_NONE_NONE", collateral type "Whole Loan", Member, CICA "NO".

2.4.5 Sample Cap/Floor Exotic Structure Trade

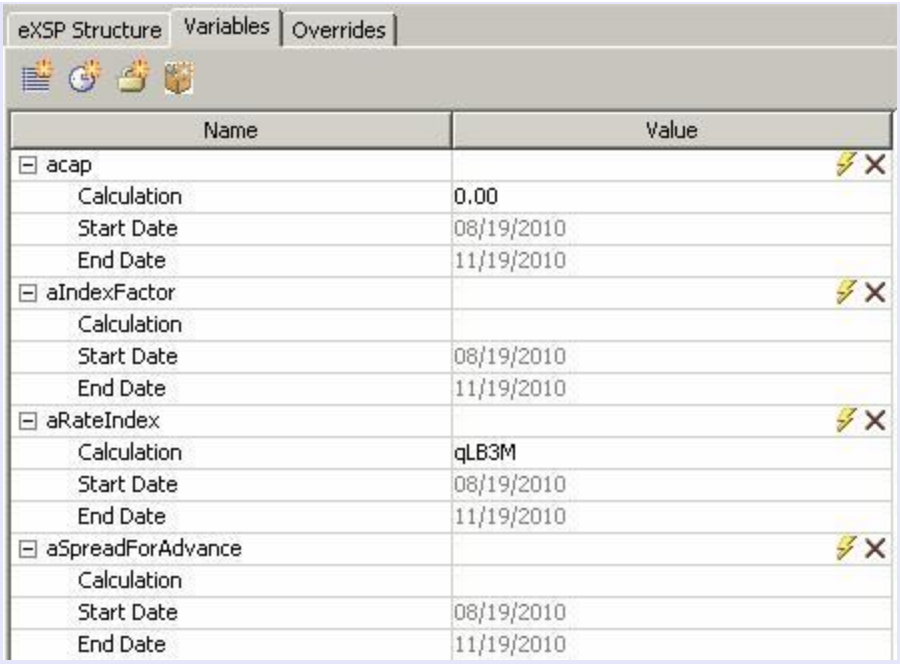
Choose Main Entry > Configuration > Product > Exotic Type Creator to create an exotic structure.

In this example, we create a cap structure on Libor 3M.

You need to have defined the exotic variable qLB3M (or any Libor 3M variable) under Main Entry > Configuration > Interest Rates > Exotic Variables as "MM.USD.LIBOR.3M.LIBOR01" (if the reference index is defined as such).

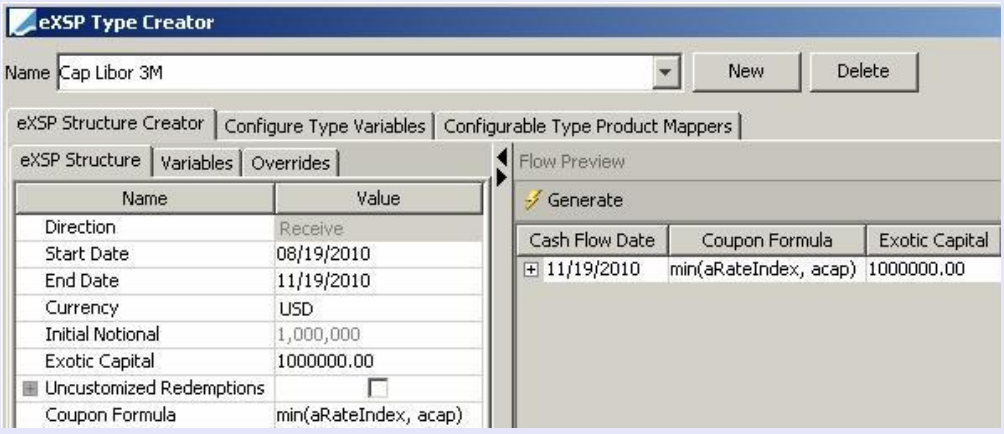
1. In the "Variables" panel, create an array variable for the cap rate, for the rate index, and for the index factor. Those will be applied to the hedge trade.

   You also need to create an empty array variable for the Advance Spread that will be retrieved from the hypersurface. It has to be called "aSpreadForAdvance". This variable is mandatory.



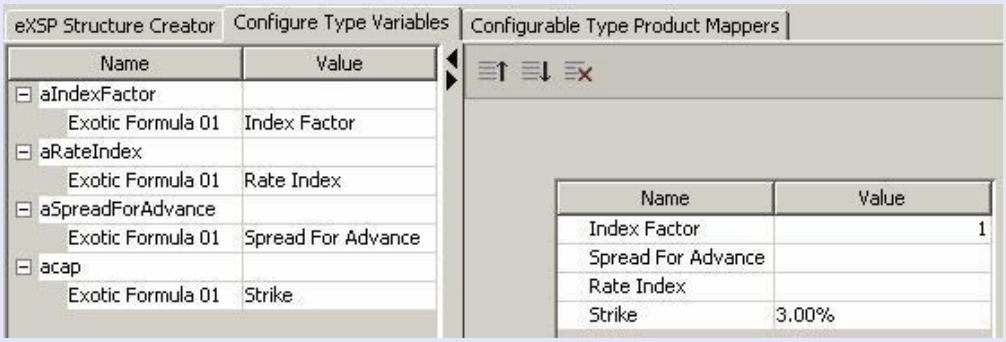
2 In the eXSP Structure panel, set the end date to **3M**, the exotic capital to **1M**, and the coupon formula to **min(aRateIndex, acap)** - It will take the minimum between the Libor 3M and the cap rate when computing the cashflows.

Then click **Generate** to generate the cashflows.



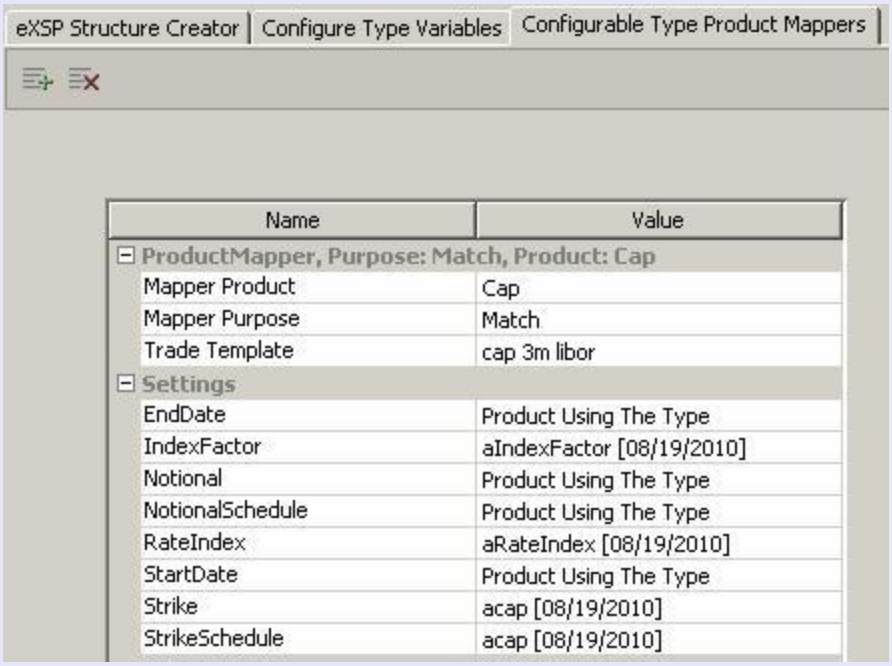
3 These variables need to be exposed in the Trade window for user capture and viewing.

Select the "Configure Type Variable" panel, and give them a meaningful name and a type.



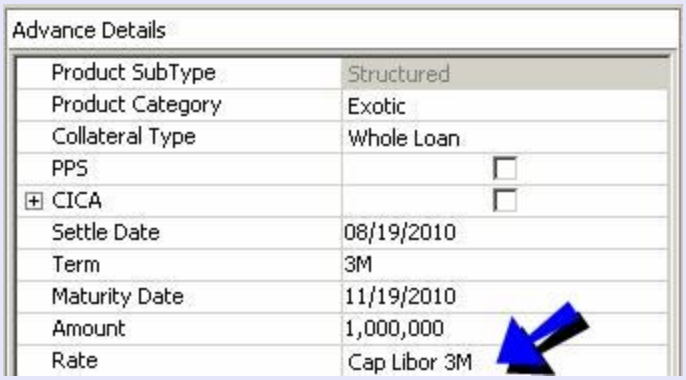
4 Select the "Configurable Type Product Mappers" panel and map the exotic structure to a cap trade template.

[NOTE: Make sure that you have saved a trade template from the Cap/Floor Trade window using CapFloor > Save As Template]



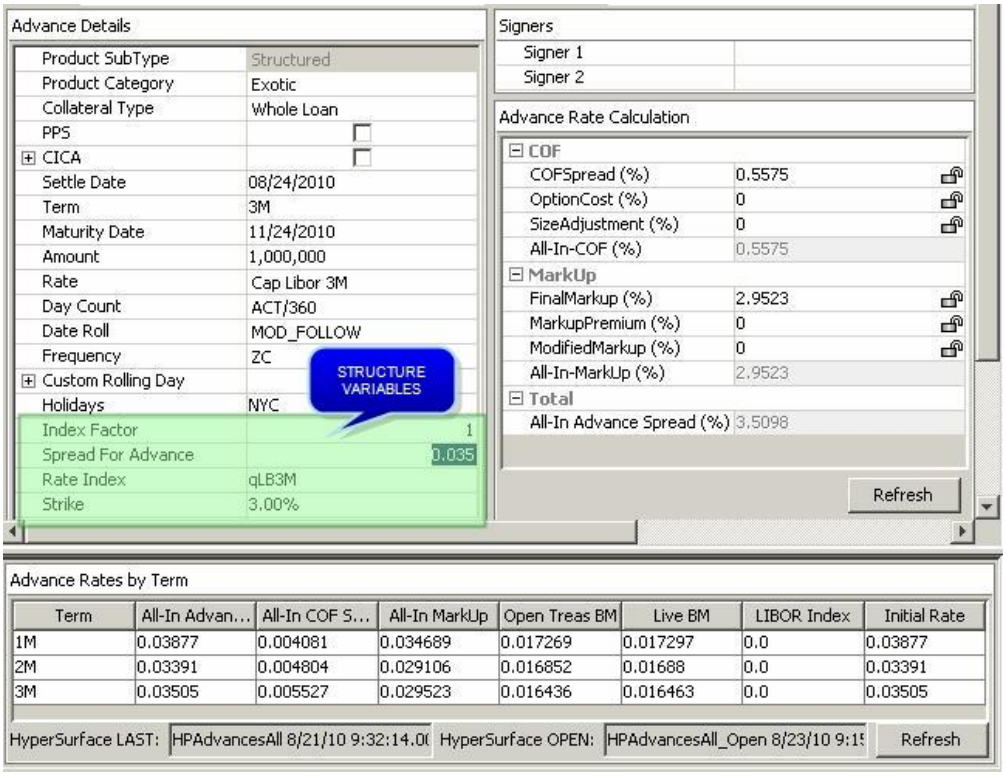
- Click to add a mapping.
- Select the product type and the trade template, then map all the fields to the Exotic Structure or to an array variable when available.

5 Save the exotic structure. You will be prompted to give it a name, for example "Cap Libor 3M". This name will be available for selection in the Rate field of the Advance Trade window.



When you hedge the advance trade using the Strip function, a cap trade is created with the characteristics of the selected trade template.

Sample Cap Exotic Trade



When you click **Refresh** in the Advance Rates by Term area, the pricing data are retrieved from the hypersurface for product index "Structured_LIBOR_3M", collateral type "Whole Loan", Member, CICA "NO".

When you click **Refresh** in the Advance Rate Calculation area, the tenor is picked up and the Spread For Advance rate is computed.

2.5 TRADE LIFECYCLE

You can terminate a trade using Back Office > Terminate. You can choose the reason "Prepayment" and select to clean up the interest at prepayment. Help is available from that window.

You can reset the floating rates of the swap using Main Entry > Trade Lifecycle > Reset > Rate Reset, or using the RATE_RESET scheduled task.

3. Defining Hypersurfaces for Advances

Choose Main Entry > Market Data > HyperSurface (menu action `marketdata.hypersurface.HyperSurfaceImplWindow`) to define a hypersurface for advances.

Advance Hypersurface Quick Reference

Prerequisites

Advance hypersurfaces are comprised of the following axes:

- Tenors - Defined when the hypersurface is created.
- Product Indices - Come from domain "Advance.productIndex" and must exist prior to creating the hypersurface.

  See Defining Product Indices for details.
- Members - Predefined (Member or Non Member).
- CICA Programs - Predefined (Yes or No).
- Collateral Types - Come from domain "Advance.collateralType" and must exist prior to creating the hypersurface. Collateral types are user-defined.

When a trade is captured, it will look for pricing data in the hypersurface for a combination of the above parameters. For example, if a trade is captured as Member, CICA Program = Yes, and Collateral Type = "Whole Loan" then you must have some pricing data in the hypersurface for this combination.

Hypersurface Generation

A given Advance trade quires a hypersurface for last values, and a hypersurface for opening values.

1. Choose HyperSurface > New to create a hypersurface, a wizard guides you through the process of creating the various components, and generates default points. You can modify the points in the Points panel.

2. Click **Save** to save the hypersurface and its components.

Pricer Configuration

A "last values" hypersurface is associated with a pricer configuration under the Product Specific panel for usage HyperSurface.

An "opening values" hypersurface is associated with a pricer configuration under the Product Specific panel for usage HyperSurfaceOpen.

Contents

3.1 Defining Product Indices

Product indices are generated by the system based on the type of Advance trade that you capture.

- For fixed Advances, the product index is unique "FRC_NONE_NONE" - This value is in the domain "Advance.productIndex" by default.
- For structured Advances, the product index is "Structured_NONE_NONE" for FRC exotic structures - This value is in the domain "Advance.productIndex" by default.

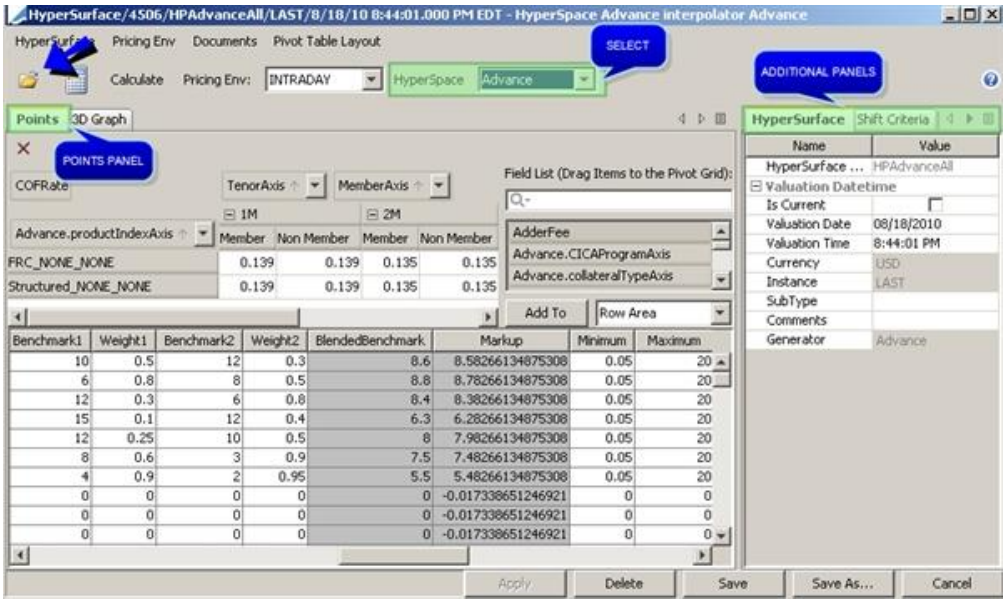
  For non FRC exotic structures, the product index is "Structured_<rate index name>_<rate index tenor>", for example Structured_LIBOR_3M.

  See Advance - "Sample Trades" for details on creating FRC and non FRC exotic structures.
- For floating Advances, the product index depends on the Advance subtype and rate index. It is created in the form:

  <advance subtype ARC or VRC>_<rate index name>_<rate index tenor>, for example ARC_LIBOR_3M.

  You need to add to the domain "Advance.productIndex" all the combinations that you may be trading, for example: ARC_LIBOR_3M, VRC_FEDFUNDS_1D, etc.

3.2 Sample Hypersurface



Choose HyperSurface > Open to load a hypersurface, or click . You will be prompted to select a hypersurface.
Then select "Advance" from the Hyper Space field to view its details.
General description of the window:

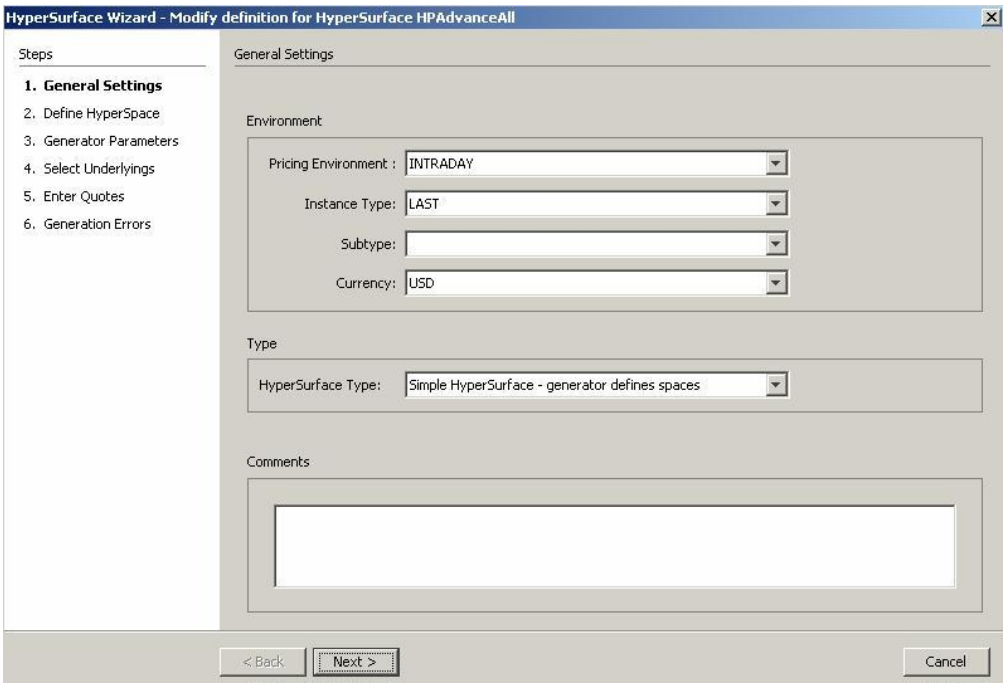
- The Points panel shows the points of the hyper space currently selected - You can enter the benchmarks there - You can filter the points to be displayed.
- The 3D Graph panel is not supported for Advance hypersurfaces because there are more than 3 axes.
- The HyperSurface panel shows the characteristics of the hypersurface: name, instance date and time, generator, etc.
- The Shift Criteria panel allows setting parameters to shift the hyper space currently selected.
- The Generator Parameters panel shows the parameters that apply to the selected generator.
- The Interpolation panel allows interpolating a given point on the hyper space currently selected.
- You can click to recalculate the points if you have modified any parameter of the hypersurface.

These panels are described in details below.

3.3 CREATING A HYPERSURFACE

3.3.1 HYPERSURFACE WIZARD

1. Choose HyperSurface > New to create a hypersurface, a wizard guides you through the process of creating the various components, and setting hypersurface characteristics.



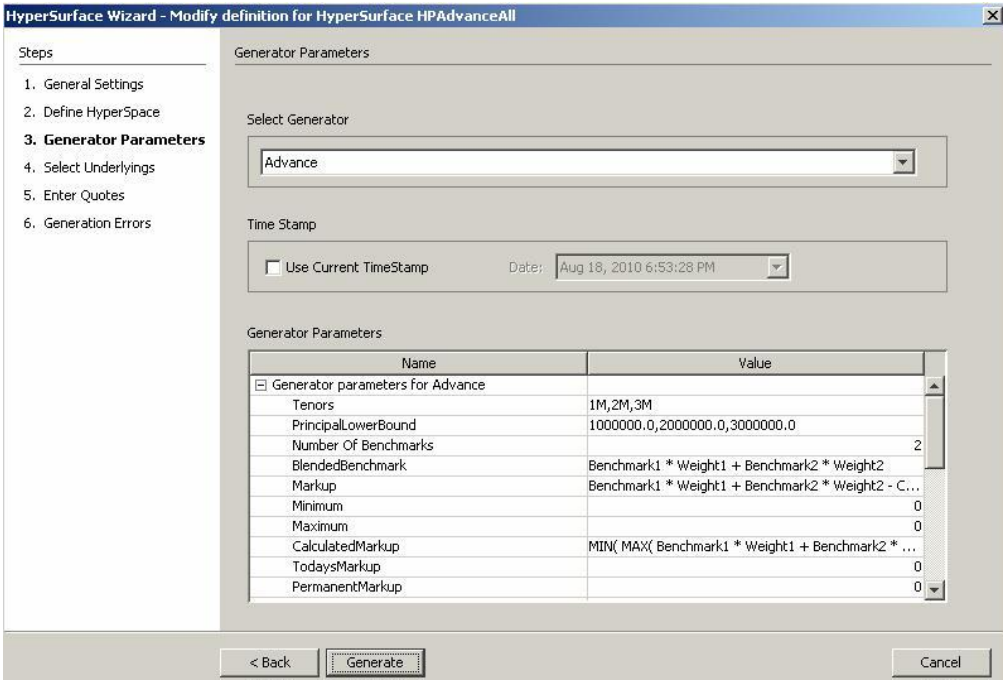
» General Settings - Select a pricing environment, an instance type, and a currency.

[**NOTE**: The instance type must be set in coordination with the value of the pricing parameter INSTANCE_TYPE]

You can add hypersurface sub types to the domain "hyperSurfaceSubTypes" as needed, and set a subtype on the hypersurface. This is for information purposes only.

Select the HyperSurface Type "Simple HyperSurface - generator defines spaces" - The components of this type of hypersurface are predefined based on the generator.

» Then click **Next**.



Select the generator "Advance".

The checkbox "Use Current TimeStamp" is checked by default, meaning that when you save the hypersurface, the system timestamps the hypersurface with the current date and time. You can clear the checkbox to enter a custom date.

The generator parameters are predefined. You can modify as needed. They are described below.

Scroll down to the market data requirements and select as applicable. They are described below.

Name	Value
⊞ Generator parameters for Advance	
⊟ MarketDataItems required for Advance	
COFRate	USD/ZC USD Libor/CLOSE
COFSpreadTo1MLibor	USD/ZC USD Libor/CLOSE
COFSpreadTo3MLibor	USD/ZC USD Libor 3M/6M/CLOSE
COFSpreadTo6MLibor	USD/ZC USD Libor 3M/6M Futures/CLOSE
PPSAdjustment	USD/ZC USD Libor/CLOSE
PutableAdjustment	USD/ZC USD Libor/CLOSE
TreasuryBenchmark	USD/ZC USD Libor/CLOSE

Generator Parameters

Parameters	Description
Tenors	Terms at which advance rates will be computed.
PrincipalLowerBound	Principal amounts for which to compute advance rates / advance spreads.
Number of Benchmarks	Default is 2. The benchmarks are defined in the Points panel once the hypersurface is generated for each combination of Tenor, Product Index, Member, CICA Program, Collateral Type.
BlendedBenchmark	Formula to compute the blended benchmark: weighted average of all benchmarks.
Markup	Formula to compute the markup: BlendedBenchmark - COFRate + CollateralPremium
Minimum	Default minimum markup, in basis points.
Maximum	Default maximum markup, in basis points.
CalculatedMarkup	Formula to compute the calculated markup: Markup adjusted with minimum and maximum values.

Parameters	Description
	MIN(MAX(Markup, Minimum), Maximum)
TodaysMarkup	Default markup for Today, in basis points - Overrides CalculatedMarkup for Today.
PermanentMarkup	Default fixed markup value, in basis points - Overrides CalculatedMarkup.
CollateralPremium	Differential between collateral type and tenor, in basis points.
MarkupPremium	Additional premium markup for non-standard advances, in basis points.
FinalMarkup	Formula to compute the final markup: CalculatedMarkup adjusted with TodaysMarkup and PermanentMarkup. The default formula is: (IntradayMarkup > 0) ? IntradayMarkup : [(PermanentMarkup > 0) ? PermanentMarkup : ((TodaysMarkup > 0) ? TodaysMarkup : CalculatedMarkup)] You can modify as needed.
AdderFee	Prepayment fee added to prepayments.
DerivativeMarkup	Markup for standalone derivatives with members, in basis points.
IntradayMarkup	Intraday markup, in basis points.
ModifiedMarkup	Markup on trade modification.
OptionCost	Default option price.
SizeAdjustment	Default advance rate / advance spread adjustments per principal amount, in basis points.

Market Data Requirements

Market Data	Description
COFRate	Zero curve to compute COF Rate.
COFSpreadTo1MLibor	Zero curve to compute COF Spread over 1M Libor.
COFSpreadTo3MLibor	Zero curve to compute COF Spread over 3M Libor.
COFSpreadTo6MLibor	Zero curve to compute COF Spread over 6M Libor.
PPSAdjustment	Zero curve to compute PPS Adjustments for Fixed Rate Credit-PPS advances. (PPS) Partial Prepayment Symmetry, in which the bank may pay to a Member if the Advance is in the money when prepaid.
PutableAdjustment	Zero curve to compute Putable Adjustments for advances with putable feature.
TreasuryBenchmark	Zero curve to compute Treasury Benchmarks.

2. Click **Generate**.

If the hypersurface is generated without errors, the wizard closes, and the points are displayed in the Points panel. Otherwise, generation errors are displayed in the wizard.

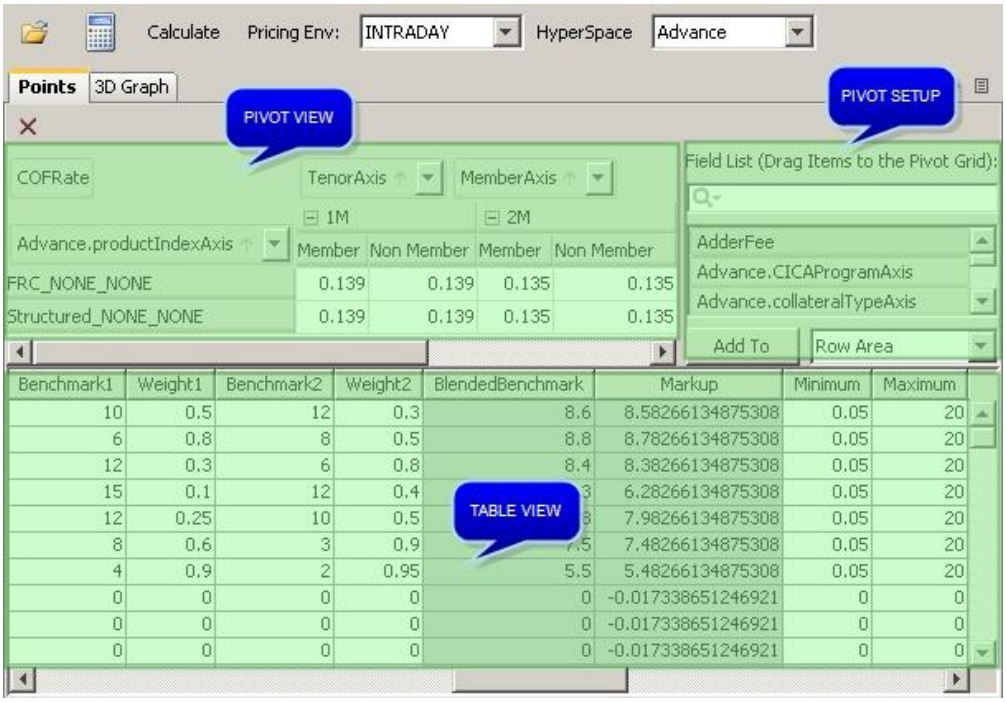
3.3.2 POINTS PANEL

The generated points are displayed in the Points panel.

The generator generates two hyperspaces: The Advance hyperspace contains benchmarks and markup information, and the AdvanceSize hyperspace contains size adjustments.

Advance

Select "Advance" from the HyperSpace field to capture benchmark information and compute markups.



You can configure the "Pivot View" as needed. In the example above, the pricing data are COFRate, the rows are product indices, and the columns are tenors and memberships. You can filter the rows and columns by clicking the header. For example, if you click "TenorAxis", you can filter which tenors you want to display.

The "Pivot Setup" allows adding information to the "Pivot View". Select a field, then select an area where you want to add the field (Row Area, Column Area, or Data Area), and click **Add To**. You can also drag a field and drop it in the "Pivot View".

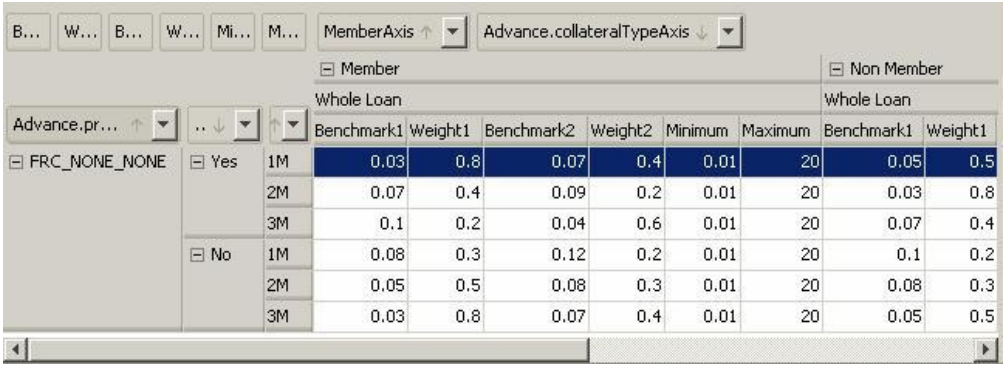
If you change the "Pivot View" layout, you can choose Pivot Table Layout > Save to save it.

The "Table View" shows all the fields in a tabular form.

» You can enter the benchmarks, weights, minimum values and maximum values so that the markup can be computed.

Sample Pivot View Setup

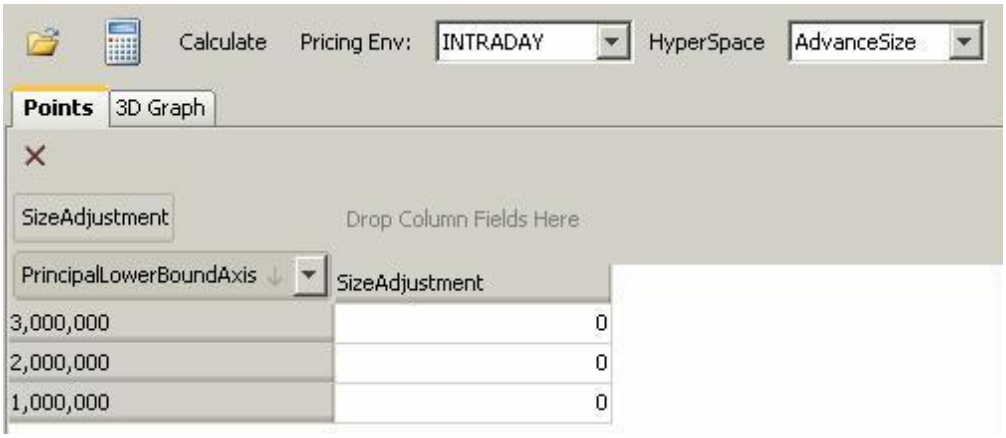
For example, you can setup the pivot view to capture benchmark data for a given product index "FRC_NONE_NONE" and a given collateral type "Whole Loan", for all tenors, all memberships, and all CICA programs.



AdvanceSize

Select "Advance" from the HyperSpace field to capture size adjustments.

You can set size adjustments per principal in basis points. They will be added to the advance rate / advance spread.



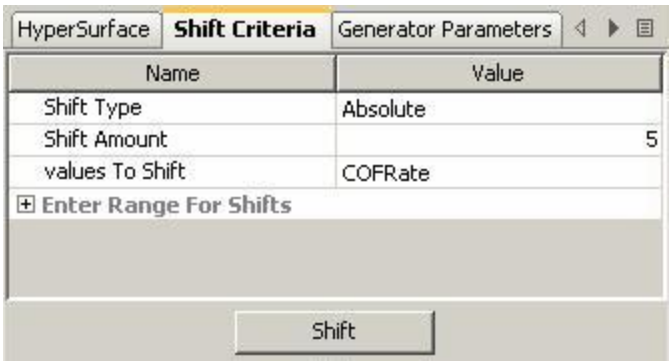
3.3.3 Save HyperSurface

Click **Save** at the bottom of the window to save the hypersurface. You will be prompted to enter a name.

[NOTE: Once the hypersurface has been saved, if you modify it and you want to save it again, you must check "Is Current" in the HyperSurface panel (or change the timestamp manually), then save the hypersurface]

3.4 Shifting a Hyper Space

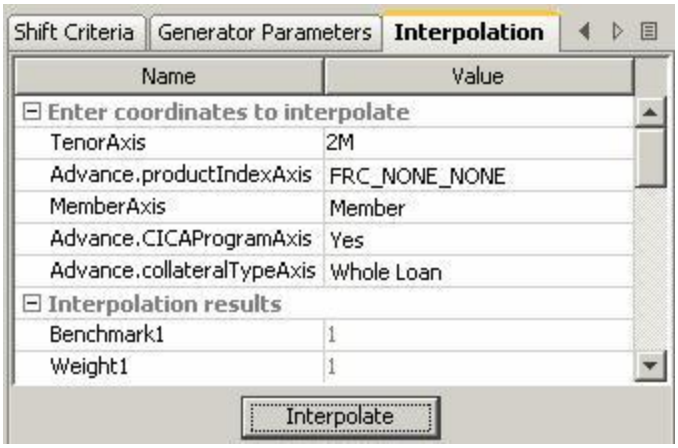
Select the Shift Criteria panel and enter shift criteria as needed.



» Then click **Shift** – The selected hyper space will be shifted accordingly.

3.5 Interpolating Points on a Hyper Space

Select the Interpolation panel and enter a point as needed.



» Then click **Interpolate** – The value is computed accordingly.

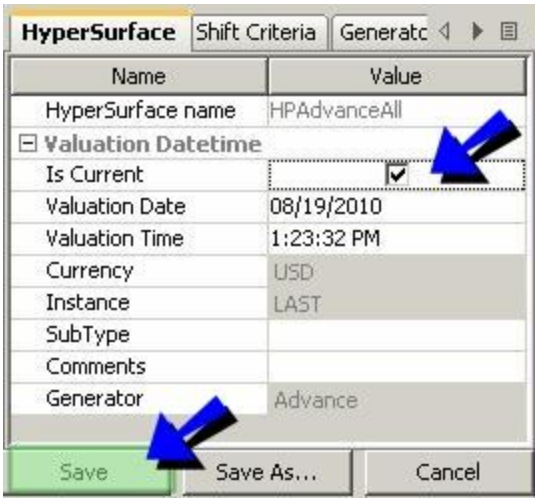
3.6 Modifying a HyperSurface

Choose Hypersurface > Open to load an existing hypersurface.

To modify the generator parameters, choose HyperSurface > Edit. You will have to regenerate the hypersurface.

To modify the points, simply modify the benchmarks, weights, etc.

Then check "Is Current" in the HyperSurface panel and click **Save**.

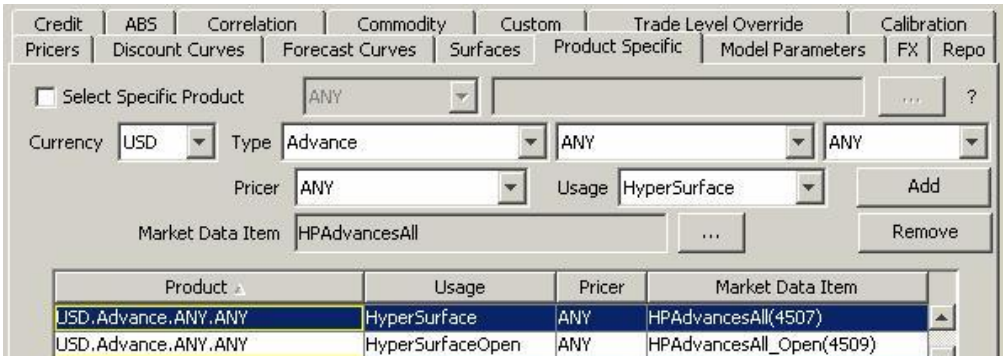


[NOTE: You cannot modify the generator of an exiting hypersurface. If you want to modify the generator, you need to delete the existing hypersurface and create a new one]

3.7 Pricer Configuration

Choose Main Entry > Market Data > Pricing Environment > Pricer Configuration.

Load a pricer configuration and select the Product Specific panel.



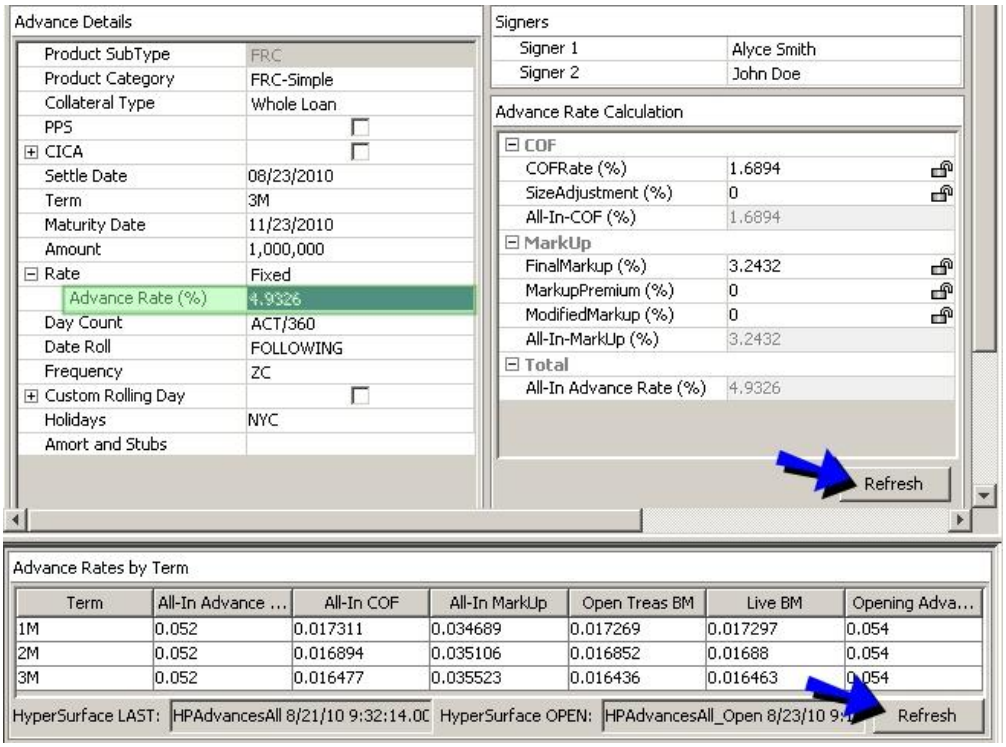
» Clear the "Select Specific Product" checkbox, and choose the product type "Advance". Select the currency as needed.

» Select usage "HyperSurface". Then click **...** to select a "last values" hypersurface (the market data type is "HyperSurfaceImpl"). Click **Add**.

» Repeat for usage "HyperSurfaceOpen" and the "opening values" hypersurface.

» Click **Save** to save the changes.

3.8 Sample Advance Trade



» Click **Refresh** in the HyperSurface area to load the hypersurfaces.

» Click **Refresh** in the Advance Rate Calculation area to display the pricing data for that trade. They are retrieved from the hypersurfaces based on the combination of Tenor, Product Index, Member, CICA Program, Collateral Type.