

Cleared OTC FX Products and Margin

March, 2019



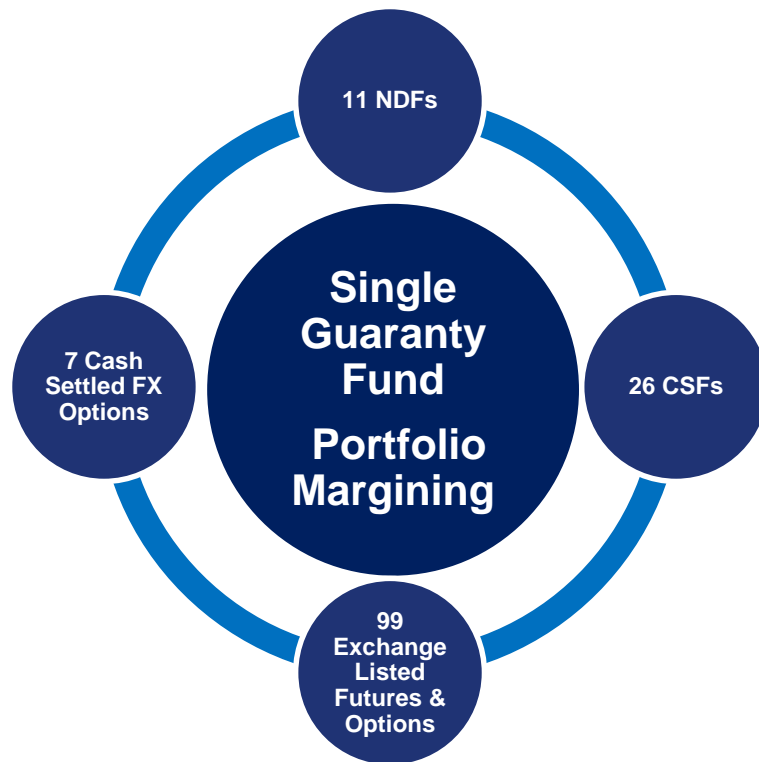
CLEARING THE WAY FORWARD

 **CME Group**

Global FX Clearing Solution

The broadest and most capital efficient FX clearing solution to meet your needs

- **Single guaranty fund:** a diverse pool of products across asset classes amounting to a >\$4 billion Base Guaranty Fund*. The result is a secure and cost effective solution which is an 1/11th of the cost on incremental funding compared to other NDF clearing providers.
- **Unparalleled portfolio margining opportunities** between cleared FX and exchange listed FX Futures and Options, with NDF margin reductions of up to 90% against emerging market futures and 56% against G10 futures**. The regulatory authorization for enabling portfolio margining between ETD FX and OTC FX products is now also in place.
- **The first FX Blending solution**, which significantly reduces notional outstanding and line items.
- **The only cleared cash-settled FX Options solution**, which provides superior cost and capital efficiencies to physically delivered options solutions, which are cost prohibitive.



*CME Base Guaranty Fund as of December 2018

** for the potential IM off-sets available

Global FX Clearing Solution

Benefits Realized Within Clearing

- Access to new counterparties previously unattainable for legal/credit reasons
- Frees up bilateral credit lines allowing for increased volume
- Pre-trade credit checks to speed up execution and clearing acceptance
- Balance sheet efficiencies from a Leverage Ratio, RWA, LCR perspective helping to generate cost savings

CME Cleared Product Scope		
OTC FX NDFs	11 Currency Pairs	USD/BRL, USD/CLP, USD/COP, USD/PEN, USD/CNY, USD/KRW, USD/RUB, USD/INR, USD/PHP, USD/IDR, USD/TWD
OTC FX CSFs	26 Currency Pairs	EUR/USD, AUD/USD, GBP/USD, USD/CHF, USD/SEK, USD/DKK, NZD/USD, USD/NOK, USD/HKD, USD/HUF, USD/ILS, USD/MXN, USD/SGD, USD/PLN, USD/ZAR, USD/CZK, USD/TRY, USD/THB, USD/CAD, USD/JPY, AUD/JPY, EUR/JPY, CAD/JPY, EUR/AUD, EUR/CHF, EUR/GBP
OTC FX Options	7 Pairs Cash Settled	AUD/USD, EUR/USD, USD/CAD, USD/JPY, EUR/GBP, GBP/USD, USD/CHF 10am NY auto exercise (with settlement in quote currency) Options out to 2 years including any strikes. Fixing Rate is WM/R 10am NY

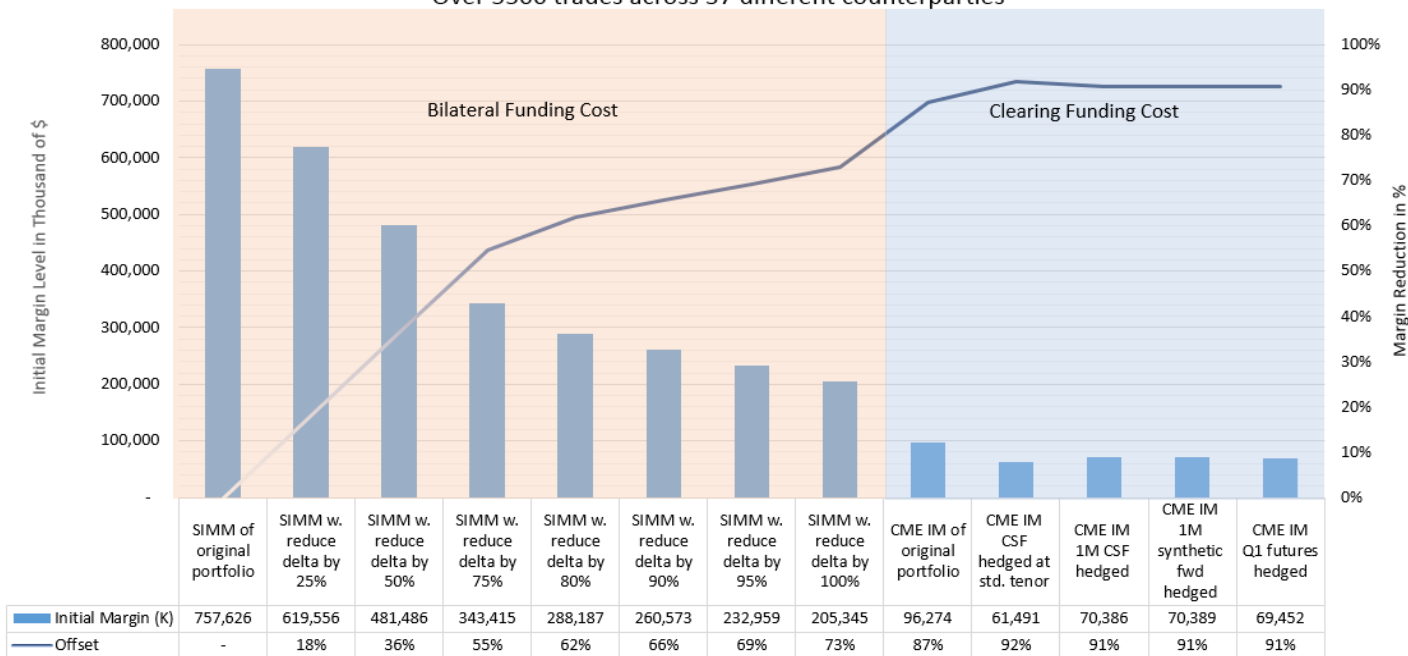
FX Forwards and FX Options

Highlights	<ul style="list-style-type: none"> All OTC FX products reside within the base risk waterfall of CME consequently offering material capital efficiencies and portfolio margining opportunities versus ETD FX products Portfolio margining of OTC FX Options versus 11 NDFs and 26 CSFs is live in production Trade submission is platform agnostic via CME ClearPort – including interfaces such as Traiana, Bloomberg and MarkitServ 					
What is driving this recent activity	<table border="1"> <tr> <td> Dealers <ul style="list-style-type: none"> Initial Margin Optimisation (UMR) Capital (Leverage Ratio/ GSIB) </td> <td> <ul style="list-style-type: none"> Ability to trade with more/new clients Mitigate settlement risk on non-CLS currencies </td> </tr> <tr> <td> Clients <ul style="list-style-type: none"> Access to more dealers and cleared liquidity Remove counterparty risk Free up bilateral credit lines Operational consistency and ease of allocations </td> <td> <ul style="list-style-type: none"> UMR Preparedness Alternative to FX Prime Brokerage Alternative to physically settled FX contracts </td> </tr> </table>	Dealers <ul style="list-style-type: none"> Initial Margin Optimisation (UMR) Capital (Leverage Ratio/ GSIB) 	<ul style="list-style-type: none"> Ability to trade with more/new clients Mitigate settlement risk on non-CLS currencies 	Clients <ul style="list-style-type: none"> Access to more dealers and cleared liquidity Remove counterparty risk Free up bilateral credit lines Operational consistency and ease of allocations 	<ul style="list-style-type: none"> UMR Preparedness Alternative to FX Prime Brokerage Alternative to physically settled FX contracts 	
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How can CME help	<ul style="list-style-type: none"> Broad FX offering across Futures, Options and Cleared OTC. FX Clearing is totally free of charge for all clients until the end of 2019 Working closely with all vendors looking to facilitate the ease and access of clearing including; Traiana, RESET, EBS, FX CONNECT, FX GO, FX ALL etc. 					

The Benefits of Clearing FX: IM Efficiencies

Example: The CME FX Options solution delivers material IM efficiencies versus the ISDA SIMM requirements on bilateral activity

Example of Initial Margin Reduction by (i) Clearing and (ii) Hedging
Over 5500 trades across 37 different counterparties



CME offers the cleared products below to manage the delta of cleared FX Options:

1

26 cash settled forwards

2

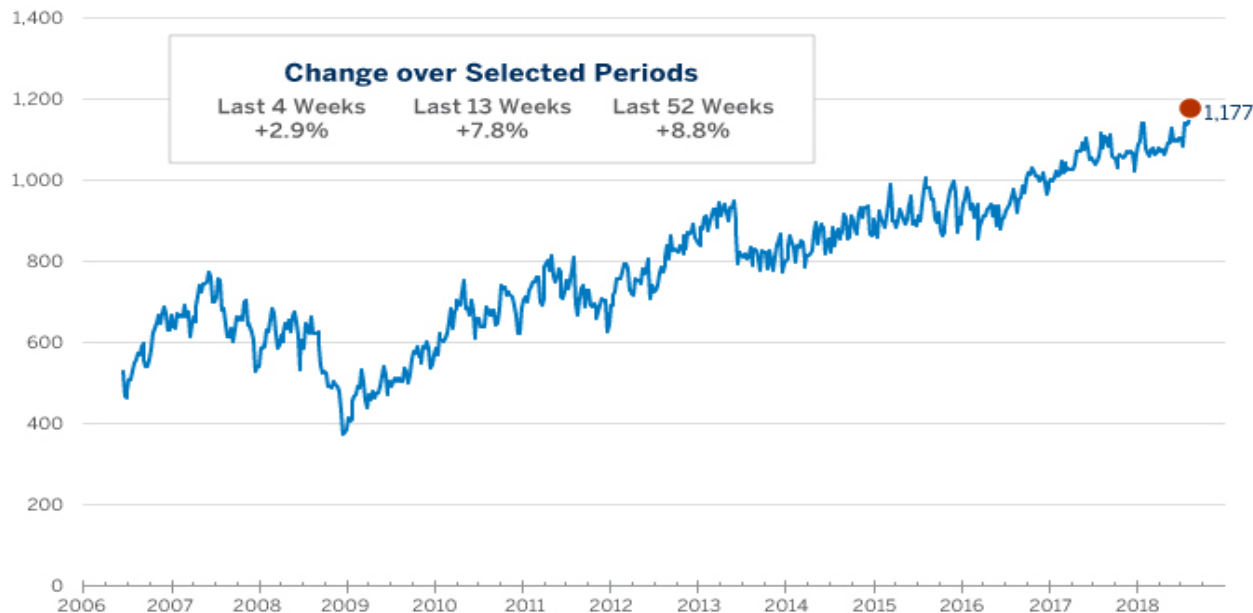
~100 Listed FX Futures (quarterly and monthly expiries)

3

CME FX Link (CLOB Traded OTC Spot Vs CME FX Futures basis)

CME Group is the Largest FX Futures Exchange

CME Group Foreign Exchange Futures Aggregate Number of Large Open Interest Holders*



* The CFTC defines large open interest holders as having at least **400** open contracts in Major Foreign Currency futures and at least **100** open contracts in Other Foreign Currency futures.

Source: CFTC

Record Number of Participants in CME FX

CME FX Futures has reached record Large Open Interest Holders of 1,177

The growing number of firms holding large exposure using futures indicates the continued industry adoption of standardized, exchange-traded products as the FX market continues its evolution

FX Link: a seamless connection between our FX futures and the OTC FX marketplace – so you can use one CME Globex spread to more easily access the efficiencies of FX futures and better manage your FX exposures.

New Records Reached in 2019, FX Link is available for USD/CHF, NZD/USD, AUD/USD, EUR/USD, GBP/USD, USD/CAD, USD/JPY and USD/MXN.

Portfolio Margin Solution for FX

Benefits Realized Within Clearing

- CME has offered portfolio margining services for ETD versus OTC products since 2012
- The existing offering for IRS is supported by 15 FCMs and used by >700 client accounts every day to generate savings of c. \$3bn
- The regulatory authorization for enabling portfolio margining between ETD FX and OTC FX products is now in place
- CME can conduct analysis to show the benefits of portfolio margining ETD FX versus OTC FX now.
- The table below shows some examples of potential savings available via the CME portfolio margining solution.*

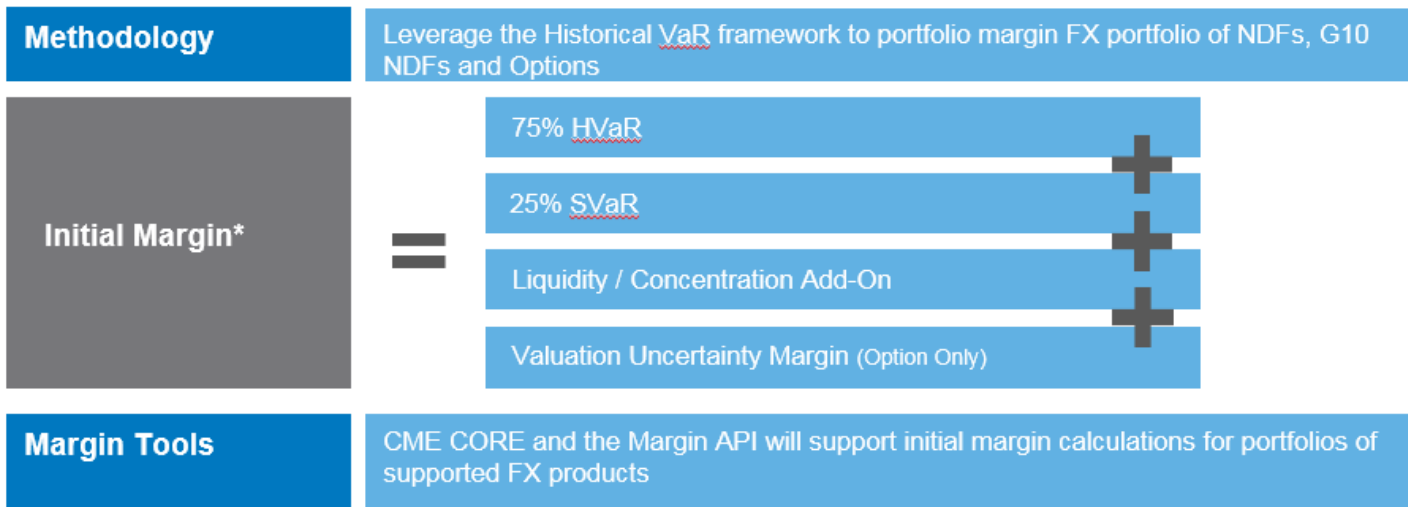
Contracts Included in Portfolio Margining	Initial Margin Off-Set
Non-Deliverable Futures Versus OTC NDFs	84%
Non-Deliverable Futures vs OTC CSFs	39%
G10 Futures Versus OTC CSFs	93%
G10 Futures Versus OTC NDFs	41%
G10 Futures Versus G10 OTC FX Options	28%

* Figures in table from analysis conducted on January 11 2018

Initial Margin Methodology

Margin Model Goals

- Captures potential loss over MPOR from all risk factors that affect the portfolio
- Achieves 99% coverage across a comprehensive set of Risk Profiles
- Anti-procyclical yet appropriately react to changes in FX risk factors and volatility regimes
- Scales to other currency pairs as well as Portfolio Margin with listed and other products
- Provide transparency to market participants via CME CORE & Deployable Libraries
- Makes easier the deployment of analytics for pre- and post- trade services



*HVaR is "Filtered" HVaR model using EWMA volatility (scaled). SVaR is Stress VaR anti pro-cyclical component. The confidence level of the VaR is 99.7%. Requirement of 99% Coverage

CME CORE

Key Benefits

- Access to CME's OTC FX margin methodologies to calculate indicative margin requirements for NDF, CSF and FXO portfolios
- Includes ISDA SIMM calculations to compare CME cleared versus bilateral IM requirements
- Provides CME CORE users with an insight into CME Group's global product suite (11 OTC FX NDFs, 26 OTC FX CSFs and 7 OTC FXO).
- Users can perform hypothetical, what-if, margin analysis to assess the impact of clearing additional trades within their existing portfolio.

The screenshot shows the CORE Margin Calculator interface. The top navigation bar includes 'Home', 'Margin Calculator', and 'Add OTC FX portfolio' (callout 1). The main area displays a 'Portfolio Summary' table with columns for Name, Description, Account, Firm, Margin Type, #Trades, Margin Result, and Result Origin. A row for '10-21-2016 Portfolio test test test FX 11' shows a 'Margin Result' of '\$ 364,916' (callout 2). Below this is a table for adding trades, with callouts 2 and 3 pointing to 'Add trades to portfolio manually or...' and 'Add trades to portfolio via CSV upload' respectively. The bottom right corner has buttons for 'Validate', 'Save', and 'Margin' (callout 3).

Account	Firm	Short Notional	Long Notional	Short Currency	Long Currency	Exchange	Maturity	CC Code
test	test	USD BRL \$ -2,035,200.00	\$ 1,000,000.00	BRL	USD	CME	12-01-2016	USDBRL
test	test	USD PHP ₱ -41,465,000.00	\$ 1,000,000.00	PHP	USD	CME	12-01-2016	USDPHP
test	test	USD MYR RM -3,067,000.00	\$ 1,000,000.00	MYR	USD	CME	12-01-2016	USDMYR
test	test	USD INR ₹ -52,670,000.00	\$ 1,000,000.00	INR	USD	CME	12-01-2016	USDINR
test	test	USD KRW ₩ -1,113,350,000.00	\$ 1,000,000.00	KRW	USD	CME	12-01-2016	USDKRW
test	test	USD CNY ¥ -6,287,500.00	\$ 1,000,000.00	CNY	USD	CME	12-01-2016	USDCNY
test	test	USD IDR Rp -9,582,500,000.00	\$ 1,000,000.00	IDR	USD	CME	12-01-2016	USDIDR
test	test	USD TWD 元 -29,127,000.00	\$ 1,000,000.00	TWD	USD	CME	12-01-2016	USD TWD
test	test	USD CLP \$ -472,400,000.00	\$ 1,000,000.00	CLP	USD	CME	12-01-2016	USDCLP
test	test	USD COP \$ -1,800,000,000.00	\$ 1,000,000.00	COP	USD	CME	12-01-2016	USD COP
test	test	USD PEN S/. -2,586,500.00	\$ 1,000,000.00	PEN	USD	CME	12-01-2016	USD PEN

Disclaimer

Neither futures trading nor swaps trading are suitable for all investors, and each involves the risk of loss. Swaps trading should only be undertaken by investors who are Eligible Contract Participants (ECPs) within the meaning of Section 1a(18) of the Commodity Exchange Act. Futures and swaps each are leveraged investments and, because only a percentage of a contract's value is required to trade, it is possible to lose more than the amount of money deposited for either a futures or swaps position. Therefore, traders should only use funds that they can afford to lose without affecting their lifestyles and only a portion of those funds should be devoted to any one trade because traders cannot expect to profit on every trade.

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