

Research paper

EURO STOXX 50[®]

Index options box spreads

Part 1:
**Mechanics, rates, liquidity &
market participation**

Content

Introduction	03
Lending, Borrowing, and Technical Construction	04
Market Liquidity & Participation	05
Competitive Rates	06
Term Structure	06
Risks and Implementation Considerations	08
Conclusion	09

Authors

Matt Koren & Robert Reatz
Sales Americas
Eurex

This paper is the first in a series examining box spreads on EURO STOXX 50 index options (Product code: OESX; Bloomberg code: SX5E) listed on Eurex. OESX are euro-denominated, cash-settled, European-style index options based on Europe's premier and most liquid equity benchmark, the EURO STOXX 50.

Our analysis throughout this series will focus on the economics of box spreads as listed and centrally cleared financing instruments, the use cases they may serve for both institutional and retail investors, and the market structure supporting their execution. We will examine how implied box spread rates compare with key eurozone and U.S. market funding rates (euro and U.S. dollar). We will also assess liquidity conditions, execution methods, and market participants in OESX boxes.

OESX box spreads are a useful lens for analyzing euro funding conditions from within the listed options market. Early data suggests that the implied yields move in tandem with euro rate expectations and on average sit 12–20 basis points above €STR, but also reflect execution costs, balance sheet demand, margin treatment, liquidity concentration, and supply-demand dynamics for synthetic financing.

In this paper, we will focus on three core areas: how box spreads function as synthetic lending and borrowing, the implied yields observed from box spread pricing, and the role of liquidity and execution.

Introduction

Continuous access to safe and liquid assets is vital for managing funding across financial markets. Cash-like assets are used as a store of value, to manage collateral (for example, at Eurex Clearing in Europe or the Options Clearing Corporation in the U.S.), to fund portfolios, and to price risk. In European markets, investors typically look to instruments tied to €STR, short-dated government bills, money market instruments, repo, and broker financing when managing short-term cash and funding needs.

Box spreads offer another way to express the same economic idea through listed options. A box spread combines calls and puts at two strikes to create a fixed payoff at expiration. When traded as a package and held to maturity, the position behaves similarly to a zero-coupon loan: one side pays a discounted amount today and receives a known amount at expiry, while the other side receives cash up front and repays the fixed amount at maturity. The discount embedded in the option

prices creates an implied yield. This makes box spreads useful beyond traditional options trading as a listed, transparent, centrally cleared funding instrument.

A long box can be used to lend cash synthetically and earn an implied rate. A short box can be used to borrow cash synthetically. Because the payoff is driven by the difference between two strikes, rather than the direction of the underlying index, a properly constructed box spread held to expiry has no exposure to equity market direction or volatility. It also does not have early exercise risk when European-style options are used. Its primary economic exposure is to interest rates, funding, and margin requirements. Given the significant liquidity in these structures, box spreads are invaluable mechanisms for efficiently managing cash obligations within Eurex Clearing (or the OCC in U.S. markets). This mechanism has made box spreads critical tools for large options traders globally, who must manage significant cash balances with clearing houses.

Lending, Borrowing, and Technical Construction

Lending Through Boxes

A long box spread can be understood as synthetic lending through the listed options market. The buyer of the box pays a net premium at inception and receives a fixed cash settlement value at expiry equal to the difference between the two strikes, adjusted by the EURO STOXX 50 option contract multiplier. Economically, this resembles purchasing a zero-coupon instrument at a discount to its maturity value. For example, a box with a strike width of 5,000 index points and a €10 multiplier has a terminal value of €50,000. If the package is purchased for €48,500, the difference between the purchase price and the terminal value represents the implied interest earned over the life of the trade. A significant benefit of lending through boxes is the effective removal of counterparty risk. Instead of lending directly to a counterparty via a traditional loan and assuming potentially significant credit risk, lending via a box structure results in the lender assuming the credit risk of the clearing house. At the time of this writing, both Eurex Clearing and the Options Clearing Corporation (OCC) in the U.S. have AA credit ratings from various credit rating agencies.

Borrowing Through Boxes

A short box spread represents the opposite transaction and can be interpreted as synthetic borrowing. The seller receives the net option premium upfront and is obligated to pay the fixed settlement value at expiry. The difference between the cash received at inception and the amount repaid at maturity represents the implied financing cost. Here again, the use of box positions allows traders to raise the collateral necessary to manage cash requirements at Eurex Clearing.

Technical Construction

The construction of a box uses four options with the same underlying index, the same expiration date, and two different strike prices. A long box is created by buying the lower-strike call, selling the lower-strike put, selling the higher-strike call, and buying the higher-strike put. This combines a synthetic long position at the lower strike with a synthetic short position at the higher strike, leaving a fixed payoff equal to the strike difference at expiration. In European markets, these are usually 5,000-point boxes, whereas U.S. markets traditionally see 1,000-point boxes trade. As a reminder, OESX settles on a trade date +1 (T+1) basis.

The short box is simply the inverse package: selling the lower-strike call, buying the lower-strike put, buying the higher-strike call, and selling the higher-strike put. Because the economics depend on the net price of the full package, the strategy should usually be executed as a package rather than being legged individually. The implied rate can be calculated by treating the box price as the present value of the terminal payoff:

$$\begin{aligned} \text{Box Price} \times e^{-(rT)} &= \text{Terminal Payoff} \\ \text{or equivalently:} \\ r &= -1/T \times \ln(\text{Box Price} / \text{Terminal Payoff}) \end{aligned}$$

where T represents the time to final settlement, typically expressed using an ACT/360 convention. For EURO STOXX 50 options, the terminal payoff is calculated as the strike width multiplied by the contract multiplier.

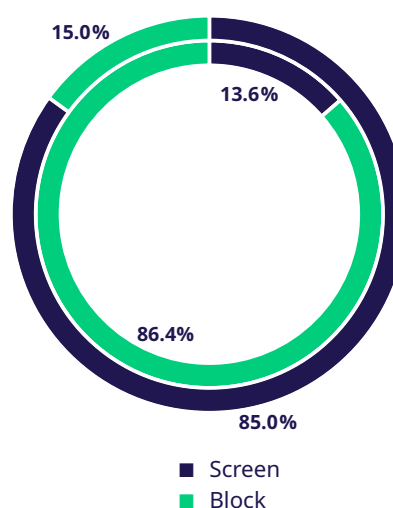
Market Liquidity & Participation

During the analysed period of January 2, 2025, to May 31, 2026, EURO STOXX 50 box spread activity totalled €6.1 billion notional across 3,680 trades, equal to approximately €17 million in average daily notional volume. Trading was most concentrated in 5,000 strike-width packages, particularly the 1,000/6,000 strikes, with 33% of trades and 94% of notional volume coming from that strike combination. This concentration helps identify where liquidity is most actionable and where implied yield observations are likely to be most reliable.

Execution access was split between screen trading and block trading. For this analysis, screen trades refer to executions in the central order book, while block trades refer to activity entered through the “TES” facility, Eurex’ fully electronic block trade mechanism. Blocks are generally large, broker-arranged trades.

Screen activity provides more visible price discovery, while block execution serves as a key mechanism for facilitating large financing trades, as shown by the difference between the screen average trade size of 97 contracts and the block average trade size of 2,200 contracts.

Figure 1: Trades by execution type – contracts traded (outer ring) vs. notional traded (inner ring)



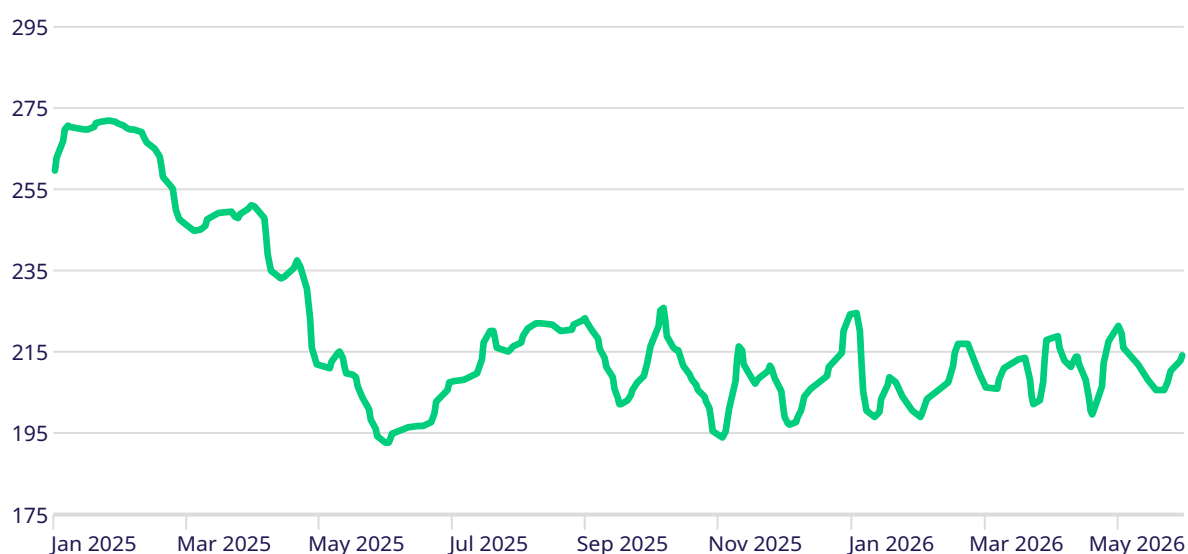
The above chart breaks down notional volume (inside) and total trades (outside) by execution type.

Competitive Rates

The economic relevance of EURO STOXX 50 box spreads is best evaluated through their implied financing rate relative to observable euro funding benchmarks. Because the terminal payoff of a properly constructed box spread is fixed, the package execution price can be translated into an implied yield and assessed against reference

rates such as €STR, Euribor, euro repo, short-dated sovereign instruments and applicable broker or clearing member financing levels. Over the sample period, the three-month EURO STOXX 50 box spread implied yield averaged 223 basis points, compared with €STR at 210.1 basis points, implying an average spread of 12.9 basis points.

Figure 2: Three-month interpolated implied box yields

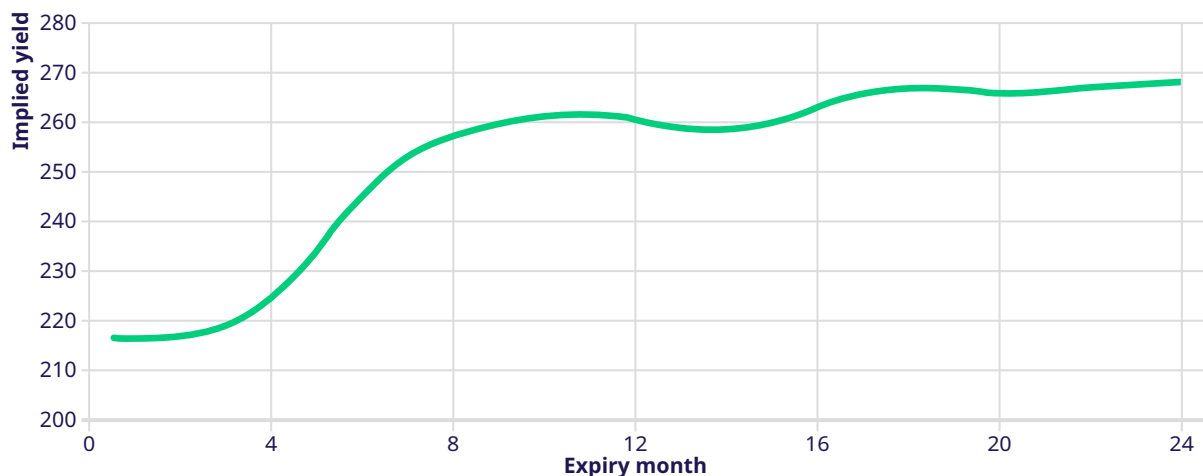


The above chart shows the implied 3-month box yield from 2 Jan 2025 through 31 May 2026. Interpolated from screen and block trades.

Term Structure

Understanding the maturity profile of box spread activity is important because it provides insight into how market participants use these structures for financing. While box spreads can be constructed across a wide range of expiries, trading activity is not evenly distributed across them.

Figure 3: 31 May 2-year implied yield curve

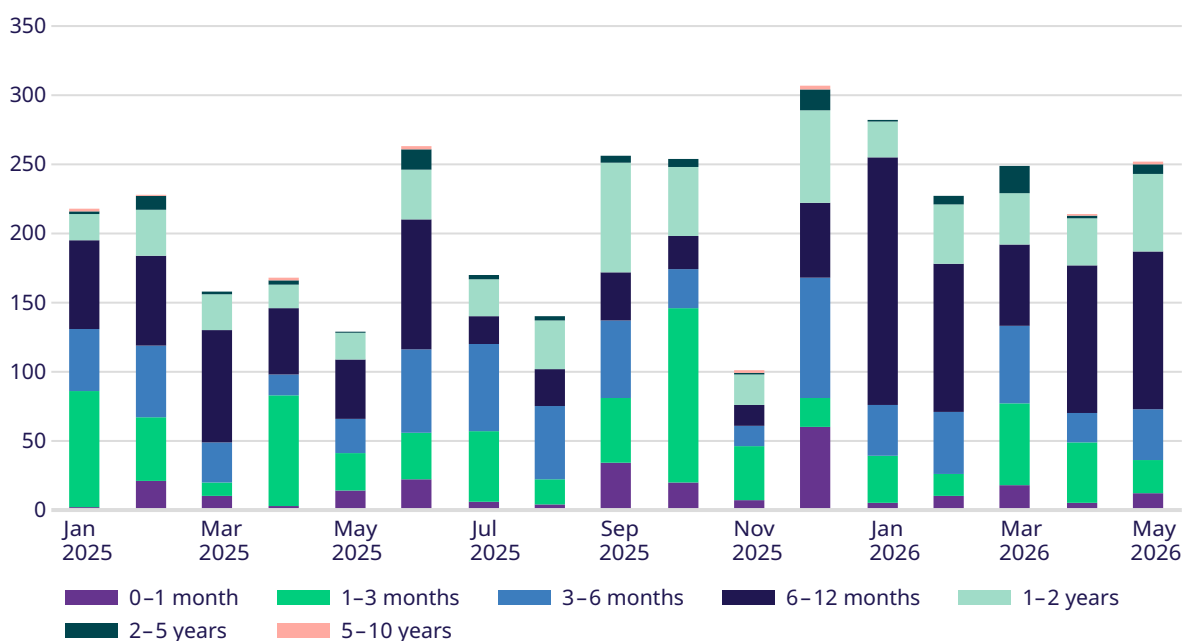


The above graph shows the 2-year implied yield curve from 31 May smoothed using a Gaussian kernel.

Figure 4: Distribution of OESX box spread trades by time to expiry

Maturity bucket	Percentage of total volume
0–1 month	7.09%
1–3 months	20.65%
3–6 months	19.92%
6–12 months	31.66%
1–2 years	17.50%
2–5 years	2.77%
5–10 years	0.41%
Grand total	100.00%

Figure 5: Monthly trades by maturity profile



The above graph shows the total number of box trades traded per month by maturity.

Risks and Implementation Considerations

While EURO STOXX 50 box spreads have a defined terminal payoff when properly constructed and held to expiry, their realized economics remain subject to several practical considerations.

The primary risk is not directional exposure to the underlying index, but implementation risk related to execution, liquidity, transaction costs, margin, collateral, and settlement. Because the strategy requires four option legs with the same expiry and two strikes, it should be executed as a package rather than being legged manually. Any failure to execute the full structure at the intended net price can introduce temporary market, volatility, and basis exposure that may materially alter the implied financing rate.

Transaction costs are particularly important because box spread yields are highly sensitive to small differences in the package execution price. The relevant rate should therefore be measured net of bid-ask impact, brokerage commissions, exchange fees, clearing fees, and any costs associated with block execution, early unwind, or rolling the position. These costs can vary greatly by market participant.

Liquidity risk is also relevant, particularly outside common strike widths and expiry buckets. Given that most trading is in 5,000 pt structures, non-standard packages could be subject to wider markets, reduced depth of liquidity, or a greater need for block execution. Additionally, participants may find less liquidity in longer-dated boxes,

as market expectations for longer-term interest rates may vary, which may result in wider bid/ask spreads.

Finally, margin and collateral treatment should be treated as central to the economics of both long and short box spreads. A long box requires upfront cash, while a short box generates upfront proceeds but creates a future payment obligation that must be supported by eligible collateral and sufficient margin capacity. That said, box positions create a risk-locked, delta-neutral position. As a result, Eurex' PRISMA margining methodology recognizes that the maximum loss of the position is capped, and initial margin requirements for the box spread itself are practically negligible.

Conclusion

EURO STOXX 50 box spreads provide a useful framework for examining listed euro financing through the options market. By combining four options into a fixed-payoff structure, box spreads allow market participants to observe an implied financing rate that can be compared with euro funding benchmarks and alternative sources of cash deployment or borrowing. The early evidence presented in this paper suggests that OESX box spread yields broadly align with euro rate expectations while trading, on average, above €STR during the sample period. These packages are also extremely valuable tools for managing cash balances held at options clearing houses.

The market structure data also highlights the importance of execution method and participant behavior. Although most trades occurred on screen, the majority of notional was traded through block execution, indicating that screen activity contributes to visible price discovery while block trading remains central for larger institutional financing trades. The concentration of activity in specific strike-width packages and expiry buckets further suggests that liquidity is strongest in standardized structures, which is important when interpreting implied yields and assessing executable rates.

This first paper is intended to establish the foundation for a broader analysis of OESX box spreads as listed financing instruments. Subsequent papers will examine the economics of box spreads in greater detail, including term structure behavior, rolling strategies, transaction costs, and comparisons with key euro and other market funding rates. Further work will also assess how different market participants use the product and whether OESX box spreads can develop into a more consistent listed-market signal for euro funding conditions.

Contact us

SALES AMERICAS

Matt Koren
matthew.koren@eurex.com

SALES EMEA

Sophie Granchi
sophie.granchi@eurex.com

Dorte Carlsen
dorte.carlsen@eurex.com

SALES APAC

Kris Hopkins
kris.hopkins@eurex.com

GLOBAL PRODUCT LEAD FOR INDEX

Floris Florquin
floris.florquin@eurex.com

EURO STOXX PRODUCT LEAD

Tobias Ehinger
tobias.ehinger@eurex.com

© Eurex, June 2026

Published by

Eurex Frankfurt AG
Mergenthalerallee 61
65760 Eschborn
Germany
www.eurex.com

ARBN Number

Eurex Frankfurt AG ARBN 100 999 764

© 2026 by Deutsche Börse AG. Eurex®, the EX® and EC®-Logo are registered trademarks of Deutsche Börse AG. This publication is published for information purposes only and does not constitute accounting advice, investment advice or an offer, solicitation or recommendation to acquire or dispose of any investment or to engage in any other transaction. While reasonable care has been taken in the preparation of this publication neither Eurex Frankfurt AG, nor any of its affiliates make any representation or warranty regarding the information contained herein. Customers should consider the legal, accounting and regulatory requirements in the jurisdictions relevant to them before using Eurex® products or services. All descriptions, examples and calculations contained in this publication are for illustrative purposes only.

Find out more on
[EURO STOXX 50 Index derivatives](#)

