

Annual report on quality of execution

Period 1 January 2022 - 31 December 2022

1. Analysis and conclusions drawn from execution monitoring

1.1 Introduction

According to Directive 2014/65/EU on Markets in Financial Instruments (MiFID II), investment firms shall publish per class of financial instrument the top 5 execution venues (or brokers where they placed orders for execution) in terms of trading volumes for all executed client orders in the previous year. Robeco has included such top 5 reports covering the year 2022 in this document and has also published the reports on its website (www.robeco.com/riam) in a machine-readable electronic format (csv file).

In addition, investment firms shall publish for each class of financial instruments, a summary of the analysis and conclusions they draw from their detailed monitoring of the quality of execution obtained. This document, which is available on the website as well, presents a combined analysis of execution obtained when placing orders with our execution brokers and when trading directly on venues.

1.2 Client categorization

Robeco's order execution policy applies to all of Robeco's clients, who have been categorized as professional clients. Robeco does not execute retail client orders. There is no differentiation in client treatment with regard to order execution arrangements.

1.3 Execution factors

When placing orders with brokers or using venues for the execution of trades which result from Robeco's investment decisions for clients, Robeco takes all sufficient steps to obtain the best possible result for its clients. In the absence of any specific instructions from the client, Robeco takes into account, if relevant, the following execution factors when executing a transaction on the client's behalf:

- Trade price or spread;
- Commission charged and other costs;
- Quality, speed and likelihood of execution and settlement;
- Order size;
- Nature of the order; and
- Any other consideration relevant to the execution of the order.

The relative importance of these factors are determined by considering matters including the characteristics of the order, the characteristics of the financial instruments that are subject to that order and the characteristics of counterparties and execution venues to which an order can be directed. Price and costs are generally of primary importance in obtaining best execution. However, other factors may gain importance, for example, when the size of a trade is large compared to the liquidity of the instrument, or where speed of execution becomes important for investment due to nature and size of the order or client cash flow requirements. In other words, well-informed trade execution decisions are made with the intention of maximizing the value of client portfolios.

Below we describe for each of the relevant asset classes the additional considerations with regard to the relative significance of the execution factors during the year 2022. During 2022 the importance of these factors did not change.

1.3.1 Equities, equity derivatives and exchange traded products

Equity orders were placed with brokers for execution. The liquidity of the share and the size of the order determined how the order was handled.

Liquid equities: low touch orders

For liquid equities, price, costs and trading impact were the most important factors to consider, seeking to obtain best execution.

Illiquid equities or large orders: high touch orders

Probability of execution and execution speed were important in case of illiquid equities or large orders. In case an order was illiquid or had high nominal value, or had high ADV, it required knowledge of the market and personal attention. Such trades were executed through High Touch execution, or through a (buy-side to buy-side) crossing network. Factors like the characteristics of the stock and its market-cap also played a role when selecting a broker.

1.3.2 Debt instruments, interest derivatives and credit derivatives (except futures)

These asset classes were executed on platforms. For these transactions, liquidity and price were basically the main determining factors given the nature of the securities, as well as the speed of execution and the size of the transaction.

Trades with limited size

In case liquidity was sufficient, orders were executed in competition, whereby brokers were requested for a quote (RFQ) on a platform. Prevailing execution dimension here were to obtain a price as close as possible to the mid-market level.

Complex trades of limited size

Complex trades of limited size usually include a component which makes valuation not available via broker screens and where pricing can vary more broadly amongst counterparties. For these types of trades Robeco periodically received information of its counterparties on how they price these more complex trades. This information was used for initial counterparty selection of which brokers should be put in competition for the trade.

Large transactions

Large (complex) transactions, which had a high likelihood of impacting the market due to their size, were generally not put in 'live' competition. Based on the information received by brokers and historic execution capabilities the best broker was selected to execute the order.

1.3.3 Interest derivatives (futures)

Orders in futures were transmitted to brokers. Interest futures tend to be traded on an electronic platform or via an algo. In case future contracts were rolled, the order was executed with the clearing brokers as this reduces costs (compared to executing with another broker and clearing with clearing broker).

1.3.4 Currency derivatives (forwards)

In general, foreign exchange orders were executed in competition. These orders were then executed by simultaneously requesting a price (RFQ) from several counterparties through the electronic platform FXall. Sometimes, the nature of a forex order justified the selection of just one counterparty – for example, in the case of currencies that are not traded on an electronic platform, for large orders that might have market impact when communicated to multiple counterparties, and for orders to be executed on a market fixing price.

Execution of 'restricted currencies' was done by the custodian. During 2022, Robeco monitored structurally that the custodian met Robeco's standards.

1.4 Close links, conflicts of interest, common ownership

Robeco does not have any close links, nor does it hold any common ownership with respect to any entity used to execute or place orders. Robeco does not have any qualified ownership over the entities used for any of the asset classes covered by this document. This allows for full flexibility to select trading partners on the basis of best execution.

Robeco's Conflicts of Interest Policy applies to any potential conflict of interest between Robeco and the execution venues and brokers used. In 2022 no conflicts of interest have been identified with respect to the venues and brokers used for any of the asset classes.

1.5 Specific arrangements (payments, discounts, etc.)

Fees, commissions and other monetary and non-monetary inducements (including discounts, rebates and gifts and entertainment) paid to or received from third parties are restricted by policies and procedures.

In accordance with MiFID II, fees paid by Robeco to brokers and/or execution venues for the execution of orders, are 'execution-only' fees. Such fees do not cover any other benefits or services, such as investment research. Charges related to the purchasing of investment research (or other services that are received in addition to execution services) are paid by Robeco directly out of its own resources. Robeco will only accept non-monetary benefits which they classify as 'minor', provided that such benefit is reasonable and proportionate, and of such a scale that it is unlikely to influence Robeco's behavior in a way that it is detrimental to the interest of its clients.

1.6 Changes regarding execution venues and brokers

It is Robeco's policy to maintain a choice of trading venues and brokers that offer the potential for Robeco to obtain the best possible result for the execution of orders on behalf of its clients on a consistent basis. A list of each of the execution venues and brokers that are used by Robeco is included in Robeco's order execution policy, which is updated at least on an annual basis.

During 2022, brokers and trading venues have been assessed regularly on criteria such as their reputation, execution price, liquidity, quality of execution (e.g. accurate and timely execution, potential to improve on price), superior services but also on the market conformity of their commission charges plus any other relevant criteria. Robeco has also monitored on a continuous basis whether the services of other brokers or trading venues would provide added value to Robeco and its clients. This led to several newly added entities to Robeco's approved broker list during 2022. The factors that have led to these changes are explained below.

In some markets, price volatility may mean that timeliness of execution is a priority. In markets that have low liquidity, the likelihood of execution becomes more important. In 2022, brokers have been added to the approved broker list, to ensure that Robeco is able to choose a broker in a certain market/region with the potential to obtain the best possible result. In other cases, the choice of venue may be limited because of the nature of the order. For example, when financial instruments are more illiquid, there may be little or no choice of venue.

1.7 Data and tools relating to the quality of execution

Robeco has a monitoring program in place to test the effectiveness of its overall execution arrangements and to have oversight of its regulatory obligations on best execution. This monitoring program includes the ongoing monitoring of the quality of the price of execution of orders, based on its own transaction data and a transaction cost analysis tool (TCA) comparing the actual execution data with the adequate benchmark. Publications of brokers and trading venues regarding the quality of execution (MiFID RTS 27 and RTS 28 reports) were not considered in Robeco's broker and trading venue reviews, due to the fact that such reports contain insufficient meaningful information. For the same reason, a temporary suspension of the obligation to make available to the public such RTS 27 reports applied to execution venues during 2022. A legislative procedure is in progress which proposes to abolish the RTS 27 reporting obligation altogether.

An explanation of how we used the information of a provider of consolidated data tickers is irrelevant for 2022, as there are still no registered consolidated tape providers.

2. Top 5 reports RTS 28/article 65 (5) MiFID II Delegated Regulation

2.1 Introduction

This chapter provides Robeco's report of the top 5 execution venues in terms of trading volumes for all executed orders per class of financial instrument in the year 2022 (RTS 28). For orders that were transmitted to another entity for execution, this report shows the top 5 brokers under article 65 (5) of the MiFID II Delegated Regulation. The report is also published on our website (www.robeco.com/riam) in a machine-readable electronic format (csv file). All data relate to transactions executed for clients who have been categorized as professional clients.

2.2 Equities – Shares & Depositary Receipts

2.2.1 Tick size liquidity bands 5 and 6 (from 2.000 trades per day)

Class of Instrument			Equities – Shares & Depositary Receipts Tick size liquidity bands 5 and 6		
Notification if <1 average trade per business day in the previous year			N		
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
JP Morgan AG (549300ZK53CNGEEI6A29)	53.3%	47.2%	N/A	N/A	0%
UBS Europe SE (5299007QVIQ7IO64NX37)	15.0%	19.6%	N/A	N/A	0%
Instinet Germany GmbH (213800A7BEQATAOUAN40)	5.2%	8.7%	N/A	N/A	0%
Liquidnet EU Limited (2138005N5TO2UJR67I36)	4.8%	3.1%	N/A	N/A	0%
Morgan Stanley Europe SE (54930056FHWP7GIWYY08)	4.8%	8.4%	N/A	N/A	0%

2.2.2 Tick size liquidity bands 3 and 4 (from 80 to 1.999 trades per day)

Class of Instrument			Equities – Shares & Depositary Receipts Tick size liquidity bands 3 and 4		
Notification if <1 average trade per business day in the previous year			N		
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
JP Morgan AG (549300ZK53CNGEEI6A29)	48.1%	54.2%	N/A	N/A	0%
UBS Europe SE (5299007QVIQ7IO64NX37)	14.0%	16.0%	N/A	N/A	0%
Liquidnet EU Limited (2138005N5TO2UJR67I36)	7.8%	4.4%	N/A	N/A	0%
Instinet Germany GmbH (213800A7BEQATAOUAN40)	5.0%	6.0%	N/A	N/A	0%
Morgan Stanley Europe SE (54930056FHWP7GIWYY08)	4.3%	5.8%	N/A	N/A	0%

2.2.3 Tick size liquidity bands 1 and 2 (from 0 to 79 trades per day)

Class of Instrument			Equities – Shares & Depository Receipts Tick size liquidity bands 1 and 2		
Notification if <1 average trade per business day in the previous year			N		
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
JP Morgan AG (549300ZK53CNGEEI6A29)	51.8%	52.7%	N/A	N/A	0%
UBS Europe SE (5299007QVIQ7IO64NX37)	15.6%	18.8%	N/A	N/A	0%
Liquidnet EU Limited (2138005N5TO2UJR67I36)	8.3%	4.9%	N/A	N/A	0%
Morgan Stanley Europe SE (54930056FHWP7GIWYY08)	4.2%	5.5%	N/A	N/A	0%
Instinet Germany GmbH (213800A7BEQATAOUAN40)	3.9%	6.6%	N/A	N/A	0%

2.3 Debt instruments: Bonds

Class of Instrument			Debt Instruments: Bonds		
Notification if <1 average trade per business day in the previous year			N		
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
Tradeweb Europe Limited (2138001WXZQOP-MPA3D50)	42.9%	20.7%	N/A	N/A	0%
Bloomberg Trading Facility Limited (549300ROEJDDAXM6LU05)	21.4%	23.8%	N/A	N/A	0%
Marketaxess Europe Limited (549300TTHIODYMGND828)	15.2%	45.8%	N/A	N/A	0%
BNP Paribas (ROMUWS-FPU8MPRO8K5P83)	1.9%	0.4%	N/A	N/A	0%
Citigroup Global Markets Limited (XKZZ2JZF41MRHTR1V493)	1.4%	0.3%	N/A	N/A	0%

The table above contains trading venues allowing Robeco to select and approach one or more potential counterparties following which a trade with one of these counterparties is agreed under the rules of the trading venue. The top 5 counterparties that were most commonly used by Robeco to execute the transactions through the trading venue's systems are presented below. Robeco does not have any close links or conflicts of interest, nor does it hold any common ownership with respect to any of these entities.

Top five counterparties commonly used through the trading venue's systems	Proportion of volume traded as a percentage of total in that class
Nomura Financial Products Europe GmbH (5493002XYZZ0CGQ6CB58)	23.5%
Barclays Bank Ireland PLC (2G5BKIC2CB69PRJH1W31)	9.5%
Goldman Sachs Bank Europe SE (8IBZUGJ7JPLH368JE346)	8.9%
Citibank Europe Public Limited Company (N1FBEDJ5J41VKZLO2475)	8.9%
J.P. Morgan SE (549300ZK53CNGEEI6A29)	8.5%

2.4 Interest rates derivatives

2.4.1 Futures and options admitted to trading on a trading venue

Class of Instrument			Interest rates derivatives Futures and options admitted to trading on a trading venue		
Notification if <1 average trade per business day in the previous year			N		
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
JP Morgan Securities PLC (K6Q0W1PS1L1O4IQL9C32)	52.0%	65.3%	N/A	N/A	0%
Barclays Bank PLC (G5GSEF7VJP5I7OUK5573)	48.0%	34.7%	N/A	N/A	0%
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-

2.4.2 Swaps, forwards, and other interest rates derivatives

Class of Instrument			Interest rates derivatives Swaps, forwards, and other interest rates derivatives		
Notification if <1 average trade per business day in the previous year			N		
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
Tradeweb Europe Limited (2138001WXZQOP-MPA3D50)	87.6%	90.0%	N/A	N/A	0%
Barclays Bank Ireland PLC (2G5BKIC2CB69PRJH1W31)	9.4%	2.2%	N/A	N/A	0%
Citibank Europe Public Limited Company (N1FBEDJ5J41VKZLO2475)	1.9%	5.1%	N/A	N/A	0%
Barclays Bank PLC (G5GSEF7VJP5I7OUK5573)	0.6%	1.3%	N/A	N/A	0%
BNP Paribas (ROMUWFPU8MPRO8K5P83)	0.3%	0.8%	N/A	N/A	0%

In the table above Tradeweb Europe Limited is a trading venue allowing Robeco to select and approach one or more potential counterparties following which a trade with one of these counterparties is agreed under the rules of the trading venue. The top 5 counterparties that were most commonly used by Robeco to execute the transactions through the trading venue's systems are presented below. Robeco does not have any close links or conflicts of interest, nor does it hold any common ownership with respect to any of these counterparties.

Top five counterparties commonly used through the trading venue's systems	Proportion of volume traded as a percentage of total in that class
Citigroup Global Markets Europe AG (6TJCK1B7E7UTXP528Y04)	22.5%
J.P. Morgan SE (549300ZK53CNGEEI6A29)	22.3%
Barclays Bank Ireland PLC (2G5BKIC2CB69PRJH1W31)	20.2%
Morgan Stanley Europe SE (54930056FHWP7GIWYY08)	12.9%
BNP Paribas (R0MUWFPU8MPRO8K5P83)	7.0%

2.5 Credit derivatives: Other credit derivatives (i.e. other than futures or options)

Class of Instrument			Credit derivatives (other)		
Notification if <1 average trade per business day in the previous year			N		
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
Tradeweb Europe Limited (2138001WXZQOP-MPA3D50)	91.1%	85.8%	N/A	N/A	0%
BNP Paribas (R0MUWFPU8MPRO8K5P83)	4.6%	6.0%	N/A	N/A	0%
J.P. Morgan SE (549300ZK53CNGEEI6A29)	2.7%	4.7%	N/A	N/A	0%
Barclays Bank Ireland PLC (2G5BKIC2CB69PRJH1W31)	0.6%	2.0%	N/A	N/A	0%
BofA Securities Europe SA (549300FH0WJAEHTIQ77)	0.3%	0.2%	N/A	N/A	0%

In the table above Tradeweb Europe Limited is a trading venue allowing Robeco to select and approach one or more potential counterparties following which a trade with one of these counterparties is agreed under the rules of the trading venue. The top 5 counterparties that were most commonly used by Robeco to execute the transactions through the trading venue's systems are presented below. Robeco does not have any close links or conflicts of interest, nor does it hold any common ownership with respect to any of these counterparties.

Top five counterparties commonly used through the trading venue's systems	Proportion of volume traded as a percentage of total in that class
Barclays Bank Ireland PLC (2G5BKIC2CB69PRJH1W31)	24.7%
J.P. Morgan SE (549300ZK53CNGEEI6A29)	24.4%
BNP Paribas (R0MUWFPU8MPRO8K5P83)	18.5%
Citigroup Global Markets Europe AG (6TJCK1B7E7UTXP528Y04)	17.3%
Morgan Stanley Europe SE (54930056FHWP7GIWYY08)	7.0%

2.6 Currency derivatives: Swaps, forwards, and other currency derivatives

Class of Instrument			Currency derivatives Swaps, forwards, and other currency derivatives		
Notification if <1 average trade per business day in the previous year			N		
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
FXall – Refinitiv Transaction Services Limited (549300SDDJE84DDJNB30)	99.6%	99.5%	N/A	N/A	0%
Banque Pictet & Cie S.A. 4LCYDN74UCFU5VPM4774	0.3%	0.4%	N/A	N/A	100%
Lan & Spar Bank A/S (213800UYAHIRLZ4NSN67)	0.1%	0.1%	N/A	N/A	100%
-	-	-	-	-	-
-	-	-	-	-	-

In the table above FXall is a trading venue allowing Robeco to select and approach one or more potential counterparties following which a trade with one of these counterparties is agreed under the rules of the trading venue. The top 5 counterparties that were most commonly used by Robeco to execute the transactions through the trading venue's systems are presented below. Robeco does not have any close links or conflicts of interest, nor does it hold any common ownership with respect to any of these counterparties.

Top five counterparties commonly used through the trading venue's systems	Proportion of volume traded as a percentage of total in that class
HSBC Continental Europe (F0HU11NY1AZMJMD8LP67)	28.6%
J.P. Morgan SE (549300ZK53CNGEEI6A29)	20.5%
Barclays Bank Ireland PLC (2G5BKIC2CB69PRJH1W31)	13.1%
BNP Paribas (R0MUWFPU8MPRO8K5P83)	11.8%
Citibank Europe Public Limited Company (N1FBEDJ5J41VKZLO2475)	10.6%

2.7 Equity Derivatives: Options and Futures admitted to trading on a trading venue

Class of Instrument			Equity Derivatives Options and Futures admitted to trading on a trading venue		
Notification if <1 average trade per business day in the previous year			N		
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
JP Morgan AG (549300ZK53CNGEEI6A29)	81.8%	90.2%	N/A	N/A	0%
UBS AG (BFM8T61CT2L1QCCEMIK50)	11.2%	3.4%	N/A	N/A	0%
Goldman Sachs & Co. LLC (FOR8UP27PHTHYVLBN30)	3.6%	1.8%	N/A	N/A	0%
Barclays Capital Securities Limited (K9WDOH4D2PY-BLSLOB484)	2.9%	3.5%	N/A	N/A	0%
JP Morgan Securities PLC (K6Q0W1PS1L104IQL9C32)	0.1%	0.1%	N/A	N/A	0%

2.8 Exchange traded products (Exchange traded funds, exchange traded notes and exchange traded commodities)

Class of Instrument			Exchange traded products (Exchange traded funds, exchange traded notes and exchange traded commodities)		
Notification if <1 average trade per business day in the previous year			N		
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
Jane Street Financial Limited (549300ZHEHX8M31RP142)	51.1%	43.0%	N/A	N/A	0%
Flow Traders B.V. (549300CLJI9XDH12XV51)	14.8%	13.3%	N/A	N/A	0%
JP Morgan AG (549300ZK53CNGEEI6A29)	9.7%	14.6%	N/A	N/A	0%
UBS Limited (REYPIEJN7XZHSUI0N355)	7.9%	1.9%	N/A	N/A	0%
Susquehanna International Securities Limited (635400IAV22ZOU1NFS89)	5.1%	2.5%	N/A	N/A	0%

2.9 Other instruments

The table below contains the brokers that were most commonly used by Robeco for trades in shares not covered by the MiFID II tick size regime including US and APAC shares.

Class of Instrument			Other instruments		
Notification if <1 average trade per business day in the previous year			N		
Top five brokers 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
JP Morgan AG (549300ZK53CNGEEI6A29)	22.8%	26.7%	N/A	N/A	0%
BofA Securities, Inc (549300HN4UKV1E2R3U73)	10.4%	11.7%	N/A	N/A	0%
UBS Limited (REYPIEJN7XZHSUI0N355)	8.4%	9.8%	N/A	N/A	0%
JP Morgan Securities PLC (K6Q0W1PS1L1O4IQL9C32)	8.3%	5.1%	N/A	N/A	0%
Citigroup Global Markets Limited (XKZZ2JZF41MRHTR1V493)	4.9%	8.2%	N/A	N/A	0%