

Front Office (FO)

Introduction to Simulation



Learning Objectives



Introduction to Simulation

At the end of this course, you should be able to:

- ✓ Launch a simulation session with different choices according to needs
- ✓ Manage the settings in the simulation screen and explain their impacts
- ✓ Troubleshoot P&L in the simulation screen

Agenda

Introduction

Best Practices

Practice

Introduction

- Overview
- Simulation screen types
- Simulation behaviour
- P&L



Introduction



Simulation Overview

Simulation is a tool that shows portfolio positions. It is a core Front Office module tool and is used for all asset classes

Used by	Traders, sales and risk managers
Purpose	<ol style="list-style-type: none">1. Follow online positions, P&L and sensitivities2. Run “what-if” scenarios to see immediate impacts on current positions, P&L and sensitivities3. Check changes from new trades or market data variations4. Analyse and hedge risks
Results	Delivered with high performance

End-user session: Simulation/ Simulation/

Introduction

Simulation Overview

The simulation engine processes the following inputs:

Dynamic inputs

Evaluation date
Loaded trades
Market parameters
Calculation conventions

Automatic refresh



Live outputs

Positions, P&L and sensitivities:

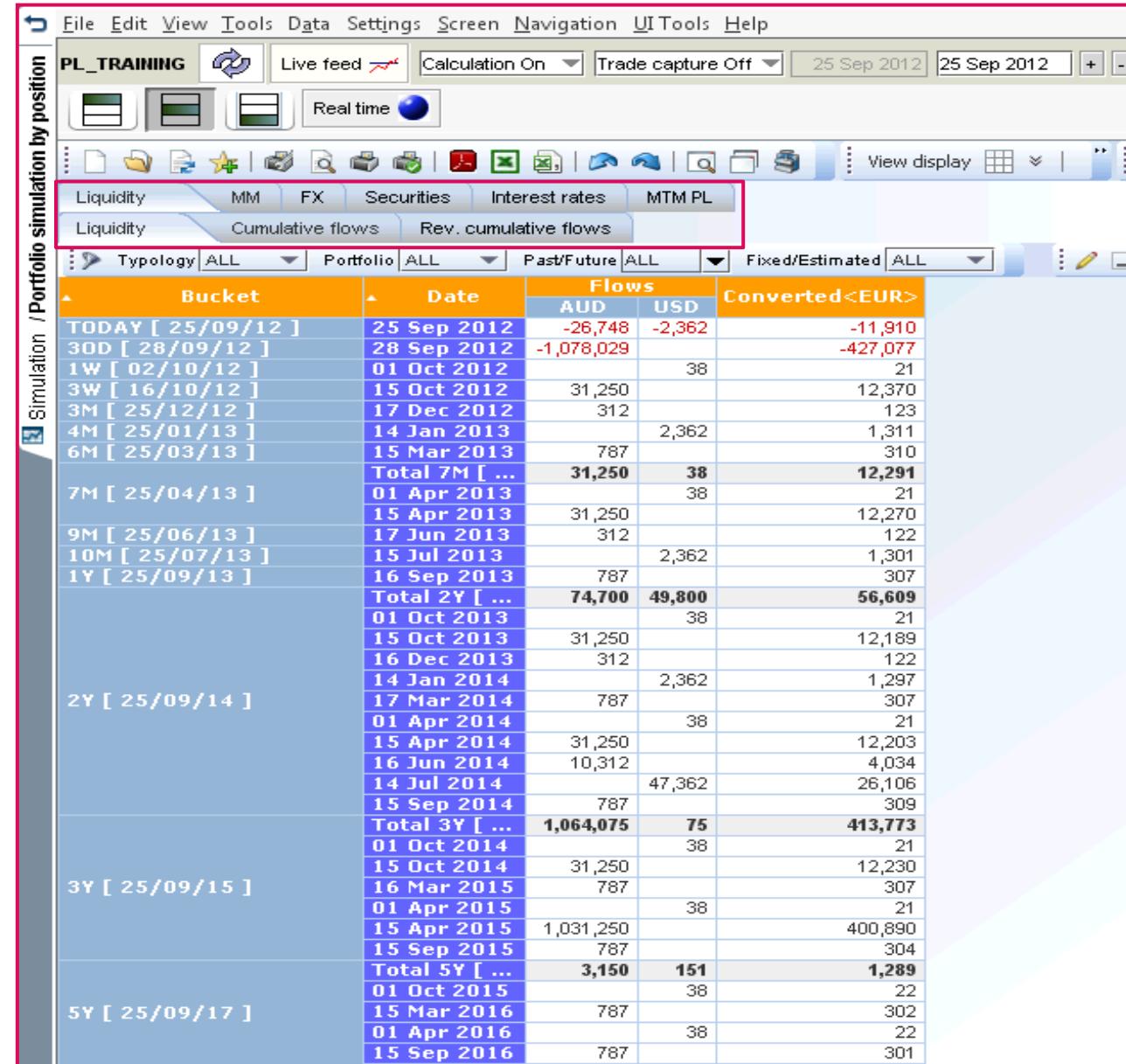
- Projected in a large selection of customized screens
- Global, or tailored to a specific financial area
- Total and/or detailed results

End-user session: Simulation/ Simulation/

Introduction

Simulation Overview

From the simulation screen, end-users can access positions, P&L and sensitivities for all asset classes using Viewer tool.



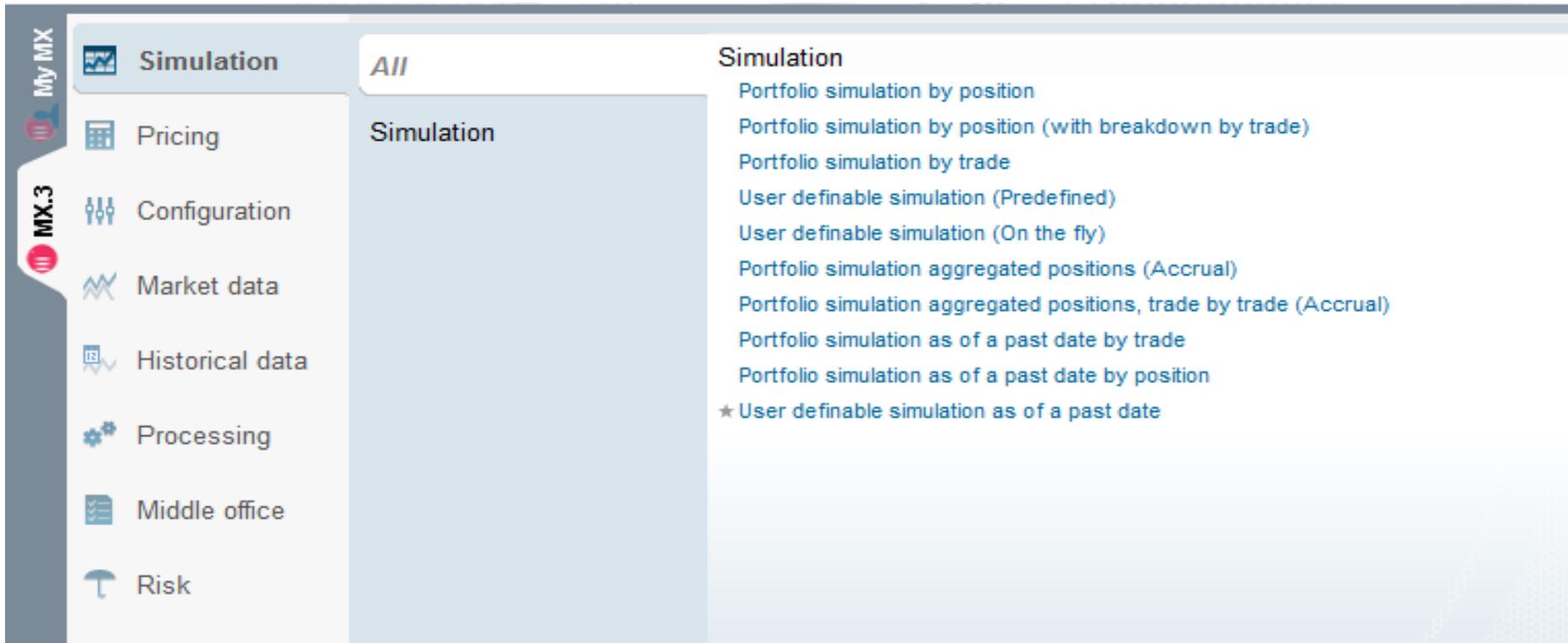
The screenshot shows the Murex PL_TRAINING simulation interface. The top menu bar includes File, Edit, View, Tools, Data, Settings, Screen, Navigation, UI Tools, and Help. The toolbar below has various icons for file operations like Open, Save, Print, and zoom. A sub-menu titled "Portfolio simulation by position" is open, showing tabs for Liquidity, MM, FX, Securities, Interest rates, and MTM PL. The MTM PL tab is selected and highlighted with a red border. Below this, there are two sub-tabs: Liquidity and Cumulative flows, with Liquidity selected. The main data area is a grid table with columns: Bucket, Date, AUD, USD, and Converted<EUR>. The table displays historical data from September 2012 to September 2016, categorized by time buckets (TODAY, 30D, 1W, 3W, 3M, 4M, 6M, 7M, 9M, 10M, 1Y, 2Y, 3Y, 5Y) and specific dates. Totals are shown for each bucket and for the entire period (Total 7M, Total 2Y, Total 3Y, Total 5Y).

Bucket	Date	AUD	USD	Converted<EUR>
TODAY [25/09/12]	25 Sep 2012	-26,748	-2,362	-11,910
30D [28/09/12]	28 Sep 2012	-1,078,029		-427,077
1W [02/10/12]	01 Oct 2012		38	21
3W [16/10/12]	15 Oct 2012	31,250		12,370
3M [25/12/12]	17 Dec 2012	312		123
4M [25/01/13]	14 Jan 2013		2,362	1,311
6M [25/03/13]	15 Mar 2013	787		310
Total 7M [...]		31,250	38	12,291
7M [25/04/13]	01 Apr 2013		38	21
15 Apr 2013		31,250		12,270
9M [25/06/13]	17 Jun 2013	312		122
10M [25/07/13]	15 Jul 2013		2,362	1,301
1Y [25/09/13]	16 Sep 2013	787		307
Total 2Y [...]		74,700	49,800	56,609
01 Oct 2013			38	21
15 Oct 2013		31,250		12,189
16 Dec 2013		312		122
14 Jan 2014			2,362	1,297
17 Mar 2014		787		307
01 Apr 2014			38	21
15 Apr 2014		31,250		12,203
16 Jun 2014		10,312		4,034
14 Jul 2014			47,362	26,106
15 Sep 2014		787		309
Total 3Y [...]		1,064,075	75	413,773
01 Oct 2014			38	21
15 Oct 2014		31,250		12,230
16 Mar 2015		787		307
01 Apr 2015			38	21
15 Apr 2015		1,031,250		400,890
15 Sep 2015		787		304
Total 5Y [...]		3,150	151	1,289
01 Oct 2015			38	22
15 Mar 2016		787		302
01 Apr 2016			38	22
15 Sep 2016		787		301

Introduction

Simulation screen types

To launch the Simulation, the end-user has several choices:



The screenshot shows the Murex MX.3 application interface. On the left, there is a vertical navigation bar with icons and labels: My MX (selected), MX.3 (highlighted with a red circle), Simulation, Pricing, Configuration, Market data, Historical data, Processing, Middle office, and Risk. The main area has a header with tabs: Simulation (selected) and All. Below the tabs, there is a search bar with the placeholder "Search". The main content area is titled "Simulation" and lists various simulation types:

- Portfolio simulation by position
- Portfolio simulation by position (with breakdown by trade)
- Portfolio simulation by trade
- User definable simulation (Predefined)
- User definable simulation (On the fly)
- Portfolio simulation aggregated positions (Accrual)
- Portfolio simulation aggregated positions, trade by trade (Accrual)
- Portfolio simulation as of a past date by trade
- Portfolio simulation as of a past date by position
- ★ User definable simulation as of a past date

End-user session: Simulation/ Simulation/

Simulation screen types: Warehouse

The warehouse is a position server that aggregates and stores financial figures for trades and their events according to some given aggregation keys.

Advantage	To improve performance on simulation by position
Computation	The warehouse service maintains computation/aggregation in real-time.
Warehouse rebuild	<p>The following processing scripts should be executed in order to rebuild the consolidated data model based only on the trade repository (i.e. detailed data model) data:</p> <ol style="list-style-type: none">1. Cleanup to replace manual truncation as of v3.1.282. Stop Engine3. Warehouse Rebuild4. Maintenance5. Start Engine

Introduction

Simulation screen types: Simulation by position

These are the fastest simulations:

Portfolio simulation by position	Results are consolidated, trades are accessible via trade contribution.
Portfolio simulation by position (with breakdown by trade)	Results are read from the warehouse non aggregated tables, providing access to trade number. (Trade contribution loads all the deals contributing to the shown amount, this is used for troubleshooting purposes, in order to identify which deal is causing an issue for example.)
Portfolio simulation aggregated positions (Accrual)	Results are consolidated but MM trades are loaded with a lower level of aggregation to calculate accrual P&L figures.
Portfolio simulation aggregated positions, trade by trade (Accrual)	Results are read from the warehouse non aggregated tables, and MM trades are loaded with a lower level of aggregation to calculate accrual P&L figures.

- ✓ The results in aggregated simulation screens are consolidated. Therefore a drilldown by deal is not always possible.
- ✓ The results are aggregated by portfolio. They are read from the warehouse tables.
- ✓ At EOD, a process is run that aggregates the P&L of deals into warehouse tables, this information is then loaded in Simulation by position.

When this screen is loaded, the simulation date must be
>= consolidation date otherwise nothing is loaded.

Introduction

Simulation screen types: Simulation by trade

The calculations in detailed simulation screens are done on each deal.

This simulation is slower than aggregated simulations:

Portfolio simulation by trade	<ul style="list-style-type: none">• Results are detailed trade by trade.• Loading by portfolio.
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The User Definable Simulation screen requires the user to enter a filter criteria so that we can apply the calculations.

User definable simulation (Predefined)	Predefined filter, selected from the list
User definable simulation (On the fly)	<ul style="list-style-type: none">• Filter criteria selected on the fly• Similar to trade query screen

The user definable simulations are not refreshed by new trades or events.
They are mainly used for troubleshooting.

End-user session: Simulation/ Simulation/

Practice 1 (1/2): Compare the portfolio simulations

By position and by trade

Compare portfolio simulations by:

- a) position
- b) position (with breakdown by trade)
- c) portfolio simulation by trade

1. Open an end-user session with the login MUREXFO/MUREXFO, group FO.

2. Open 2 additional FO sessions using the '+' tab.

3. Open one type of simulation screen in each of the different sessions.

Think of labeling the tabs!

4. Load in each simulation screen all FI portfolios.

5. Load the following views (using the search functionality in the gallery):

MX_PL_MTM breakdown daily (c) for the simulations by position

MX_PL_MTM breakdown daily (d) for the simulation by trade

6. Compare the 3 sessions: **Are P&L prices synchronised in all 3 sessions?**

7. Add a line breakdown by transaction number in all 3 sessions (using the edit view mode):

from the Data Dictionary, the field is called **Trade number**.

Save view changes. **Are there differences in all 3 sessions?**



Practice 1 (2/2) : Compare the portfolio simulations



By position and by trade

Compare portfolio simulations by: position; position (with breakdown by trade) and portfolio simulation by trade

8. In "Portfolio simulation by position", select a position to view the trades contributing to it (e.g. a KFW 3.5% 7/15 bond in the portfolio FI_BND_CORP_EU). To do so, right click on the bond label (field Instrument) and select "Trade contribution/ Explain position" in the menu.
9. Once the screen is open, open the view REF_PL
10. Check the different P&L components (last fields of the view) in the trade contribution and compare them to the portfolio simulation by trade (beware of the currency)
11. Load a user definable simulation (on the fly) on a set of the trades that you see in the trade contribution
12. Compare the P&L values to the one from the portfolio simulation by position (breakdown by trade)



Introduction

Simulation screen types: Simulation as of past date

- Simulation as of past date:
 1. Prompts the user to select the past date, then any filter, and finally select a portfolio.
 2. Loads trades that correspond to status of database as of selected past date.
 3. Bases the revaluation past date market data of the corresponding data set.

Simulation as of past date can be by position, trade or other user definable criteria.

Portfolio simulation as of past date by trade	<ul style="list-style-type: none">• Results are detailed, by trade, at past date• Loading by portfolio
Portfolio simulation as of past date by position	<ul style="list-style-type: none">• Results are consolidated, by position, at past date• Loading by portfolio
User definable simulation as of past date	<ul style="list-style-type: none">• Results are detailed, by trade, at past date• Filter on the fly

End-user session: Simulation/ Simulation/

Simulation screen types: Other simulation screens

Other simulation screens

Today Portfolio simulation by trade	Filtered on today's deals only, will not display previously inserted deals.
Counterpart side simulation	Filtered on one counterpart, the buy/sell is reversed compared to portfolio simulations.
Fund simulation by trade	Filtered on a fund in detailed mode – asset management specific simulation.
Fund simulation by position	Filtered on a fund in consolidated mode – asset management specific simulation.

End-user session: Simulation/ Simulation/

Introduction

Simulation Behaviour: Trade Selection

Simulation by Portfolio can be dynamically refreshed with operations performed:

- ✓ New Trades are inserted into the loaded portfolios.
- ✓ Events (market operations) are performed on existing trades of the loaded portfolios.

Rights are set in Supervisor session

Automatic refresh

Supervisor session: Portfolios/ Portfolios rights

“Autotrade capture” flag is available in the simulation screen (or also under Settings/ Simulation screen settings/ Trade capture).

All users	Automatic refresh
By user	Only trades or events inserted by current user and attached to loaded portfolio impact the simulation.
Inactive	Only trades or events inserted from current session and attached to loaded portfolio impact the simulation.

Under Settings/ Simulation screen settings/ Simulation Server

Introduction



Simulation Behaviour: Market Parameters

The market data loaded when the user enters the simulation screen are based on the default market data set assigned to the user's FOD.

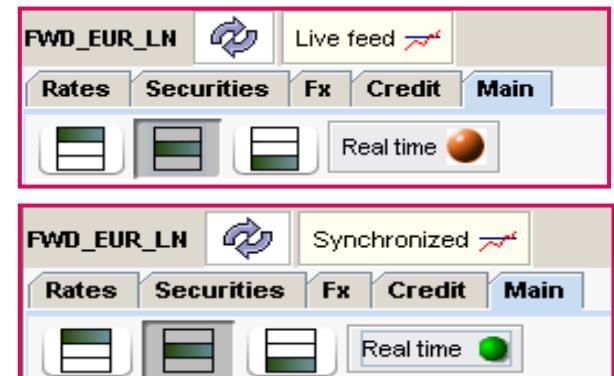
The Simulation screen can be connected to Real-time feed.

Real-time activated	Refreshes the market data in the simulation screen. The P&L and different figures on screen are recalculated using the real-time market data.
Real-time deactivated	The DB market data is loaded on screen. The P&L and different figures are calculated using the DB market data.

Two real-time connectivity modes are available:

Live Feed	Market data are refreshed automatically according to a user defined refresh cycle.
On demand	User is prompted when new market data becomes available. Market data are refreshed only when requested by user.

The market data viewer connected to RT can be used to both publish and retrieve market data.



These settings are also available under Settings/ Simulation screen settings/ Realtime status.

Introduction

Simulation Behaviour: Market Parameters

Users connected to MX using their different sessions can update the market data simultaneously.

Active sessions can be **protected from changes** made to other sessions unless:

1. A refresh is requested (*File/ Market data/ Reload Stored Market Data*), or
2. Simulation is re-launched.

Users can do 2 types of changes on the market data in the simulation screen: local and global

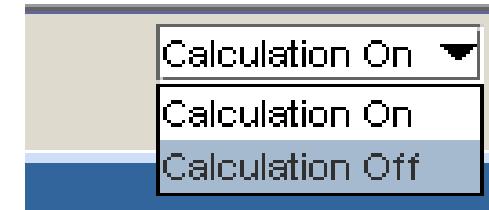
Local changes	Performed on market data (loaded in memory) from within simulation screens: <ul style="list-style-type: none">• Directly on-screen.• Zooming on Loaded Market Data, but without global save.
Global changes	Performed on "official" market data set by saving Loaded Market Data.

Zooming on the individual screens from the Market data tree in View/ Popup Market data can also allow performing live changes or saving them to the database.

Simulation Behaviour: Market Parameters

Two calculation modes are available to the users in the simulation screen:

ON	Any change in market data or horizon date re-calculates the position.
OFF	Single changes do not imply a recalculation, this allows several changes before the system re-calculates the position.



Introduction

Simulation Behaviour: Evaluation Date



The simulation can run on 2 dates:

ON	Default date It can be shifted forward
OFF	<ol style="list-style-type: none">1. Trades loaded with their status as of selected date2. Trades loaded from detailed tables3. Revaluation uses market data as of selected date

Theta & Horizon date: From simulation screen, forward move of horizon date shows actual time decay effect (theoretical Theta).

Theta as of past date: When simulation is loaded as of past date and horizon is moved forward, system considers loaded deals only.

Introduction

Simulation Behaviour: Calculation Assumptions

The different calculation settings in simulation can customize the display choices. They are applied on 3 levels:

	Scope	Set under the screen	Example
General settings and pricing settings	Shared by all users	Configuration/ Settings/ General settings	Gamma calculation: bucketed
Current session settings	Applied in the scope of current session only	Configuration/ Settings/ Current session settings	Same as general settings
Simulation settings	Used exclusively in simulation screens	Configuration/ Settings/ Simulation settings	Real-time status: Connected (Automatic retrieve)

Troubleshooting Tips:

- ✓ Some flags impact calculations only if market conditions change.

Example: When moving horizon, rates may remain constant or equal Fwd-Fwd rates.

- ✓ Other flags impact the P&L values without any market change.

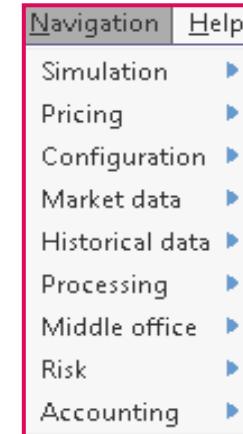
Example: Discounting On/Off → if discounting flag is on, then the P&L will take the effect of discounting in the result. If the flag is set to no, then the P&L will not display discounting effects in the numbers.

Introduction

Simulation Behaviour: Access

Access to general menu

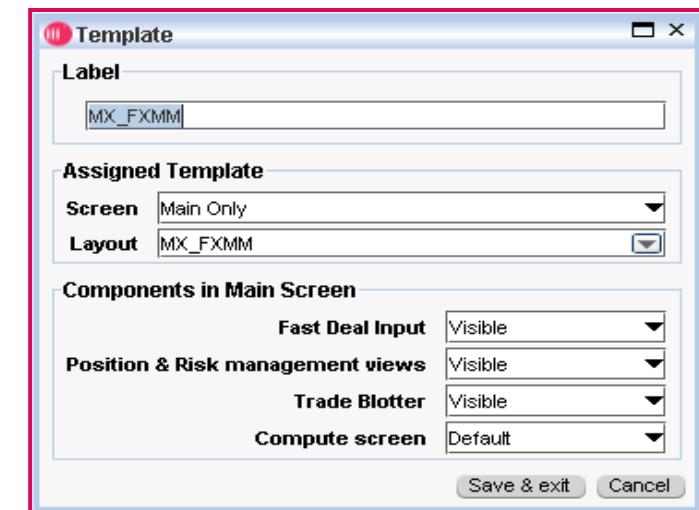
The user does not need to exit from the simulation screen to access the different screens in MX.
All the screens are accessible from the Navigation menu in Simulation



Configurable access to the different screens in simulation

Access to the various screens can be set in a configurator session:

- Main only
- Specific screens
- Include Fast Deal Input & trade blotter



End-user session: Simulation/ Simulation/

Configurator session: Infrastructure/ FO desk/ Settings/ Risk Engine/ Simulation screen assignments

Practice 2 (1/2): Market data effects

Market data effects in simulation

View the market data changes effects in the simulation

1. Open 2 sessions with the login MUREXFO/MUREXFO.
2. Open the group FO in each session.
3. Launch a portfolio simulation by trade in the 2 separate sessions on the portfolio FWD_EUR_LN, view MX_PL_MTM summary (d).
4. Record the P&L figures.
5. Stop the real time feed *if activated*. Remember how to do so?
6. Reload stored market data:
 - a) How?
 - b) Has anything changed in current session?
7. Change the EUR/USD spot rate in the loaded market data:
 - a) How?
 - b) Do not save, simply exit → Has anything changed in current session? In second session? Why?

Practice 2 (2/2): Market data effects

Market data effects in simulation

View the market data changes effects in the simulation

8. Restore the previous values
9. Change the EUR/USD spot rate but save globally this time.
 - a) Has anything changed in current session? In second session?
Why?
 - b) Update the second session's P&L.

Compare the 2 sessions

Introduction

P&L: Absolute P&L vs. Relative P&L

Business users are generally interested in a **variation P&L** between two dates, for example P&L since the beginning of the year, beginning of the month, or the day before (also known as P&L performance).

This is called **relative P&L** in MX.

Absolute P&L	P&L since inception (evaluation date), also called live to day P&L.
Relative P&L	= Absolute P&L as of day 1 – Absolute P&L as of day 2 The most common relative P&L are the daily, monthly and yearly.

The simulation data from the data dictionary provides only information as of the horizon date (updated in real time)

To display values as of different dates, the simulation needs to access their **stored values** previously calculated at different dates through the Datamart module.

It is also possible to calculate the variation of these displayed values between two dates within the simulation viewer.

For example: Let's assume the P&L for the previous business day has been stored (i.e. closing P&L based on official rates).

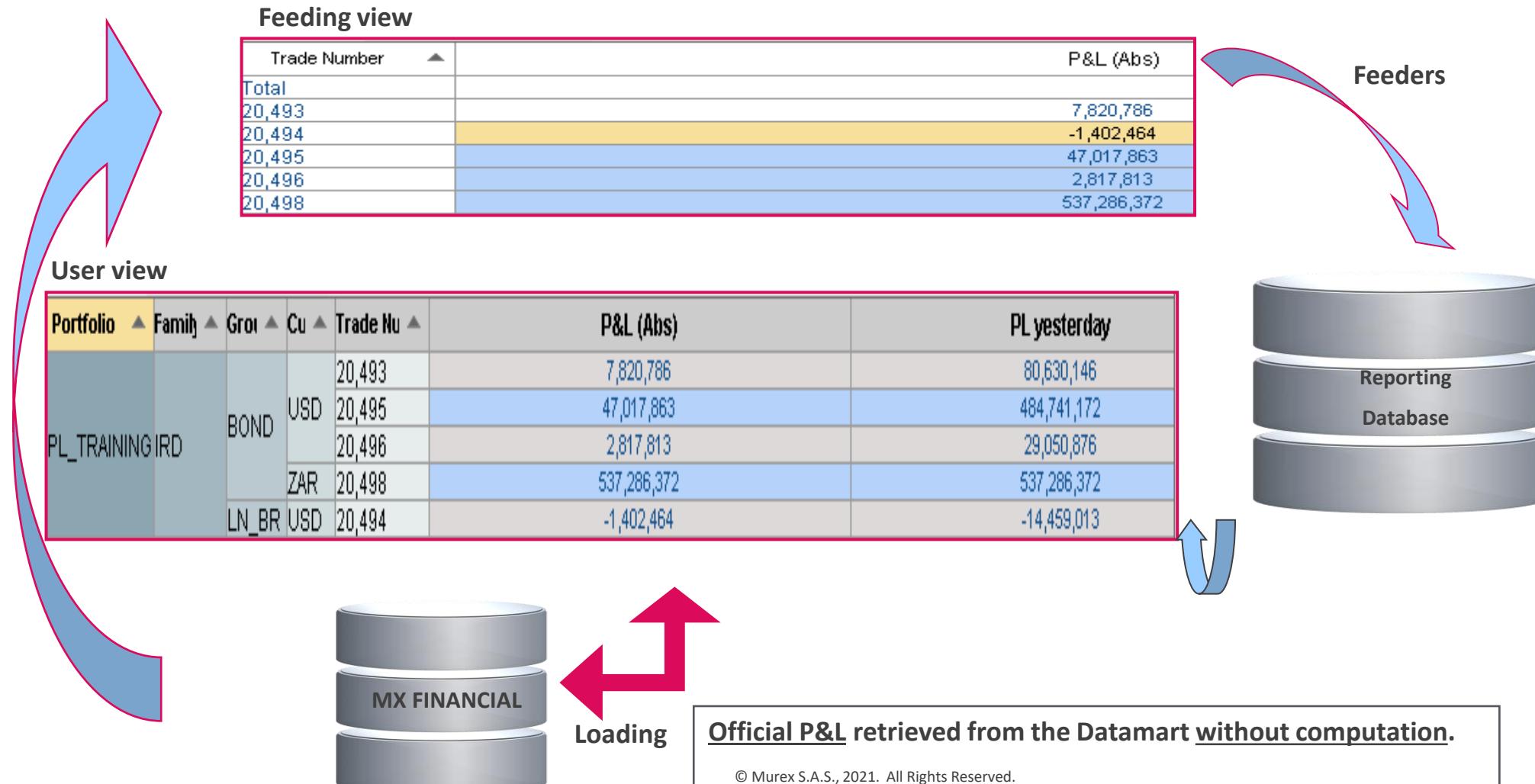
This stored yesterday P&L can be displayed in the simulation viewer together with today's P&L.

As such, the daily P&L can be calculated directly within the simulation viewer.

Introduction

P&L: Absolute P&L vs. Relative P&L

P&L Variation: How does it work in MX?



P&L Variation Datamart

The Stored P&L is the absolute P&L of a position or a trade, copied and saved for a given date in the Datamart table (usually at End Of Day via a script of feeders)

This captured P&L will be used in the future in order to compare results for reporting purposes or to review prior positions.

In simulation:

Daily P&L	Today P&L – Yesterday P&L
Monthly P&L (MTD P&L)	Today P&L – Last open day of the previous month P&L
Yearly P&L (YTD P&L)	Today P&L – Last open day of the previous year P&L

Where:

- ✓ Today P&L: calculated on the fly in the simulation
- ✓ Yesterday P&L, Last OD of previous month P&L and Last OD of previous year P&L: stored values read from the Datamart (P&L table).
- ✓ The Stored P&L table breaks down P&L components into separate fields for :
 - Financing
 - Present Value Effect
 - Brokerage Fees

P&L: Absolute P&L vs. Relative P&L

P&L Variation: P&L Variance

This relative P&L can be compared to the P&L Var amount, which gives the expected change in P&L between yesterday and today based on the different variables used in calculating the P&L (curves, rates, etc.).

The P&L Variance module can be used to explain the P&L movement between yesterday and today.

P&L Variation: Settings



It is possible to display the P&L stored values or the P&L variation

To display the P&L variation in the simulation viewer:

1. Create a view for the historical outputs which are stored in the Datamart. The matching is done by trade number (or another consolidation key).
2. On the considered field, right-click → Output Settings>Source settings.
3. Choose “Stored” as a source.

You can specify in which tables the data should be retrieved, for which data (storing view) and which corresponding Datamart snapshot (tag).

The screenshot shows two windows. On the left, a table titled "Daily P&L<EUR>" displays various P&L values. On the right, a dialog box titled "Settings" has the "Source Settings" tab selected. The "Source" dropdown is set to "Stored". The "Data Loading" section includes fields for "Table" (set to "REF_PL.REP"), "Storing View" (set to "REF_PL"), "Date" (set to "21 Sep 2012"), "Shifter" (set to "-01 BD"), "Type" (set to "Public"), and "Tag" (set to "REF_PL.REP"). The "Data Processing" section includes fields for "Display Mode" (set to "Variation"), "Filter Column" (set to "TP_PFOLIO"), and "Totals" (set to "Computed"). A red box highlights the "Source" dropdown in the "Source Settings" tab, and a red arrow points from the "Source" step in the list above to this box. Another red box highlights the "Source Settings" tab itself.

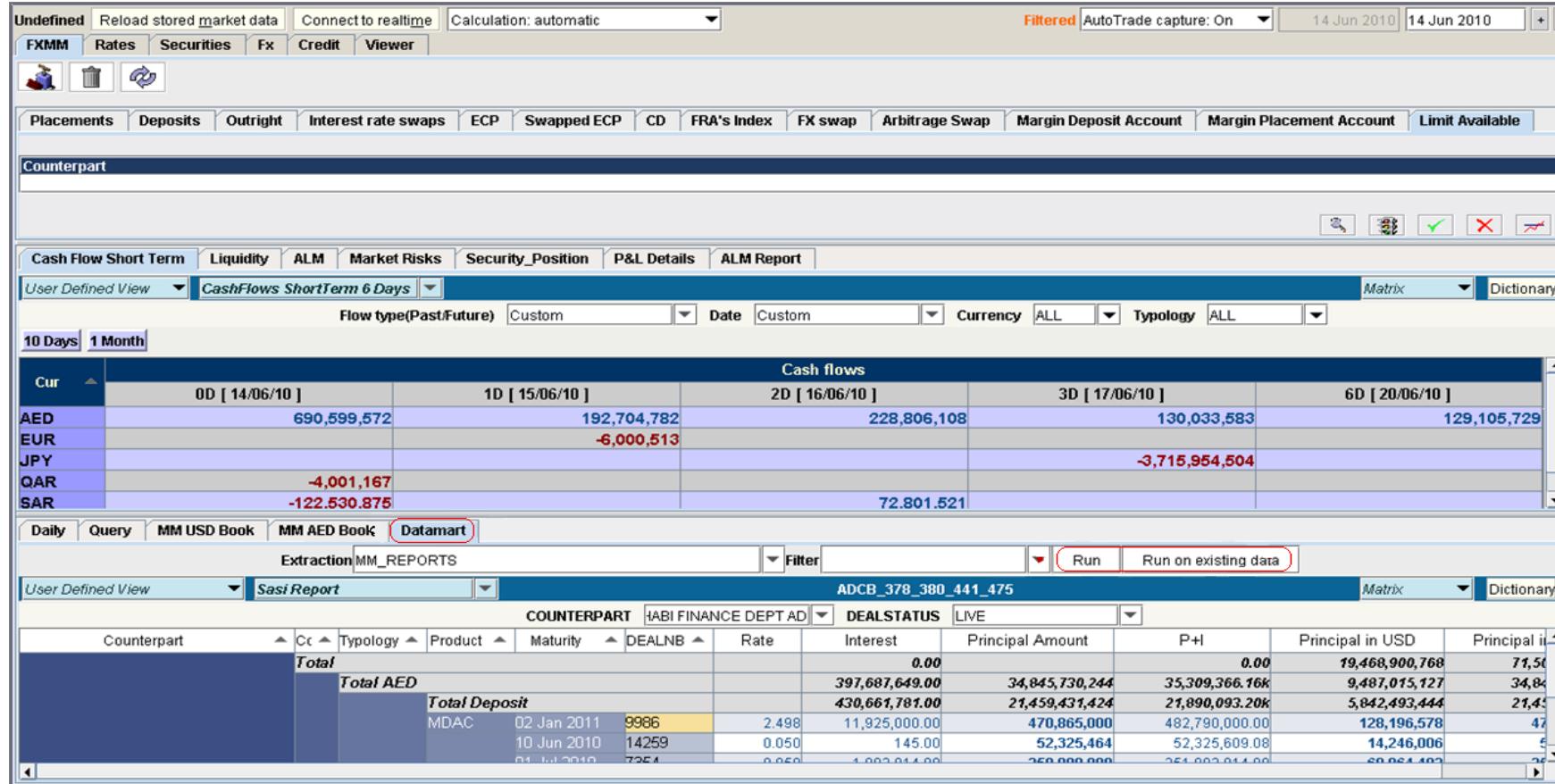
Output Settings>Source Settings:

Source	Stored
Table	Name of table within which closing P&L results stored.
Date	Populated automatically based on shifter rule.
Shifter	-IBD for daily P&L.
Type	Public and Tag determine more precisely which stored dataset to recover.
Display Mode	Variation for daily P&L.

Introduction

P&L: Capturing the P&L in the Datamart

The Datamart can be used to capture the Today's P&L in order to use in the future.



The screenshot shows the Murex FXMM application interface. The top navigation bar includes tabs for Undefined, Reload stored market data, Connect to realtime, Calculation: automatic, Filtered, AutoTrade capture: On, and dates 14 Jun 2010 to 14 Jun 2010. Below the navigation bar are several toolbars and buttons for Placements, Deposits, Outright, Interest rate swaps, ECP, Swapped ECP, CD, FRA's Index, FX swap, Arbitrage Swap, Margin Deposit Account, Margin Placement Account, and Limit Available. A toolbar for Counterpart is also present. The main workspace displays a grid of cash flows for various currencies (AED, EUR, JPY, QAR, SAR) over different days (0D to 6D). The 'Datamart' tab is highlighted in red. Below the grid, a section titled 'Sasi Report' shows a table with columns for COUNTERPART, DEALSTATUS, and LIVE. The table contains data for Total, Total AED, and Total Deposit, along with specific entries for MDAC deals.

COUNTERPART	DEALSTATUS	LIVE
Total		
Total AED		
Total Deposit		
MDAC	02 Jan 2011 9986	2.498
	10 Jun 2010 14259	0.050
	04 Jul 2010 7254	0.050
		11,925,000.00
		470,865,000
		52,325,464
		250,000,000
		251,000,000
		50,000,000
		128,196,578
		482,790,000
		52,325,609.08
		14,246,006
		251,000,000
		50,000,000

End-user session: Simulation/ Simulation/ Datamart tab

Introduction

P&L: Troubleshooting P&L

Daily P&L is wrong:

Daily P&L = Today's absolute P&L – Yesterday's absolute P&L

The incorrect value can come from today's evaluated P&L or yesterday's stored P&L.

Stored P&L is incorrect:

It can be recalculated manually by loading a simulation as of past date and looking at the view used for P&L storage.

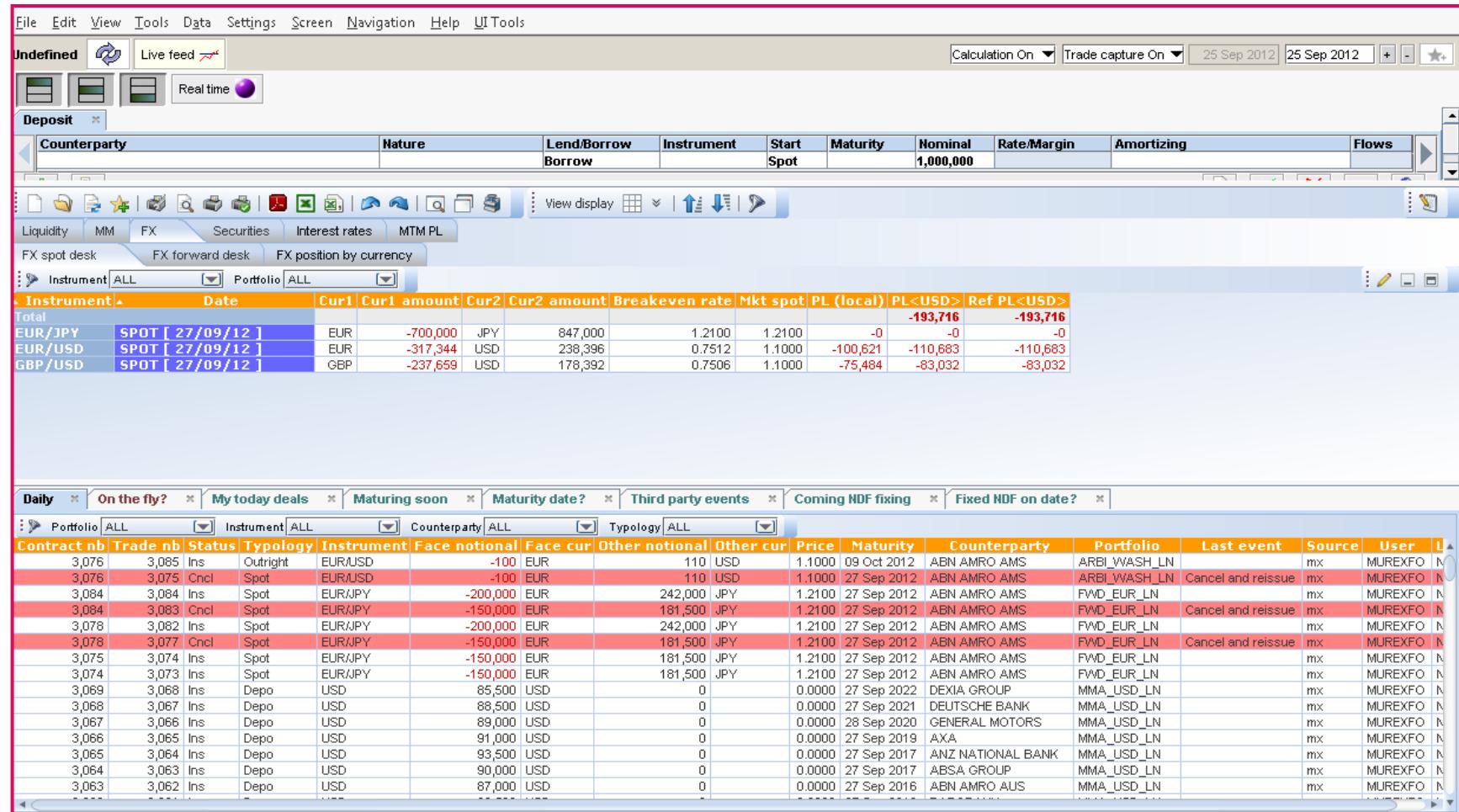
The Stored P&L is different from the recalculated P&L:

This happens when changes affecting past dates P&L are made, such as:

- > Modification of past market data
- > Insertion of a back-traded deal

Introduction

Examples: FXMM screen



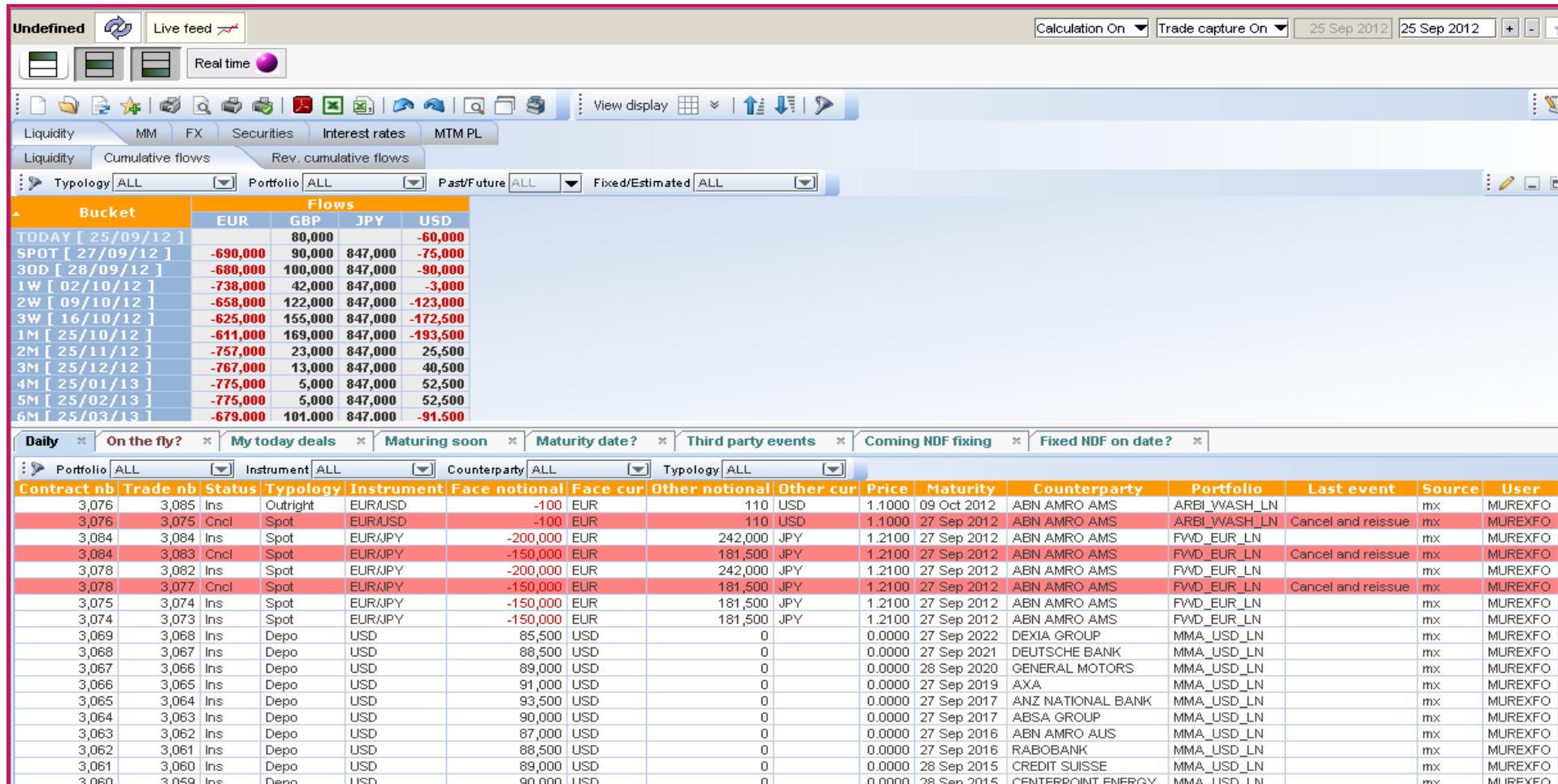
The screenshot shows the Murex FXMM interface with several key features highlighted:

- Fast deal input:** The top section of the screen is a deal entry form. It includes fields for Counterparty, Nature (Borrow), Lend/Borrow, Instrument (Spot), Start date (25 Sep 2012), Maturity date (25 Sep 2012), Nominal amount (1,000,000), Rate/Margin, Amortizing, and Flows. A red bracket on the right points to this area.
- Position keeping and P&L monitoring:** Below the deal input is a table showing instrument positions and P&L. It lists EUR/JPY, EUR/USD, and GBP/USD with their respective details like Date, Cur1, Cur1 amount, Cur2, Cur2 amount, Breakeven rate, Mkt spot, PL (local), PL<USD>, and Ref PL<USD>. A red bracket on the right points to this area.
- Deal blotter:** The bottom section is a deal blotter table with columns for Contract nb, Trade nb, Status, Typology, Instrument, Face notional, Face cur, Other notional, Other cur, Price, Maturity, Counterparty, Portfolio, Last event, Source, User, and ID. Numerous deals are listed, each with specific details like currency pairs, amounts, and counterparties. A red bracket on the right points to this area.

Introduction

Examples: Viewer screen

Views are typically built for each asset class. The different views are customisable and flexible



The screenshot shows a Murex viewer interface with various tabs and filters at the top, including 'Real time' and date ranges from '25 Sep 2012' to '25 Sep 2012'. Below the tabs, there are two main data tables.

Liquidity View:

Bucket	Flows	EUR	GBP	JPY	USD
TODAY [25/09/12]		80,000		-60,000	
SPOT [27/09/12]	-690,000	90,000	847,000	-75,000	
30D [28/09/12]	-680,000	100,000	847,000	-90,000	
1W [02/10/12]	-738,000	42,000	847,000	-3,000	
2W [09/10/12]	-658,000	122,000	847,000	-123,000	
3W [16/10/12]	-625,000	155,000	847,000	-172,500	
1M [25/10/12]	-611,000	169,000	847,000	-193,500	
2M [25/11/12]	-757,000	23,000	847,000	25,500	
3M [25/12/12]	-767,000	13,000	847,000	40,500	
4M [25/01/13]	-775,000	5,000	847,000	52,500	
5M [25/02/13]	-775,000	5,000	847,000	52,500	
6M [25/03/13]	-679,000	101,000	847,000	-91,500	

Trade View:

Contract nb	Trade nb	Status	Typology	Instrument	Face notional	Face cur	Other notional	Other cur	Price	Maturity	Counterparty	Portfolio	Last event	Source	User
3,076	3,085	Ins	Outright	EUR/USD	-100	EUR	110	USD	1.1000	09 Oct 2012	ABN AMRO AMS	ARBL_WASH_LN		mx	MUREXFO
3,076	3,075	Cncl	Spot	EUR/USD	-100	EUR	110	USD	1.1000	27 Sep 2012	ABN AMRO AMS	ARBL_WASH_LN	Cancel and reissue	mx	MUREXFO
3,084	3,084	Ins	Spot	EUR/JPY	-200,000	EUR	242,000	JPY	1.2100	27 Sep 2012	ABN AMRO AMS	FWD_EUR_LN		mx	MUREXFO
3,084	3,083	Cncl	Spot	EUR/JPY	-150,000	EUR	181,500	JPY	1.2100	27 Sep 2012	ABN AMRO AMS	FWD_EUR_LN	Cancel and reissue	mx	MUREXFO
3,078	3,082	Ins	Spot	EUR/JPY	-200,000	EUR	242,000	JPY	1.2100	27 Sep 2012	ABN AMRO AMS	FWD_EUR_LN		mx	MUREXFO
3,078	3,077	Cncl	Spot	EUR/JPY	-150,000	EUR	181,500	JPY	1.2100	27 Sep 2012	ABN AMRO AMS	FWD_EUR_LN	Cancel and reissue	mx	MUREXFO
3,075	3,074	Ins	Spot	EUR/JPY	-150,000	EUR	181,500	JPY	1.2100	27 Sep 2012	ABN AMRO AMS	FWD_EUR_LN		mx	MUREXFO
3,074	3,073	Ins	Spot	EUR/JPY	-150,000	EUR	181,500	JPY	1.2100	27 Sep 2012	ABN AMRO AMS	FWD_EUR_LN		mx	MUREXFO
3,069	3,068	Ins	Depo	USD	85,500	USD	0		0.0000	27 Sep 2022	DEXIA GROUP	MMA_USD_LN		mx	MUREXFO
3,068	3,067	Ins	Depo	USD	68,500	USD	0		0.0000	27 Sep 2021	DEUTSCHE BANK	MMA_USD_LN		mx	MUREXFO
3,067	3,066	Ins	Depo	USD	89,000	USD	0		0.0000	28 Sep 2020	GENERAL MOTORS	MMA_USD_LN		mx	MUREXFO
3,066	3,065	Ins	Depo	USD	91,000	USD	0		0.0000	27 Sep 2019	AXA	MMA_USD_LN		mx	MUREXFO
3,065	3,064	Ins	Depo	USD	93,500	USD	0		0.0000	27 Sep 2019	ANZ NATIONAL BANK	MMA_USD_LN		mx	MUREXFO
3,064	3,063	Ins	Depo	USD	90,000	USD	0		0.0000	27 Sep 2017	ABSA GROUP	MMA_USD_LN		mx	MUREXFO
3,063	3,062	Ins	Depo	USD	87,000	USD	0		0.0000	27 Sep 2016	ABN AMRO AUS	MMA_USD_LN		mx	MUREXFO
3,062	3,061	Ins	Depo	USD	88,500	USD	0		0.0000	27 Sep 2016	RABOBANK	MMA_USD_LN		mx	MUREXFO
3,061	3,060	Ins	Depo	USD	89,000	USD	0		0.0000	28 Sep 2015	CREDIT SUISSE	MMA_USD_LN		mx	MUREXFO
3,060	3,059	Ins	Depo	USD	90,000	USD	0		0.0000	28 Sep 2015	CENTERPOINT ENERGY	MMA_USD_LN		mx	MUREXFO

Agenda



Introduction



Best Practices



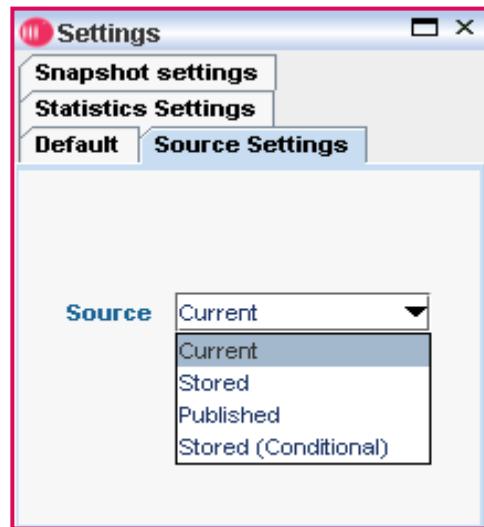
Practice

Best Practices

Stored P&L

To check if the P&L is stored or current in the simulation screen:

1. Change the view mode to Edit mode.
2. Right-click → Fields>Output Settings>Source Settings.



In the “View P&L” pop up window on one deal, it is the absolute P&L.

In the simulation it can be: Current, Stored, Published or Stored (Conditional).

Best Practices



Stored P&L

Stored P&L is used in calculating the daily change in P&L, often required by users.

The stored P&L is the P&L on the deal as of past date.

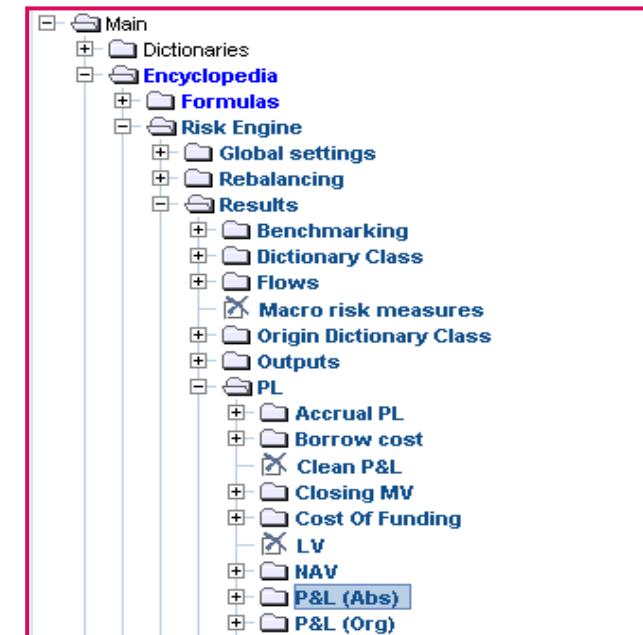
$$\text{Daily P\&L} = \text{P\&L Absolute today} - \text{P\&L Absolute of yesterday (Stored)}$$

To check if the stored P&L value is correct in simulation:

1. Reconcile it with P&L as of past date.
2. In an end-user session, start a simulation as of past date and select yesterday's date.
3. Select a view that provides the P&L (Abs) information, or simply drag the field from the Dictionary (Ctrl+Shift+D).
4. If P&L Stored is different than P&L as of yesterday, then the stored

P&L value is incorrect.

The screenshot shows the Murex user interface with a sidebar on the left containing 'Simulation', 'Pricing', and 'Configuration' buttons. The main area is titled 'Simulation' and lists several options: 'Portfolio simulation by position', 'Portfolio simulation by position (with breakdown by trade)', 'Portfolio simulation by trade', 'User definable simulation (Predefined)', and 'User definable simulation (On the fly)'. A red box highlights the 'Simulation' button in the sidebar and the 'Simulation' section in the main area.



Agenda



Introduction



Best Practices



Practice

Quiz 1/3

Simulation: putting it together

1. Which Simulation screen should be used in order to load a portfolio in simulation in the fastest way possible
 - a. Fund simulation by trade
 - b. Portfolio simulation by trade
 - c. Portfolio simulation by position

2. In order to refresh the market data only when the 'retrieve button' is clicked one should use:
 - a. Live Feed
 - b. On demand

3. How does the system behave when the calculation mode is set to OFF:
 - a. Any change in market data or horizon date re-calculates the position
 - b. Single changes do not imply a recalculation, this allows several changes before the system re-calculates the position



Quiz 2/3

Simulation: putting it together

4. Map the following types of simulation to their functions:

- a. User definable simulation
 - b. Portfolio simulation aggregated positions (Accrual)
 - c. Portfolio simulation by trade
 - d. User definable simulation as of past date
 - e. Portfolio Simulation by position
 - f. Portfolio simulation aggregated positions trade by trade (Accrual)
-
- 1. Results are consolidated, trades accessible via trade contribution
 - 2. Results are consolidated, but MM trades are read in a detailed mode to calculate accrual P&L figures
 - 3. Predefined filter, selected from list
 - 4. Results are detailed, by trade, at past date
 - 5. Results are detailed, by trade
 - 6. Results are read from the warehouse, from detailed tables, and MM trades are read in a detailed mode to calculate accrual P&L figures



Quiz 3/3

Simulation: putting it together

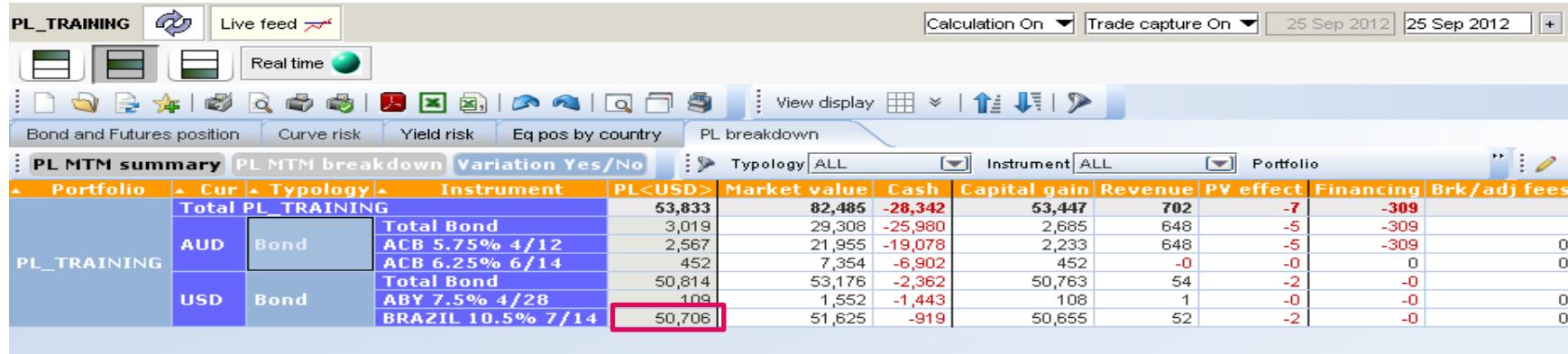
5. In a session opened with user MUREXFO a market value of a spot is changed via a simulation screen. Which of the following affirmations is TRUE:
 - a. Users opening other Simulation screens simultaneously will see the effect of the change when they click on the button reload stored market data only if MUREXFO has saved the new values in the database using the global save button.
 - b. Users opening other Simulation screens simultaneously will immediately see the effect of the change on the Market data
 - c. Users opening other Simulation screens simultaneously will see the effect of the change when they start a new MX session
6. User Jim is complaining that he finds it very unpractical that he has to log out of the simulation screen every time he needs to open the 'Option series market data screen'. Can you help him?
 - a. Yes. He can access this screen directly from the Navigation menu from within the Simulation screen
 - a. No, but he can try to enhance the performance of his session using specific flags in his `launcherAll.mxres`



Practice 3: Troubleshooting a P&L jump 1/2

Daily P&L

The trader has reported a Daily P&L jump in the consolidated simulation for portfolio PL_TRAINING. What could be done to solve this issue?

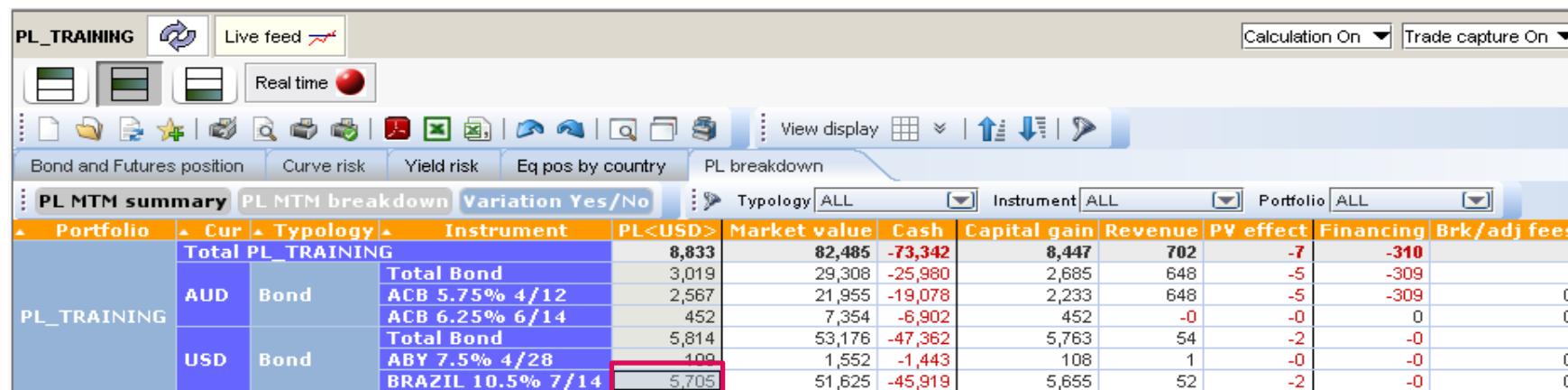


This screenshot shows the Murex PL TRAINING interface. The main window displays a table titled 'PL MTM summary' under the 'Variation Yes/No' tab. The table details the portfolio's performance across different currencies and instrument types. A significant daily P&L jump is visible for the 'BRAZIL 10.5% 7/14' bond position, which is highlighted with a red border.

Portfolio	Cur	Typology	Instrument	PL<USD>	Market value	Cash	Capital gain	Revenue	PV effect	Financing	Brk/adj fees
			Total PL_TRAINING	53,833	82,485	-26,342	53,447	702	-7	-309	
PL_TRAINING	AUD	Bond	Total Bond	3,019	29,308	-25,980	2,685	648	-5	-309	
			ACB 5.75% 4/12	2,567	21,955	-19,078	2,233	648	-5	-309	0
	USD	Bond	ACB 6.25% 6/14	452	7,354	-6,902	452	-0	-0	0	0
			Total Bond	50,814	53,176	-2,362	50,763	54	-2	-0	0
			ABY 7.5% 4/28	109	1,552	-1,443	108	1	-0	-0	0
			BRAZIL 10.5% 7/14	50,706	51,625	-919	50,655	52	-2	-0	0

Simulation by position: the Daily PL for the Bond BRAZIL 10.5% 7/14 is \$50,706:

Simulation by trade: the Daily PL for the Bond BRAZIL 10.5% 7/14 is \$5,705:



This screenshot shows the Murex PL TRAINING interface. The main window displays a table titled 'PL MTM summary' under the 'Variation Yes/No' tab. The table details the portfolio's performance across different currencies and instrument types. The 'BRAZIL 10.5% 7/14' bond position is highlighted with a red border, showing a significantly smaller daily P&L compared to the previous screenshot.

Portfolio	Cur	Typology	Instrument	PL<USD>	Market value	Cash	Capital gain	Revenue	PV effect	Financing	Brk/adj fees
			Total PL_TRAINING	8,833	82,485	-73,342	8,447	702	-7	-310	
PL_TRAINING	AUD	Bond	Total Bond	3,019	29,308	-25,980	2,685	648	-5	-309	
			ACB 5.75% 4/12	2,567	21,955	-19,078	2,233	648	-5	-309	0
	USD	Bond	ACB 6.25% 6/14	452	7,354	-6,902	452	-0	-0	0	0
			Total Bond	5,814	53,176	-47,362	5,763	54	-2	-0	0
			ABY 7.5% 4/28	109	1,552	-1,443	108	1	-0	-0	0
			BRAZIL 10.5% 7/14	5,705	51,625	-45,919	5,655	52	-2	-0	0

Practice 3: Troubleshooting a P&L jump 2/2



Daily P&L

The trader has reported a Daily P&L jump in the consolidated simulation for portfolio PL_TRAINING. The problem should be approached using the following four steps:

1. Reproduce the issue:
 - a. Login with user/password: MUREXFO/MUREXFO, group: FO
 - b. Load the portfolio PL_TRAINING in consolidated simulation.
 - c. Check the value of the P&L for the portfolio PL_TRAINING (\$53,833)
2. Isolate the issue:
 - a. Open another FO session and load a detailed simulation on the same portfolio.
 - b. Compare the outputs: is the issue impacting all instruments?
 - c. Try to breakdown and spot the problem
3. Analyse the issue:
 - a. List the mismatches between both simulations
 - b. What could be the origin of such discrepancies: transaction ticket? market data set?
4. Correct the issue:
 - a. Where are consolidated figures taken from?
 - b. How are they stored there?
 - c. Can you propose a corrective action?



Practice 4: Troubleshooting a P&L jump 1/2

Daily P&L

The trader has reported a Daily P&L jump in the consolidated simulation for the Bond ACB 5.75% 4/12 between yesterday and today. What could be done to solve this issue?

Initial screen:

Portfolio		Cur	Typology	Daily PL<USD>	MTD PL<USD>	YTD PL<USD>
Total PL_TRAINING				-2	3,389	3,389
PL_TRAINING	AUD	Total AUD		-2	3,280	3,280
	AUD	Bond		3,280	3,280	3,280
PL_TRAINING	USD	Total USD		-3,282		
		Bond		0	109	109
	USD	Total USD		109	109	109
		Bond		-108		

Current screen:

Portfolio		Cur	Typology	Daily PL<USD>	MTD PL<USD>	YTD PL<USD>
Total PL_TRAINING				2,567	3,389	3,389
PL_TRAINING	AUD	Total AUD		2,567	3,280	3,280
	AUD	Bond		3,280	3,280	3,280
PL_TRAINING	USD	Total USD		-713		
		Bond		0	109	109
	USD	Total USD		109	109	109
		Bond		-108		

Practice 4: Troubleshooting a P&L jump 2/2



Daily P&L

The trader has reported a Daily P&L jump in the consolidated simulation for the Bond ACB 5.75% 4/12 between yesterday and today. What could be done to solve this issue?

1. Reproduce the issue:
 - a. Login with user/password: MUREXFO/MUREXFO, group: FO.
 - b. Load the portfolio PL_TRAINING in consolidated simulation.
 - c. Check the value of the P&L for the portfolio PL_TRAINING
 - d. Reproduce the current screen
2. Isolate the issue:
 - a. Breakdown the problem
 - b. Spot the root cause of the issue
3. Analyse the issue:
 - a. Open the detailed simulation and check the absolute P&L v/s the consolidated (with focus of Bond ACB 5.75% 4/12)
 - b. In case the consolidation is ok, open the consolidated simulation as of yesterday and compare yesterday P&L versus Stored P&L.
4. Correct the issue



Practice 5: Simulation of Past date



System behaviour

Sam from FXD FO desk calls for a wrong value in the Simulation as of past date. Can you help him explain it ?

1. Log in using MUREXFO/MUREXFO
2. Open the group FO
3. Open the portfolio simulation by trade with the portfolio CLIENT1_PAR, view 'MX_PL_MTM summary (d)'
4. Enter a simple forward deal.
5. Launch a simulation as of past date (yesterday) in another session and look at the P&L
6. Shift the horizon forward by 1 day
7. Add a breakdown by trade number in your view. Identify the trade you inserted



Customise the simulation screen settings

1. Change the screen Simulation by trade for the FO_FXD_TR group so the template selected uses the default assigned layout MX_FXD and the trade blotter is hidden.
2. Change the “Trade capture” setting for your current user only and check the impacts on the simulation when entering a trade.
3. Change the aggregation currency to EUR for all users and check the impact in the P&L view MX_PL_MTM summary (c).

Compare portfolio simulations by

- ✓ position
- ✓ position (with breakdown by trade)
- ✓ portfolio simulation by trade

1. Compare the 3 sessions: The 3 sessions should display the same P&L results.
2. Add a line breakdown by transaction number in all 3 sessions (using the edit view mode): The field Trade number is available in the Data dictionary under *Murex Formulas.Trade number*.
3. Are there differences in the same view in the different sessions? The portfolio simulation by position does not load the information deal by deal. It loads aggregated positions from the warehouse.
4. Check the different P&L components in the trade contribution and compare them to the portfolio simulation by trade: The P&L by trade in the trade contribution (simulation by position) should be the same as the portfolio simulation by trade. This shows that the consolidated simulation offers very similar outputs to the detailed one but with much better performances.
5. Compare the P&L to the one from the portfolio simulation by position (breakdown by trade): It should be the same.



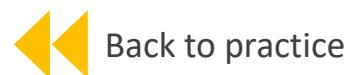
Back to practice

Practice 2 solution



View the market data changes effects in the simulation

1. Once in the simulation, open the views gallery and select the view **MX_PL_MTM summary (d)**.
2. Copy the P&L for each type of trade
3. Go to *File/Real time/Disconnect* or click on the **Real time** button
4. Reference market data:
 - a. Click on “Reload stored market data”
 - b. There is no live feed here, and the loaded data are already the reference data
5. Change of EUR/USD spot
 - a. Go to View/ Pop-up market data/ FX spot and change the spot
 - b. The P&L is changed in the view.
6. Click on “Reload stored market data”
7. Click on “Save global”.

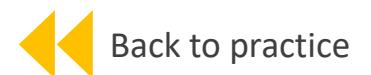


Practice 5 solution



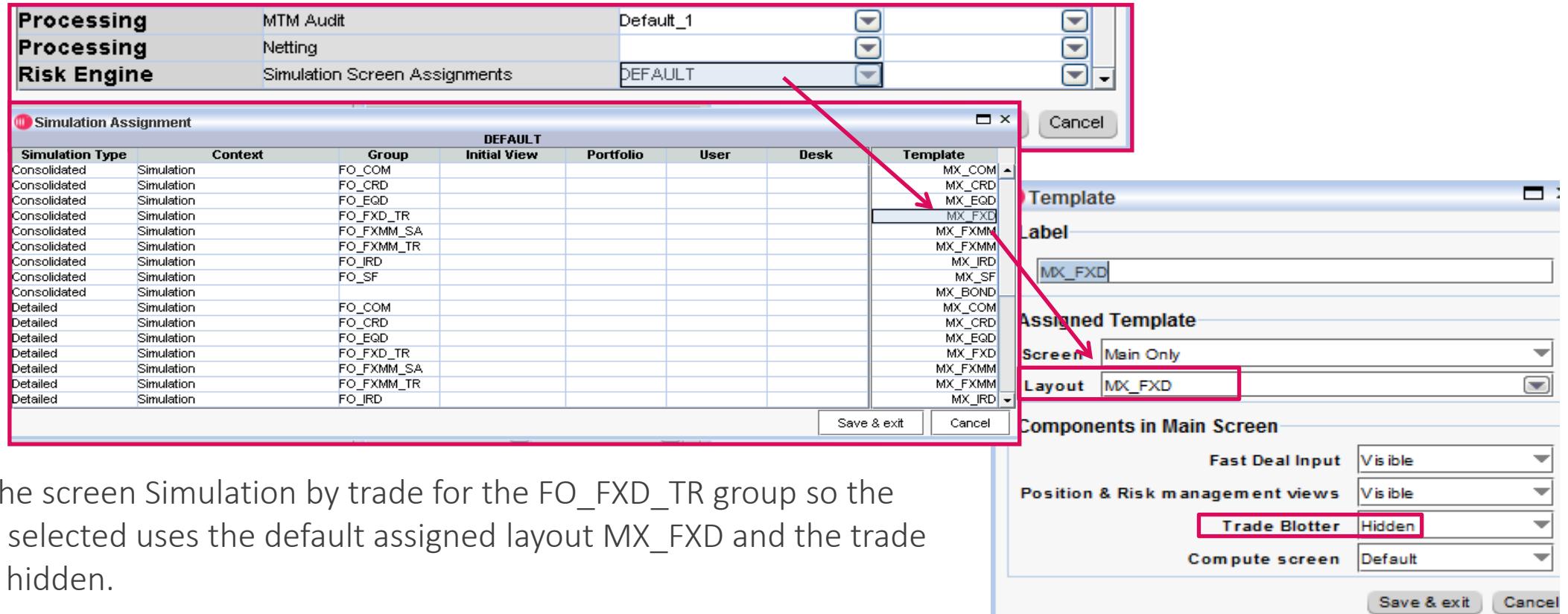
Sam from FXD FO desk calls for a wrong value in the Simulation as of past date. Can you help him explain it ?

1. Trade insertion is done under Navigation/ Processing/ Trades/ Insert trades.
2. The newly inserted trade does not contribute to the P&L.
3. The newly inserted trade still does not contribute to the position. Shifting the horizon just shows the theoretical theta but does not show the simulation as of today.



Practice 6 solution

Customise the simulation screen settings



The screenshot shows the 'Simulation Assignment' dialog box. In the 'Template' column for the 'FO_FXD_TR' group, the dropdown menu is open, showing options like 'MX_EQD' and 'MX_FXD'. The 'MX_FXD' option is highlighted. A secondary window titled 'Template Assignment' is overlaid, showing the 'Assigned Template' section where 'MX_FXD' is selected. In the 'Components in Main Screen' section, the 'Trade Blotter' dropdown is set to 'Hidden'.

Simulation Type	Context	Group	Initial View	Portfolio	User	Desk	Template
Consolidated	Simulation	FO_COM					MX_COM
Consolidated	Simulation	FO_CRD					MX_CRD
Consolidated	Simulation	FO_EQD					MX_EQD
Consolidated	Simulation	FO_FXD_TR					MX_FXD
Consolidated	Simulation	FO_FXMM_SA					MX_FXMM
Consolidated	Simulation	FO_FXMM_TR					MX_FXMM
Consolidated	Simulation	FO_IRD					MX_IRD
Consolidated	Simulation	FO_SF					MX_SF
Consolidated	Simulation						MX_BOND
Detailed	Simulation	FO_COM					MX_COM
Detailed	Simulation	FO_CRD					MX_CRD
Detailed	Simulation	FO_EQD					MX_EQD
Detailed	Simulation	FO_FXD_TR					MX_FXD
Detailed	Simulation	FO_FXMM_SA					MX_FXMM
Detailed	Simulation	FO_FXMM_TR					MX_FXMM
Detailed	Simulation	FO_IRD					MX_IRD

Change the screen Simulation by trade for the FO_FXD_TR group so the template selected uses the default assigned layout MX_FXD and the trade blotter is hidden.

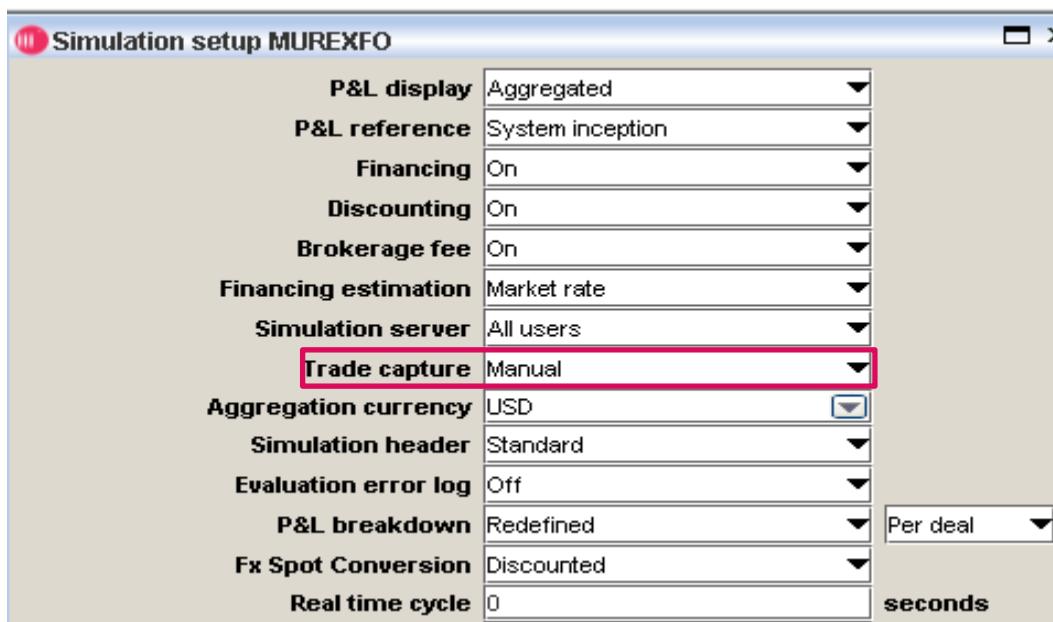
→ The modification is done in the CONFIG session:

Practice 4 solution (1/2)

Customise the simulation screen settings

1. Change the « trade capture » setting for your current user only and check the impacts on the simulation when entering a trade.

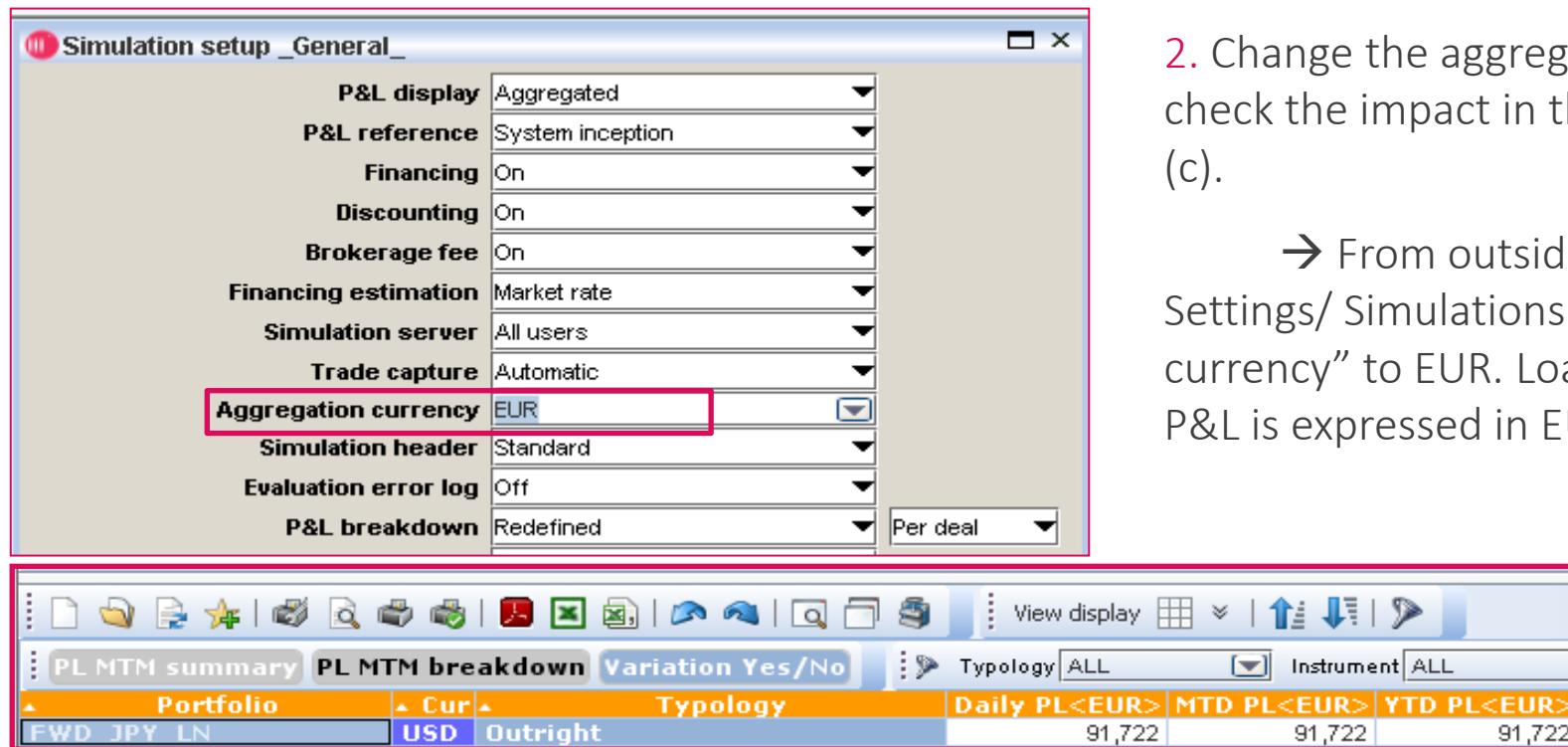
→ Inside the simulation, go to Settings/ Simulation screen settings. Change the “Trade capture” flag from Automatic to Manual. When entering a trade, it does not impact the positions immediately.



 Back to practice

Practice 4 solution (2/2)

Customise the simulation screen settings.



The screenshot shows two windows from the Murex software. The top window is titled "Simulation setup _General" and contains various configuration options. The "Aggregation currency" field is highlighted with a red border. The bottom window is titled "PL MTM summary" and displays a table of performance metrics for a portfolio. The "Daily PL<EUR>" column shows values of 91,722 for three categories: FWD JPY LN, USD, and Outright.

Portfolio	Cur	Typology	Daily PL<EUR>	MTD PL<EUR>	YTD PL<EUR>
FWD JPY LN	USD	Outright	91,722	91,722	91,722

2. Change the aggregation currency to EUR for all users and check the impact in the P&L view MX_PL_MTM summary (c).

→ From outside the simulation, go to Configuration/ Settings/ Simulations settings and change the “Aggregation currency” to EUR. Load the simulation afterwards → the P&L is expressed in EUR

THANK YOU

