

## Product information

### Liquidity Fragmentation Analytics LFA

#### Background

LFA is a toolbox of statistical analyses on the quality of trades across European markets. It is based on the notion of best execution price, including two criteria: the price for the investor (trading prices) and the cost (trading fees).

#### What Equiduct offers

Equiduct is expanding its data offering and launching a new "Liquidity Fragmentation Analytics" service to complement its current VBBO data offering.

This benchmark provides valuable information for:

- Buy side
- Sell side
- Press
- Research analysts
- Regulators
- Compliance
- Issuers

The service, which is delivered as a report in chart form and also in spreadsheets for customized analysis, allows the user to see:

- Where trades were executed
- Where trades should have been executed in order to achieve the best price
- Which platforms would be the beneficiaries and the losers of flow if best price and lowest transaction cost had been achieved
- What monetary benefit could have been achieved if best price and lowest transaction cost had been attained
- That the industry has not yet developed sufficient smart order routing tools to ensure they are delivering best execution to their clients.
- Many buy side clients are still unaware of the better prices that could have been available to them.

The spreadsheets contain raw data which can be processed by the user to produce tailored results, for example by:

- Index

**Customize** your report and raw data for your individual use

**Produce** your own Analysis

## Product information

- Trade size
- Geographical region
- Sector (class of business/industry)
- Most active stocks
- Time interval (daily, weekly etc.)
- Level of Fragmentation

Equiduct continuously stores this data and, according to demand, intends to make available further products based on it.

### Trustworthy sources - Where the data comes from

Equiduct receives direct, real time exchange feeds from our ultra-low latency provider Fixnetix. This data is already the basis for our VBBO calculation. At launch, Equiduct calculated the VBBO price for approximately 500 stocks across three home exchanges and four MTFs (LSE, XETRA, EURONEXT, CHI-X, TURQUOISE, BATS, NASDAQ OMX). In July 2010, the stock universe covered over 1200 instruments and we intend to expand both the universe of stocks and the number of execution venues in the near future.

**Over 1200 Stocks  
across:**

LSE  
Xetra  
Euronext  
Chi-X  
Turquoise  
BATS  
NASDAQ OMX

All incoming and outgoing data comes into Equiduct through a low latency (< 5 ms) high frequency network which can support peak deliveries of 500,000 market data price updates per second. It is stored in Equiduct's tick database, a robust, state of the art database that has been built to support all exchange activities, and can be used for back testing, replaying historical data, and calculating fragmentation and liquidity over different time periods.

**Low latency  
High frequency  
network**

As a regulated market, Equiduct market data is of the same high quality standard as that required for a trading system.

### Distribution

Equiduct will distribute its LFA by e-mail with regular reports posted on the Equiduct website  
<http://www.equiduct.com/market-data/lfa.asp>

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### Why pre-trade fragmentation?

Equiduct offers pre-trade fragmentation information based on 2 main criteria of Best Execution requirements:

- Best prices: The comparison of prices over all seven markets takes place at the exact same time. Therefore, we are in a position to compare level I (single trades) and level II (order book) data prices across all relevant markets.
- Lowest trading cost.

**Pre trade fragmentation – Identifying best possible result**

The data can be used to build experience and understanding. It can, therefore, be used by banks to review their best execution policy and help them to allocate their order flow – or enable the buy side to find a better broker or bank.

**Review the best execution policy And allocate the order flow**

In addition, as the data is archived Equiduct can offer a fixed, consolidated historical order book for level I and level II prices. Or, to put it more simply, Equiduct stores the exact order situation over all relevant markets at every point in time.

### LFA Security Universe and Data Capture

The LFA product provides analysis of all securities which meet the following selection criteria;

- All equities listed on the CESR Database of MiFID Instruments, AND
- Continuously traded on at least two trading venues , AND
- Are eligible for CCP clearing in either SIS X-Clear, LCH.Clearnet Ltd and/or LCH.Clearnet SA, AND
- Is a constituent of FTSE100, FTSE250, FTSE350, AEX, BEL20, CAC40, DAX30, PSI, Euronext 100, Euronext 150, Stoxx50, DJ Stoxx 50, OR
- Is traded with sufficient frequency as determined by Equiduct.

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In July 2010, this security universe contained over 1200 stocks, and is reviewed monthly.

The Equiduct tick database captures all order book (Level II) and trade data for all LFA securities, from up to seven venues;

- London Stock Exchange
- Euronext (Paris, Amsterdam, Lisbon, Brussels)
- Deutsche Börse (Xetra)
- NASDAQ OMX Europe
- Chi-X
- BATS Trading Europe
- Turquoise Visible

**Full orderbook**  
Analysing level II data

Equiduct will amend venue coverage as required.

## Methodology

The LFA approach considers a virtual stream of orders corresponding to the observed trades from published information from each of the contributing exchanges. Only order book trades from continuous trading periods are considered in the analysis; auction trades or trades arising from "dark" execution services are excluded.

Our algorithm compares the real net traded price of all trades with the net prices available on each of the different venues at that precise point in time. It means that for each trade, the analysis includes the trading fees of the execution venue and compares it with the consolidated order book which also includes all the net prices of each order (price + trading fees for each originating venue). Trading fees considered: the analysis considers the variable fees published on the exchanges websites at the start of the month for the entire month. They will be reviewed monthly.

**From best price to best possible result**  
New methodology includes the traded price AND the trading costs

Fees as at **July 1<sup>st</sup> 2010**:

	Chi-X	Turquoise	BATS Europe	Nasdaq OMX Europe	LSE	Xetra	Euronext
Fees in Bps	0.3	0.28	0.2 for UK stocks 0.3 for other stocks	0.15 for NYSE-Euronext traded securities 0.30 for securities	0.43 <sup>1</sup>	0.48	1.20 Bps

<sup>1</sup> The fees for the LSE is calculated for a broker executing an average of £4 Blns per month

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				listed on all other markets			
Cap							1.25 €
Floor					0.10 £	0.60 €	

Each trade sent by the markets is analysed individually by Equiduct. With the millisecond granularity that Equiduct is able to associate to each trade, it is possible for Equiduct to compare every trade with the consolidated order book at that exact point in time and thus determine if it is a buy or a sell order.

We then compare the real traded price of the trade with the consolidated order book at the exact point in time before the trade occurred.

The real net price traded is compared to the net VWAP for the order volume across all venues trading the security. An order is considered to have missed a better price if;

- In the case of a buy order, the net VWAP available on the consolidated market is strictly lower than the real net price traded.
- In the case of a sell order, the net VWAP available on the consolidated market is strictly higher than the real net price traded.

Where an order missed a better net price on other venue(s), the LFA calculates the optimal order split across those venues, prioritising venues accordingly to net prices and volume— order volume is allocated against venues offering the best [price +/- trading fees] first.

The amount of price improvement calculated as the difference between the real net price traded and the net VWAP of the consolidated order book.

The new price improvement resulting from the calculation includes: the real price improvement for the investor on the price traded AND the cost improvement.

**LFA**  
Calculates the  
optimal order split

Theoretical order allocations at the individual trade level are then aggregated up to an instrument, index and venue level, to deliver a high-level analysis of how liquidity could have been executed under an optimal best price model.

## Acknowledged Assumptions

## **Product information**

The LFA approach considers only the price of execution and trading costs in determining if an order should have been routed to an alternate venue. In practice, market participants may consider a variety of other factors including liquidity, likelihood of execution and access to clearing and settlement services.

The LFA approach uses only visible order book data in generating the consolidated order book. Any iceberg or dark orders present in any contributing order books cannot be incorporated into the analysis. Furthermore, the timestamp of order book (Level II) data is determined as the time of data receipt, which may be subject to data latency or delays.

Some securities are traded on different venues under different currencies. Each trade is compared to the order book in the currency it was traded, but for consolidation purposes the LFA analysis converts all prices and amounts into Euros, using a daily exchange rate set at approximately 16:30 UK time on the trading day

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### NOTES TO EDITORS

#### About Equiduct

Equiduct offers a fast and cost-effective all in one trading solution. Its sophisticated market model enables investment firms to provide order by order best execution to their clients in the easiest possible way. All the loose ends of MiFID compliant trading are brought together in a unique set of product modules: VBBO (Volume-weighted Best Bid and Offer), PartnerEx and HybridBook. A flexible approach to clearing & settlement keeps costs predictable and low.

As one of the most innovative high performance IT solutions available, developed, delivered and supported by Equiduct Systems, Equiduct offers groundbreaking speed and performance providing a competitive edge when compared to both new MTFs and established European stock exchanges. Equiduct is a regulated market, enabling it to stand out against the various Multilateral Trading Facilities (MTFs) that have emerged following the introduction of MiFID.

[www.equiduct.com](http://www.equiduct.com)