THE 2018 ALGORITHMIC TRADING SURVEY

LONG-ONLY

The new algo landscape

The arrival of MiFID II has shaken up the capital markets and algorithmic trading is no exception. The 2018 algo survey provides a glimpse into where long-only buy-side firms are setting their priorities in the early days of the new regulatory landscape.

Last year's algo survey found an industry in fluctuation ahead of the impending arrival of MiFID II, as long-only buy-side firms were deep in preparation for the new regulatory landscape, prioritising execution quality, market impact and anonymity as key requirements from their algo providers.

The scrutiny on algorithmic trading standards from regulators is only set to increase now that MiFID II has finally come into effect throughout the European markets. UK watchdog the Financial Conduct Authority (FCA) and the Bank of England's Prudential Regulation Authority (PRA) made a joint call in mid-February for financial institutions to increase awareness and

"With further elements of MiFID II still to be enforced, algo strategies will be heavily informed by the early stages of the new trading landscape, as will commercial relationships"

safety controls regarding the use of algorithms, as well as creating senior roles to take direct responsibility for algorithmic trading.

Much of this was already part of the changes under MiFID II, but it's a clear warning to the markets that

algorithmic trading will continue to occupy a spotlight for regulators going forward. The 2018 algo survey, conducted in the early days of the new regulatory regime, depicts the higher levels of scrutiny long-only firms are now applying across the board when it comes to algorithmic execution capabilities and options.

While it will be too early for the buy-side to make definitive judgements on the services provided by their brokers, trends are already beginning to emerge as to where long-only firms will be specifically questioning algorithmic capabilities. With further elements of MiFID II still to be enforced, algo strategies will be heavily informed by the early stages of the new trading landscape, as will commercial relationships.

This critical approach is evident in the scores provided by this year's long-only firms, shown in Figure 1 alongside ratings for the previous
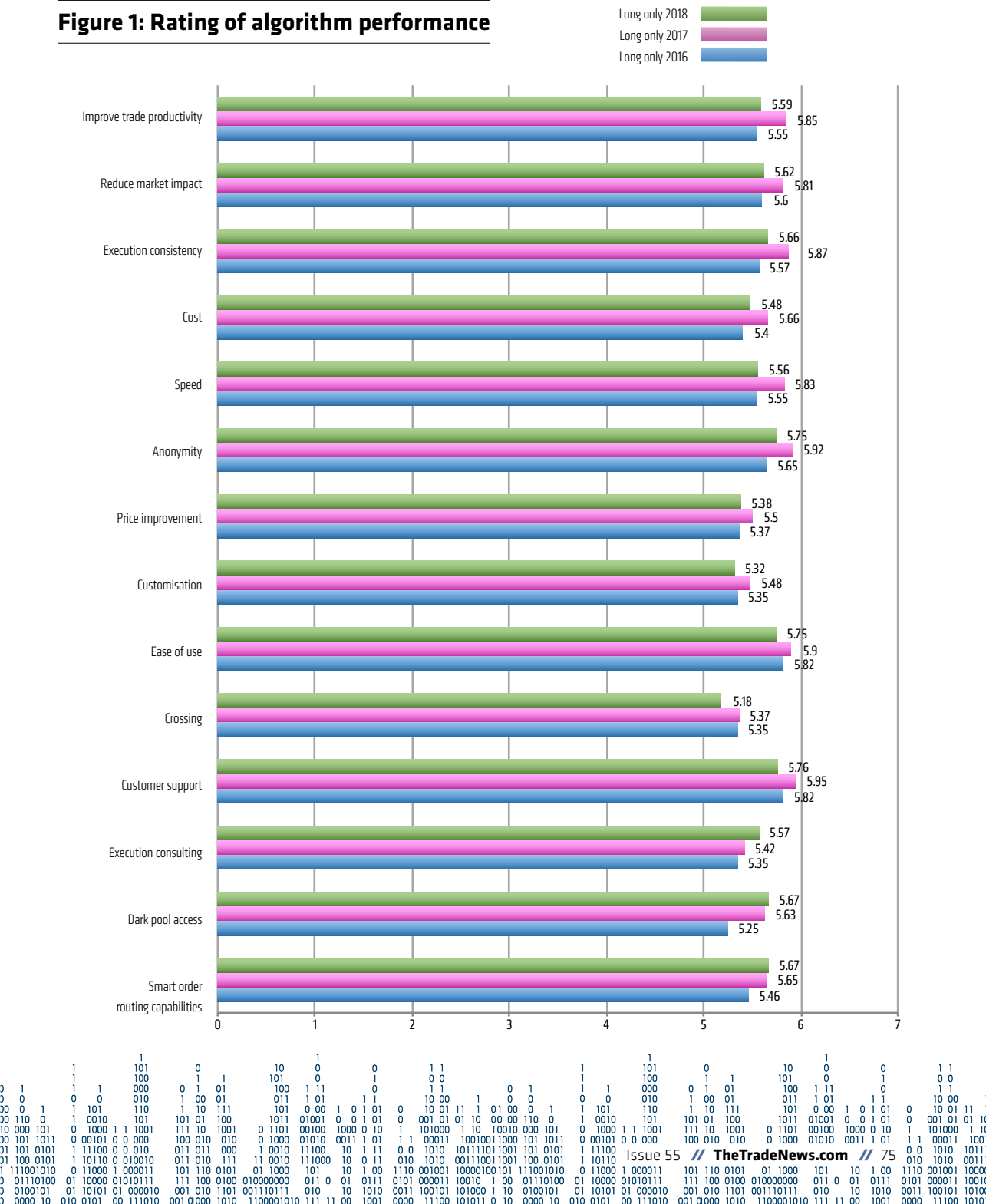
Figure 1: Rating of algorithm performance

Long only 2018
Long only 2017
Long only 2016

Category	2018	2017	2016
Improve trade productivity	5.59	5.85	5.55
Reduce market impact	5.62	5.81	5.6
Execution consistency	5.66	5.87	5.57
Cost	5.48	5.66	5.4
Speed	5.56	5.83	5.55
Anonymity	5.75	5.92	5.65
Price improvement	5.38	5.5	5.37
Customisation	5.32	5.48	5.35
Ease of use	5.75	5.9	5.82
Crossing	5.18	5.37	5.35
Customer support	5.76	5.95	5.82
Execution consulting	5.57	5.42	5.35
Dark pool access	5.67	5.63	5.25
Smart order routing capabilities	5.67	5.65	5.46

Figure 2: Reasons for using algorithms (% of responses)

Legend:
- Long only 2018 (green)
- Long only 2017 (magenta)
- Long only 2016 (blue)

Reason	Long only 2018	Long only 2017	Long only 2016
Better prices (price improvement)	7.78	8.91	7.5
Consistency of execution performance	13.69	12.68	10
Customisation of capabilities	7.74	7.05	5.2
Ease of use	14.57	12.39	9.2
Greater anonymity	9.18	10.75	11.9
Higher speed, lower latency	7.9	6.27	4.8
Increase trader productivity	11.29	12.32	8.4
Internal crossing	4.67	6.69	4.4
Lower commission rates	7.98	7.27	5.2
Reduce market impact	11.93	13	11.8
Results match pretrade estimates	3.27	2.67	0.3

Figure 3: Average number of providers used by AUM

Long only 2018
Long only 2017
Long only 2016

AUM	Long only 2018	Long only 2017	Long only 2016
Not answered	2.87	1.77	3.49
Up to $0.25 billion	2.5	1.53	3.51
$.02 5- 0.5 billion	2.17	2.26	1.12
$0.5 - 1 billion	2.5	1.43	3.13
$1 - 10 billion	3.64	3.53	4.32
$10 - 50 billion	4.26	3.81	3.75
More than $50 billion	4.41	3.51	5.09

two years. Overall the average score was a respectable 5.57, which despite falling from last year's average of 5.7, is consistent with 2016's results, a trend which can be seen across most of the categories under evaluation. The highest score was achieved in the customer support category this year with 5.76, hardly surprising given the increasing level of ongoing assistance brokers and algo providers must now provide to their asset management clients both pre-and post-adoption. Clearly the sell-side has been delivering on these demands in the run-up to MiFID II.

"Brokers will continue to assess where they are generating revenues from their buy-side clients, but in the new trading environment, the balance of power seems to reside with the asset managers."

Along similar lines there were high scores for the quality of execution consulting and dark pool access. Consulting may have become something of a dirty word on the buy-side as a result of the work required ahead of MiFID II's arrival, but its role in driving algo understanding and implementation, particularly when it comes to achieving best execution, seems to have been acknowledged by the survey's respondents. Trading in the dark has also been a hot topic within

the context of the new regulations and its importance is clearly being recognised as the scoring suggests, having increased for the past three years. However, the extent to which the impact of the double volume caps (DVCs) will affect the use of algos specifically for off-exchange trading remains to be seen.

Faster, better, simpler

Long-only firms have clearly put down a marker as to where their priorities lie when it comes to adopting and using algos, as can be seen in Figure 2, which shows some interesting new trends. Clearly there is increasing desire in the post-MiFID II landscape for algos that provide greater consistency of execution performance, improve trader performance and are, quite simply, easier to use. The three areas scored well with respondents to this question, particularly the ease of use factor, which accounted for 14.57% of response and has increased by over half since 2016's survey.

The importance of improving trader productivity and reducing market impact may have dropped year-on-year, but neither factor displayed a significant decrease

and remain top priorities for long-only firms. Speed and lower latency also continues to grow in popularity, as does the ability to customise algos to fit specific trading strategies or portfolios. A large drop in the importance of anonymity over the past few years also indicates that long-only firms are now less concerned with masking their activity from other participants and are instead focusing on streamlining the algo trading process while reducing costs as much as possible. Least surprising of all is the decline of internal crossing capabilities, which, in the context of MiFID II doing away with broker crossing networks (BCNs), was largely to be expected once the regulation came into force.

Another trend that was largely

Figure 4: Number of providers used (% of responses)

Long only 2018
Long only 2017
Long only 2016

1-2: 34.34 / 34 / 23.4
2-3: 26.11 / 31.1 / 22.1
5+: 39.55 / 34.9 / 54.5

Figure 5: Algorithm usage by value traded (% of responses)

Long only 2018
Long only 2017

Category	Long only 2018	Long only 2017
Not answered	4.27	6.28
0 - 5%	5.69	9.6
5 - 10 %	5.28	8.03
10 - 20%	9.56	12.56
20 - 30%	11.18	16.23
30 - 40%	12.19	3.84
40 - 50%	14.02	8.73
50 - 60%	8.13	7.85
60 - 70%	9.76	9.95
70 - 80%	9.76	5.58
>80%	10.16	11.34
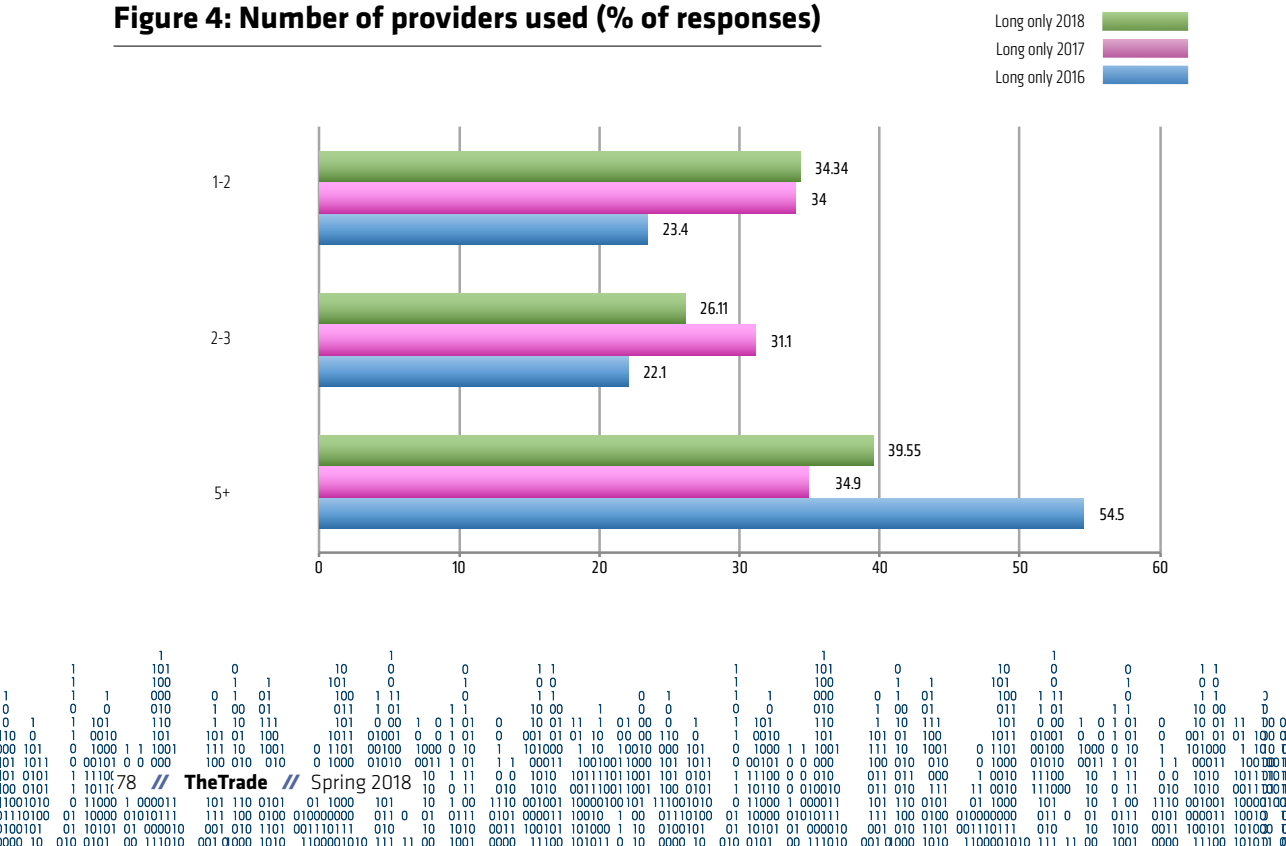
expected to continue into 2018 following the implementation of MiFID II was the consolidation of brokers and algo providers by the buy-side, and in turn the reduction of technology complexity and cost. Instead it seems the opposite is true and Figure 3 shows as much; the adoption of multiple algo providers has increased almost across the board, with only those on the smaller end – those managing between $0.25 and $0.5 billion – reducing the number of algos they use, albeit by a small margin.

From the very small (with up to $0.25 billion in AuM) to the larger players (more than $50 billion in AuM), long-only firms have been taking on more algo providers over the past year, even though most are still hovering around the two to three provider mark, possibly with an eye on the new requirements for best execution that have come into play. By increasing the level of access to algorithmic trading route options, firms will be better positioned to provide evidence of best execution practises, which would be limited by sticking to just one or two algo providers.

Even so, around one-third of long-only respondents to this year's survey are sticking with either one or two algo providers, according to Figure 4. This is consistent with the results from last year's survey, although there was a 5% year-on-year decrease in firms using three to four algo providers, while the proportion of firms with more than five providers increased by the same amount. It would be surprising to see all but the largest buy-side firms continuing to use more than five algo providers as the effects of MiFID II bed in properly. Brokers will continue to assess where they are generating revenues from their buy-side clients, but in the new trading environment, the balance of power seems to reside with the asset managers.

Increasing popularity
As algos become easier to use and advancements in technology march onwards, buy-side trading desks are becoming increasingly comfortable in letting algos do the work while human traders are able to focus on the finer details, although this will be an area of keen interest to regulators. As such, it's little surprise to see the proportion of trades conducted by algo increasing in the 2018 survey. The number of firms trading less than 30% of their value through algos dropped significantly

year-on-year, with just under one-third of long-only firms fitting into this category, down from almost half of respondents last year.

The most significant change occurred with firms trading between 30-50% of their value with algos, which jumped from 12.57% in 2017 to 26.21% in this year's survey, suggesting that firms that had previously shunned algo trading are coming around to the benefits that automated trading can offer. There were marginal increases for number of algos used for 50-70% of value traded, but a more noticeable spike in the 70-80% range, where proponents of algo trading are investing further in electronic trading methods.
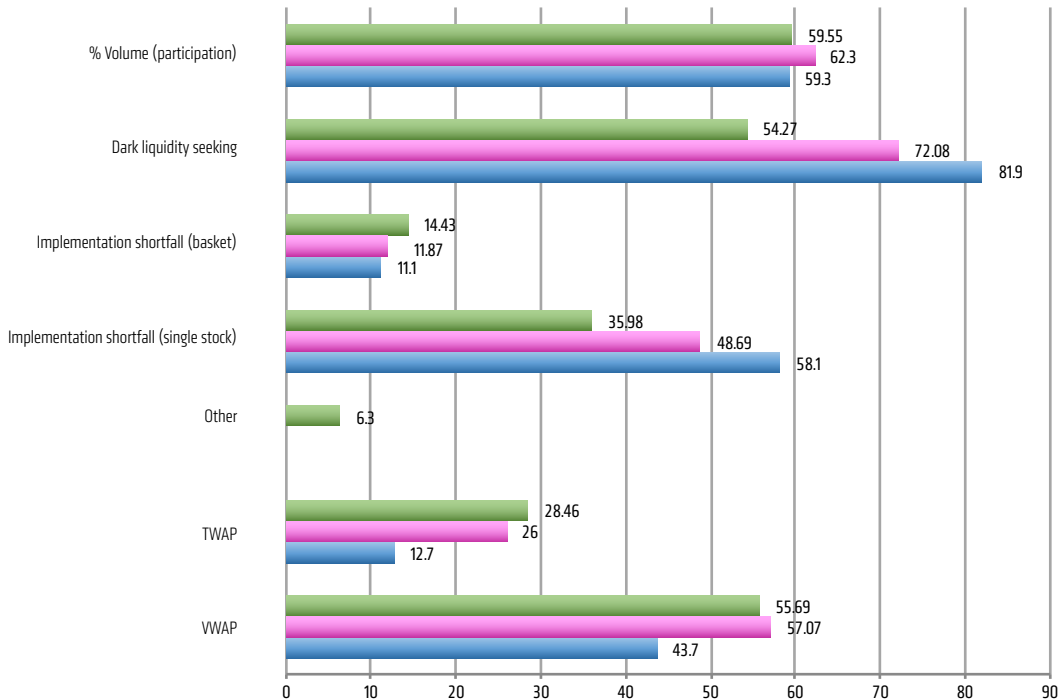
In terms of the types of algos that long-only firms are choosing to use, Figure 6 shows a distinct shift away from dark liquidity seeking, which has fallen dramatically since 2016, when 81.9% of respondents were using these types of algos to just 54.27% this year. Whether this is in direct correlation to the introduction of the DVCs under MiFID II remains to be seen but gains for the TWAP and implementation short-fall (basket)-type algos this year indicate that long-only firms are now choosing to move away from automated dark trading. One of the most historically popular types of algorithm, participation-based algos, saw consistent usage and the same is true for VWAP-type algos.

It seems then that even in the early days of MiFID II, certain trends are already emerging. Greater regulatory oversight has forced the buy-side's hand into learning far more about the algos they use

Figure 6: Types of algorithms used (% of responses)

Long only 2018
Long only 2017
Long only 2016

% Volume (participation)
- 59.55
- 62.3
- 59.3

Dark liquidity seeking
- 54.27
- 72.08
- 81.9

Implementation shortfall (basket)
- 14.43
- 11.87
- 11.1

Implementation shortfall (single stock)
- 35.98
- 48.69
- 58.1

Other
- 6.3

TWAP
- 28.46
- 26
- 12.7

VWAP
- 55.69
- 57.07
- 43.7

and why, particularly when it comes to best execution, and the FCA has been very clear that this is one area that is at the top of their agenda going forward. For their part, brokers and algo providers have stepped up to support their clients over the course of the last year, both for their own sakes and the wider industry.

The popularity of automated trading is showing no signs of slowing down and even though the technology continues to grow even more complex under the hood, traders are clearly becoming much more comfortable with the systems which allow them to focus their attention elsewhere while still fulfilling their responsibilities. How this will develop as the new regulatory landscape will be fascinating to watch.

The TRADE would like to thank all of the buy- and sell-side firms that took part in this year's survey. As always, we encourage as many firms to take part as possible and to get their clients involved. In the Summer 2018 edition of The TRADE we will publish the second part of this year's survey, which will evaluate the responses from hedge fund respondents.
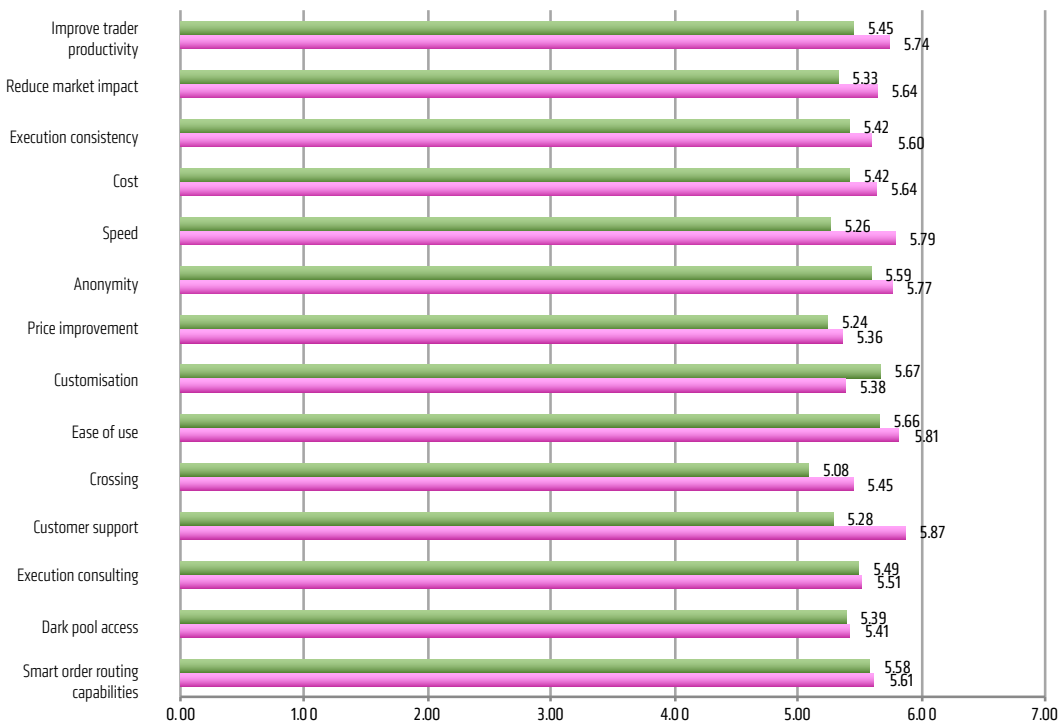
Bank of America Merrill Lynch

Bank of America Merrill Lynch (BAML) saw a slight increase in the percentage of responses it received within this year's survey from long-only firms, putting it behind only Kepler Chevreux and ITG with 5.52% of the total of long-only respondents. Nearly two-thirds of those were from large clients with over $10 billion in AuM, and all long-only respondents said that their usage of BAML algos had either stayed consistent or increased year-on-year. Just over half of its long-only respondents exclusively use BAML as an algo provider, marginally higher than the survey average, although over one-third are considering adopting additional algo providers in the future. BAML clients still favour Bloomberg's EMSX although there is a fair distribution between several other EMS providers from other long-only respondents, including FlexTrade, ITG and Portware.

BAML may have received more responses to this year's survey but the bank's areas of performance almost exclusively declined year-on-year across the board according to respondents, scoring an average of 5.42 across all categories, down from 5.61 last year and below the overall average in this year's survey.

The only category in which BAML saw an increase was in its customisation capabilities, which rose to 5.67 this year and was the only space in which the provider outscored the survey average. Alongside customisation, it scored well among long-only firms for its levels of ease of use, execution consulting and trader productivity, however these scores were all below the overall survey averages. Anonymity was a particularly successful space for BAML, with long-only respondents rating the provider with a score of 5.59.

Year	Improve trader productivity	Reduce market impact	Execution consistency	Cost	Speed
2018	5.45	5.33	5.42	5.42	5.26
2017	5.74	5.64	5.60	5.64	5.79

BANK OF AMERICA MERRILL LYNCH RATINGS FOR ALGORITHM PERFORMANCE

■ 2018 ■ 2017

Category	2018	2017
Improve trader productivity	5.45	5.74
Reduce market impact	5.33	5.64
Execution consistency	5.42	5.60
Cost	5.42	5.64
Speed	5.26	5.79
Anonymity	5.59	5.77
Price improvement	5.24	5.36
Customisation	5.67	5.38
Ease of use	5.66	5.81
Crossing	5.08	5.45
Customer support	5.28	5.87
Execution consulting	5.49	5.51
Dark pool access	5.39	5.41
Smart order routing capabilities	5.58	5.61

Bloomberg

Bloomberg attracted one of the lowest percentages of responses from long-only firms in this year's survey, accounting for just 1.58% of total respondents. Those that did rate Bloomberg were hardly generous with their scoring either, as the data giant ranked consistently poorly in almost every category reviewed. Respondents were primarily from the $1-10 billion in AuM range, with only two firms over $10 billion in AuM reviewing Bloomberg, from a variety of trading activities across asset classes.

All of Bloomberg's respondents said they do not use any other algos in their trading activities and two-thirds recorded that usage of Bloomberg algos had increased on the previous year. One-third of respondents said they are considering adopting additional algo providers in addition to Bloomberg, with some requiring functionality for customisation features for algos in order to optimise or make decrement executions. Unsurprisingly, EMSX was the exclusive choice of execution system for Bloomberg clients.

Bloomberg's scoring will be of some concern, as the vendor failed to attract a score of 5 in all but two of the categories reviewed. Its highest score was for cost with 5.56, above the survey wide average, although this did represent a decrease on its score from 2017. There were significant drops in year-on-year ratings for execution consistency, ease of use and crossing, but Bloomberg's lowest scores were in the customer support and execution consulting categories with 3.45 and 3.83 respectively, going against the overall survey trend, where both categories scored well in the early days of the new MiFID II regime.

BLOOMBERG RATINGS FOR ALGORITHM PERFORMANCE

Year	Improve trader productivity	Reduce market impact	Execution consistency	Cost	Speed
2018	5.07	4.84	4.68	5.56	4.24
2017	5.56	5.48	5.65	5.67	5.58

Category	2018	2017
Improve trader productivity	5.07	5.56
Reduce market impact	4.84	5.48
Execution consistency	4.68	5.65
Cost	5.56	5.67
Speed	4.24	5.58
Anonymity	4.64	5.31
Price improvement	4.43	5.21
Customisation	4.64	5.28
Ease of use	4.84	5.77
Crossing	3.50	4.52
Customer support	3.45	4.79
Execution consulting	3.83	4.96
Dark pool access	4.84	5.18
Smart order routing capabilities	4.64	5.30

Citi

Citi will have every reason to be pleased with the results of this year's long-only survey, seeing an increase in both the percentage of respondents and scoring levels for its algo capabilities. Having poached Sabrina Wilson from Deutsche Bank to run the bank's electronic and algorithmic trading for derivatives in July last year, Citi's efforts to boost its offering seem to be going down well with its clients.
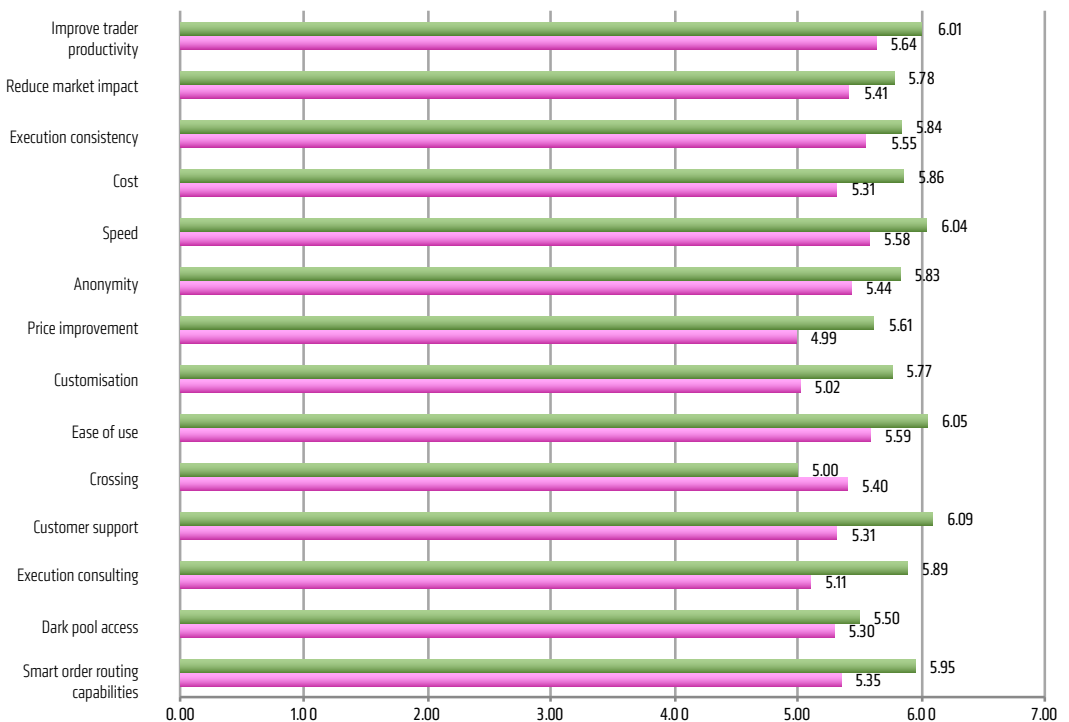
Despite receiving just over 2.5% of total long-only responses for this year's survey, Citi notched an impressive overall score among profiled providers of 5.8 up from 5.35 in 2017, with only Kepler Chevreux, RBC Capital Markets and Jeffries scoring higher. Citi achieved the highest ratings for cost and speed with 5.86 and 6.05 respectively, but also logged scores of over 6 in the trader productivity, ease of use, and customer support brackets.

Overall, Citi outscored the survey average in 12 of the 14 categories and recorded year-on-year increases in all but one area, as crossing declined although this was in line with the overall trend of the survey.

Just over half of long-only respondents said they had increased their use of Citi algos this year while two-thirds use them exclusively. Areas that clients would like to see improvements included electronic access to large blocks on liquid names (essentially the functionality offered by systematic internalisers for large orders sizes), deeper market structure commentary and further insight into where performance has been missed. Long-only respondents for Citi came from a range of AuM size brackets across asset classes, adopting a variety of different execution systems to reflect diverse trading strategies.

Year	Improve trader productivity	Reduce market impact	Execution consistency	Cost	Speed
2018	6.01	5.78	5.84	5.86	6.04
2017	5.64	5.41	5.55	5.31	5.58

CITI RATINGS FOR ALGORITHM PERFORMANCE

■2018 ■2017

	2018	2017
Improve trader productivity	6.01	5.64
Reduce market impact	5.78	5.41
Execution consistency	5.84	5.55
Cost	5.86	5.31
Speed	6.04	5.58
Anonymity	5.83	5.44
Price improvement	5.61	4.99
Customisation	5.77	5.02
Ease of use	6.05	5.59
Crossing	5.00	5.40
Customer support	6.09	5.31
Execution consulting	5.89	5.11
Dark pool access	5.50	5.30
Smart order routing capabilities	5.95	5.35

Deutsche Bank

Deutsche Bank received the second lowest tally of long-only respondents of profiled providers in this year's survey with 1.74%, although this was a marked improvement on 2017, when it drew almost half of that count. The bank's long-only clients metered out an average rating of 5.24 for its algo capabilities, again placing Deutsche Bank one place above the bottom slot this year, with only Bloomberg achieving a lower overall score of profiled providers.
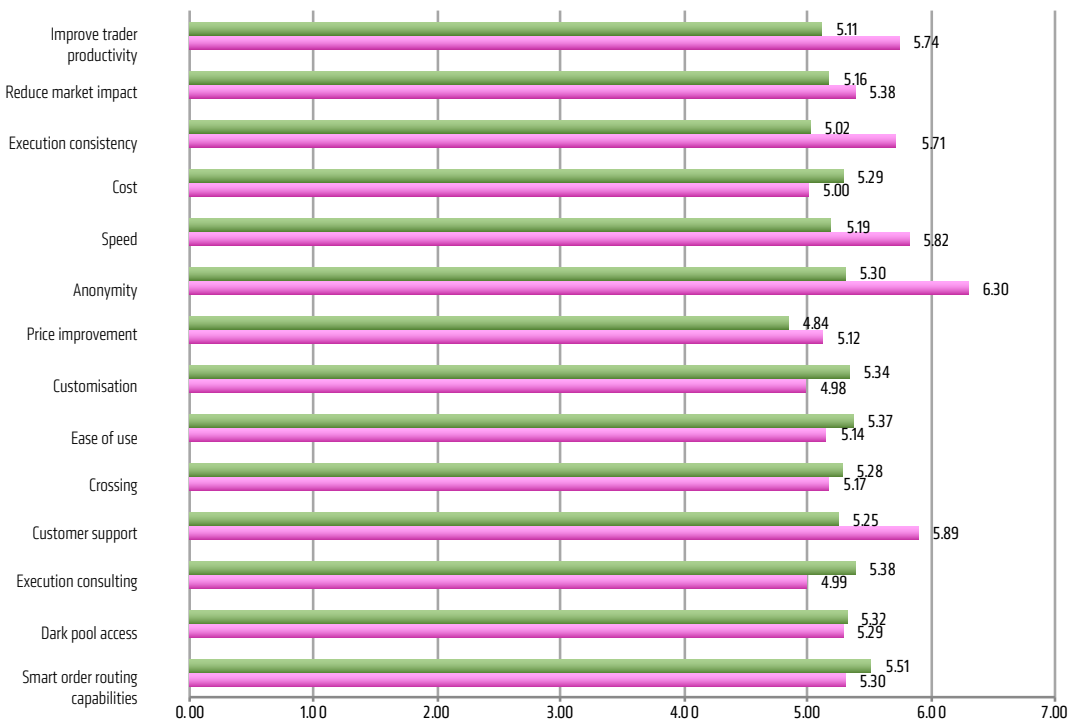
Long-only respondents for Deutsche Bank primarily came from mid-to-large sized clients with at least $10 billion of AuM, primarily active in both equities and exchange-traded funds with around half of clients also trading bonds, foreign exchange or other fixed income products. Just over half of long-only respondents said their usage of Deutsche Bank algos had stayed the same

year-on-year while the rest said usage had increased over the period. Only one respondent said they were looking at implementing algos from other providers, with users citing areas of improvement such as the ability to show orders to sales traders on an order-by-order basis, detailed transaction cost analysis, increased performance, lower commissions and further customisation of algos.

Deutsche Bank's scores across categories were consistently below the survey average, although did see year-on-year increases for half of all attributes rated, including ease of use, customisation, cost and similarly to most providers, execution consulting. Of more concern will be declining scores for improving trader productivity, customer support, speed, execution consistency and anonymity, which fell to 5.34 from a very commendable 6.3 in last year's survey.

Year	Improve trader productivity	Reduce market impact	Execution consistency	Cost	Speed
2018	5.11	5.16	5.02	5.29	5.19
2017	5.74	5.38	5.71	5.00	5.82

DEUTSCHE BANK RATINGS FOR ALGORITHM PERFORMANCE

	2018	2017
Improve trader productivity	5.11	5.74
Reduce market impact	5.16	5.38
Execution consistency	5.02	5.71
Cost	5.29	5.00
Speed	5.19	5.82
Anonymity	5.30	6.30
Price improvement	4.84	5.12
Customisation	5.34	4.98
Ease of use	5.37	5.14
Crossing	5.28	5.17
Customer support	5.25	5.89
Execution consulting	5.38	4.99
Dark pool access	5.32	5.29
Smart order routing capabilities	5.51	5.30

Goldman Sachs

Goldman Sachs has made significant investments into its technology capabilities in recent years as it seeks to move away from its traditional banking legacy and the trend of gradual improvement is evident in the responses from its long-only clients in this year's survey. Building on a strong showing in the 2017 algo survey, Goldman Sachs drew 3.47% of overall long-only respondents this year, more than doubling its percentage year-on-year.
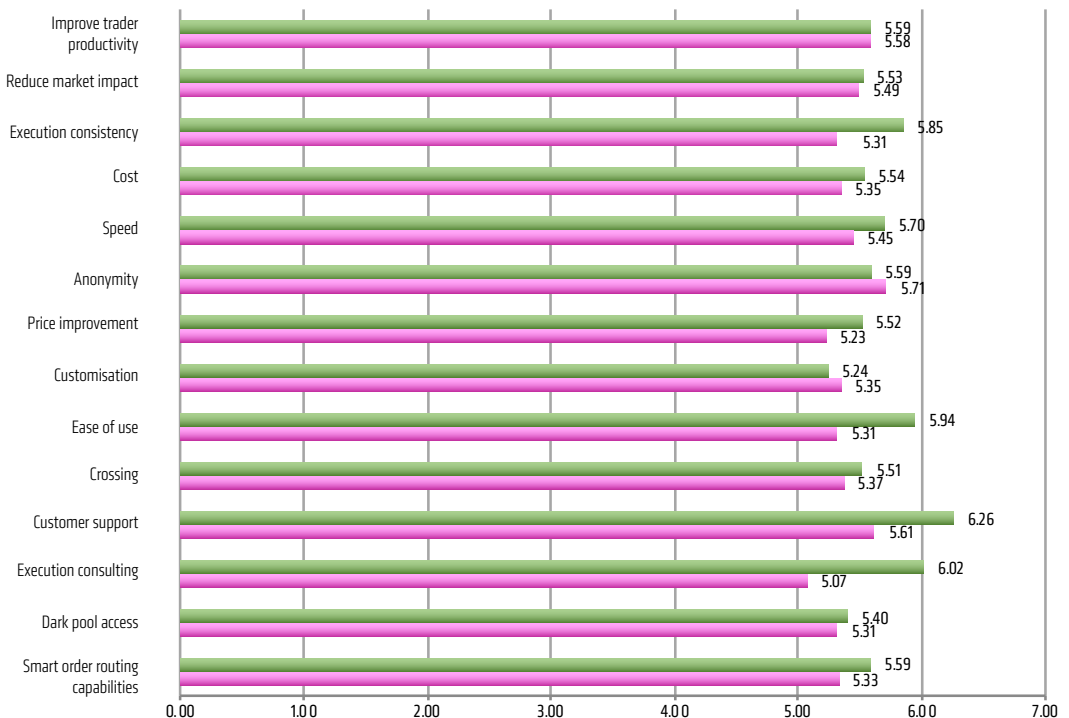
These respondents were almost exclusively from large clients, with only a handful representing firms with under $10 billion in AuM, and just under half said their usage had increased over the past year, while the rest said usage stayed the same. Only three of Goldman Sachs' respondents use additional algorithms and around one-third are considering adding additional providers in future. When reviewing Goldman Sachs'

algos, long-only respondents highlighted desired functionality to be introduced including algos that vary the venues they access based on the completion percentage of the order, detailed transaction cost analysis, a mid-touch service and algos for FX portfolios.

In terms of scoring, Goldman Sachs achieved respectable results across all 14 performance categories in this year's survey, with incremental improvements in areas such as trader productivity, reducing market impact and dark pool access. The firm scored highly in customer support and execution consulting, with year-on-year increases of 0.65 and 0.94 respectively, largely in line with the overall trends of the survey. The only areas where Goldman Sachs recorded a decrease in scores were for customisation and anonymity, although these declines were only around 0.1 in both categories.

GOLDMAN SACHS RATINGS FOR ALGORITHM PERFORMANCE	Year	Improve trader productivity	Reduce market impact	Execution consistency	Cost	Speed
	2018	5.59	5.53	5.85	5.54	5.70
	2017	5.58	5.49	5.31	5.35	5.45

GOLDMAN SACHS RATINGS FOR ALGORITHM PERFORMANCE

	2018	2017
Improve trader productivity	5.59	5.58
Reduce market impact	5.53	5.49
Execution consistency	5.85	5.31
Cost	5.54	5.35
Speed	5.70	5.45
Anonymity	5.59	5.71
Price improvement	5.52	5.23
Customisation	5.24	5.35
Ease of use	5.94	5.31
Crossing	5.51	5.37
Customer support	6.26	5.61
Execution consulting	6.02	5.07
Dark pool access	5.40	5.31
Smart order routing capabilities	5.59	5.33

Instinet

Instinet performed comparatively well in the overall long-only survey in terms of responses, drawing in a much higher proportion of replies with 3.16% compared to the year prior, when it received just 1.67% of the overall. The firm attracted the most responses from long-only respondents in the mid-size range, managing between $1-50 billion in AuM, with half a dozen clients coming from the over $50 billion bracket. Over half of Instinet's clients said they were active in either ETFs or foreign exchange products while only a few were trading fixed income or listed derivatives.

Around one-fifth of long-only respondents for Instinet are considering adopting additional providers, with greater customisation a highly desired feature among those assessing their options. Despite this, no firm said their usage of Instinet algos had decreased,

with around one-third saying usage had stayed the same from the previous year and the rest recording increased use, some as much as 25%. The vast majority of Instinet's long-only clients are using Bloomberg as an EMS provider, with ITG and Fidessa also proving popular.

Instinet's scoring was largely consistent with results from last year's survey, although there were declining scores year-on-year in half of the categories reviewed. Reducing market impact, cost, speed, anonymity, ease of use and customer support all declined year-on-year, with the largest fall coming in Instinet's anonymity capabilities. Despite this, anonymity has still one of the strongest scores for Instinet this year. Dark pool access was the only category in which Instinet scored an improvement in consistency on last year and well above the survey average of 5.67.

Year	Improve trader productivity	Reduce market impact	Execution consistency	Cost	Speed
2018	5.75	5.49	5.81	5.35	5.85
2017	5.54	5.52	5.67	5.76	5.97

INSTINET RATINGS FOR ALGORITHM PERFORMANCE

■ 2018 ■ 2017

	2018	2017
Improve trader productivity	5.75	5.54
Reduce market impact	5.49	5.52
Execution consistency	5.81	5.67
Cost	5.35	5.76
Speed	5.85	5.97
Anonymity	5.76	6.18
Price improvement	5.39	5.26
Customisation	5.55	5.43
Ease of use	5.50	5.78
Crossing	5.52	4.89
Customer support	5.51	5.69
Execution consulting	5.61	5.27
Dark pool access	6.00	5.34
Smart order routing capabilities	5.89	5.42
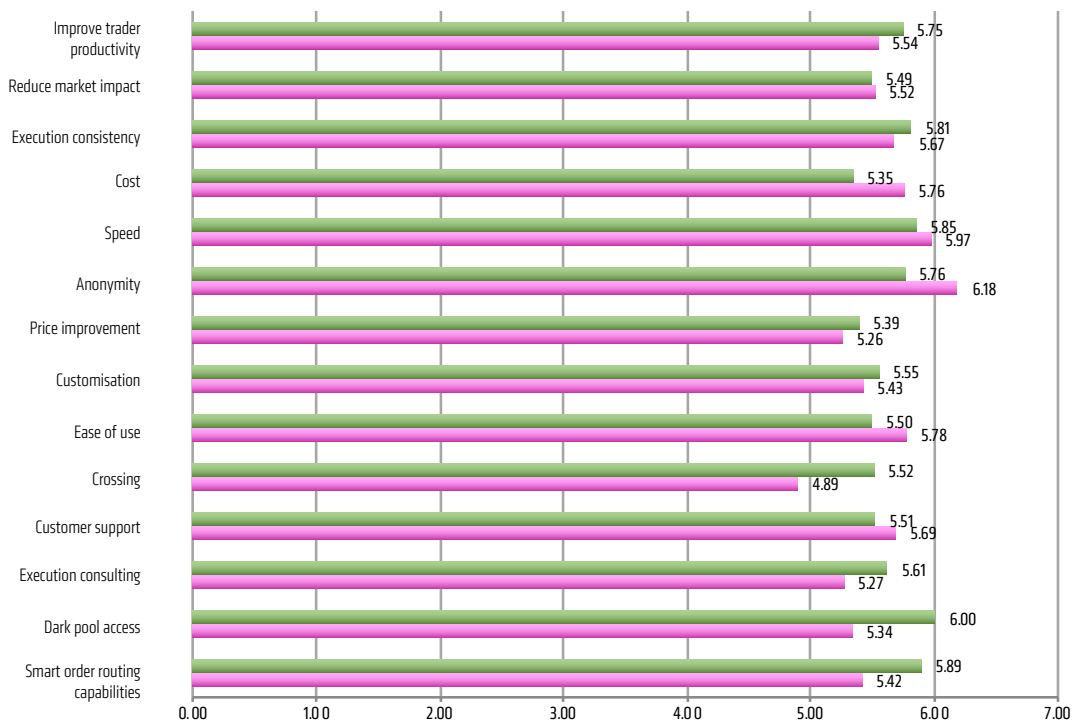
ITG

ITG saw a slight increase in the percentage of responses from this year's survey from long-only firms, putting it behind only Kepler Chevreux with 5.84% of the total of long-only respondents. Despite the increase, respondents were generally more critical of ITG algos this year, with scores in nine of the 14 categories declining year-on-year. While there were no significant decreases in any of the areas reviewed, the same is true of those categories which recorded an increased score; ITG's cost, price improvement, customer support, dark pool access and smart order routing capabilities all saw a rise on last year's results, but none by more than 0.2 year-on-year. The lowest score attributed to ITG by long-only respondents was for its crossing capabilities, which dropped to 5.19 in this year's survey.

The majority of respondents for ITG manage over $50 billion in assets, with a similar number from the $10-50 billion bracket. Over one-quarter of respondents said their usage of ITG algos had stayed the same since last year, while the rest all indicated that usage had increased. Around one-third of respondents use additional algos alongside those from ITG for functionality such as implementation shortfall, cash balance baskets, artificial intelligence and greater customisation. However, over 40% of long-only respondents said they are considering using other algo providers for reasons including more market structure commentary, finding liquidity outside the spreads and systematic internaliser volumes. Unsurprisingly, ITG's Triton was the most used EMS among the vendor's respondents, indicating this continues to be an important part of its business proposition.

Year	Improve trader productivity	Reduce market impact	Execution consistency	Cost	Speed
2018	5.53	5.52	5.37	5.52	5.47
2017	5.63	5.67	5.72	5.44	5.66

ITG RATINGS FOR ALGORITHM PERFORMANCE

■ 2018 ■ 2017

JP Morgan

JP Morgan drew a lower proportion of responses in this year's algo survey - compared with 2017 - from long-only respondents, generating 3.79% of the total responses, enough to put the firm squarely in the middle of its peers. Responses came primarily from mid-to-large-sized firms with at least $10 billion in AuM, with an even distribution of activity in non-equities asset classes including fixed income, foreign exchange and electronically-traded funds. Long-only firms that have adopted JP Morgan algos lean heavily towards using Bloomberg as an EMS provider, with ITG and Charles River also mentioned.
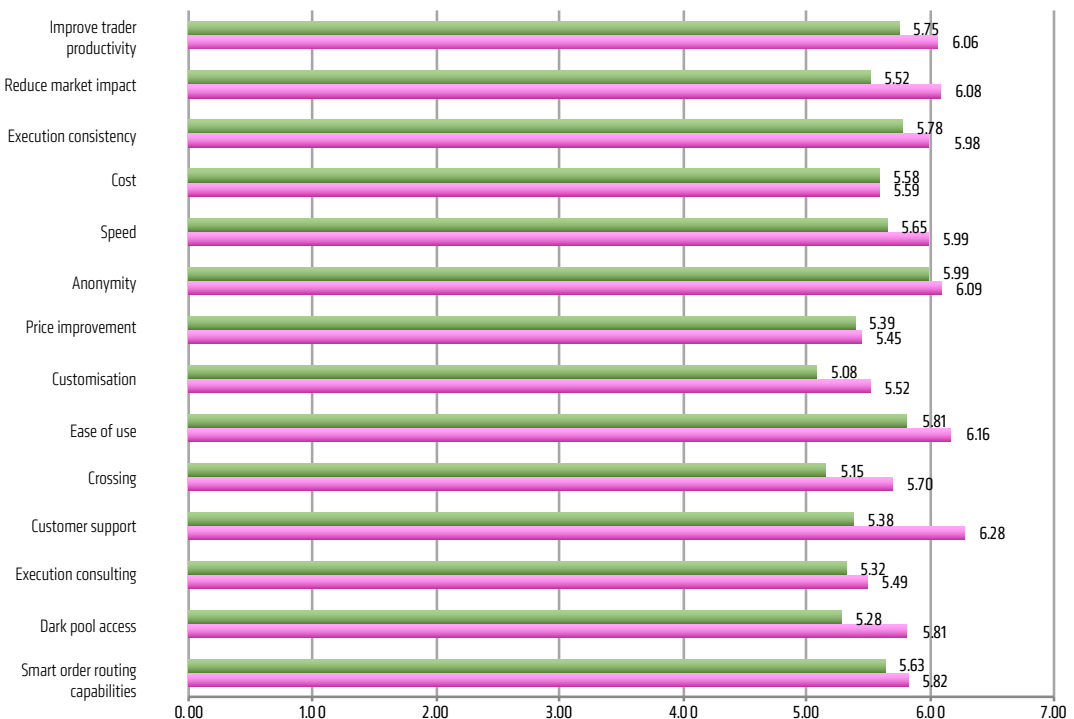
Around 60% of long-only respondents said their usage of JP Morgan algos had increased year-on-year, while the rest saw usage stay consistent. Only three firms said they used other algos from other providers than JP Morgan, however, just under half of the survey

are evaluating other providers for future use, with areas of functionality that respondents cited as wanted included the ability to control routing destinations from the desktop, the use of more dark pools and different types of liquidity seeking. Bloomberg is the EMS of choice for JP Morgan's clients according to this year's survey, with over one-third of long-only firms utilising EMSX.

JP Morgan's scores decreased across all 14 categories in this year's survey. While there were only marginal drops in ratings for cost, price improvement, execution consulting and smart order routing capabilities, there was a significant drop for JP Morgan's customer support, which fell from 6.28 to 5.38 year-on-year. Despite these decreases, JP Morgan still scored higher in almost all categories than the overall survey averages, particularly for speed, anonymity and crossing.

JP MORGAN RATINGS FOR ALGORITHM PERFORMANCE	Improve trader productivity	Reduce market impact	Execution consistency	Cost	Speed
2018	5.75	5.52	5.78	5.58	5.65
2017	6.06	6.08	5.98	5.59	5.99

Kepler Cheuvreux

Kepler Cheuvreux was one of the standout performers in this year's long-only algo survey, drawing the highest percentage of responses by some distance. The firm attracted 10.9% of the total responses for the survey, almost double its nearest competitor and nearly double its tally from the previous year. Despite the more critical nature of this year's respondents, Kepler Cheuvreux was rated highly across all 14 categories in this year's long-only algo survey, consistently scoring above the survey average in all areas. While the firm's scores did fall slightly compared to last year's results, these were mostly marginal decreases in line with the wider trends of the survey in 2018 and were more in line with last year's results. Kepler Cheuvreux scored above 6 in the reducing market impact, execution

consistency, speed, and customer support categories, while its lowest scores were for cost (5.55) and crossing (5.33).

Respondents came from a range of AuM brackets, with just over one-third managing over $10 billion in assets and nearly one-quarter in the $1-10 billion of AuM bracket. Over one-third of long-only respondents recorded increased usage of Kepler Cheuvreux algos over the past year, some by as much as 50%, while the rest saw usage stay the same over the same period. Around 10% of respondents said they use additional algos alongside those from Kepler Cheuvreux, while just under 20% said they are considering adopting algos from other providers looking for more detailed transaction cost analysis, increased performance, lower commissions and further customisation functionalities.

Year	Improve trader productivity	Reduce market impact	Execution consistency	Cost	Speed
2018	5.91	6.14	6.11	5.55	6.04
2017	6.11	6.19	6.40	5.55	6.13

KEPLER CHEUVREUX RATINGS FOR ALGORITHM PERFORMANCE

Liquidnet

Liquidnet saw a marked increase in the percentage of responses it drew in this year's long-only algo survey more than doubling its percentage of responses from the previous year by recording 4.26% of the total. The firm received generally favourable scores from respondents, and although there were several year-on-year decreases, still maintained a strong position in this year's survey, scoring higher than average in most of the 14 categories reviewed.
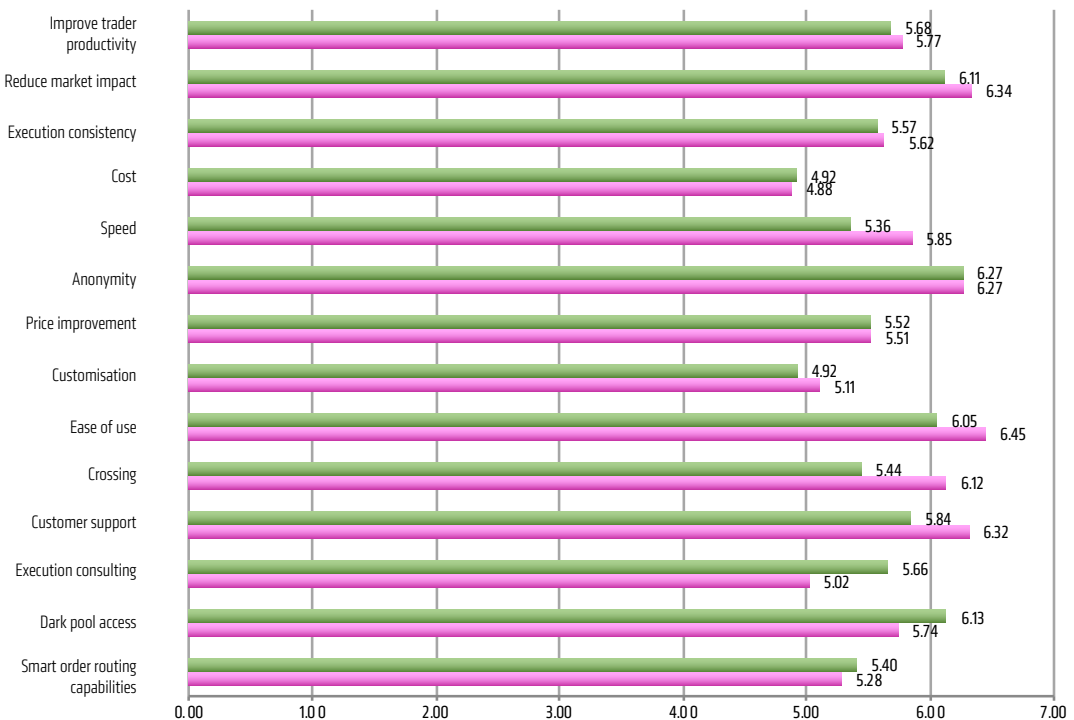
Anonymity, dark pool access, reducing market impact and ease of use all attracted scores higher than 6, although there were decreases for Liquidnet's speed, customer support and, most noticeably, crossing capabilities. Crossing was a particular area of strength for Liquidnet in last year's survey; however, this decline is in line with the wider survey results for long-only firms this year.

Respondents were primarily from the mid to large-sized brackets, with an equal split between the $1-10 billion, $10-50 billion and more than $50 billion in AuM ranges. Most respondents were active only in the equities space, with around one-third also trading foreign exchange products. Two-thirds of respondents recorded increased usage of Liquidnet algos compared to the previous year and almost three-quarters use Liquidnet algos exclusively.

Almost half of long-only firms said they are considering using algos from other providers, with a range of additional functionalities mentioned, including access to systematic internalisers, optimised large-in-scale interaction, and finding liquidity outside the spreads. Just under half of Liquidnet's long-only respondents use Bloomberg EMSX with other EMS providers including ITG, Charles River and Eze.

Year	Improve trader productivity	Reduce market impact	Execution consistency	Cost	Speed
2018	5.68	6.11	5.57	4.92	5.36
2017	5.77	6.34	5.62	4.88	5.85

LIQUIDNET RATINGS FOR ALGORITHM PERFORMANCE

■ 2018 ■ 2017

Morgan Stanley

Morgan Stanley recorded almost double the percentage of responses on last year's long-only algo survey, drawing 5.21% of the total responses, up from 2.91% in 2017, putting the firm behind only Kepler Cheuvreux, ITG and BAML. Over half of Morgan Stanley's respondents manage assets worth more than $50 billion while one-quarter came from the $10-50 billion in AuM bracket. Bloomberg was the EMS provider of choice for Morgan Stanley long-only respondents, with ITG and Charles River also proving popular options.

Long-only scores for Morgan Stanley were quite mixed this year, with an overall rating across all categories of 5.31, slightly below the survey-wide average and the firm's result for last year. Morgan Stanley scored well in the cost, dark pool access and smart order routing capabilities categories, rating higher than the survey averages

as well as receiving favourable ratings for anonymity and ease of use. There were year-on-year decreases in 10 of the 14 categories reviewed for Morgan Stanley, most significantly for customisation (0.92), improving trader productivity (0.71) and reducing market impact (0.62).

Respondents were primarily active in electronically-traded funds, foreign exchange and listed derivatives, alongside equities. Half of long-only firms said they have increased use of Morgan Stanley algos over the past year, some as much as 25%, while the rest experienced consistent usage levels. One-quarter of Morgan Stanley's respondents said they are considering adopting algos from other providers, with access to systematic internalisers and indicators of volumes, greater levels of customisation and deeper insight into performance all mentioned as desired functionalities.

Year	Improve trader productivity	Reduce market impact	Execution consistency	Cost	Speed
2018	5.23	5.15	5.43	5.57	5.44
2017	5.94	5.77	5.81	5.60	5.88

MORGAN STANLEY RATINGS FOR ALGORITHM PERFORMANCE

■ 2018 ■ 2017

Category	2018	2017
Improve trader productivity	5.23	5.94
Reduce market impact	5.15	5.77
Execution consistency	5.43	5.81
Cost	5.57	5.60
Speed	5.44	5.88
Anonymity	5.46	6.10
Price improvement	5.29	5.76
Customisation	4.67	5.58
Ease of use	5.50	5.84
Crossing	5.26	5.56
Customer support	5.32	5.63
Execution consulting	4.97	5.24
Dark pool access	5.60	5.45
Smart order routing capabilities	5.48	5.49

UBS

The percentage of long-only reviews for UBS stayed consistent for this year's algo survey, with 4.42% of total responses. Just under 70% of respondents for UBS came from the $10-50 billion in AuM bracket, while the rest hold between $1-10 billion and around one-third of firms are active in electronically-traded funds or foreign exchange in addition to equities. Bloomberg was the EMS provider of choice for UBS' long-only clients, with ITG, Charles River and Fidessa also mentioned.

Half of long-only respondents for UBS recorded increased usage of its algos compared to the previous year while the other half saw usage stay at similar levels. Respondents almost exclusively use UBS algos with only a few outliers adopting those from other providers, while only five said they were considering adding further providers in future. Additional algo

functionality desired by long-only firms included mid-touch service, deeper market structure commentary and insight, optimised large-in-scale interaction, and custom-made links to specific liquidity venues.

In terms of scoring, UBS saw decreasing scores across the majority of categories reviewed, with an average score of 5.37 down from 5.66 last year; however, these ratings were largely in line with the overall long-only survey trends. UBS' highest scores came in the anonymity, dark pool access and smart order routing capabilities categories, while its most significant year-on-year decreases were for speed, which dropped 0.67 year-on-year, and improving trader productivity, which fell by 0.74 on the previous year. The lowest score attributed to UBS in this year's survey was for price improvement, which came in at 4.88.

Year	Improve trader productivity	Reduce market impact	Execution consistency	Cost	Speed
2018	5.14	5.21	5.37	5.44	5.18
2017	5.88	5.64	5.90	5.55	5.85

UBS RATINGS FOR ALGORITHM PERFORMANCE

	2018	2017
Improve trader productivity	5.14	5.88
Reduce market impact	5.21	5.64
Execution consistency	5.37	5.90
Cost	5.44	5.55
Speed	5.18	5.85
Anonymity	5.85	6.03
Price improvement	4.88	5.28
Customisation	5.21	5.37
Ease of use	5.62	5.93
Crossing	5.26	5.50
Customer support	5.34	5.75
Execution consulting	5.36	5.35
Dark pool access	5.71	5.57
Smart order routing capabilities	5.65	5.63