Vanguard Brokerage Services - Held NMS Stocks and Options Order Routing Public Report

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4th Quarter, 2020

October 2020

S&P 500 Stocks

Summary

Non-Directed Orders as % of All Orders	Market Orders as % of Non-Directed Orders	Marketable Limit Orders as % of Non- Directed Orders	Non-Marketable Limit Orders as % of Non- Directed Orders	Other Orders as % of Non-Directed Orders
100.00	49.67	5.15	40.30	4.87

Venues

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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 Market Orders(cents per hundred shares)	Net Payment Paid/ Received for Marketable Limit Orders(USD)	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 Non- Marketable Limit Orders(cents per hundred shares)	Net Payment Paid/Received for Other Orders(USD)	Net Payment Paid/ Received for Other Orders(cents per hundred shares)
Citadel Securities (CDRG)	41.97	43.03	42.93	41.60	33.10	0	0.0000	0	0.0000	0	0.0000	0	0.0000
Virtu Americas, LLC (NITE)	26.75	23.59	26.01	29.43	37.61	0	0.0000	0	0.0000	0	0.0000	0	0.0000
UBS Securities LLC (UBSS)	21.99	21.67	21.57	21.99	25.69	0	0.0000	0	0.0000	0	0.0000	0	0.0000
G1 Execution Services, LLC (ETMM)	9.29	11.71	9.50	6.98	3.59	0	0.0000	0	0.0000	0	0.0000	0	0.0000

Material Aspects:

Citadel Securities (CDRG):

https://nms606.karngroup.com/api/606stats/public606/606/report/VGRD_ALL/material/2020Q4/SP500/CDRG/e7dfb6de341e057e7d51abc3bede6d1f4dddf76d/Material%20Aspects%20Equities.pdf

Virtu Americas, LLC (NITE):

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JBS Securities LLC (UBSS

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G1 Execution Services, LLC (ETMM):

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October 2020

Non-S&P 500 Stocks

Summary

Non-Directed Orders as % of All Orders	Market Orders as % of Non-Directed Orders	Marketable Limit Orders as % of Non- Directed Orders	Non-Marketable Limit Orders as % of Non- Directed Orders	Other Orders as % of Non-Directed Orders
100.00	56.09	4.92	34.31	4.68

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 Market Orders(cents per hundred shares)	Net Payment Paid/ Received for Marketable Limit Orders(USD)	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 Non- Marketable Limit Orders(cents per hundred shares)	Net Payment Paid/Received for Other Orders(USD)	Net Payment Paid/ Received for Other Orders(cents per hundred shares)
Citadel Securities (CDRG)	36.55	35.99	37.69	37.78	33.07	0	0.0000	0	0.0000	0	0.0000	0	0.0000
Virtu Americas, LLC (NITE)	33.37	30.59	34.79	36.69	40.79	0	0.0000	0	0.0000	0	0.0000	0	0.0000
G1 Execution Services, LLC (ETMM)	18.29	23.65	17.06	11.42	5.74	0	0.0000	0	0.0000	0	0.0000	0	0.0000
UBS Securities LLC (UBSS)	11.79	9.77	10.46	14.11	20.39	0	0.0000	0	0.0000	0	0.0000	0	0.0000

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Citadel Securities (CDRG):

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October 2020

Options

Summary

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	Non-Directed Orders as % of All Orders	Market Orders as % of Non-Directed Orders	Marketable Limit Orders as % of Non- Directed Orders	Non-Marketable Limit Orders as % of Non- Directed Orders	Other Orders as % of Non-Directed Orders
	100.00	0.12	17.80	75.95	6.14

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 Market Orders(cents per hundred shares)	Net Payment Paid/ Received for Marketable Limit Orders(USD)	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 Non- Marketable Limit Orders(cents per hundred shares)	Net Payment Paid/Received for Other Orders(USD)	Net Payment Paid/ Received for Other Orders(cents per hundred shares)
Citadel Group, Options (CDEL)	55.92	53.47	55.39	55.94	57.30	219	18.8689	49,410	18.9742	54,245	18.8642	2,774	18.9248
Susquehanna International Group, LLP (SUSQ)	32.76	34.32	33.95	32.42	33.52	14,395	14.8787	8,488	14.4685	23,956	14.3260	225	15.0000
Wolverine Execution Svc. (WEXO)	11.30	12.21	10.65	11.63	9.17	25	15.0000	5,463	14.9770	9,182	14.9429	1,140	15.0000
Citigroup Global Markets Inc (SBSH)	0.01	0.00	0.00	0.02	0.01	0	0.0000	0	0.0000	0	0.0000	0	0.0000

Citadel Group, Options (CDEL):

https://nms606.karngroup.com/api/606stats/public606/606/report/VGRD_ALL/material/2020Q4/0/CDEL/74d4083636bc0c887185bb158b9fb8a305b27ace/Material%20Aspects%200ptions.pdf

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November 2020

S&P 500 Stocks

Summary

Non-Directed Orders as % of All Orders	Market Orders as % of Non-Directed Orders	Marketable Limit Orders as % of Non- Directed Orders	Non-Marketable Limit Orders as % of Non- Directed Orders	Other Orders as % of Non-Directed Orders
100.00	52.48	5.28	37.30	4.95

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 Market Orders(cents per hundred shares)	Net Payment Paid/ Received for Marketable Limit Orders(USD)	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 Non- Marketable Limit Orders(cents per hundred shares)	Net Payment Paid/Received for Other Orders(USD)	Net Payment Paid/ Received for Other Orders(cents per hundred shares)
Citadel Securities (CDRG)	42.94	44.14	43.59	42.20	35.20	0	0.0000	0	0.0000	0	0.0000	0	0.0000
Virtu Americas, LLC (NITE)	25.66	22.41	24.93	28.83	37.02	0	0.0000	0	0.0000	0	0.0000	0	0.0000
UBS Securities LLC (UBSS)	22.84	22.70	22.84	22.81	24.50	0	0.0000	0	0.0000	0	0.0000	0	0.0000

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 Market Orders(cents per hundred shares)	Net Payment Paid/ Received for Marketable Limit Orders(USD)	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 Non- Marketable Limit Orders(cents per hundred shares)	Net Payment Paid/Received for Other Orders(USD)	Net Payment Paid/ Received for Other Orders(cents per hundred shares)
G1 Execution Services, LLC (ETMM)	8.55	10.74	8.64	6.17	3.27	0	0.0000	0	0.0000	0	0.0000	0	0.0000

Citadel Securities (CDRG):

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November 2020

Non-S&P 500 Stocks

Summary

Non-Directed Orders as % of All Orders	Market Orders as % of Non-Directed Orders	Marketable Limit Orders as % of Non- Directed Orders	Non-Marketable Limit Orders as % of Non- Directed Orders	Other Orders as % of Non-Directed Orders
100.00	56.51	5.14	33.38	4.98

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 Market Orders(cents per hundred shares)	Net Payment Paid/ Received for Marketable Limit Orders(USD)	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 Non- Marketable Limit Orders(cents per hundred shares)	Net Payment Paid/Received for Other Orders(USD)	Net Payment Paid/ Received for Other Orders(cents per hundred shares)
Citadel Securities (CDRG)	37.38	36.84	38.51	38.59	34.18	0	0.0000	0	0.0000	0	0.0000	0	0.0000
Virtu Americas, LLC (NITE)	32.22	29.78	33.28	35.17	38.99	0	0.0000	0	0.0000	0	0.0000	0	0.0000
G1 Execution Services, LLC (ETMM)	18.35	23.33	17.32	11.86	6.31	0	0.0000	0	0.0000	0	0.0000	0	0.0000
UBS Securities LLC (UBSS)	12.06	10.05	10.90	14.38	20.53	0	0.0000	0	0.0000	0	0.0000	0	0.0000

Material Aspects:

Citadel Securities (CDRG):

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November 2020

Options

Summary

Non-Directed Orders as % of All Orders	Market Orders as % of Non-Directed Orders	Marketable Limit Orders as % of Non- Directed Orders	Non-Marketable Limit Orders as % of Non- Directed Orders	Other Orders as % of Non-Directed Orders
100.00	0.11	16.39	76.80	6.70

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 Market Orders(cents per hundred shares)	Net Payment Paid/ Received for Marketable Limit Orders(USD)	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 Non- Marketable Limit Orders(cents per hundred shares)	Net Payment Paid/Received for Other Orders(USD)	Net Payment Paid/ Received for Other Orders(cents per hundred shares)
Citadel Group, Options (CDEL)	62.28	61.84	60.00	62.51	65.22	336	18.9037	72,497	18.9223	71,160	18.9202	3,352	18.3309
Susquehanna International Group, LLP (SUSQ)	26.92	27.96	30.31	26.27	26.08	14,390	14.9739	11,835	14.6269	28,466	14.4882	17	1.4636
Wolverine Execution Svc. (WEXO)	10.80	10.20	9.69	11.22	8.70	68	15.0000	7,255	14.9684	10,175	14.9983	1,337	15.0000
Citigroup Global Markets Inc (SBSH)	0.00	0.00	0.00	0.00	0.00	0	0.0000	0	0.0000	0	0.0000	0	0.0000

Material Aspects:

Citadel Group, Options (CDEL):

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December 2020

Summary

	Non-Directed Orders as % of All Orders	Market Orders as % of Non-Directed Orders	Marketable Limit Orders as % of Non- Directed Orders	Non-Marketable Limit Orders as % of Non- Directed Orders	Other Orders as % of Non-Directed Orders
ĺ	100.00	52.81	5.16	37.26	4.77

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 Market Orders(cents per hundred shares)	Net Payment Paid/ Received for Marketable Limit Orders(USD)	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 Non- Marketable Limit Orders(cents per hundred shares)	Net Payment Paid/Received for Other Orders(USD)	Net Payment Paid/ Received for Other Orders(cents per hundred shares)
Citadel Securities (CDRG)	42.85	43.92	43.35	42.24	35.21	0	0.0000	0	0.0000	0	0.0000	0	0.0000
UBS Securities LLC (UBSS)	24.51	24.81	24.58	24.00	25.15	0	0.0000	0	0.0000	0	0.0000	0	0.0000
Virtu Americas, LLC (NITE)	23.69	20.05	23.22	27.25	36.63	0	0.0000	0	0.0000	0	0.0000	0	0.0000
G1 Execution Services, LLC (ETMM)	8.95	11.21	8.86	6.51	3.01	0	0.0000	0	0.0000	0	0.0000	0	0.0000

Material Aspects: Citadel Securities (CDRG):

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December 2020

Non-S&P 500 Stocks

Summary

Ì	Non-Directed Orders as % of All Orders	Market Orders as % of Non-Directed Orders	Marketable Limit Orders as % of Non- Directed Orders	Non-Marketable Limit Orders as % of Non- Directed Orders	Other Orders as % of Non-Directed Orders
	100.00	56.26	5.25	33.73	4.76

Venue - Non-directed Order Flow	Non- Directed Orders Orders (%) (%)		Non- Marketable Limit Orders (%)	Other Orders (%)	Net Payment Paid/Received for Market Orders(USD)	Net Payment Paid/ Received for Market Orders(cents per hundred shares)	Net Payment Paid/ Received for Marketable Limit Orders(USD)	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 Non- Marketable Limit Orders(cents per hundred shares)	Net Payment Paid/Received for Other Orders(USD)	Net Payment Paid/ Received for Other Orders(cents per hundred shares)
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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 Market Orders(cents per hundred shares)	Net Payment Paid/ Received for Marketable Limit Orders(USD)	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 Non- Marketable Limit Orders(cents per hundred shares)	Net Payment Paid/Received for Other Orders(USD)	Net Payment Paid/ Received for Other Orders(cents per hundred shares)
Citadel Securities (CDRG)	35.52	34.68	36.25	37.08	33.50	0	0.0000	0	0.0000	0	0.0000	0	0.0000
Virtu Americas, LLC (NITE)	30.96	28.11	32.91	34.37	38.40	0	0.0000	0	0.0000	0	0.0000	0	0.0000
G1 Execution Services, LLC (ETMM)	21.16	26.49	19.87	14.45	7.12	0	0.0000	0	0.0000	0	0.0000	0	0.0000
UBS Securities LLC (UBSS)	12.36	10.72	10.97	14.10	20.98	0	0.0000	0	0.0000	0	0.0000	0	0.0000

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December 2020

Options

Summary

Non-Directed Orders as % of All Orders	Market Orders as % of Non-Directed Orders	Marketable Limit Orders as % of Non- Directed Orders	Non-Marketable Limit Orders as % of Non- Directed Orders	Other Orders as % of Non-Directed Orders
100.00	0.08	17.23	76.48	6.22

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 Market Orders(cents per hundred shares)	Net Payment Paid/ Received for Marketable Limit Orders(USD)	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 Non- Marketable Limit Orders(cents per hundred shares)	Net Payment Paid/Received for Other Orders(USD)	Net Payment Paid/ Received for Other Orders(cents per hundred shares)
Citadel Group, Options (CDEL)	67.36	69.08	66.30	67.42	69.41	248	18.7838	82,520	18.9102	82,315	18.8521	4,456	18.8872
Susquehanna International Group, LLP (SUSQ)	24.39	24.81	26.98	23.89	23.33	13,069	14.9277	9,298	14.0553	26,486	14.3260	203	8.8743
Wolverine Execution Svc. (WEXO)	8.26	6.11	6.71	8.69	7.27	26	15.0000	5,861	14.9931	8,158	14.6894	1,181	15.0000

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https://nms606.karngroup.com/api/606stats/public606/606/report/VGRD_ALL/material/2020Q4/0/CDEL/74d4083636bc0c887185bb158b9fb8a305b27ace/Material%20Aspects%20Options.pdf

 $Susque hanna\ International\ Group, LLP\ (SUSQ): \\ https://nms606.karngroup.com/api/606stats/public606/606/report/VGRD_ALL/material/2020Q4/O/SUSQ/74d4083636bc0c887185bb158b9fb8a305b27ace/Material%20Aspects%20Options.pdf$

 $Wolverine\ Execution\ Svc.\ (WEXO): \\ https://nms606.karngroup.com/api/606stats/public606/606/report/VGRD_ALL/material/2020Q4/O/WEXO/74d4083636bc0c887185bb158b9fb8a305b27ace/Material%20Aspects%20Options.pdf$