



THE 2019 ALGORITHMIC TRADING SURVEY HEDGE FUNDS

Doubling down on algos

The 2019 algorithmic trading survey finds that brokers are stepping up to the plate in the post-MiFID II landscape to provide consistent execution to hedge fund firms that are more knowledgeable and discerning than ever before.

The first part of this year's algorithmic trading survey, published in Issue 59 of *The TRADE*, found that brokers had begun to outpace their banking counterparts when it came to satisfying the needs of their long-only buy-side clients in almost every facet of performance.

While there are clear areas of differential performance among various algo providers, the overall showing from the 2019 survey is

contingent of hedge fund firms in this year's survey, with the total average score across all algo providers rising to 5.72, a significant increase on the total average of 5.47 in 2018 and even above the pre-MiFID II score of 5.68 in 2017. This would seem to indicate that for algorithmic trading, both from the perspective of the provider and the end user, MiFID II amounted to a bump in the road that offered a chance to review where im-

under evaluation. While there were more noticeable fluctuations in this year's scores in comparison to those recorded in 2017, the trend is more positive, with some areas showing market improvement to the pre-MiFID II era such as execution consulting and price improvement.

The highest score achieved in this year's hedge fund algo survey was in the customer support category (5.92), closely followed by anonymity (5.81), ease of use (5.81) and improve trader productivity (5.80). There was no area of performance that received a score lower than 5.50 – the lowest being 5.57 for price improvement – which indicates a good overall level of satisfaction among hedge funds towards their algo providers.

The areas of performance that showed the greatest year-on-year improvements were in the cost (up 0.44 from 2018), improve trader productivity (up 0.41 from 2018), price improvement (up 0.35 from 2018) and customisation (up 0.35 from 2018). The two new performance categories introduced in

“For algorithmic trading, both from the perspective of the provider and the end user, MiFID II amounted to a bump in the road that offered a chance to review where improvements could be made to the process and product.”

largely positive, as the industry moves further away from regulatory compliance concerns brought about by MiFID II and reprioritises quality of execution and securing better outcomes for the end investor.

This trend is once again evident from responses provided by the

improvements could be made to the process and product. And it would seem those improvements are now being recognised.

Figure 1 shows a continuation of the trend seen in the long-only results of this year's survey, with increased year-on-year scores in all but one of the functional categories

Figure 1: Rating of algorithm performance

Hedge fund 2019 ■
 Hedge fund 2018 ■
 Hedge fund 2017 ■

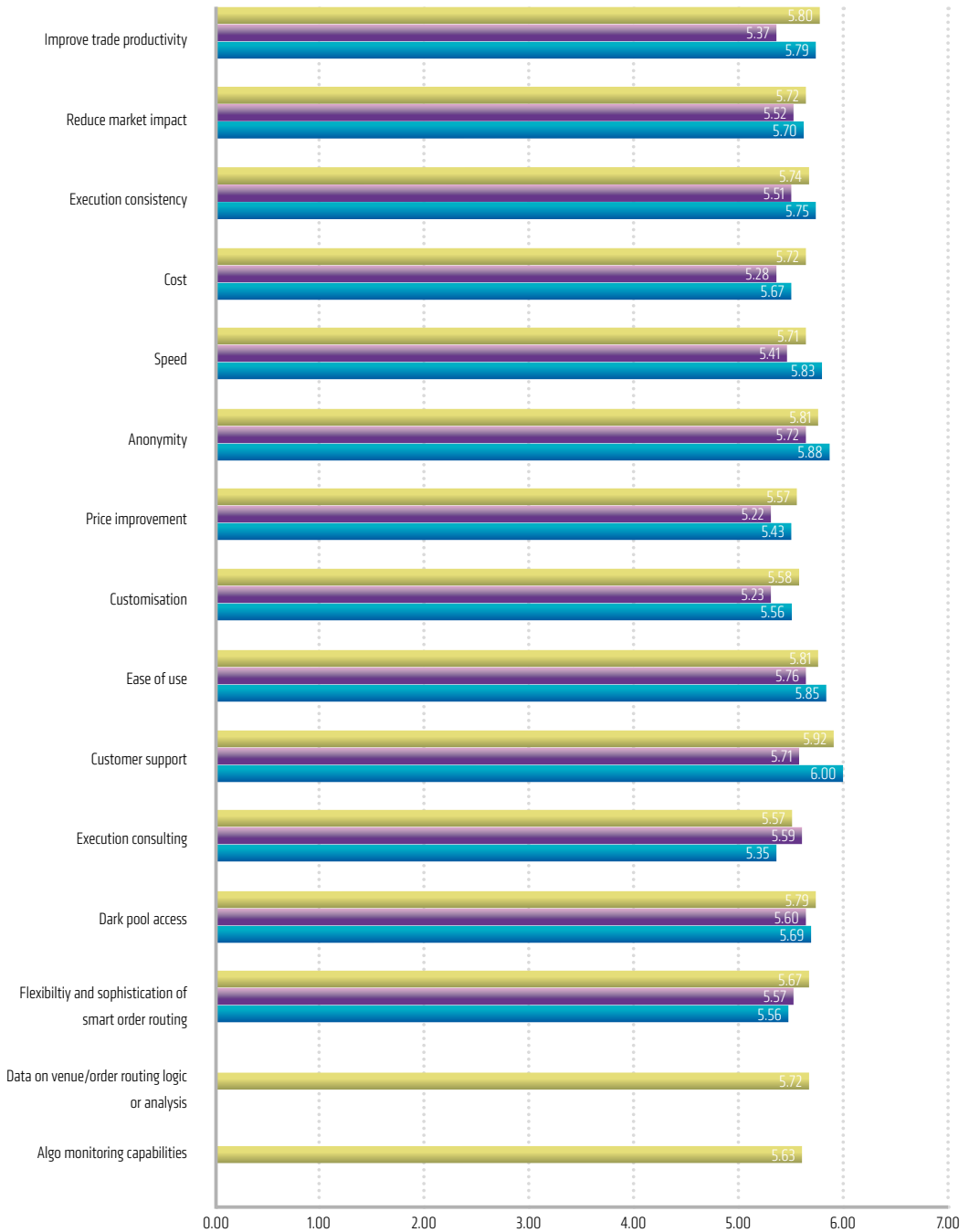


Figure 2: Reasons for using algorithms (% of responses)

Hedge fund 2019 ■
 Hedge fund 2018 ■
 Hedge fund 2017 ■

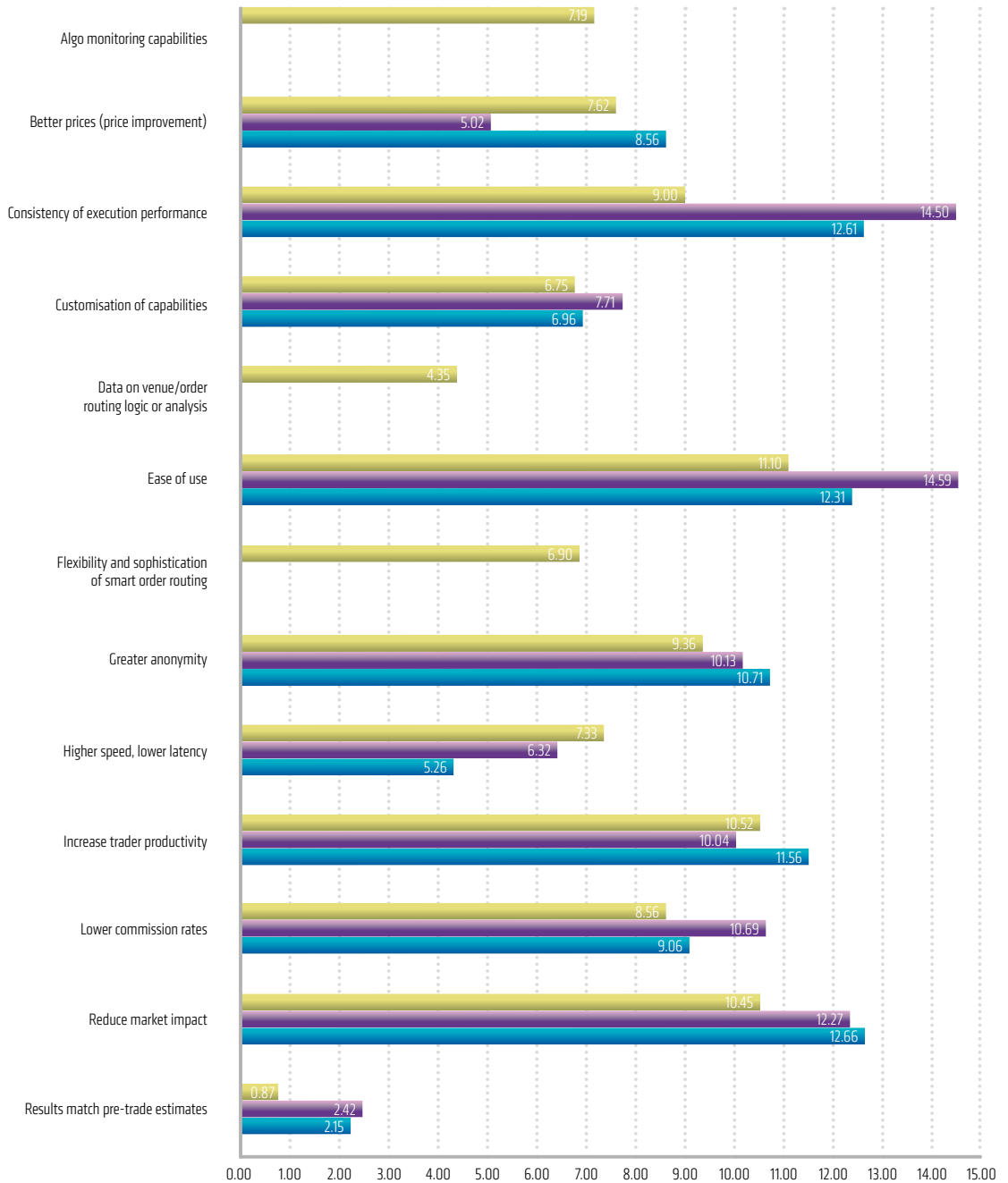
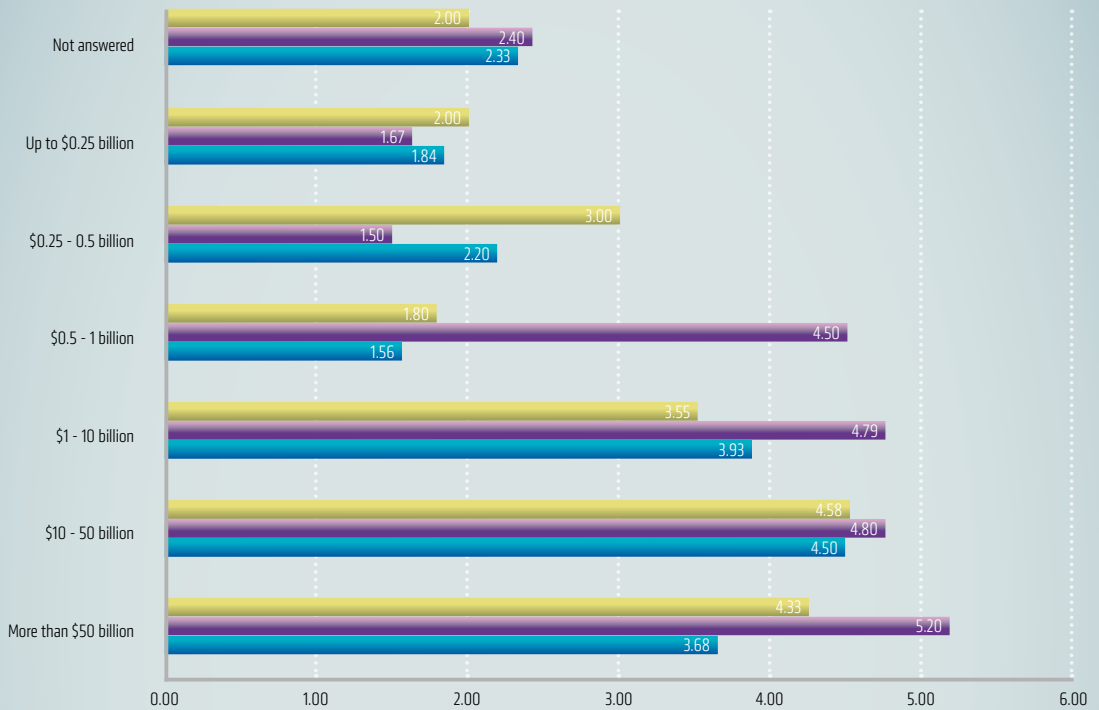


Figure 3: Average number of providers used by AUM

Hedge fund 2019 
 Hedge fund 2018 
 Hedge fund 2017 



this year's survey both received respectable scores – 5.72 for data on venue/order routing logic or analysis, and 5.63 for algo monitoring capabilities, slightly above the scores recorded from long-only respondents.

Similarly to the responses from long-only buy-side firms, the scoring in this year's survey suggests that efficiency has become the key watchword for algo end users. While cost will always be a factor for trading operations, improved perceptions around trader performance, price improvement, the ability to customise algos for different trading strategies and the ease with which they can be used indicate that algo pro-



viders are stepping up their efforts to optimise automated trading for their clients.

Hedge fund firms continue to adopt and use algos for much the same reasons as they have historically done, according to Figure 2, regardless of the regulatory landscape. The importance of consistent execution performance (9.00%), an increase in trader productivity (10.52%), reduction in market impact (10.45%) and ease of use (11.10%) were once again selected as the main reasons for

hedge funds to use algorithms within their trading operations, although price improvement has also steadily become a

more important factor as well.

While ease of use continues to be the most cited reason for using algos among hedge funds, suggesting that buy-side firms are still placing a high value on simplicity and reliability when it comes to technology offerings, it is the increase in price improvement functionality that best illustrates the direction of travel. As regulatory focus diminishes, attention toward securing the best outcomes from algo trading is once again reasserting itself as the

dominant force for the buy-side.

There were new factors included within this section of the algo survey this year, with the removal of internal crossing from the reasons for using algos and the addition of algo monitoring capabilities (accounting for 7.19% of responses), data on venue/order routing logic or analysis (4.35%) and flexibility and sophistication of smart order routing (6.90%).

Reversed trend

One of the most interesting trends that the algo survey has thrown up in recent years has been the fluctuating number of providers that buy-side firms, both long-only and hedge fund, are choosing to implement and use. In last year's survey, hedge funds were almost exclusively using greater numbers of

algo providers than they had historically – the only exception being on the lower end of the AuM scale – however that trend is now clearly in reverse, as shown in Figure 3.

Hedge fund firms that are managing up to \$0.25 billion and \$0.25 to \$0.5 billion in assets were the only two groups to record increased numbers of algo providers this year, with the latter bracket actually doubling the average number of providers year-on-year, from 1.5 in 2018 to 3 this year, still far above the figures from the 2017 survey as well. Mid-sized and larger hedge funds, however, showed that they have been cutting down on the number of algo providers they are engaged with, most noticeably in the \$0.5 to \$1 billion AuM bracket, which recorded a sharp drop from an average 4.5 algo providers last year to just 1.8 in this year's survey. While the larger hedge funds are still averaging over 4 algo providers, it would be reasonable, based on recent trends, to expect this figure to fall as the industry moves further away from compliance-focused objectives.

The trend of algo provider consolidation among hedge funds is illustrated clearly in Figure 4,



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

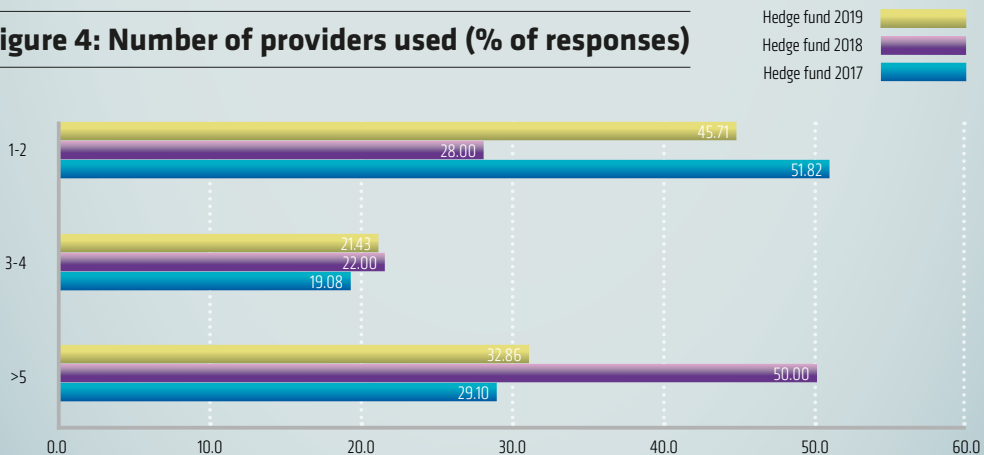
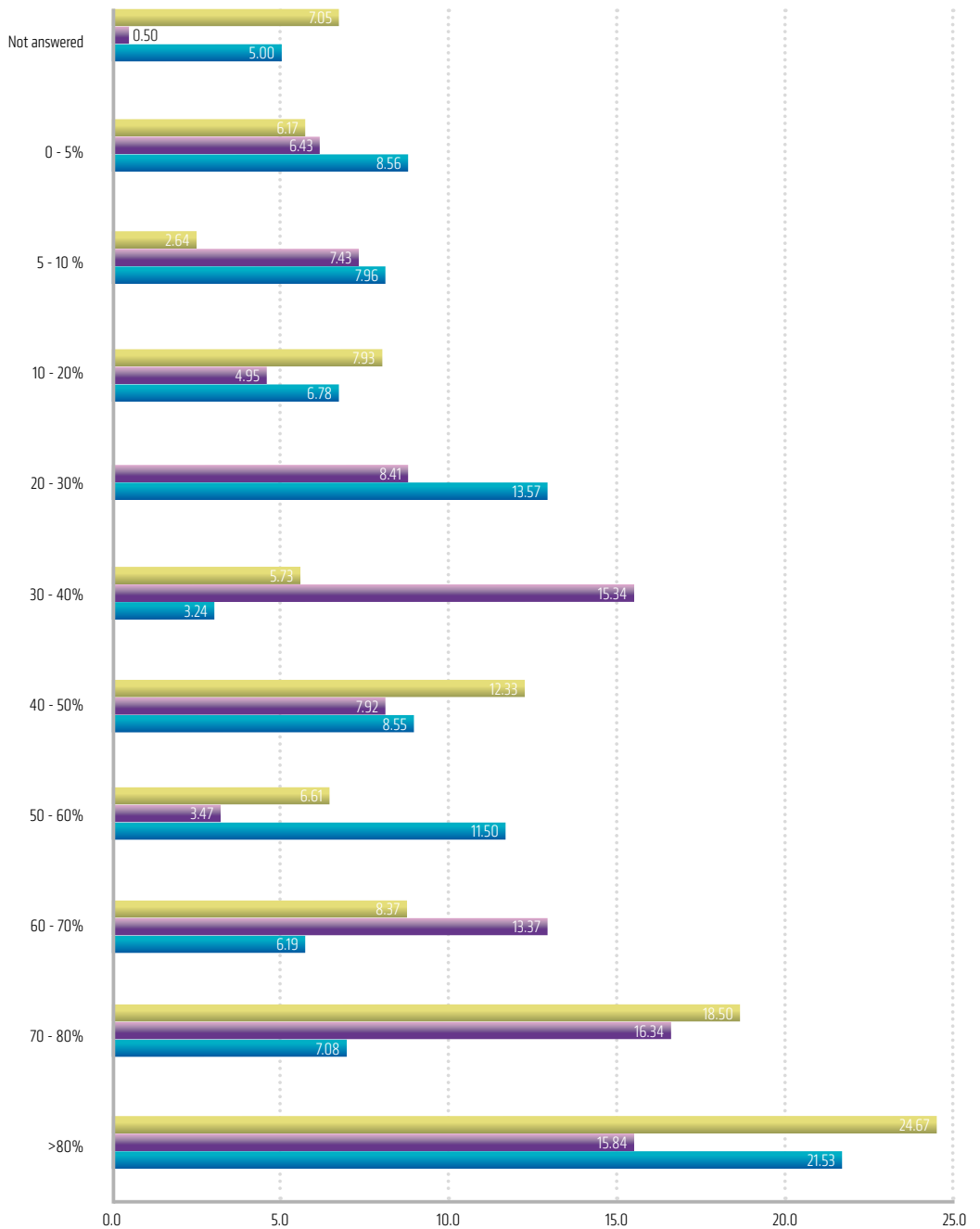


Figure 5: Algorithm usage by value traded (% of responses)

Hedge fund 2019 
 Hedge fund 2018 
 Hedge fund 2017 



which shows the average number of providers used by firms regardless of AuM. There has been a significant year-on-year shift for hedge funds to move towards using between one and two providers, accounting for nearly half of all hedge fund respondents, whereas previously these firms said they were using more than 5 in last year's survey. All of this would suggest that hedge funds used 2018 as a sort of 'test drive' period, to take new algos out for a spin before deciding on which ones they would adopt on an ongoing basis.

While hedge funds are clearly becoming more canny about which providers they are using for algorithmic trading, the figures for how much of their value is traded in this manner evidence that algo popularity is definitely on an upward curve. Figure 5 shows that over half (58.15%) of hedge fund respondents are using algos to trade more than 50% of their total value traded, with almost one-quarter indicating that algos account for more than 80% of value traded. Accordingly, there was a noticeable decline on the lower end of value traded scale, indicating that hedge funds are now increasingly heading towards a path of greater automation in search of higher levels of trade efficiencies.

In terms of the types of algos that hedge funds are choosing to adopt and use, Figure 6 shows a spike in the use of implementation short-fall (single stock), VWAP and % volume (participation) algos on a year-on-year basis, with respective

“As regulatory focus diminishes, attention toward securing the best outcomes from algo trading is once again reasserting itself as the dominant force for the buy-side.”

Methodology

Hedge fund buy-side survey respondents were asked to give a rating for each algorithm provider on a numerical scale from 1.0 (very weak) to 7.0 (excellent), covering 15 functional criteria.

In general, 5.0 is the 'default' score of respondents. In total, just under 30 providers received responses and the leading providers obtained dozens of evaluations, yielding thousands of data points for analysis. Only the evaluations from clients who indicated they that they were engaged in managing hedge fund firms or have been used to compile the provider profiles and overall market review information.

Each evaluation was weighted according to three characteristics of each respondent: the value of assets under management; the proportion of business done using algorithms; and the number of different providers being used. In this way the evaluations of the largest and broadest users of algorithms were weighted at up to three times the weight of the smallest and least experienced respondent.

Finally, it should be noted that responses provided by affiliated entities are ignored. A few other responses where the respondent could not be properly verified were also excluded. We hope that readers find this approach both informative and useful as they assess different capabilities in the future.

increases of 11.39%, 11.02% and 14.98% compared to 2018's results. There was a smaller increase in the use of dark liquidity seeking algos in this year's survey (up 4.14%), although this is still well below the levels seen in the 2017 survey.

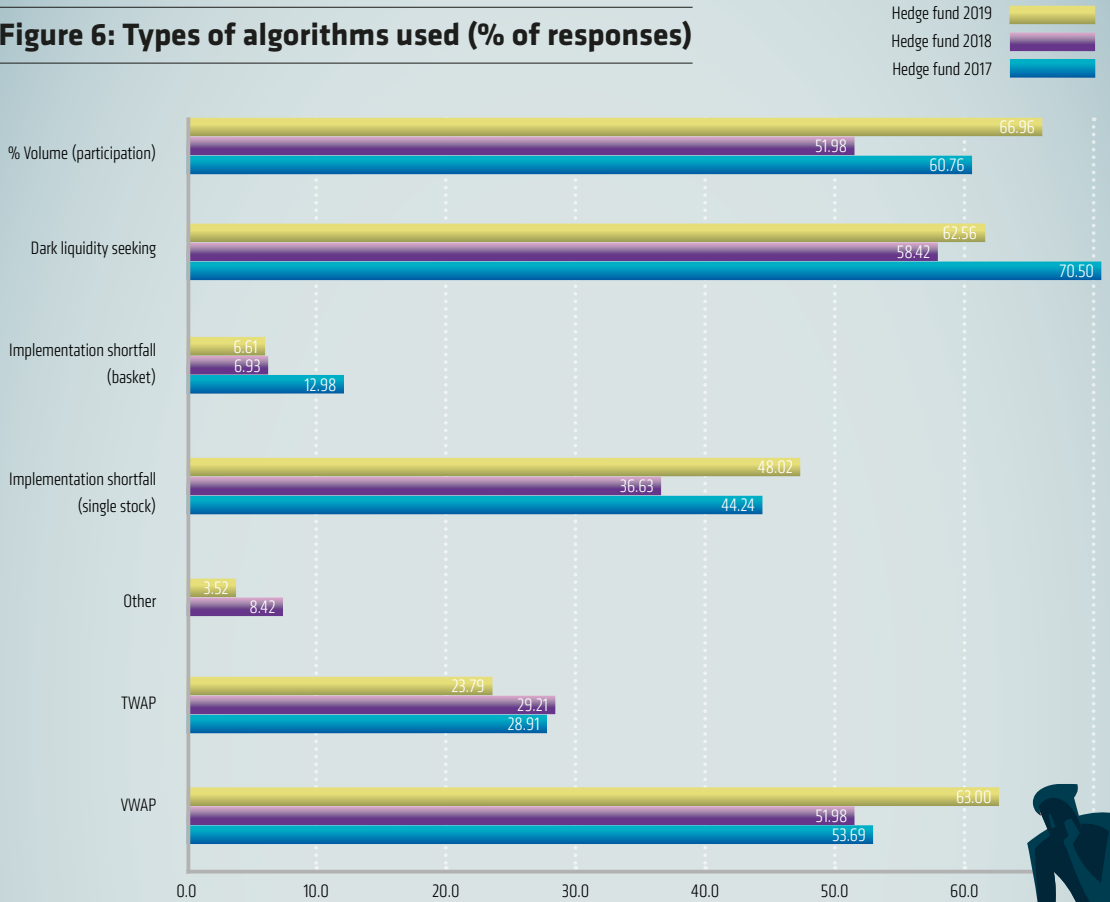
In parallel to the results from long-only buy-side firms, hedge funds are also rating brokers on a far higher level than their banking counterparts, as can be viewed in the 12 algo provider profiles included in this year's survey. While banks performed slightly better according to hedge funds compared to the results from long-only firms, they were still generally outperformed in almost every area by brokers.

The conclusions that can be

drawn from this year's algo survey – incorporating both long-only firms and hedge funds – is that the focus has firmly swung back to increased execution efficiencies and outcomes as the use of algorithmic trading increases, as the buy-side also applies increasing scrutiny on their providers. The question going forward is who among these providers, as the industry begins to eat itself through consolidation, will be left standing to fulfil the evolving needs of the market.

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 as possible to take part and to get their clients involved. In the Q3 edition of The TRADE we will be publishing the results of this year's Execution Management Systems (EMS) survey.

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



Bank of America Merrill Lynch

Bank of America Merrill Lynch (BAML) recorded a significant increase in the level of percentage of responses it received from hedge funds, over double the percentage it received in last year's survey, ranking joint-sixth in terms of response levels this year. Just over half of hedge fund respondents for BAML managed over \$10 billion of assets, although there was a relatively even split of respondents across AuM brackets. BAML recorded increased year-on-year scores in nine of the 15 categories under review in this year's survey, with an average score of 5.70 (up 0.28 from 2018), fractionally below the survey-wide aver-

age score of 5.72. The most significant year-on-year improvements were in the speed (up 0.63), dark pool access (up 0.48) and cost (up 0.73) categories, while the bank's best area of performance was in customer support, where it recorded a score of 6.15, which represented a year-on-year improvement of 0.89. BAML also received a score of 6.10 in the anonymity category. Meanwhile there were decreased year-on-year scores from hedge fund respondents in the customisation (down 0.45), ease of use (down 0.30) and execution consulting (down 0.13) categories.

BANK OF AMERICA MERRILL LYNCH RATINGS FOR ALGORITHM PERFORMANCE


Increase trader productivity	Reduce market impact	Execution consistency	Cost	Speed	Anonymity	Price improvement	Customisation
5.80	5.31	5.66	5.74	5.80	6.10	5.44	5.17

Ease of use	Customer support	Execution consulting	Dark pool access	Flexibility and sophistication of smart order routing	Algo monitoring capabilities	Data on venue/order routing logic or analysis	Average score
5.44	6.15	5.70	5.67	5.90	6.05	5.61	5.70

KEY STATS


 **6.15**
Highest score
(customer support)

 **5.17**
Lowest score
(customisation)

 **59%**
Most popular non-equity asset traded via algo by respondents:
Exchange-traded funds

 **+0.89**
Best year-on-year score
(customer support)

 **-0.45**
Worst year-on-year score
(customisation)

 **53%**
Most used algo performance measurement method:
Implementation shortfall TCA

Bernstein

Bernstein was one of the two major outperformers in this year's hedge fund survey, alongside Exane BNP Paribas. The firm recorded a consistent percentage of responses from hedge funds in line with last year's results, primarily from respondents managing up to \$10 billion in AuM and around one-third from the larger AuM brackets. Bernstein recorded the highest average score of any of the profiled providers in this year's hedge fund survey with 6.08, narrowly ahead of Exane BNP Paribas (6.06) and Mirabaud Securities (6.01). The firm recorded the highest scores of profiled providers in four of the 15 categories under review: anonymity (6.28), customisation (6.05),


flexibility and sophistication of smart order routing (5.99) and algo monitoring capabilities (6.06). The broker also recorded a score of above 6.00 in 10 of the 15 categories and year-on-year improvements across all areas of performance, most noticeably for flexibility and sophistication of smart order routing, execution consulting, execution consistency and reducing market impact, which increased 0.99, 0.83, 0.91 and 0.75 respectively on last year's results. Bernstein's lowest score came in the execution consulting category (5.86), however this was still the second-highest score of all profiled providers in this area.


BERNSTEIN RATINGS FOR ALGORITHM PERFORMANCE


Increase trader productivity	Reduce market impact	Execution consistency	Cost	Speed	Anonymity	Price improvement	Customisation
5.95	6.09	6.10	6.09	6.21	6.28	5.94	6.05


Ease of use	Customer support	Execution consulting	Dark pool access	Flexibility and sophistication of smart order routing	Algo monitoring capabilities	Data on venue/order routing logic or analysis	Average score
5.94	6.19	5.86	6.21	5.99	6.06	6.18	6.08

KEY STATS


 **6.28**
Highest score
(anonymity)

 **5.86**
Lowest score
(execution consulting)

 **58%**
Most popular non-equity
asset traded via algo by
respondents: Listed derivatives

 **+0.99**
Most improved year-
on-year score
(flexibility and sophistication
of smart order routing)

 **+0.12**
Least improved
year-on-year score
(customer support)

 **42%**
Most used algo
performance measurement method:
Implementation shortfall TCA

Citi

Citi saw an almost fourfold increase in the level of percentage of responses it received from hedge funds in this year's survey, with respondents coming from a relatively even split of AuM brackets. Citi's overall score in this year's hedge fund survey dropped by 0.15 to 5.24, well below the survey-wide average of 5.72, the lowest total of all the profiled providers. The bank will have cause to be concerned with the scores provided by hedge fund respondents, which ranked Citi with the lowest scores of all profiled providers in 5 of the 15 performance categories reviewed: increas-

ing trader productivity (4.92), reducing market impact (5.13), price improvement (5.10), ease of use (5.13) and customer support (5.35). The most marked year-on-year area of declining performance for Citi was in the customer support category, which scored highly in 2018 (6.18), but saw a decline of 0.83 in this year's survey, while there were other noticeably lower scores for ease of use (down 0.76), increasing trader productivity (down 0.45) and price improvement (down 0.39). Citi recorded year-on-year improvements for cost (up 0.30) and customisation (up 0.19).

CITI RATINGS FOR ALGORITHM PERFORMANCE

Increase trader productivity	Reduce market impact	Execution consistency	Cost	Speed	Anonymity	Price improvement	Customisation
4.92	5.13	5.34	5.24	5.14	5.26	5.10	5.48

Ease of use	Customer support	Execution consulting	Dark pool access	Flexibility and sophistication of smart order routing	Algo monitoring capabilities	Data on venue/order routing logic or analysis	Average score
5.13	5.35	5.48	5.24	5.32	5.34	5.11	5.24

KEY STATS



5.48

Highest score
(execution consulting/
customisation)



4.92

Lowest score
(improve trader performance)



50%

**Most popular non-equity asset
traded via algo by respondents:**
Exchange-traded funds



+0.30

**Most improved year-
on-year score:**
(cost)



-0.83

**Least improved
year-on-year score:**
(customer support)



42%

**Most used algo
performance measurement
method: Implementation
shortfall TCA**

Credit Suisse

Credit Suisse recorded a significant increase in the percentage of responses it received from hedge funds in this year's survey, over double the percentage it recorded in 2018. The majority of respondents were from mid-cap size range, with almost 60% of respondents managing between \$1-10 billion of AuM. Credit Suisse saw scores from hedge fund respondents mostly improve in this year's survey, with an average score of 5.59, a year-on-year improvement of 0.19 on 2018's survey, but just below the survey-wide average score of 5.72. The bank's standout area of performance in this year's survey was in the customer support category,

which scored 6.13 and represented a major improvement of 1.01 over its 2018 rating. Credit Suisse also saw year-on-year improvements for increasing trader productivity (up 0.45), reducing market impact (up 0.47), execution consistency (up 0.40), price improvement (up 0.27), customisation (up 0.26), ease of use (up 0.47) and dark pool access (up 0.27). However, there are areas where Credit Suisse saw previously high scores in last year's survey decline year-on-year, particularly in the flexibility and sophistication of smart order routing (down 0.43), anonymity (down 0.62) and cost (down 0.37) categories.

CREDIT SUISSE RATINGS FOR ALGORITHM PERFORMANCE

Increase trader productivity	Reduce market impact	Execution consistency	Cost	Speed	Anonymity	Price improvement	Customisation
5.49	5.23	5.67	5.49	5.28	5.26	5.21	5.82

Ease of use	Customer support	Execution consulting	Dark pool access	Flexibility and sophistication of smart order routing	Algo monitoring capabilities	Data on venue/order routing logic or analysis	Average score
5.71	6.13	5.64	5.79	5.57	5.70	5.82	5.59

KEY STATS



6.13

Highest score
(customer support)



5.21

Lowest score
(price improvement)



14%

Most popular non-equity asset traded via algo by respondents:
Foreign exchange



+1.01

Most improved year-on-year score
(customer support)



-0.62

Least improved year-on-year score
(anonymity)



43%

Most used algo performance measurement method: VWAP TCA

Exane BNP Paribas

Exane BNP Paribas was one of the two standout performers of this year's hedge fund survey, alongside Bernstein. The firm recorded a significantly higher percentage of responses to this year's survey, with the vast majority of hedge fund respondents from small to mid-cap AuM brackets, with just 12% of firms managing more than \$10 billion. The broker recorded the second-highest average score of all profiled providers in this year's survey with 6.06, marginally behind Bernstein (6.08), an increase of 0.65 year-on-year. Exane BNP Paribas received several noticeable year-on-year improvements from respondents, including those for price improvement

(up 1.16), increasing trader productivity (up 1.04), speed (up 0.94), execution consistency (up 0.84), cost (up 0.83), dark pool access (up 0.80) and reducing market impact (up 0.70). The firm also recorded the highest scores of all profiled providers in six of the 15 functional performance categories under review, including one of the two new categories introduced this year, data on venue/order routing logic or analysis (6.14). The only area in which Exane BNP Paribas saw a year-on-year decline was for execution consulting, which dropped 0.15 in this year's survey, a relatively modest decline in line with the survey average.

EXANE RATINGS FOR ALGORITHM PERFORMANCE

Increase trader productivity	Reduce market impact	Execution consistency	Cost	Speed	Anonymity	Price improvement	Customisation
6.07	6.24	6.18	6.09	6.32	6.20	5.98	6.05

Ease of use	Customer support	Execution consulting	Dark pool access	Flexibility and sophistication of smart order routing	Algo monitoring capabilities	Data on venue/order routing logic or analysis	Average score
6.15	6.24	5.58	5.77	5.96	5.94	6.14	6.06

KEY STATS



6.32

Highest score
(speed)



5.58

Lowest score
(execution consulting)



50%

Most popular non-equity asset traded via algo by respondents: Listed derivatives



+1.16

Most improved year-on-year score
(price improvement)



-0.15

Least improved year-on-year score
(execution consulting)



38%

Most used algo performance measurement method: Implementation shortfall TCA

Goldman Sachs

Goldman Sachs recorded a significant increase in the percentage of responses it received from hedge fund firms in this year's survey, with just under half of those managing over \$10 billion in AuM. Goldman Sachs saw its overall rating stay consistent with its score from last year's survey, recording an average of 5.57 this year, a marginal decrease of 0.03 year-on-year, and slightly below the survey-wide average of 5.72. The bank's scores across the 15 areas of performance under review were rather more varied, with seven categories recording increased year-on-year scores and six showing a year-on-year decrease. The most notable areas of improvement for Goldman

Sachs were for cost (up 0.47), ease of use (up 0.35) and dark pool access (up 0.35), while there were marginal increases in a further four categories. There were several instances where hedge fund respondents handed out significantly lower scores for Goldman Sachs compared to last year, most noticeable in the execution consulting (down 0.64), customer support (down 0.49), reducing market impact (down 0.40) and execution consistency (down 0.63) categories. Goldman Sachs was also attributed the lowest score of all profiled providers in the execution consistency category (5.32).

GOLDMAN SACHS RATINGS FOR ALGORITHM PERFORMANCE

Increase trader productivity	Reduce market impact	Execution consistency	Cost	Speed	Anonymity	Price improvement	Customisation
5.69	5.36	5.32	5.83	5.70	5.63	5.70	5.21

Ease of use	Customer support	Execution consulting	Dark pool access	Flexibility and sophistication of smart order routing	Algo monitoring capabilities	Data on venue/order routing logic or analysis	Average score
6.08	5.69	5.27	5.70	5.42	5.09	5.80	5.57

KEY STATS



6.08

Highest score
(ease of use)



5.09

Lowest score
(algo monitoring capabilities)



50%

Most popular
non-equity asset traded
via algo by respondents
Exchange-traded funds



+0.46

Most improved
year-on-year score
(cost)



-0.64

Least improved
year-on-year score
(execution consulting)



43%

Most used
algo performance
measurement method:
Implementation shortfall TCA

JP Morgan

JP Morgan recorded an almost fivefold increase in the percentage of responses it received from hedge fund firms in this year's survey, with almost two-thirds of respondents managing over \$10 billion in AuM. JP Morgan received mixed scores from hedge fund respondents in this year's survey, with an overall score of 5.61, a minor decrease of 0.08 year-on-year and just below the survey-wide average of 5.72. The bank recorded increased year-on-year scores in five categories in this year's survey, although some of these were so fractional as to be almost negligible; the most noticeable improvements according to hedge fund respondents were in the customisation (up 0.20) and

dark pool access (up 0.22) categories, the latter also the highest-scoring category for JP Morgan across the areas of performance under review (5.98). However, there were eight categories in which JP Morgan recorded decreased year-on-year scores, including reducing market impact (down 0.38), execution consistency (down 0.29), anonymity (down 0.38), price improvement (down 0.23) and execution consulting (down 0.34). For the two new categories introduced in this year's survey – algo monitoring capabilities and data on venue/order routing logic or analysis – JP Morgan received average scores of 5.63 and 5.68 respectively.

JP MORGAN RATINGS FOR ALGORITHM PERFORMANCE

Increase trader productivity	Reduce market impact	Execution consistency	Cost	Speed	Anonymity	Price improvement	Customisation
5.94	5.47	5.49	5.54	5.57	5.70	5.31	5.57

Ease of use	Customer support	Execution consulting	Dark pool access	Flexibility and sophistication of smart order routing	Algo monitoring capabilities	Data on venue/order routing logic or analysis	Average score
5.82	5.68	5.20	5.98	5.64	5.63	5.68	5.61

KEY STATS



5.98

Highest score
(dark pool access)



5.20

Lowest score
(execution consulting)



56%

Most popular non-equity asset traded via algo by respondents:
Exchange-traded funds



+0.22

Most improved year-on-year score
(dark pool access)



-0.38

Least improved year-on-year score
(reduce market impact/anonymity)



56%

Most used algo performance measurement method: Implementation shortfall TCA

Kepler Cheuvreux

Kepler Cheuvreux saw a significant increase in the percentage of responses it received from hedge fund firms, with the vast majority of respondents coming from the small and mid-sized AuM brackets and just 20% of respondents managing more than \$10 billion in AuM. Kepler Cheuvreux will have every right to be disappointed with its scores in this year's survey, particularly as it was one of the standout performers in the 2018 edition. The broker recorded an average score of 5.63, just below the survey average of 5.72. There were year-on-year decreases in scores across 10 of the 15 categories reviewed, most noticeably in

the reducing market impact (down 0.70), anonymity (down 0.32), price improvement (down 0.35), ease of use (down 0.59), customer support (down 0.57) and flexibility and sophistication of smart order routing (down 0.30) categories. However, there were marginal year-on-year improvements in the increasing trader productivity (up 0.14), cost (up 0.10) and customisation (up 0.18) categories. Kepler Cheuvreux's highest score came in the customer support category (5.97), although this only ranked sixth-highest among the 12 algo providers profiled this year.

KEPLER CHEUVREUX RATINGS FOR ALGORITHM PERFORMANCE

Increase trader productivity	Reduce market impact	Execution consistency	Cost	Speed	Anonymity	Price improvement	Customisation
5.83	5.58	5.86	5.71	5.61	5.76	5.31	5.75

Ease of use	Customer support	Execution consulting	Dark pool access	Flexibility and sophistication of smart order routing	Algo monitoring capabilities	Data on venue/order routing logic or analysis	Average score
5.63	5.97	5.73	5.24	5.47	5.44	5.54	5.63

KEY STATS



5.97

Highest score
(customer support)



5.24

Lowest score:
(dark pool access)



40%

Most popular non-equity asset traded via algo by respondents: Listed derivatives



+0.18

Most improved year-on-year score
(customisation)



-0.70

Least improved year-on-year score:
(reduce market impact)



44%

Most used algo performance measurement method: VWAP TCA

Liquidnet

Liquidnet saw a marginal increase in the percentage of responses it received from hedge fund firms in this year's survey, with around one-third of respondents managing \$10-50 billion in AuM. Liquidnet recorded a varied set of results in this year's survey, with some significant year-on-year fluctuations. The firm received an average score of 5.33, one of the lowest scores to Liquidnet of all profiled providers in six of the 15 areas of performance under review in this year's survey: cost (5.18), speed (4.91), customi-

sation (4.74), dark pool access (5.23), flexibility and sophistication of smart order routing (5.23) and algo monitoring capabilities (5.03). Liquidnet's poorest area of performance year-on-year was clearly in the dark pool access category, which scored significantly lower than in last year's survey, falling from 6.24 in 2018 to 5.23 in this year's survey. However, there were also noticeable areas of improvement for Liquidnet compared to last year, with year-on-year increases in the reducing market impact (up 0.32), cost (up 0.69), price improvement (up 0.58), and customer support (up 0.32) categories.

LIQUIDNET RATINGS FOR ALGORITHM PERFORMANCE

Increase trader productivity	Reduce market impact	Execution consistency	Cost	Speed	Anonymity	Price improvement	Customisation
5.65	6.16	5.35	5.18	4.91	5.75	5.63	4.74

Ease of use	Customer support	Execution consulting	Dark pool access	Flexibility and sophistication of smart order routing	Algo monitoring capabilities	Data on venue/order routing logic or analysis	Average score
5.28	5.76	5.28	5.23	5.23	5.03	4.82	5.33

KEY STATS



6.16

Highest score
(reduce market impact)



4.74

Lowest score
(customisation)



40%

Most popular non-equity asset traded via algo by respondents:
Exchange-traded funds



+0.69

Most improved year-on-year score
(cost)



-1.01

Least improved year-on-year score
(dark pool access)



47%

Most used algo performance measurement method: Implementation shortfall TCA

Mirabaud Securities

Mirabaud Securities is a new entry for this year's hedge fund algo trading survey, garnering a respectable percentage of responses, with only four of the profiled providers attracting higher. Respondents for Mirabaud Securities were primarily from the small to mid-cap AuM brackets, with only two firms managing more than \$10 billion of assets. Mirabaud Securities produced a strong showing according to hedge fund respondents this year, attaining an average score of 6.01, well above the survey average of 5.72, representing the third-highest average score of all profiled providers. The broker scored higher than any

other provider in five of the 15 areas of performance under review in this year's survey: ease of use (6.16), customer support (6.34), execution consulting (6.18), dark pool access (6.37) and data on venue/order routing logic or analysis (6.31). Mirabaud Securities also received a score of over 6.0 in the increasing trader productivity (6.07) and algo monitoring capabilities (6.03) categories. The firm's lowest score was in the speed category (5.60), although this still represents a respectable performance. The challenge for Mirabaud Securities will now be maintaining, or improving, these scores in next year's survey.

MIRABAUD RATINGS FOR ALGORITHM PERFORMANCE

Increase trader productivity	Reduce market impact	Execution consistency	Cost	Speed	Anonymity	Price improvement	Customisation
6.02	5.96	5.93	5.98	5.60	5.95	5.88	5.64

Ease of use	Customer support	Execution consulting	Dark pool access	Flexibility and sophistication of smart order routing	Algo monitoring capabilities	Data on venue/order routing logic or analysis	Average score
6.16	6.34	6.18	6.37	5.88	6.03	6.31	6.01

KEY STATS



6.37

Highest score
(dark pool access)



5.60

Lowest score
(speed)



64%

Most popular non-equity asset
traded via algo by respondents:
Exchange-traded funds



N/A

Most improved
year-on-year score



N/A

Least improved
year-on-year score



43%

Most used algo
performance measurement
method: VWAP TCA

Morgan Stanley

Morgan Stanley recorded a small increase in the percentage of responses it received from hedge fund firms in this year's survey, with half of respondents managing assets worth between \$1-10 billion. Morgan Stanley received an average score of 5.75 in this year's survey, both above the survey-wide average of 5.72 and a 0.35 increase on its score in last year's survey, as well as representing the highest average score achieved by a bank this year. Morgan Stanley recorded year-on-year increases in 11 of the 15 areas of performance reviewed, most noticeably for increasing trader productivity (up 0.58), reducing market impact

(up 0.77), cost (up 0.36), execution consulting (up 0.35), dark pool access (up 0.46) and flexibility and sophistication of smart order routing (up 0.33). It was in the customisation category where the bank truly outperformed this year however; while its score of 5.56 was relatively modest compared to other profiled providers, this was an area of underperformance for Morgan Stanley in last year's survey (4.53), and a year-on-year increase of 1.02 represents significant improvement. The only area in which the bank saw a decreased year-on-year score was for customer support (down 0.18).

MORGAN STANLEY RATINGS FOR ALGORITHM PERFORMANCE

Increase trader productivity	Reduce market impact	Execution consistency	Cost	Speed	Anonymity	Price improvement	Customisation
5.75	5.70	5.80	5.88	5.91	5.74	5.49	5.56

Ease of use	Customer support	Execution consulting	Dark pool access	Flexibility and sophistication of smart order routing	Algo monitoring capabilities	Data on venue/order routing logic or analysis	Average score
5.81	5.69	5.54	6.04	5.86	5.68	5.81	5.75

KEY STATS



6.04

Highest score
(dark pool access)



5.49

Lowest score
(price improvement)



50%

Most popular non-equity asset traded via algo by respondents: Foreign exchange



+1.02

Most improved year-on-year score
(customisation)



-0.18

Least improved year-on-year score
(customer support)



40%

Most used algo performance measurement method: Implementation shortfall TCA

UBS

UBS recorded a twofold increase in the percentage of responses it received from hedge fund firms in this year's survey, with just over half of respondents managing more than \$10 billion in AuM. UBS recorded a slight improvement in its average score for this year's survey with 5.59, an increase of 0.13 on the 2018 edition, although this was just below the survey-wide average of 5.72. The bank saw year-on-year increases in eight of the 15 areas of performance under review, with the most noticeable improvements coming in the increase trader productivity (up 0.66), reducing market impact (up 0.56), speed (up 0.52), price improve-

ment (up 0.95) and customer support (up 0.36) categories. However, there were also significant year-on-year decreases for anonymity (down 0.38), flexibility and sophistication of smart order routing (down 0.25) and execution consulting (down 0.51). UBS' score in the execution consulting category (5.06) was also the lowest of all profiled providers in this year's survey. The bank's scores in the two new functional categories for this year's survey produced a modest result for algo monitoring capabilities (5.61) and a relatively low score for data on venue/order routing logic or analysis (5.25).

UBS RATINGS FOR ALGORITHM PERFORMANCE

Increase trader productivity	Reduce market impact	Execution consistency	Cost	Speed	Anonymity	Price improvement	Customisation
5.61	5.78	5.65	5.52	5.72	5.64	5.46	5.56

Ease of use	Customer support	Execution consulting	Dark pool access	Flexibility and sophistication of smart order routing	Algo monitoring capabilities	Data on venue/order routing logic or analysis	Average score
5.85	5.72	5.06	5.65	5.71	5.61	5.25	5.59

KEY STATS



5.85

Highest score
(ease of use)



5.06

Lowest score
(execution consulting)



36%

Most popular non-equity
asset traded via algo by
respondents: Listed derivatives



+0.95

Most improved
year-on-year score
(price improvement)



-0.51

Least improved
year-on-year score
(execution consulting)



45%

Most used
algo performance
measurement method:
Implementation shortfall TCA