EUREX Architects of trusted markets

Whitepaper

Eurex Passive Liquidity Protection

Mission Statement

For Eurex, transparency is key for fair and orderly trading in a fully electronic and fast-paced financial market environment. At the heart of this trading infrastructure lies the Central Limit Order Book (order book) as the primary source of firm and competitive liquidity; continuously available, transparent to all market participants, and a reference to many downstream liquidity pools and execution channels. To keep the order book strong and resilient, the participation of a diverse market participant base is needed, following different investment interests via a variety of trading strategies, which eventually result in different liquidity needs at different points in time. For Eurex, this is a key cornerstone for a healthy market with competitive prices that are available to all market participants. To achieve these goals, it is the responsibility of exchanges and regulators to establish sound and transparent rules that are grounded in sophisticated functionalities to allow all participants to interact in a fair and orderly manner in the same order book.

In light of technical innovations over recent years, the speed of trading has become significantly more important for all market participants, especially when competing for the best prices in the order book. However, not every market participant is willing or able to keep pace with these developments, and heterogeneity among the latency requirements of the entire market has thus increased. For an exchange, it has therefore become fundamental to success to shape the trading environment in such way that each and every participant, no matter their individual latency capacities, is able to participate in order book trading. Failing in this task will result in the systematic exclusion of market participants from actively contributing to price formation.

With Passive Liquidity Protection (PLP), Eurex has pioneered providing a functional solution to level the playing field for market participants when trading in the order book. In this paper, Eurex elaborates on the idea and the motivation behind introducing PLP, as well as providing an overview of what has been achieved so far. For a detailed analysis of the effects the introduction of PLP had on the trading characteristics and liquidity picture of DAX® index options, Eurex also provides a separate document to report exact data via a benchmark case study.

The status quo in the order book

By offering liquidity in the order book, market participants contribute to the aggregation of supply and demand which, in turn, determines the fair market price. Trading interest not offered in the order book cannot directly contribute to this price formation. A split in liquidity might thus result in biased prices, limited information transmission, and restrictions on price discovery. It is therefore vital that all market participants have fair access to the order book and can show their individual liquidity contribution at the most competitive price. Offering liquidity in the order book provides a price signal that is visible and available to everyone at every time, and hence bears the effort for the offering participant to maintain this continuously to minimize the risk of execution taking place when the offer is outdated. Execution on outdated prices can be costly for the offering market participant and is often referred to as adverse selection. While there are various reasons why adverse selection might occur when offering liquidity in the order book, one of the most common is surely latency arbitrage.

Latency arbitrageurs capitalize on cross market or cross product price disparities by executing against stale order book liquidity before this liquidity can be updated by its owner to reflect the current price level. Especially in the options markets, latency arbitrageurs can utilize multiple ways to exploit price differences between instruments and correlated indexes as latency arbitrage triggering price updates may originate from the options as well as the futures area. In a scenario where the arbitrageurs have a significant latency advantage over the market participant active in providing liquidity, the risk and cost of failing in such arbitrage strategies is low. Consequently, if participants cannot adequately protect themselves against latency arbitrage, they end-up widening the spreads they quote, showing less liquidity, or simply exiting the order book.

Over recent years, Eurex has observed significant developments in technology on the participant side and related larger differences in participant setups. This has also had an impact on adverse selection due to latency arbitrage in various options products, resulting in a situation where those market participants who offer liquidity in the order book and cannot protect against such behaviour have taken defensive measures. Consequently, due to several market participants facing these challenges when providing competitive liquidity, the liquidity in options products is not living up to its potential.

Eurex is proud of the capacities offered by its T7 trading platform and trusts in the benefits such a fast and deterministic infrastructure provides to market participants. With continuous developments in network and latency, the Eurex T7 trading platform is able to likewise serve the needs of latency sensitive participants, as well as non-latency sensitive participants with high transaction flow. Eurex T7 strives to be a platform that serves all market participants.

Eurex is therefore keen to innovate and pioneer, in terms of both technical and functional solutions that help foster order book integrity, and address these challenges from multiple directions. Passive Liquidity Protection is Eurex's functional answer to creating a level playing field where all market participants can compete in the same order book without being exposed to structural disadvantage due to different latency requirements in asset classes, where this is of relevance.

What does Eurex want to achieve with Passive Liquidity Protection?

With Passive Liquidity Protection (PLP), Eurex aims to improve the liquidity picture and price discovery process of the order book in products where price discovery is dominated by underlying or exogenous markets, i.e. in markets where latency arbitrage is significantly affecting some market participants. PLP is thus not suited to all products and must be carefully considered before being implemented. As a consequence, Eurex decided to focus and implement PLP in options and selected futures strongly depending on a reference market, such as Eurex Foreign Exchange futures.

PLP achieves its goals by differentiating between those orders arriving in the order book which add liquidity – passive liquidity – and those which are aggressive, i.e., which remove liquidity from the order book. With PLP, passive orders go straight into the order book while aggressive orders will be deferred by a very short period, between 1 and 3 milliseconds – the so called PLP deferral time. PLP does not differentiate on participant level, but rather on the level of each individual order, ensuring that all market participants are subject to the same rules and treated equally. PLP applies to all aggressive orders, irrespective of the entering participant being a professional liquidity provider, a proprietary firm, or agent trader/bank sending flow from an end investor. All aggressive orders are delayed; all passive orders are not. The rules for PLP therefore apply to all market participants equally, no matter the individual participant's business model or trading setup. Everyone can send a passive order and participate, and no one is excluded due to regulatory, technical or individual setup reasons.

With this latency differentiation, PLP disincentivizes latency arbitrage as those market participants that actively maintain orders in the order book have the opportunity to update their orders if there is an external signal, such as a price move in the underlying stock or future. Most notably, PLP does not provide any information advantage to market participants in the order book – deferred aggressive orders are not visible upfront. A passive market participant thus cannot anticipate incoming orders and can only consider reacting to transparent market information available to all market participants, e.g. a change in the underlying price.

With PLP, market participants can focus more on providing liquidity and serving the end-investor rather than competing on technology and avoiding aggressive trades from other liquidity providers. By reducing the risk of adverse selection, market participants will be again willing to show more competitive prices and bigger sizes, i.e., turning down their defensive measures and re-focusing on price competition, resulting in a more attractive liquidity picture for everyone. The benefits of PLP are not only available to professional liquidity providers or specific investment firms. Every market participant that contributes to price discovery by placing resting orders in the order book will be protected by PLP. Everyone that consumes liquidity from the order book will also benefit from an improved liquidity picture and price discovery. In addition, PLP is lowering barriers for new entrants that are not so heavily invested in latency and, consequently, have not so far considered the order book as an attractive execution channel.

What has Eurex achieved with Passive Liquidity Protection?

After an extensive consultation period involving market participants and regulators, PLP was launched in June 2019 as a pilot project for German and French single stocks options. Following the successful pilot, PLP was expanded to all single stocks and DAX® index options in August 2020.

As of today, Eurex continues to monitor changes in the market microstructure and regularly shares results with market participants and regulators. The following results are evident and observable in the respective products – for a detailed overview on the measured effects, please refer to the DAX® index option case study available on the Eurex PLP webpage.

Impact on Latency Arbitrage

The amount of adverse selection with regard to latency arbitrage is significantly reduced with PLP, i.e., market participants active in the order book suffer less from trades that only target outdated liquidity. As such, PLP has proven to be able to address the core issue of latency arbitrage. Empirical results already indicate a sharp decrease in the first days of trading when PLP is active, and this effect can still be measured after 3 months and 6 months. For this, Eurex applies various measures to identify latency arbitrage. This includes Eurex measuring volumes that are not executed in the order book due to the fact that the participant modified or deleted the respective passive offering within the deferral time shortly before an aggressive member was able to execute this order, i.e., the so-called Protected Volume. Protected Volume aggregates to up to 2–4% of the overall traded volume in the order book.

Protected volumes can be found with nearly all market participants that are active and competitive in the order book. Naturally, the largest share of protected volume can be attributed to passive liquidity providers who are constantly active at the most competitive price levels.

Eurex also evaluates the aggressive counterparties of Protected Volume, i.e., those who were not able to execute an order due to PLP. It is evident that client orders are barely involved on the aggressive side and are only rarely affected by the PLP deferral time. Instead, in more than 95% of the observed Protected Volumes, a professional liquidity taker was involved looking for a latency sensitive, temporal execution opportunity. Orderly trading is thus not negatively affected by PLP, while all aggressive liquidity takers can interact with resting liquidity when their investment decision is not only related to a latency sensitive, temporal execution opportunity. Clients only account for 0.1% of the protected volume, such that client price discovery is not negatively affected at all.

Before the implementation of PLP, several market participants raised concerns regarding whether liquidity providers might misuse the PLP induced deferral time to offer liquidity that cannot be executed against, since the offering participant would again remove the order or quote during the PLP deferral time. Eurex closely monitors the lifetime of orders that are resting in the order book and has not yet identified any systematic, adverse behaviour in the products where PLP is active. This finding is also confirmed by various market participants that are actively trading these products. Still, behaviour will be continuously monitored in order verify that market and trading integrity are not harmed by PLP.

For more details on how PLP affects latency arbitrage in DAX® index options, please see the DAX® index option case study available at the Eurex website.

Impact on Liquidity Picture

As passive market participants are better protected against adverse selection and latency arbitrage trades are prevented, it can be shown that competition in the order book has dramatically increased. Results indicate that smaller market participants in particular are willing to provide more competitive prices, either by joining to offer liquidity at the best price level which they did not consider before PLP activation, or by re-joining liquidity provision after they already left the order book. A significant share of the overall volume available in the order book thus moves closer to the best price level and strengthens the top of the order book, greatly improving order book integrity and resilience by making it less susceptible to price fluctuations.

With more market participants competing in the order book, prices become more competitive. Eurex observes that participants try to capitalize on the protection by offering better prices to increase the chance of being executed on their offerings.

The extent to which the offered bid-ask spreads tightens is related to the level of competition in the respective order book, i.e., the number of market participants that are active in the product and the potential of new market participants willing to join this competition at the best price level. Within DAX® index options, the best offered bid-ask spread tightened by an average of 18%, still measurable after 6 months compared to the time before PLP activation. For less liquid and less competitive products, Eurex observed smaller but still positive changes.

Eurex has also identified an increase in sizes available in the top of the order book after the introduction of PLP. With DAX® index options, the best offered tradable sizes increased by more than 30%, 6 months after the introduction of PLP. The size increase peaked at around 100% during the observation period. The extent of this effect largely depends on the extent of change in other liquidity parameters such as the quoted bid-ask spread. In case of a significant tightening of the bid-ask spread, market participants will be more hesitant to show the same sizes on the improved price level in order to maintain a steady market risk exposure. In case of a significantly tightened bid-ask spreads, additional offered sizes thus depend on the number of participants that join the new price level for or those that reconsider their market risk exposure. In case of marginal tightening of the bid-ask spread, the effect of increasing sizes available in the order book is much more pronounced.

For more details on how PLP affects the order book liquidity picture and competition in the order book in DAX® index options, please see the DAX® index option case study available on the Eurex PLP website.

Conclusions

With every change in established processes and trading dynamics, the question arises of whether the results obtained with the change can be considered sustainable and robust, or whether the results exceed the downsides of the changes due to increased complexity, invoked costs of change, or the disruption of established trading paradigms. After the successful introduction of PLP in the single stock options and index option areas, Eurex is more convinced than ever about the positive effects PLP offers to the market as a whole in terms of fairness and integrity.

In order to quantify the effects of PLP, Eurex has published a dedicated Case Study on the Eurex PLP website. On the results that were obtained up to 6 months after the introduction of PLP in the DAX® index options In addition, Eurex provides comprehensive insights into individual effects or performances for market participants on a regular basis, as well as disseminating the results at Eurex Working Committees.

Eurex continues to monitor the effects PLP has on trading in the order book, with a special interest in long-term effects such as changing execution statistics and the long-term attractiveness of order book trading. We are dedicated to a transparent and open discussion on this matter and look forward to further improving the PLP landscape at Eurex.

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