EUREX Architects of trusted markets

Expected market impact and use cases for Daily EURO STOXX 50® Options

Zero Day Options | 0DTE

Daily Options: Daily EURO STOXX 50® Options available for trading

Contents

Daily index option expirations have been around for over a decade. However, the widespread adoption of daily expirations coincided with the introduction of daily expirations in the S&P 500 (SPX) arena. This paper discusses Eurex's EURO STOXX 50® index suite, the latest segment to introduce daily expiring options. To gauge how these options will be used, and how they could impact the EURO STOXX 50® ecosystem, we turn to the SPX option market.

1. A brief history of daily expirations

The introduction of daily SPX expirations resulted in a dramatic increase in liquidity for the whole SPX market. It opened new methods of trading options based on shorter-term outlooks for the equity markets. The acceptance of Daily Options has exceeded expectations due to expanded use by current index option traders and new traders, with a short-term outlook, attracted to the index option market.

In late August 2023, Eurex introduced EURO STOXX 50® End-of-Day (EoD) options using the base symbol of OEXP. This new product follows similar expiration rollouts to other heavily traded index option markets. Table 1 shows an overview of the specifications for these new contracts.

OEXP options offer daily expirations for five consecutive trading days. Consequently, options with 1–5 days remaining to expiration are available at any point in time. The final settlement will be on market close, 17:30 CET. Furthermore, end-of-month options are listed for the following three months, sharing the same PM settlement process. Adding five consecutive daily and three month-end expirations created new hedging and trading strategies in the EURO STOXX 50® ecosystem.

Daily expirations allow market participants to pinpoint hedging and positioning around specific events, such as major macroeconomic data releases or central bank rate decisions.

Table 1: EURO STOXX 50® End-of-Day (EoD) contracts pecifications

	Description
Eurex product ID	OEXP
Underlying / ISIN	EURO STOXX 50® Index / ISIN: EU0009658145
Contract size / value	EUR 10.00
Tick size	Premium-dependent tick size: Bid up to: 0.10–10.00: 0.10 index points 10.25–25.00: 0.25 index points 25.50+: 0.50 index points
Strike price intervals	5 index points
Contract terms	• The first five trading days • The three consecutive month-end trading days • Available settlement days: Monday, Tuesday, Wednesday, Thursday, Friday. Last trading day of the month
Last trading day / Final settlement day	Last trading day of the relevant contract Close of trading on the last day: 17:30 CET
Final settlement price	Index level of the EURO STOXX 50® Index based on the closing price of the underlying stocks
Minimum block trade size	1,000 contracts
Trading hours	09:00 – 17:30 CET (TES 9:00 – 19:00 CET)

Data source: Eurex

2. Expected Market Impact

The potential influence these new contracts could have on the current EURO STOXX 50® options market may be determined by looking at the US S&P 500 Index options market. Since the launch of daily expirations in 2022, SPX option volume has grown tremendously. However, despite concerns, most of this volume has been additive to the market and has not impacted longer-dated option liquidity.

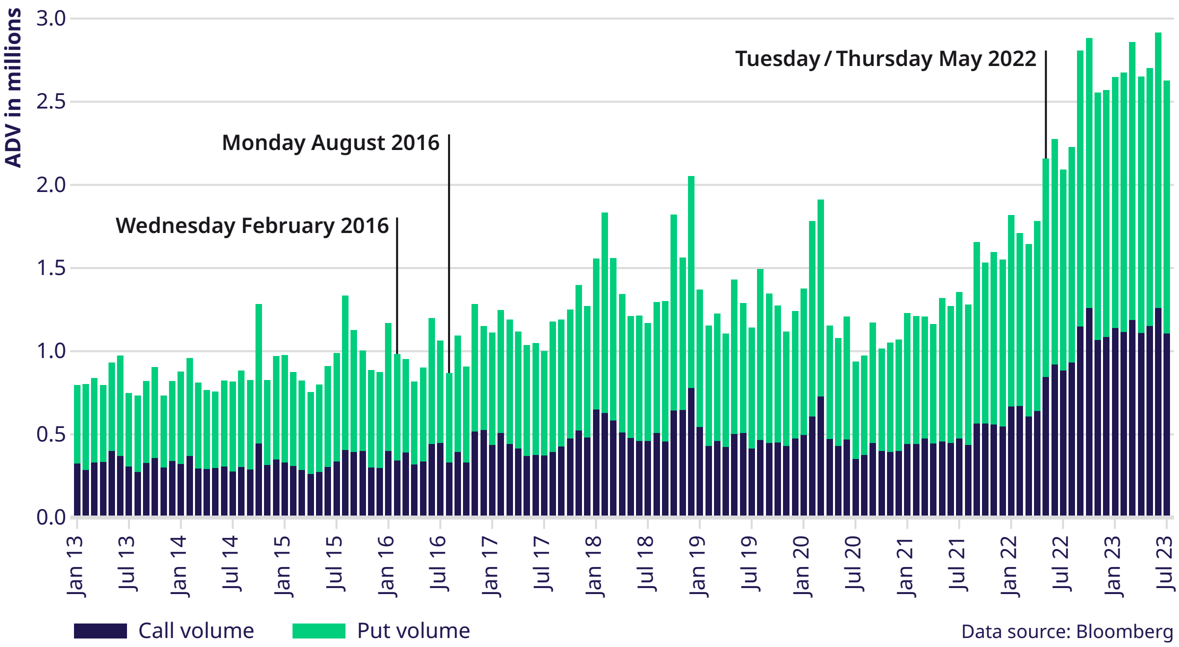
2.1 Potential impact on volumes – a look at the US market

Daily expirations for the SPX index options market in their current format were introduced over a 12-year period starting in 2010 with the launch of PM settled SPX options expiring every Friday. Wednesday and Monday expirations were added in 2016. Finally, Tuesday and Thursday expirations completed the offering in 2022. Figure 1 highlights the monthly average daily volume for SPX options from January 2013 through July 2023. The launch months for all but Friday expirations are also highlighted on the chart.

Prior to the introduction of Tuesday and Thursday expirations in May 2022, which resulted in daily SPX expirations, the SPX option average daily volume by month exceeded 2,000,000 contracts once (December 2018). After daily expirations were available, the average daily volume reached more than 2,600,000 contracts. This clearly indicates that the introduction of daily expirations has resulted in the volume being additive to the market and not cannibalizing trading in the more traditional expirations.

Another interesting data point is found by exploring the open interest of SPX options. Figure 2 shows the average open interest for SPX index options by month over the same period as the average daily volume chart in Figure 1.

Figure 1: SPX Index Option average daily volume by month

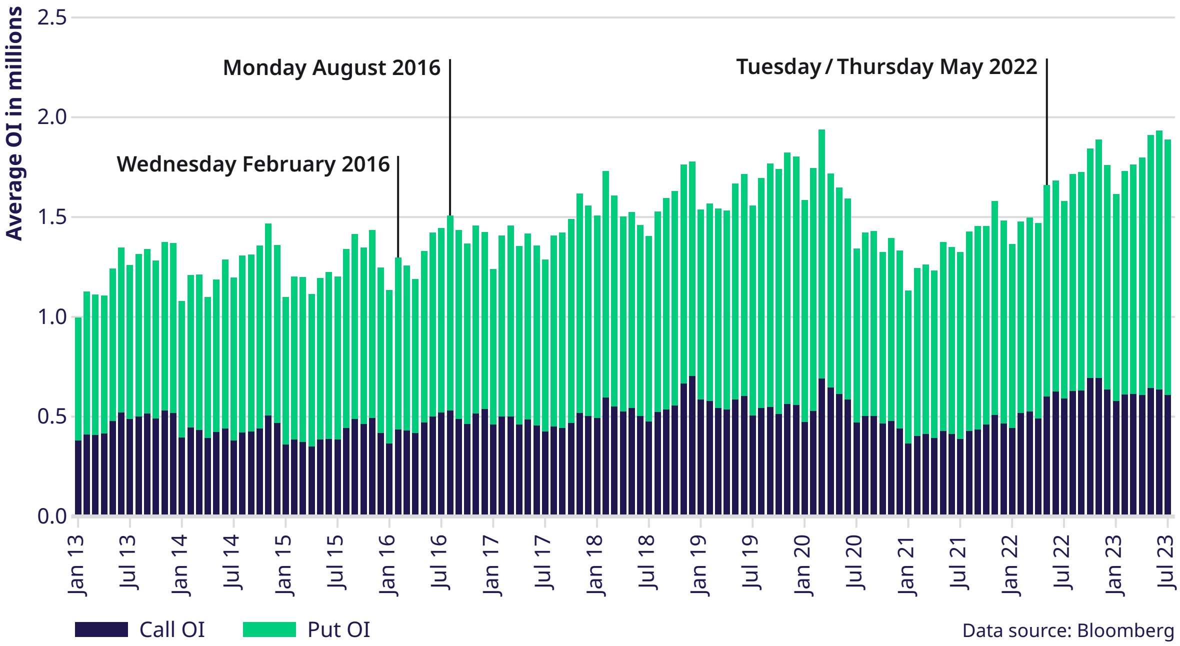


Data source: Bloomberg

“ Daily Options offer a regulated and transparent alternative to the OTC market. In this cleared environment, traders also benefit from additional margin efficiencies.

Michael Peters
CEO of Eurex

Figure 2: SPX Index Option average open interest by month



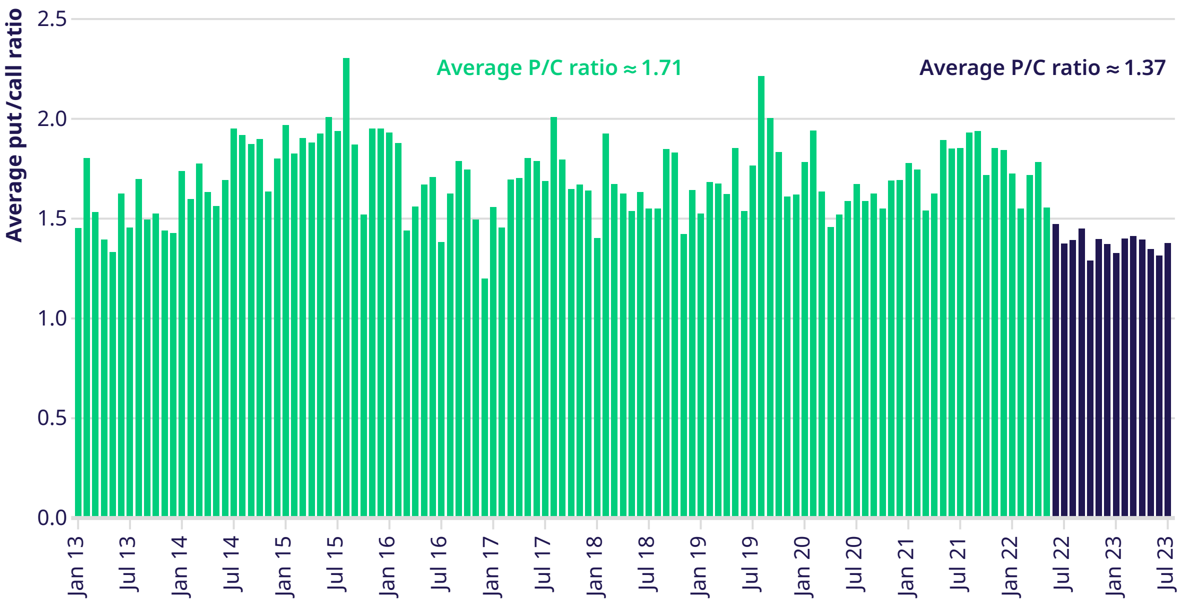
Data source: Bloomberg

The average open interest in April 2022, before daily expirations were available, was about 15 million contracts. In July 2023, this figure rose to 19 million contracts, representing an increase of 26%, while average daily volume increased 47%. The volume increase outpacing the increase in open interest is a function of traders increasingly using short-dated SPX options for short-term trading purposes and not as a substitute for hedging.

2.2 Will the new product affect relative volumes in put versus call options?

Index options are one of the most efficient, if not the most efficient, methods of hedging an equity portfolio. Due to this widespread usage of index options for hedging, more puts than calls trade on most trading days. However, with the introduction of daily expirations, there has been a shift in the volume breakdown for SPX index options. Figure 3 shows the average put/call ratio by month. Here, the green bars represent the ratio before Daily Options were made available and the blue bars show the put/call ratio after the introduction of daily expirations.

Figure 3: SPX Index Option put/call ratio by month



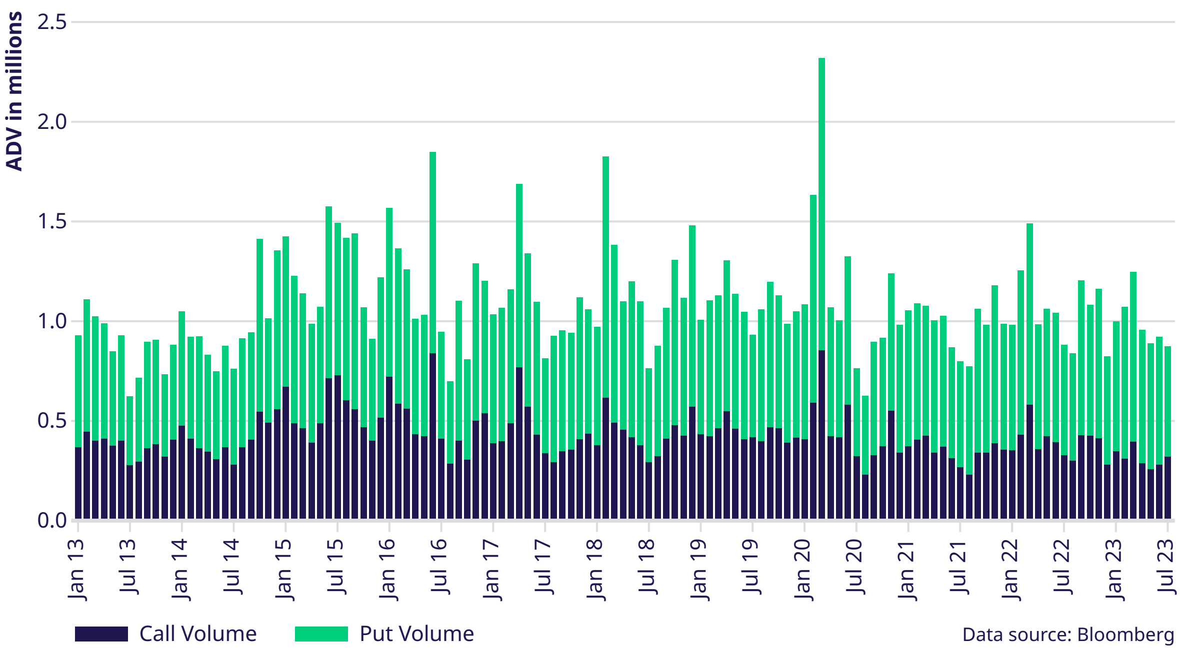
Data source: Bloomberg

Prior to the full rollout of daily expirations, the SPX put/call ratio averaged around 1.71. Once daily SPX expirations were introduced, the put/call ratio dropped below 1.50, averaging 1.37. The average EURO STOXX 50® put/call ratio from January 2013 through July 2023 is just over 1.65, in line with the pre-daily option SPX figure.

This shift lower in the SPX put/call ratio is a function of call options representing a larger portion of options trading. It is safe to assume traders use short-dated SPX calls more frequently to speculate on short-term trends or take advantage of the time decay into expiration. This trade was rarely available before the introduction of non-standard expirations.

For comparison's sake, Figure 4 shows the average daily volume for EURO STOXX 50® options starting in January 2013. This figure has been consistently around one million contracts, with some instances where volume exceeded 1.5 million contracts. These spikes in volume coincide with extra volatility in the underlying index.

Figure 4: EURO STOXX 50® Index Option average daily volume by month



Data source: Bloomberg

The put and call volume trends follow that of the S&P 500 complex, with the average put/call ratio over this period around 1.6. Once daily expirations are available, call volume, as a portion of the average daily volume, could increase due to more short-term trading.

2.3 Could the introduction of Daily Options affect implied volatility for longer-dated options?

As noted, the initial launch of daily index options in the US occurred in May 2022. US stocks experienced excess volatility in 2022, but index implied volatility did not react as many market participants felt it 'should'. Specifically, there is a belief that the introduction of Daily Options resulted in lower implied volatility for longer-dated options.

One method of determining whether SPX short-dated option activity impacts longer-dated option implied volatility is to compare SPX trading to a market with a volatility index and, until recently, no Daily Options. The ideal market for this comparison is the EURO STOXX 50® and VSTOXX. Table 2 compares these two market pairs for July 2022 – June 2023.

Table 2: S&P 500 / VIX and EURO STOXX 50® / VSTOXX data

Pair	Correlation	Realized volatility	Vol index high
S&P 500 / VIX	–0.67	19.36%	33.63
EURO STOXX 50® / VSTOXX	–0.76	17.15%	33.07

Data source: Bloomberg

VSTOXX is a consistent 30-day implied volatility measure based on EURO STOXX 50® option pricing, as VIX is for the S&P 500. All market participants know the inverse relationship between VSTOXX and the EURO STOXX 50®. For example, the correlation between daily changes in the EURO STOXX 50® and VSTOXX was –0.76 from July 2022 through June 2023. This is typical of the relationship between the two.

Over the 12-month period covering July 2022 – June 2023, the realized volatility for the S&P 500 was just over 19%, 2% higher than the same figure for the EURO STOXX 50®. Finally, one source of discussion around the impact of daily options was focused on VIX. Specifically that, despite a bear market, VIX did not top the 40.00 level. This level is normally surpassed during a bear market and VIX did not come close to 40.00, peaking at 33.63. The high for VSTOXX was just below that of VIX, which shows that despite a bear market, the muted volatility levels were a function of market expectations and not due to short-dated options gaining volume.

Using the same period for the S&P 500, VIX yields a similar result with a correlation of –0.67. However, when the daily change for the S&P 500 is compared to the daily change for a 1-day ATM straddle as a percent of the S&P 500, the correlation is +0.06. The correlation close to zero indicates no relationship between the daily price changes for the S&P 500 and ATM straddle pricing. Increases in the straddle pricing as a percentage of the market tend to coincide with events that may result in large moves for the equity market. The takeaway is that short-dated index options display more anticipatory pricing than the longer-dated index options and are more reactionary to changes in the underlying index.

2.4 Daily Options and systemic risk in financial markets

There are unwarranted concerns about short-dated options creating the conditions for a systemic risk event in the financial markets. However, due to central clearing and stringent risk monitoring by brokerage firms, it is doubtful that short-dated options may be the cause of the next headline-grabbing market event.

There are numerous historical examples of derivatives causing systemic market issues. Although this list is not comprehensive, the CFA Institute book A Practical Guide To Risk Management lists 35 financial risk events. These events include losses by firms like Long Term Capital Management (1998) and the Orange County debacle (1994). The table below breaks down these thirty-five market events by instrument or market.

Instrument	Number of instances
Interest Rate Markets	11
Foreign Exchange	10
Energy Markets	4
Financial Futures	4
Commodities	3
Stocks	3

Source: A Practical Guide To Risk Management, CFA Institute 2011

Note that listed options do not make the list, which is attributed to risk being monitored on a real-time basis by exchanges and clearing houses. Additionally, the listed options market has several liquidity providers that assure market liquidity during higher market volatility. Eurex has a minimum of four market-making firms committed to providing liquidity from day one for the new short-dated EURO STOXX 50® options.

3. Popularity of Daily Options

For years, option traders executed strategies specific to option expiries. These end-of-life strategies were expected to result in a liquid market for Daily Options on day one. However, the popularity of weekly and then daily expirations surpassed even the most bullish expectations.

A successful listed derivative market needs to appeal to a variety of market participants. Like their longer-dated counterparts, short-dated index options appeal to hedgers, speculators, and liquidity providers.

3.1 Short-term hedging and positioning

As noted, index options traditionally experience more put than call trading. This is a function of those options offering efficient hedging opportunities. Short-dated index options also find uses among hedgers as they offer the opportunity to hedge against specific event risks.

A speculative trade may cover any period from minutes to years. However, most speculative traders focus on trades that last just hours or, at most, a couple of days. Daily index option expirations are very attractive to a trader with a short-term outlook. Short-term trading is not

> **Particularly against the backdrop of increasingly volatile markets, Daily Options are another innovative solution for the professional market to efficiently manage exposures in a regulated and transparent market environment.**
>
> Randolf Roth
> Member of the Eurex Executive Board

limited to individual investors, as recently many institutions rely on short-term trend trading to generate alpha. Options that expire at the end of a trading day are perfect vehicles to implement these strategies and have likely contributed to the rise in intraday trend trading by hedge funds.

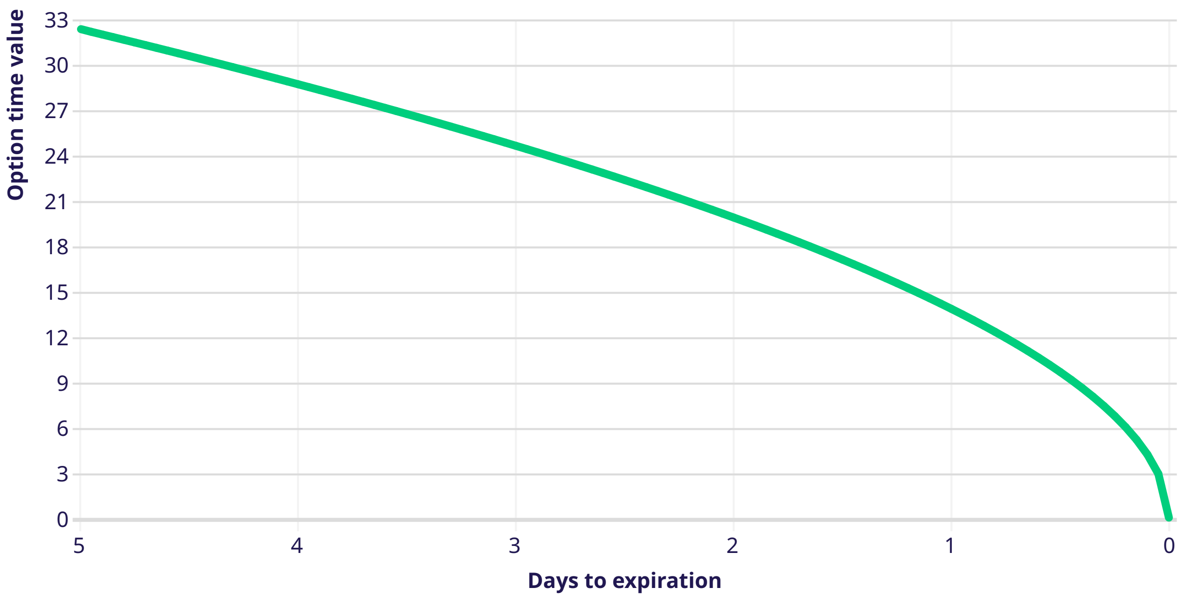
3.2 An increase in carry strategy opportunities

A popular use of options is selling volatility or taking advantage of time decay. At-the-money options experience accelerating time decay as expiration approaches. Figure 5 shows five days of time decay for an option with the underlying market at 4,450 and implied volatility of 12%, figures that are consistent with the EURO STOXX 50®.

The chart on below is an academic exercise, with the passage of time being the only changing factor. A common strategy, long before daily expirations were created, was to take advantage of rapid time decay through selling ATM options.

When a market participant purchases an option, a time value component is associated with the option's price. To profit from this option purchase,

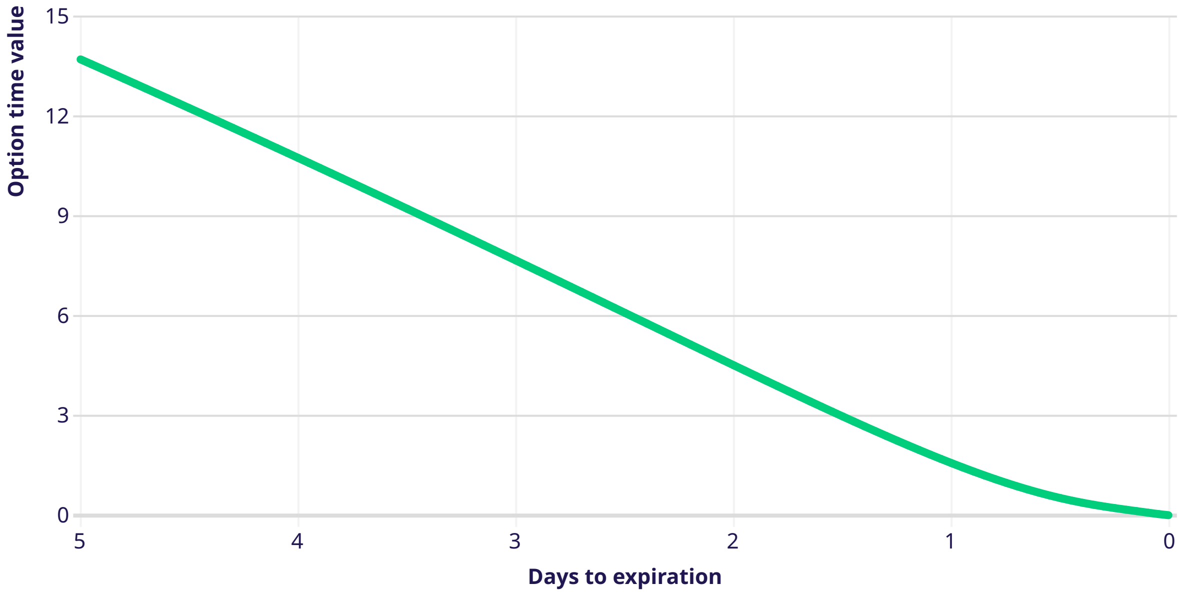
Figure 5: EURO STOXX 50® at-the-money time decay



the underlying market needs to move to cover the decay of the time value component. Short-dated in-the-money options will have very little time value and are ideal for trading an outlook based on just a day or two. Figure 6 shows the time value for a hypothetical EURO STOXX 50® option that is 1% in the money (index at 4,500 and 4,455 call strike price) and 12% implied volatility.

The premium for this 1% ITM call is 58.50, but 45.00 of the cost of the option is intrinsic value, which leaves 13.50 of time value. If the EURO STOXX 50® is unchanged over the five-day period, the result would be a loss for an option buyer of 13.50. With one day until expiration, only 1.60 of time value remains, i.e., the call would cost 46.60 with 45.00 points of intrinsic value.

Figure 6: 5-day EURO STOXX 50® 1% ITM time decay



4. Conclusion

The introduction of daily expirations in the SPX arena resulted in a dramatic increase in volume. Additionally, the liquidity across all tenors has benefitted from increased SPX options trading. One change to the market, which may also be considered positive, is the relative use of call options with a reduction in the put/call ratio.

Eurex introducing daily PM settled options on the EURO STOXX 50® adds an especially useful tool to a trader's toolbox. The rapid adoption of Daily Options in other broad-based index markets clearly indicates that EURO STOXX 50® Daily Options will attract a variety of option participants from day one.

For more information, visit our website at www.eurex.com

About Eurex

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