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XETRA

MARKET IMPACT OF LARGE ETF ORDERS

White paper



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MARKET IMPACT OF LARGE ETF ORDERS AT XETRA

The global exchange-traded funds (ETFs) space is one of the fastest-growing segments of the financial markets over the last 20 years with the number of funds growing from about 290 funds in 2003 to over 10,000 as of September 2023. The simplicity of gaining exposure to an index or an active strategy through a single trade that is just like buying or selling shares in a company plus the low management fees charged by ETF managers have both greatly contributed to the popularity of these products.

However, with rapid growth come challenges and in the ETF space one key consideration for investors is liquidity. Specifically, liquidity for large transactions or liquidity for funds with lower assets under management. As an early leader in the ETF space, Deutsche Börse's trading venue Xetra® has been the primary venue for listing ETFs in Europe. The exchange has also launched dedicated market making programmes to ensure that ETFs listed on Xetra have a high level of liquidity, allowing investors to move in and out of funds with little market impact. These programmes were designed to take advantage of the unique liquidity profile of ETFs, which allows market makers to source additional liquidity from the underlying market through the product's inherent creation/redemption mechanism.

ETF liquidity providers

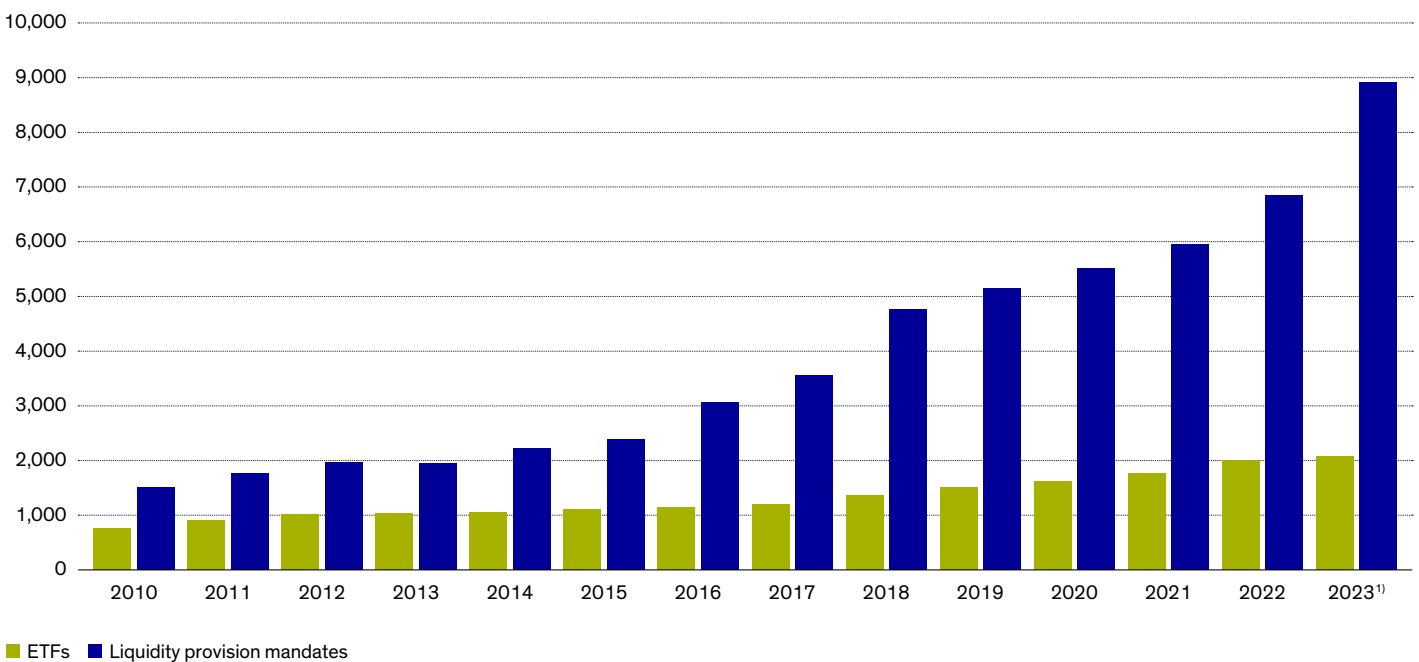
There are two general types of liquidity providers making markets for ETFs on Xetra, Designated Sponsors and Regulated Market Makers. A Designated Sponsor is a market maker who has an obligation to post quotes for their assigned funds. Quoting obligations for a Designated Sponsor include a minimum quoting participation rate of 90 per cent of the time. A Regulated Market Maker also has quoting obligations, but they are not as stringent as the rules for the Designated Sponsor. For example, a Regulated Market Maker is expected to quote markets they are participating in at least 50 per cent of the time.

ETF and liquidity provision trends

The chart in Figure 1 shows the number of ETFs listed on Xetra, plus the number of liquidity provision mandates by year, with 2023 representing figures at the end of September 2023. Liquidity provision mandates consist of both Regulated Market Makers and Designated Sponsors.

ETFs listed on Xetra and liquidity provision mandates by year

Figure 1



Data source: Xetra

1) Data including September 2023

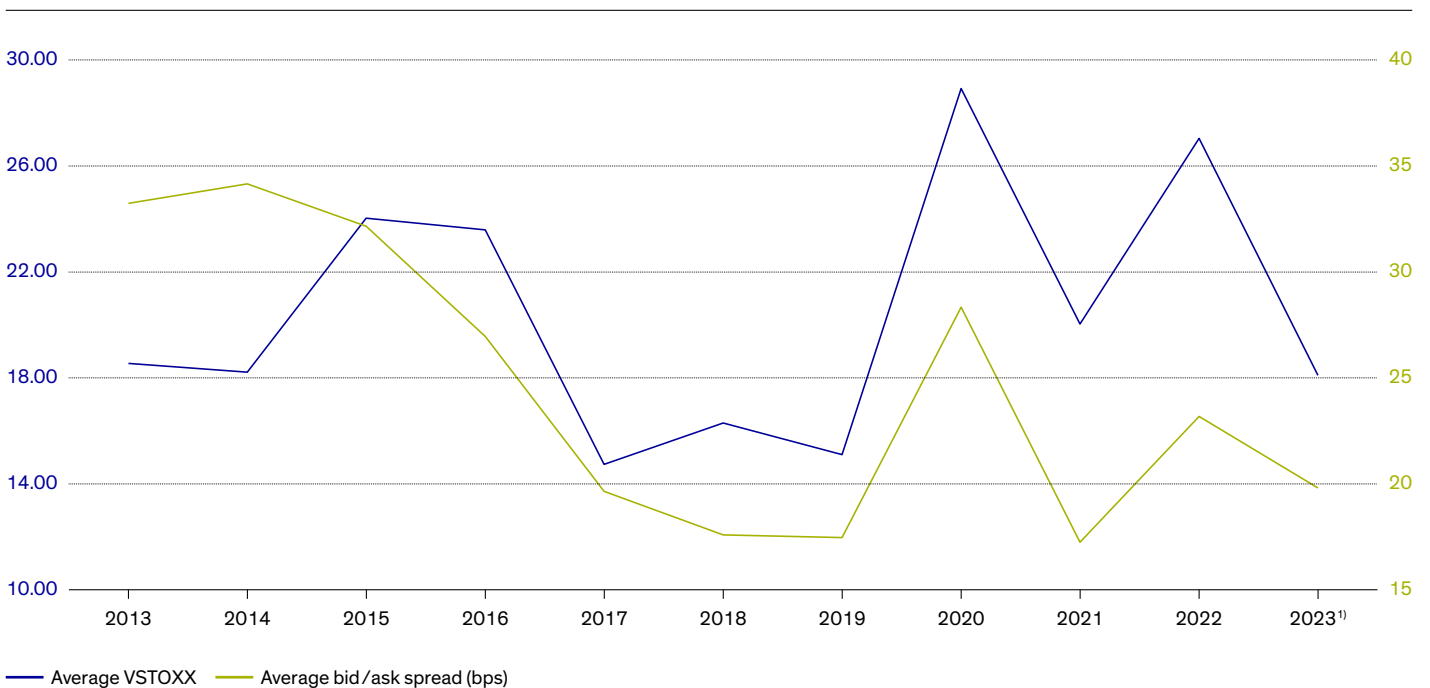
At the end of 2010, the number of ETFs listed stood at 761. That figure has almost tripled over the last thirteen years to just under 2,100 ETFs. Over the same period, the number of liquidity provision mandates has jumped from just over 1,500 to just shy of 9,000 as of September 2023. Finally, note that, even in 2020 and 2022, years with excess volatility, the number of liquidity provision mandates increased on a year-over-year basis.

Liquidity when it is needed

During normal trading periods, liquidity is often an afterthought. However, liquidity can become particularly important when the financial markets are volatile, and participants are seeking to execute trades. The EURO STOXX 50® Volatility Index (VSTOXX®) is a measure of 30-day expected volatility in European equities. Expressed in percentage points, VSTOXX is also a good guide to explore liquidity in low and high volatility markets. Figure 2 shows the average VSTOXX value by year, including the first nine months of 2023, along with the annual average bid-ask spread for exchange traded funds over the same period.

Average VSTOXX and ETF bid-ask spread by year

Figure 2



Data source: Bloomberg

1) Data including September 2023

The average bid-ask spread (green line) on the chart represents about a quarter of the ETFs available for trading, but those that have been listed on Xetra since the first day of 2013. The blue line, showing the average close for VSTOXX by year, reached elevated levels in 2020 and 2022. Note, despite the higher volatility for those two years, the average bid-ask spread continues to trend lower. For example, in 2022 VSTOXX averaged just over 27 percentage points while the average exchange traded product bid-ask spread was 23 basis points. In earlier time periods, the bid-ask spread was wider, despite lower expected market volatility. This clearly shows that liquidity in ETFs on Xetra has continued to increase over the past few years.

The previous chart depicts the average bid-ask spread for ETFs that have been listed on Xetra since 2013. Newer funds may trade less frequently than the funds with over a decade of history. However, every ETF has at least one Designated Sponsor and 75 per cent of ETFs have at least two. This ensures market liquidity for both actively traded funds and those that experience less turnover.



Large trading examples

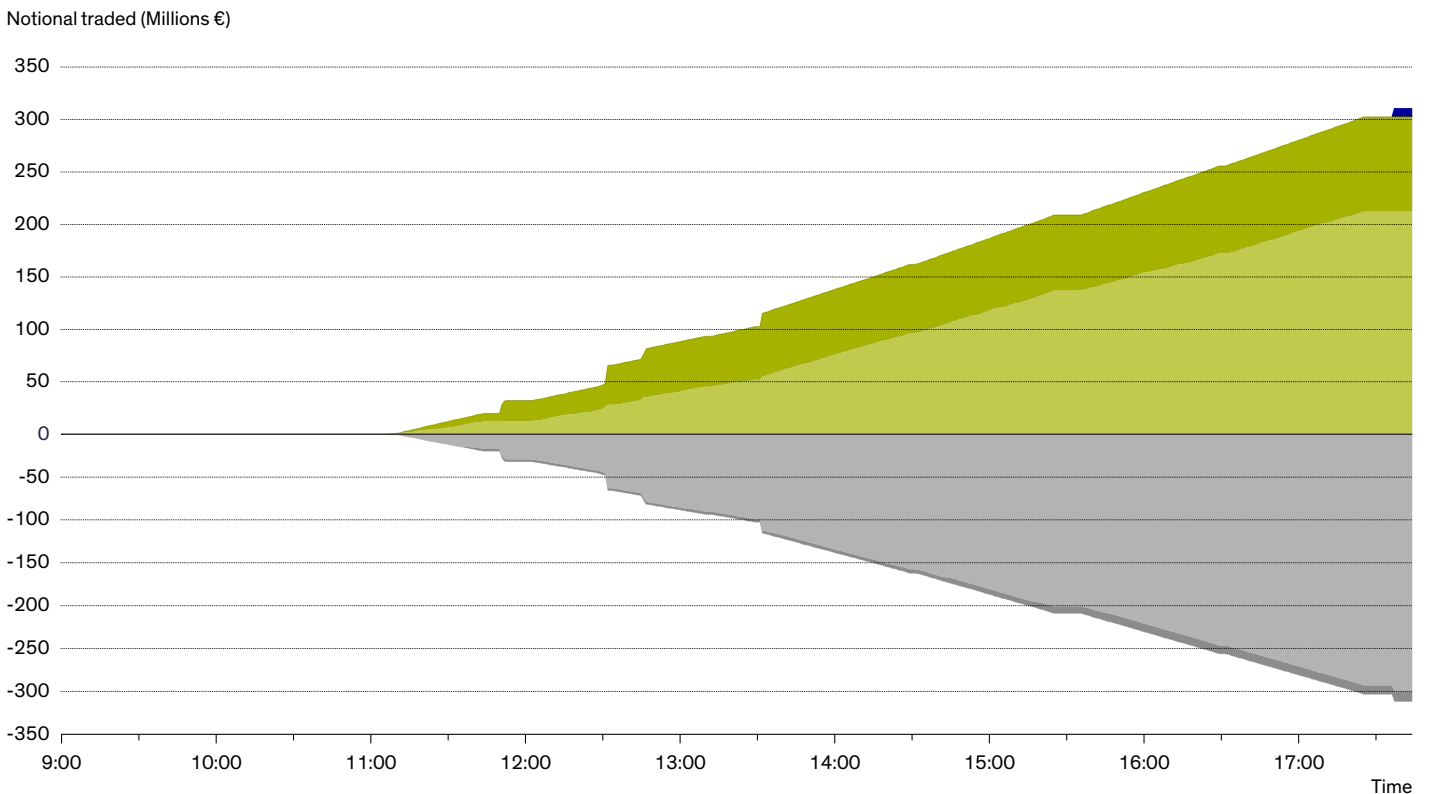
The following three examples of large ETF trades and the subsequent market activity demonstrate how the market making programmes designed by Xetra support liquidity provision in real time. Each of these trades involves executions of a single entity exceeding €100 million notional with at least 90 per cent of the volume on either the bid or ask side indicating a large buy or sell. For each trade, a graphical breakdown of the entities taking the other side of the large trade along with how aggressively the large trader is buying or selling the ETF is shown. Also, we explore the price behaviour of each ETF over the time that the large trader is buying or selling their position. Finally, we analyse the bid-ask spread relative to days where there is not a large buyer or seller in the marketplace.

Example 1: EURO STOXX

The first example to demonstrate how a large trade was able to be executed while not impacting market liquidity is 16 December 2022 in a EURO STOXX UCITS ETF (DE000A0D8Q07 - SXXEEX GY). This was a purchase with about 68 per cent of the trade aggressively executed by the buyer and about 3 per cent traded in the closing auction, meaning that at least 29 per cent of the trade received a price improvement over the prevailing best offer prices of the ETF. The large trade was executed via an algorithm by splitting it into smaller limit orders with limit prices set close to the ETF’s best offer price at the time of order entry. Figure 3 breaks down the nature of each execution as either aggressive, passive, or part of the closing auction. The bottom half of Figure 3 highlights the type of market participants that were on the other side of this large buyer.

Execution breakdown

Figure 3



Type of execution: ■ Aggressive 68.20% ■ Passive 29.08% ■ Closing auction 2.72%
 Volume by type of counterparty¹⁾: ■ Market maker 96.18% ■ Investment bank 3.73% ■ High frequency trader 0.06% ■ Proprietary trader 0.02%

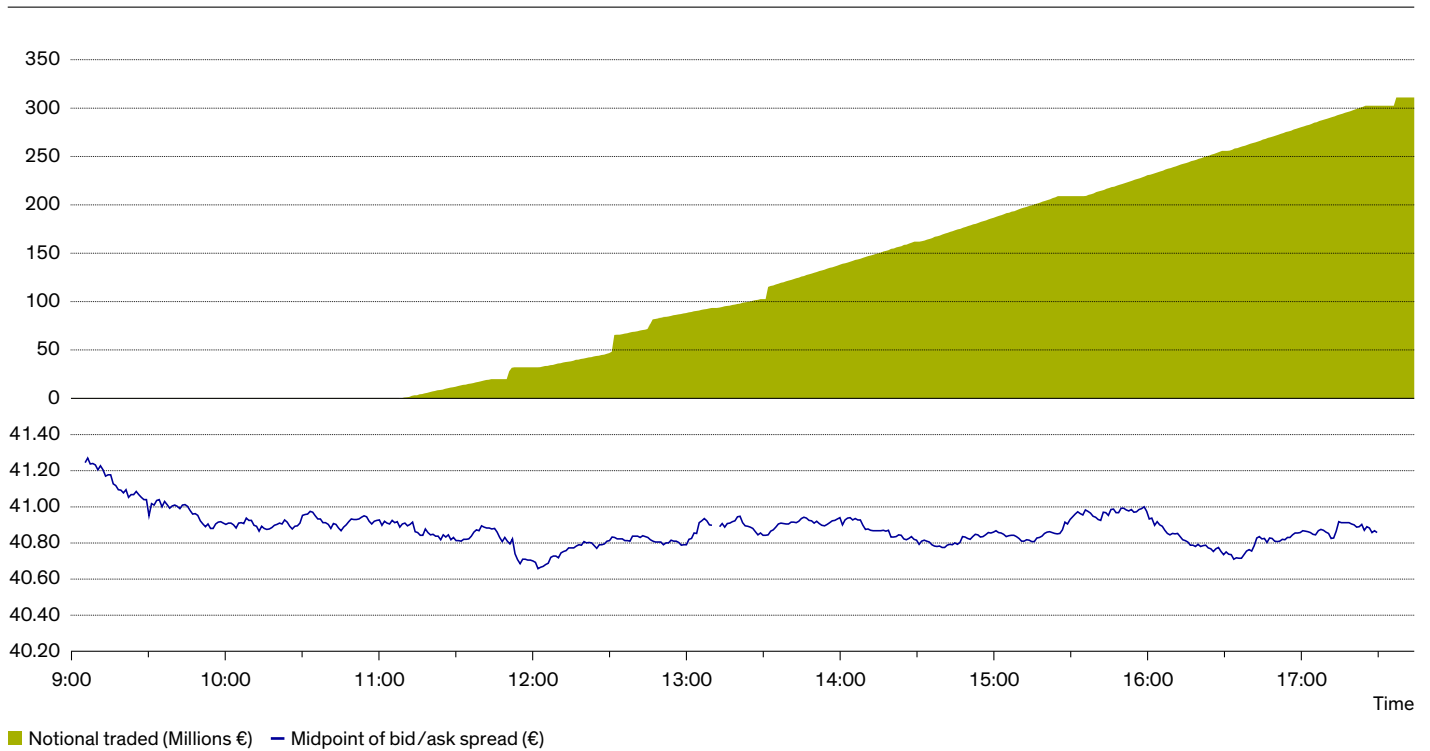
Data source: Xetra
 1) Values do not add to 100% due to rounding.

This first large transaction was mostly facilitated by market makers with over 96 per cent of the volume. Of the small portion not executed by market makers, most of that volume was attributed to investment banks.

The second look at this large ETF purchase highlights the price of the fund before the large buyer started accumulating shares and during their accumulation of a position topping €300 million.

Price activity before and during executions

Figure 4



Data source: Xetra

About one third of the trading day passed before this trader started accumulating shares of SXXEEX GY. The first execution occurred at about €41.00. Notice the price, which is depicted by the midpoint of the bid-ask spread, does not signal any price spikes. This despite a large buyer consistently purchasing shares for several hours.

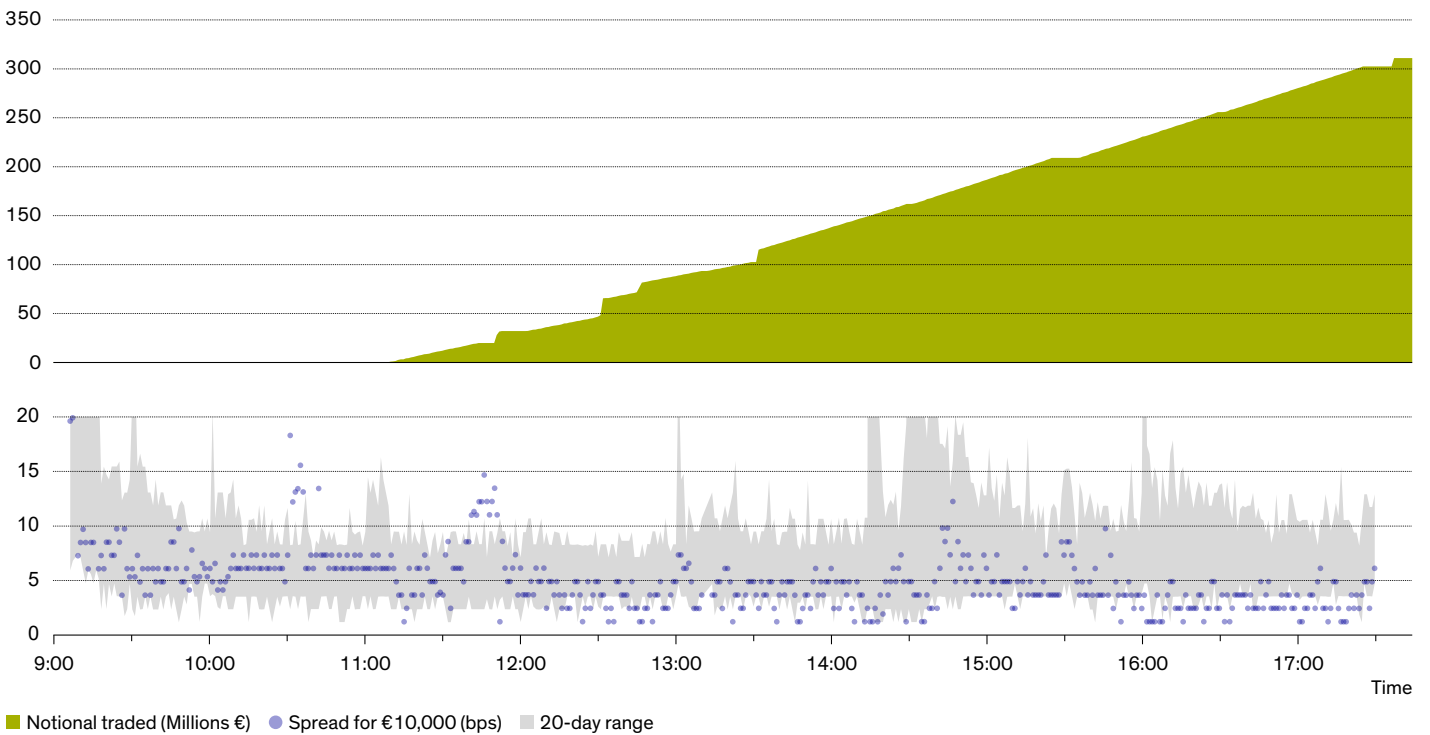


Finally, Figure 5 shows the bid-ask spread relative to the 20-day range of the spread over the course of the trading day. The bid-ask spread width is based on the bid or offer prices in order to buy or sell €10,000 of the fund.

The blue dots represent the bid-ask spread. The grey area indicates the range. Note the bid-ask spread widens some as the trader starts to execute in the marketplace. However, as the day passes, the spread tightens and often remains at the lower end of the 20-day range, averaging 4.3 basis points over the execution period. This compares to an average spread of 5.9 basis points over the 20 days preceding execution.

Bid-ask spread before and during execution

Figure 5



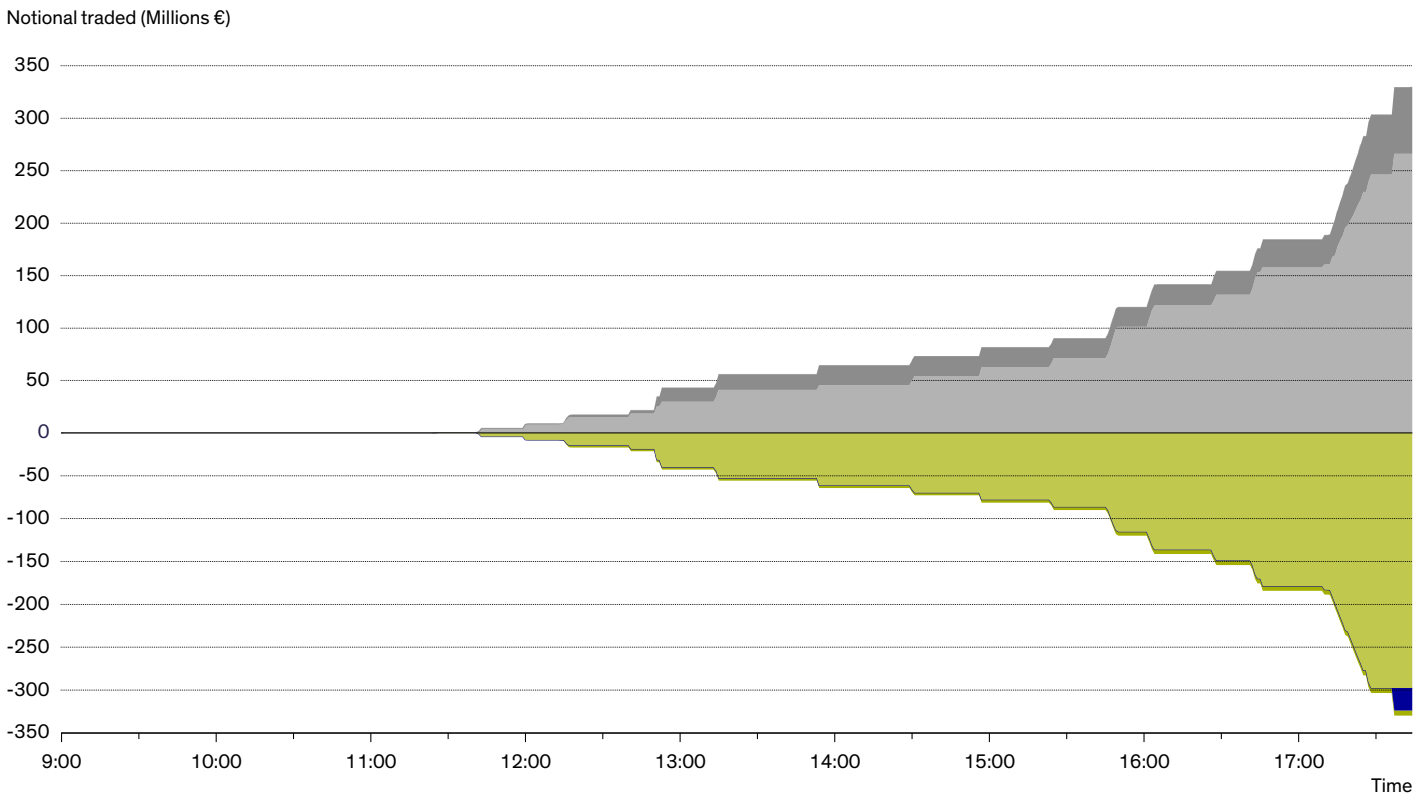
Data source: Xetra

Example 2: MSCI Europe

The second trade as an example of how liquid Xetra ETF trading can be shows up on 20 December 2022 in an MSCI Europe UCITS ETF (IE00B1YZSC51 - IQQY GY). Note in Figure 6, the trader behind this sale used a more aggressive execution style with over 90 per cent of the volume taking liquidity from the market.

Execution breakdown

Figure 6



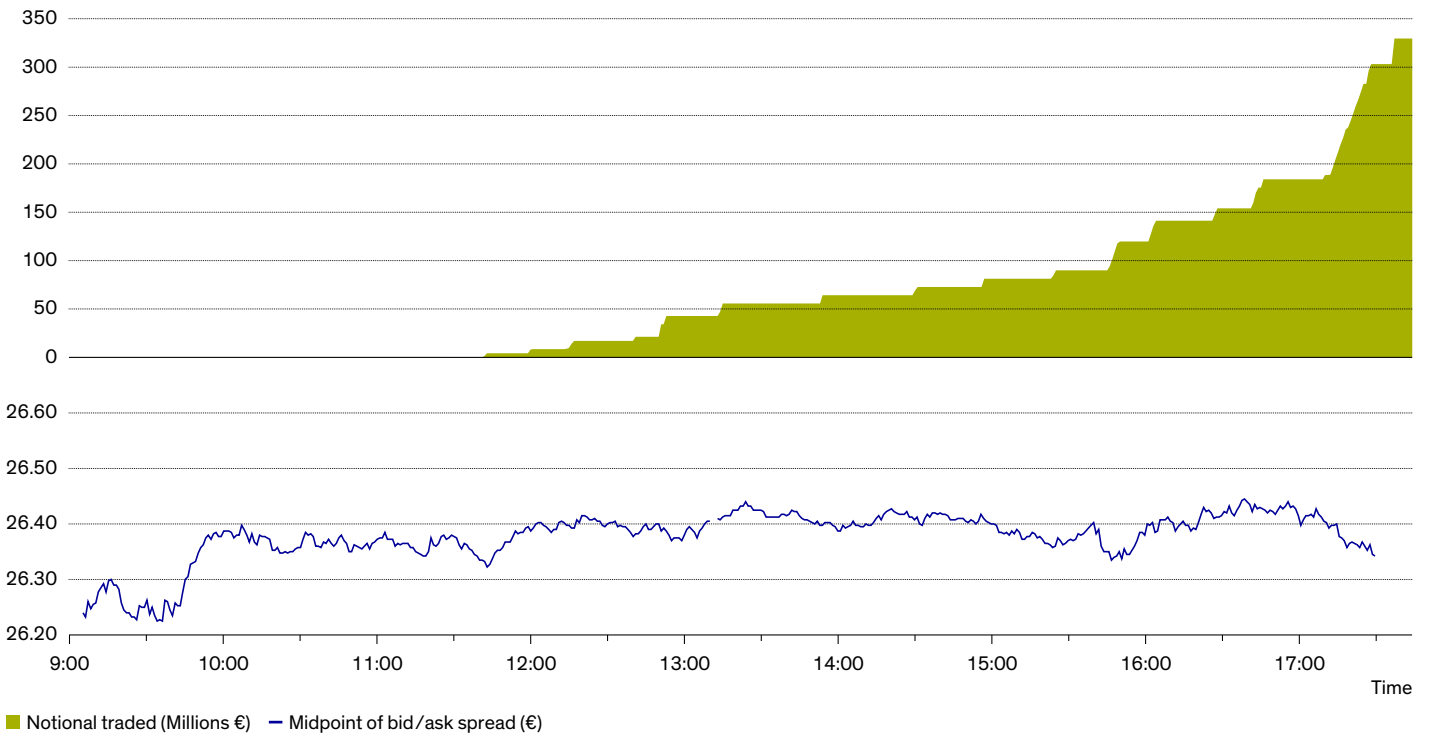
The firm behind this trade was aggressively selling shares over the course of the trading day. Similar to the previous example, the execution of the large trade was implemented via an algorithm. However, investment banks contributed a higher percentage of total liquidity on the other side of the trade than in the first trading example (19.3 per cent), while market makers accounted for just over 80 per cent of the volume.

Recall this trade is a sale and if the market is not able to provide sufficient liquidity, the price of the fund would trend lower as the trader continues to sell shares. Figure 7 shows the price activity for the fund leading up to and during the time when there was a large seller in the marketplace.

IQQY GY was just below €26.40 when the seller entered the market. Despite the large trade size and aggressive nature of the executions, the fund never experienced a significant short-term price drop as might be expected if there was insufficient liquidity to absorb the selling pressure. Finally, Figure 8 shows the bid-ask spread relative to recent history. The average bid-ask spread over the execution period was 4.9 basis points, which compares very favourably with the average 20-day spread of 5.5 basis points prior to the trade execution.

Price activity before and during executions

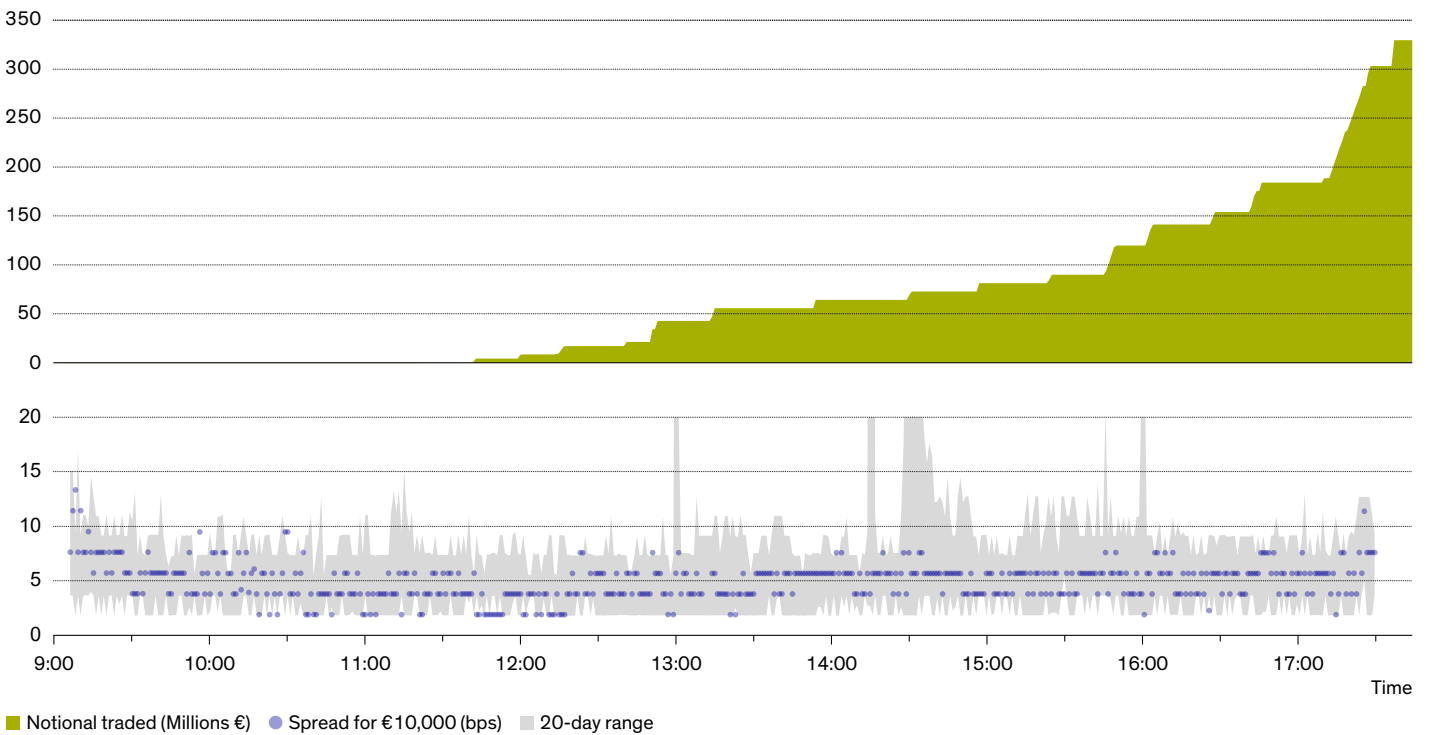
Figure 7



Data source: Xetra

Bid-ask spread before and during execution

Figure 8



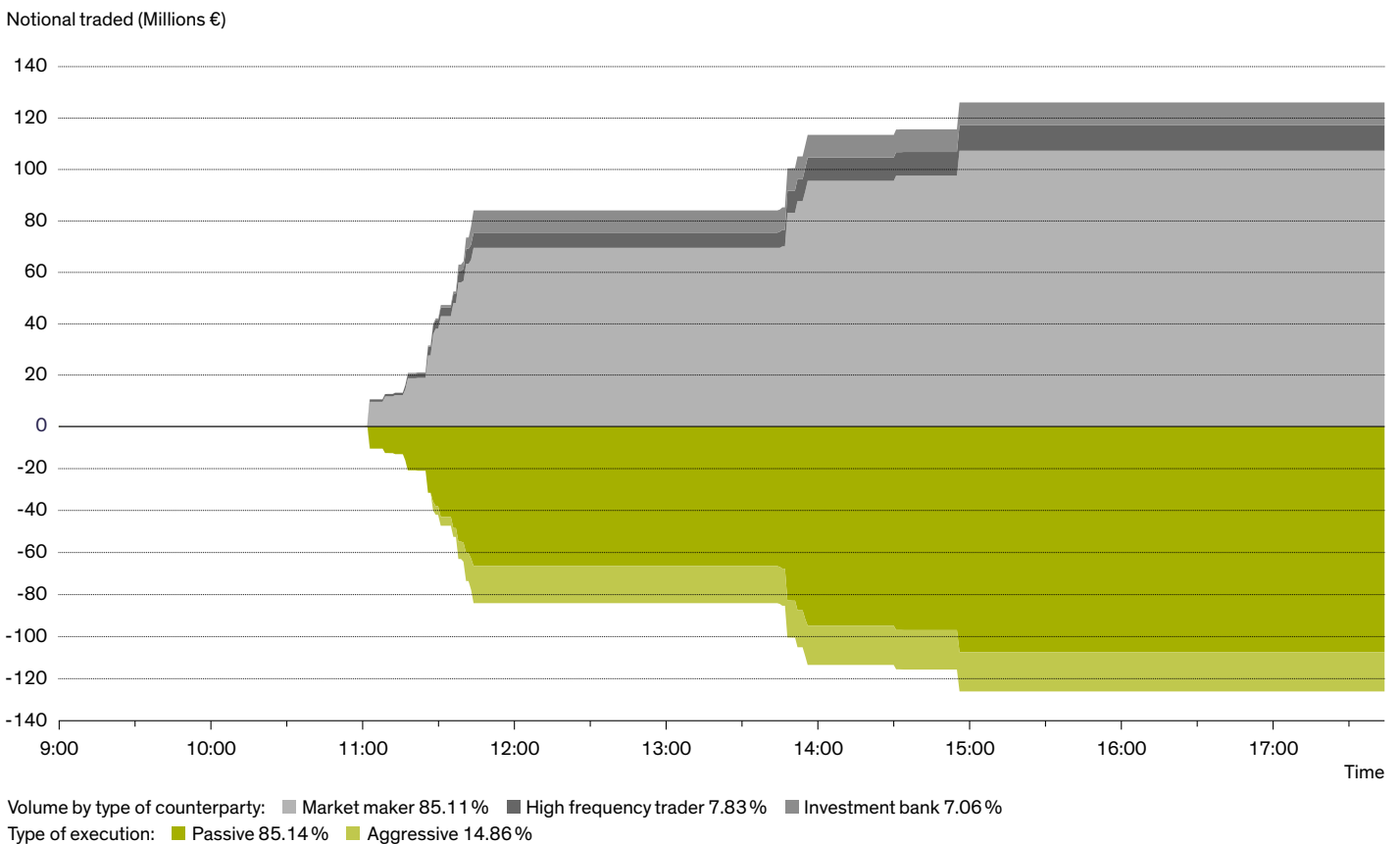
Data source: Xetra

Example 3: EURO STOXX 50

A final trading example occurred on 21 March 2023 in a EURO STOXX 50 UCITS ETF (DE0005933956 - SX5EEX GY) with a large sell executed starting around 11:00 and the final sale at about 15:00. Unlike the previous two examples, this trade was more passively executed with over 85 per cent of the volume falling into this category, effectively resulting in a significant price improvement over an execution at the prevailing bid prices of the ETF. In this example, an algorithm was put to work that used both limit and iceberg orders with most limit prices set inside market to realize the price improvement. Figure 9 shows market makers taking 85.1 per cent of the other side of the trade with high frequency traders and investment banks filling the remaining volume.

Execution breakdown

Figure 9

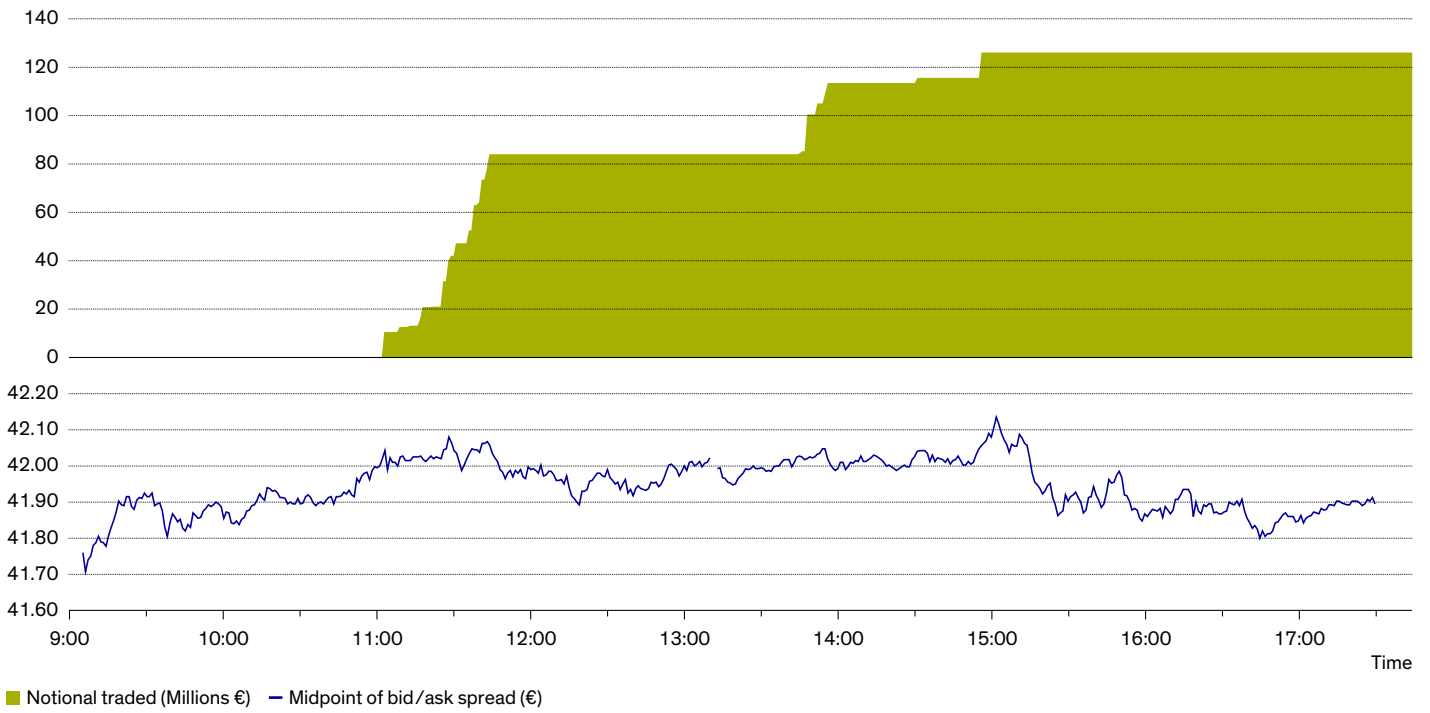


Recall this is a sale and most of the executions were classified as passive. In Figure 10, the fund price again shows no significant price drop as a result of the seller’s activity, indicating that the trader was able to sell over €120 million in shares in a highly effective manner over the course of four hours.

Figure 11 depicts the bid-ask spread relative to recent trading. Despite the presence of a large seller in the market, the bid-ask spread is mostly at the lower end of the 20-day range during the execution period. As in the previous examples, the average spread during the execution window (3.1 basis points) is significantly lower than the average spread for the 20-day period prior to execution (3.5 basis points).

Price activity before and during executions

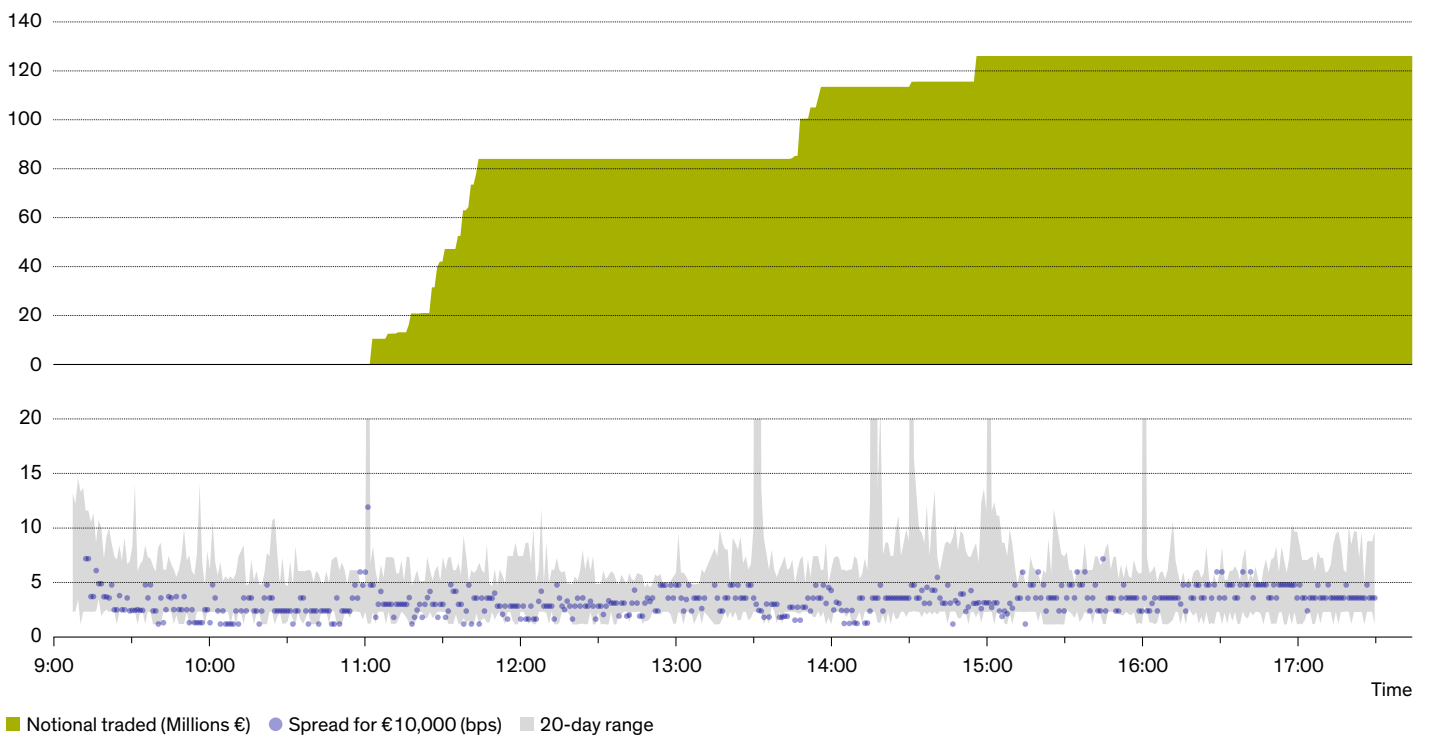
Figure 10



Data source: Xetra

Bid-ask spread before and during execution

Figure 11



Data source: Xetra

CONCLUSION

Xetra is Europe's leading marketplace for listing and trading ETFs. A major factor in this success is due to the joint efforts made by the exchange, issuers and market makers to ensure liquidity is readily available for market participants, whether big or small. Large trades can be executed in a highly efficient manner, so that screen liquidity is not impacted, and liquidity which is available but not displayed on-screen is tapped to execute the trade. Effective use of on-book algorithms can further optimise execution results, potentially enabling investors to realise significant price improvements over the prevailing bid and offer prices in the market. Despite continuous buying and selling pressure over many hours, market makers and other liquidity providers continued to meet the liquidity demand both in terms of size and spread, accumulating sizeable positions while doing so.



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