Bloomberg FX Fixings BFIX Methodology

FX Benchmark solutions

Bloomberg

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Version Control

Material updates from previous version

Date	Update
August 2023	• Algorithm change - Removed the last 6 seconds of each fixing window, reallocated weight to front of the window. • Updated Methodology format
March, 2023	• Expanded BFIX universe updated • Forwards pre-production validation
August, 2022	• Sierra Leone ISO code SLL has been retired and replaced with SLE effective July 31, 2022 • BFIX on Belarusian Ruble (BYN) ceased from July 18, 2022, due to sustained drop in an active market.
February, 2022	• BFIX for the Russian Ruble has switched sources from BGNE to BGN until fully executable pricing resumes in the market.
November 2021	• Local market hours of Chile Peso (CLP) to close at 4:00pm from 1:30pm. • Update to Exhibit D: Holiday schedule • Updates to chapters 2, 4, 6 and 8. • BFIX website move to 25min delay from 5min
November 2020	Updated Latam NDF methodology. Calculations for tenors switched to using liquidity from pointsas opposed to outrights.
April 2020	Updated to include ESG disclosure, exhibit F.
May 2018	As of Sunday May 13, 2018, the data source for 24 currency pairs changed from BGN to BGNE,section 2.2. Update rules on future 'observed' Christmas and New Year Holidays.
November 2017	• Change to the Time Weighted Average Price ("TWAP") window for all non-G10 spot currencies to 306 seconds. This window was previously only applied to G10 currencies, whereas non-G10 spots carried a 906 second window. • Where a fixing cannot be produced due to inadequate input from the BFIX pricing source, the previous fixing will be carried forward. Previously, in such instances, a fixing was not provided. Specification of various factors considered in addressing errors and restatements. • Update to governance and oversight section to include certain compliance and audit procedures. Update to stakeholder engagement procedures to include periodic empaneling of advisory councils.
May 2016	First version

Introduction

This methodology (the "Methodology") has been made available by Bloomberg Index Services Limited ("BISL") and sets out the rules, criteria, risk factors and other information application to the Bloomberg BFIX Benchmarks (the "Indices" and each, an "Index"). Capitalized terms used in this Methodology but not otherwise defined have the meanings set forth in Appendix I (Glossary).

Objectives and key features

The Bloomberg BFIX rates aim to produce Spot, Forward and Non-Deliverable Forward ("NDF") FX rate fixings for certain currencies and metals, detailed in Exhibit A to this methodology.

Using Bloomberg LP's (Bloomberg L.P. and collectively with its affiliates "Bloomberg") data, technology, and distribution platforms, BFIX is made available with the objective of providing FX fixings that are reliable, representative, and transparent for the currency and metals markets around the world. The benchmark offers an unbiased source of FX data for market participants who need to use foreign exchange rates for portfolio benchmarking, derivatives valuation, index construction and trade execution.

- Calculated and published every 30minutes throughout the day when markets are open.

- Operates from 5.30pm on Sunday EST to 5pm Friday EST, see Section 3 for further details of publication hours and local market hours.

- Produces over 5200 fixings covering over 140 core currencies against the United States Dollar, (USD), 1170 Spot cross pairs and over 3900 Forward and NDF fixings.

- Rates are published on the Bloomberg terminal to a dedicated screen BFIX <GO> within 15 seconds of the end of the fix for USD based Spots & Forwards and within 1 minute for others.

- BFIX can be consumed in many Bloomberg analytics and APIs and is also available via our Enterprise Data suite of services for commercial application of the benchmark. To inquire about data licenses or other questions, please contact bfixinquiry@bloomberg.net

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Compliance and regulatory certifications:

- UK BMR compliant benchmark
- Administered by Bloomberg Index Services Limited (BISL)
- Regulated by Financial Conduct Authority (FCA)
- Confirmed in alignment with the BFIX family of benchmarks with the International Organization of Securities Commissions (IOSCO) Principles for Financial Benchmarks

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Section 1 : Input Data

BFIX rates are based on pricing provided by the Bloomberg Executable Rates ("BGNE") and Bloomberg Generic Price ("BGN") sources.

Classification of Pricing

- Spot USD currency pairs employed by BGNE are from purely executable pricing.

- All other data is from BGN which is a blend of executable and/or indicative pricing.

- BFIX prices several currencies that utilize a peg system and may be driven by the associated peg of that country. BFIX also has several legacy EURO currencies. Pegs and EURO legacy currencies are listed in Exhibit A.

BGNE (Bloomberg Executable rates)

The BGNE pricing source is a real-time pricing composite based purely on executable data feeds from Bloomberg's FXGO trading platform. They are received from a diverse universe of sources who provide them for the primary purpose of soliciting actual FX transactions from the market. BGNE is computed as the median average bid/offer and currently is available for Spot currency pairings only.

The following spot USD currency pairs employ the BGNE source for pricing. Any crosses of the below by definition will by driven by executable pricing from the underlying USD currency pair.

	Name	Currency pair
1	Australian Dollar	AUDUSD
2	British Pound	GBPUSD
3	Canadian Dollar	USDCAD
4	Chinese R. Yuan HK	USDCNH
5	Czech Koruna	USDCZK
6	Danish Krone	USDDKK
7	Euro	EURUSD
8	Hong Kong Dollar	USDHKD
9	Hungarian Forint	USDHUF
10	Indian Rupee	USDINR
11	Israeli Shekel	USDILS
12	Japanese Yen	USDJPY
13	Mexican Peso	USDMXN
14	New Zealand Dollar	NZDUSD
15	Norwegian Krone	USDNOK
16	Polish Zloty	USDPLN
17	Romanian Leu	USDRON
18	Singapore Dollar	USDSGD
19	South African Rand	USDZAR
20	Swedish Krona	USDSEK
21	Swiss Franc	USDCHF
22	Thai Baht	USDTHB
23	Turkish New Lira	USDTRY

BGN (Bloomberg Generic Price)

BGN prices are designed to show market-consensus bid and ask rates from a select subset of Bloomberg's FX price sources, which have met selection criteria such as pricing consistency, frequency, and quality. BGN has extensive coverage across Spot and forwards and includes executable pricing as well as indicative where markets are less liquid.

Section 2: Calculation

Time weighted average price (TWAP)

A BFIX rate is calculated by taking a Time-Weighted Average Price ("TWAP") of BGNE or BGN bid and ask prices.

The TWAP uses a triangular function with the peak of the triangle on the last second of the fix. The time leading up to the last second is a linear TWAP, while the last second (peak) has a 10% weight.

Each time slice of the fixing is one second long. The BGNE and BGN can produce multiple prices within one second for a currency pair of which the arithmetic average is taken to produce one BGNE or BGN price for each second to be used in the BFIX window.

TWAP Windows

The time frames for TWAP vary for spots, swaps and outrights and metals as follows:

- For all Spot currencies, the linear TWAP will be three hundred seconds (five minutes).
- For all swap points and outrights the linear TWAP will be nine hundred seconds (fifteen minutes).
- For metals the linear TWAP will be six hundred seconds (ten minutes).

Illustrative example of Spot BFIX
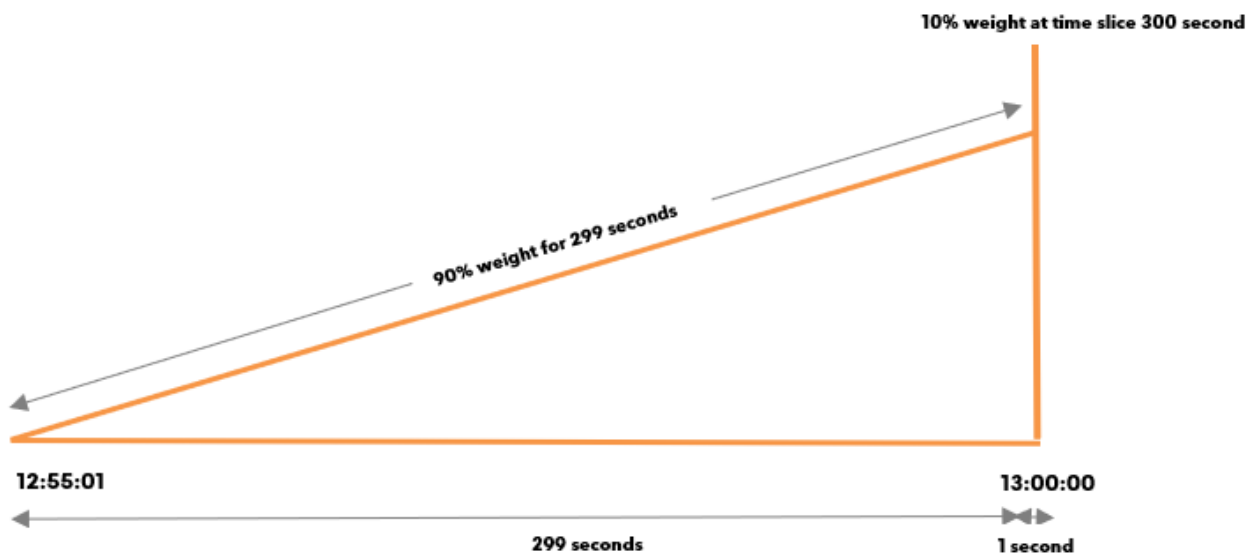
Formula

The following is the formula to calculate the weight:

$$Weight = \frac{.9}{\left(\frac{Seconds - 1}{2}\right) * (Seconds)} * TimeSlice$$

$$Weight = Weight\ of\ a\ given\ Time\ Slice$$

$$Seconds = Number\ of\ seconds\ in\ fixing$$

$$TimeSlice = Seconds\ into\ fixing\ window$$

The following is the formula to calculate the BFIX price:

$$BFIX = \frac{\sum(P_s * W_s) + (P_{peak} * W_{peak})}{\sum W}$$

$P_s = Average\ price\ in\ the\ second$

$W_s = Weight\ of\ second$

$W = Weights\ with\ an\ available\ price$

$P_{peak} = Average\ Price\ at\ fixing\ time$

$W_{peak} = 10\%$

Rounding

Market convention, as represented by the history of source inputs, dictates the number of decimal places used in a fixing. When the application of algorithms produces an additional decimal place for the bid and/or ask, BFIX will round that number up or down as warranted.

To help ensure a measurable bid/ask spread, the bid is always rounded down and the ask is always rounded up. For example, a bid/ask calculation of 1.10919 / 1.10921 will be rounded to 1.1091 / 1.1093 with a mid of 1.1092.

This is on Spot FX only and not on Forwards.

Cross Calculation

All BFIX currencies are quoted against the USD only. Any other currency pair is thus cross calculated via the USD BFIX rates. This is on the final BFIX rates themselves and not during the BFIX TWAP calculation.

For example, a EURJPY BFIX spot rate will be crossed using the EURUSD BFIX rate and the USDJPY BFIX rate and not using direct EURJPY pricing. This is to avoid the issue of arbitrage triangulation.

Date Alignment

BFIX employs date alignment on crosses.

A significant benefit to BFIX is the adoption of accurate market settlement date alignment which factors in local market holidays. BFIX will adhere to the market settlement date of the currency pair daily.

Most currencies follow a T+2-day settlement but some follow T+1 settlement like CAD Canadian Dollar, PHP Philippine Peso, TRY Turkish Lira and RUB Russian Ruble.

When cross calculating a T+2 currency and a T+1 currency BFIX will adjust the T+1 pair up to T+2 by BFIX Tom/Next (T/N) Points. If the T/N Points are not available BFIX interpolates between the spot and the next available tenor.

The exception is UAH which operates on T+0 basis and crosses against UAH are brought back to value T0.

 If there are no forward tenors available on a currency, BFIX will not date align.

BFIX also will make adjustment when market holidays are observed and reflect the standard market settlement date for the currency pair as traded in the global spot foreign exchange market.

Forwards

For currencies that are classed as deliverable the BFIX TWAP will use swap POINTS as the main source of liquidity and derive the Outright.

For example, USDCAD (Canadian Dollar) 1month:

BFIX Spot + BFIX Points = BFIX Outright

For Non-Deliverable Forward (NDF) defined currencies the BFIX TWAP will use the outright market as the source of liquidity. Therefore, the BFIX Swap points will be derived

For example, USDKRW (Korean Won) 1month BFIX NDF:

BFIX Outright - BFIX Spot = BFIX Points

The exception is Latam NDFs which will act like a deliverable currency utilizing swap points as the principal source of liquidity and derive the outrights.

Active Market

An active market is one in which BFIX has received from BGN or BGNE at least one bid and ask price in the fixing window. In no event will BFIX take a BGN or BGNE price that is from a single source, unless predefined as a peg currency, see exhibit A. In no event will BGN or BGNE produce a price, or BFIX produce a fixing, that can be reverse engineered.

If no qualified BGN or BGNE price can be produced within a fixing window, the previous fix will be carried forward.

Carry Forward

Where no activity occurs in a BFIX Spot, Forward or Metals window the BFIX will take the previous fixing and publish that until the market becomes active again.

When local markets are closed the Spot price is carried forward. However, the NDF market remains active. The BFIX will thus allow the NDF pricing to remain active but carry forward the derived points or outrights until the local market opens again.

For example, USDKRW (Korean won) 1mth BFIX NDF. The spot and BFIX Points will carry forward from the local market close, but the BFIX NDF Outright will take live liquidity. Once the local market opens again the spot is allowed to access live liquidity and the points are derived as above.

Section 3: Publication

BFIX Coverage

BFIX operates 24 hours a day for all weekdays of the year in line with the following market hours and subject to local currency hours policy and national holidays policy below:

- First BFIX at each week will be Sunday 5:30pm New York time.
- Last BFIX of each week will be Friday 5pm New York time.

BFIX will be produced every 30 minutes on the hour and half-hour during these times if an "active market" persists and input minimums are met, subject to the policy on national holidays below.

Policy on National Holidays

The FX market is a global 24 hour a day market. A public holiday in a country does not necessarily mean the FX market is closed.

BFIX is published on all days as long as an active market is open.

However, liquidity on such holidays in the currency in question may be considerably lower, potentially failing to qualify as an active market, meaning BFIX will not publish for that currency and the last fix will be carried forward.

In some of the less liquid currencies or where currency trading offshore is not allowed, it is likely BFIX will have significantly reduced coverage on national holidays.

In addition, BFIX will not publish on the following days where liquidity is known to be significantly impacted: Easter Friday, Christmas Day and New Year's Day. Please see a list in Exhibit C that lists these dates over the next 5 years.

Delivery Methods

Absent a disruption or failure, BFIX will be published on the Bloomberg Professional service within 15 seconds of the fixing time for USD based spots & Forwards and within 1 minute for all others. The rates can be consumed as a source in many Bloomberg functions and API.

A select number of currencies and times for the spot price only will be available on the Bloomberg website under a delay of 25 minutes. https://www.bloomberg.com/professional/product/indices/bfix/

Those select currencies and times are listed in Exhibit D.

Hours of Local Currencies

There are some currencies where offshore trading does not occur or is not permitted by that country. BFIX will be published when the local market is open, and when closed, carry forward the closing price until the market opens again. This impacts the following currencies with all open and close times in local market hours.

Country	ISO	Open	Close	Country	ISO	Open	Close
Argentine Peso	ARS	10:00am	3:00pm	Malaysian Ringgit	MYR	8:00am	6:00pm
Bahrain Dinar	BHD	9:00am	1:30pm	Omani Rial	OMR	8:00am	2:00pm
Brazilian Real	BRL	9:00am	6:00pm	Pakistani Rupee	PKR	9:30am	5:30pm
Chilean Peso	CLP	8:30am	4.00pm	Peru New Sol	PEN	9:00am	1:30pm
China Renminbi	CNY	9.30am	3.00am	Philippine Peso	PHP	9:00am	4:00pm
Colombian Peso	COP	8:00am	1:00pm	Qatar Rial	QAR	8:00am	1:30pm
Egyptian Pound	EGP	8:30am	2:30pm	Saudi Arabian Riyal	SAR	9:00am	5:00pm
Indian Rupee	INR	9.00am	3:30pm	South Korean Won	KRW	9:00am	3:30pm
Indonesian Rupiah	IDR	9:00am	3:00pm	Taiwan Dollar	TWD	9:00am	4:00pm
Israeli Shekel	ILS	8:00am	11:00pm	UAE Dirham	AED	9:00am	3:00pm
Kenyan Shilling	KES	8:00am	6:00pm	Uruguay Peso	UYU	9:00am	3:00pm
Kuwaiti Dinar	KWD	8:00am	2:00pm				

Section 4: Benchmark Oversight & Governance

Committee structure

BISL uses three primary committees to provide overall governance and oversight of its benchmark administration activities:

- The Product, Risk & Operations Committee ("**PROC**") is responsible for the first line of control over the creation, design, production and dissemination of benchmark indices, strategy indices and fixings administered by BISL.

- The oversight function is provided by Bloomberg's Benchmark Oversight Committee ("**BOC**"). The BOC is independent of the PROC and is responsible for the review and challenge of the BISL Board of Directors and the PROC regarding relevant aspects of the provision of Benchmarks by BISL, as set out in the UK BMR.

- The Risk Committee ("**RiskCo**") advises the Board, the PROC and the BOC on the Company's overall risk appetite, tolerance and strategy and oversees the Company's risk exposure and risk strategy

Material Changes

Material changes will be reflected and tracked in updated versions of this methodology.

Material changes related to the benchmarks will be made available in advance to affected stakeholders whose input will be solicited. The stakeholder engagement will set forth the rationale for any proposed changes as well as the timeframe and process for responses.

The Administrator will endeavour to provide at least two weeks for review prior to any material change going into effect. In the event of exigent market circumstances, this period may be shorter. Subject to requests for confidentiality, stakeholder feedback and the Administrator's responses will be made accessible upon request.

In determining whether a change to a fixing is material, the following factors shall be considered:

- The economic and financial impact of the change.

- Whether the change affects the original purpose of the fixing; and/or

- Whether the change is consistent with the overall objective of the fixing and the underlying market interest it seeks to measure

Terminations

In addition to material changes, BISL may from time to time terminate one or more benchmarks ("Discontinued Benchmarks"), whether due to changes in market structure, a lack of requisite data, insufficient usage, or for other regulatory or practical concerns. The process for terminating such Discontinued Benchmarks is as follows:

The PROC will review proposed terminations, considering the reasons for termination, the impact on users (if any), the availability of alternative products and other such factors. If termination is approved, users will be provided as much prior notice as is reasonable under the circumstances, typically 90 days.

In the event there is little or no known usage identified, the Discontinued benchmarks may be terminated with less (or no) notice, as applicable. In the event the Discontinued benchmarks are licensed for use as the basis of an ETF or other widely- available financial product or is otherwise determined by BISL to be an important benchmark without reasonable substitutes, the notice period may be extended, as warranted.

Any advance notice period is subject to BISL being reasonably able to continue administering and calculating such benchmark during such period (for example, BISL has access to requisite data on commercially reasonable terms, is not subject to any litigation or other claims, has adequate internal resources and capabilities, etc.). Terminations and associated user engagement decisions made by the PROC are subject to review by BISL's oversight function, the BOC.

Disruption to service / restatements

Periods of inability to provide a fixing are generally dictated by anticipated periods where there is no active market, such as holidays or off-trading hours for less frequently traded currencies.

Bloomberg has robust controls and procedures in place to minimize unanticipated fixing failures and their impact. In the event of such an unanticipated failure, BFIX would determine whether the event occurred during an active market. If so, BFIX will endeavor to publish the fixing or revised fixing as soon as practicable.

If no qualified BGN or BGNE price can be produced within a fixing window, the previous fix will be carried forward.

Bloomberg makes every effort to provide accurate calculation of BFIX Fixings. However, to the extent a material error in a fixing is uncovered following its publication and dissemination, a notification will be sent to BFIX clients alerting them of such error and the expected date of a revised publication, if warranted.

Bloomberg considers the following factors to determine whether to restate. Not all conditions need to be present to warrant a restatement, and certain factors may be more determinative that others depending on the circumstances of the given error:

   A.   The relative importance of the data field impacted by the error

   B.   When the error occurred and when it was discovered

   C.   The number of fixings affected

   D.   Whether the impacted fixings are linked to tradable products

   E.   The magnitude of the error

   F.   The burden of restatement on client re-processing relative to the impact of the error

   G.   The impact of the restatement on analytical tools

Bloomberg reserves the right not to amend or republish any BFIX rate after the publication of the rate.

Data Providers & Data Extrapolation

The benchmarks are produced without the interpolation or extrapolation of input data. As discussed previously, the benchmarks use carry-forwards rather than interpolation or extrapolation, but the Administrator will update this methodology and its internal procedures should either become necessary.

In addition, the Administrator seeks to avoid contributions of input data that may be subject to the discretion of the source of such data and instead seeks to use input data that is readily available and/or distributed for a number of non-index or benchmark creation purposes.

Accordingly, the benchmarks require no 'contributors' to produce and no codes of conduct with any such sources are required

Expert Judgement

The benchmarks are rules-based, and their construction is designed to consistently produce values without the exercise of expert judgment or discretion. Nevertheless, BISL may use expert judgment or discretion with regards to the following:

   • Fixing restatements

   • Extraordinary circumstances during a market emergency

   • Data interruptions, issues, and closures

When expert judgment or discretion is required, BISL aims to be consistent in its application, with recourse to written procedures outlined in the methodology of the benchmarks and internal procedures manuals. BISL maintains and enforces policies and procedures to prevent conflicts of interest from inappropriately influencing index construction, production, and distribution, including the use of expert judgment or discretion.

Section 5: Risk associated with BFIX

The following is a summary of certain risks associated with BFIX but is not meant to be an exhaustive list of all risks associated with using BFIX, an investment in currencies or metals, or investments measured against BFIX. Though the fixings are designed to be representative of the markets they measure, they may not be representative of every use case. There is also inherent, though transparent, judgment in their construction, as outlined in this methodology. They are also designed for general applicability and not to address the individual needs of users. Bloomberg does not advise as to the usefulness of BFIX to a particular circumstance, and users are therefore encouraged to seek their own counsel for such matters.

This methodology is subject to change, which may impact its usefulness to users. Though efforts will be made to alert users of this change, not every individual user may be aware of them. Such changes may also significantly impact the usefulness of BFIX.

Bloomberg may also determine to cease publication of BFIX or a particular fixing provided by BFIX. Bloomberg maintains internal policies regarding user transitions, but there is no guarantee an adequate alternative is available generally or for a particular use case.

Markets for currencies and metals, as with all markets, can be volatile. As BFIX is designed to measure those markets, its fixings could be materially impacted by market movements, thus significantly impacting the use or usefulness of the fixings for some or all users. Also, certain currency and metals markets are less liquid than others, and even the most liquid markets may suffer periods of illiquidity. Illiquidity can have an impact on the quality or amount of data available to BFIX for calculation and may cause BFIX to produce unpredictable results.

BFIX is based on executable and indicative bid and ask rates which are supplied by source institutions in their discretion. While they reflect where those institutions would be willing to transact, they may not be reflective of where they transacted.

Also, while BFIX will not accept pricing from BGN that is derived from a single source, (unless predefined as a peg currency), the number of source rates with respect to a particular fixing may be relatively few at any given snapshot. However, in no event will BGN produce a price, or BFIX produce a fixing, that can be reverse engineered.

Section 6: Limitations of BFIX

Though the benchmarks are designed to be representative of the markets they measure or otherwise align with their stated objective, they may not be representative in every case or achieve their stated objective in all instances. They are designed and calculated strictly to follow the rules of this methodology, and any fixing Level or other output is limited in its usefulness to such design and calculation.

Markets for currencies, as with all markets, can be volatile, including those market interests which the benchmarks intend to measure or upon which the benchmarks are dependent in order to achieve their stated objective. For example, certain currency markets are less liquid than others, and even the most liquid markets may suffer periods of illiquidity. Illiquidity can have an impact on the quality or amount of data available to BFIX for calculation and may cause BFIX benchmarks to produce unpredictable results.

In addition, market trends and changes to market structure may render the objective of the benchmarks unachievable or to become impractical to replicate by investors. As BFIX benchmarks are designed to measure those markets, its benchmarks could be materially impacted by market movements, thus significantly impacting the use or usefulness of the fixings for some or all users.

Exhibit A: List of BFIX Currencies

BFIX EUROPE								
SECURITY NAME	Code	Pricing	SECURITY NAME	Code	Pricing	SECURITY NAME	Code	Pricing
Albanian Lek Spot	ALL	BGN	Falkland Is Pound Spot	FKP	PEG	Polish Zloty Spot	PLN	BGNE
Bosnia-Herze Convrt Mrka	BAM	PEG	Georgia Lari Spot	GEL	BGN	Romanian Leu Spot	RON	BGNE
British Pound Spot	GBP	BGNE	Gibraltar Pound Spot	GIP	PEG	Russian Ruble SPOT (TOM)	RUB	BGN
Bulgarian Lev Spot	BGN	BGN	Hungarian Forint Spot	HUF	BGNE	Serbian Dinar Spot	RSD	BGN
Czech Koruna Spot	CZK	BGNE	Iceland Krona Spot	ISK	BGN	St. Helena Pound Spot	SHP	PEG
Danish Krone Spot	DKK	BGNE	Macedonia Denar Spot	MKD	BGN	Swedish Krona Spot	SEK	BGNE
Euro Spot	EUR	BGNE	Moldova Leu Spot	MDL	BGN	Swiss Franc Spot	CHF	BGNE
Euro. Curr. Unit Spot	XEU	PEG	Norwegian Krone Spot	NOK	BGNE	Ukraine Hryvnia Spot	UAH	BGN

BFIX AMERICAS								
SECURITY NAME	Code	Pricing	SECURITY NAME	Code	Pricing	SECURITY NAME	Code	Pricing
Argentine Peso Spot	ARS	BGN	Colombian Peso Spot	COP	BGN	Mexican Peso Spot	MXN	BGNE
Aruban Guilder Spot	AWG	PEG	Costa Rican Colon Spot	CRC	BGN	Neth. Ant. Guilder Spot	ANG	PEG
Bahamas Dollar Spot	BSD	PEG	Cuban Peso Spot	CUP	PEG	Nicaragua Cordoba Spot	NIO	BGN
Barbados Dollar Spot	BBD	PEG	Dominican Rep. Spot	DOP	BGN	Panamanian Balboa Spot	PAB	PEG
Belize Dollar Spot	BZD	PEG	East Caribbean Dollar	XCD	PEG	Paraguay Guarani Spot	PYG	BGN
Bermudian Dollar Spot	BMD	PEG	Ecuadorean Sucre Spot	ECS	PEG	Peruvian Sol Spot	PEN	BGN
Brazilian Real Spot	BRL	BGN	El Salvador Colon Spot	SVC	PEG	Suriname Dollar Spot	SRD	BGN
Canadian Dollar Spot	CAD	BGNE	Guatemala Quetzal Spot	GTQ	BGN	Trinidad/Tobago Dol Spot	TTD	BGN
Cayman Islands Dollar	KYD	PEG	Haiti Gourde Spot	HTG	BGN	Uruguay Peso Spot	UYU	BGN
Chilean Peso Spot	CLP	BGN	Honduras Lempira Spot	HNL	BGN			

BFIX AFRICA & GULF								
SECURITY NAME	**Code**	**Pricing**	**SECURITY NAME**	**Code**	**Pricing**	**SECURITY NAME**	**Code**	**Pricing**
Algerian Dinar Spot	DZD	BGN	Israeli Shekel Spot	ILS	BGNE	Qatari Riyal Spot	QAR	BGN
Angolan Kwanza Spot	AOA	BGN	Jordanian Dinar Spot	JOD	BGN	Rwanda Franc Spot	RWF	BGN
Bahraini Dinar Spot	BHD	BGN	Kenyan Shilling Spot	KES	BGN	S. African Rand Spot	ZAR	BGNE
Botswana Pula Spot	BWP	BGN	Kuwaiti Dinar Spot	KWD	BGN	Saudi Riyal Spot	SAR	BGN
Brunei Dollar Spot	BND	PEG	Lesotho Loti Spot	LSL	PEG	Sierra Leone Leone Spot	SLE	BGN
CFA Franc Bceao	XOF	PEG	Malagascy Ariary Spot	MGA	BGN	Tanzanian Shilling Spot	TZS	BGN
CFA Franc Beac	XAF	PEG	Mauritania Ouguiya Spot	MRU	BGN	Tunisian Dinar Spot	TND	BGN
Egyptian Pound Spot	EGP	BGN	Mauritius Rupee Spot	MUR	BGN	Turkish Lira Spot	TRY	BGNE
Eswatini Lilangeni Spot	SZL	PEG	Moroccan Dirham Spot	MAD	BGN	UAE Dirham Spot	AED	BGN
Ethiopian Birr Spot	ETB	BGN	Namibia Dollar Spot	NAD	PEG	Ugandan Shilling Spot	UGX	BGN
Ghana Cedi Spot	GHS	BGN	New Mozambique Metical	MZN	BGN	Zambian Kwacha Spot	ZMW	BGN
Guinea Franc Spot	GNF	BGN	Nigeria Naira Spot	NGN	BGN			
Guinea-Bissau Peso Spot	GWP	PEG	Omani Rial Spot	OMR	BGN			

BFIX ASIA PACIFIC								
SECURITY NAME	**Code**	**Pricing**	**SECURITY NAME**	**Code**	**Pricing**	**SECURITY NAME**	**Code**	**Pricing**
Australian Dollar Spot	AUD	BGNE	Kyrgyzstan Som Spot	KGS	BGN	Seychelles Rupee Spot	SCR	BGN
Azerbaijan Manat New Spt	AZN	BGN	Macau Pataca Spot	MOP	PEG	Singapore Dollar Spot	SGD	BGNE
Bhutan Ngultrum Spot	BTN	PEG	Malaysian Ringgit Spot	MYR	BGN	Solomon Is. Dollar Spot	SBD	BGN
China Renminbi Spot	CNY	BGN	Mongolian Togrog Spot	MNT	BGN	South Korean Won Spot	KRW	BGN
Comoros Franc Spot	KMF	PEG	Nepalese Rupee Spot	NPR	PEG	Sri Lankan Rupee Spot	LKR	BGN
Fiji Dollar Spot	FJD	BGN	New Zealand Dollar Spot	NZD	BGNE	Taiwan Dollar Spot	TWD	BGN
Hong Kong Dollar Spot	HKD	BGNE	Offshore Deliverable CNY	CNH	BGNE	Thai Baht Spot	THB	BGNE
Indian Rupee Spot	INR	BGNE	Pacific Island Franc	XPF	PEG	Tonga Pa'Anga Spot	TOP	BGN
Indonesian Rupiah Spot	IDR	BGN	Pakistani Rupee Spot	PKR	BGN	Vanuatu Vatu Spot	VUV	BGN
Japanese Yen Spot	JPY	BGNE	Papua N.G. Kina Spot	PGK	BGN	Vietnamese Dong Spot	VND	BGN
Kazakhstan Tenge Spot	KZT	BGN	Philippines Peso Spot	PHP	BGN			

BFIX LEGACY EURO								
SECURITY NAME	Code	Pricing	SECURITY NAME	Code	Pricing	SECURITY NAME	Code	Pricing
Andorran Peseta Spot	ADP	PEG	Finnish Markka Spot	FIM	PEG	Lithuanian Litas Spot	LTL	PEG
Austrian Schilling Spot	ATS	PEG	French Franc Spot	FRF	PEG	Luxembourg Franc Spot	LUF	PEG
Belgian Franc Spot	BEF	PEG	German Mark Spot	DEM	PEG	Maltese Lira Spot	MTL	PEG
Croatian Kuna Spot	HRK	PEG	Greek Drachma Spot	GRD	PEG	Portuguese Escudo Spot	PTE	PEG
Cypriot Pound Spot	CYP	PEG	Irish Punt Spot	IEP	PEG	Slovakia Koruna Spot	SKK	PEG
Dutch Guilder Spot	NLG	PEG	Italian Lira Spot	ITL	PEG	Slovenia Tolar Spot	SIT	PEG
Estonian Kroon Spot	EEK	PEG	Latvian Lats Spot	LVL	PEG	Spanish Peseta Spot	ESP	PEG

BFIX METALS		
SECURITY NAME	Code	Pricing
Gold Spot $/Oz	XAU	BGN
Palladium Spot $/Oz	XPD	BGN
Platinum Spot $/Oz	XPT	BGN
Silver Spot $/Oz	XAG	BGN

Exhibit B: Glossary

Active market
An active market is one in which Bloomberg has received at least one bid and ask price in the fixing window.

Ask
The rate at which a market maker is willing to sell the base currency or metal. Also known as an offer.

Bid
The price at which the market maker is willing to buy the base currency or metal.

Bloomberg Generic Price (BGN)
A representative price based on executable and indicative rates sourced from participants in the applicable market.

Bloomberg Executable Rates (BGNE)
A representative price based on executable data feeds from Bloomberg's FXGO trading platform.

Exchange controls
Various legal or regulatory controls restricting the purchase or sale of currencies, such as the banning of the use or possession of foreign currencies within the subject country, restrictions on currency exchange to government-approved exchangers, fixed exchange rates and restrictions on the amount of a currency that may be imported or exported.

Executable
As opposed to an indicative quote, an executable quote could be dealt on.

Forward
The foreign exchange rate on a date in the future.

FX
Foreign Exchange

G10 currencies
AUD, CAD, CHF, DKK, EUR, GBP, JPY, NOK, NZD and SEK.

Indicative
A market maker's provided quote indicating where it would be willing to transact but is not obliged to transact at the price. Also known as 'not firm'.

Local market trading hours
The timeframe or hours a market is defined as open.

Market maker
A firm or trader that is making a bid and an ask price to the market to trade on and take on the risk associated with the trade.

Market taker
Anyone who is trading on prices and will hit the bid or offer in the market but not provide bid/ask prices.

NDF
Means 'non-deliverable forwards', which are contracts that involve no exchange of principal, are fixed at a pre-determined price, and are typically settled in USD (or sometimes, in the case of Eastern Europe, in EUR) at the prevailing spot exchange rate taken from an agreed source, at an agreed time, on an agreed future date.

Outrights
A forward that locks in the price at which a currency can be bought or sold on a future date. Also known as 'Forward Outright'. Also appears as 'FX Outrights'.

Peak weight
The weight at the top of a time weighted average price defined in BFIX calculation as 10%.

Spot rate
The foreign exchange rate on the settlement date.

Swap points
The annualized percentage premium or discount that the forward outright (all-in rate) represents over the current spot rate.

Tick
The minimum upward or downward movement in the currency is called a tick. For example, a movement in EUR*USD from 1.1028 to 1.1029 is defined as the price has moved up by 1 tick. In USD*JPY if the price moves from 110.25 to 110.20 the price has moved down by 5 ticks.

Tickers
Each BGN price that can be populated resides in a unique 'ticker' on the Bloomberg Professional service that can be called. 'EG GBP Curncy <GO>' is a ticker and BGN is a source to use on such ticker.

TWAP
Time-Weighted Average Price. A method of calculating an average price over a specified period of time.

Exhibit C: Schedule of Days BFIX will not operate

BFIX will not price on three specific business days of the year due to lack of liquidity. Good Friday, and the observed market days for Christmas Day and New Years Day as per the open days of the Fedwire services from the Federal reserve.

Where December 25 and January 1 fall on a Saturday, the National observed holiday will be on the Friday but there is no close of the Fedwire and markets will be open on Friday.

If those holidays fall on a Sunday, then the holiday is observed on the Monday and in addition Fedwire is closed. Please note 2021 was an example of Christmas day falling on a Saturday, but BFIX was open on the Friday before, Dec 24, 2021.
2027 is the next year this occurs.
The below is a table of days where BFIX will not be published.

Date	Day	Holiday
2021		
January 1	Friday	New Years Day
April 2	Friday	Good Friday
2022		
April 15	Friday	Good Friday
December 26	Monday	Christmas Day
2023		
January 2	Monday	New Years Day
April 7	Friday	Good Friday
December 25	Monday	Christmas Day
2024		
January 1	Monday	New Years Day
March 29	Friday	Good Friday
December 25	Wednesday	Christmas Day
2025		
January 1	Wednesday	New Years Day
April 18	Friday	Good Friday
December 25	Thursday	Christmas Day
2026		
January 1	Thursday	New Years Day
April 3	Friday	Good Friday
December 25	Friday	Christmas Day
2027		
January 1	Friday	New Years Day
March 26	Friday	Good Friday
2028		
April 14	Friday	Good Friday
December 25	Monday	Christmas Day
2029		
January 1	Monday	New Years Day
March 30	Friday	Good Friday
December 25	Tuesday	Christmas Day

Exhibit D: Currencies available on the public website (25min delay)

The below list of currencies is a subset of BFIX rates and fixing times are available for reference purposes only, on the BFIX public website which can be found [here](#)

Website BFIX Currencies against EUR					
SECURITY NAME	Code	SECURITY NAME	Code	SECURITY NAME	Code
Australian Dollar Spot	AUD	Hungarian Forint Spot	HUF	Romanian Leu Spot	RON
Brazilian Real Spot	BRL	Indian Rupee Spot	INR	Russian Ruble SPOT (TOM)	RUB
British Pound Spot	GBP	Indonesian Rupiah Spot	IDR	S. African Rand Spot	ZAR
Bulgarian Lev Spot	BGN	Japanese Yen Spot	JPY	Singapore Dollar Spot	SGD
Canadian Dollar Spot	CAD	Malaysian Ringgit Spot	MYR	South Korean Won Spot	KRW
Croatian Kuna Spot	HRK	Mexican Peso Spot	MXN	Swedish Krona Spot	SEK
Czech Koruna Spot	CZK	New Zealand Dollar Spot	NZD	Swiss Franc Spot	CHF
Danish Krone Spot	DKK	Norwegian Krone Spot	NOK	Thai Baht Spot	THB
Hong Kong Dollar Spot	HKD	Philippines Peso Spot	PHP	Turkish Lira Spot	TRY

Website BFIX Currencies against CAD					
SECURITY NAME	Code	SECURITY NAME	Code	SECURITY NAME	Code
Australian Dollar Spot	AUD	Malaysian Ringgit Spot	MYR	Singapore Dollar Spot	SGD
Brazilian Real Spot	BRL	Mexican Peso Spot	MXN	South Korean Won Spot	KRW
British Pound Spot	GBP	New Zealand Dollar Spot	NZD	Swedish Krona Spot	SEK
China Renminbi Spot	CNY	Norwegian Krone Spot	NOK	Swiss Franc Spot	CHF
Hong Kong Dollar Spot	HKD	Peruvian Sol Spot	PEN	Taiwan Dollar Spot	TWD
Indian Rupee Spot	INR	Russian Ruble SPOT (TOM)	RUB	Thai Baht Spot	THB
Indonesian Rupiah Spot	IDR	S. African Rand Spot	ZAR	Turkish Lira Spot	TRY
Japanese Yen Spot	JPY	Saudi Riyal Spot	SAR		

Website BFIX Currencies against USD					
SECURITY NAME	Code	SECURITY NAME	Code	SECURITY NAME	Code
Australian Dollar Spot	AUD	Hong Kong Dollar Spot	HKD	Polish Zloty Spot	PLN
British Pound Spot	GBP	Hungarian Forint Spot	HUF	S. African Rand Spot	ZAR
Canadian Dollar Spot	CAD	Israeli Shekel Spot	ILS	Singapore Dollar Spot	SGD
Czech Koruna Spot	CZK	Japanese Yen Spot	JPY	Swedish Krona Spot	SEK
Danish Krone Spot	DKK	Mexican Peso Spot	MXN	Swiss Franc Spot	CHF
Euro Spot	EUR	New Zealand Dollar Spot	NZD	Thai Baht Spot	THB
Gold Spot $/Oz	XAU	Offshore Deliverable CNY	CNH	Turkish Lira Spot	TRY

Website times (Local city times)					
City	**Time**	**City**	**Time**	**City**	**Time**
Beijing	09:30	Seoul	14:00	London	16:00
Singapore / Kuala Lumpur	11:00	Tokyo	15:00	Ottawa	12:00
Manila	11:30	Mumbai	12:00	New York	12:30
Jakarta / Bangkok	11:00	Frankfurt	14:00	New York	17:00

Exhibit F: Environmental, Social and Governance Disclosure

Explanation of how ESG factors are reflected in the key elements of the benchmark methodology	
1. Name of the benchmark administrator.	*Bloomberg Index Services Limited ("BISL")*
2. Type of benchmark	*Other Benchmark*
3. Name of the benchmark or family of benchmarks.	*Bloomberg Fixings ("BFIX")*
4. Does the benchmark methodology for the benchmark or family of benchmarks take into account ESG factors?	No
5. If the response to (4) is positive, please list below those ESG factors that are taken into account in the benchmark methodology. Please explain how those ESG factors are used for the selection, weighting or exclusion of underlying assets.	
a) List of environmental factors considered: *N/A*	Selection, weighting or exclusion: *N/A*
b) List of social factors considered: N/A	Selection, weighting or exclusion: *N/A*
c) List of governance factors considered: *N/A*	Selection, weighting or exclusion: *N/A*
6. Data and standards used.	
a) Data input. (i) Describe whether the data are reported, modelled or, sourced internally or externally. (ii) Where the data are reported, modelled or sourced externally, please name the third party data provider.	*N/A*
b) Verification of data and guaranteeing the quality of those data. Describe how data are verified and how the quality of those data is ensured.	*N/A*
c) Reference standards Describe the international standards used in the benchmark methodology.	*N/A*
Information updated on:	22 April 2020

Take the next step.

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