Eurex Clearing Circular 024/19

Prisma: Time-to-Expiry Adjustment relevant for quarterly expiry for the first time in March 2019

Summary

With Eurex Clearing Prisma Release 8.0, in December 2018, the functionality of the Time-to-Expiry Adjustment was rolled out and taken live in January 2019.

The Time-to-Expiry Adjustment affects the margining of short-to-expiry, cash-settled positions within Eurex Clearing's portfolio margining model Prisma. It addresses the potential risks of calendar-spread like positions, whose short-to-expiry leg expires within the Margin Period of Risk (MPOR).

Eurex Clearing would like to use the opportunity to raise awareness of this initial margin model adjustment prior to the large quarterly expiry of exchange-traded derivatives in March 2019.

Please find detailed information regarding the Prisma Time-to-Expiry Adjustment below.

Attachments:

- none

Date: 8 March 2019

Recipients:
All Clearing Members, DC Market Participants, DCs With System Access and Basic DCs of Eurex Clearing AG and Vendors

Authorised by:
Thomas Laux

Target group:

- Front Office/Trading
- Middle + Back Office

Related circular:
056/18

Contact:
Risk Exposure Management,
T +49-69-211-1 24 52,
F +49-69-211-1 84 40,
risk@eurexclearing.com

Prisma: Time-to-Expiry Adjustment relevant for quarterly expiry for the first time in March 2019

Quick facts

1. Status quo (as of end 2018)

Calculation of Eurex Clearing Prisma Initial Margin is based on a full-revaluation scenario simulation. The latter employs a single time step with step-size equal to the Margin Period of Risk (MPOR) for all products within the respective Liquidation Group Split, irrespective of their actual expiry.

Expiring positions are in scope of the Time-to-Expiry Adjustment, if they meet all of the following conditions:

- Positions expiring are cash-settled.
- Their remaining time-to-expiry is shorter than Margin Period of Risk.
- They provide margin offsets to the non-expiring part of the portfolio.

2. Prisma Release 8.0 delivered content

Eurex Clearing introduced the Time-to-Expiry Adjustment for listed derivatives in order to improve handling of calendar spread portfolios and thereby ensuring the ongoing safety of the clearing house. The introduction was also reflected in the transparency enabler files, which are made available to the Members on a daily basis.

Introduction schedule by MPOR of Liquidation Group Splits:

- Liquidation Group Splits with two day MPOR: Single-step introduction by January 2019.
- Liquidation Group Splits with three day MPOR: Step-wise introduction in three steps from January 2019 until December 2019 to foster market acceptance and to allow participants to potentially adjust their roll behaviour across expiries. Step 1 of the introduction took place in January 2019.

Time-to-Expiry Adjustment

The Time-to-Expiry Adjustment is a model component of Eurex Clearing Prisma. For general details of the latter, please refer to the Eurex Clearing website www.eurexclearing.com under the link:

Risk management > Eurex Clearing Prisma

The Time-to-Expiry Adjustment (TEA) is a fully embedded component of the Initial Margin figure. Initial Margin for a given portfolio is thus composed of four core building blocks:

- Market Risk Initial Margin (MRIM),
- Long Option Credit (LOC),
- Time-to-Expiry Adjustment (TEA),
- Liquidity Adjustment (LA).

The Time-to-Expiry Adjustment is driven by a simulated delta in market risk, assuming short-to-expiry positions are already expired, i.e. removed from the overall portfolio:

- If the risk decreases, short-to-expiry positions have been actively adding risk to the overall portfolio.
- If risk increases, short-to-expiry positions have been reducing (i.e. hedging) risk of the overall portfolio.

The magnitude of the observed change in risk is an estimator of the delta in market risk with respect to the genuine single-step in time Initial Margin model and feeds into TEA in a weighted fashion.

The following key features of Time-to-Expiry Adjustment are employed to ensure risk adequacy:

- The delta assessment described above is done in a cascading fashion to capture a higher resolution.
- It differentiates between the settlement types of expiring positions, focusing on cash settled products only. Physically settled products still provide an approximately equivalent delta exposure by means of the physical assets beyond the life-time of the derivative that maintain the core risk profile. They are therefore not removed from the overall portfolio during the delta assessment.

For further technical details, please refer to the Eurex Clearing Prisma User Guide. This document is available in the Member Section of the Eurex Clearing website under the following link:

Eurex Clearing Member Section > Risk & Collateral Management > Eurex Clearing Prisma > Documents & Circulars > Documents Release 8.0

Examples

Figure 1 depicts a simplified calendar-spread-like trading strategy for illustration purposes. The strategy exhibits the following two risk profiles with their respective MRIMs shortly before and after expiry of the first leg within the genuine Initial Margin model.

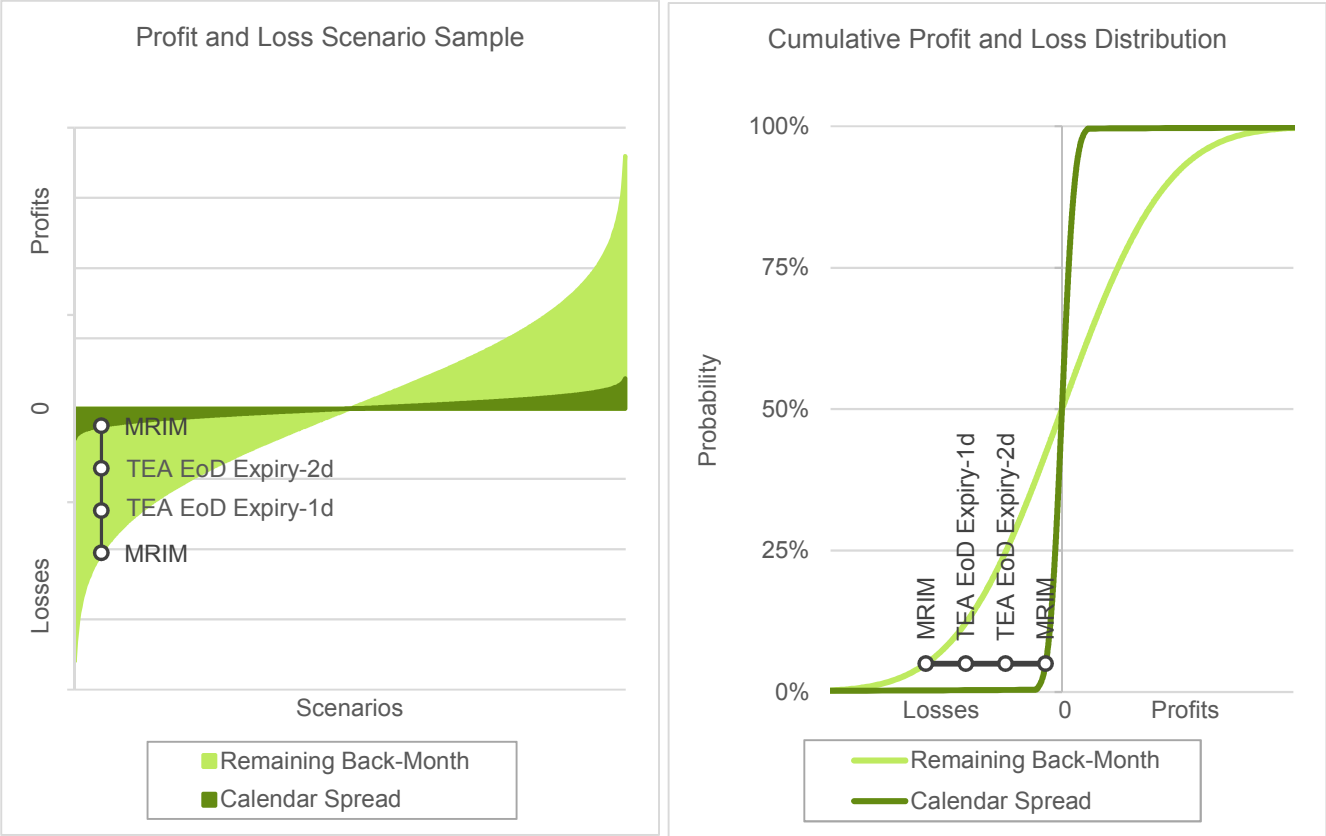

Figure 1: Example of TEA for a calendar-spread strategy

Both plots depict the same fact base, while the left hand side rather puts the scenario sample view into focus, the right hand side is more holistic taking the probabilistic view.

Assuming no further trading takes place, TEA “interpolates pro-actively” between the before and after risk profile of the portfolio, closing the negative delta between the MRIM of the before and after portfolio. If the delta is positive, TEA is zero. The iterative TEA design allows for a gradual closure of the delta and mitigates against jumps in

margin due to expiry positions as much as possible. How fast TEA absorbs this delta depends on the number of steps and the parameterisation of weights employed[1].

3. Calendar spread on EURO STOXX 50 Futures

Figure 2 depicts simulated Initial Margin figures based on a single calendar spread on EURO STOXX 50 futures across the third Friday September expiry 2018.

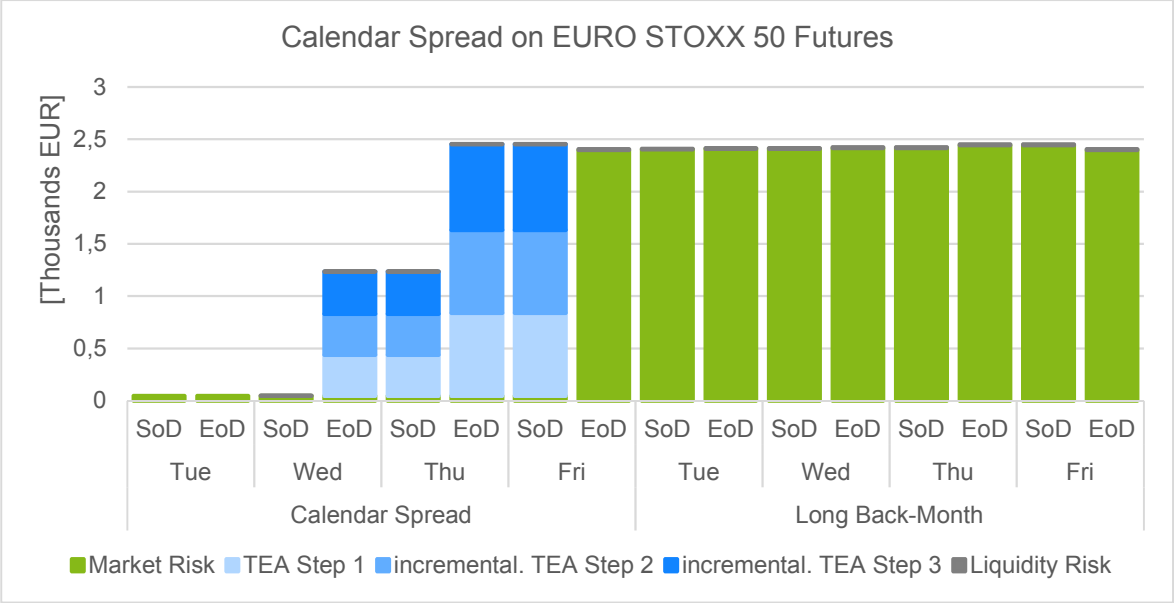

Figure 2: Real-life Initial Margins simulated for a Calendar Spread on EURO STOXX 50 Futures

The plot does not only depict the cascading nature of TEA while closing in on expiry, it also provides a view on expected TEA figures across the step-wise increase of weights for the Equity Liquidation Group throughout 2019.

With the final parameterisation, no more offsets are granted between expiring cash-settled positions and the remaining portfolio at EoD one day before their expiry, which is the Friday in the example above.

[1] The plots depict a two-step approach with cumulative weights of 1/3 and 2/3, which for instance corresponds to the second step of the parameterization for Liquidation Group Splits with three days MPOR.

4. Calendar spread on EURO STOXX 50 options @3350

Figure 3 is the equivalent view on the previous example while considering a calendar spread of ATM options and including the respective Premium Margin.

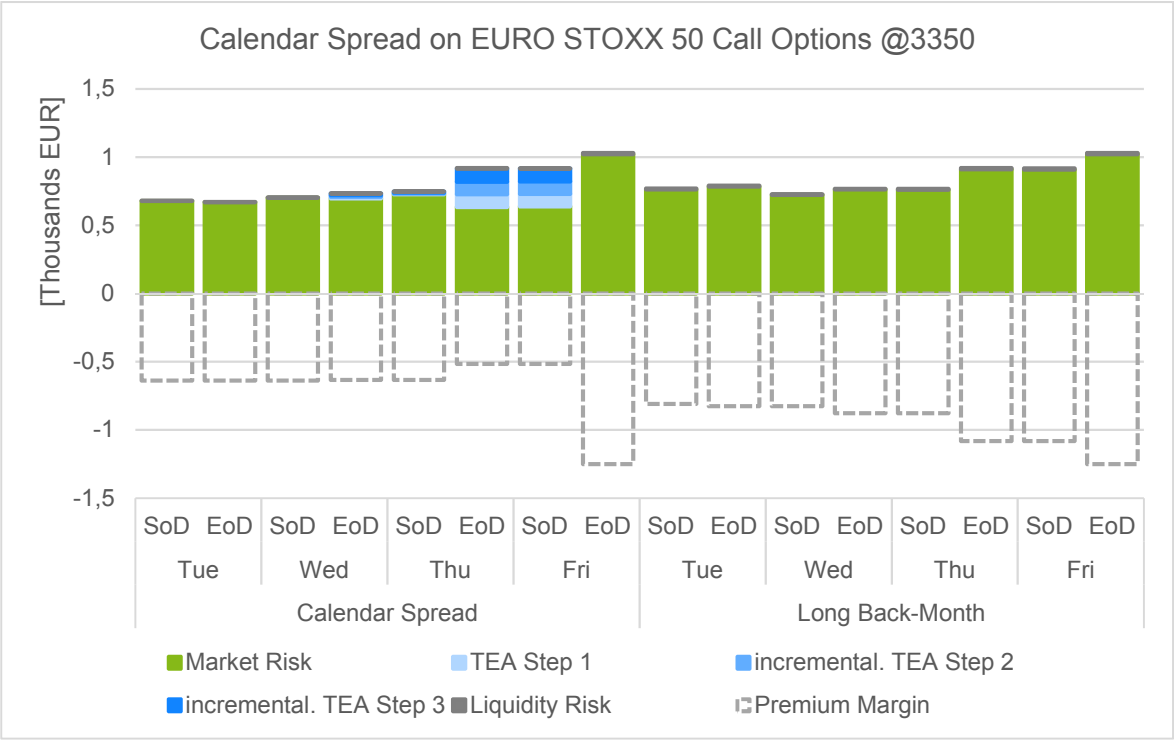

Figure 3: Real-life Initial Margins simulated for a Calendar Spread on EURO STOXX 50 Futures including Premium Margin

Parameter sets and implementation schedule

The following weighting schemes are applied to the respective Liquidation Group Splits.

Liquidation Group[2]	Split / MPOR	TEA active	Introduction Approach	Number of Expiry Horizons	Cumulative Weighting Scheme
PAC01, PCB01, PEF01, **PFI01,** PFX01, PGE01	2 days	✓	Single-Step	2	Jan 2019: $[0.5, 1.0]$
PCM01, **PEQ01,** PPM01, PPR01	3 days	✓	Step-Wise	2	Jan 2019: $[0.165, 0.33]$ Jun 2019: $[0.33, 0.66]$ Dec 2019: $[0.5, 1.0]$
PFI01, PFX01	5 days	✗			

The step-wise introduction of increasing weights for Liquidation Group Splits with three days MPOR aims at fostering market acceptance and to allow for participants to adjust their roll behaviour across expiries. Steps are applied in January, June and December of 2019.

[2] Please refer to the appendix for a mapping of Liquidation Group codes to descriptive names.

Frequently Asked Questions

Please find answers to frequently asked questions below.

Which Liquidation Groups (Splits) will TEA be applied to?

All Liquidation Groups Splits containing short-to-expiry exchange traded derivatives, i.e. all splits with either two or three days MPOR.

What is the earliest point in time when TEA is invoked prior to an expiration date?

At the EoD snapshot two business days prior to the maturity of such expiring positions.

Does TEA differentiate between futures and options?

No, TEA solely relies on the number of business days to expiry and the settlement type of the product.

Does TEA differentiate between standard and flex products?

No, TEA solely relies on the number of business days to expiry and the settlement type of the product. Thereby, TEA ensures a consistent treatment across all products. Flex products expiring outside standard cycle codes may thus incur TEA.

Which products affect TEA?

Core vehicle of TEA is the 'what-if' analysis constructed from positions in cash settled short-to-expiry products only. If the portfolio does not contain any of these, TEA will be zero. However, if it does, whether TEA will be positive and to what degree depends on the risk interplay of the overall and the 'what-if' portfolio.

How to avoid TEA?

Avoid positions in cash settled products that are hedging the remaining portfolio and that are maturing within the activation period of TEA. One way to do that is to roll cash settled positions before EoD 2 business days prior to their expiry.

If this is not possible try to roll cash settled positions as early as possible since TEA will increase until their maturity.

Which Liquidation Groups are affected most?

Since TEA focusses on cash-settled products, the Equity Liquidation Group via its index products is impacted most on an overall aggregated level based on simulations across historic expiries. However, impacts highly depend on individual portfolio structure and trading behaviour.

How to estimate TEA?

A rough upper bound of the initial margin including TEA is the initial margin of the portfolio excluding cash settled products (expiring within the activation period of TEA) times the cumulative weight, if higher than current initial margin. This level will be attained EoD one day before expiry of those products.

More accurate estimates can be obtained by making use of the respective scaling schemes.

The Cloud Prisma Margin Estimator (cPME) can be used to obtain such estimates by constructing respective portfolios manually. Please consult the Eurex Clearing Prisma User Guide for details (see no. 6 b. below)

Is the introduction of TEA driven by 'lessons learned' from a recent member default at another clearing house?

No, TEA has been developed as a methodological follow-up to Prisma's initial "Time-to-Expiry Split" approach (Eurex Clearing circular 133/14).

Will the initial TEA parameterisation change over time?

Yes, for selected Liquidation Groups a parametric phase-in across three steps is planned over the course of 2019. This shall support the introduction of TEA, foster market acceptance and grant time to allow participants to adjust their roll behaviour across expiries, if they wish to do so. With each step impacts will increase moderately until final parameterization is attained, i.e. until cumulative weights sum to one.

Appendix

5. Listing of Liquidation Groups

Code	Liquidation Group Name
PAC01	Asian cooperation KOSPI/TAIFEX Liquidation Group
PCB01	Corporate Bond Liquidation Group
PCM01	Commodity (Index) Derivatives Liquidation Group
PEF01	Derivatives on Fixed Income ETFs Liquidation Group
PEQ01	Listed Equity (Index) Derivatives Liquidation Group
PFI01	Listed Fixed Income Liquidation Group
PFX01	FX Derivatives Liquidation Group
PGE01	IRS Constant Maturity Futures Liquidation Group
PPM01	Precious Metal Derivatives Liquidation Group
PPR01	Property Futures Liquidation Group

6. References

a. Eurex Clearing Prisma website:

www.eurexclearing.com > Risk management > Eurex Clearing Prisma

b. Eurex Clearing Prisma, User Guide: Methodology Description:

www.eurexclearing.com > Eurex Clearing Member Section > Risk & Collateral Management > Eurex Clearing Prisma > Documents & Circulars > Documents Release 8.0

c. Prisma Margin Estimator in Cloud:

https://eurexmargins.prod.dbgservice.com/estimator

Unless the context requires otherwise, terms used and not otherwise defined in this circular shall have the meaning ascribed to them in the Clearing Conditions.

If you have any questions or need further information please contact Risk Exposure Management via tel. +49-69-211-1 24 52, fax +49-69-211-1 84 40 or e-mail: risk@eurexclearing.com.

8 March 2019