SIREN | FX NCFX

SIREN FX Benchmark

DOCUMENT AUTHOR:	New Change FX
DOCUMENT OWNER:	New Change FX
STATUS:	Approved
DATE CREATED:	January 2020
VERSION:	3.0
LAST UPDATED:	August 2023

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Introduction

This benchmark statement is provided by New Change Currency Consultants Ltd ("New Change FX" or "NCFX" or the "Company") as the administrator of the SIREN FX Benchmark and in accordance with Article 27 of Regulation (EU) 2016/1011 of the European Parliament and the Council of 8 June 2016 (the "Benchmark Regulation" or "BMR"). The SIREN FX Benchmark is devised by Siren FX (formerly Raidne). This statement is intended to meet the requirements of the BMR on indices used as benchmarks in financial instruments and financial contracts or to measure the performance of investment funds.

On 27 February 2018, HM Treasury in the UK passed into legislation the Financial Services and Markets Act 2000 (Benchmarks) Regulations 2018, thereby fully adopting the BMR (EU) 2016/2011. On that date the Financial Conduct Authority (FCA) in the UK granted New Change FX permission under Part 4A of the Financial Services and Markets Act 2000 to carry on the regulated activity of administering a benchmark.

The Benchmark Statement below makes reference to Article 27 and 28 of the BMR as well as the technical standards (RTS) accompanying the BMR, published in September 2016, and where applicable makes reference to the specific clause or sub-clause within Articles 27 and 28 of the BMR, or specific Articles and clauses within the RTS relating to disclosure requirements for Benchmark Statements in Section 9.4 of the RTS.

New Change FX can be found on the FCA financial services register with firm reference number 793983. The FCA is the sole regulatory supervisor for New Change FX.

Benchmark Statement

1. General Information:
RTS Section 9.4 Article 7 – Type of Benchmark
• The SIREN FX Benchmark qualifies as a Non-significant Benchmark in that it does not satisfy the criteria as either a Critical Benchmark or a Significant Benchmark.
BMR Article 27,1,(a) and RTS Section 9.4 Article 1,1 – Rationale and Economic Reality Measured
• SIREN FX is a fair benchmark designed for settling spot FX transactions at a point in time and to provide an alternative to the 4pm Fix. It is published every 30 minutes during the trading week for all the NCFX-MI Benchmark spot pairs (see separate NCFX-MI Benchmark Statement). • The SIREN FX Benchmark is devised by Siren FX and uses the NCFX-MI Benchmarks, meaning SIREN FX is calculated in real time using live mid-rate spot FX data. • The SIREN FX Benchmark has a long observation window of 20 minutes. • It seeks to address the excessive market impact that inevitably arises when executing large transactions over a short 5-minute fixing window, where there is more demand for liquidity than the market can absorb.
BMR Article 27,1,(b) and RTS Section 9.4 Article 1,3 – Discretion Used in Calculation
• Contributions to the underlying NCFX-MI Benchmarks must be relevant, timely and fully automated. There is no data submitted from any manual systems. • Discretion is neither permitted nor possible in creation of the NCFX-MI Benchmarks. • One of the key characteristics of NCFX-MI Benchmarks is the absence of human intervention in determining the mid-rate as it is wholly automated.
2. Methodology and Input Data
BMR Article 27,2,(a),(b) – Definitions and Methodology
• SIREN FX is an FX spot benchmark that is published every 30 minutes across a pre-determined set of currency pairs. • SIREN FX uses a 20-minute fixing window and is derived from data extracted at one-second intervals from NCFX-MI Benchmarks. • SIREN FX spot weightings use the concept of optimal execution[1] to reflect the risks when executing larger trades. The methodology seeks to minimise price risk and market impact. • The model derives an optimal trading trajectory given a fixed time horizon and is driven by the ratio of the market risk over the market impact, or

Omega. The Omega liquidity measure of 3 is established from observing a large set of trade data over a long period of time.[2]
- The optimal trajectory provides the weights for the SIREN FX calculation, which is then applied every second to the observed mid-price over the benchmark window. The weight increases as it approaches the fix.
- The methodology has been reviewed and agreed by New Change FX's Benchmark Oversight Committee in 2019.

BMR Article 27,2,(c) – Input Data

- The NCFX-MI Benchmarks provide aggregated data derived automatically from connected FX marketplaces and are published every 50 milliseconds; SIREN FX uses a snapshot at one-second intervals of NCFX Benchmark mid-market spot rates.
- All input FX data feeds received into NCFX-MI Benchmarks are from the top of the marketplaces' books and are available to market participants to transact business.

3. Limitations and Errors

BMR Article 27,2,(e),(f),(g) and RTS Section 9.4 Article 1,2 – Limitations and Unreliable Data

- Each member of the underlying NCFX-MI Family of Benchmarks requires a minimum of two independent contributing marketplaces (ECNs) to be accepted for use in calculation of the SIREN FX Benchmarks.
- Where, for whatever reason, at least two independent marketplaces are not able to furnish a rate, New Change FX will not publish the underlying NCFX-MI Benchmark. In the absence of the underlying data, the SIREN FX Benchmark would not be available to users until such time as normal conditions resume and at least two independent marketplaces are able to resume publication of prices in real-time. Users would be notified accordingly.
- In the event of an adverse change of circumstances for a given member of families of benchmarks, clients would be notified, and the benchmark withdrawn until such time as the underlying NCFX-MI Benchmark data became available again.
- Given the fully automated nature of the index and its calculation, we have not knowingly had an error in the calculation of the index over the years for which the index values have been available. If an error was identified, we would check the inputs that created the error and check the nature of the error. If the error were deemed to indeed be an error, for example one of the underlying inputs being quoted to the wrong decimal place, the error would be corrected, and the value of the index revised.

4. Changes and Cessation

BMR Article 27,1,(c),(d), BMR Article 28 and RTS Section 9.4 Article 1,4 – Benchmark Changes or Cessation

- There may be circumstances in or beyond the control of the administrator that would lead to either a change in the methodology or the cessation of the production of the NCFX-MI Family of Benchmarks.
- Where there is a change of methodology, benchmark users would be given three months' advanced warning.
- Where the administrator decides to stop providing a benchmark, benchmark users would be given three months' notice and the administrator would suggest any credible alternative benchmarks if possible.

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A Note on Methodology – Optimal Execution and SIREN FX Calculation Methodology

The concept of optimal execution in economics determines the optimal trading trajectory when considering the opposing concepts of market risk and market impact. These are related as follows:

Low market risk ↔ Faster execution ↔ High Market Impact

Low Market Impact ↔ Slower execution ↔ Higher market risk

The classic optimal execution model for market orders was first described by Almgren and Chriss in a 2000 publication[1]. In their model they constructed an exact solution for the trade trajectory given a fixed time horizon T:

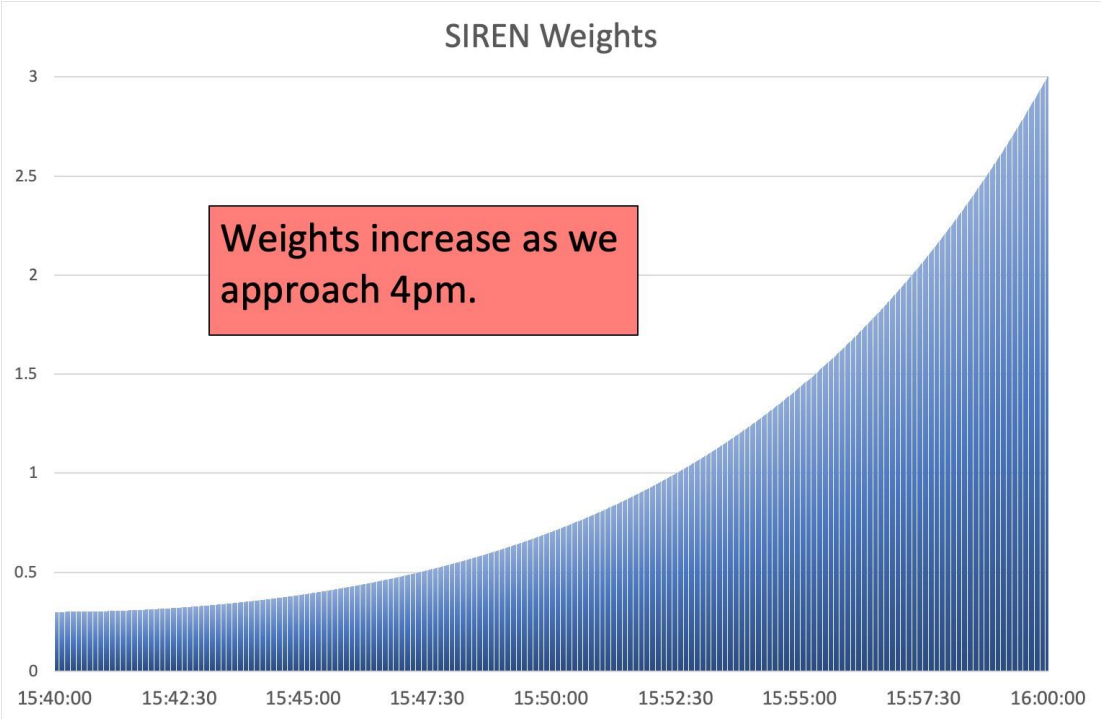
$$\frac{Q(t)}{Q(0)} = \frac{\sinh(\Omega(1-\tau))}{\sinh\Omega}, \qquad \Omega = T\sqrt{\frac{\lambda\sigma^2}{a+b}}, \quad \tau = \frac{t}{T}$$

Here, "sigma" is the volatility of the underlying and "a" and "b" are the temporary and permanent price impact caused by trading. "Q(t)" represents the quantity of the trade held at any time "t" over the trading horizon "T".

The trajectory is driven by Omega which is a ratio of the market risk over the market impact. This can be determined for a given asset using market data. Generally, the more liquid a currency is, the higher the omega, implying more execution can happen closer to the fix.

For our benchmark we are considering the opposite problem of executing a given notional by time T. This is analogous to the related problem in equities of executing an algorithm to hit the close and is known as a Market-On-Close (MOC) algorithm. Using the Almgren-Chriss framework we can simply reverse time to generate this trajectory.

The optimal trajectory is used to determine the weights for our SIREN FX calculation. The liquidity measure omega is chosen optimally from observed market impact across a large number of trades. We apply the SIREN FX weight to the observed mid- price every second over the benchmark window. The weights increase as we approach the benchmark as shown in the example below:



An important element of this methodology is that market impact is a function of the volume to be traded at the benchmark. To reduce the market impact for larger notionals, we have chosen a 20-minute window for the benchmark calculation.

The SIREN FX fix is calculated in real-time using live mid-market spot data as the weights are known in advance.

NCFX Benchmark mid-market spot rates are snapped every second in the price construction.

The SIREN FX Benchmark is published twice an hour for all standard FX trading hours and is available for 71 currency pairs.

References:

[1] Almgren, R. and Chriss, N. (2000), "Optimal Execution of Portfolio Transactions". *Journal of Risk*, 3, 5-39.

[2] Walton, J. (2020), "SIREN: A fair benchmark for FX", Raidne Whitepaper.