### IPV, RISK, AND SURVEILLANCE SOLUTION

CONFIDENTIAL

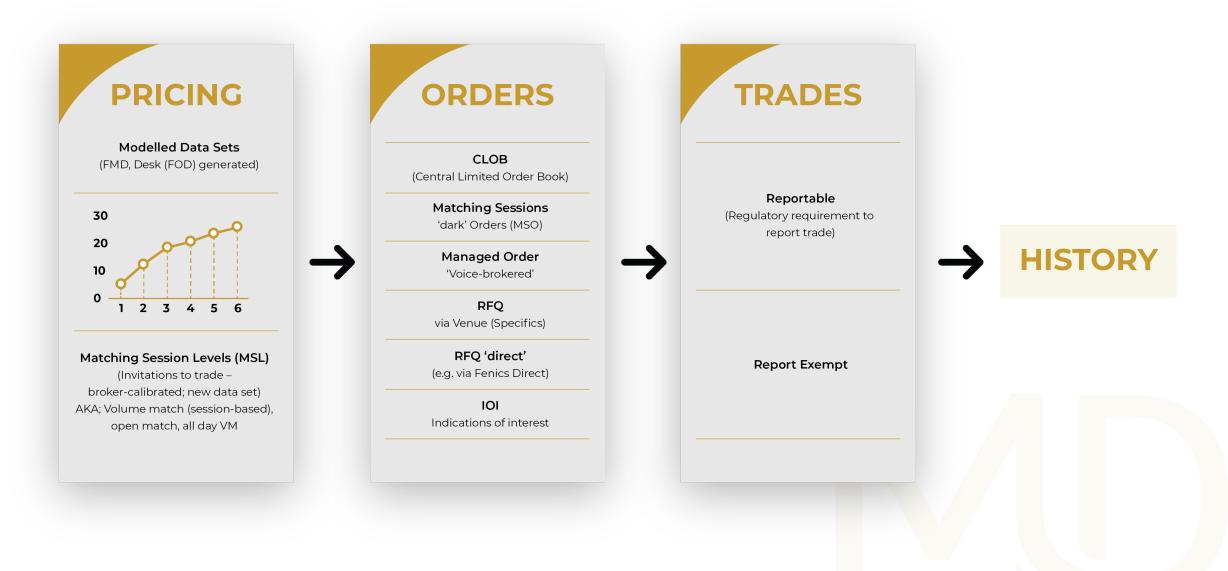


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BGC Partners provides a full range of trade execution and broker-dealer services. Fenics Market Data, the market data division of BGC Partners, harvests billions of data points on a daily basis.



Fenics Market Data curates this harvested data and creates comprehensive data packages in multiple formats.
 'Level 2' data; Full-time series of order and trade data, by instrument or strategy, aggregated across venues.
 Full indicative price and parameter surfaces are available in real-time, hourly, and end-of-day.
 Comprehensive historical datasets, going back to 2000 for some asset classes.



### FMD COVERAGE – NON-EXCHANGE, 'HARD TO VALUE' INSTRUMENTS

	- w. (		Asset Class Summary of Fenics N	ID datasets		0	Orders				Trades		
Brokerages	Asset Class	Product	Product details	Instrument details	Indicative Surfaces	CLOB	VM	Voice	Electronic	Hybrid	Voic		
		Sovereign Bonds	G10 and Emerging Markets	Circa 120 separate sovereign entities to include, EM and non-EM in EMMEA, APAC and LatAm		Yes	Yes		Yes	Yes			
BGC	Fixed Income	Corporate Bonds	G10 and Emerging Markets	Circa 90 countries covered in IG, HY and non-rated bonds; Structured notes and mortgage backed issuance		Yes	Yes		Yes	Yes			
GFI		Inflation Bonds	Inflation Linked Bonds	Coverage of the key inflation linked bond markets including US TIPS, GBP Linkers and EUR (Germany, France, Italy)		Yes	Yes		Yes	Yes			
		Repos	GC, Specials and Term	Mainly Sovereigns, some corporates		AMER only			Yes	Yes	Yes		
BGC		Credit Indices	Main indices	On and off the run		Yes	Yes		Yes	Yes			
GFI	<b>Credit Derivatives</b>	Credit Index Options	G10, EM and single name	Full sovereign and corporate coverage		Yes	Yes		Yes	Yes			
Sunrise		Credit Default Swaps	G10, EM and single name	Full sovereign and corporate coverage	Yes	Yes	Yes		Yes	Yes			
BGC GFI		IRS	Swaps, tenor basis swaps, xccy basis swaps, FRAs	'New' RFRs, OIS and LIBOR	Yes	EUR IRS Streamers		EUR only	Yes	Yes	Yes		
Aurel RP Martin	Interest Rates	Inflation	ZC swaps	US CPI, GBP RPI, HICPxT	Yes	Yes	Yes		Yes	Yes			
Remate Liquidez	Inflation  ZC swaps  US CPI, GBP RPI, HICPxT  Yes    Ite  IRO  Swaptions, Cap/Floors, Exotics  Major traded ccys  Yes - available for 32 ccys  EN	EMEA only	EMEA only		Yes	Yes							
112/2020/09		Spot/Forwards	Forwards, swaps, NDFs	All traded ccy pairs	for 32 ccys EMEA only only Yes	Yes	Yes						
BGC GFI	FX	Options		All traded ccy pairs	Yes - available for approx 400 ccy pairs	Yes	8. B		Yes	Yes	Yes		
BGC		Power and Gas	Forwards, Swaps, Options	US Power, US NatGas, EMEA Coal, EMEA Nat Gas, EMEA Power, LNG, LPG	Yes	Yes			Yes				
Amerex Ginga	Commodities	Oil	Forwards, Swaps	Crude Oil, Fuel Oil, Asian Distilates, Asian Fuel Oil, Asian Gasoline, Asian PetChems	Yes								
Poten		Freight	Forwards, Swaps	Wet and Dry		Yes	8		Yes				
Sunrise		Metals	Forwards, Swaps, Options	Base and Precious	Yes								
Sunrise BGC GFI	Equities	Equity Derivatives	Options, Dividend Swaps, Variance Swaps, Exotics	Non-exchange traded products on indices and single names	Vol surfaces for KOSPI, HSCEI, HSI, NK225, ASX 200			EMEA only					

### IPV

Hard-to-source information for complex instruments satisfying accounting standards, FASB ASC Topic 820/ FAS 157 – US GAAP and IFRS 13 / IAS 39 – International GAAP, and the allocation of assets and liabilities to the correct level within the Fair Value Hierarchy.

Executable bid-offer levels are essential to satisfy Prudent Valuation regulation (recently promoted by the FCA and ECB and being rolled out globally), which requires Additional Valuation Adjustments to be deducted from Common Equity Tier 1 capital. Real, executable market activity, giving critical corroboration of other pricing sources (modelled, indicative and consensus data) in which auditors and regulators are placing less credence.

### **RISK**

Real price observations, increasing breadth and depth of coverage, leading to a reduction in setaside capital under The Fundamental Review of the Trading Book (FRTB), which is part of part of Basel III capital requirements.



Fenics harvests information from BGC's multiple, industry-leading brokerages and creates a best-in-class solution that will be invaluable in identifying many surveillance obligations, such as spoofing or layering, in the more challenging to monitor / illiquid asset classes.



instrument or strategy, aggregated across venues.

Data is transformed into full-time series of order and trade data, by

### **IPV, RISK, AND SURVEILLANCE**

History is available from 3 Jan 2018.

### **DATA FIELDS INCLUDE**

Date, Time, Instrument Name, Underlying CCY Pair, Strategy, Tenor, Expiry Date, FX Delta, Option Type, Status, Side, Price, Price Type, Quantity, Transaction ID, Type (Order / Trade), Instrument Description, Trade Type, Leg Ref, Deal Ref.

Date	Time	Name	Underlying	Strategy	Tenor	ExpiryDate	FX Delta	Option Type	Status	Side	Price	Price Type	Quantity	Transaction ID	Type (Trade/Order)	Instrument Full Name	Туре	legref	dealRef
25/02/2020	25/02/2020 07:48	EURGBP_1_1_0_8_2	EURGBP	Straddle	1W		50		New	buy	6	volatility	20,000,000	50414801	Order	EURGBP ATM 1W			
25/02/2020	25/02/2020 07:48	EURGBP_1_1_0_8_2	EURGBP	Straddle	1W		50		New	sell	7.5	volatility	20,000,000	50414804	Order	EURGBP ATM 1W			
25/02/2020	25/02/2020 09:55	EURGBP_1_1_0_8_2	EURGBP	Straddle	1W		50		Cancelled	buy	6	volatility	20,000,000	50414801	Order	EURGBP ATM 1W			
25/02/2020	25/02/2020 09:55	EURGBP_1_1_0_8_2	EURGBP	Straddle	1W		50		Cancelled	sell	7.5	volatility	20,000,000	50414804	Order	EURGBP ATM 1W			
25/02/2020	25/02/2020 15:10	EURGBP_1_1_0_8_2	EURGBP	Straddle	1W		50		New	buy	6.25	volatility	20,000,000	50417624	Order	EURGBP ATM 1W			
25/02/2020	25/02/2020 15:10	EURGBP_1_1_0_8_2	EURGBP	Straddle	1W		50		New	sell	6.75	volatility	20,000,000	50417626	Order	EURGBP ATM 1W			
25/02/2020	25/02/2020 15:13	EURGBP_1_1_0_8_2	EURGBP	Straddle	1W		50		New	buy	6.4	volatility	20,000,000	50417645	Order	EURGBP ATM 1W			
25/02/2020	25/02/2020 15:17	EURGBP_1_1_0_8_2	EURGBP	Straddle	1W		50		New	buy	6.5	volatility	20,000,000	50417669	Order	EURGBP ATM 1W			
25/02/2020	25/02/2020 15:17	EURGBP_1_1_0_8_2	EURGBP	Straddle	1W		50		Cancelled	buy	6.4	volatility	20,000,000	50417645	Order	EURGBP ATM 1W			
25/02/2020	25/02/2020 15:18	EURGBP_1_1_0_8_2	EURGBP	Straddle	1W		50		Filled	sell	6.75	volatility	20,000,000	50417626	Order	EURGBP ATM 1W			
25/02/2020	25/02/2020 15:18	EURGBP_1_1_0_8_2	EURGBP	Straddle	1W	03/03/2020	50	Put	New	Sell	6.75	volatility	10,000,000	50417626	Trade		Managed	7233557-S	7587333
25/02/2020	25/02/2020 15:18	EURGBP_1_1_0_8_2	EURGBP	Straddle	1W	03/03/2020	50	Call	New	Sell	6.75	volatility	10,000,000	50417626	Trade		Managed	7233556-S	7587333
25/02/2020	25/02/2020 15:18	EURGBP_1_1_0_8_2	EURGBP	Straddle	1W		50		Filled	buy	6.75	volatility	20,000,000	50417677	Order	EURGBP ATM 1W			
25/02/2020	25/02/2020 15:18	EURGBP_1_1_0_8_2	EURGBP	Straddle	1W	03/03/2020	50	Put	New	Buy	6.75	volatility	10,000,000	50417677	Trade		Electronic	7233557-B	7587333
25/02/2020	25/02/2020 15:18	EURGBP_1_1_0_8_2	EURGBP	Straddle	1W	03/03/2020	50	Call	New	Buy	6.75	volatility	10,000,000	50417677	Trade		Electronic	7233556-B	7587333
25/02/2020	25/02/2020 17:00	EURGBP_1_1_0_8_2	EURGBP	Straddle	1W		50		Cancelled	buy	6.25	volatility	20,000,000	50417624	Order	EURGBP ATM 1W			
25/02/2020	25/02/2020 17:00	EURGBP_1_1_0_8_2	EURGBP	Straddle	1W		50		Cancelled	buy	6.5	volatility	20,000,000	50417669	Order	EURGBP ATM 1W			

### **FMD INSIGHTS**

Targeted intelligence – pre-aggregated, instrument-level intelligence designed to convey complex market movements / dynamics in an intuitive and easy-to-consume format. Available for multiple snap times during the day.

Delivery via CSV file or FTP.

#### **INSTRUMENT IDENTIFICATION** LIQUIDITY Order Volumes Trade Volumes Liquidity Scores Option Order Number Number Number Trade Average Number of Evaluation Currency Term FX Delta of Active Exercise of Daily of Daily of Daily Liquidity Liquidity Strategy Description Daily Trades Trade Size Pair (Months) Order Size Date Counterparties Style Bids Offers Orders 31/03/2021 USDJPY 6 ATMF Straddle European 50 10 10 20 34,763,124 1 2 20,333,333 1 1 **Risk Reversal** 10 31/03/2021 USDJPY 6 RR European 4 5 31/03/2021 USDJPY 6 RR 25 3 3 6 26,457,143 **Risk Reversal** 50,781,250 1 5 European 31/03/2021 USDJPY 6 10 25,217,391 3 SM Strangle Margin 4 European 31/03/2021 6 SM 25 3 3 USDJPY Strangle Margin European 30,000,000 50,000,000

#### LIQUIDITY INSIGHT

### **FMD INSIGHTS**

Targeted intelligence – pre-aggregated, instrument-level intelligence designed to convey complex market movements / dynamics in an intuitive and easy-to-consume format. Available for multiple snap times during the day.

Delivery via CSV file or FTP.

		INSTRU	MENT IDE	NTIFICATION						PRIC	ING			
							Executable Bid-Offers				Tra	ded Levels	Corroboration	
Evaluation Date	Currency Pair	Term (Months)	Strategy	Description	Option Exercise Style	FX Delta	Last Bid	Timestamp of Last Bid	Last Offer	Timestamp of Last Offer	Last Traded Price	Timestamp of Last Trade	FMD Closing Price within Bid-Offer	FMD Closing Price vs Last Trade
31/03/2021	USDJPY	6	ATMF	Straddle	European	50	6.475	31/03/2021 14:07	6.75	31/03/2021 14:07	6.625	30/03/2021 15:16	1	-0.02
31/03/2021	USDJPY	6	RR	Risk Reversal	European	10	31/03/2021	10/02/2021 11:41	-2	10/02/2021 17:00				
31/03/2021	USDJPY	6	RR	Risk Reversal	European	25	31/03/2021	31/03/2021 12:08	-0.7	31/03/2021 09:43			1	
31/03/2021	USDJPY	6	SM	Strangle Margin	European	10	31/03/2021	22/03/2021 20:52	1.15	22/03/2021 20:52	0.95	28/01/2021 02:12		
31/03/2021	USDJPY	6	SM	Strangle Margin	European	25	31/03/2021	17/03/2021 09:31	0.275	17/03/2021 09:31	0.275	17/03/2021 09:31		

#### **PRICING INSIGHT**

#### SAMPLE FXO CONSOLIDATED ORDERBOOK FOR THE FRTB RFET THE POWER OF COMMITTED QUOTES

ccy_pair	term	tenor	delta	strategy	26/11/2020	27/11/2020	30/11/2020	01/12/2020	02/12/2020
USDJPY	6	6M	10	Risk Reversal	1	0	0	0	0
USDJPY	6	6M	10	Butterfly	0	0	1	1	1
USDJPY	6	6M	25	Risk Reversal	0	1	0	1	1
USDJPY	6	6M	25	Butterfly	0	0	1	0	0
USDJPY	6	6M	50	Straddle	1	1	1	1	1
USDJPY	12	1Y	10	Risk Reversal	0	0	0	0	0
USDJPY	12	1Y	10	Butterfly	0	1	1	1	1
USDJPY	12	1Y	25	<b>Risk Reversal</b>	0	1	1	1	1
USDJPY	12	1Y	25	Butterfly	0	0	1	0	0
USDJPY	12	1Y	50	Straddle	1	1	1	1	1
USDJPY	84	7Y	10	Risk Reversal	0	0	0	0	0
USDJPY	84	7Y	10	Butterfly	0	0	0	1	0
USDJPY	84	7Y	25	<b>Risk Reversal</b>	0	0	0	0	0
USDJPY	84	7Y	25	Butterfly	0	0	0	0	0
USDJPY	84	7Y	50	Straddle	0	1	1	0	1
						Orders			Trades

### IPV, RISK, AND SURVEILLANCE



#### **RECAP AND SURVEILLANCE**

### **FMD** – Trade and Order Recap

Detailed, bank-specific, daily trade and order recap service, by LEIs and venue.

#### **FMD** – Level 2 with Surveillance

Detailed, complete, multi-venue order book and trade consolidated tape of all tradeable instruments.

### **FMD** – Dominance Reports

An aggregated summary of all BGC Partners' order and trade volumes compared to activity for a client-specific LEI.

### **FMD** – Level 2 with Surveillance

Time series data in OTC / non-exchange asset classes are very rare.

FMD data is transformed into a full-time series of order and trade data, by instrument or strategy, aggregated across venues.

Files flag the client's activity for specific LEIs, in the context of the broader market (Level 2 data is totally anonymised).

#### Data Fields include:

Date, Time, Instrument Name, ISIN Leg 1, ISIN Leg 2, Status, Side, Price, Price Type, Quantity (bucketed as per rule tbc), Quantity Type, Currency, Transaction ID, Type (Order / Trade), Orderbook stack – Client participation flag – LEI transaction ID.

File Name	Date	Time	Name	ISIN	Client	Venue	Status	Side	Price	Price Type						Order
					Particip	Trans ID					Quantity	aining Qua	Std Size	Currency	Transaction ID	Trade
*	*	•	Τ.,	-	-	-		* *	*		-	۲	*	*	*	Туре 🔻
CORP_US	2020-02-04	2020-02-04T09:14:13.143616000	NFLX 4.625 29	XS2076099865	Y	IY2207483	New	buy	112	percentage	1	1	1	EUR	2020.02.04_order_4932	order
CORP_US	2020-02-04	2020-02-04T09:14:14.289314000	NFLX 4.625 29	XS2076099865	Ν		New	sell	112.5	percentage	1	1	1	EUR	2020.02.04_order_4933	order
CORP_US	2020-02-04	2020-02-04T09:14:14.295049000	NFLX 4.625 29	XS2076099865	Ν		Cancelled	sell	112.5	percentage	6	6	1	EUR	2020.02.04_order_4808	order
CORP_US	2020-02-04	2020-02-04T09:14:14.296765000	NFLX 4.625 29	XS2076099865	Ν		Cancelled	sell	112.5	percentage	0	0	1	EUR	2020.02.04_order_4915	order
CORP_US	2020-02-04	2020-02-04T09:14:56.321258000	NFLX 4.625 29	XS2076099865	Ν		New	sell	112.375	percentage	4	4	1	EUR	2020.02.04_order_4939	order
CORP_US	2020-02-04	2020-02-04T09:20:07.665574000	NFLX 4.625 29	XS2076099865	Y	IY2207483	Replaced	buy	112.125	percentage	1	1	1	EUR	2020.02.04_order_4932	order
CORP_US	2020-02-04	2020-02-04T09:20:09.333255000	NFLX 4.625 29	XS2076099865	Ν		Replaced	sell	112.375	percentage	1	1	1	EUR	2020.02.04_order_4933	order
CORP_US	2020-02-04	2020-02-04T09:20:09.336835000	NFLX 4.625 29	XS2076099865	Ν		Cancelled	sell	112.375	percentage	4	4	1	EUR	2020.02.04_order_4939	order
CORP_US	2020-02-04	2020-02-04T09:29:31.750996000	NFLX 4.625 29	XS2076099865	Ν		New	sell	112.25	percentage	4	4	1	EUR	2020.02.04_order_5093	order
CORP_US	2020-02-04	2020-02-04T09:53:53.630757000	NFLX 4.625 29	XS2076099865	Ν		Cancelled	sell	112.25	percentage	4	4	1	EUR	2020.02.04_order_5093	order
CORP_US	2020-02-04	2020-02-04T09:58:25.747333000	NFLX 4.625 29	XS2076099865	Ν		New	sell	112.25	percentage	2	2	1	EUR	2020.02.04_order_5387	order
CORP_US	2020-02-04	2020-02-04T10:12:45.504296000	NFLX 4.625 29	XS2076099865	Y	IY689202	Filled	buy	112.25	percentage	1	0	1	EUR	2020.02.04_order_5486	order
CORP_US	2020-02-04	2020-02-04T10:12:45.504296000	NFLX 4.625 29	XS2076099865	Ν		Partially Fille	ed sell	112.25	percentage	2	1	1	EUR	2020.02.04_order_5387	order
CORP_US	2020-02-04	2020-02-04T12:39:39.425098000	NFLX 4.625 29	XS2076099865	Y	IY2207483	Cancelled	buy	112.125	percentage	1	1	1	EUR	2020.02.04_order_4932	order
CORP_US	2020-02-04	2020-02-04T12:39:40.635518000	NFLX 4.625 29	XS2076099865	Ν		Cancelled	sell	112.375	percentage	1	1	1	EUR	2020.02.04_order_4933	order

### **FMD** – Dominance Reports

An aggregated summary of all BGC Partners' order and trade volumes compared to activity for a client-specific LEI. The report can be accessed by asset class, sector, sub-sector, and individual instrument. It can also be tailored to highlight specific risk factors in a fast and efficient manner.

		Order /	Analysis		Trade Analysis						
Region	Count of Orders (ex Client)	Count of Client Orders	Total Order Count %age of Trades		Count of Trades (ex Client)	Count of Client Trades	Total Trade Count	%age of Trades			
CORP_IG_DE	470	85	555	15%	114	12	126	5 10%			
CORP_IG_DK	4	0	4	0%							
CORP_IG_ES	38	7	45	16%	6	1	7	7 14%			
CORP_IG_FI	9	3	12	25%							
CORP_IG_FR	145	102	247	41%	42	12	54	1 22%			
CORP_IG_GB	111	23	134	17%	23	5	28	18%			

#### **SUMMARY**

- Real price observations consisting of trades and orders (committed quotes)
- There is considerably more order data than trade data (10-20 times)
- Covers 'non-exchange traded' (formerly OTC) instruments information is only available from main inter-dealer brokers
- Full 'audit trail' timestamps, trading venue MIC, etc.
  Data provenance is evident
- Daily market data of full-price and parameter surfaces (real-time, hourly and end-of-day)
- Comprehensive historic data available for all asset classes



#### **CONTACT US**

Fenics Market Data Sales datasales@fenics.com

and the state of the

**NEW YORK** 

110 East 59th Street New York, NY 10022 LONDON

5 Churchill Place, Canary Wharf London E14 5HU

fenicsmd.com

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