

PLP in the DAX[®] Index Option

Eurex Case Study

13 July 2021



Introduction

This presentation summarizes the results of the case study conducted in the light of the introduction of the Passive Liquidity Protection (PLP) into the DAX[®] Index Option (ODAX) product on August 24th, 2020 at Eurex. The results shown here indicate the positive effects PLP has on latency arbitrage, trading, liquidity provision and stimulating diversity and competition in the market.

This presentation is structured as follows:

- 1. Motivation: What is the problem and what to we want to achieve?**
- 2. Case Study ODAX - What did we achieve in the DAX[®] Index Option?**
- 3. Concluding remarks and further information**

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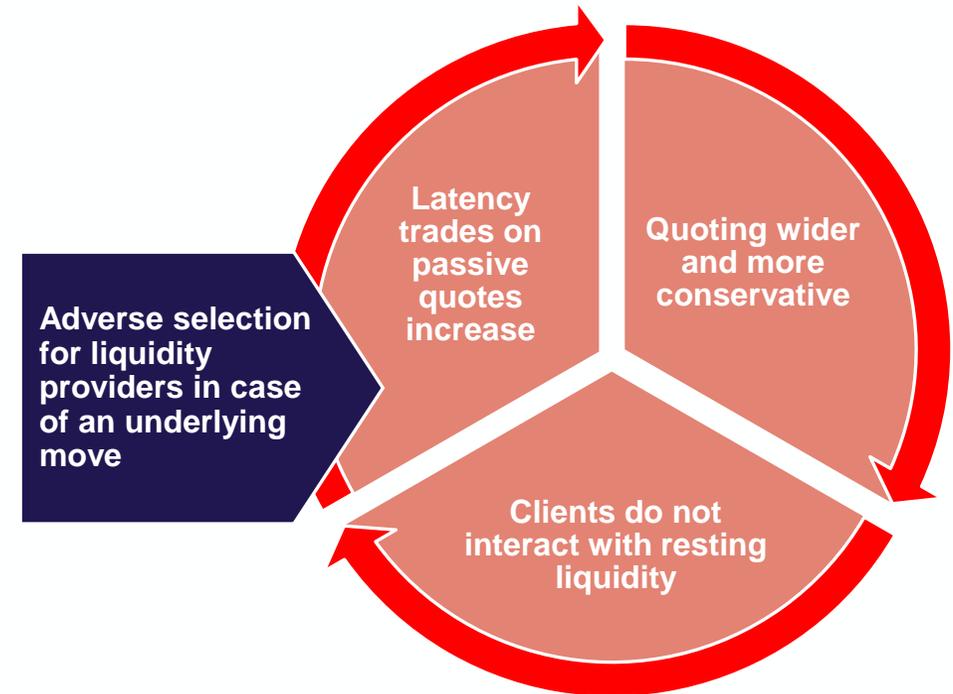
Motivation:

What is the problem and what to we want to achieve?

Problem: latency arbitrage is constraining liquidity provision in options trading

Motivation

- In a latency sensitive trading environment, providing passive liquidity in the order book is becoming less attractive as market participants need to act fast to avoid being hit if the underlying price moves
- On the other side, the number of attractive client trades on the quote is limited as clients tend to place their order within the order book spread instead of hitting the passive quote
- This triggers a vicious circle where many liquidity providers avoid pricing competition and order book quality decreases

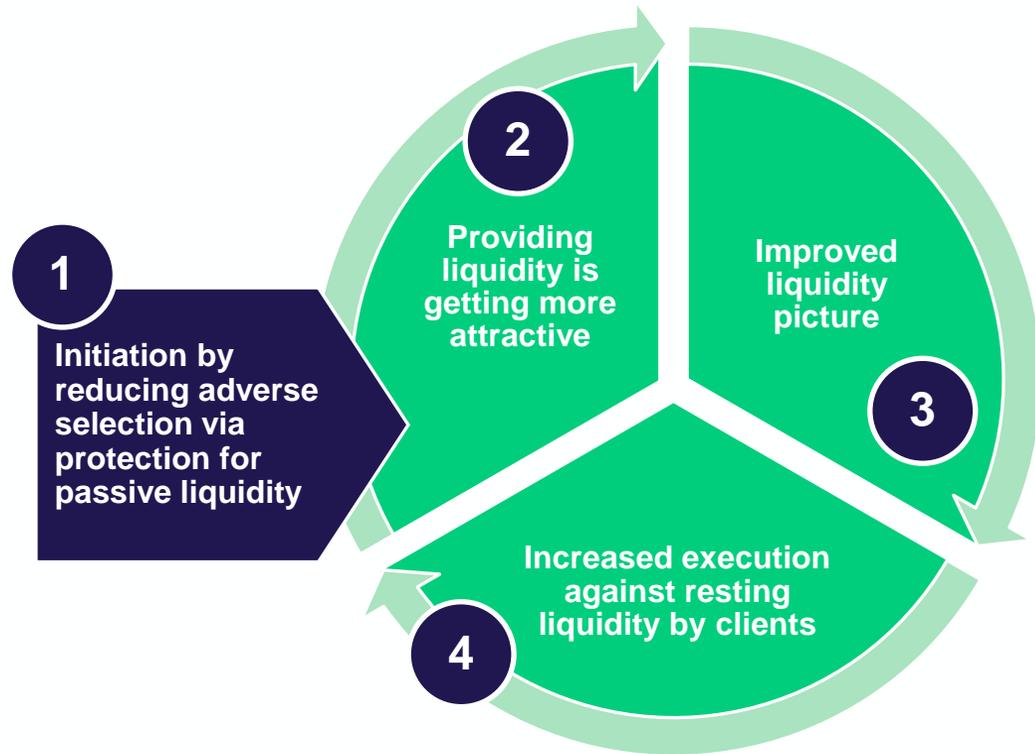


Objective

- Enable market participants to show their true pricing and quoting capabilities by mitigating the risk of latency arbitrage
- Solution should not foresee any special treatment of a particular participant group, no changes to technical protocol and impact on non-latency sensitive participants should be very small

Solution: PLP can stop this vicious circle and re-initiate passive competition

PLP in a nutshell



How does PLP affect trading?

- 1 PLP provides a uniform latency differentiation to all passive orders and quotes in the order book that can be utilized to react on transparent market signals before being executed
- 2 As a consequence, the number of adverse trades for passive liquidity providers will decrease which will make liquidity provision more attractive
- 3 Competition in liquidity provision will increase and thus the order book liquidity picture available to all participants will improve
- 4 With more clients executing on the improved order book liquidity, passive liquidity provision will become further attractive

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Case Study ODAX

What did we achieve in the DAX[®] Index Option?

Status quo and setup – PLP in the DAX[®] Index Option

Facts about the DAX[®] Index Option

- The DAX[®] Index Option is one of Eurex's flagship products, referencing the broadly established German blue chip stock market index DAX[®], one of the most well-known German market indicators
- With approximately 24 million contracts traded in 2020 and more than 120 active trading participants, the DAX[®] Index Option is of significant relevance for many investors

Case study setup

- On August 24th, 2020, PLP was introduced to the DAX[®] Index Option with a deferral time of 1.5 milliseconds – i.e., all aggressive orders are delayed by 1.5 milliseconds before they can interact with orders and quotes in the order book – passive orders and quotes are not delayed.
- Eurex observed and continues to observe market quality indicators prior and after the introduction of PLP, specifically, 3 months prior to the launch of PLP (Pre-PLP – since May) as well as 3 months after the launch of PLP (3mPost-PLP – till November) and 6 months after the launch of PLP (6mPost-PLP – till February)
- Results are compared to identical market quality indicators of a control product that does not have PLP activated, the EURO STOXX 50[®] Index Option, in order to control for seasonal, volatility or macroeconomic changes not related to the PLP introduction

PLP effects on latency arbitrage

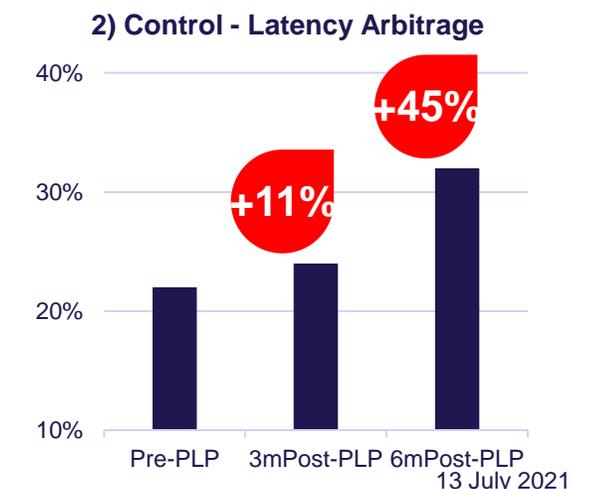
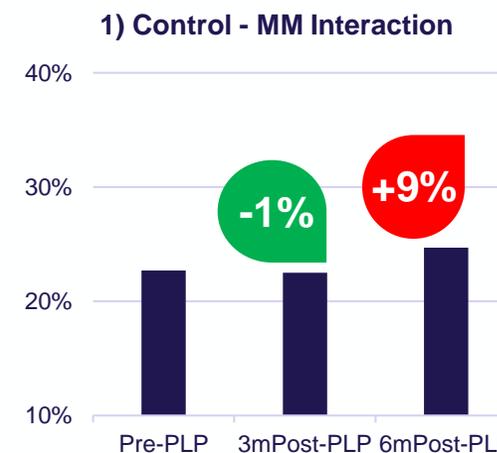
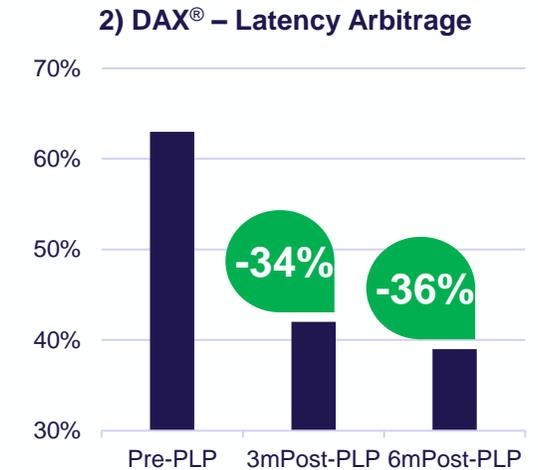
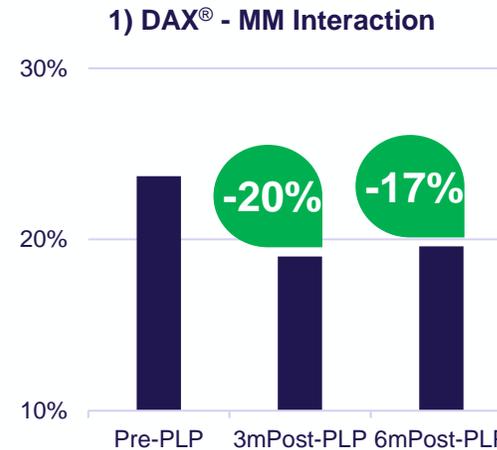


Measuring latency arbitrage

- Eurex examines two distinct performance measures in order to determine the level of latency arbitrage
 - Amount of market maker interaction, i.e., the share of overall executed volumes trades between professional liquidity providers (MM interaction)
 - Share of overall market maker interaction, where the passive liquidity provider tried to withdraw from trading but was executed beforehand (Latency Arbitrage)

Effects on latency arbitrage

- The DAX[®] Index Option saw a significant decrease in both measures, which continues to be observable after 6 months. In the same observation period, the control saw a steady increase in both latency arbitrage measures



Protected Volumes link PLP and latency arbitrage reduction



Measuring Protected Volumes

- Protected Volumes are defined as non-executed orders, where the passive counterparty was able to update or remove the passive order before execution only due to the PLP deferral time
- Protected Volumes are only observable for products with PLP, and thus cannot be compared to the control
- Protected Volumes causally link PLP to the reduction in latency arbitrage as it shows the origin of the non-executed orders
- After 3 and 6 months, the overwhelming majority of non-executed orders are found between professional liquidity takers and liquidity providers
- Client trading is not affected by PLP, no shadow or ghost liquidity is hindering client interaction with other trading participants

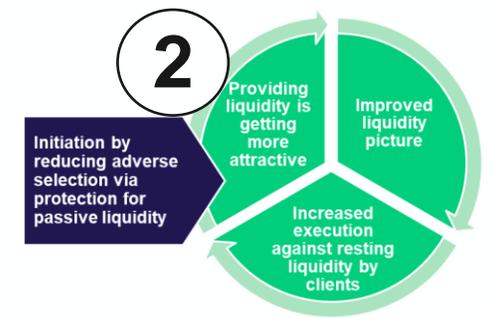
3m – Post PLP

		Passive Counterparty			
		Agent	Market Making	Proprietary	Total
Aggressive Counterparty	Agent	0%	0%	0%	0%
	Market Making	1%	82%	12%	95%
	Proprietary	0%	3%	2%	5%
	Total	1%	85%	14%	100%

6m – Post PLP

		Passive Counterparty			
		Agent	Market Making	Proprietary	Total
Aggressive Counterparty	Agent	0%	0%	0%	0%
	Market Making	1%	83%	12%	96%
	Proprietary	0%	3%	1%	4%
	Total	1%	86%	13%	100%

PLP effects on order book competition



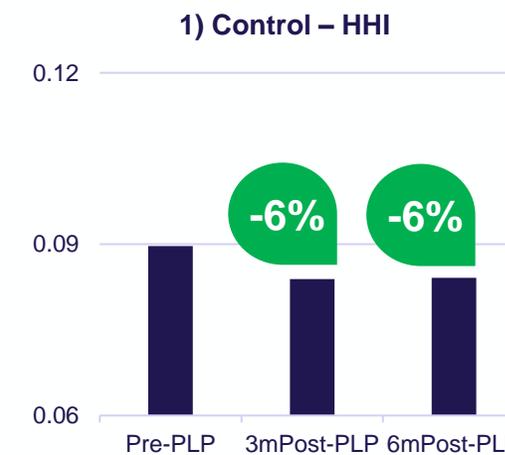
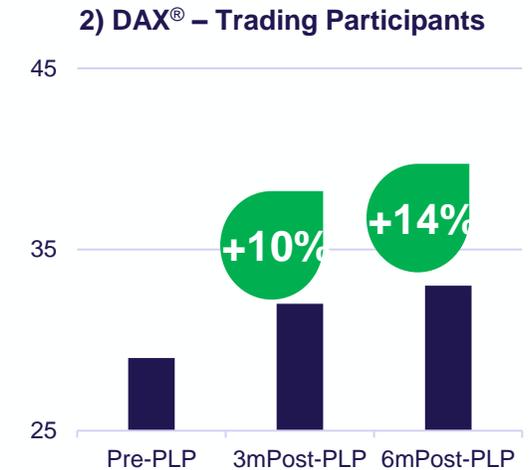
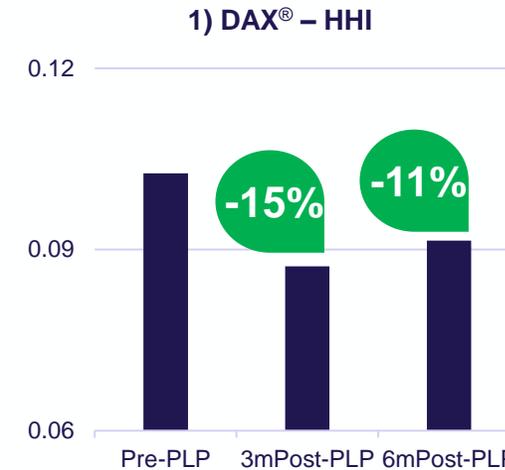
Measuring competition

- 1) Eurex measures the Herfindahl Index based on the traded order book volumes (HHI). A Herfindahl Index of 1 indicates a monopoly, decreasing HHI indicates an increase in market competition.
- 2) To measure competition on top of the order book, the median number of trading participants continuously active on the best price level over a month is counted (Trading Participants)

Effects on competition

- The introduction of PLP induced significant competition as additional trading participants joined trading the order book in ODAX. The number of participants at the best price level also increased. In comparison, the control saw only minor improvements in both measures during the observation period

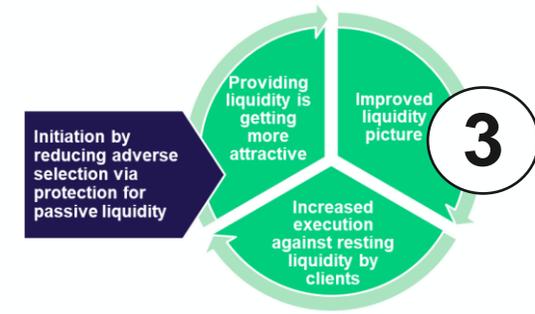
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PLP effects on the liquidity picture

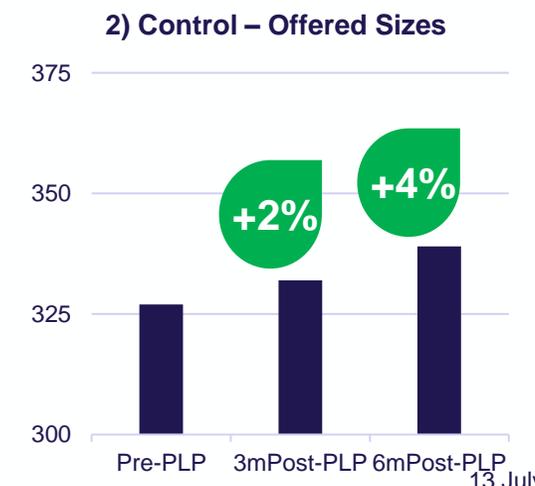
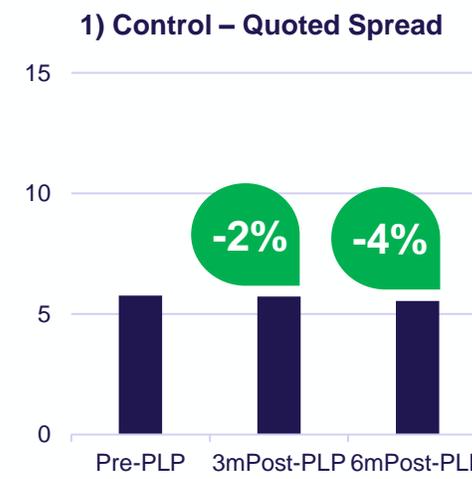
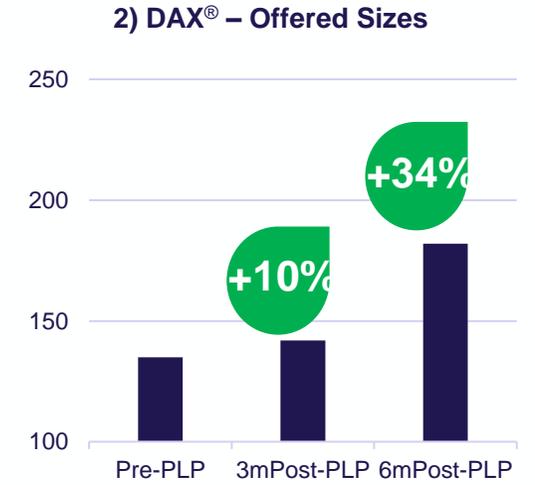
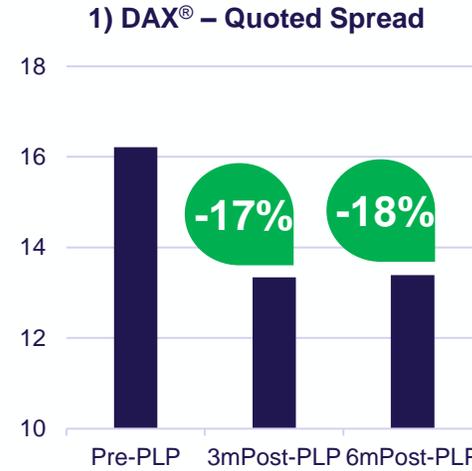


Measuring the liquidity picture

- Eurex uses several metrics to measure liquidity, two measurements are considered in this assessment:
 - Quoted Bid-Ask spread in index points on a daily basis, averaged over all instruments (Quoted Spread)
 - Median offered sizes on bid and ask side on a daily basis, averaged over all instruments traded (Offered Sizes)

Effects on the liquidity picture

- On the first date of activation, quoted spreads in the DAX[®] Index Option already improved significantly, so did offered sizes. In comparison, the control saw only minor improvements in the liquidity picture during the observation period



PLP effects on Client Executions and Client Aggressiveness



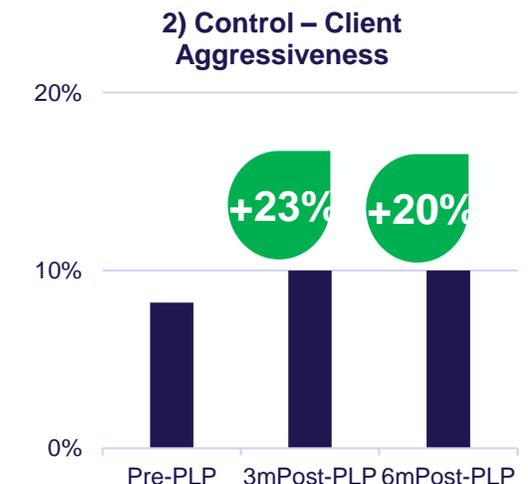
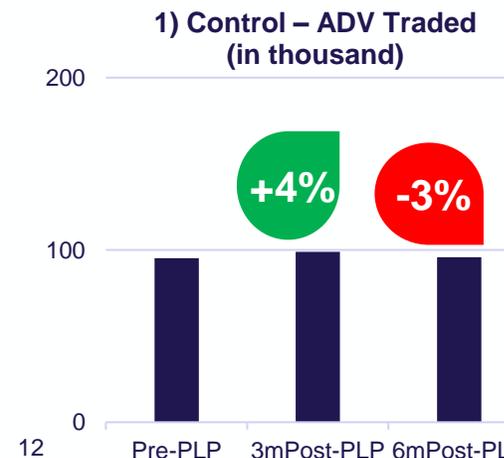
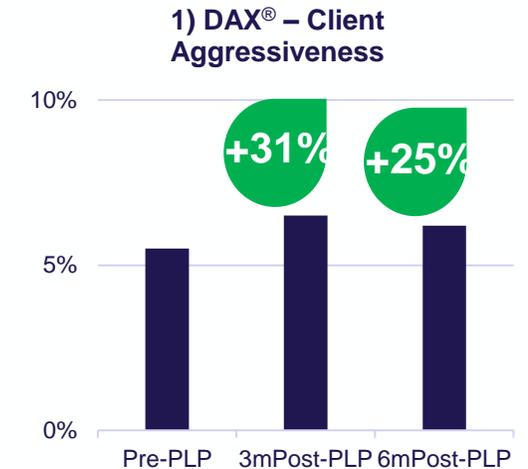
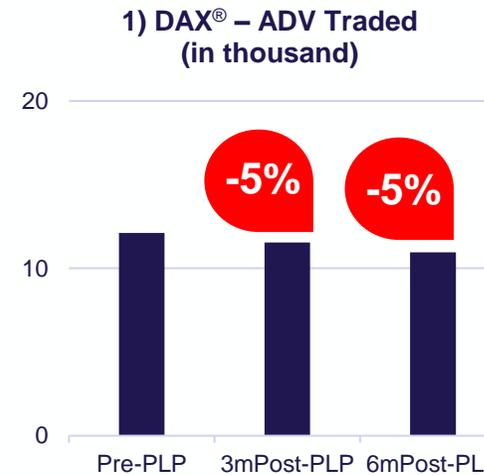
Measuring Executed Volumes and Client Aggressiveness

Eurex relies on two distinct measurements:

- 1) The average daily volumes (ADV) executed by clients in the order book per product (ADV Traded)
- 2) The overall share of aggressively executed client volumes against resting liquidity in the order book (Client Aggressiveness)

Effects on Executed Volumes and Client Aggressiveness

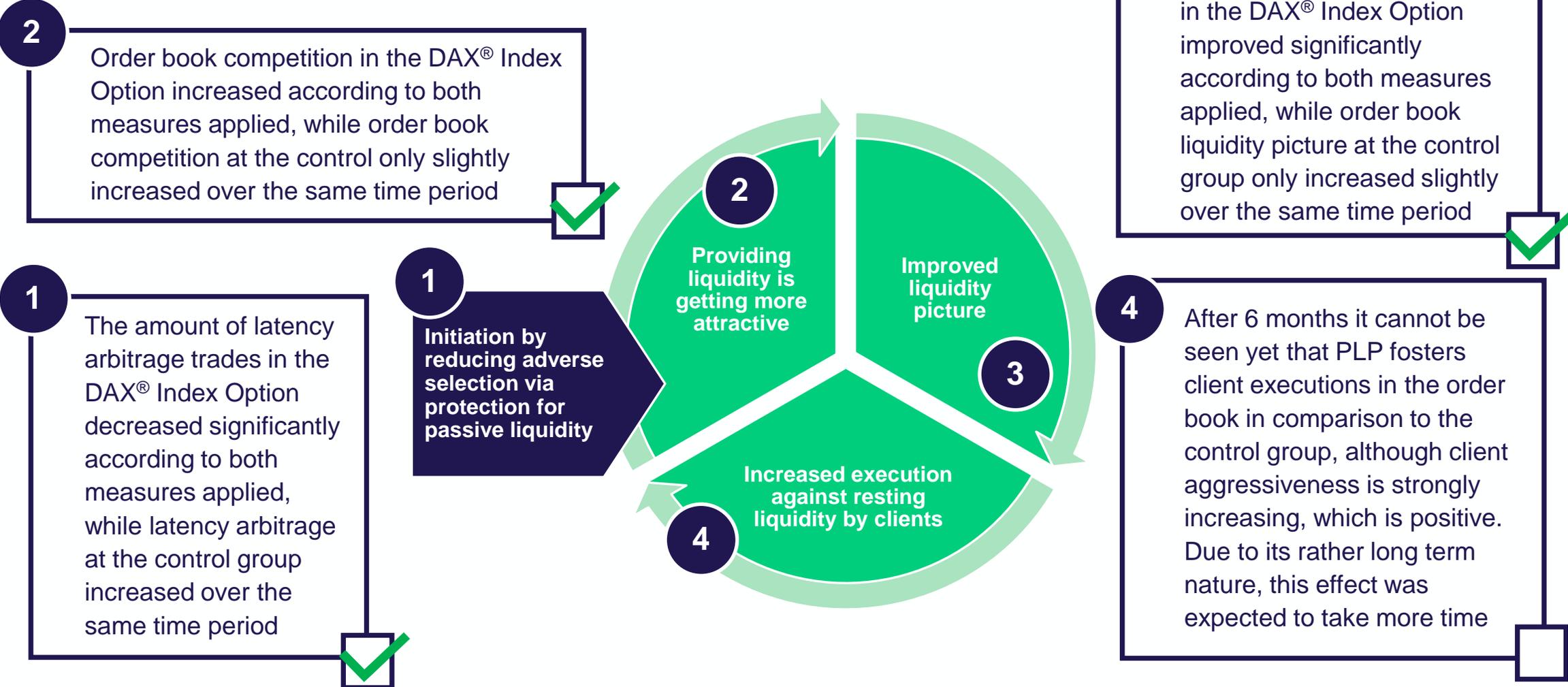
- Client ADVs declined in the DAX[®] Index Option. Compared to the control, a difference in development is only observable after 3 months, after 6 months both products share the same development.
- Concerning client aggressiveness, the DAX[®] Index Option shows a stronger increase after 3 months, this difference reduces slightly after 6 months



3 Conclusions & Outlook

Where do we want to go?

Conclusions



Thank you!

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