



2018 ORDER EXECUTION REPORT- EQUITIES

As part of the MiFID II Directive, which came into force on 3rd January 2018, Northern Trust Global Investments Limited (“NTGIL”) is required to summarise and make public on an annual basis, for each class of financial instruments as set out in the rules, the top five execution venues in terms of trading volumes where client orders were executed, or transmitted to a broker for execution, and information on the quality of execution obtained.

This document sets out the relevant data and analysis for 2018 Equities transactions, broken down into the following classes based on ‘tick size’:

- Shares and depository receipts (with average of 2000+ trades per day)
- Shares and depository receipts (with average of 80 to 1999 trades per day)
- Shares and depository receipts (with average of less than 79 trades per day)

In order to provide context for the tables shown, we have included data indicating the percentages of client transactions NTGIL executed in 2018, broken down by class both in terms of volume (the value of the transactions) and the number of trades undertaken.

TICK SIZE	PROPORTION OF VOLUME TRADED IN SECURITIES OF THAT TICK SIZE AS A % OF TOTAL TRADING VOLUME	PROPORTION OF NUMBER OF ORDERS EXECUTED IN SECURITIES OF THAT TICK SIZE AS % OF TOTAL NUMBER OF ORDERS
2000+	45.4%	48.2%
80-1999	10.5%	11.5%
0-79	44.1%	40.3%

The majority of transactions executed by NTGIL for clients were in securities which fall within the classes with the largest and smallest average daily trading volume, while a small percentage were traded for those in the between the two previously mentioned classes. NTGIL predominantly manages passive investment funds and mandates, which invest predominantly in securities which make up indices such as the MSCI world, whose constituents tend to be larger, more frequently traded securities. Benchmark changes and portfolio rebalances can also cause for more activity in less frequently traded securities.

TOP FIVE DATA – ALL TRANSACTIONS

NTGIL operates as a discretionary investment manager; as such no client directed orders were received during 2018.

NTGIL does not directly execute client orders for Equities on trading venues, all orders are transmitted to firms for execution, therefore orders were not considered ‘passive’ or ‘aggressive’ for the purpose of this report.

2018 ORDER EXECUTION REPORT- EQUITIES

CLASS OF INSTRUMENT

(A) EQUITIES -SHARES AND DEPOSITARY RECEIPTS, (I) TICK SIZE 2000+

Notification if <1 average trade per business day in the previous year	No				
Top Five Execution Venues ranked in terms of trading volumes (descending order)	Proportion of volume traded as a percentage of total in that class	Proportion of orders executed as percentage of total in that class	percentage of passive orders	percentage of aggressive orders	percentage of directed orders
Goldman Sachs International (W22LROWP2IHZNBB6K528)	23.2%	18.4%	NA	NA	NA
Investment Technology Group Limited (213800EEC95PRUCEUP63)	13.0%	10.2%	NA	NA	NA
The Northern Trust Company of Hong Kong Limited (549300EHFNROFBP5JG29)	12.3%	14.4%	NA	NA	NA
Société Générale SA (O2RNE8IBXP4R0TD8PU41)	9.7%	12.5%	NA	NA	NA
Citigroup Global Markets Limited (XKZZ2JZF41MRHTR1V493)	8.5%	8.3%	NA	NA	NA

CLASS OF INSTRUMENT

(A) EQUITIES -SHARES AND DEPOSITARY RECEIPTS, (II) TICK SIZE 80-1999

Notification if <1 average trade per business day in the previous year	No				
Top Five Execution Venues ranked in terms of trading volumes (descending order)	Proportion of volume traded as a percentage of total in that class	Proportion of orders executed as percentage of total in that class	percentage of passive orders	percentage of aggressive orders	percentage of directed orders
Northern Trust Investments, Inc. (BEL4B8X7EHJU845Y2N39)	42.2%	10.3%	NA	NA	NA
Goldman Sachs International (W22LROWP2IHZNBB6K528)	17.5%	22.8%	NA	NA	NA
Investment Technology Group Limited (213800EEC95PRUCEUP63)	9.5%	14.1%	NA	NA	NA
Citigroup Global Markets Limited (XKZZ2JZF41MRHTR1V493)	6.0%	8.0%	NA	NA	NA
Société Générale SA (O2RNE8IBXP4R0TD8PU41)	5.0%	12.9%	NA	NA	NA

CLASS OF INSTRUMENT

(A) EQUITIES -SHARES AND DEPOSITARY RECEIPTS, (III) TICK SIZE 0-79

Notification if <1 average trade per business day in the previous year	No				
Top Five Execution Venues ranked in terms of trading volumes (descending order)	Proportion of volume traded as a percentage of total in that class	Proportion of orders executed as percentage of total in that class	percentage of passive orders	percentage of aggressive orders	percentage of directed orders
Northern Trust Investments, Inc. (BEL4B8X7EHJU845Y2N39)	72.9%	66.4%	NA	NA	NA
The Northern Trust Company of Hong Kong Limited (549300EHFNROFBP5JG29)	21.0%	24.2%	NA	NA	NA
Macquarie Capital (Europe) Limited (549300GX4FPMFF91RJ37)	1.5%	2.5%	NA	NA	NA
HSBC Bank PLC (MP6I5ZYZBEU3UXPYFY54)	1.0%	1.9%	NA	NA	NA
Credit Suisse Securities (Europe) Limited (DL6FFRRLF74S01HE2M14)	0.9%	0.9%	NA	NA	NA

Northern Trust Global Investments Limited is based in London and our trading desk covers European, Middle East and African (EMEA) markets. Our affiliate investment management trading desks, Northern Trust Investments Incorporated (based in Chicago) and The Northern Trust Company Hong Kong Limited (based in Hong Kong), cover markets in the Americas and Asia Pacific regions respectively.

Orders from NTGIL's portfolio managers are sent to our London trading desk. For securities where the most liquid market is in EMEA, the desk determines which external broker they consider to offer best execution, based on the execution factors described, and transmits orders to external brokers for execution.

For orders where the most liquid market for the security is in another region, the desk transmits the order to our affiliate's trading desk. (Acting as NTGIL's agent) A trader acting for that affiliate determines which external broker they consider offers best execution, applying NTGIL's order execution policy, and transmits the order to them for execution. Orders for securities to be traded in EMEA are sent by NTI and TNTCHK's trading desks to NTGIL for transmission to brokers.

The Equity portfolios managed by NTGIL include a significant number managed to a benchmark of the MSCI World (of which nearly two thirds of constituents are North America domiciled securities) and MSCI Emerging Markets (of which three quarters are Asia Pacific domiciled securities) accordingly the proportion of orders transmitted for trading in those regions is greater than orders received from affiliates for trading of EMEA securities. This accounts for the inclusion of Northern Trust Investments Inc. and The Northern Trust Company Hong Kong Limited in our top five firms to which orders are transmitted.

TRANSMISSION OF TRANSACTIONS FOR EMEA MARKETS

In order to provide a full picture of the firms to which NTGIL transmits client orders, we have also included tables showing data for all securities and additional tables showing NTGIL's transmission of client orders for EMEA securities (e.g. those we transmit to external brokers for execution).

For EMEA securities, the majority of orders executed were for securities in the largest sized class, while smaller proportions of orders were transmitted for securities in the other two classes to a variable degree.

TICK SIZE	PROPORTION OF VOLUME TRADED IN SECURITIES OF THAT TICK SIZE AS A PERCENTAGE OF TOTAL TRADING VOLUME	PROPORTION OF NUMBER OF ORDERS EXECUTED IN SECURITIES OF THAT TICK SIZE AS PERCENTAGE OF TOTAL NUMBER OF ORDERS
2000+	81.6%	73.5%
80-1999	12.5%	19.3%
0-79	5.8%	7.2%

With the exclusion of non-European securities, our lists of the top five firms to which we transmitted client orders differs across the three sizes with the proportion of volumes descending from the largest tick size to the smallest, albeit with the order and percentages sent to brokers differing, as certain brokers offer more competitive terms for some situations or certain securities.

As all brokers offer consistent commission rates for transactions depending on the market on which the relevant security is listed, the percentage of orders transmitted to particular brokers is indicative of one or more factors, including; that

broker may offer wider coverage than others, that they may offer a better or more responsive customer service; that they may price securities more competitively for certain trading strategies or that they may offer more competitive terms overall due to other considerations (e.g. for large in scale orders).

TOP FIVE BROKERS TICK SIZE 2000+ NTGIL TRADING ONLY

Broker	Volume	Trades
Goldman Sachs International (W22LROWP2IHZNBB6K528)	28.2%	22.9%
Investment Technology Group Limited (213800EEC95PRUCEUP63)	15.8%	12.6%
Société Générale SA (O2RNE8IBXP4R0TD8PU41)	14.9%	17.9%
Citigroup Global Markets Limited (XKZZ2JZF41MRHTR1V493)	11.8%	15.6%
Credit Suisse Securities (Europe) Limited (DL6FFRRLF74S01HE2M14)	10.3%	10.3%

TOP FIVE BROKERS TICK SIZE 80-1999 NTGIL TRADING ONLY

Broker	Volume	Trades
Goldman Sachs International (W22LROWP2IHZNBB6K528)	32.0%	25.7%
Investment Technology Group Limited (213800EEC95PRUCEUP63)	17.4%	15.9%
Citigroup Global Markets Limited (XKZZ2JZF41MRHTR1V493)	11.0%	9.0%
Société Générale SA (O2RNE8IBXP4R0TD8PU41)	9.2%	14.5%
Barclays Bank PLC (G5GSEF7VJP5I7OUK5573)	8.7%	9.6%

TOP FIVE BROKERS TICK SIZE 0-79 NTGIL TRADING ONLY

Broker	Volume	Trades
Macquarie Capital (Europe) Limited (549300GX4FPMFF91RJ37)	24.5%	26.4%
HSBC Bank PLC (MP6I5ZYZBEU3UXPYFY54)	16.1%	20.4%
Credit Suisse Securities (Europe) Limited (DL6FFRRLF74S01HE2M14)	14.7%	9.9%
Citigroup Global Markets Limited (XKZZ2JZF41MRHTR1V493)	13.2%	8.0%
Goldman Sachs International (W22LROWP2IHZNBB6K528)	6.3%	7.8%

ALL EQUITIES TRADES NTGIL TRADING ONLY

Broker	Volume	Trades
Goldman Sachs International (W22LROWP2IHZNBB6K528)	27.4%	22.3%
Investment Technology Group Limited (213800EEC95PRUCEUP63)	15.3%	12.9%
Société Générale SA (O2RNE8IBXP4R0TD8PU41)	11.0%	14.6%
Citigroup Global Markets Limited (XKZZ2JZF41MRHTR1V493)	10.5%	9.9%
Credit Suisse Securities (Europe) Limited (DL6FFRRLF74S01HE2M14)	8.8%	6.6%

The largest volumes during 2018 for the most liquid securities were transmitted to Goldman Sachs International for execution, this reflects that, relative to other brokers, they offered the most competitive terms for market on close orders transmitted for execution, which are more frequently utilized for trading around month end/ benchmark rebalances in which trading is generally in larger size than intra-month transactions.

We transmit orders to a number of agency brokers (brokers which do not operate their own book) including, Investment Technology Group Limited who account for the next highest amount of volume and trading, providing consistent access to a variety of liquidity pools.

Transactions transmitted to Société Générale SA represent a mixture of competitive terms for market on close trading around rebalances and trading at market. A standard commission schedule is in place for all approved brokers, distinguished by the market in which securities are listed, the volume and number of transactions transmitted to particular brokers is determined by other factors such as the extent of coverage in quoting.

Other brokers, including Merrill Lynch, HSBC and Barclays, do not appear due to receiving significant number of transactions for a particular type or of instruments but because they provided relatively more competitive terms more frequently, or across a large number of different instruments and trading strategies.

Macquarie Capital (Europe) Limited received a higher percentage for securities with the smallest tick sizes compared to those with larger average daily volumes as they provide coverage and reliable pricing for securities traded on UAE and other middle eastern/ emerging markets exchanges.

EXECUTION FACTORS AND ARRANGEMENTS

Passive management products, such as index portfolios, have very specific dealing benchmarks. Timeliness and likelihood are the most important execution factors in so far as, generally, a successful outcome for an index fund is to achieve a specific market on close price to match the valuation of the security within the benchmark index, for any trade or set of trades. Trades are therefore submitted in a manner which will result in the greatest likelihood of achieving such a benchmark and our analysis considers how close the price achieved was compared to the relevant benchmark price.

The order execution arrangements for passive portfolios seek to minimise market impact and maximise liquidity in the execution of client orders. The objective is to minimize market exposure and transaction costs, whilst matching the index risk and return characteristics and minimising operational risk throughout the process. Where it is deemed appropriate to trade away from the index implementation point portfolio managers are expected to use sound judgement and rationale to devise appropriate trading strategies, to minimise risk and ensure that mandates are managed within client expectations and guidelines.

Generally, two execution strategies are available for execution of orders for passive portfolios:

1. Market on close orders: Transmission of aggregated market on close orders to a single broker for execution at a specified time (generally the index closing time)

In deciding which to follow they will consider the importance of certainty of execution at a price close to the benchmark index price, compared to dispersion of executions away from the benchmark price given the size of the trade.

For orders sent for execution on market close, we expect to be executing at or near the close price. Our analysis monitors transactions which vary from the close price by more than set thresholds, which are set based on the relevant market and whether its operations make it possible to achieve the 'close price' or not., incorporating expected costs in various markets. We further apply profit and loss thresholds to consider materiality.

2. Orders transmitted for execution during market trading

Other equity portfolios may have specific investment objectives, and the portfolios are managed with the aim of meeting these through the use of dealing models and approaches which are seeking to exploit particular market price conditions. Often a successful execution result for the equity portfolios is to prioritise speed and achieve a rapid execution. This is reflected in the fact that an implementation shortfall benchmark is frequently the correct transaction cost analysis benchmark for the equity portfolios.

EXECUTION QUALITY

An implementation shortfall calculation will consider the actual cost of a trade and compare it against the predicted cost of a trade using a transaction cost estimation model – which considers markets movement, cost of market impact and speed of execution.

Periodic monitoring is in place to highlight outliers where executed prices are outside thresholds determined based on the trading strategy and market concerned. These are reviewed independently by the Compliance department and where considered necessary escalated to the Global Head of Trading for investigation and a response, with the results and explanations provided for review and reported through NTGIL's governance structure to the NTAM International Commissions and Trading Committee. Periodically, any broker identified as providing materially poor performance against relevant benchmark prices is discussed and appropriate intervention made where required. This may include escalation of issues with the broker, changes in the volume or types of order that may be sent or the removal of a broker from NTGIL's approved broker list.

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