

The Xetra logo consists of the word "XETRA" in a bold, sans-serif font. The letter "X" is stylized with a yellow and green gradient, while the remaining letters "ETRA" are in a solid blue color.

Xetra Client Analytics



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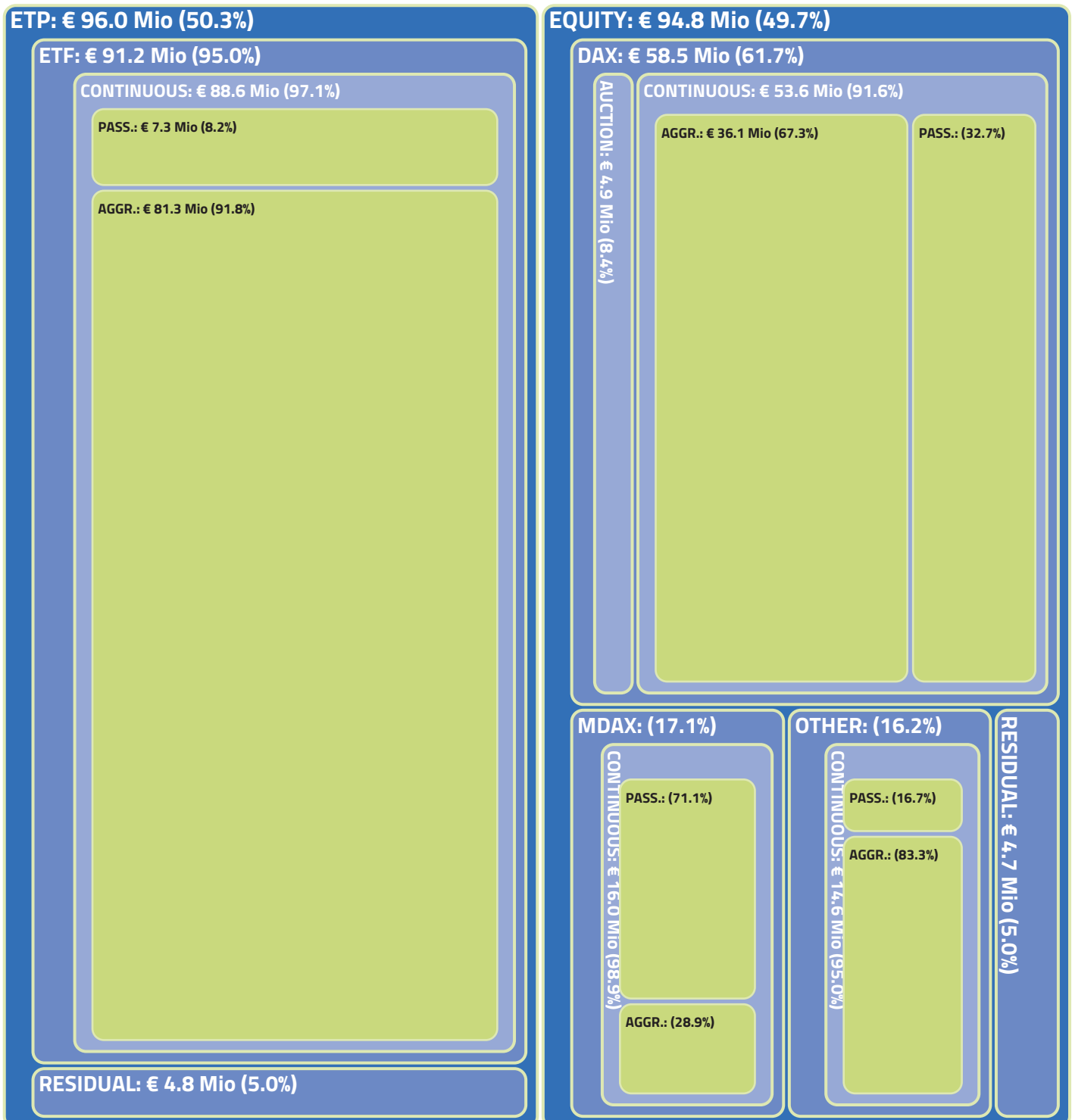
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PARTICIPANT ABC

01 December, 2023 - 31 December, 2023

Proprietary
Broker
 Retail Broker

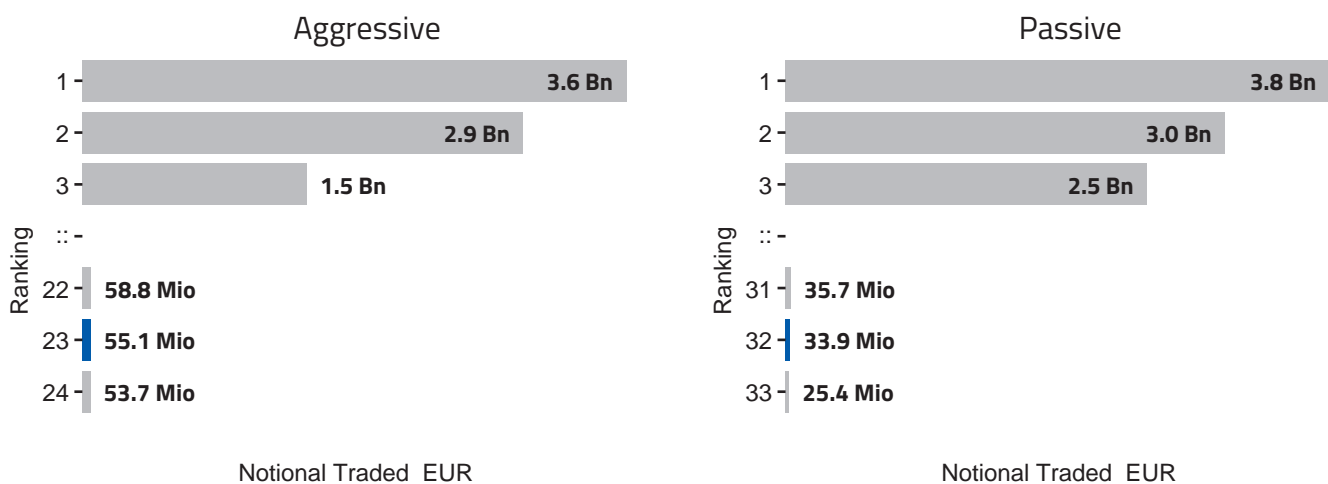


Trading Notionals Report

Equity - All

Trading Phase	Side	Member			Peer Group	
		Notional	A/P Share	Rank	Notional	A/P Share
Continuous Trading	A	55,070,474	61.9%	23	19,021,488,663	41.4%
Continuous Trading	P	33,850,893	38.1%	32	26,956,226,795	58.6%
Opening Auction		4,244,273		26	1,987,404,339	
Intraday Auction		76,700		34	3,081,729,906	
Volatility Auction		60,095		29	30,281,374	
Closing Auction		1,504,443		37	49,153,219,358	

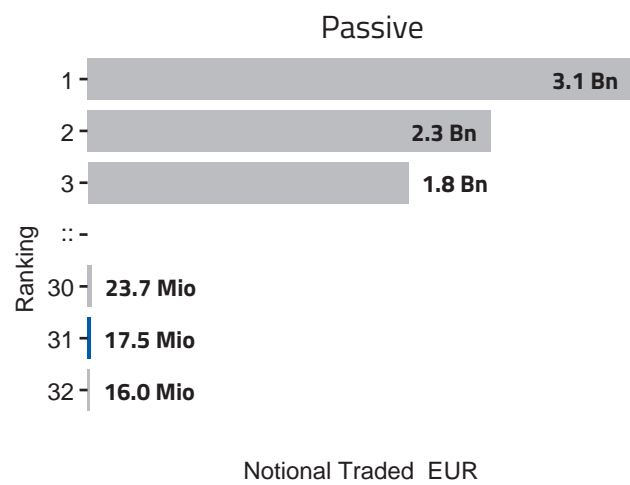
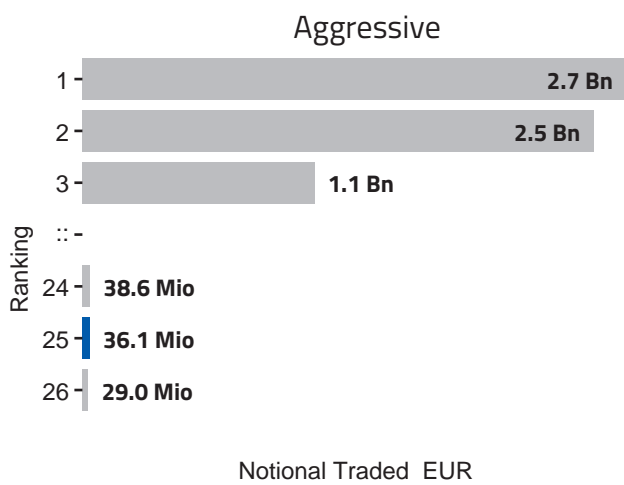
Peer Ranking Continuous Trading



Equity - DAX

Trading Phase	Side	Member			Peer Group	
		Notional	A/P Share	Rank	Notional	A/P Share
Continuous Trading	A	36,070,504	67.3%	25	14,205,622,934	42.5%
Continuous Trading	P	17,534,910	32.7%	31	19,237,365,856	57.5%
Opening Auction		3,710,013		25	1,668,123,654	
Closing Auction		1,217,475		36	40,323,942,555	

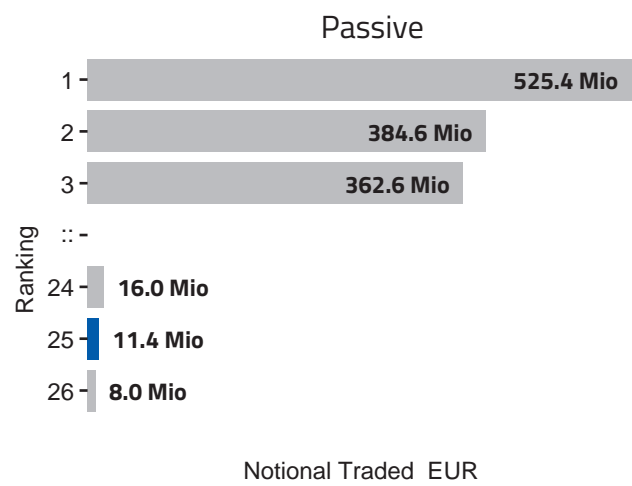
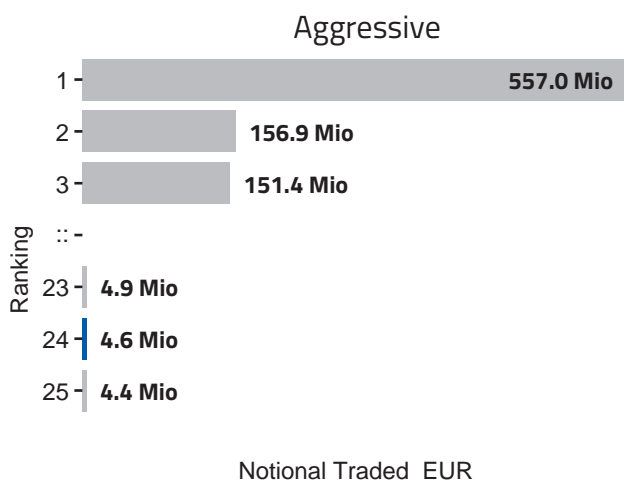
Peer Ranking Continuous Trading



Equity - MDAX

Trading Phase	Side	Member			Peer Group	
		Notional	A/P Share	Rank	Notional	A/P Share
Continuous Trading	A	4,626,898	28.9%	24	1,998,790,727	34.9%
Continuous Trading	P	11,374,169	71.1%	25	3,721,984,529	65.1%
Opening Auction		13,965		36	149,427,338	
Intraday Auction		58,580		23	66,710,973	
Closing Auction		101,700		37	7,183,243,975	

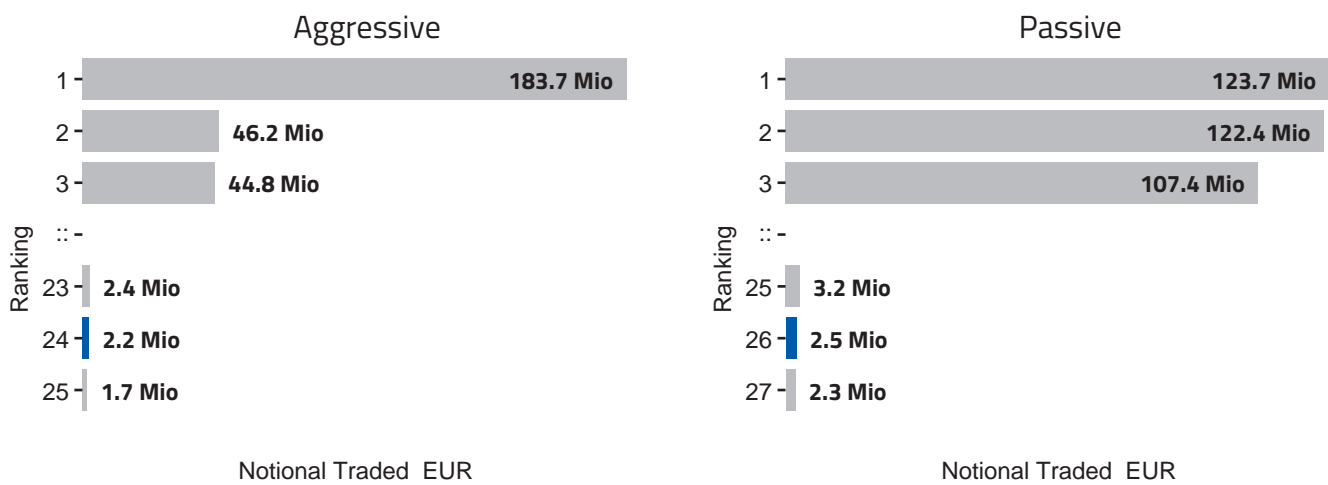
Peer Ranking Continuous Trading



Equity - SDAX

Trading Phase	Side	Member			Peer Group	
		Notional	A/P Share	Rank	Notional	A/P Share
Continuous Trading	A	2,224,438	47.1%	24	692,823,320	36.8%
Continuous Trading	P	2,499,267	52.9%	26	1,189,370,147	63.2%
Opening Auction		13,020		33	37,866,799	
Volatility Auction		7,140		28	3,100,578	

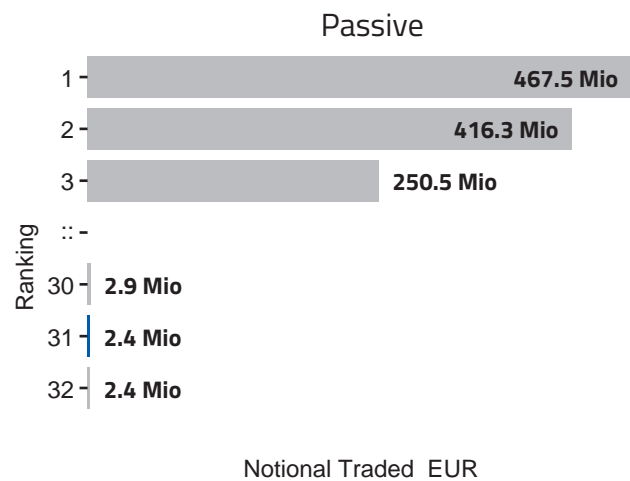
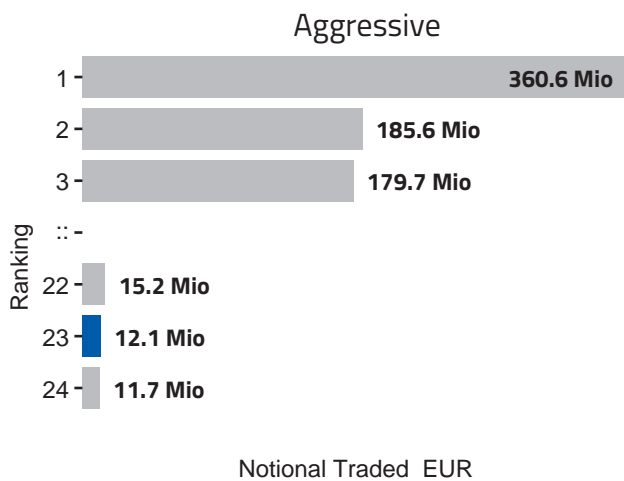
Peer Ranking Continuous Trading



Equity - OTHER

Trading Phase	Side	Member			Peer Group	
		Notional	A/P Share	Rank	Notional	A/P Share
Continuous Trading	A	12,148,635	83.3%	23	2,124,251,684	43.1%
Continuous Trading	P	2,442,549	16.7%	31	2,807,506,265	56.9%
Opening Auction		507,275		23	131,986,549	
Intraday Auction		18,120		26	7,586,178	
Volatility Auction		52,956		27	14,174,897	
Closing Auction		185,268		31	588,121,311	

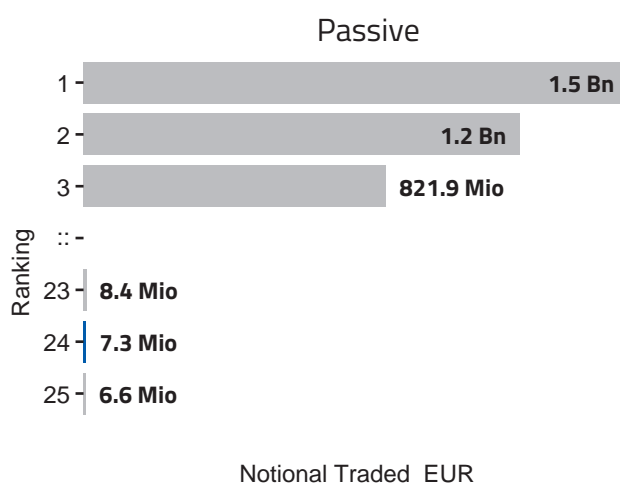
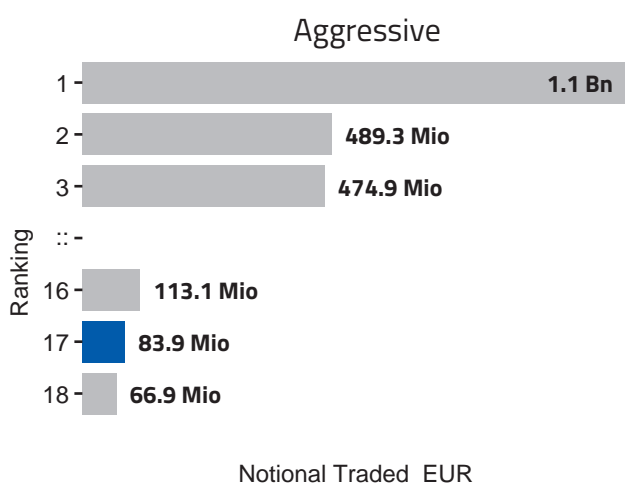
Peer Ranking Continuous Trading



ETP - All

Trading Phase	Side	Member			Peer Group	
		Notional	A/P Share	Rank	Notional	A/P Share
Continuous Trading	A	83,908,163	92.0%	17	5,896,487,152	47.0%
Continuous Trading	P	7,264,415	8.0%	24	6,655,537,705	53.0%
Opening Auction		4,576,593		18	489,774,746	
Intraday Auction		63,402		22	22,927,356	
Closing Auction		155,217		28	828,078,309	

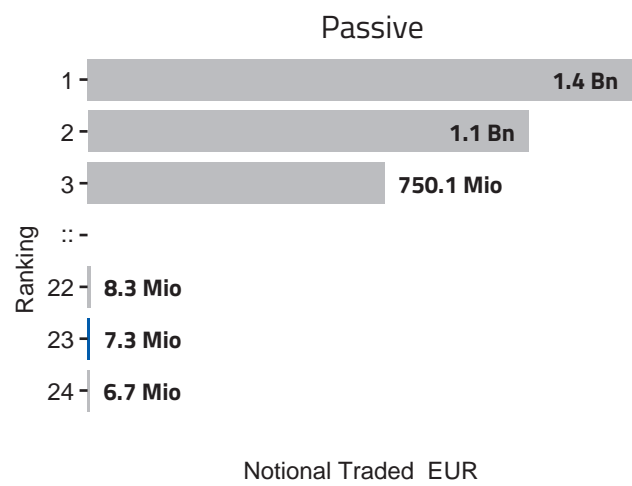
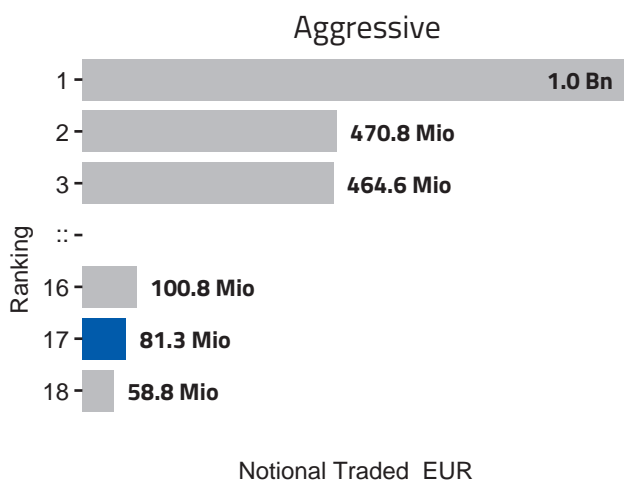
Peer Ranking Continuous Trading



ETF - OTHER

Trading Phase	Side	Member			Peer Group	
		Notional	A/P Share	Rank	Notional	A/P Share
Continuous Trading	A	81,311,790	91.8%	17	5,633,934,659	47.4%
Continuous Trading	P	7,260,714	8.2%	23	6,261,194,811	52.6%
Opening Auction		2,506,517		20	471,696,929	
Intraday Auction		63,402		22	22,182,415	
Closing Auction		66,068		30	823,148,279	

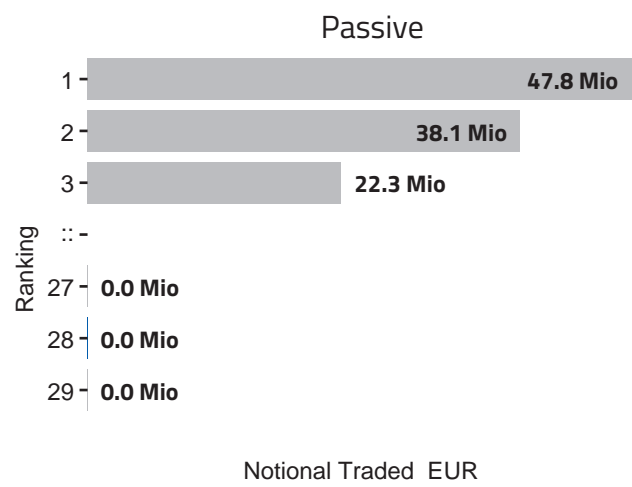
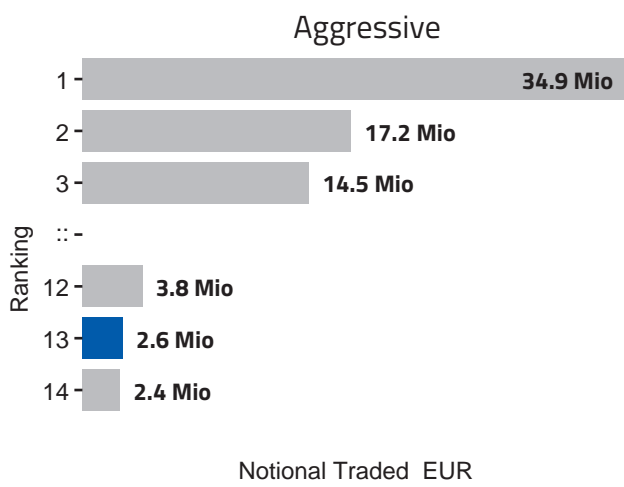
Peer Ranking Continuous Trading



ETC - OTHER

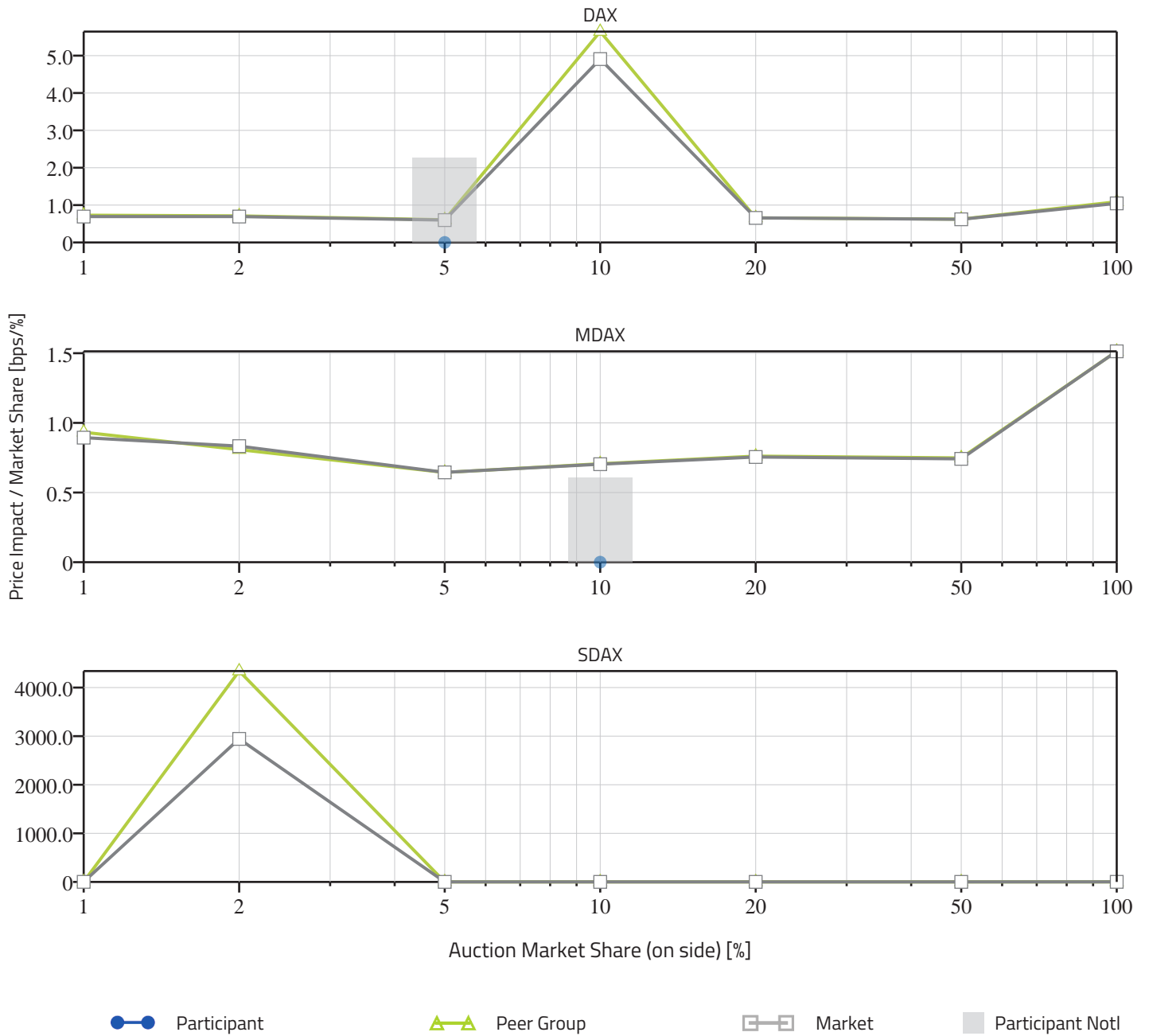
Trading Phase	Side	Member			Peer Group	
		Notional	A/P Share	Rank	Notional	A/P Share
Continuous Trading	A	2,596,373	99.9%	13	141,852,325	43.2%
Continuous Trading	P	3,702	0.1%	28	186,466,823	56.8%
Opening Auction		2,070,076		1	11,367,635	
Closing Auction		89,149		8	3,955,730	

Peer Ranking Continuous Trading

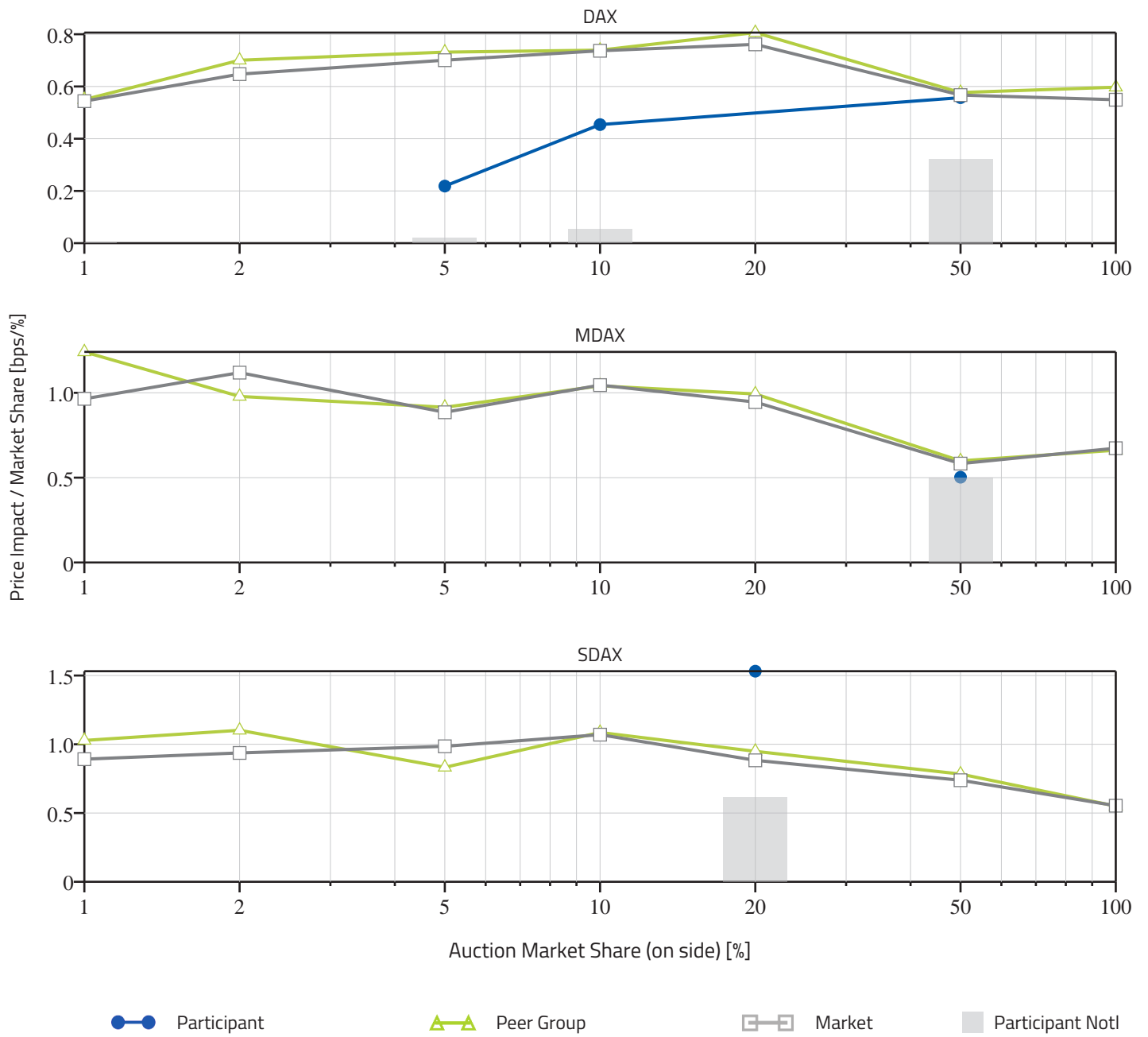


Auction Price Impact

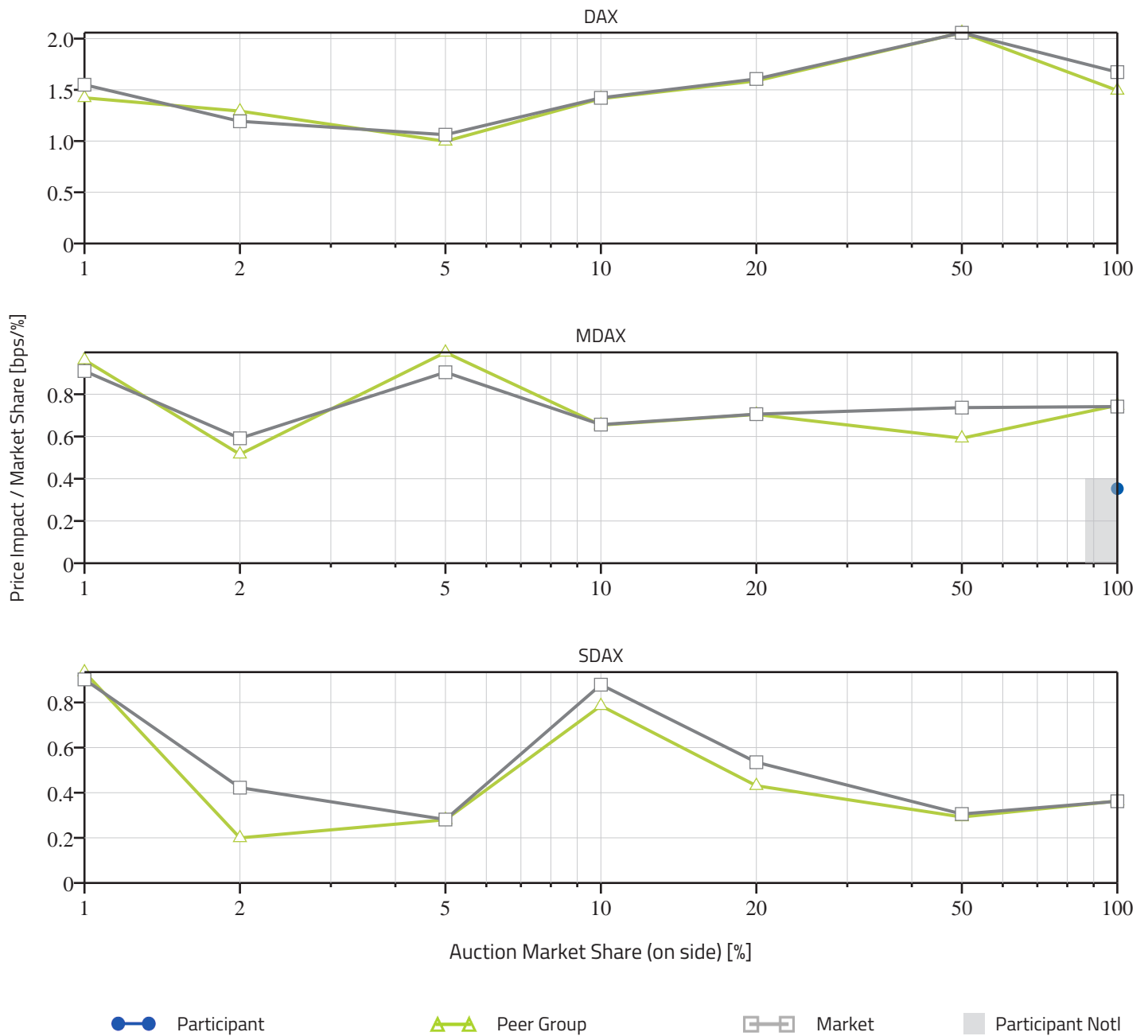
Closing auction



Opening auction



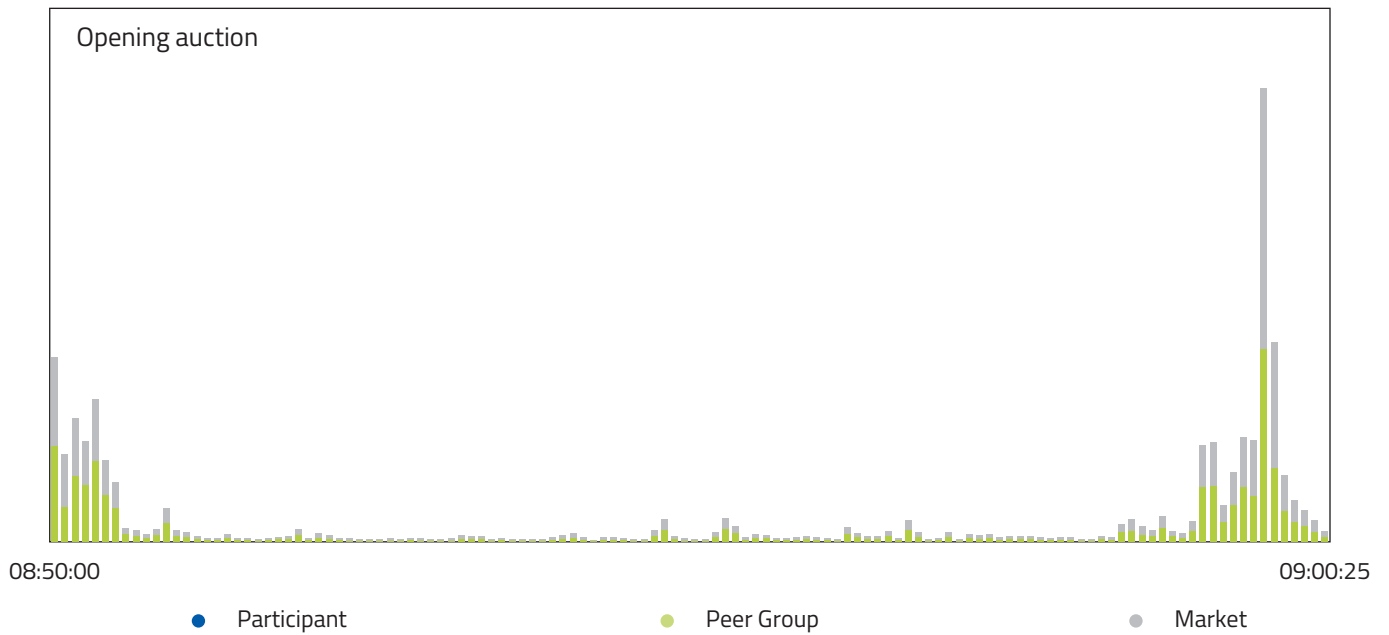
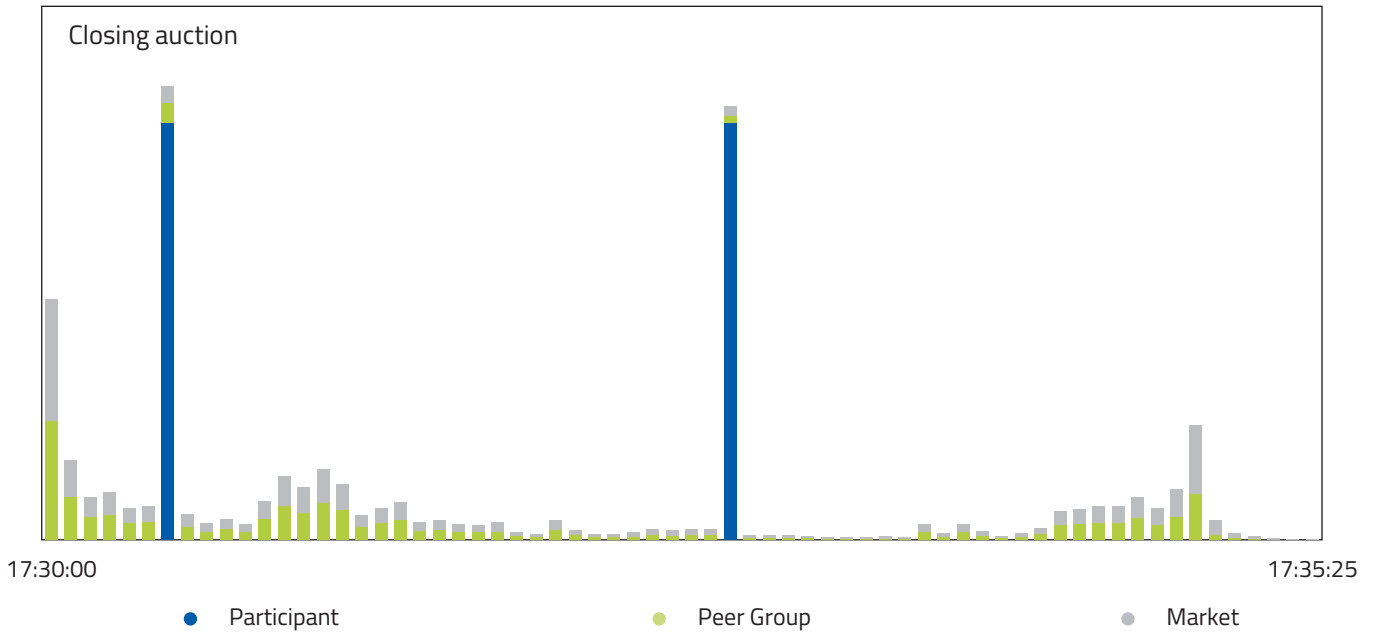
Intraday auction

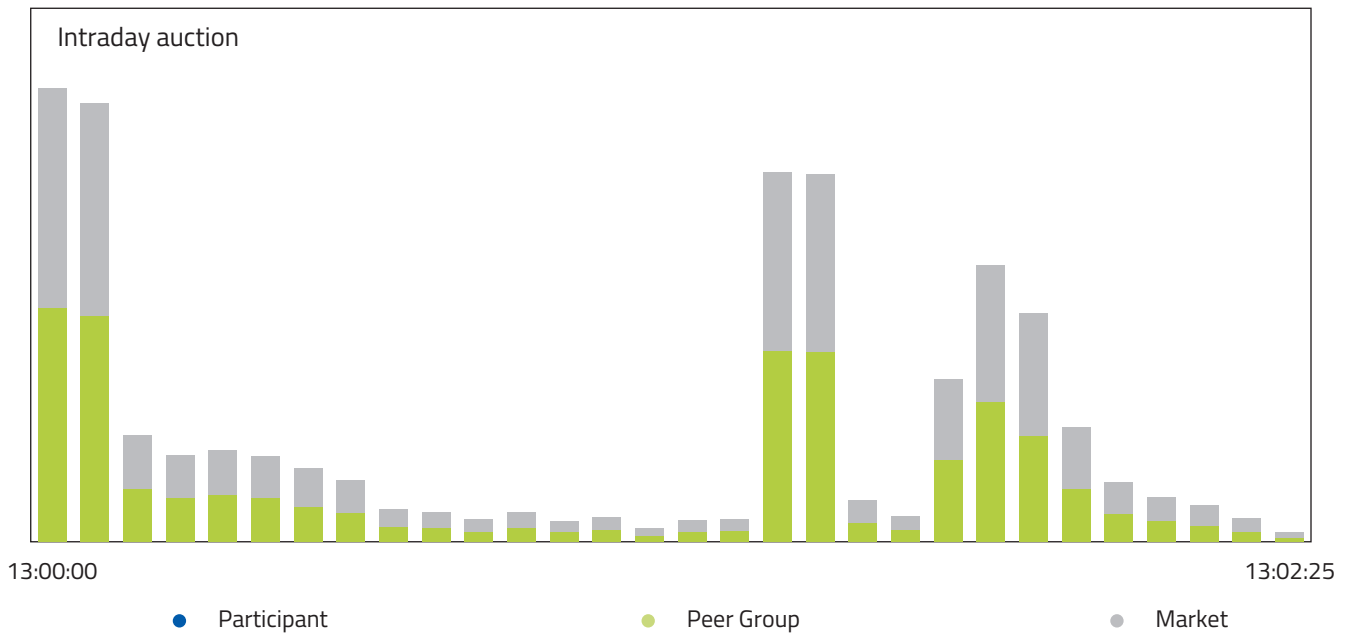


Methodology

- Baseline: Uncross w/o participants orders on this side.
- Trade price vs. mid price at T + 10 s.
- Price impact: Actual vs baseline uncrossing price.

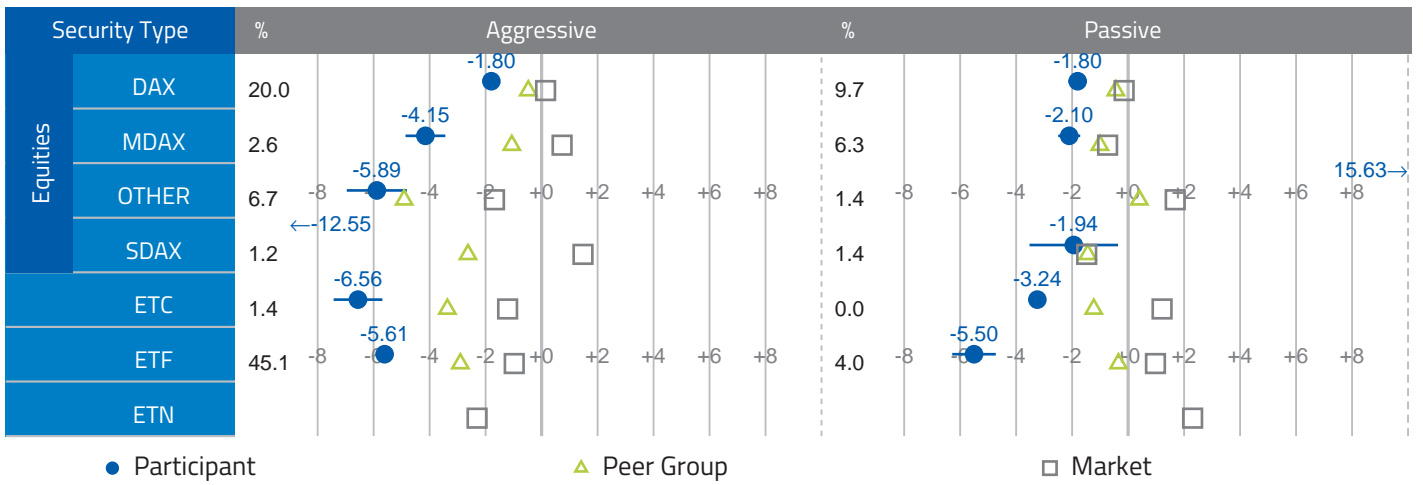
Auction Insert Times





Xetra Continuous Trading Markout Analysis

Security Type



Methodology

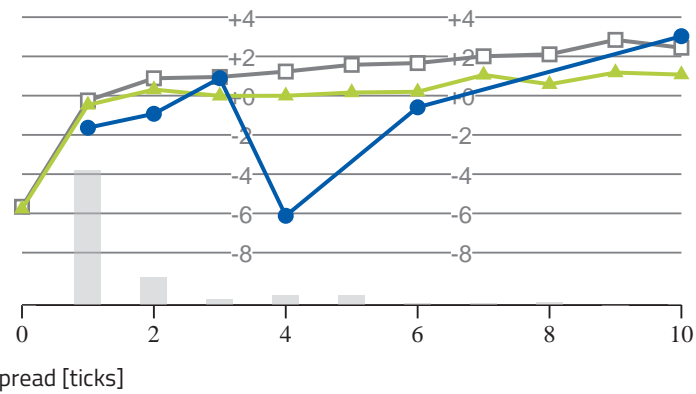
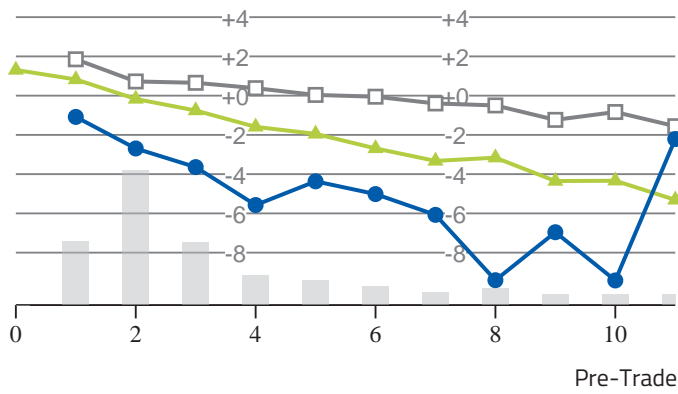
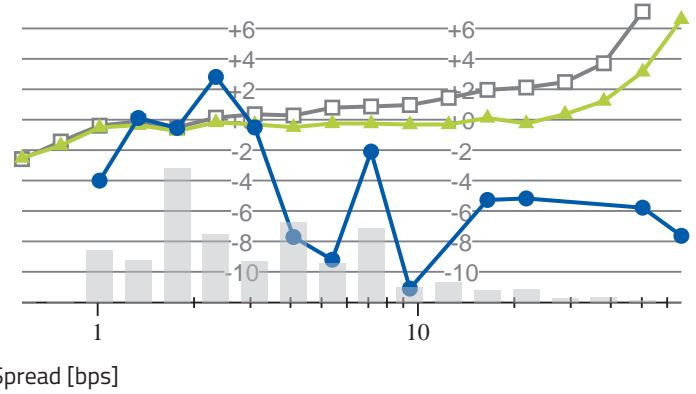
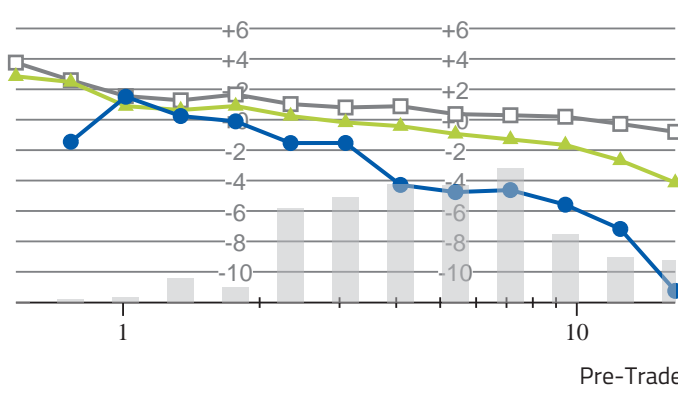
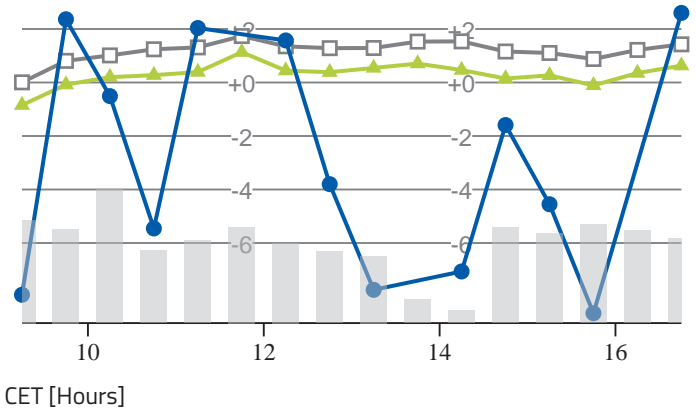
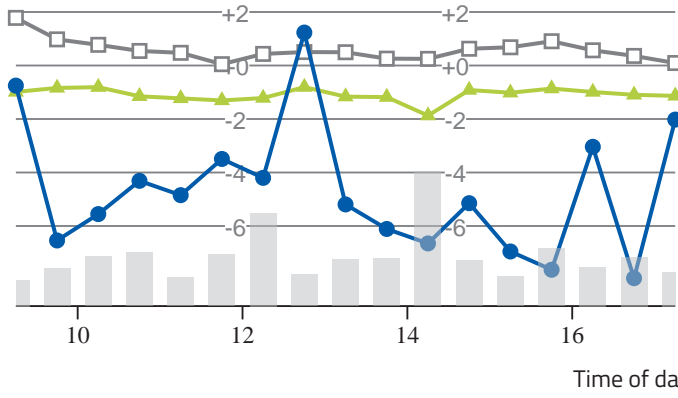
- All values in basispoints.
- Trade price vs. mid price at T + 10 s.
- Last available mid or trade price within 10 s interval ahead of auctions
- Each trade weighted based on EUR notional
- Error bars based on bootstrapping 100 samples each comprising half the trades
- Continuous Trading only (excl. auctions, TES, Trade-at-Close)
- Gross, i.e., not including trading fees

Continuous

All values are expressed in basis points.

Aggressive

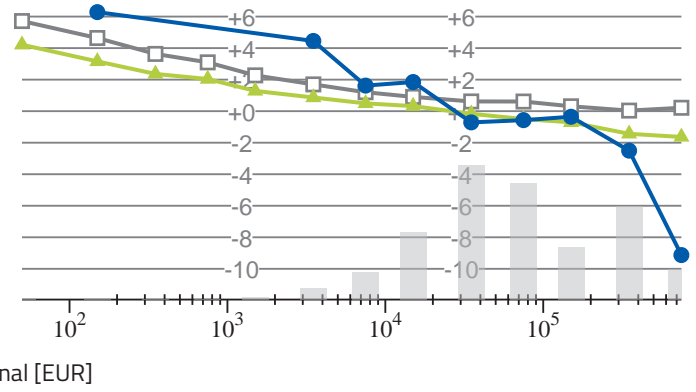
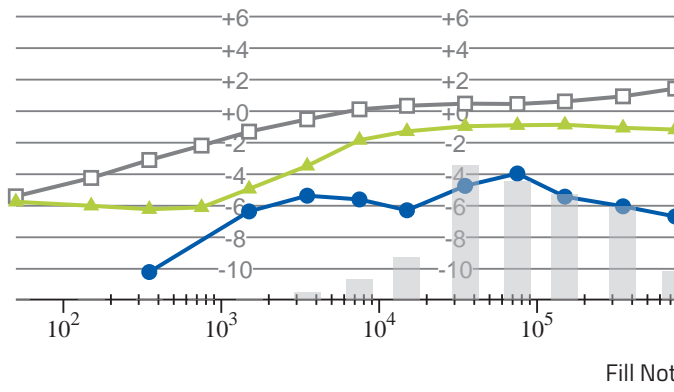
Passive



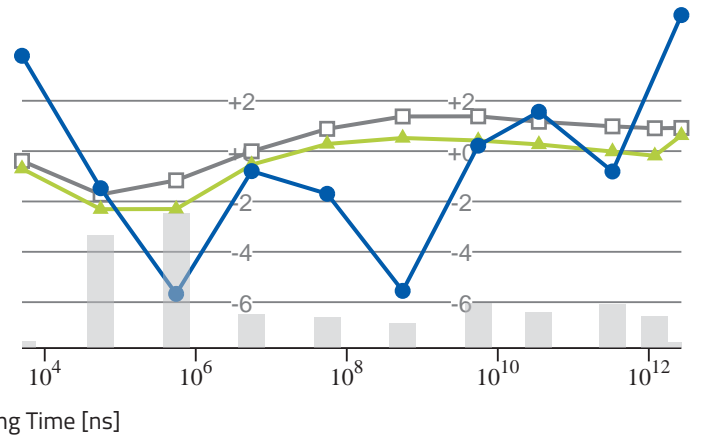
● Participant ▲ Peer Group □ Market ■ Participant NotI

Aggressive

Passive



Fill Notional [EUR]



Order Resting Time [ns]

● Participant

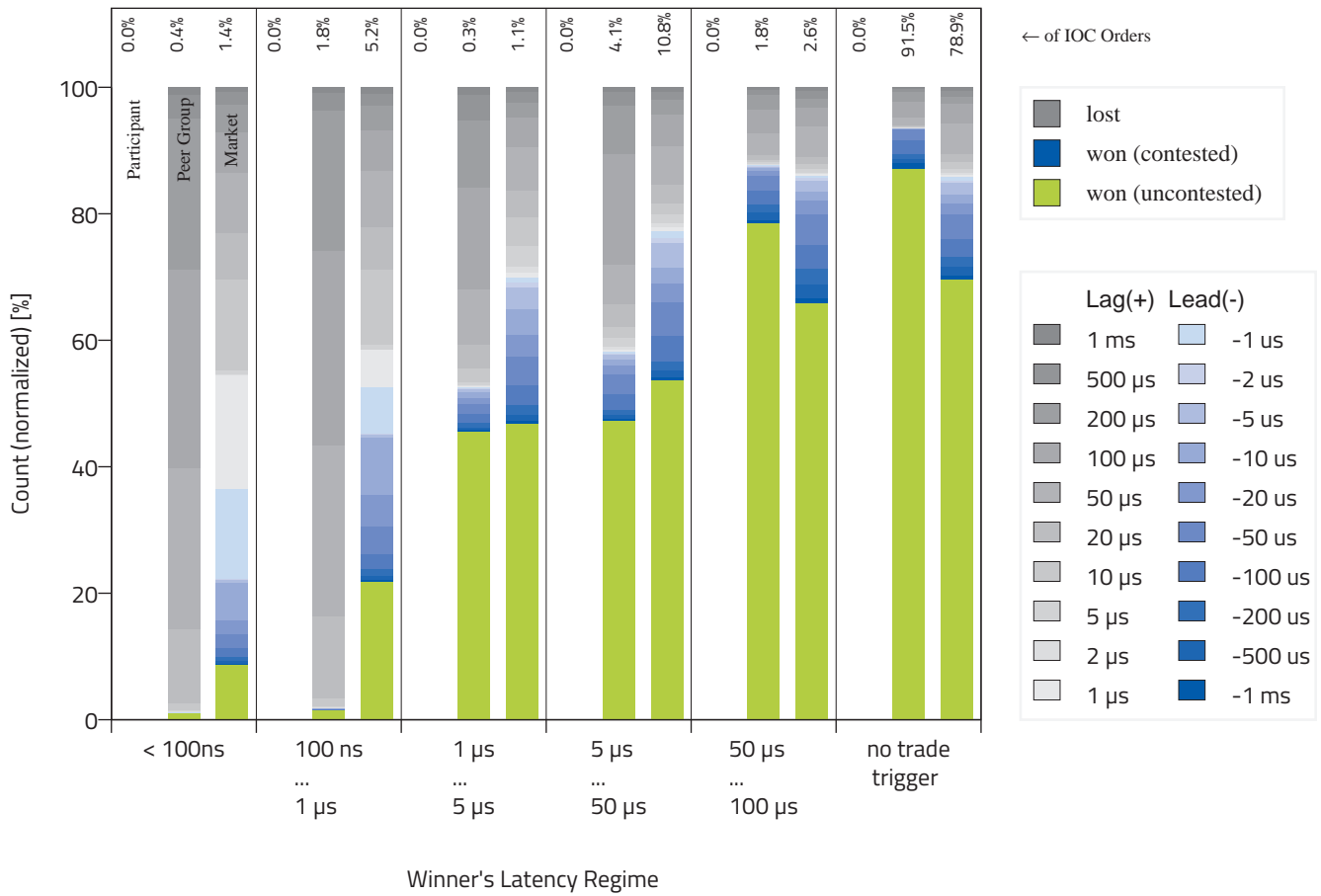
▲ Peer Group

□ Market

■ Participant Notional

IOC Miss Report

IOC Miss Rate by Race Competitiveness

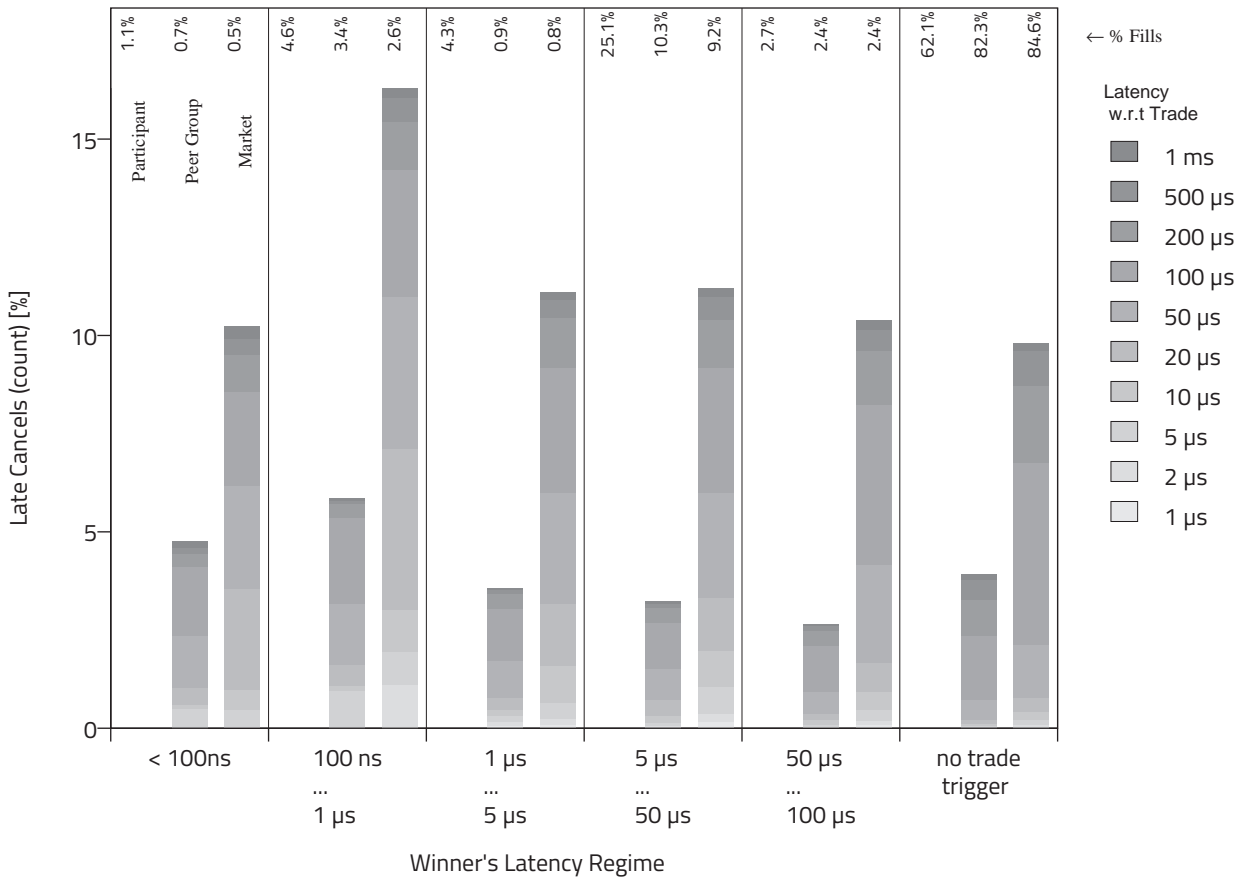


Methodology

- All trades from IOC orders.
- Continuous trading phase.
- IOC (& FOK) misses within 1 ms (gateway-in-timestamp) of winner.
- Only misses for levels traded by winner.
- Misses by winning participant are ignored.
- Only first miss of each participant is considered.
- No miss within 1 ms uncontested.
- Grey shades based on GWI latency w.r.t. winner.
- Green shades based on GWI lead w.r.t. fastest loser.
- Latency regime based on t_{9d} HPT timestamp of most recent previous trade (XEUR or XETR) and t_{3a} of winner.

Late Cancel Report

Late Cancel Rate by Race Competitiveness

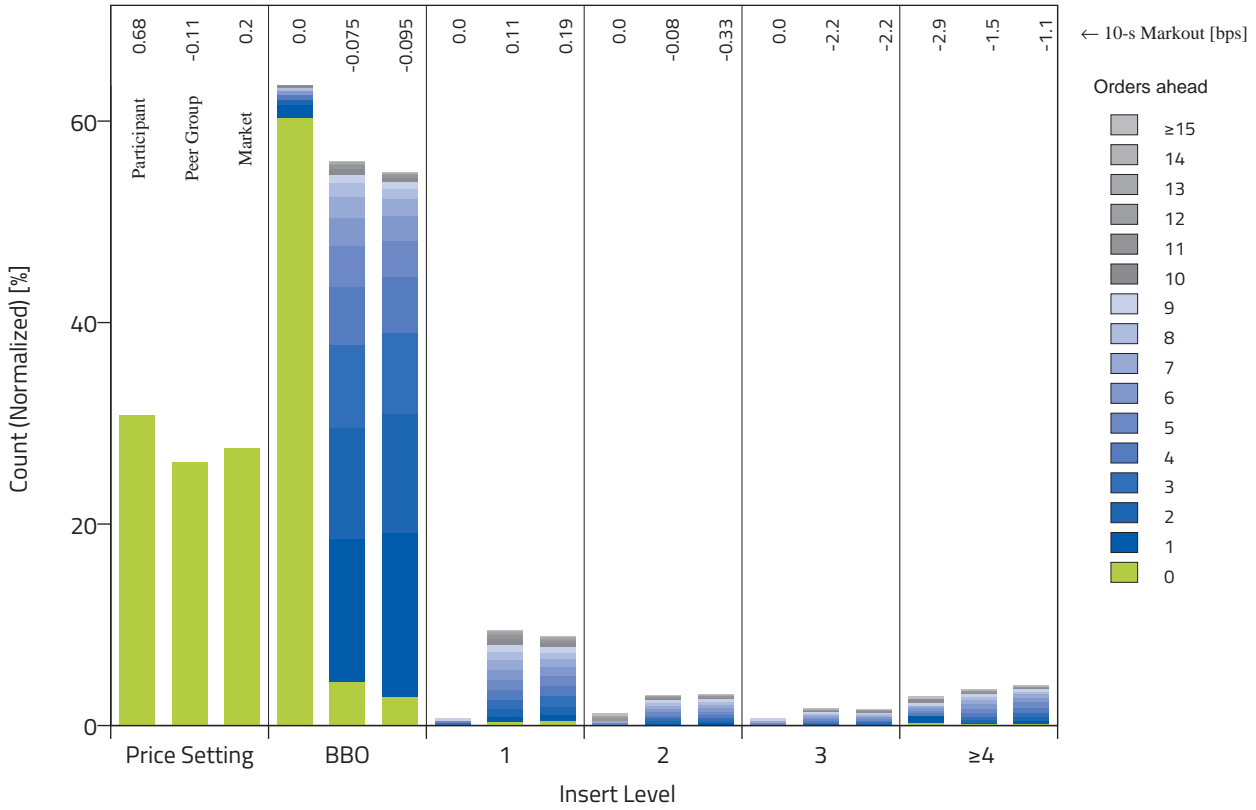


Methodology

- Passive fills during continuous trading.
- Consider cancel requests within 1 ms after last fill.
- Only cancel requests submitted through HF session.
- Ignore cancel requests after partial fills - only noop cancel requests.
- Only cancel requests for orders (quote inactivation or update requests are not treated as cancel requests).
- Failed modify requests for fully filled orders not included.
- Latency regime based on t 9d HPT timestamp of most recent previous trade (XEUR or XETR) and t 3a of winner.

Queue Position Report

Distribution of Insert Levels and Queue Positions

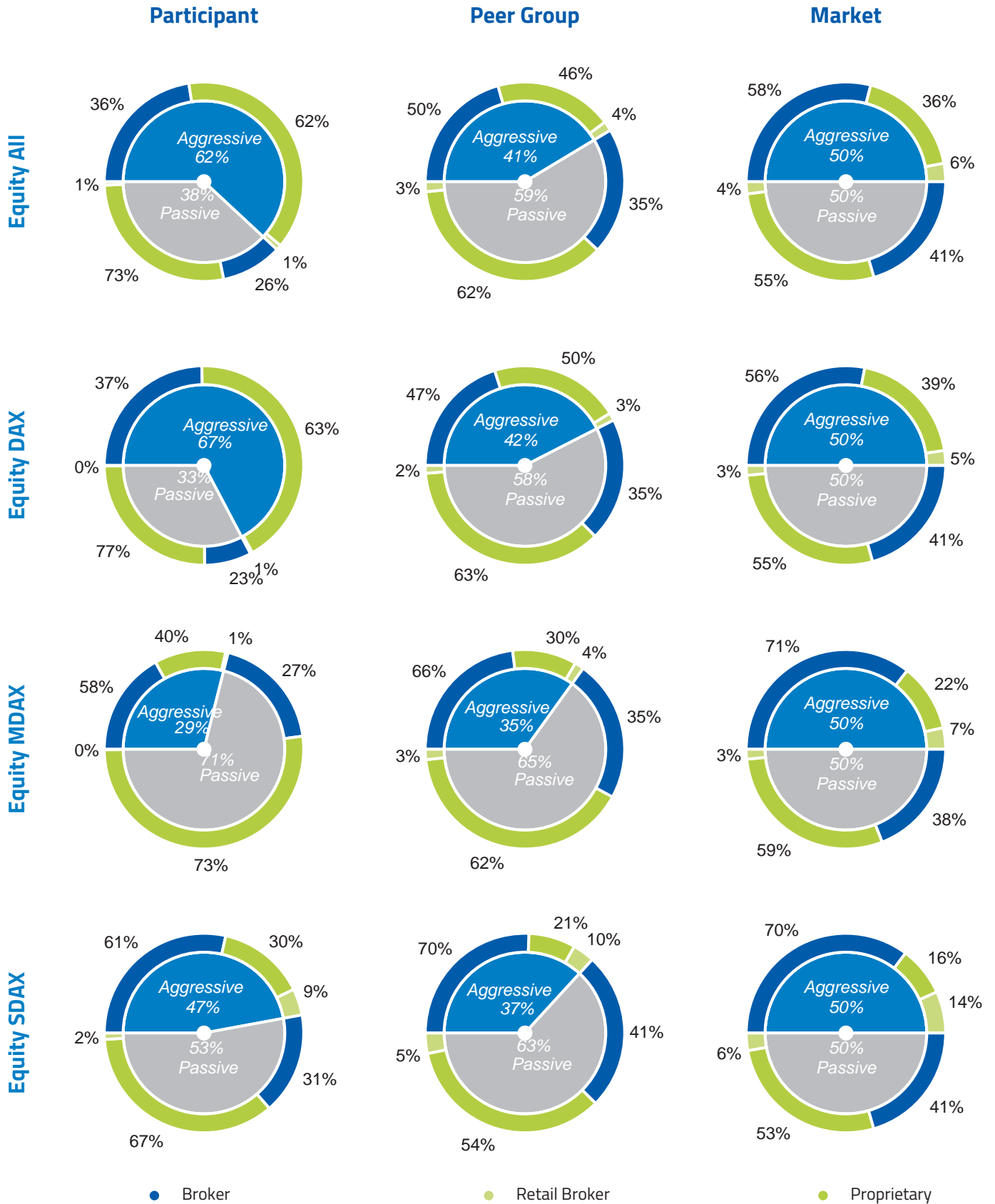


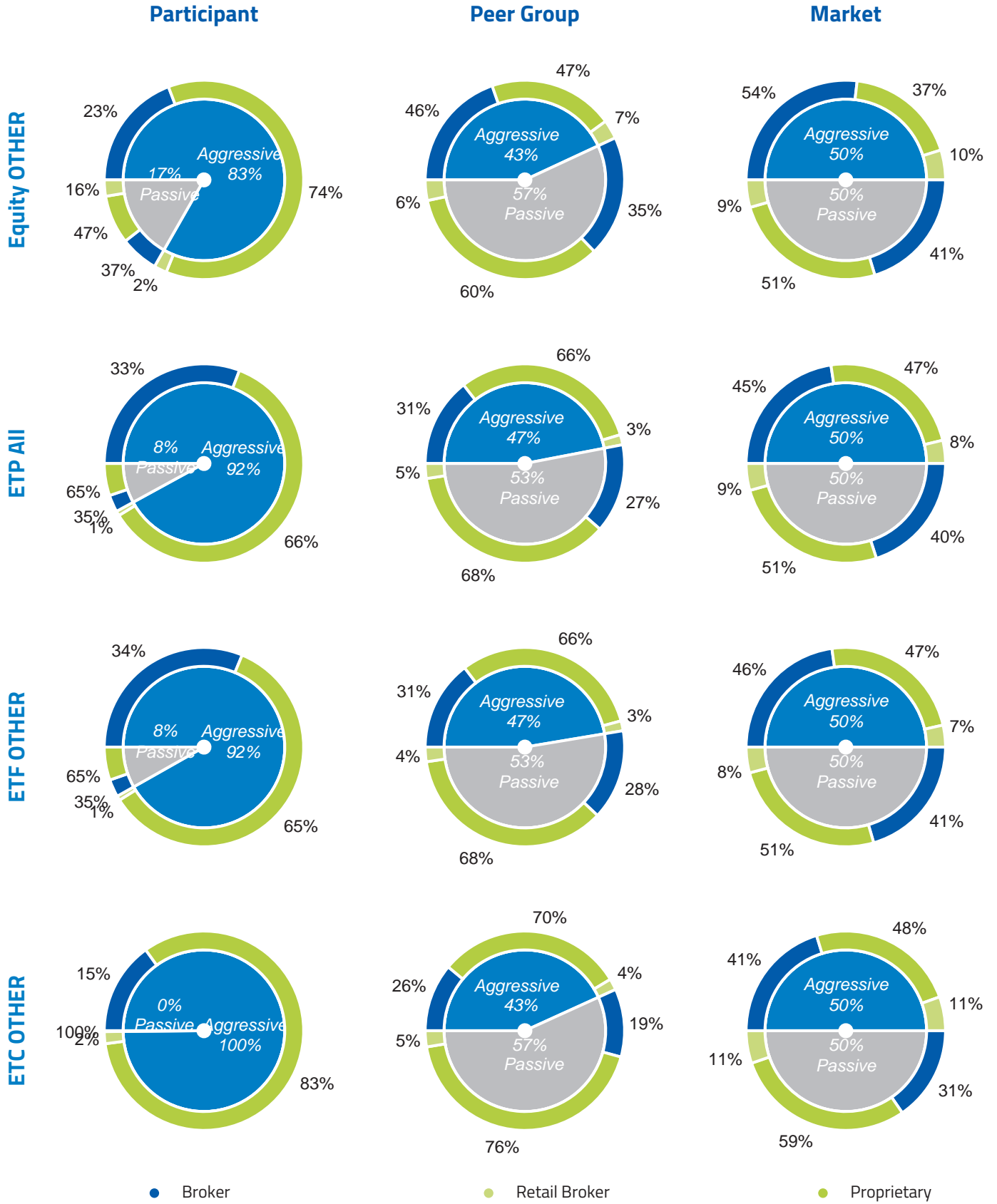
Methodology

- DAX, MDAX, SDAX constituents only.
- Only orders inserted and filled during current day's continuous trading phase.
- Join BBO but 0 orders ahead
- Markouts: T+10 s trade price to mid.
- Orders ahead at the time of order insert on the order's price level.

Counterparty Composition

Continuous Trading



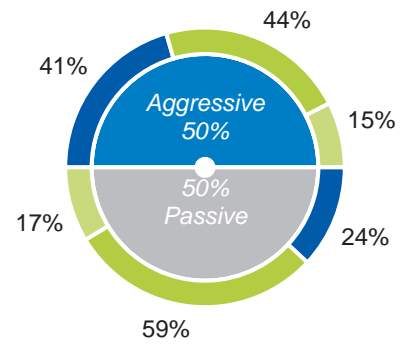
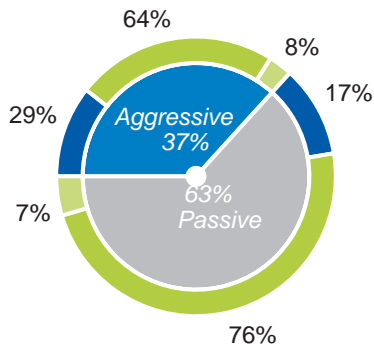


ETN OTHER

Participant

Peer Group

Market

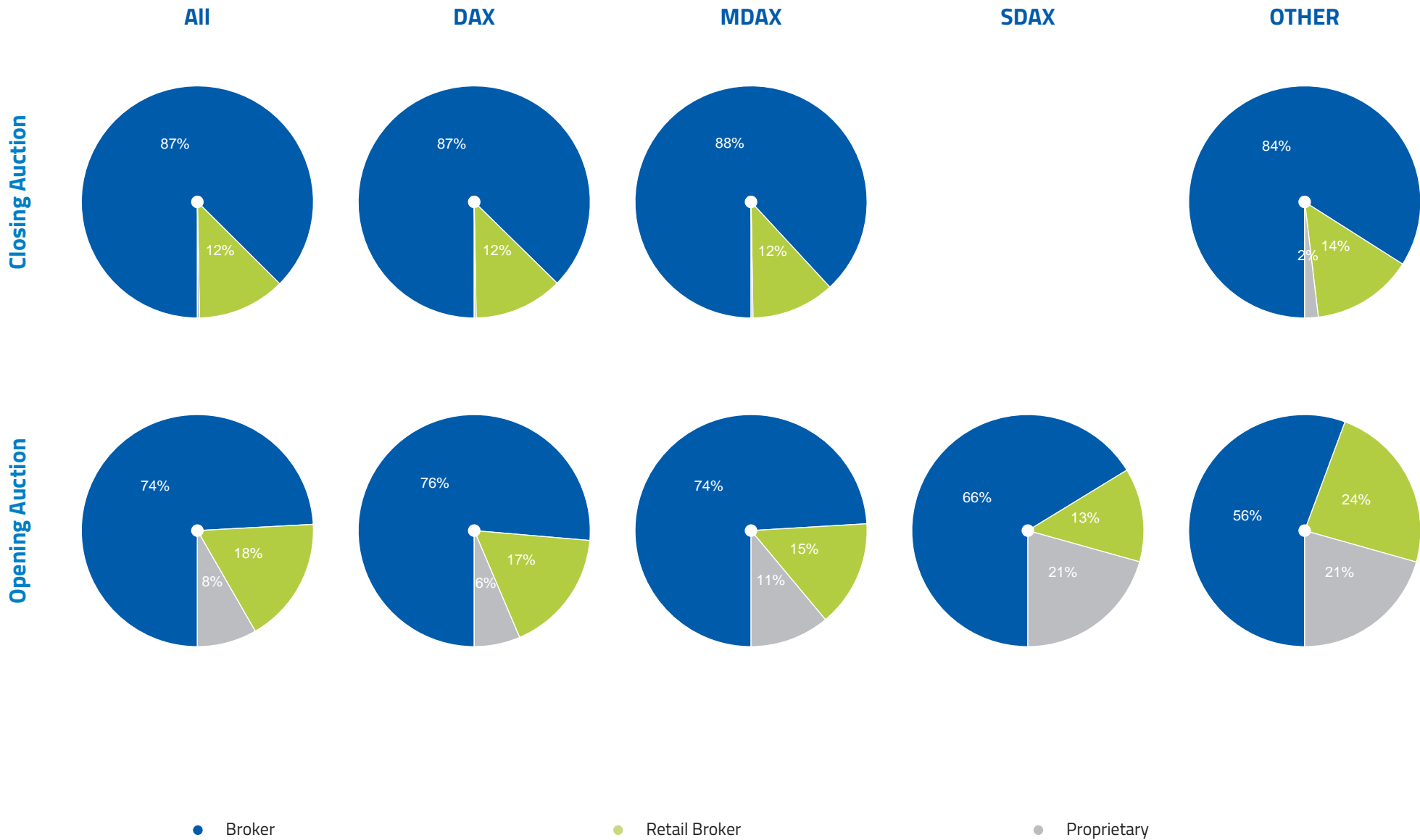


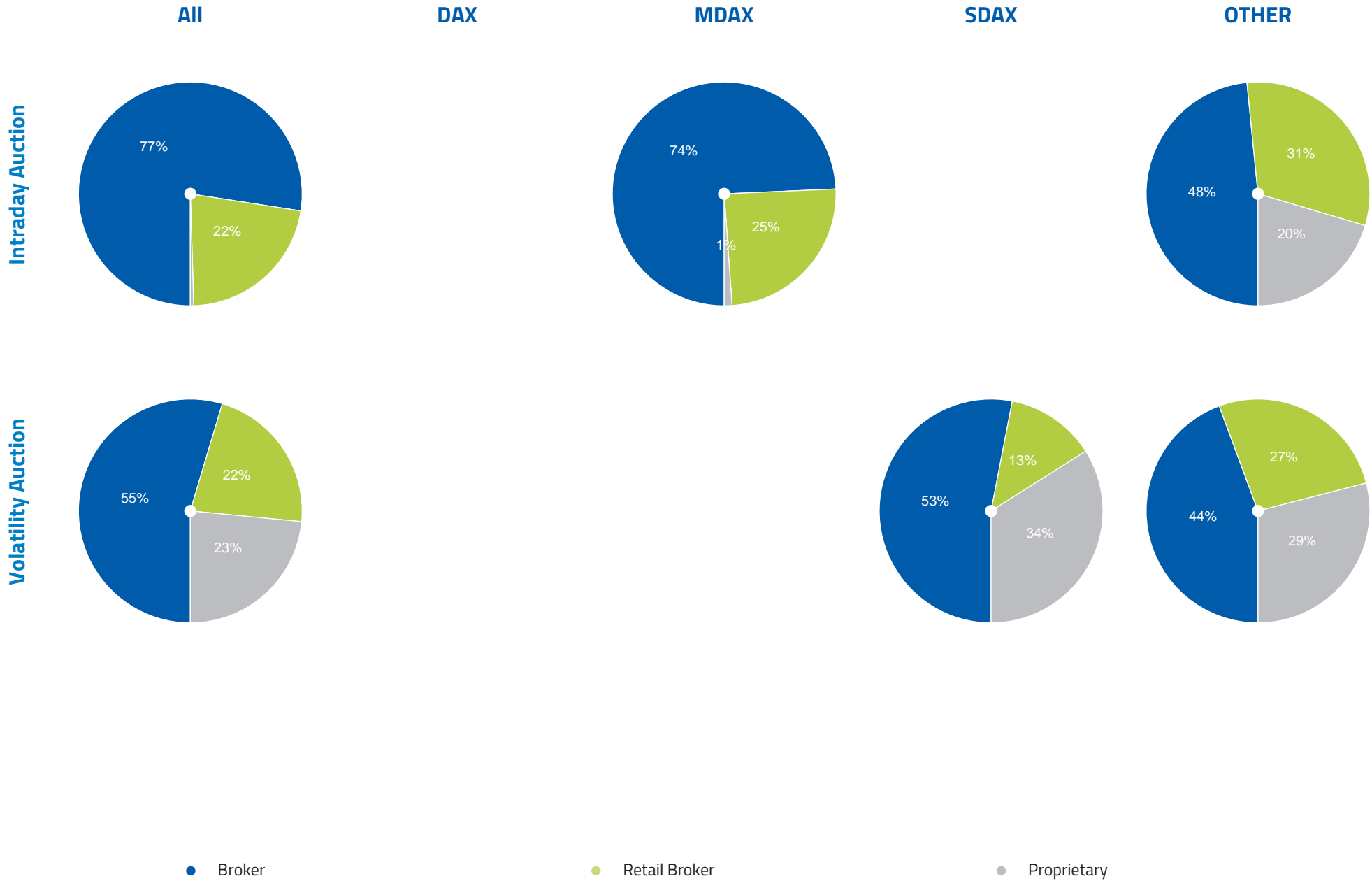
● Broker

● Retail Broker

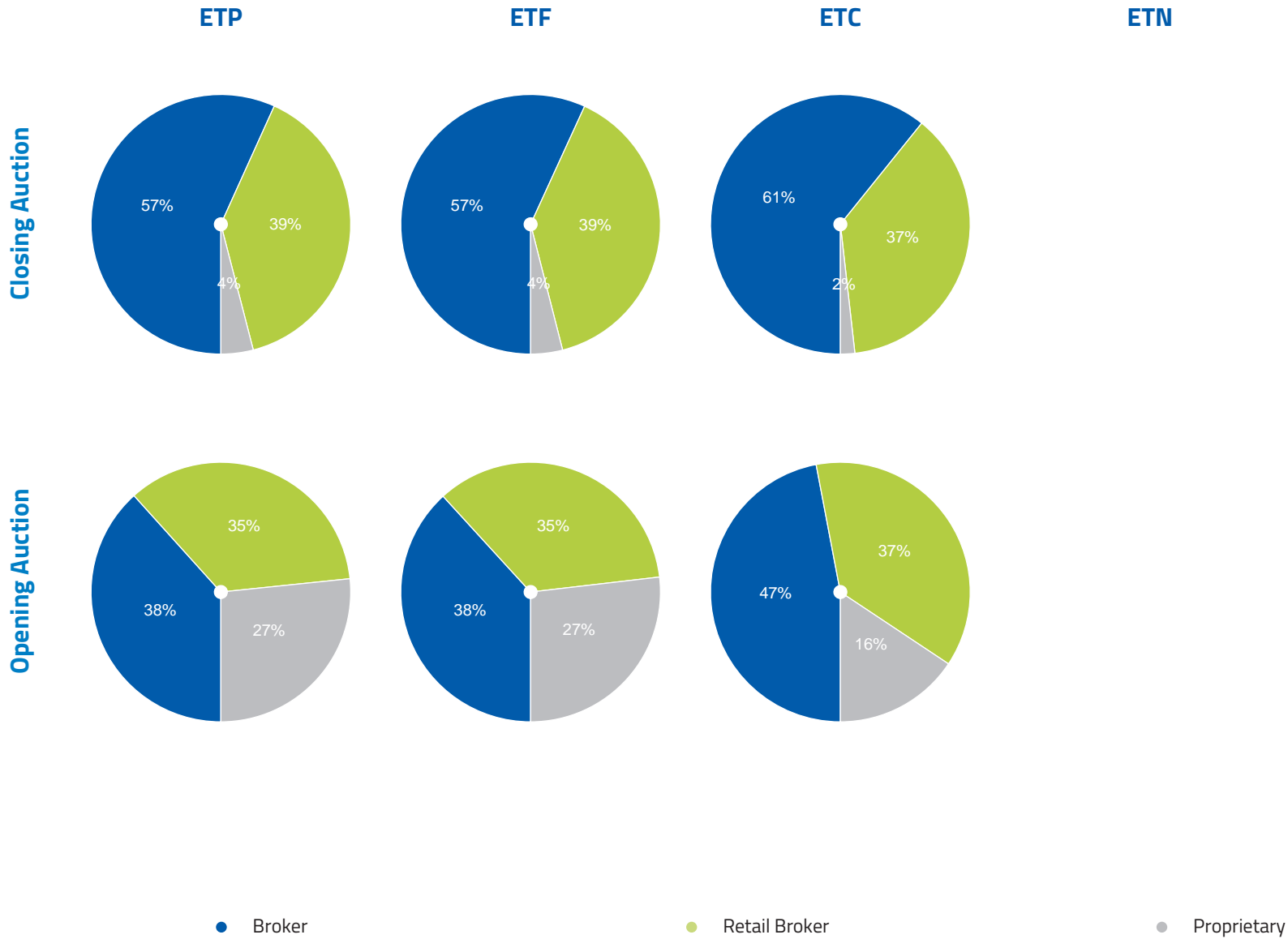
● Proprietary

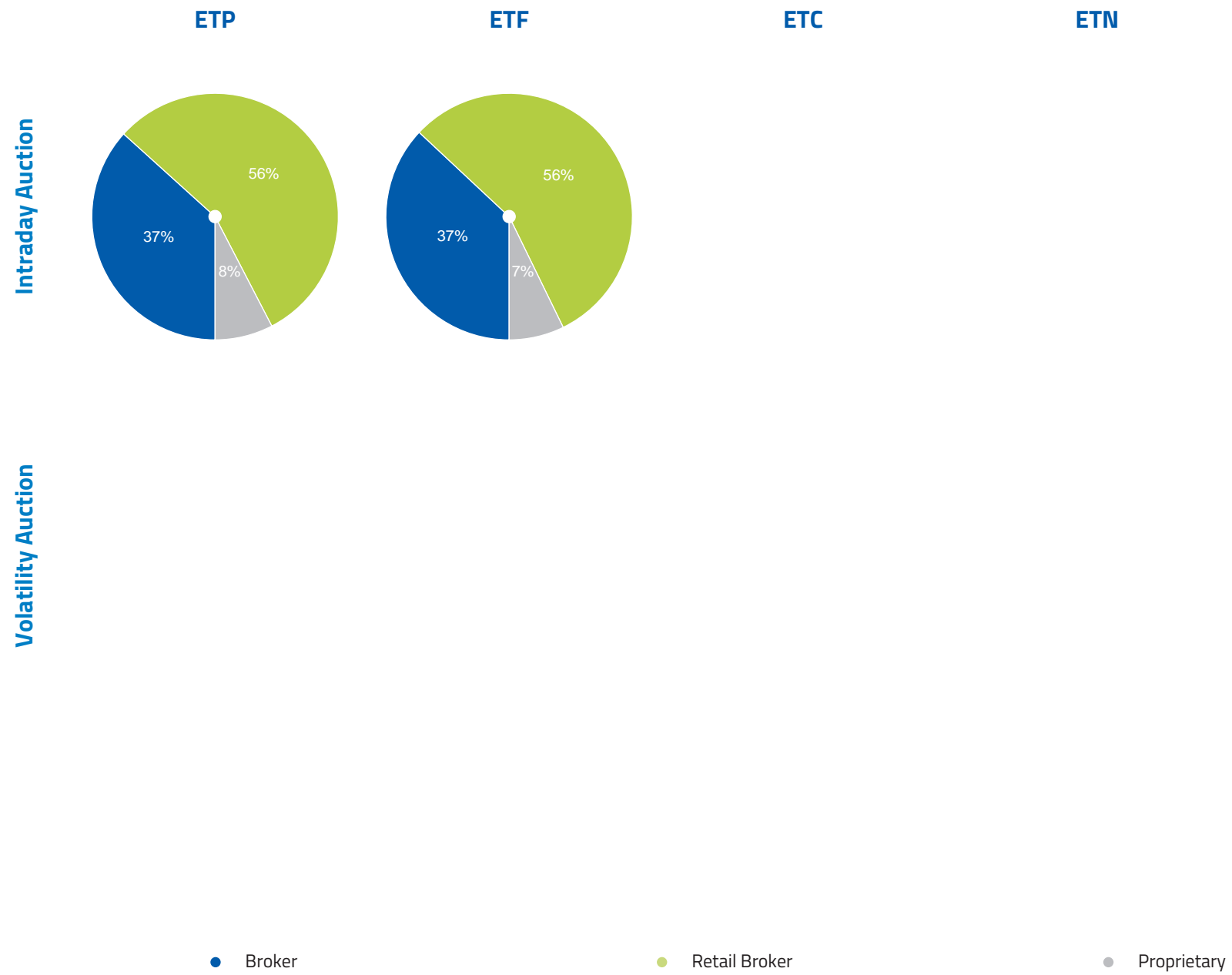
Auctions Equity





Auctions ETP





Trade Size

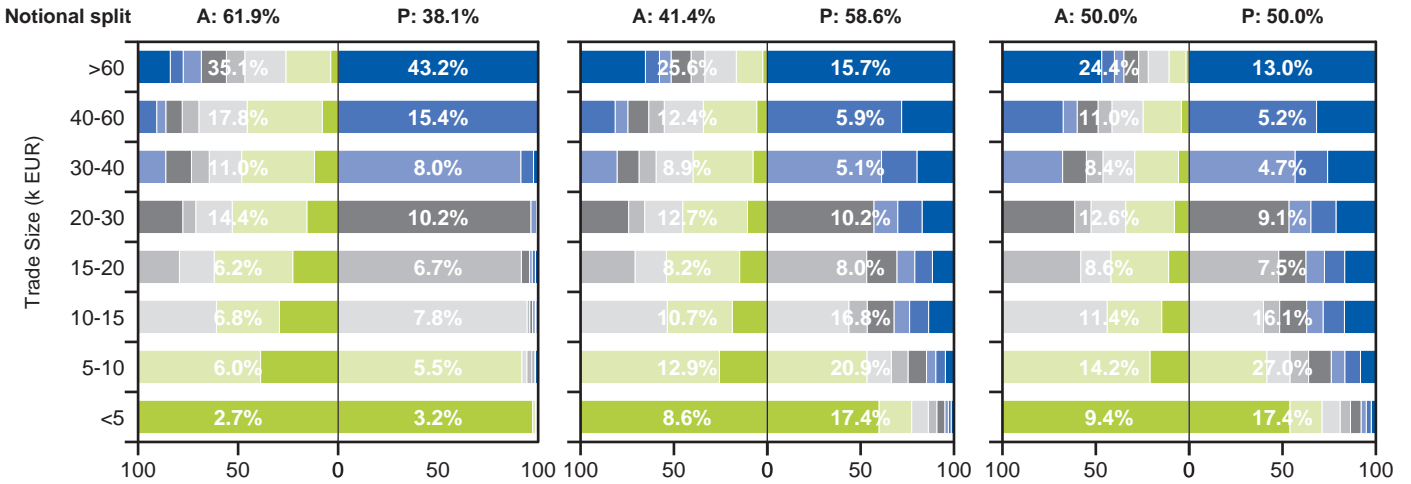
Continuous Trading

Participant

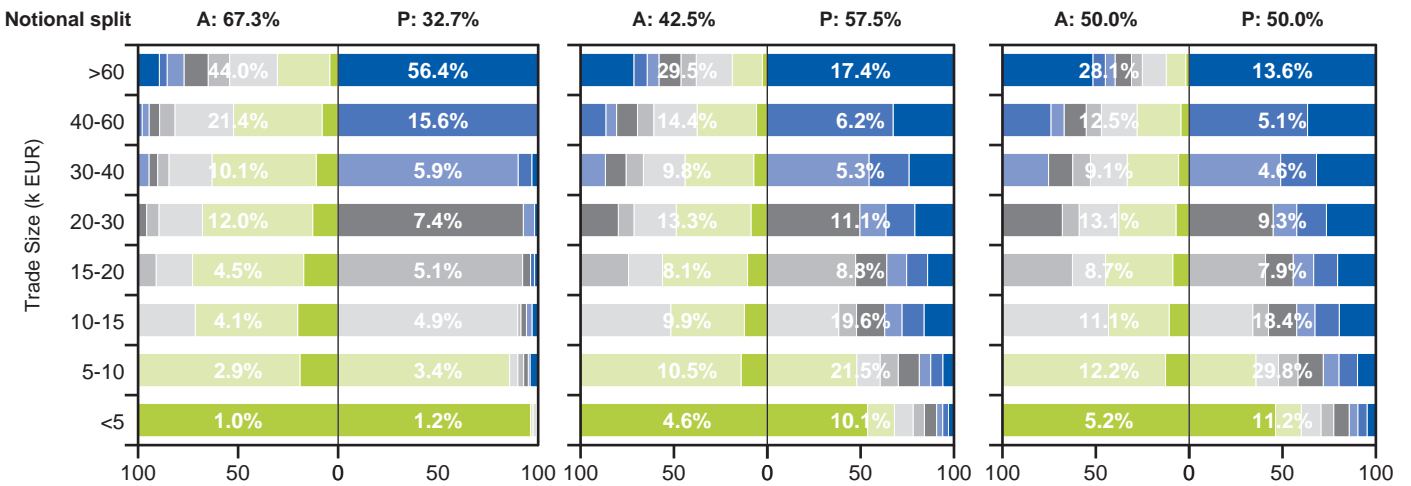
Peer Group

Market

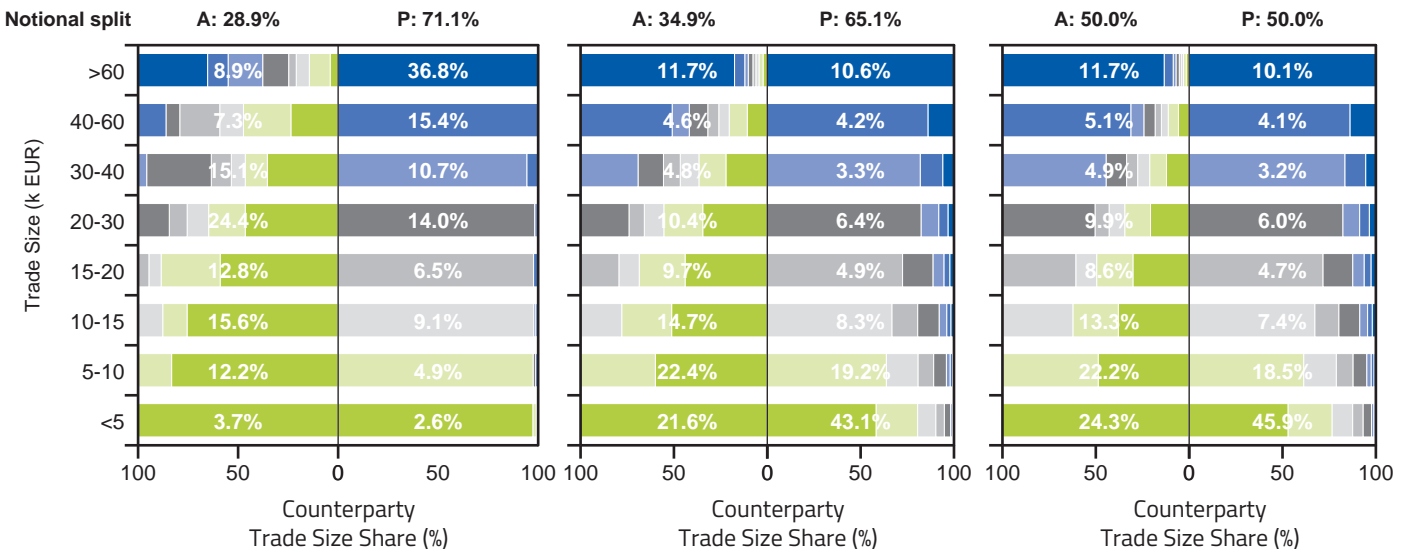
Equity-All



Equity-DAX



Equity-MDAX



Counterparty Trade Size Share (%)

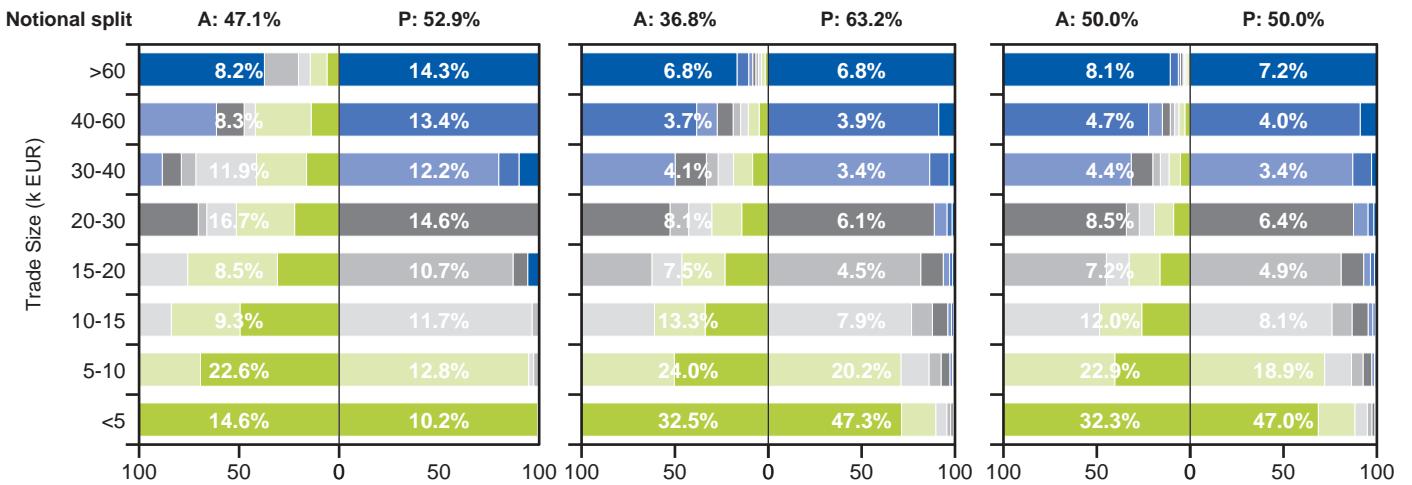
Legend: <5 KEUR (dark green), 5-10 KEUR (light green), 10-15 KEUR (grey), 15-20 KEUR (dark grey), 20-30 KEUR (black), 30-40 KEUR (blue), 40-60 KEUR (dark blue), >60 KEUR (navy)

Participant

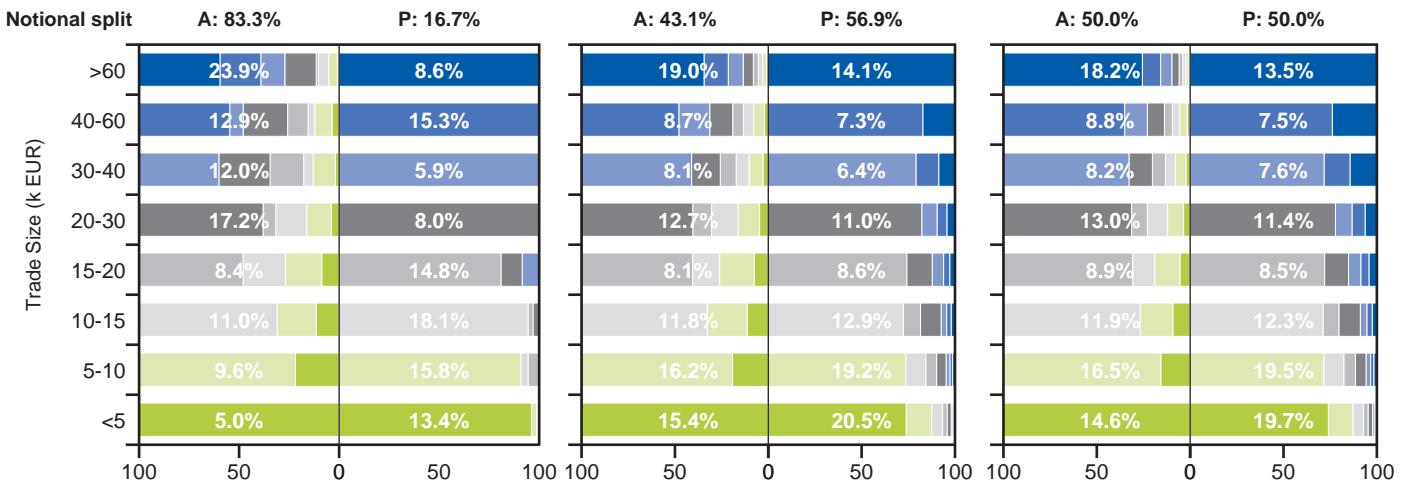
Peer Group

Market

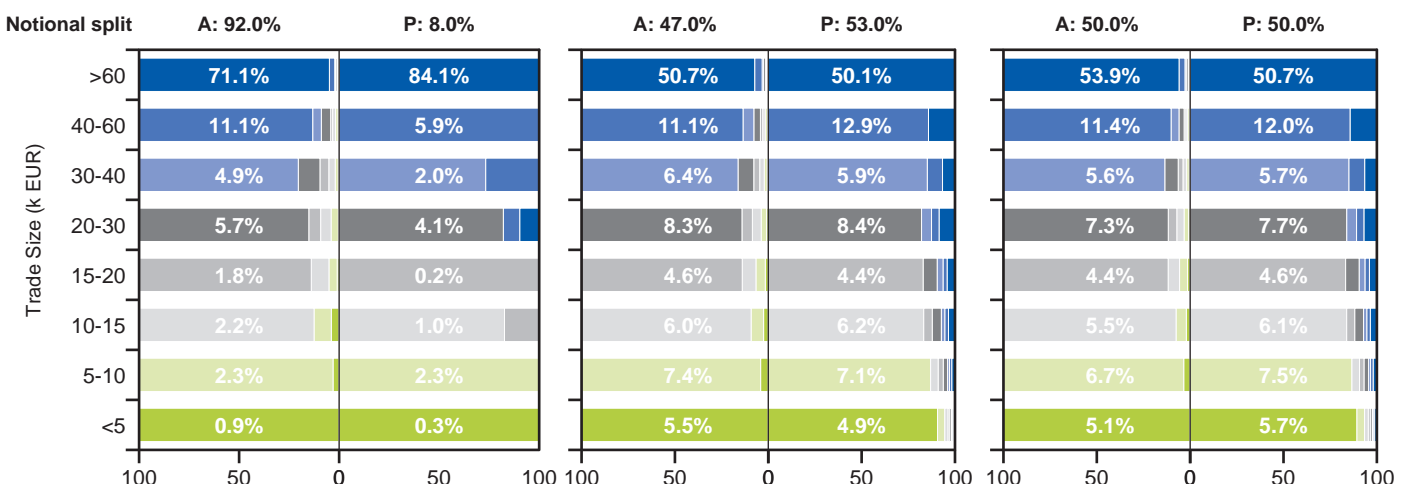
Equity-SDAX



Equity-OTHER



ETP-All

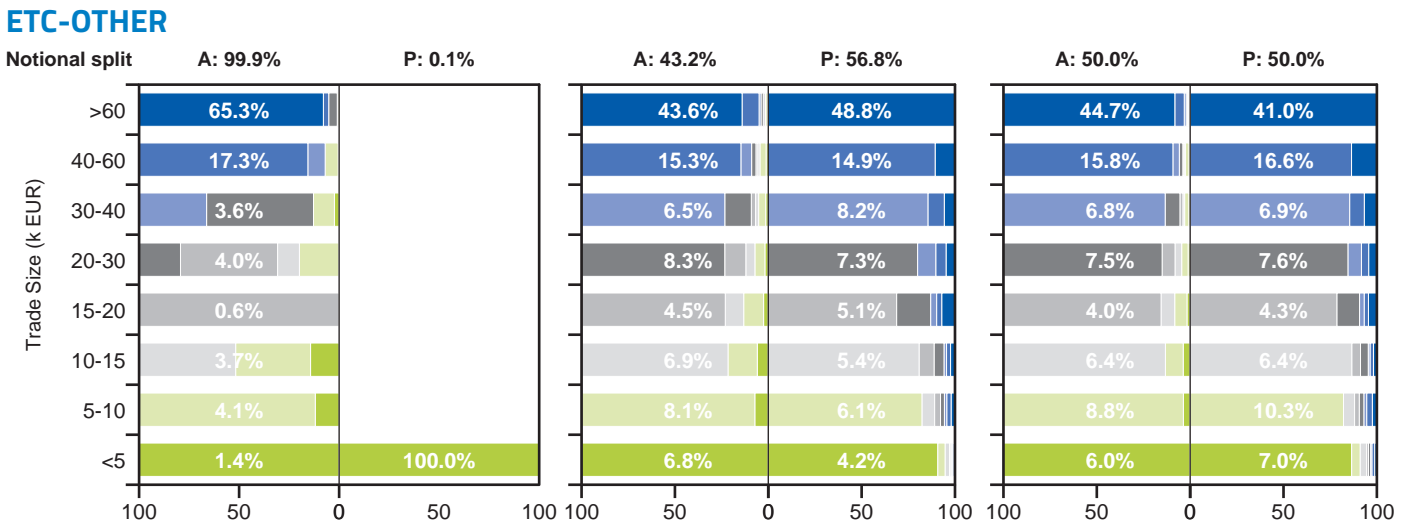
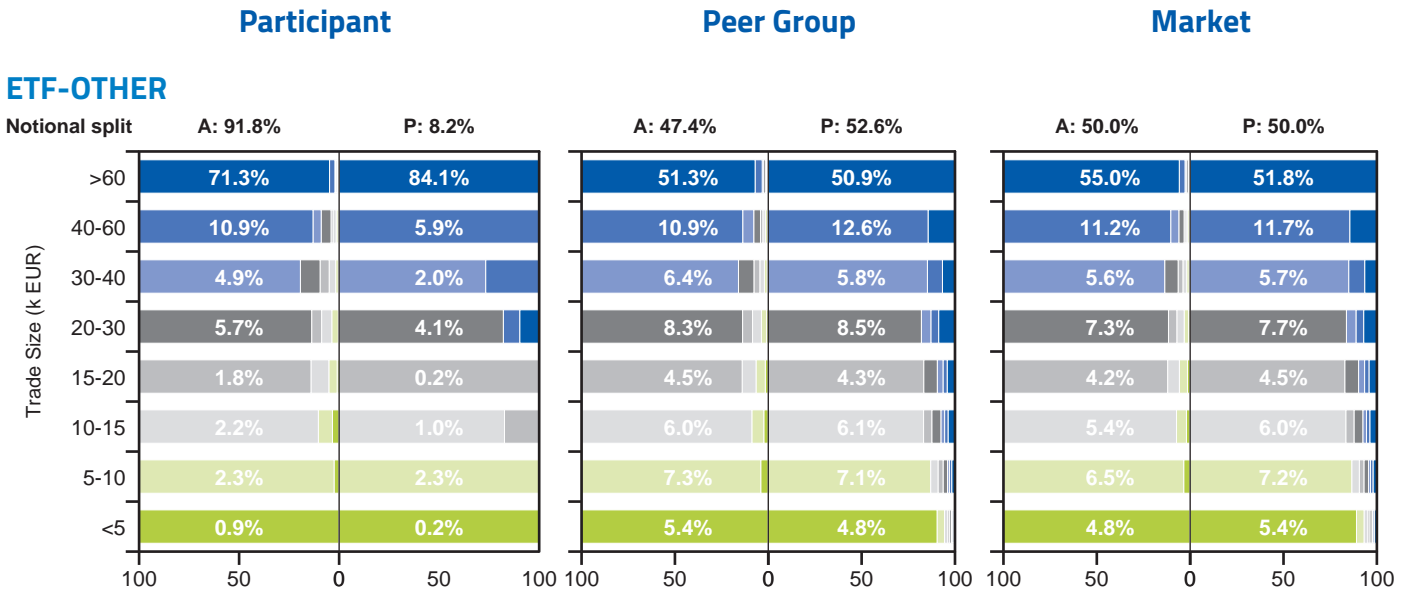


Counterparty Trade Size Share (%)

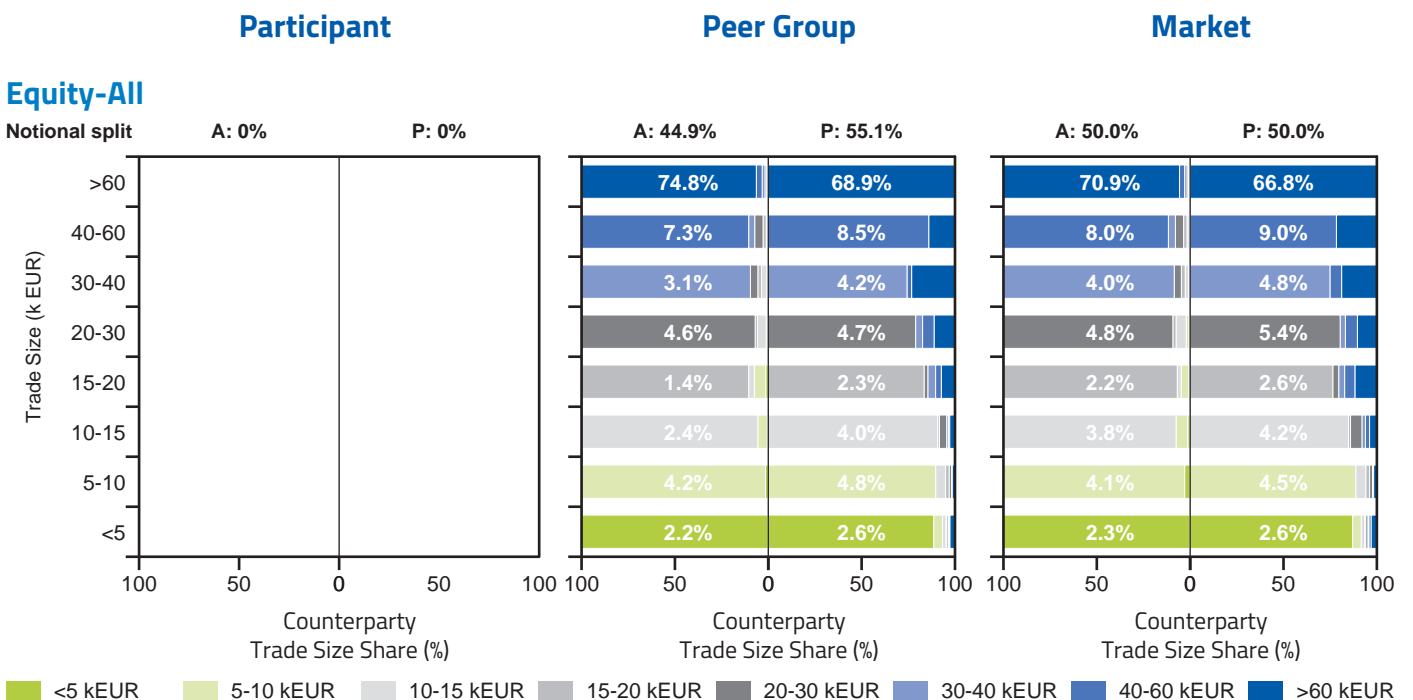
Counterparty Trade Size Share (%)

Counterparty Trade Size Share (%)

Legend: <5 KEUR (dark green), 5-10 KEUR (light green), 10-15 KEUR (grey), 15-20 KEUR (dark grey), 20-30 KEUR (black), 30-40 KEUR (blue), 40-60 KEUR (dark blue), >60 KEUR (navy)



Trade-at-Close

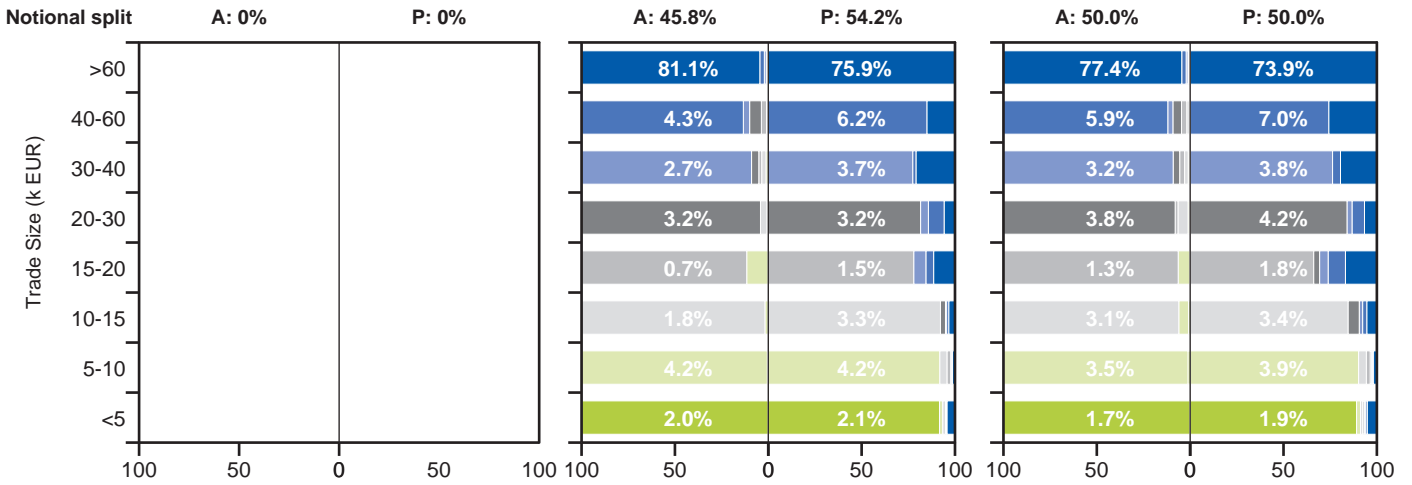


Participant

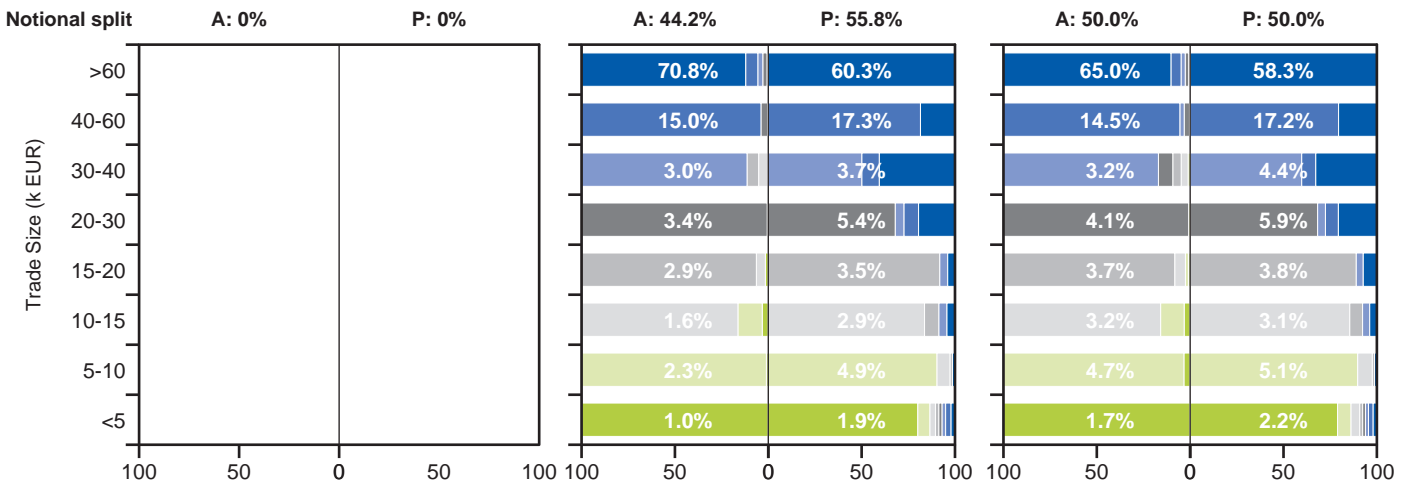
Peer Group

Market

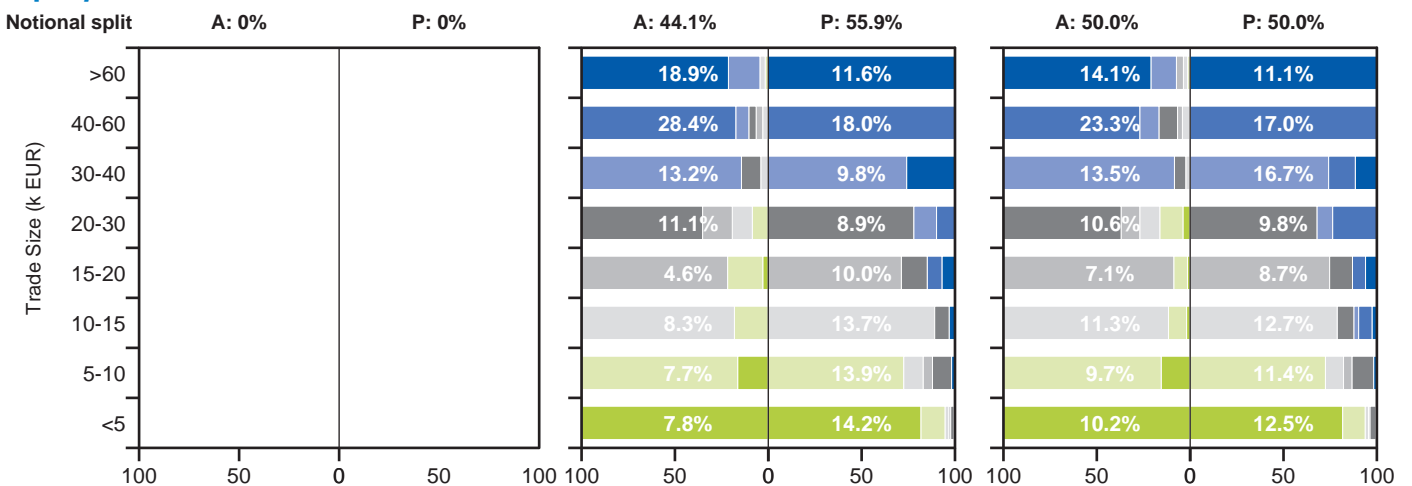
Equity-DAX



Equity-MDAX



Equity-SDAX



Counterparty Trade Size Share (%)

Counterparty Trade Size Share (%)

Counterparty Trade Size Share (%)

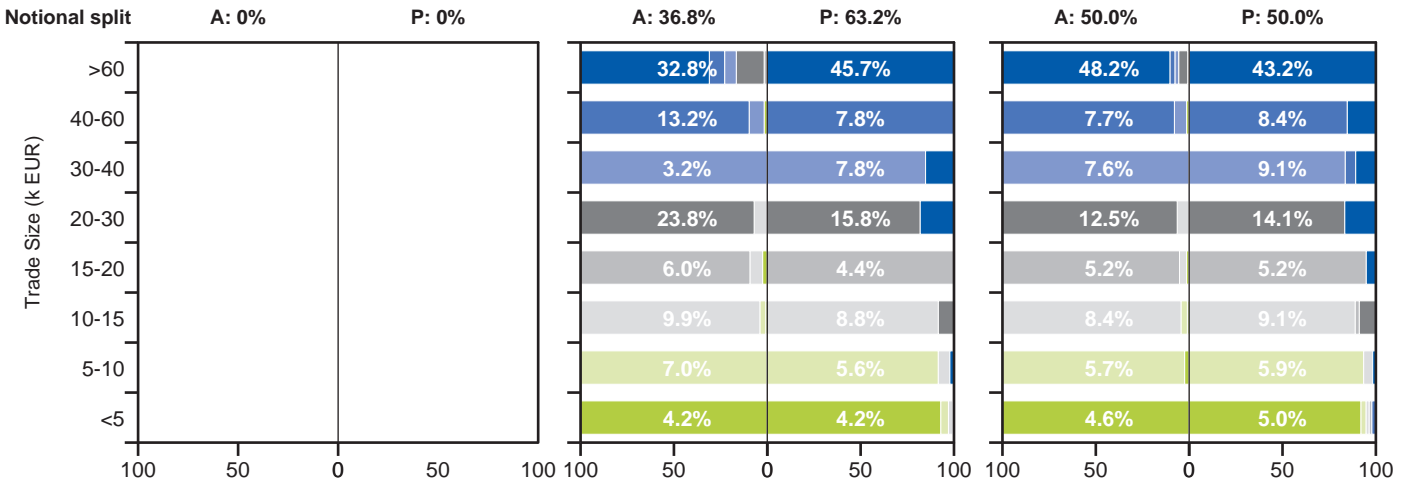
■ <5 KEUR
 ■ 5-10 KEUR
 ■ 10-15 KEUR
 ■ 15-20 KEUR
 ■ 20-30 KEUR
 ■ 30-40 KEUR
 ■ 40-60 KEUR
 ■ >60 KEUR

Participant

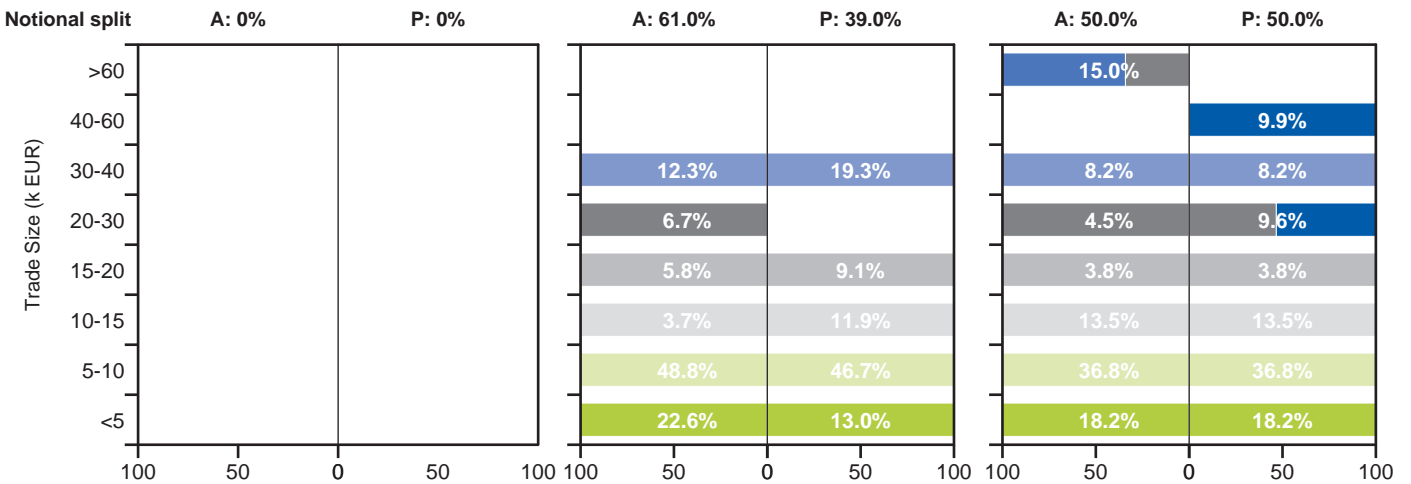
Peer Group

Market

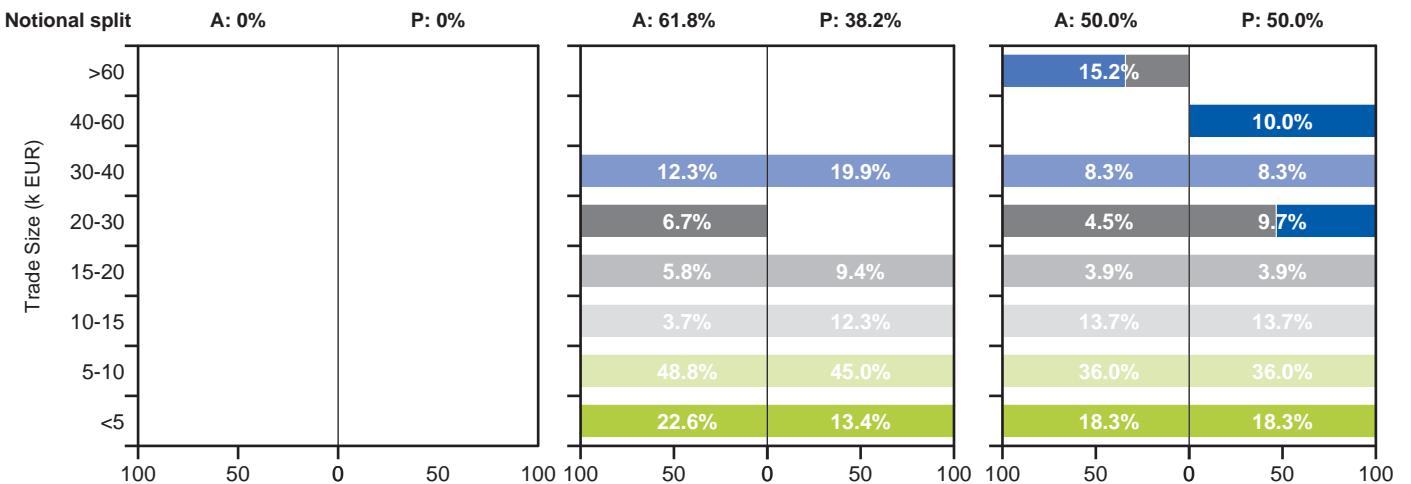
Equity-OTHER



ETP-All



ETF-OTHER



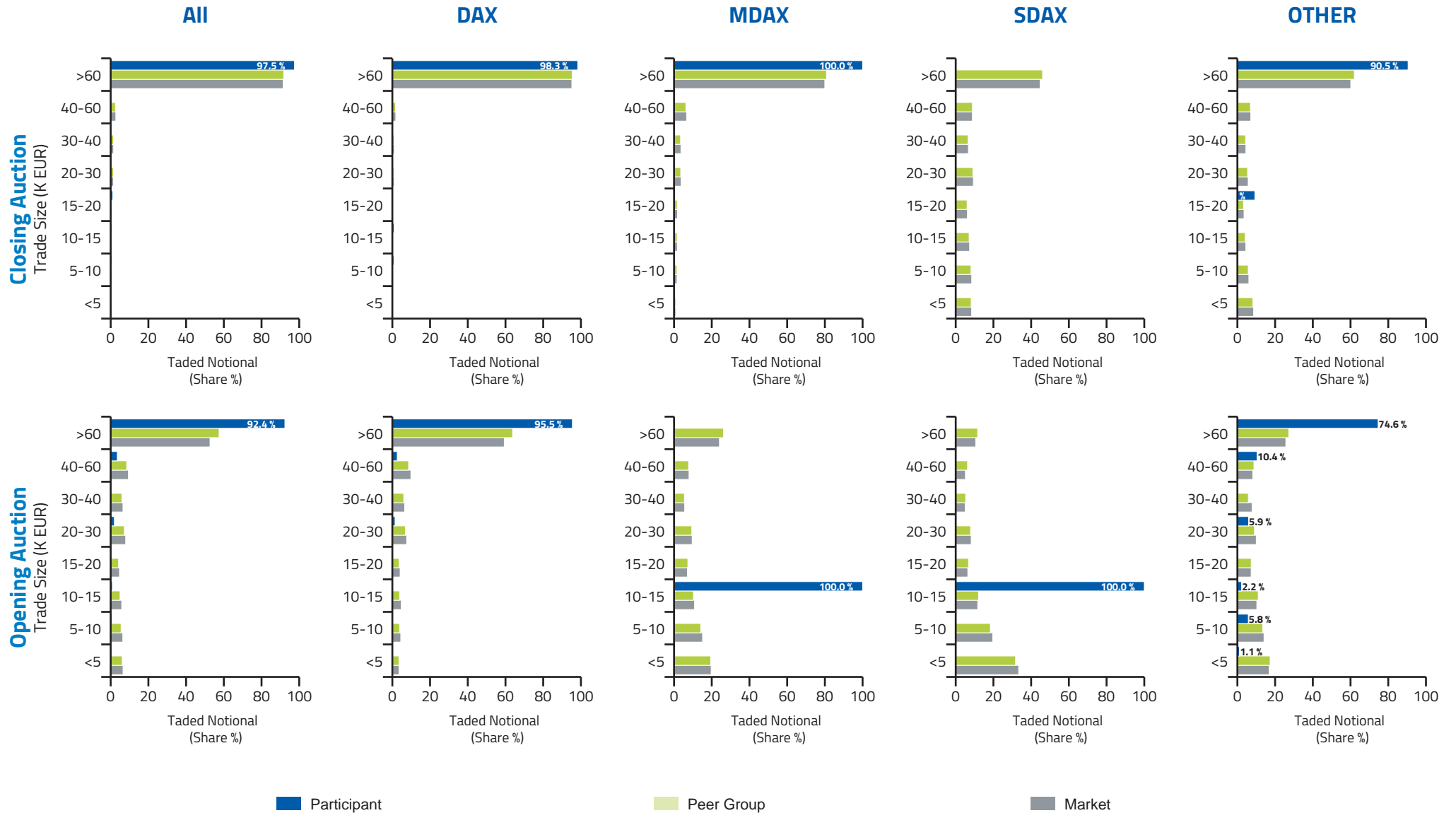
Counterparty Trade Size Share (%)

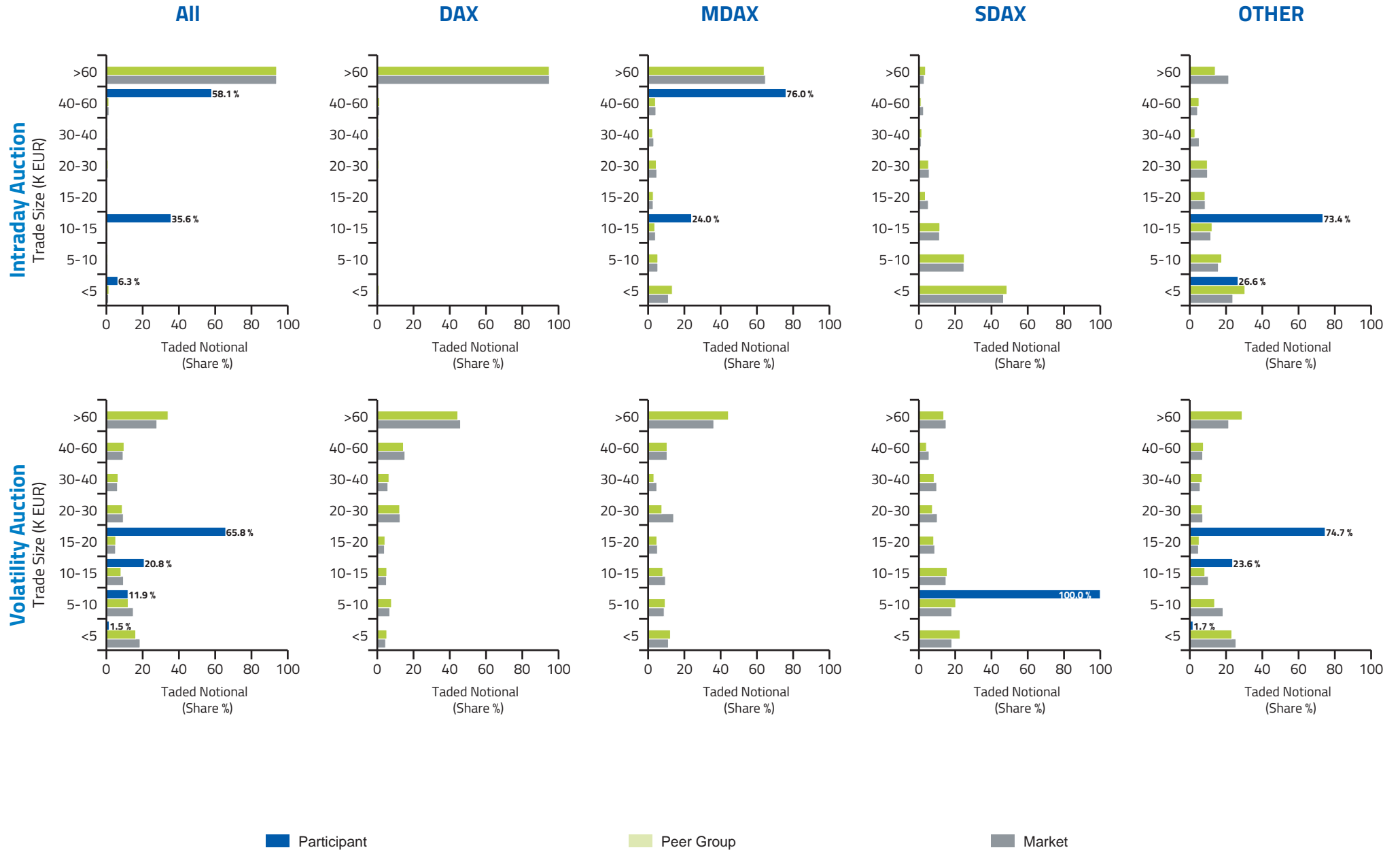
Counterparty Trade Size Share (%)

Counterparty Trade Size Share (%)

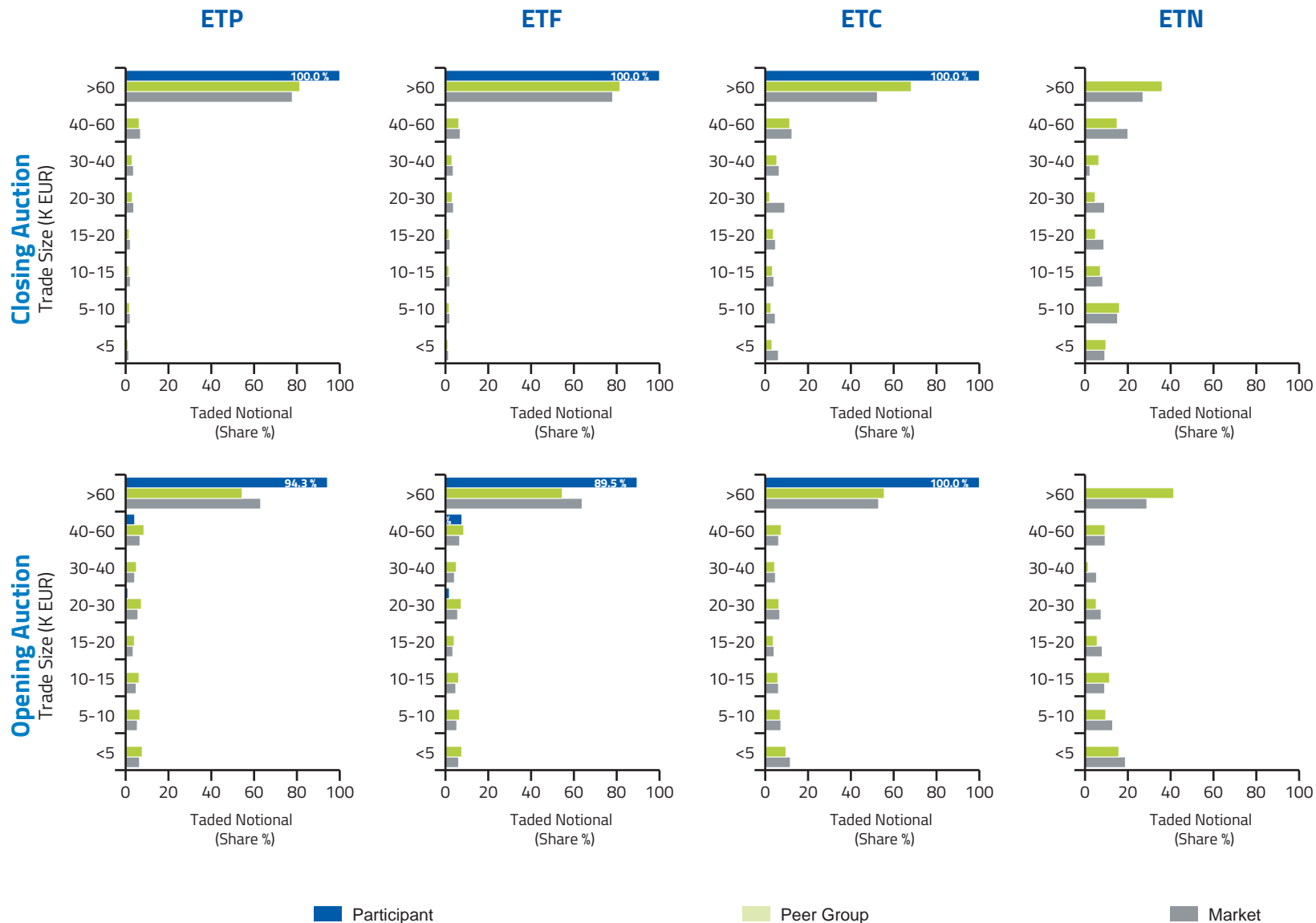
■ <5 kEUR
 ■ 5-10 kEUR
 ■ 10-15 kEUR
 ■ 15-20 kEUR
 ■ 20-30 kEUR
 ■ 30-40 kEUR
 ■ 40-60 kEUR
 ■ >60 kEUR

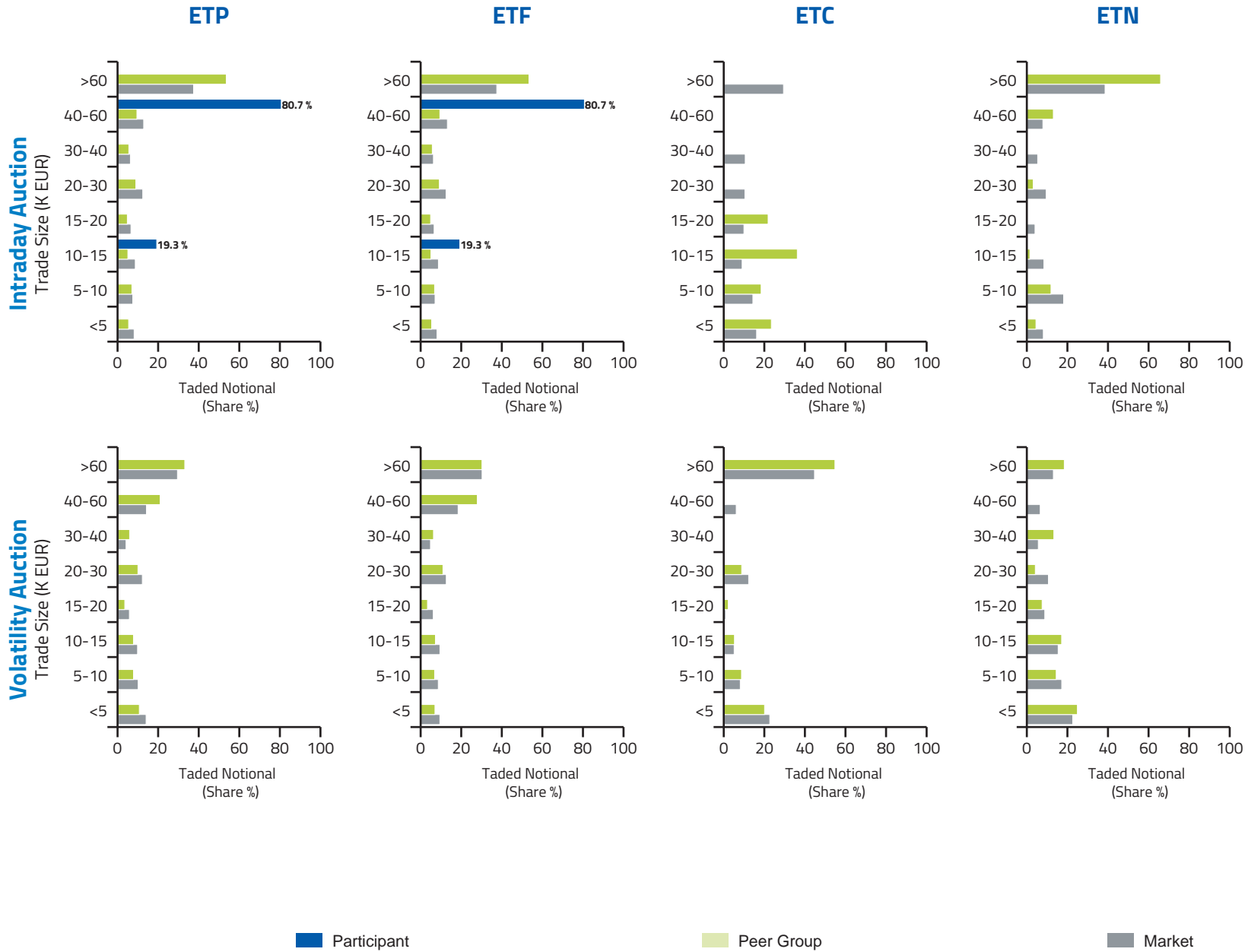
Auctions Equity



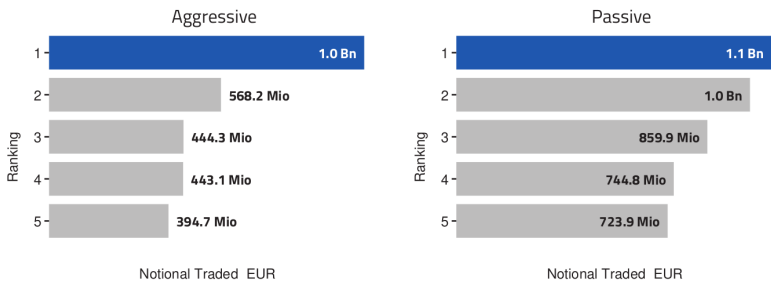
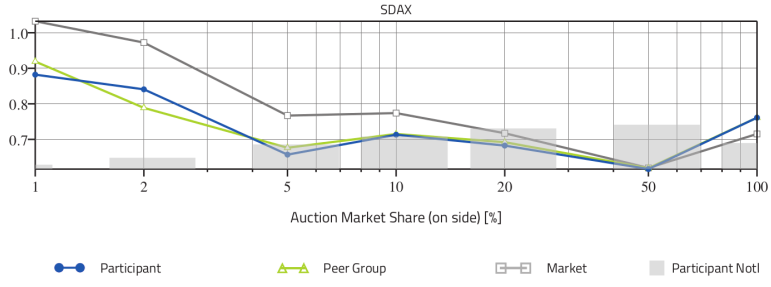


Auctions ETP



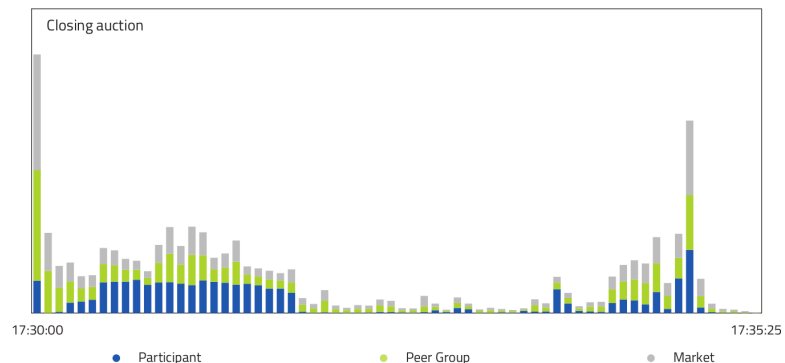


Methodology

KPIs	Methodology																								
<p>Peer Group Ranking Continuous Trading</p>  <table border="1"> <caption>Aggressive Trading Style</caption> <thead> <tr> <th>Ranking</th> <th>Notional Traded EUR</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1.0 Bn</td> </tr> <tr> <td>2</td> <td>568.2 Mio</td> </tr> <tr> <td>3</td> <td>444.3 Mio</td> </tr> <tr> <td>4</td> <td>443.1 Mio</td> </tr> <tr> <td>5</td> <td>394.7 Mio</td> </tr> </tbody> </table> <table border="1"> <caption>Passive Trading Style</caption> <thead> <tr> <th>Ranking</th> <th>Notional Traded EUR</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1.1 Bn</td> </tr> <tr> <td>2</td> <td>1.0 Bn</td> </tr> <tr> <td>3</td> <td>859.9 Mio</td> </tr> <tr> <td>4</td> <td>744.8 Mio</td> </tr> <tr> <td>5</td> <td>723.9 Mio</td> </tr> </tbody> </table>	Ranking	Notional Traded EUR	1	1.0 Bn	2	568.2 Mio	3	444.3 Mio	4	443.1 Mio	5	394.7 Mio	Ranking	Notional Traded EUR	1	1.1 Bn	2	1.0 Bn	3	859.9 Mio	4	744.8 Mio	5	723.9 Mio	<p>The ranked traded notionals of the participant's peer group are depicted within this graph.</p> <p>Reading The Chart</p> <ul style="list-style-type: none"> The participant's traded notional is colored in blue.
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<p>Closing Auction Price Impact</p>  <table border="1"> <caption>Price Impact Data at 10% Auction Market Share</caption> <thead> <tr> <th>Category</th> <th>Price Impact (bps/%)</th> </tr> </thead> <tbody> <tr> <td>Participant</td> <td>0.7</td> </tr> <tr> <td>Peer Group</td> <td>~0.7</td> </tr> <tr> <td>Market</td> <td>~0.8</td> </tr> </tbody> </table>	Category	Price Impact (bps/%)	Participant	0.7	Peer Group	~0.7	Market	~0.8	<p>The Price Impact is calculated as the difference between the Actual Price and the Baseline Price, where:</p> <ul style="list-style-type: none"> - The Actual price represents the official closing price reported by XETRA, which is determined by following the principle of Maximizing Executions. - Baseline: By removing the order of the participant on the side the participant is trading on, the uncrossing price is determined by following the principle of Maximizing Executions. <p>The data is aggregated by weighting the values by the notional traded.</p> <p>The bars reports the distribution of the notional traded by the participant during closing auctions.</p> <p>Reading The Chart</p> <ul style="list-style-type: none"> When the auction market share in one side is of 10% (x-axis), the price impact/market share (bps/%) for the Participant (blue line) is of 0.7, which is similar to the participants Peer Group (green line), but much lower than the one for the participants Market category (grey line). 																
Category	Price Impact (bps/%)																								
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KPIs

DAX40 Auction Traded Order Insert Times



Methodology

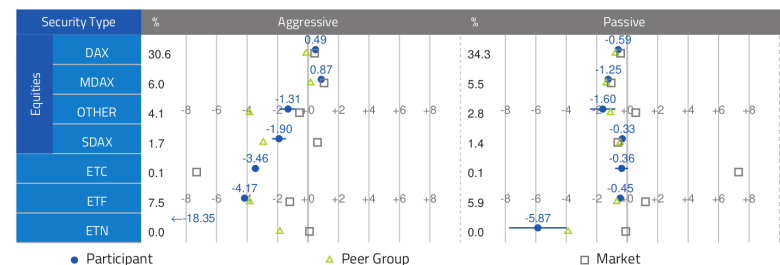
The graph reports the distribution of traded orders inserted during the outcry period.

Filters: Only Dax constituents.

Reading The Chart

- y-axis: Column heights represent density within participant (blue bars), peer group (green bars), market category (gray bars).
- x-axis: Time (Time resolution is 5s).
- The **Participant** (blue bars) insert their orders mainly after 17:30:20 until 17:31:20. The participant's **Peer Group** also insert orders during this time frame, but less than the participant's **Market**.

Continuous Trading Markouts



$$\text{Markout}_{t,p} = \text{Buy}_{t,p} * (\text{Midprice}_{t+10s} - \text{Price}_{t,p})$$

$\text{Buy}_{t,p}$ takes the value of 1 if the trade in t for participant p is a buy order and -1, otherwise.

Midprice_{t+10s} is the last available mid or trade price within 10s interval ahead of the trade.

$\text{Price}_{t,p}$ is the execution price for trade in t for participant p.

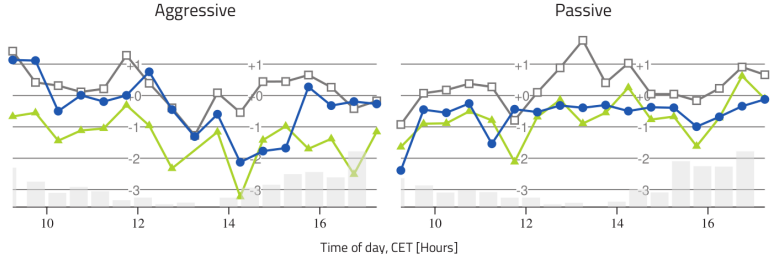
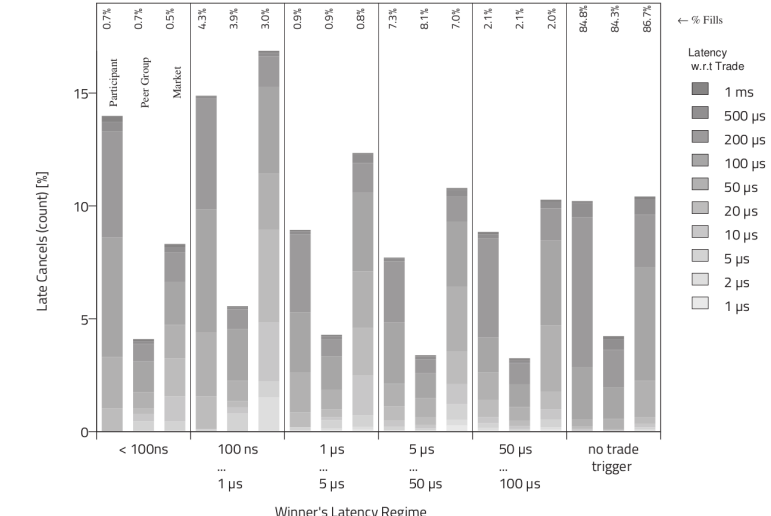
Each trade is weighted based on EUR notional traded.

Percentages are shares of participant's overall traded notional

Note: all values are expressed in basis points.

Reading The Chart

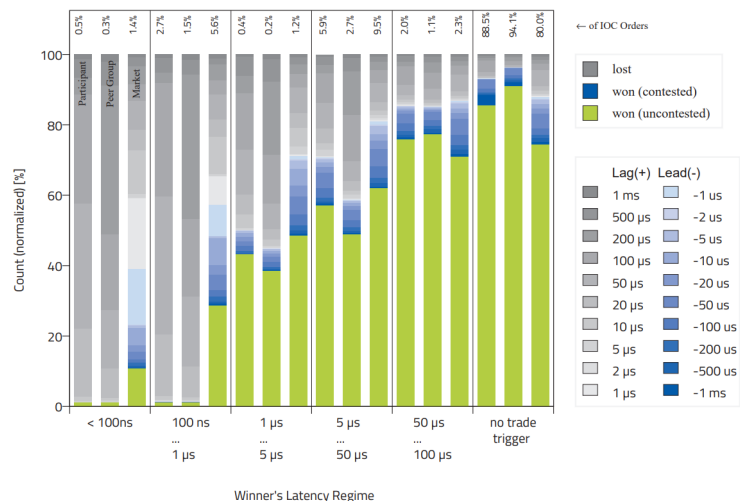
- For DAX constituents and on the aggressive side, the markouts for **Participant** (blue circle) is of **+0.49** bps, which is similar to the ones calculated for the participants **Market** (gray square), but slightly larger than the ones calculated for the participants **Peer Group** (green triangle).

KPIs	Methodology
<p>Continuous Trading Markouts Variations</p> 	<p>The markouts are also plotted reported as a function of:</p> <ul style="list-style-type: none"> • Time of Day. • Pre-Trade Spreads in bps. • Pre-Trade Spreads in Ticks. • Fill Notional. • Order Resting Time. • Markouts by counterparty composition (broker, retail broker and proprietary). • Order Type: Regular, Stop, Iceberg, One Cancel Order and Quote. • Order Type: Market vs. Limit Orders. • Time in force: GFD: Good for Day, GTC: Good till canceled, IOC: Immediate or Cancel, FOK: Fill or Kill, GTX: Good-till-crossing/auction, GTD: Good till Date.
<p>Late Cancels</p> <p>Late Cancel Rate by Race Competitiveness</p> 	<p>The graph sheds light on the % of Late Cancels Passive fills orders during continuous trading.</p> <p>Considering only passive fills orders during continuous trading, it counts the % of orders the participant tried to cancel, however she was too late (the shade of the gray provides information by how slower).</p> <p>The results are reported for different buckets, and for each bucket, the % of passive fills is reported.</p> <p>Filters:</p> <ul style="list-style-type: none"> - Passive fills during continuous trading. - Consider cancel requests within 1 ms after last fill. - Only cancel requests submitted through HF session. - Ignore cancel requests after partial fills - only noop cancel requests. - Only cancel requests for orders (quote inactivation or update requests are not treated as cancel requests). - Failed modify requests for fully filled orders not included. <p>Latency regime based on t9d HPT timestamp of most recent previous trade (XEUR or XETR) and t3a of winner.</p> <p>Reading The Chart</p> <ul style="list-style-type: none"> • The left bucket: <100ns: the winner must have had less than 100ns reaction time, while the bucket on the right: no trigger: there was no trade triggering the reaction of participants to trade. • For the bucket: <100ns: approximately 14% of Participant's fill orders were late cancels and the passive fills represented 0.7%. Approximately 4% of participants Peer Group's fill orders were late cancels and the passive fills represented 0.7%. • For the bucket: <1µs: approximately 9% of Participant's fill orders were late cancels and the passive fills represented 0.9%. Approximately 5% of participants Peer Groups's fill orders were late cancels and the passive fills represented 0.9%.

KPIs

IOC Misses

IOC Miss Rate by Race Competitiveness



Methodology

Decomposing missed IOCs by the Winner's Latency Regime.

Classification of an IOC: Take a trade and check the sequence of trades occurring within 1-millisecond window. Based on the previous, IOCs are classified as:

- Won (uncontested): no competitors are targeting the same volume (green bars).
- Won (contested): there are other competitors targeting the same volume, however, the participant had a faster reaction time and the shade of the blue provides information by how faster.
- Lost: IOC was unsuccessful and the shade of the gray bars provides information by how slower it was the reaction time of the participant in contrast to the competitors.

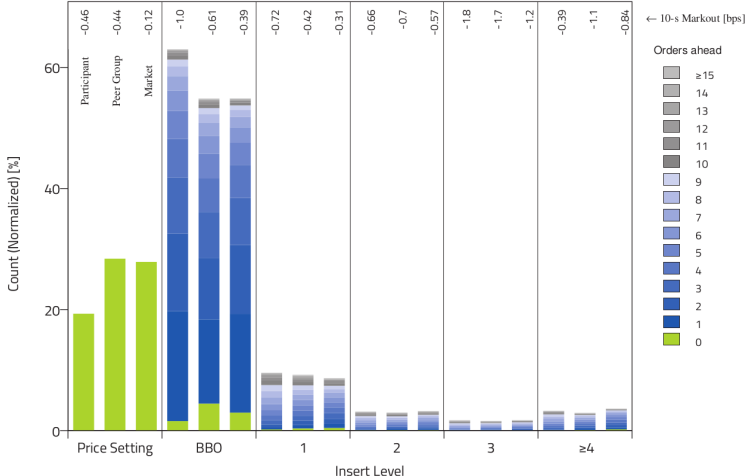
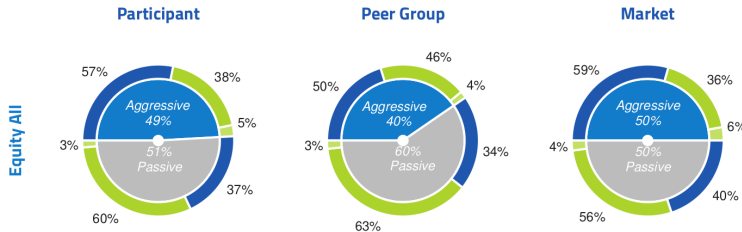
The percentages on the top of the chart are the percentages of IOCs orders within this competitiveness bucket.

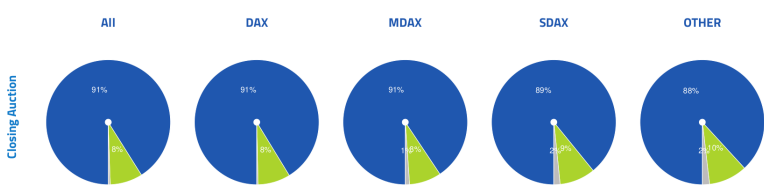
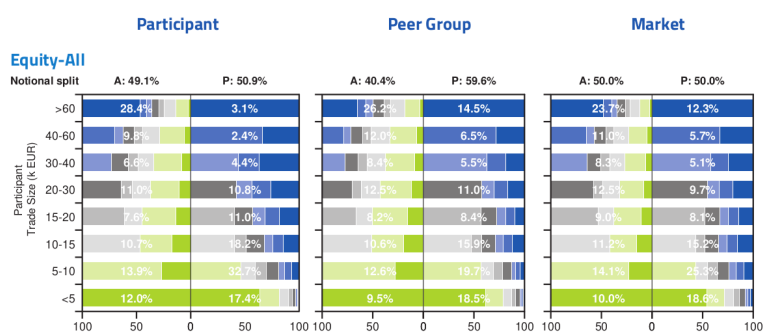
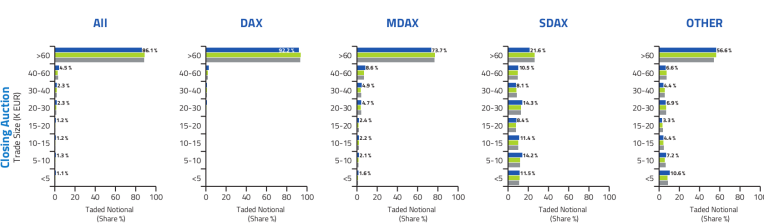
The IOCs are calculated for: all trades from IOC orders and only the fastest order of each participant is considered within each trading bucket.

The IOCs of the participant (left bar) are benchmarked against the peer group (middle bar) and the market (right bar).

Reading The Chart

- The left bucket: <100ns: the winner must have had less than 100ns reaction time, while the bucket on the right: no trade trigger: there was no trade triggering the reaction of participants to trade.
- For the bucket: <100ns: approximately **1%** of **Participant's** IOCs won (contested), while the rest of **Participant's** IOCs lost. These figures are very similar to the ones registered by the participant's **Peer Group's**.
- For the bucket: <1μs (the winner must have had less than 1μ reaction time): approximately **50%** of **Participant's** IOCs won (45% were uncontested and 5% contested), and the rest of **Participant's** IOCs lost. For the participant's **Peer Group's**, less than **45%** won (5% were uncontested and 40% contested), while the rest lost.

KPIs	Methodology
<p data-bbox="91 240 259 268">Queue Position</p> <p data-bbox="91 300 613 327">Distribution of Insert Levels and Queue Positions</p>  <p data-bbox="91 858 573 885">Counterparty Composition Continuous Trading</p> 	<p data-bbox="925 196 1070 223">Methodology</p> <p data-bbox="925 240 1816 268">The graph reports the distribution of passive fills depending on the initial queue position:</p> <ul data-bbox="925 284 2083 422" style="list-style-type: none"> - Price setting orders: those orders improving the BBO (green bars). - BBO - the orders joining the queue at BBO (blue bars), or joining the BBO with 0 orders ahead (iceberg peak refills) (green bars). - The breakdown is also provided, separately for orders joining the levels 1, 2, 3, and for levels ≥ 4. <p data-bbox="925 438 2134 494">On top of the charts, for each group, the 10-s Markouts [bps] are reported, which are calculated as Midpoint after T+10s vs trade price (for more details, see section: Continuous Trading Markouts).</p> <p data-bbox="925 510 2101 590">The distribution of passive fills is calculated for: DAX, MDAX, SDAX constituents. It considers only orders inserted and filled during current day's continuous trading phase and orders ahead at the time of order insert on the order's price level.</p> <p data-bbox="925 606 2105 662">The distribution of passive fills of the participant (left bar) is benchmarked against the peer group (middle bar) and the market (right bar).</p> <p data-bbox="925 678 1120 705">Reading The Chart</p> <ul data-bbox="925 721 2134 837" style="list-style-type: none"> • Around 19% of the Participant's fills were price setting orders, with a markout of -0.46, while more than 60% were at the BBO, with a markout of -1.0. • Around 30% of the participant's Peer Group's fills were price setting orders, with a markout of -0.44, while around 55% were at the BBO, with a markout of -0.61.
	<p data-bbox="925 861 2134 917">For each trade all trade legs are decomposed and assigned the corresponding Peer Group based on the participant(s) the trade was executed against.</p> <p data-bbox="925 933 2105 989">For aggressive trades the decomposition of filled orders on the passive side is considered. For passive trades only the respective participant's notional that was executed against the aggressive trade is considered.</p> <p data-bbox="925 1005 1120 1032">Reading The Chart</p> <ul data-bbox="925 1048 2121 1165" style="list-style-type: none"> • [49%] of the Participant's traded notional were aggressive trades. Of which 57%, 38% and 5% was traded against Broker, Proprietary and Retail Broker respectively. • [60%] of the participant's Peer Group's traded notional were passive trades. Of which 34%, 63% and 3% was traded against Broker, Proprietary and Retail Broker respectively.

KPIs	Methodology
<p>Counterparty Composition Auctions</p> <p>Auctions Equity</p> 	<p>Auction counterparty composition figures represent the pro-rata of matched volume in the auction and as such they can be seen as market shares of the respective peer groups during the auction.</p> <p>Auction breakdowns are only shown for the auction where the participant executed any traded volume.</p> <p>Reading The Chart</p> <ul style="list-style-type: none"> 91%, 8%, and <1% of the total auction traded notional was executed by Broker, Proprietary and Retail Broker respectively for the Closing Auction on the DAX constituents.
<p>Trade Size</p> 	<p>The y-axis represents the groupings of trade size buckets [x]. The grouping is done for both, the aggressive [A] and passive [P] side, where for the passive side we categorise according to the limit order size.</p> <p>The color coded breakdowns provide an insight into the decomposition of the respective breakdown of matched notional by the same trade size bucket categorisation.</p> <p>The centered percentage numbers on the bars indicate the relative traded notional in that bucket. E.g. 12.0% of all aggressive trade notional was executed within the traded notional bucket <5k EUR for the Participant.</p> <p>Reading The Chart</p> <ul style="list-style-type: none"> The split in the horizontal bars indicates the relative counterparty trade size category notional that this trade size category[x] was matched with. For the aggressive [A] side this means the composition of limit order sizes (notional) that the aggressive trade in bucket [x] was matched with. For the passive [P] side this represents the composition of aggressive order sizes (notional) that the passive limit order according to bucket [x] was matched against.
<p>Trade Size Auctions</p> <p>Auctions Equity</p> 	<p>The y-axis represents the groupings of trade size buckets [x] originating from the <i>Participant, Peer Group</i> and <i>Market</i>.</p> <p>The 3 horizontal bars denote the relative share of overall traded notional to each [x] for <i>Participant, Peer Group</i> and <i>Market</i>.</p> <p>Reading The Chart</p> <ul style="list-style-type: none"> For the Closing Auction across the DAX constituents, 92.2% of the participant's traded notional was executed through trades with size >60k EUR.

Glossary

Trading Notionals: This defines the traded notional in EUR.

Side: Side corresponds to the side of the trade.

Trading Phase: Trading Phase is comprised of Continuous Trading, Trade-At-Close, Opening-, Intraday-, Volatility- and Closing Auction.

A/P Share: Share of Aggressive and Passive trading notional of total trading notional under the respective **Trading Phase**.

Rank: The participant's rank among the peer group.

Peer Group: The pool of participants that are assigned to the participant's peer group, including the participant.

Aggressive: The side of the trade. Equal to the taker side.

Passive: The side of the trade. Equal to the maker side.

Herausgeber

Deutsche Börse Market Data + Services
mds.deutsche-boerse.com
name.surname@deutsche-boerse.com
+49 69 2110

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