

The logo for OpenDay 2026 features a circular graphic composed of several blue, glowing, semi-transparent segments arranged in a ring. The text "OpenDay" and "2026" is positioned to the right of this graphic.

OpenDay
2026

Unlocking Liquidity in the STIR Market

The evolution of Money Market Index Futures
at Eurex

24 September 2026



DEUTSCHE BÖRSE
GROUP

Agenda



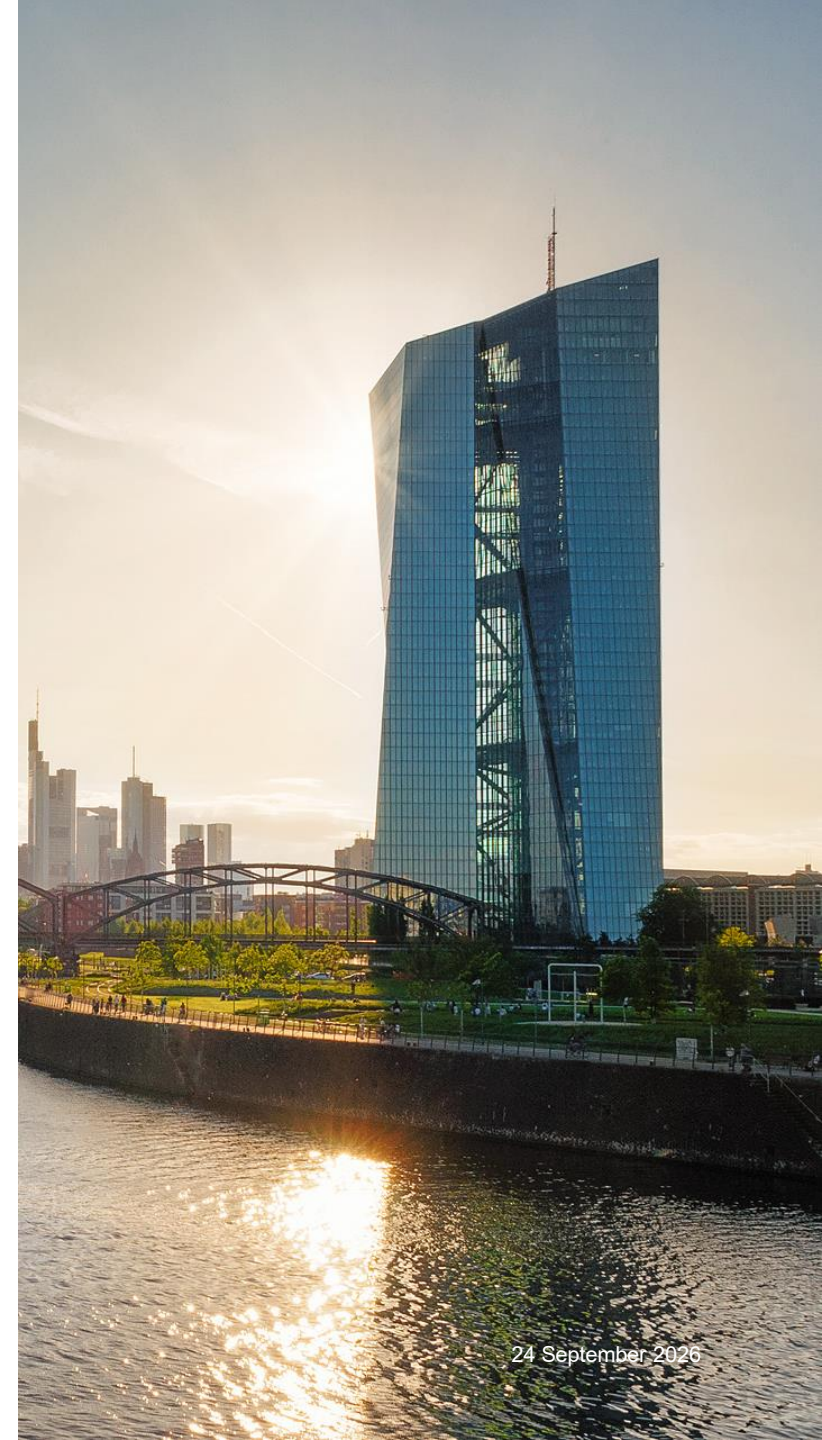
- 1 STIR Futures at Eurex
- 2 Concept of Synthetic Matching
- 3 Condor Synthetics
- 4 Bundle Synthetics
- 5 Matching Algorithms at Eurex

1 STIR Futures at Eurex

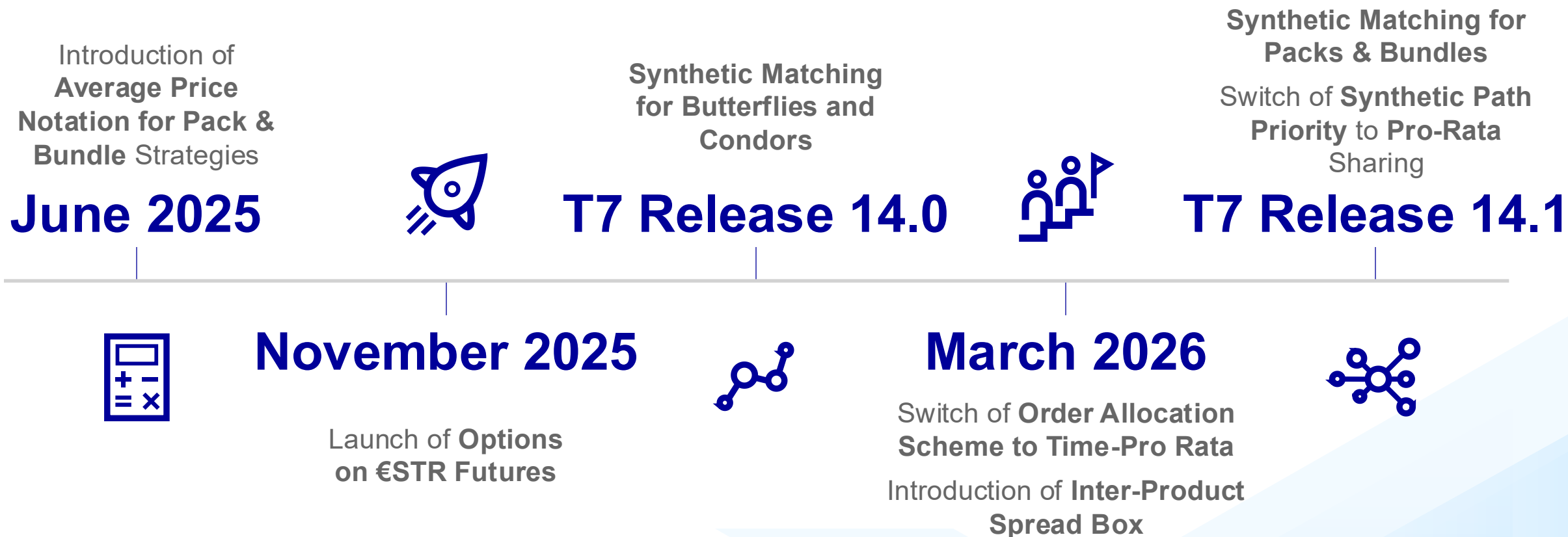
Short-term interest rate (STIR) derivatives

Setting the benchmark across the euro yield curve

- Value of financial instruments driven by expectations from near-term interest rates
- Primary tool for expressing views on central bank policy, managing funding risk, and hedging exposure to benchmark rates
- **3-month EURIBOR Futures (FEU3)**, referencing Euro Interbank Offered Rate based on interest rates at which Eurozone banks borrow funds from another
- **3-month Euro STR Futures (FST3)**, referencing €STR as the new benchmark risk-free rate



Transformation over the last years



2 Concept of Synthetic Matching

Concept of Synthetic Matching (1)

- Considering **orderbook sides with best price level** and **accumulated quantity of best price level**; except on incoming side, individual orders are not considered
- Orderbook sides are combined in such way that the combination is completely balanced and results to a **closed match path**
 - **Example:** closed match path of length 2 $buy SI(A) \oplus sell Spd(A,B) \oplus sell SI(B)$
- Any orderbook side of a closed match path can **represent the incoming orderbook side** containing the incoming order with corresponding price and quantity; all remaining orderbook sides on the passive side are creating a **synthetic path resulting to an orderbook side opposite to the incoming orderbook side**
 - **Example:** incoming $sell SI(B)$ is opposite to $buy SI(A) \oplus sell Spd(A,B) =: synbuy SI(B)$
- **Any closed match path has a specific orientation**; change of orientation results to the opposite side of the incoming orderbook side
 - **Example:** opposite orientation of above $sell SI(A) \oplus buy Spd(A,B) \oplus buy SI(B)$

Notation $synbuy SI(B)$ is indicating a **synthetic combination resulting in the corresponding orderbook side**.

Concept of Synthetic Matching (2)

Match price condition:

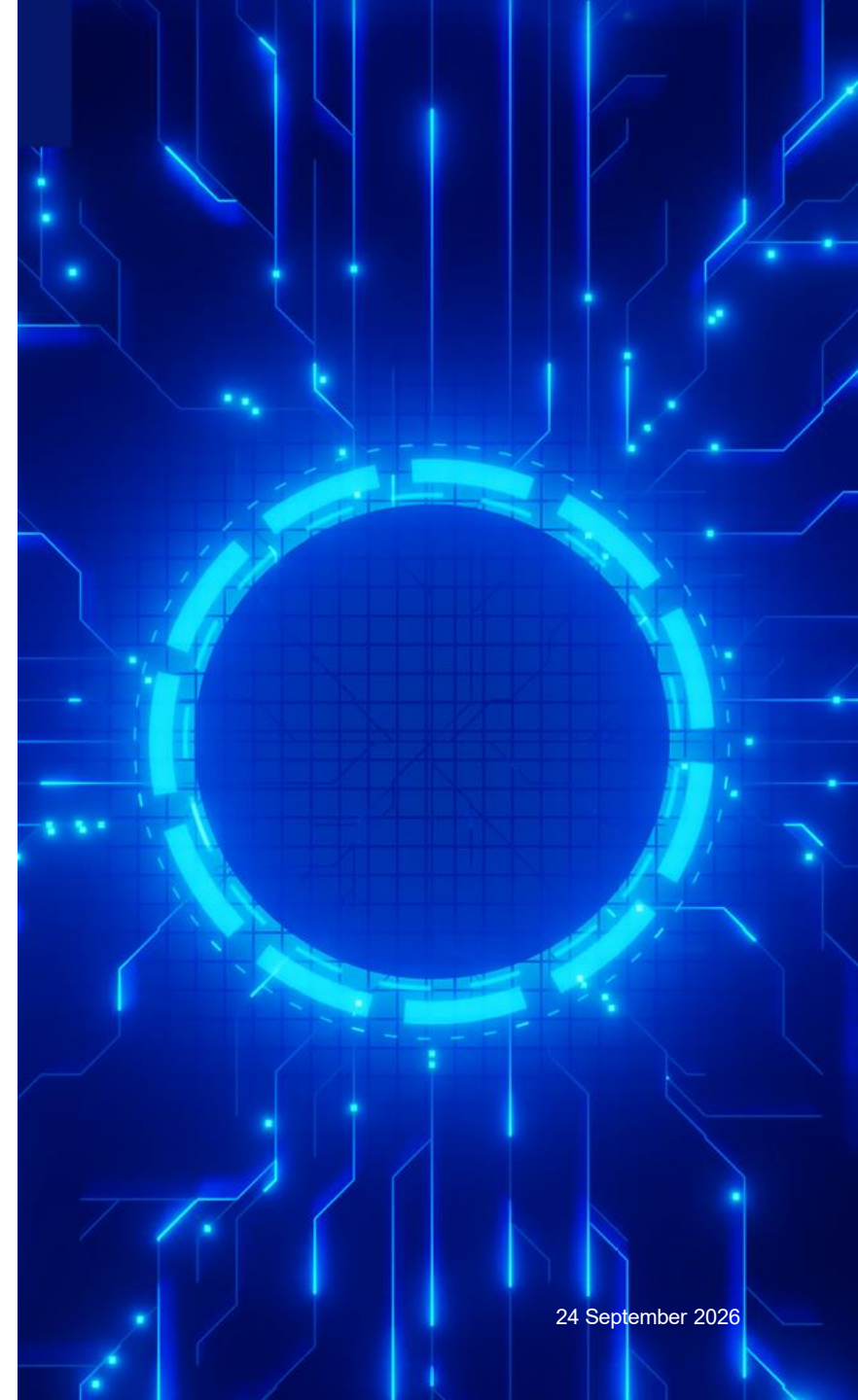
- **Sum of sign-adapted price** of orderbook sides along a closed synthetic match path including incoming orderbook side must be **equal to or larger than zero** (all ask prices are multiplied by (-1) before summing up)
- Consequently, the price limit of an incoming buy (sell) order must be equal to or higher (lower) than the price limit of the synthetic path on passive orderbook side opposite to incoming aggressive one

Match quantity condition:

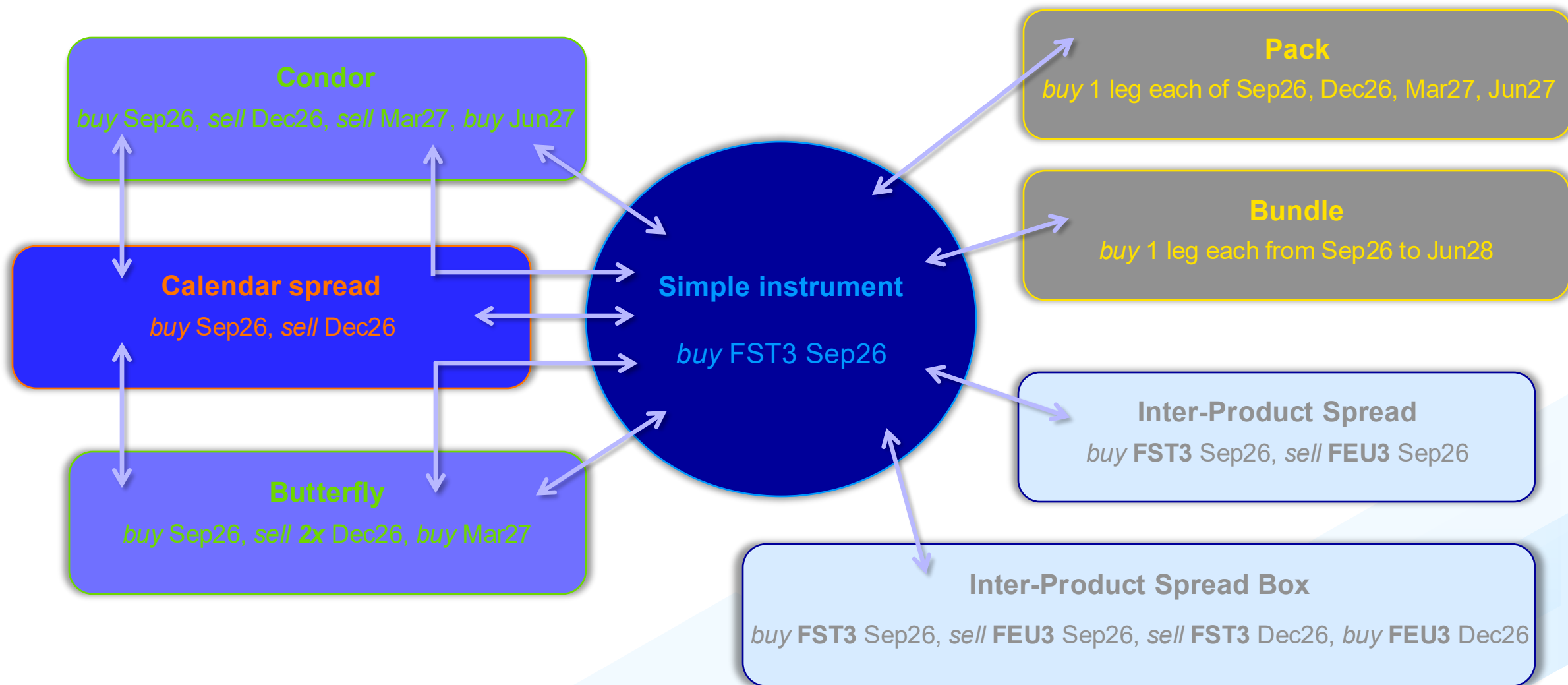
- **Minimum over quantity contributions of all orderbook sides** including incoming orderbook side along a closed path must be strictly larger than zero
- For any complex instruments with leg ratio 1 involved in closed synthetic match path, the match quantity condition is automatically satisfied

Synthetic Combinations

- Synthetic matching for simple instruments and calendar spread instruments available for various futures products at Eurex
- STIRs product suite offers additional complex instruments like futures condors & butterflies as well as packs and bundles with more than two legs
- Synthetic matching in condors/butterflies and packs/bundles complements already existing calendar spread synthetic matching and enhances orderbook liquidity and transparency in these products



Strategies in STIR futures



3 Condor Synthetics

Condor Synthetics: Closed Match Paths for Condor

Only most essential synthetic condor combinations considered.

$A = \text{Dec26}, B = \text{Mar27}, C = \text{Jun27}, D = \text{Sep27}$

- Condor synthetics is based on **4 different closed match paths** consisting of one **condor orderbook** side and additional orderbook sides of **simple instruments** or **calendar spreads**
 - Closed match path of length 4: $\text{buy SI}(A) \oplus \text{sell SI}(B) \oplus \text{sell SI}(C) \oplus \text{buy SI}(D) \oplus \text{sell Con}(A, B, C, D)$
 - Closed match path of length 3: $\text{buy SI}(A) \oplus \text{sell SI}(B) \oplus \text{sell Spd}(C, D) \oplus \text{sell Con}(A, B, C, D)$
 - Closed match path of length 3: $\text{buy Spd}(A, B) \oplus \text{sell SI}(C) \oplus \text{buy SI}(D) \oplus \text{sell Con}(A, B, C, D)$
 - Closed match path of length 2: $\text{buy Spd}(A, B) \oplus \text{sell Spd}(C, D) \oplus \text{sell Con}(A, B, C, D)$
- As mentioned before, closed match paths have two different orientations; only the sell side of the condor order book is given above
- Please note that the 4 different closed match paths contain the same condor with the same 4 expiries
- Other closed match paths containing **one or more condors are not considered**
 - Condor composed of diagonal calendar spread : $\text{buy SI}(A) \oplus \text{sell Spd}(B, D) \oplus \text{sell SI}(C) \oplus \text{sell Con}(A, B, C, D)$
 - Match path containing two condors: $\text{buy Spd}(A, B) \oplus \text{sell Con}(A, B, C, D) \oplus \text{sell Con}(C, D, E, F) \oplus \text{sell Spd}(E, F)$

Condor Synthetics: Closed Match Paths for Butterfly

Butterflies treated as specific condors with second and third condor leg identical to each other.

$A = \text{Dec26}, B = \text{Mar27}, C = \text{Jun27}, D = \text{Sep27}$

- Consequently, the following 4 different closed match paths consists of one **butterfly orderbook** side and orderbook sides of **simple instruments** or **calendar spreads**:
 - Closed match path of length 4: $\text{buy SI}(A) \oplus \text{sell SI}(B) \oplus \text{sell SI}(B) \oplus \text{buy SI}(C) \oplus \text{sell But}(A, B, C)$ 
 - Closed match path of length 3: $\text{buy SI}(A) \oplus \text{sell SI}(B) \oplus \text{sell Spd}(B, C) \oplus \text{sell But}(A, B, C)$
 - Closed match path of length 3: $\text{buy Spd}(A, B) \oplus \text{sell SI}(B) \oplus \text{buy SI}(C) \oplus \text{sell But}(A, B, C)$
 - Closed match path of length 2: $\text{buy Spd}(A, B) \oplus \text{sell Spd}(B, C) \oplus \text{sell But}(A, B, C)$
- Again, closed match paths are **characterized by their orientation**, only sell side of butterfly orderbook mentioned above
- Please note that the 4 different closed match paths contain the same butterfly with the same 3 expiries
- Other closed match paths containing, e.g., **more than one butterfly are not considered**
 - Match path containing two butterflies: $\text{buy Spd}(A, B) \oplus \text{sell But}(A, B, C) \oplus \text{sell But}(B, C, D) \oplus \text{sell Spd}(C, D)$

Condor Synthetics: Category 1 vs Category 2 Paths

- To avoid crossed orderbook situations, condor synthetics distinguishes between different categories of synthetic paths
- All paths resulting to a synthetic butterfly or synthetic condor are handled as synthetic paths of category 1 (implied-in), i.e., **any price or quantity update of a synthetic butterfly or condor path is immediately distributed via market data interfaces**
- All synthetic paths resulting to a simple instrument or calendar spreads and which contain a butterfly or condor orderbook side are treated as synthetic paths of category 2 (implied-out), i.e., **any update of price or quantity of synthetic simple instrument or calendar spread paths derived from condor synthetics is only triggered in case of an incoming simple instrument or calendar spread order** entering the opposite orderbook side
- Synthetic paths of category 1 are used to **create additional liquidity in butterflies and condors** and synthetic paths of category 2 are required to **prevent crossed orderbook situations** in butterflies and condors.

Example 1

Taking closed match path

$buy SI(A) \oplus sell SI(B) \oplus sell Spd(B, C) \oplus sell But(A, B, C),$

the synthetic combination $buy SI(A) \oplus sell SI(B) \oplus sell Spd(B, C)$ is representing $synbuy But(A, B, C)$ orderbook side.

Any price or quantity update of $synbuy But(A, B, C)$ resulting from a price or quantity update in the orderbook sides $buy SI(A)$, $sell SI(B)$ or $sell Spd(B, C)$ will be published immediately.

Example 2

Taking closed match path

$buy SI(A) \oplus sell SI(B) \oplus sell Spd(B, C) \oplus sell But(A, B, C),$

the synthetic combination $sell SI(B) \oplus sell Spd(B, C) \oplus sell But(A, B, C)$ is representing $synsell SI(A)$.

Matching of $synsell SI(A)$ against an incoming $buy SI(A)$ will prevent display of crossed orderbook $But(A, B, C)$ if incoming $buy SI(A)$ would be written to its orderbook instead of matching.

4 Bundle Synthetics

Bundle Synthetics: Closed Match Paths

Incoming buy bundle order is executed **against synthetic sell bundle orderbook** on passive side opposite to incoming bundle order (implied-in):

Incoming order: $\text{buy } \text{Bndl}_n^{\text{inc}}(A_1, \dots, A_{4n})$

Orderbook side:

$$\begin{aligned} \text{sell } \text{Bndl}_n^{\text{syn}}(A_1, \dots, A_{4n}) &= \text{sell } \text{SI}(A_1) \oplus \dots \oplus \text{sell } \text{SI}(A_{4n}) \\ &= \bigoplus_{i=1}^{4n} \text{sell } \text{SI}(A_i) \end{aligned}$$

Price and/or quantity information of **synthetically created Packs and Bundles** are published via market data interfaces and are considered for matching against incoming Pack or Bundle order on opposite order book side.

Incoming buy simple instrument order is executed **against synthetic sell simple orderbook** on passive side opposite to incoming simple instrument order (implied-out):

Incoming order: $\text{buy } \text{SI}^{\text{inc}}(A_j)$ for some $j = 1, \dots, 4 \cdot n$

Orderbook side:

$$\text{sell } \text{SI}^{\text{syn}}(A_1) = \text{sell } \text{Bndl}_n(A_1, \dots, A_{4n}) \oplus \bigoplus_{i=1, i \neq j}^{4n} \text{buy } \text{SI}(A_i)$$

Price and/or quantity information of **synthetically created simple instruments containing a bundle** are considered for matching against incoming simple instrument order on opposite order book side.

Please note

The general representation of closed match paths includes **any reversed closed match path**.

Taking the closed match paths on this slide with $\text{sell } \text{Bndl}_n^{\text{syn}}$, its reversal results in the **counter-orientated** closed match path containing $\text{buy } \text{Bndl}_n^{\text{syn}}$.

5 Matching Algorithms at Eurex

Matching Algorithm in Eurex Derivatives Markets

Overview: 3-Level Priority Structure

Basic Matching Priority 1: Price Priority

Book orders are **prioritized by their price**. Buy (sell) orders with higher (lower) price have higher priority.

Basic Matching Priority 2: Path Priority

Only applicable in futures markets
supporting synthetic matching

To increase matching opportunities, orderbook sides are synthetically combined. Path priority is governing the **priority of different *synthetic combinations*** resulting to the same orderbook side. Direct orderbook side (trivial synthetic path) is included by path priority.

Basic Matching Priority 3: Order Priority

Priority of orders contributing to the best price level of an orderbook side are governed by the ***order allocation scheme*** determining how many lots of an individual price best order is considered for matching.

Matching Algorithm in Eurex Derivatives Markets

Path Priority: Synthetic Paths of Same Orderbook Side

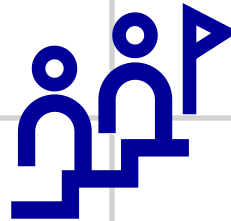


Priority of synthetic paths is governed *first by price* and *second by composition*



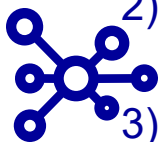
Priority of *synthetic paths having different prices* (Basic Matching Prio 1):

Analog to price priority of individual orders, synthetic path with better price has higher priority than synthetic path on same orderbook side with worse price



Priority of *synthetic paths of same orderbook side with same price* (Basic Matching Prio 2):

- 1) Synthetic combination of calendar spreads & simple instruments
- 2) Synthetic combination of butterfly / condor & simple instruments or calendar spreads
- 3) Synthetic combination of pack / bundle & simple instruments



Synthetic path of same instrument type combination with earlier expiration has higher priority than synthetic paths of same instrument type combination with later expiration



Matching Algorithm in Eurex Derivatives Markets

Path Priority: Details about Basic Matching Priority

Path priority rules specify the involvement of orderbook sides different from incoming

In case more than one price-best path is available for matching against the incoming order, the following different path priority rules are supported:

T7 configuration on product and instrument type level determines which path priority rule applies.

Direct Path first:

- Direct Path (opposite orderbook side of incoming order) is preferred over synthetic paths
- Thus, **incoming order is preferentially matched** against opposite orderbook side (direct side)

Synthetic Path first:

- Synthetic paths in compliance with priority outlined before are preferred over direct path
- Incoming order is preferentially matched against orderbook sides different from direct one and, consequently, results to **trades spread over several instruments** and to increased traded volume

Pro-rata Sharing:

- Direct path and synthetic paths are considered for matching against the incoming order **in accordance with their quantity percentage**
- Incoming order is matched **against direct and other orderbook sides**; again, matching of incoming orders results to increased traded volume in different orderbook sides

Matching Algorithm in Eurex Derivatives Markets

Order Priority: Order Allocation Schemes

Eurex supports the two most common allocation schemes

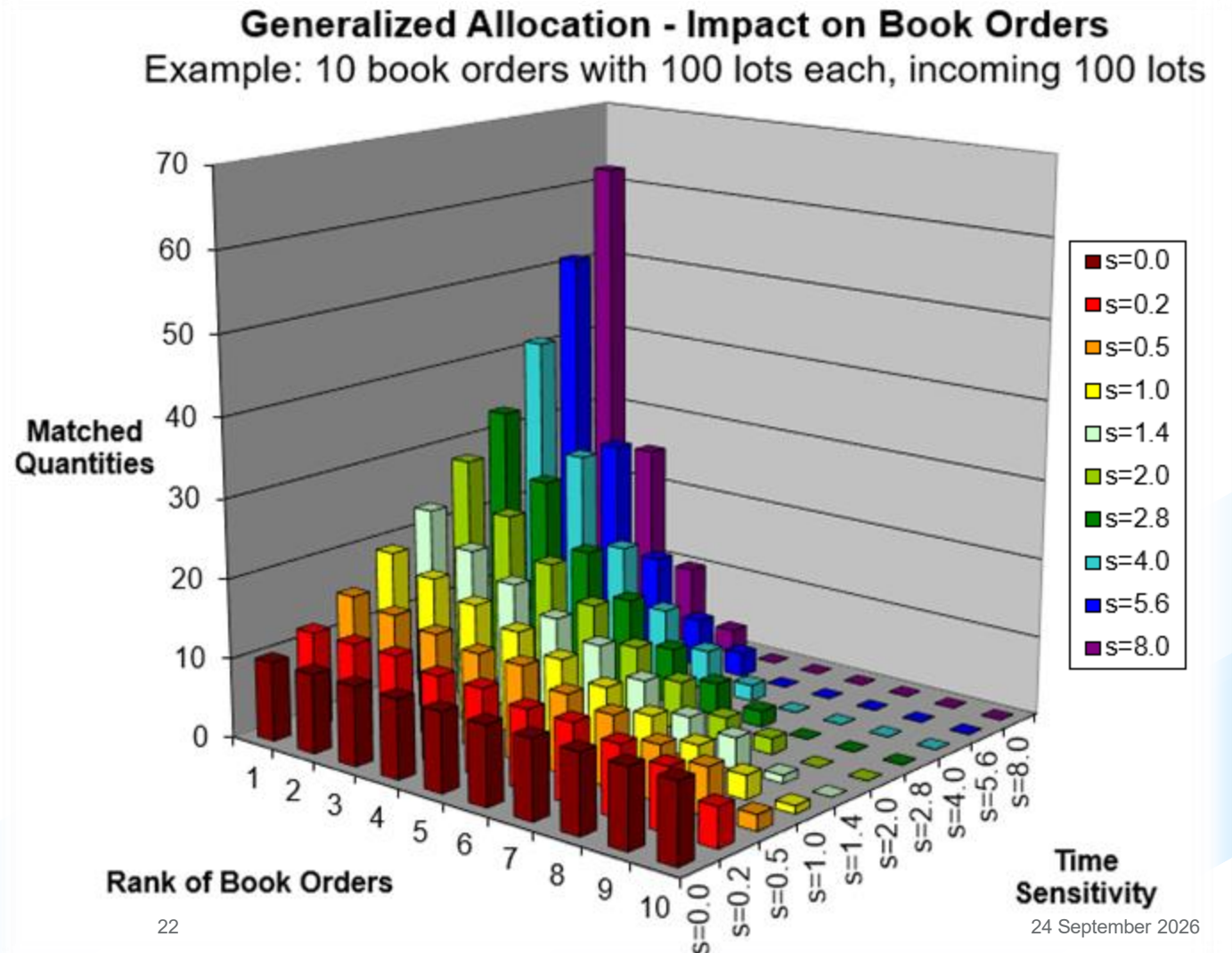
- Only book orders having the same best price are considered
- Purpose of order allocation scheme: incoming quantity is smaller than accumulated quantity of price-best orders and needs to be **allocated to individual price-best orders**
- Generally, incoming quantity matched against passive orderbook side can be associated with quantity
 - of incoming order
 - to be allocated to orderbook side due to synthetic matching
 - of orderbook side with overlapping price level partially involved in uncrossing auction procedure
- **Two basic order allocation schemes** are commonly used
 - **Time Allocation** (FIFO, price-level based “winner takes it all” principle)
 - **Pro-rata Allocation** (all price-best orders are considered in accordance with their size contributing to the best price level regardless of order entry time)
- Is there an order allocation scheme which is a **consistent combination of time and pro-rata allocation**, i.e., which rewards the earliest entered order and, also, considers subsequently entered orders?

Matching Algorithm in Eurex Derivatives Markets

Order Priority: Time-Pro-Rata Allocation Schemes

Additionally, Eurex supports a time-pro-rata allocation scheme

- Time-Pro-Rata (TPR) order allocation scheme **combines time and pro-rata allocation** in a consistent manner.
- Eurex is using a **balanced TPR allocation scheme** with time sensitivity parameter $s = 1$, where time allocation and pro-rata allocation are **equally weighted**.



Questions?

The logo for OpenDay 2026 features the text "OpenDay" in a large, white, sans-serif font, with "2026" in a slightly smaller font below it. The text is enclosed within a circular frame made of dashed white lines. The background of the slide is a deep blue with a network of glowing white lines and dots, resembling a circuit board or data network, with a bright light source at the bottom right.

OpenDay
2026

Isabel Rott

Functional Analyst | Eurex Trading Design

Eurex Frankfurt AG
11 Westferry Circus
London E14 4HD
UNITED KINGDOM

Phone +44 7483 195131

E-mail isabel.rott@deutsche-boerse.com



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