

Research Report

Enhancing Market Liquidity through Liquidity Provider Incentives

AGAINST THE BACKGROUND OF FRAGMENTED EUROPEAN EQUITIES TRADING, MARKET OPERATORS HAVE EMPLOYED DIFFERENT STRATEGIES TO INCREASE LIQUIDITY ON THEIR MARKET RELATIVE TO OTHER TRADING VENUES. ONE OF THESE STRATEGIES IS TO INCENTIVIZE LIQUIDITY PROVIDERS VIA FEE REBATES. THIS ARTICLE PRESENTS AN EMPIRICAL INVESTIGATION OF THE INTRODUCTION OF THE XETRA LIQUIDITY PROVIDER PROGRAM AT DEUTSCHE BÖRSE AND ITS IMPACT ON LIQUIDITY AND TRADING VOLUME ON THE INTRODUCING MARKET ITSELF AND ON THE CONSOLIDATED EUROPEAN MARKET.

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Introduction

Due to the increased fragmentation of securities markets after the introduction of the Markets in Financial Instruments Directive (MiFID II) in Europe, incumbent exchanges and alternative venues intensively compete for investors' order flow. Therefore, market operators implemented specific fee schedules and rebate schemes. By these, market participants are incentivized to increase liquidity, which thereby lowers implicit transaction costs and thus total transaction costs.

On October 4th, 2016, Deutsche Börse introduced an incentive program on its electronic trading platform Xetra offering fee rebates for liquidity

providers. Specifically, participating market makers are rewarded a 100% fee rebate for passively executed orders and quotes in DAX30 instruments if they fulfill certain obligations concerning quoted volume and presence time at the best bid and ask. The Xetra Liquidity Provider (XLP) Program originally started as a pilot but was transferred into a regular pricing scheme immediately after the end of the pilot on March 31st, 2017. The goal of the XLP Program is to enhance liquidity on Xetra and thus to attract more trading volume due to decreased transaction costs for market participants.

The introduction of the XLP Program on Xetra serves as a quasi-natural experiment to analyze

the behavior of market makers and market participants in terms of liquidity provision and trading. We also investigate how single-market liquidity provider incentives influence liquidity and trading volumes both on the single market itself and on the consolidated European market as a whole. On the one hand, this analysis is relevant from the perspective of a market operator in order to assess whether the introduction of liquidity provider incentives is successful in increasing the venue's trading volume and market share. On the other hand, the analysis of a single-market liquidity provider program is also highly important from the perspective of market participants caring about aggregate market liquidity of a stock available on different venues. Higher aggregate liquidity supply in fragmented markets lowers costs, might attract additional trading volume, and reduces the cost of capital for issuers.

Fee Schedules Aimed at Increasing Liquidity and Trading Volume

In particular, our analysis is related to the empirical findings by Dosanjh (2013), who shows that liquidity significantly improved after the introduction of market maker incentives on the Australian ETF market. Moreover, our analysis contributes to research streams which analyze the effects of specific fee schedules and other means to improve market liquidity: Foucault et al. (2013) as well as Malinova and Park (2015) investigate the effect of maker/taker pricing that is predominantly implemented by new alternative venues to attract liquidity in the fragmented market environment. Another stream of research analyzes the

so-called "payment for order flow", in which venues and market makers award brokers with cash payments in order to receive uninformed retail order flow (Battalio et al., 2001; Parlour and Rajan, 2003).

The Xetra Liquidity Provider Program

The goal of the XLP Program is to incentivize liquidity provision at the visible best bid and offer in continuous trading of DAX30 instruments on Xetra. The pilot phase, which was announced on August 22nd, 2016, started on October 4th, 2016 (Deutsche Börse Group, 2016). Liquidity providers who want to participate in the program have to sign an additional contract with Deutsche Börse. For each full month of participation, Deutsche Börse will grant a 100% fee rebate for passively executed orders and quotes in DAX30 instruments.

In order to qualify for the fee rebates, market participants have to fulfill two monthly requirements: First, the registered liquidity providers have to place orders at the visible best bid and offer with at least EUR 5,000 minimum volume per side with a presence time of at least 20% during continuous trading. The presence time is averaged over bid and offer of all DAX30 instruments. Second, liquidity providers have to account for at least 1% of total passively executed volume in DAX30 instruments.

Empirical Investigation

For the empirical investigations, we use Thomson Reuters Tick History (TRTH) high-frequency trade and order book information.

Since the XLP Program is applied for DAX30 instruments only, the constituents of this index traded on Xetra are the main subject of interest. To derive robust results on the effects of the liquidity provider incentives, we consider different observation windows up to 100 trading days before and after the start of the XLP Program. Therefore, our observation period lasts from May 13th, 2016, to February 21st, 2017.

In order to analyze the effects of the XLP Program on liquidity and trading volume on Xetra as well as on the aggregate liquidity and trading volume in the fragmented market environment for trading DAX30 instruments in Europe, we apply a difference-in-differences (DiD) approach to exclude possible confounding effects. In our case, the treatment is the introduction of the XLP Program on Xetra. For the control group, we rely on the highly correlated stocks of the French CAC40 index not being subject to changes in the fee schedule during our observation period. For each

constituent of the DAX30 and the CAC40, we construct a synthetic consolidated order book, in which we merge all information from the main market and the alternative venues Bats, Chi-X, and Turquoise on a tick-by-tick basis.

Effects on the Main Market Xetra

Table 1 reports the changes in liquidity and turnover on Xetra relative to the Euronext control group after the introduction of the XLP program. All liquidity measures, i.e., relative spread, order book depth (Depth(10)), and volume on the top (i.e., the first level) of the order book (L1-Volume), on Xetra significantly improve due to the liquidity provider program. However, no relevant positive effect on turnover can be observed.

This result is also supported by a DiD regression showing that relative spreads on Xetra decreased significantly after the introduction of the liquidity provider program even when controlling for possible confounding effects via

the control group (trading in CAC40 stocks on Euronext). By investigating different subsamples of ten, 50, and 100 trading days, we observe an increasing magnitude from ten to 100 days for this effect. For longer observation windows, our results suggest that liquidity providers at least partially pass over savings in transaction fees to market participants in the form of tighter spreads. The competition between liquidity providers is further enhanced by the obligation of 20% presence time at the best bid and ask. Dividing the observed stocks in three equally sized subsamples with respect to market capitalization and price level, the decrease in spreads is robust across all six groups. However, the DiD coefficient is only significant for those DAX30 stocks with medium and small market capitalization or price level, respectively. A possible explanation for this observation could be the fact that competition between market makers is already very high for the most liquid stocks with high market capitalization so that the fee rebates

do not significantly decrease spreads even further. Moreover, many high market cap stocks already trade at their minimum tick sizes leaving less room for further improvement.

Besides improvements in relative spreads, the XLP Program also aims at increasing volumes at the top of the order book. This is also shown by our results since both the order book depth measured by Depth(10) as well as the euro volume on the top of the order book (L1-Volume) increase as suggested by positive DiD coefficients, which are robust across all observation windows and subsamples. The rationale behind the increase in order book depth and L1-Volume is that liquidity providers need to fulfill minimum volume requirements of EUR 5,000 in order to qualify for the fee rebates. Moreover, minimum presence time at the top of the book incentivizes liquidity providers to provide liquidity at the first order book level and to shift volumes on deeper order book levels to the top more often.

		Pre	Post	% Change	DiD
Turnover	Xetra	72.20	78.50	8.72%	1.28%
	Euronext	54.93	59.02	7.44%	
Relative Spread	Xetra	4.93	4.39	-10.93%	-8.09%
	Euronext	4.19	4.07	-2.85%	
Depth (10)	Xetra	1.08	1.25	16.07%	13.29%
	Euronext	0.83	0.86	2.78%	
L1-Volume	Xetra	0.10	0.13	28.80%	16.63%
	Euronext	0.09	0.11	12.17%	

Table 1: Changes in Liquidity and Turnover on the Main Venue Compared to the Control Group

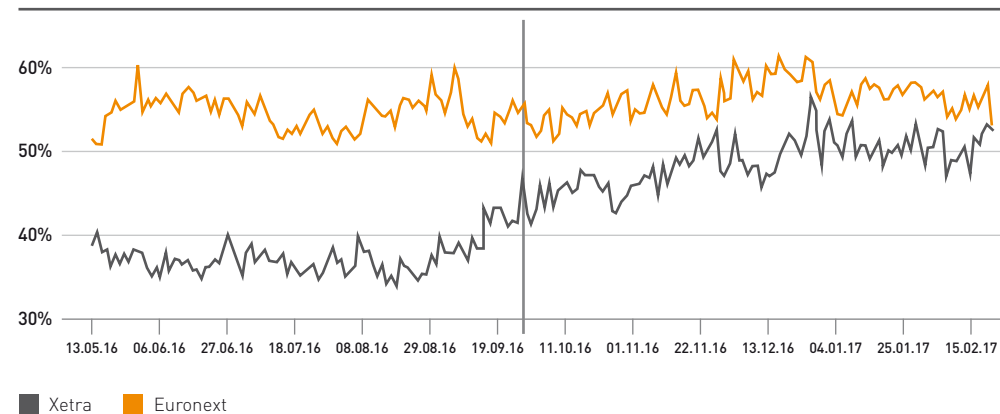


Figure 1: Contributions of the Main Market to Consolidated L1-Volume (in %)

As the analysis has shown, the XLP Program was successful in increasing liquidity on the main market Xetra along different dimensions. Consequently, the market might gain additional order flow resulting in higher trading volumes.

Effects on the Aggregate Market

The picture of the contributions of the single market to the consolidated market supports the success of the XLP Program further. As depicted in Figure 1, the contribution of Xetra to the aggregate volume at the European best bid and offer (L1-Volume) has improved after the liquidity provider program. However, while we can observe positive effects for the market introducing the liquidity provider program, the descriptive results depicted in Table 2 show a less positive effect for turnover and liquidity measures in the fragmented market as a whole. In contrast to the main market (see Table 1), the descriptive results in Table 2 show

that turnover in the aggregate market rather decreases. Yet, the results of the DiD regression show no significant effect for turnover, indicating that the main market gains market share at the expense of other markets trading the same instrument. In addition, we do not find a relevant increase in aggregate liquidity. Despite the positive effects shown by the descriptive analysis, the results of the DiD regression are insignificant for relative spread, Depth(10), and L1-Volume for most observation periods and subsamples.

Since there is no incentive to provide tighter spreads on the alternative venues, the effect of the main market is too weak to result in a significant change in the consolidated market. Consequently, gains of Xetra, on which the liquidity provider program is implemented, are largely at the expense of competing alternative venues. In summary, the analysis of the consolidated market perspective reveals that

there is no benefit of a single-market liquidity provider program for the consolidated European securities market.

Conclusion

Our results show strong support for the effectiveness of liquidity provider incentives for the market that introduces them. This is especially relevant for stocks beyond the most-liquid stocks. However, no gains for aggregate liquidity and turnover can be observed. In the consolidated market, rather than increasing aggregate liquidity due to lower transaction costs, market participants seem to redistribute liquidity provision and trading activity to the market offering fee rebates. Consequently, a single-market liquidity provider program, which only links the incentive to quality parameters on that market, increases the respective market's liquidity and market share at the expense of competing venues. While it leads to welfare gains for market participants that solely have access to the respective market, e.g., customers of retail brokers, it does not lead to welfare gains for market participants that have full access to the fragmented market environment. Therefore, linking incentives to quality parameters referring to the consolidated market, i.e., an incentive for quotation at the consolidated spread (European best bid and offer), likely will not only grow the market share of the incentivizing market but also in parallel increase aggregate liquidity and turnover in the fragmented market as a whole.

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		Pre	Post	% Change	DiD
Turnover	DAX30	138.22	132.99	-3.79%	-9.37%
	CAC40	96.47	101.86	5.59%	
Relative Spread	DAX30	3.54	3.40	-3.96%	-2.13%
	CAC40	3.25	3.19	-1.83%	
Depth (10)	DAX30	1.84	1.97	6.87%	7.37%
	CAC40	1.35	1.35	-0.50%	
L1-Volume	DAX30	0.16	0.19	17.71%	4.26%
	CAC40	0.12	0.14	13.44%	

Table 2: Changes in Liquidity and Turnover in the Consolidated Market