Ally Invest Securities LLC - Held NMS Stocks and Options Order Routing Public Report
Generated on Fri May 19 2023 13:26:42 GMT-0400 (Eastern Daylight Time)

1st Quarter, 2023

January 2023

S&P 500 Stocks

Summary

<table>
<thead>
<tr>
<th>Non-Directed Orders as % of All Orders</th>
<th>Market Orders as % of Non-Directed Orders</th>
<th>Marketable Limit Orders as % of Non-Directed Orders</th>
<th>Non-Marketable Limit Orders as % of Non-Directed Orders</th>
<th>Other Orders as % of Non-Directed Orders</th>
</tr>
</thead>
<tbody>
<tr>
<td>100.00</td>
<td>22.10</td>
<td>3.87</td>
<td>65.99</td>
<td>8.04</td>
</tr>
</tbody>
</table>

Venues

<table>
<thead>
<tr>
<th>Venue - Non-directed Order Flow</th>
<th>Non-Directed Orders (%)</th>
<th>Market Orders (%)</th>
<th>Marketable Limit Orders (%)</th>
<th>Non-Marketable Limit Orders (%)</th>
<th>Other Orders (%)</th>
<th>Net Payment Paid/Received for Market Orders(USD)</th>
<th>Net Payment Paid/Received for Marketable Limit Orders(USD)</th>
<th>Net Payment Paid/Received for Non-Marketable Limit Orders(USD)</th>
<th>Net Payment Paid/Received for Non-Marketable Limit Orders(USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1 Execution Services, LLC</td>
<td>32.48</td>
<td>19.99</td>
<td>21.67</td>
<td>37.64</td>
<td>29.73</td>
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<td>Two Sigma Securities, LLC</td>
<td>21.91</td>
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<td>6,115.26</td>
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<td>1,777.07</td>
<td>3,969.91</td>
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Material Aspects:

G1 Execution Services, LLC:
We receive payment for executed orders routed to G1X Execution Services at the following rates:
(i) Marketable order, listed equity priced at $1.00 per share or more: up to $0.0022 per share
(ii) Non-marketable order: up to $0.003 per share
We do not negotiate for higher payment rates in exchange for lower execution quality.

CITADEL SECURITIES LLC:
We receive payment for executed orders routed to Citadel Securities with respect to listed equities priced at $1.01 per share or more, at the following rates:
(i) Marketable order: up to $0.0022 per share
(ii) Non-marketable order: up to $0.003 per share
(iii) Extended hours order: up to $0.001 per share
These payment arrangements are conditioned upon regular attestations to Citadel that substantially all of the orders we route to them qualify as “retail” orders (i.e., originating from natural persons and not generated by trading algorithms or other computerized methods). Although we do not negotiate for higher payment rates in exchange for lower execution quality, in general there is an inverse (though not necessarily proportional) relationship between payment for order flow rates and price improvement.
Two Sigma Securities, LLC:
We receive payment for executed orders routed to Two Sigma Securities with respect to listed equities priced at $1.00 per share or more, at the following rates:
(i) Marketable order: up to $0.0021 per share
(ii) Non-marketable order: up to $0.003 per share
(iii) Order greater than 10,000 shares or $250,000 principal value: up to $0.003 per share
These payment arrangements are conditioned upon regular attestations to Two Sigma that substantially all of the orders we route to them qualify as "retail" orders (i.e., originating from natural persons and not generated by trading algorithms or other computerized methods). Although we do not negotiate for higher payment rates in exchange for lower execution quality, in general there is an inverse (though not necessarily proportional) relationship between payment for order flow rates and price improvement.

Virtu Americas, LLC:
We receive payment for executed orders routed to Virtu Americas with respect to listed equities priced at $1.00 per share or more, at the following rates:
(i) Marketable order: up to $0.00175 per share
(ii) Non-marketable order: up to $0.003 per share
(iii) Order greater than 10,000 shares or $250,000 principal value: $0.003 per share
We do not receive payment for any extended hours orders, regardless of size or marketability. These payment arrangements are conditioned upon regular attestations to Virtu that substantially all of the orders we route to them qualify as "retail" orders (i.e., originating from natural persons and not generated by trading algorithms or other computerized methods). Although we do not negotiate for higher payment rates in exchange for lower execution quality, in general there is an inverse (though not necessarily proportional) relationship between payment for order flow rates and price improvement.

APEX CLEARING CORPORATION:
We route orders of listed equities to our clearing firm, Apex Clearing Corporation, which further routes them to execution venues with which it has relationships. The execution venues may pay Apex for such order flow, in which case Apex retains 10% of such payment and pays us the remaining 90%. We do not determine or influence where Apex routes our orders. Further, we do not participate in any discussions concerning the payment-for-order-flow arrangements between Apex and the execution venues, nor do we influence those arrangements in any manner. See https://www.apexcouring.com/sec-rule-606-and-607/ for reports concerning Apex’s order routing practices, which we are adopting by reference.

January 2023

Non-S&P 500 Stocks

Summary

<table>
<thead>
<tr>
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<th>Market Orders as % of Non-Directed Orders</th>
<th>Marketable Limit Orders as % of Non-Directed Orders</th>
<th>Non-Marketable Limit Orders as % of Non-Directed Orders</th>
<th>Other Orders as % of Non-Directed Orders</th>
</tr>
</thead>
<tbody>
<tr>
<td>100.00</td>
<td>23.23</td>
<td>5.23</td>
<td>63.09</td>
<td>8.46</td>
</tr>
</tbody>
</table>

Venues

| Venue - Non-directed Order Flow | Non-Directed Orders (%) | Market Orders (%) | Marketable Limit Orders (%) | Non-Marketable Limit Orders (%) | Other Orders (%) | Net Payment Paid/Received for Market Orders(USD) | Net Payment Paid/Received for Non-Marketable Limit Orders(USD) | Net Payment Paid/Received for Marketable Limit Orders(USD) | Net Payment Paid/Received for Non-Marketable Limit Orders(cents per hundred shares) | Net Payment Paid/Received for Marketable Limit Orders(cents per hundred shares) | Net Payment Paid/Received for Non-Marketable Limit Orders(USD) | Net Payment Paid/Received for Marketable Limit Orders(USD) | Net Payment Paid/Received for Other Orders(USD) | Net Payment Paid/Received for Other Orders(cents per hundred shares) |
|---------------------------------|------------------------|------------------|-----------------------------|--------------------------------|------------------|-----------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| G1 Execution Services, LLC      | 31.24                  | 19.95            | 20.96                       | 36.70                          | 27.82            | 18,377.77                                     | 23,5019                                                     | 8,708.55                                                      | 24,3563                                                                                                                             | 13,882.91                                                                                               | 23,2063                                                                                      | 3,254.71                                                                                     | 25,6959                                                                                                           |
| CITADEL SECURITIES LLC          | 31.08                  | 25.17            | 25.94                       | 31.84                          | 44.81            | 17,499.88                                     | 17,8317                                                    | 6,767.61                                                      | 15,2462                                                                                                                             | 14,615.61                                                                                               | 24,8861                                                                                      | 6,980.97                                                                                     | 11,2890                                                                                                           |
| Two Sigma Securities, LLC       | 23.69                  | 44.86            | 43.95                       | 15.39                          | 14.92            | 34,321.15                                     | 19,4340                                                    | 13,160.08                                                     | 16,2306                                                                                                                             | 25,071.07                                                                                               | 22,0498                                                                                     | 5,408.94                                                                                     | 21,8843                                                                                                           |
| Virtu Americas, LLC             | 14.00                  | 10.02            | 9.15                        | 16.07                          | 12.45            | 8,041.67                                      | 20,0237                                                   | 2,949.57                                                      | 19,8281                                                                                                                             | 5,688.74                                                                                               | 26,2338                                                                                     | 550.70                                                                                                                                  | 22,7126                                                                                                           |

Material Aspects:
G1 Execution Services, LLC.
We receive payment for executed orders routed to G1X Execution Services at the following rates:

(i) Marketable order, listed equity priced at $1.00 per share or more: up to $0.0022 per share
(ii) Marketable order, listed equity priced up to $1.00 per share: up to $0.001 per share
(iii) Non-marketable order, listed equity priced at $1.00 per share or more: up to $0.003 per share
(iv) Order greater than 10,000 shares or $250,000 principal value: $0.003 per share

These payment arrangements are conditioned upon regular attestations to G1X that substantially all of the orders we route to them qualify as “retail” orders (i.e., originating from natural persons and not generated by trading algorithms or other computerized methods). Although we do not negotiate for higher payment rates in exchange for lower execution quality, in general there is an inverse (though not necessarily proportional) relationship between payment for order flow rates and price improvement.

CITADEL SECURITIES LLC:
We receive payment for executed orders routed to Citadel Securities with respect to listed equities priced at $1.00 per share or more, at the following rates:

(i) Marketable order: up to $0.0022 per share
(ii) Non-marketable order: up to $0.003 per share
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APEX CLEARING CORPORATION:
We route orders of listed equities to our clearing firm, Apex Clearing Corporation, which further routes them to execution venues with which it has relationships. The execution venues may pay Apex for such order flow, in which case Apex retains 10% of such payment and pays us the remaining 90%. We do not determine or influence where Apex routes our orders. Further, we do not participate in any discussions concerning the payment-for-order-flow arrangements between Apex and the execution venues, nor do we influence those arrangements in any manner. See https://www.apexclearing.com/sec-rule-606-and-607/ for reports concerning Apex’s order routing practices, which we are adopting by reference.

Virtu Americas, LLC:
We receive payment for executed orders routed to Virtu Americas with respect to listed equities priced at $1.00 per share or more, at the following rates:

(i) Marketable order: up to $0.00175 per share
(ii) Non-marketable order: up to $0.003 per share
(iii) Order greater than 10,000 shares or $250,000 principal value: $0.003 per share

We do not receive payment for any extended hours orders, regardless of size or marketability. These payment arrangements are conditioned upon regular attestations to Virtu that substantially all of the orders we route to them qualify as “retail” orders (i.e., originating from natural persons and not generated by trading algorithms or other computerized methods). Although we do not negotiate for higher payment rates in exchange for lower execution quality, in general there is an inverse (though not necessarily proportional) relationship between payment for order flow rates and price improvement.

January 2023

Options

Summary

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<th>Other Orders as % of Non-Directed Orders</th>
</tr>
</thead>
<tbody>
<tr>
<td>100.00</td>
<td>7.78</td>
<td>9.82</td>
<td>49.86</td>
<td>32.54</td>
</tr>
</tbody>
</table>

Venues

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<tr>
<th>Venue - Non-directed Order Flow</th>
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<th>Market Orders (%)</th>
<th>Marketable Limit Orders (%)</th>
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<th>Net Payment Paid/Received for Market Orders(USD)</th>
<th>Net Payment Paid/Received for Marketable Limit Orders(cents per hundred shares)</th>
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<th>Net Payment Paid/Received for Other Orders(cents per hundred shares)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CITADEL SECURITIES LLC</td>
<td>38.60</td>
<td>30.33</td>
<td>32.40</td>
<td>39.32</td>
<td>41.36</td>
<td>28,057.00</td>
<td>49,0953</td>
<td>64,717.00</td>
<td>49,610.00</td>
<td>51,202.00</td>
<td>48,048.67</td>
</tr>
</tbody>
</table>
Material Aspects:
CITADEL SECURITIES LLC:
We receive payment for executed multi-listed, non-index option orders routed to Citadel Securities at a rate of up to $0.50 per contract. Citadel waives fees associated with index options so long as they do not exceed 5% of the total monthly volume. These payment arrangements are conditioned upon regular attestations to Citadel that substantially all of the orders we route to them qualify as "retail" orders (i.e., originating from natural persons and not generated by trading algorithms or other computerized methods). Although we do not negotiate for higher payment rates in exchange for lower execution quality, in general there is an inverse (though not necessarily proportional) relationship between payment for order flow rates and price improvement.

Wolverine Execution Services, LLC:
We receive payment for executed multi-listed, non-index option orders routed to Wolverine Execution Services at the following rates:
(i) Single-Leg order, non-Penny Interval Program: up to $1.00 per contract
(ii) Single-Leg order, Penny Interval Program: up to $0.35 per contract
(iii) Multi-Leg order, non-Penny Interval Program: up to $1.00 per contract
(iv) Multi-Leg order, Penny Interval Program: up to $0.43 per contract

Wolverine waives fees associated with index options so long as they do not exceed 5% of the total monthly volume. These payment arrangements are conditioned upon regular attestations to Wolverine that substantially all of the orders we route to them qualify as "retail" orders (i.e., originating from natural persons and not generated by trading algorithms or other computerized methods). Although we do not negotiate for higher payment rates in exchange for lower execution quality, in general there is an inverse (though not necessarily proportional) relationship between payment for order flow rates and price improvement.

APEX CLEARING CORPORATION:
We route orders of multi-listed orders to our clearing firm, Apex Clearing Corporation, which further routes them to execution venues with which it has relationships. The execution venues may pay Apex for such order flow, in which case Apex forwards such payment to us. We do not determine or influence where Apex routes our orders. Further, we do not participate in any discussions concerning the payment-for-order-flow arrangements between Apex and the execution venues, nor do we influence those arrangements in any manner. See https://www.apexclearing.com/sec-rule-606-and-607/ for reports concerning Apex's order routing practices, which we are adopting by reference.

Global Execution Brokers LP:
We receive payment for executed multi-listed, non-index option orders routed to Global Execution Brokers at the following rates:
(i) Single-Leg order, non-Penny Interval Program: up to $1.00 per contract
(ii) Single-Leg order, Penny Interval Program: up to $0.37 per contract
(iii) Multi-Leg order, non-Penny Interval Program: up to $1.00 per contract
(iv) Multi-Leg order, Penny Interval Program: up to $0.44 per contract

Global Execution Brokers waives fees associated with index options so long as they do not exceed 5% of the total monthly volume. These payment arrangements are conditioned upon regular attestations to Global Execution Brokers that substantially all of the orders we route to them qualify as "retail" orders (i.e., originating from natural persons and not generated by trading algorithms or other computerized methods). Although we do not negotiate for higher payment rates in exchange for lower execution quality, in general there is an inverse (though not necessarily proportional) relationship between payment for order flow rates and price improvement.

February 2023

S&P 500 Stocks

Summary

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</tr>
</thead>
<tbody>
<tr>
<td>100.00</td>
<td>21.13</td>
<td>3.72</td>
<td>67.16</td>
<td>7.99</td>
</tr>
</tbody>
</table>

Venues
Material Aspects:

CITADEL SECURITIES LLC:
We receive payment for executed orders routed to Citadel Securities with respect to listed equities priced at $1.00 per share or more, at the following rates:
(i) Marketable order: up to $0.0022 per share
(ii) Non-marketable order: up to $0.003 per share
(iii) Extended hours order: up to $0.001 per share
(iv) Order greater than 10,000 shares or $250,000 principal value: up to $0.003 per share

We do not receive payment for any extended hours orders, regardless of size or marketability. These payment arrangements are conditioned upon regular attestations to Citadel that substantially all of the orders we route to them qualify as "retail" orders (i.e., originating from natural persons and not generated by trading algorithms or other computerized methods). Although we do not negotiate for higher payment rates in exchange for lower execution quality, in general there is an inverse (though not necessarily proportional) relationship between payment for order flow rates and price improvement.

Virtu Americas, LLC:
We receive payment for executed orders routed to Virtu Americas with respect to listed equities priced at $1.00 per share or more, at the following rates:
(i) Marketable order: up to $0.00175 per share
(ii) Non-marketable order: up to $0.003 per share
(iii) Order greater than 10,000 shares or $250,000 principal value: $0.003 per share

We do not receive payment for any extended hours orders, regardless of size or marketability. These payment arrangements are conditioned upon regular attestations to Virtu that substantially all of the orders we route to them qualify as "retail" orders (i.e., originating from natural persons and not generated by trading algorithms or other computerized methods). Although we do not negotiate for higher payment rates in exchange for lower execution quality, in general there is an inverse (though not necessarily proportional) relationship between payment for order flow rates and price improvement.

APEX CLEARING CORPORATION:
We route orders of listed equities to our clearing firm, Apex Clearing Corporation, which further routes them to execution venues with which it has relationships. The execution venues may pay Apex for such order flow, in which case Apex retains 10% of such payment and pays us the remaining 90%. We do not determine or influence where Apex routes our orders. Further, we do not participate in any discussions concerning the payment-for-order-flow arrangements between Apex and the execution venues, nor do we influence those arrangements in any manner. See https://www.apexclearing.com/sec-rule-606-and-607/ for reports concerning Apex’s order routing practices, which we are adopting by reference.

Two Sigma Securities, LLC:
We receive payment for executed orders routed to Two Sigma Securities with respect to listed equities priced at $1.00 per share or more, at the following rates:
(i) Marketable order: up to $0.0022 per share
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These payment arrangements are conditioned upon regular attestations to Two Sigma that substantially all of the orders we route to them qualify as "retail" orders (i.e., originating from natural persons and not generated by trading algorithms or other computerized methods). Although we do not negotiate for higher payment rates in exchange for lower execution quality, in general there is an inverse (though not necessarily proportional) relationship between payment for order flow rates and price improvement.

G1 Execution Services, LLC:
We receive payment for executed orders routed to G1X Execution Services at the following rates:
(i) Marketable order, listed equity priced at $1.00 per share or more: up to $0.0022 per share
(ii) Marketable order, listed equity priced under $1.00 per share: up to $0.001 per share
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February 2023
Non-S&P 500 Stocks

Summary

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<th>Market Orders (%)</th>
<th>Marketable Limit Orders (%)</th>
<th>Non-Marketable Limit Orders (%)</th>
<th>Other Orders (%)</th>
<th>Net Payment Paid/Received for Market Orders(USD)</th>
<th>Net Payment Paid/Received for Market Orders(cents per hundred shares)</th>
<th>Net Payment Paid/Received for Limit Orders(USD)</th>
<th>Net Payment Paid/Received for Limit Orders(cents per hundred shares)</th>
<th>Net Payment Paid/Received for Non-Marketable Limit Orders(USD)</th>
<th>Net Payment Paid/Received for Non-Marketable Limit Orders(cents per hundred shares)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CITADEL SECURITIES LLC</td>
<td>35.83</td>
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<tr>
<td>Virtu Americas, LLC</td>
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<td>6,354.76</td>
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<tr>
<td>Two Sigma Securities, LLC</td>
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<td>G1 Execution Services, LLC</td>
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<td>3,391.66</td>
<td>23,1814</td>
<td>7,025.14</td>
<td>25,6380</td>
</tr>
</tbody>
</table>

Material Aspects:

CITADEL SECURITIES LLC:
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Virtu Americas, LLC:
We receive payment for executed orders routed to Virtu Americas with respect to listed equities priced at $1.00 per share or more, at the following rates:
(i) Marketable order: up to $0.0075 per share
(ii) Non-marketable order: up to $0.003 per share
(iii) Order greater than $250,000 principal value: $0.003 per share
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(i) Marketable order, listed equity priced at $1.00 per share or more: up to $0.0022 per share
(ii) Marketable order, listed equity priced under $1.00 per share: up to $0.001 per share
(iii) Non-marketable order, listed equity priced at $1.00 per share or more: up to $0.003 per share
(iv) Order greater than 10,000 shares or $250,000 principal value: $0.003 per share

These payment arrangements are conditioned upon regular attestations to G1X that substantially all of the orders we route to them qualify as “retail” orders (i.e., originating from natural persons and not generated by trading algorithms or other computerized methods). Although we do not negotiate for higher payment rates in exchange for lower execution quality, in general there is an inverse (though not necessarily proportional) relationship between payment for order flow rates and price improvement.

February 2023

Options

Summary

<table>
<thead>
<tr>
<th>Non-Directed Orders as % of All Orders</th>
<th>Market Orders as % of Non-Directed Orders</th>
<th>Marketable Limit Orders as % of Non-Directed Orders</th>
<th>Non-Marketable Limit Orders as % of Non-Directed Orders</th>
<th>Other Orders as % of Non-Directed Orders</th>
</tr>
</thead>
<tbody>
<tr>
<td>100.00</td>
<td>8.31</td>
<td>9.83</td>
<td>50.71</td>
<td>31.15</td>
</tr>
</tbody>
</table>

Venues

<table>
<thead>
<tr>
<th>Venue - Non-Directed Order Flow</th>
<th>Non-Directed Orders (%)</th>
<th>Market Orders (%)</th>
<th>Marketable Limit Orders (%)</th>
<th>Non-Marketable Limit Orders (%)</th>
<th>Other Orders (%)</th>
<th>Net Payment Paid/Received for Market Orders(USD)</th>
<th>Net Payment Paid/Received for Marketable Limit Orders(USD)</th>
<th>Net Payment Paid/Received for Non-Marketable Limit Orders(USD)</th>
<th>Net Payment Paid/Received for Other Orders(USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CITADEL SECURITIES LLC</td>
<td>38.32</td>
<td>30.34</td>
<td>32.33</td>
<td>39.00</td>
<td>41.24</td>
<td>31,437.50</td>
<td>69,605.00</td>
<td>49,673.22</td>
<td>53,320.00</td>
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<tr>
<td>Wolverine Execution Services, LLC</td>
<td>31.06</td>
<td>29.20</td>
<td>24.80</td>
<td>30.09</td>
<td>35.12</td>
<td>22,650.40</td>
<td>33,693.85</td>
<td>40,183.5</td>
<td>39,601.20</td>
</tr>
<tr>
<td>Global Execution Brokers LP</td>
<td>30.61</td>
<td>40.46</td>
<td>42.87</td>
<td>30.91</td>
<td>23.64</td>
<td>34,569.49</td>
<td>67,999.70</td>
<td>42,758.8</td>
<td>69,584.99</td>
</tr>
</tbody>
</table>

Material Aspects:

CITADEL SECURITIES LLC:
We receive payment for executed multi-listed, non-index option orders routed to Citadel Securities at a rate of up to $0.30 per contract. Citadel waives fees associated with index options so long as they do not exceed 5% of the total monthly volume. These payment arrangements are conditioned upon regular attestations to Citadel that substantially all of the orders we route to them qualify as “retail” orders (i.e., originating from natural persons and not generated by trading algorithms or other computerized methods). Although we do not negotiate for higher payment rates in exchange for lower execution quality, in general there is an inverse (though not necessarily proportional) relationship between payment for order flow rates and price improvement.

Wolverine Execution Services, LLC:
We receive payment for executed multi-listed, non-index option orders routed to Wolverine Execution Services at the following rates:

(i) Single Leg order, non-Penny Interval Program: up to $1.00 per contract
(ii) Single Leg order, Penny Interval Program: up to $0.35 per contract
(iii) Multi Leg order, non-Penny Interval Program: up to $1.00 per contract
(iv) Multi Leg order, Penny Interval Program: up to $0.43 per contract

Wolverine waives fees associated with index options so long as they do not exceed 5% of the total monthly volume. These payment arrangements are conditioned upon regular attestations to Wolverine that substantially all of the orders we route to them qualify as “retail” orders (i.e., originating from natural persons and not generated by trading algorithms or other computerized methods). Although we do not negotiate for higher payment rates in exchange for lower execution quality, in general there is an inverse (though not necessarily proportional) relationship between payment for order flow rates and price improvement.

APEX CLEARING CORPORATION:
We route orders of multi-listed options to our clearing firm, Apex Clearing Corporation, which further routes them to execution venues with which it has relationships. The execution venues may pay Apex for such order flow, in which case Apex forwards such payment to us. We do not determine or influence where Apex routes our orders. Further, we do not participate in any discussions concerning the payment-for-order-flow arrangements between Apex and the execution venues, nor do we influence those arrangements in any manner. See https://www.apexclearing.com/sec-rule-606-and-607/ for reports concerning Apex’s order routing practices, which we are adopting by reference.

Global Execution Brokers LP:
We receive payment for executed multi-listed, non-index option orders routed to Global Execution Brokers at the following rates:

(i) Single-Leg order, non-Penny Interval Program: up to $1.00 per contract
(ii) Single-Leg order, Penny Interval Program: up to $0.37 per contract
(iii) Multi-Leg order, non-Penny Interval Program: up to $1.00 per contract
(iv) Multi-Leg order, Penny Interval Program: up to $0.44 per contract

Global Execution Brokers waives fees associated with index options so long as they do not exceed 5% of the total monthly volume. These payment arrangements are conditioned upon regular attestations to Global Execution Brokers that substantially all of the orders we route to them qualify as "retail" orders (i.e., originating from natural persons and not generated by trading algorithms or other computerized methods). Although we do not negotiate for higher payment rates in exchange for lower execution quality, in general there is an inverse (though not necessarily proportional) relationship between payment for order flow rates and price improvement.

March 2023

S&P 500 Stocks

Summary

<table>
<thead>
<tr>
<th>Non-Directed Orders as % of All Orders</th>
<th>Market Orders as % of Non-Directed Orders</th>
<th>Marketable Limit Orders as % of Non-Directed Orders</th>
<th>Non-Marketable Limit Orders as % of Non-Directed Orders</th>
<th>Other Orders as % of Non-Directed Orders</th>
</tr>
</thead>
<tbody>
<tr>
<td>100.00</td>
<td>21.09</td>
<td>4.38</td>
<td>67.47</td>
<td>7.06</td>
</tr>
</tbody>
</table>

Venues

<table>
<thead>
<tr>
<th>Venue - Non-directed Order Flow</th>
<th>Non-Directed Orders (%)</th>
<th>Market Orders (%)</th>
<th>Marketable Limit Orders (%)</th>
<th>Other Orders (%)</th>
<th>Net Payment Paid/Received for Market Orders(USD)</th>
<th>Net Payment Paid/Received for Marketable Limit Orders(USD)</th>
<th>Net Payment Paid/Received for Non-Marketable Limit Orders(USD)</th>
<th>Net Payment Paid/Received for Other Orders(USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CITADEL SECURITIES LLC</td>
<td>37.20</td>
<td>25.34</td>
<td>26.86</td>
<td>40.36</td>
<td>48.84</td>
<td>5,215.75</td>
<td>22.0000</td>
<td>1,366.75</td>
</tr>
<tr>
<td>Two Sigma Securities, LLC</td>
<td>22.39</td>
<td>45.61</td>
<td>44.16</td>
<td>14.52</td>
<td>14.70</td>
<td>10,540.33</td>
<td>24.3296</td>
<td>3,557.78</td>
</tr>
<tr>
<td>G1 Execution Services, LLC</td>
<td>13.52</td>
<td>9.76</td>
<td>10.26</td>
<td>15.04</td>
<td>12.28</td>
<td>2,214.33</td>
<td>23.9572</td>
<td>620.47</td>
</tr>
</tbody>
</table>

Material Aspects:

CITADEL SECURITIES LLC:
We receive payment for executed orders routed to Citadel Securities with respect to listed equities priced at $1.00 per share or more, at the following rates:

(i) Marketable order: up to $0.0022 per share
(ii) Non-marketable order: up to $0.003 per share
(iii) Extended hours order: up to $0.001 per share
(iv) Order greater than 10,000 shares or $250,000 principal value: up to $0.003 per share

These payment arrangements are conditioned upon regular attestations to Citadel that substantially all of the orders we route to them qualify as "retail" orders (i.e., originating from natural persons and not generated by trading algorithms or other computerized methods). Although we do not negotiate for higher payment rates in exchange for lower execution quality, in general there is an inverse (though not necessarily proportional) relationship between payment for order flow rates and price improvement.

Virtu Americas, LLC:
We receive payment for executed orders routed to Virtu Americas with respect to listed equities priced at $1.00 per share or more, at the following rates:
(i) Marketable order: up to $0.00175 per share
(ii) Non-marketable order: up to $0.003 per share
(iii) Order greater than 10,000 shares or $250,000 principal value: $0.003 per share
We do not receive payment for any extended hours orders, regardless of size or marketability. These payment arrangements are conditioned upon regular attestations to Virtu that substantially all of the orders we route to them qualify as “retail” orders (i.e., originating from natural persons and not generated by trading algorithms or other computerized methods). Although we do not negotiate for higher payment rates in exchange for lower execution quality, in general there is an inverse (though not necessarily proportional) relationship between payment for order flow rates and price improvement.

APEX CLEARING CORPORATION:
We route orders of listed equities to our clearing firm, Apex Clearing Corporation, which further routes them to execution venues with which it has relationships. The execution venues may pay Apex for such order flow, in which case Apex retains 10% of such payment and pays us the remaining 90%. We do not determine or influence where Apex routes our orders. Further, we do not participate in any discussions concerning the payment-for-order-flow arrangements between Apex and the execution venues, nor do we influence those arrangements in any manner. See https://www.apexclearing.com/sec-rule-606-and-607/ for reports concerning Apex’s order routing practices, which we are adopting by reference.

Two Sigma Securities, LLC:
We receive payment for executed orders routed to Two Sigma Securities with respect to listed equities priced at $1.00 per share or more, at the following rates:
(i) Marketable order: up to $0.0022 per share
(ii) Non-marketable order: up to $0.003 per share
(iii) Order greater than 10,000 shares or $250,000 principal value: up to $0.003 per share
These payment arrangements are conditioned upon regular attestations to Two Sigma that substantially all of the orders we route to them qualify as “retail” orders (i.e., originating from natural persons and not generated by trading algorithms or other computerized methods). Although we do not negotiate for higher payment rates in exchange for lower execution quality, in general there is an inverse (though not necessarily proportional) relationship between payment for order flow rates and price improvement.

G1 Execution Services, LLC:
We receive payment for executed orders routed to G1X Execution Services at the following rates:
(i) Marketable order, listed equity priced at $1.00 per share or more: up to $0.0022 per share
(ii) Marketable order, listed equity priced under $1.00 per share: up to $0.001 per share
(iii) Non-marketable order, listed equity priced at $1.00 per share or more: up to $0.003 per share
(iv) Order greater than 10,000 shares or $250,000 principal value: $0.003 per share
These payment arrangements are conditioned upon regular attestations to G1X that substantially all of the orders we route to them qualify as “retail” orders (i.e., originating from natural persons and not generated by trading algorithms or other computerized methods). Although we do not negotiate for higher payment rates in exchange for lower execution quality, in general there is an inverse (though not necessarily proportional) relationship between payment for order flow rates and price improvement.

---

**March 2023**

**Non-S&P 500 Stocks**

**Summary**

<table>
<thead>
<tr>
<th>Non-Directed Orders as % of All Orders</th>
<th>Market Orders as % of Non-Directed Orders</th>
<th>Marketable Limit Orders as % of Non-Directed Orders</th>
<th>Non-Marketable Limit Orders as % of Non-Directed Orders</th>
<th>Other Orders as % of Non-Directed Orders</th>
</tr>
</thead>
<tbody>
<tr>
<td>100.00</td>
<td>23.07</td>
<td>5.33</td>
<td>63.66</td>
<td>7.94</td>
</tr>
</tbody>
</table>

**Venues**

<table>
<thead>
<tr>
<th>Venue - Non-directed Order Flow</th>
<th>Non-Directed Orders (%)</th>
<th>Market Limit Orders (%)</th>
<th>Non-Marketable Limit Orders (%)</th>
<th>Other Orders (%)</th>
<th>Net Payment Paid/Received for Market Orders(USD)</th>
<th>Net Payment Paid/Received for Marketable Limit Orders(USD)</th>
<th>Net Payment Paid/Received for Non-Marketable Limit Orders(USD)</th>
<th>Net Payment Paid/Received for Other Orders(USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CITADEL SERVICES LLC</td>
<td>36.84</td>
<td>25.42</td>
<td>27.26</td>
<td>39.93</td>
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<td></td>
<td></td>
<td>15.1845</td>
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<td>8,098.08</td>
</tr>
<tr>
<td>Virtu Americas, LLC</td>
<td>26.13</td>
<td>19.57</td>
<td>18.07</td>
<td>29.59</td>
<td>22.84</td>
<td>18,087.77</td>
<td>19,3811</td>
<td>8,496.76</td>
</tr>
<tr>
<td>Two Sigma Securities, LLC</td>
<td>23.88</td>
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<td>44.50</td>
<td>15.62</td>
<td>13.86</td>
<td>40,097.38</td>
<td>19,6424</td>
<td>18,047.09</td>
</tr>
<tr>
<td>G1 Execution Services, LLC</td>
<td>13.16</td>
<td>9.65</td>
<td>10.17</td>
<td>14.87</td>
<td>11.66</td>
<td>10,721.10</td>
<td>23,0808</td>
<td>5,057.37</td>
</tr>
</tbody>
</table>
Material Aspects:

CITADEL SECURITIES LLC:
We receive payment for executed orders routed to Citadel Securities with respect to listed equities priced at $1.00 per share or more, at the following rates:
(i) Marketable order: up to $0.0022 per share
(ii) Non-marketable order: up to $0.0022 per share
(iii) Extended hours order: up to $0.001 per share
These payment arrangements are conditioned upon regular attestations to Citadel that substantially all of the orders we route to them qualify as "retail" orders (i.e., originating from natural persons and not generated by trading algorithms or other computerized methods). Although we do not negotiate for higher payment rates in exchange for lower execution quality, in general there is an inverse (though not necessarily proportional) relationship between payment for order flow rates and price improvement.

Virtu Americas, LLC:
We receive payment for executed orders routed to Virtu Americas with respect to listed equities priced at $1.00 per share or more, at the following rates:
(i) Marketable order: up to $0.0075 per share
(ii) Non-marketable order: up to $0.003 per share
(iii) Order greater than 10,000 shares or $250,000 principal value: up to $0.003 per share
We do not receive payment for any extended hours orders, regardless of size or marketability. These payment arrangements are conditioned upon regular attestations to Virtu that substantially all of the orders we route to them qualify as "retail" orders (i.e., originating from natural persons and not generated by trading algorithms or other computerized methods). Although we do not negotiate for higher payment rates in exchange for lower execution quality, in general there is an inverse (though not necessarily proportional) relationship between payment for order flow rates and price improvement.

Two Sigma Securities, LLC:
We receive payment for executed orders routed to Two Sigma Securities with respect to listed equities priced at $1.00 per share or more, at the following rates:
(i) Marketable order: up to $0.0022 per share
(ii) Non-marketable order: up to $0.003 per share
(iii) Order greater than 10,000 shares or $250,000 principal value: up to $0.003 per share
These payment arrangements are conditioned upon regular attestations to Two Sigma that substantially all of the orders we route to them qualify as "retail" orders (i.e., originating from natural persons and not generated by trading algorithms or other computerized methods). Although we do not negotiate for higher payment rates in exchange for lower execution quality, in general there is an inverse (though not necessarily proportional) relationship between payment for order flow rates and price improvement.

APEX CLEARING CORPORATION:
We route orders of listed equities to our clearing firm, Apex Clearing Corporation, which further routes them to execution venues with which it has relationships. The execution venues may pay Apex for such order flow, in which case Apex retains 10% of such payment and pays us the remaining 90%. We do not determine or influence where Apex routes our orders. Further, we do not participate in any discussions concerning the payment-for-order-flow arrangements between Apex and the execution venues, nor do we influence those arrangements in any manner. See https://www.apexclearing.com/sec-rule-606-and-607/ for reports concerning Apex's order routing practices, which we are adopting by reference.

G1 Execution Services, LLC:
We receive payment for executed orders routed to G1X Execution Services at the following rates:
(i) Marketable order, listed equity priced at $1.00 per share or more: up to $0.0022 per share
(ii) Non-marketable order, listed equity priced under $1.00 per share: up to $0.001 per share
(iii) Non-marketable order, listed equity priced at $1.00 per share or more: up to $0.003 per share
These payment arrangements are conditioned upon regular attestations to G1X that substantially all of the orders we route to them qualify as "retail" orders (i.e., originating from natural persons and not generated by trading algorithms or other computerized methods). Although we do not negotiate for higher payment rates in exchange for lower execution quality, in general there is an inverse (though not necessarily proportional) relationship between payment for order flow rates and price improvement.

March 2023

Options

Summary

<table>
<thead>
<tr>
<th>Non-Directed Orders as % of All Orders</th>
<th>Market Orders as % of Non-Directed Orders</th>
<th>Marketable Limit Orders as % of Non-Directed Orders</th>
<th>Non-Marketable Limit Orders as % of Non-Directed Orders</th>
<th>Other Orders as % of Non-Directed Orders</th>
</tr>
</thead>
<tbody>
<tr>
<td>100.00</td>
<td>7.62</td>
<td>8.99</td>
<td>50.65</td>
<td>32.74</td>
</tr>
</tbody>
</table>

Venues
<table>
<thead>
<tr>
<th>Venue - Non-directed Order Flow</th>
<th>Non-Directed Orders (%)</th>
<th>Market Orders (%)</th>
<th>Marketable Limit Orders (%)</th>
<th>Other Orders (%)</th>
<th>Net Payment Paid/Received for Market Orders(USD)</th>
<th>Net Payment Paid/Received for Marketable Limit Orders(USD)</th>
<th>Net Payment Paid/Received for Non-Marketable Limit Orders(USD)</th>
<th>Net Payment Paid/Received for Other Orders(USD)</th>
<th>Net Payment Paid/Received for Other Orders(cents per hundred shares)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CITADEL SECURITIES LLC</td>
<td>38.63</td>
<td>30.38</td>
<td>32.50</td>
<td>39.23</td>
<td>41.29</td>
<td>32,960.50</td>
<td>48,1625</td>
<td>67,511.50</td>
<td>49,4213</td>
</tr>
<tr>
<td>Wolverine Execution Services, LLC</td>
<td>31.38</td>
<td>29.16</td>
<td>25.03</td>
<td>30.23</td>
<td>35.44</td>
<td>23,171.10</td>
<td>39,0922</td>
<td>38,171.30</td>
<td>43,4046</td>
</tr>
<tr>
<td>Global Execution Brokers LP</td>
<td>29.99</td>
<td>40.46</td>
<td>42.46</td>
<td>30.54</td>
<td>23.27</td>
<td>35,453.22</td>
<td>40,3878</td>
<td>72,205.51</td>
<td>45,5064</td>
</tr>
</tbody>
</table>

**Material Aspects:**

**CITADEL SECURITIES LLC:**
We receive payment for executed multi-listed, non-index option orders routed to Citadel Securities at a rate of up to $0.50 per contract. Citadel waives fees associated with index options so long as they do not exceed 5% of the total monthly volume. These payment arrangements are conditioned upon regular attestations to Citadel that substantially all of the orders we route to them qualify as “retail” orders (i.e., originating from natural persons and not generated by trading algorithms or other computerized methods). Although we do not negotiate for higher payment rates in exchange for lower execution quality, in general there is an inverse (though not necessarily proportional) relationship between payment for order flow rates and price improvement.

**Wolverine Execution Services, LLC:**
We receive payment for executed multi-listed, non-index option orders routed to Wolverine Execution Services at the following rates:
(i) Single-Leg order, non-Penny Interval Program: up to $1.00 per contract
(ii) Single-Leg order, Penny Interval Program: up to $0.35 per contract
(iii) Multi-Leg order, non-Penny Interval Program: up to $1.00 per contract
(iv) Multi-Leg order, Penny Interval Program: up to $0.43 per contract
Wolverine waives fees associated with index options so long as they do not exceed 5% of the total monthly volume. These payment arrangements are conditioned upon regular attestations to Wolverine that substantially all of the orders we route to them qualify as “retail” orders (i.e., originating from natural persons and not generated by trading algorithms or other computerized methods). Although we do not negotiate for higher payment rates in exchange for lower execution quality, in general there is an inverse (though not necessarily proportional) relationship between payment for order flow rates and price improvement.

**APEX CLEARING CORPORATION:**
We route orders of multi-listed options to our clearing firm, Apex Clearing Corporation, which further routes them to execution venues with which it has relationships. The execution venues may pay Apex for such order flow, in which case Apex forwards such payment to us. We do not determine or influence where Apex routes our orders. Further, we do not participate in any discussions concerning the payment-for-order-flow arrangements between Apex and the execution venues, nor do we influence those arrangements in any manner. See https://www.apexclearing.com/sec-rule-606-and-607/ for reports concerning Apex’s order routing practices, which we are adopting by reference.

**Global Execution Brokers LP:**
We receive payment for executed multi-listed, non-index option orders routed to Global Execution Brokers at the following rates:
(i) Single-Leg order, non-Penny Interval Program: up to $1.00 per contract
(ii) Single-Leg order, Penny Interval Program: up to $0.37 per contract
(iii) Multi-Leg order, non-Penny Interval Program: up to $1.00 per contract
(iv) Multi-Leg order, Penny Interval Program: up to $0.44 per contract
Global Execution Brokers waives fees associated with index options so long as they do not exceed 5% of the total monthly volume. These payment arrangements are conditioned upon regular attestations to Global Execution Brokers that substantially all of the orders we route to them qualify as “retail” orders (i.e., originating from natural persons and not generated by trading algorithms or other computerized methods). Although we do not negotiate for higher payment rates in exchange for lower execution quality, in general there is an inverse (though not necessarily proportional) relationship between payment for order flow rates and price improvement.