

FX Options in the Age of Uncleared Margin Rules



CONTENTS

- 2 Executive Summary
- 3 Introduction
- 3 The Current Market Structure in FX Options
- 5 The Regulatory Landscape
- 6 How Are FX Options Traders Responding?
- 7 A More Flexible and Robust Solution
- 8 The Case for Capital Efficiencies in Listed Options
- 9 Reducing Execution Costs with Listed Options
- 9 Summarizing the Results of the Buy-Side OTC Analysis
- 10 Comparing CME with Buy-Side OTC Liquidity
- 11 Conclusion



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UNCLEARED MARGIN RULES AND OTHER RECENT MARKET STRUCTURE CHANGES HAVE THE POTENTIAL TO VASTLY CHANGE THE TRADING OF FX OPTIONS

SHIFTING TO LISTED FX OPTIONS COULD SAVE UPWARD OF **70%** PER TRADE

Executive Summary

The Uncleared Margin Rules (UMR), which started rolling through the industry two years ago, are set to cover all institutions with derivatives exposure of just \$8 billion in less than 18 months. These rules and other recent market structure changes have the potential to vastly change the economics of trading foreign exchange (FX) options: both directly through bilateral trading and indirectly through changing the economics of FX Prime Brokerage (FXPB). In a somewhat surprising development, only 1 in 5 buy-side firms have said that they have begun to examine the impact that UMR would have on their trading costs.

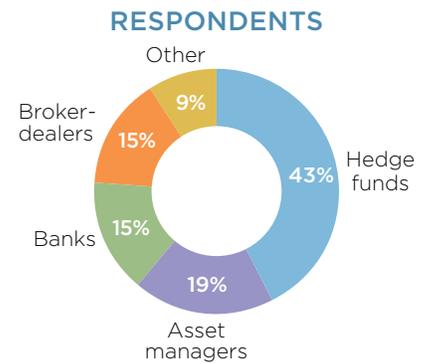
To further shed light on the situation, Greenwich Associates examined FX trader behavior and the potential impact of shifting FX options to a listed environment. To do so, we examined the costs of trading FX options over-the-counter (OTC) and compared it to similar trades executed on a regulated exchange. The model used includes the average size of a typical FX options trade, spreads costs, and how trades are offset, among other variables. To validate key inputs into the model and gather feedback on current demand and pricing, we spoke with FX traders on the buy and sell side, covering 54 institutions.

The analysis demonstrates that the buy side has an alternative available that can potentially provide meaningful cost savings to trading FX options in the OTC market. In fact, under some circumstances, the cost to trade could be reduced by upward of 70% by trading listed FX options.

With exchanges such as CME evolving their product offerings to better align with client trading behavior and OTC convention, the friction to shift positions to a listed environment is quickly lessening. Given that one-quarter of buy-side firms in the study feel that the quality of FX options quotes that they are receiving bilaterally are deteriorating, along with the potentially significant impacts UMR will have on a large portion of the industry in 2020, we anticipate a meaningful increase in the number of traders who will turn to listed FX options as a viable alternative to some of their OTC activity.

METHODOLOGY

During the second half of 2018, Greenwich Associates interviewed 54 FX traders at hedge funds, asset managers, banks, broker-dealers, and other types of financial institutions in the United States and Europe to gather their feedback on FX options trading behavior and current/expected demand for trading listed FX options. Study participants provided average bid-ask spreads for FX options trades, as well as other data points that impacted their cost to trade.



Introduction

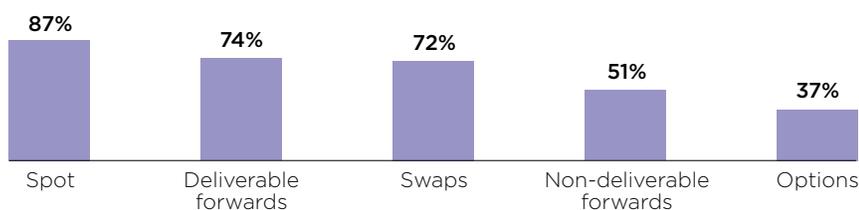
Given the size and complexity of the FX market, there have been countless new developments from firms seeking to carve out a niche for themselves, offering to improve efficiency, lower costs or increase access. Whether it is from new product development, the launch of new e-trading platforms, or attempts to streamline traders' workflows, the market sees its share of innovative new ideas increase each year. At the same time, incumbent players seek to maintain the status quo in a market that continues to generate billions of dollars in revenues for participants.

Against this backdrop, many innovations tend to be evolutionary rather than revolutionary, but that does not make their impact any less meaningful. One area of the FX market where we have recently seen substantial change is in FX options. Historically, this market has been entirely OTC, a bilateral relationship between a buy-side firm and its sell-side dealers. But, as we have seen in other asset classes, alternatives are emerging. These innovations cannot come quickly enough, particularly as many buy-side firms are starting to examine how regulatory changes, as well as sell-side revenue pressures, may impact these bilateral relationships.

The Current Market Structure in FX Options

Unlike most other parts of the FX market, the FX options market remains largely traditional in its structure. According to the Greenwich Associates 2018 Global Foreign Exchange Study, just 37% of global options volume is executed electronically (as compared to 70–80% in most other products).

PROPORTION OF FX VOLUME TRADED ELECTRONICALLY



Note: Based on responses from 844 global top-tier financial users of foreign exchange.
Source: Greenwich Associates 2018 Global Treasury Services Study

However, looking at only one year of data glosses over the changing dynamics. Compared to just five years ago, options volumes executed electronically have doubled. In the age of MiFID II, investors can no longer rely on a handful of trusted counterparties and are increasingly seeking out new ways to connect with many market participants simultaneously and efficiently. Therefore, unlike the rest of the e-trading landscape in FX, where most flows are already electronic, the growth of electronic trading in options should accelerate.

With over 70% of study participants seeing value in an all-to-all model for options, we expect growth to ramp up.

We are also witnessing significant interest and growth in leveraging protocols outside of the traditional request-for-quote (RFQ) model. Whether this is via auction platforms in credit, streaming prices in rates, or all-to-all trading in FX, the buy side is increasingly open to venues that disrupt traditional trading mechanisms. It is not just trading platforms that are offering solutions based on new protocols; exchanges are also at the forefront of this evolution. In the options space, for example, CME offers the largest all-to-all electronic venue for trading FX options in the world*. With over 70% of study participants seeing value in an all-to-all model for options, we expect growth to ramp up.

LISTED FX OPTIONS TURNOVER FOR MAJOR REGULATED EXCHANGES GLOBALLY

| Exchange | 2018 Notional Turnover (\$millions) | ADV* (\$millions) | Active Currency Pairs |
|----------------------------------|-------------------------------------|-------------------|--|
| CME Group | \$2,191,566 | \$8,697 | EUR/USD, JPY/USD, GBP/USD, AUD/USD, CAD/USD, CHF/USD, MXN/USD, NZD/USD |
| National Stock Exchange of India | \$487,282 | \$1,981 | USD/INR, GBP/INR, EUR/INR |
| BSE India Limited | \$393,704 | \$1,600 | USD/INR, EUR/INR |
| Tel-Aviv Stock Exchange | \$144,407 | \$589 | USD/ILS, EUR/ILS |
| Johannesburg Stock Exchange | \$39,863 | \$159 | USD/ZAR, EUR/ZAR, GBP/ZAR |
| Moscow Exchange | \$32,974 | \$130 | USD/RUB, EUR/RUB, EUR/USD, GBP/USD |
| BM&FBOVESPA | \$5,172 | \$21 | USD/BRL |
| Borsa Istanbul | \$5,219 | \$21 | TRY/USD |
| TAIFEX | \$4,001 | \$16 | USD/CNT, USD/CNH |
| Hong Kong Exchanges and Clearing | \$2,976 | \$12 | USD/CNH |
| MexDer | \$1,268 | \$5 | USD/MXN |
| ICE Futures US | \$537 | \$2 | US Dollar Index |

Source: World Federation of Exchanges members, affiliates, correspondents and non-members.
*Sourced by Greenwich Associates

PERCEIVED BENEFITS OF AN ANONYMOUS ALL-TO-ALL FX OPTIONS PLATFORM



Note: Based on 28 respondents.
Source: Greenwich Associates 2019 FX Options Study

The Regulatory Landscape

Technology is not the sole driving force behind changes in FX market structure. Regulations aimed at particular market participants or trading activities and the ripple effect they cause are having a profound impact on the FX landscape. Pressure from large investors to resolve conduct issues alongside regulations such as MiFID II have forced traders to pay closer attention to transaction costs and execution more than ever before.

As a result, the use of transaction cost analysis (TCA) in FX is soaring. Nearly 2 in 3 FX trading desks now perform TCA, and with the rise of data and tools that make the process more efficient, we expect that figure to grow even further. However, that may be difficult to implement in FX options given the lack of transparent data, and another reason why investors may be likely to seek out all-to-all venues seen in other markets.

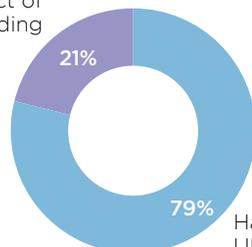
Market participants are also focused on UMR, which require participants to exchange initial (IM) and variation margin (VM) for FX options positions held bilaterally and to hold balances over \$50M at a third-party custodian where they cannot be re-hypothecated. While UMR has been on the radar for several years, the costs were manageable when just a few large dealer counterparties were involved. But they will rise considerably in September 2020 when most of the industry becomes impacted.

Furthermore, buy-side participants who, to date, have relied on FXPBs to centralize their operational exposures cannot expect to be fully shielded from this impact. In a recently published Citi FXPB report (*Collateral Damage? How Uncleared Margin Rules Will Revolutionize the FXPB Business Model*), Citi highlighted that, “Funding costs and FXPB pricing will inevitably increase to offset these regulatory challenges ... [and this] will drive a seminal change in structure for the FX marketplace.”

Given the potential large-scale disruption to the state of OTC FX options trading in less than 18 months, we were interested to know how far along the buy side was in their thinking about UMR and its impact on their trading activity. Surprisingly, of all the buy-side firms in the study, only 21% noted that that they have begun to examine the impact that UMR will have on the cost of trading OTC FX options.

ANALYZING THE IMPACT OF UMR ON FX OPTIONS TRADING

Have analyzed impact of UMR on FX options trading



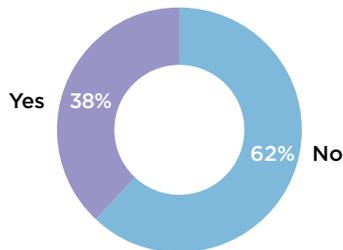
Have not analyzed impact of UMR on FX options trading

Note: Based on 19 respondents.
Source: Greenwich Associates 2019 FX Options Study

How Are FX Options Traders Responding?

Many traders are looking toward the future and have started to examine the impact that technology and new regulatory requirements will have on the FX options market. Nearly 40% see listed FX options as a potential tool to complement and, in some cases, to replace their OTC options trading. This number is likely to grow as these traders become better informed on the true cost of new regulations, assess how to mitigate conduct issues and achieve best execution standards, and take a closer look at the benefits of alternatives.

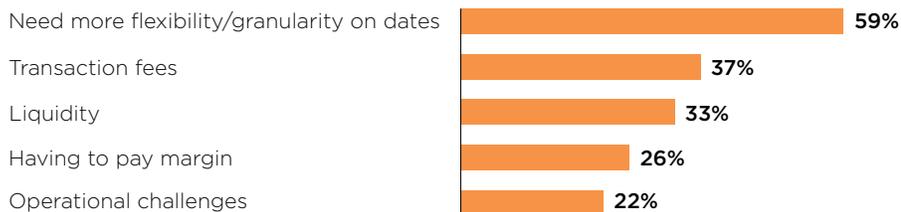
CONSIDERING LISTED FX OPTIONS WHEN FIRM BECOMES SUBJECT TO EXCHANGING MARGIN



Note: Based on 26 respondents.
Source: Greenwich Associates 2019 FX Options Study

The OTC traders in our study indicated that product flexibility, exchange fees and liquidity were primary factors that made them hesitant to consider exchange-listed products. Our analysis suggests these hurdles are diminishing quickly and, in some cases, may be more perceived than real.

IMPEDIMENTS TO USING LISTED FX OPTIONS



Note: Based on 27 respondents.
Source: Greenwich Associates 2019 FX Options Study

This should be good news for many traders, as new alternatives to diversify and expand their pool of liquidity could not come soon enough. When we asked about their perceptions of the quality of OTC FX options quotes they received from their key sell-side counterparties, 1 in 4 traders already felt that there has been some deterioration in the quality of those quotes, noting that they were either hit-or-miss or extremely inconsistent. On the other hand, on-exchange traders estimate that just over one-third (35%) of their trades are executed at mid-rate.

ELECTRONIC ALL-TO-ALL VERSUS BILATERAL LIQUIDITY

It is difficult to directly compare the electronic liquidity on a central matching platform with liquidity available on a bilateral basis, as they are fundamentally different execution processes. Each has its benefits and drawbacks. The full quality of liquidity in a transparent, electronic central order book is hard to quantify because participants will never display their full interest continuously, hence there could be much larger size or better prices available instantaneously when a new order shows up. This process of liquidity resilience or replenishment is widely evidenced in most electronic spot platforms. In such a market, participants tend to split larger orders to execute piecemeal via an algorithm to reduce the trade footprint and minimize the total execution costs. A key benefit of executing on such a platform is that participants can use limit orders to save a significant portion of the quote spread because of the open competition and potential pent-up interest in taking the opposite side.

CLOB LIQUIDITY VS. BILATERAL TRADING

| | Benefits | Drawbacks |
|-----------|------------------------|------------------------------|
| CLOB | Anonymous | Order flow transparency |
| | Limit orders | Full liquidity not displayed |
| | All-to-all competition | Standardized products |
| | Price transparency | |
| | Operational efficiency | |
| Bilateral | Full amount quote | Take-it-or-leave-it quotes |
| | Special attention | Positioning knowledge |
| | Trade flow privacy | Best-ex not clear |
| | | Audit trail tracking |
| | | |

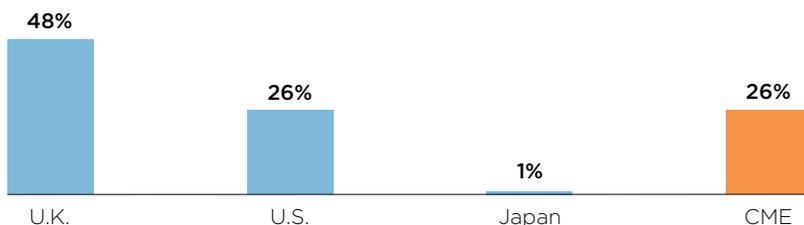
Source: Greenwich Associates 2019 FX Options Study and CME

A More Flexible and Robust Solution

While the listed FX options market will not be as robust as the traditional OTC market in the near term, there is rapidly growing evidence that traders may be underestimating the liquidity available in listed options. For example, the following chart compares CME's 2018 electronic average daily volume (ADV) to that of single-dealer (SDP) and multidealer (MDP) platforms.

FX OPTIONS—ELECTRONIC DIRECT ADV

Regional combined turnover of SDPs and MDPs and CME Globex



Source: FXJSC, FXC and TFEMC April 2018 semi-annual surveys

In order to compete head-on with OTC trading, exchanges are rapidly evolving their product offerings to meet traders' needs. Beside the significant increase in electronic liquidity, exchanges are simplifying their offerings and aligning them with the OTC conventions familiar to most traders; they are also adding more strikes and maturities to improve hedging flexibility. Additionally, CME's block trading capability allows traders to leverage their bilateral relationships during times when it is less conducive to trade options electronically or when clients want or need special pricing attention. This type of functionality could play a significant role in helping bridge the gap between OTC and listed trading, and help buy-side accounts to more easily migrate some of their activity onto exchanges.

The Case for Capital Efficiencies in Listed Options

In its report on the impact UMR would have on the FXPB market, Citi included a funding cost analysis for a hypothetical trade covered under the UMR rules. Astonishingly, the resulting analysis showed that fees would need to increase 31 times just to neutralize funding costs associated with a competitive working capital rate of 50 basis points. Clients will likely not bear the full brunt of the necessary fee increases but should expect to see fees meaningfully increase in the future.

This is not to say, however, that clients do not have alternatives to accepting these fee increases. Greenwich Associates examined the findings of a recent capital and funding analysis performed by CME. The analysis calculated the IM requirement of a simulated portfolio under three scenarios: dealer-facing counterparties under non-optimized bilateral standard initial margin model (SIMM), dealer-facing counterparties via single PB achieving netted SIMM, and the equivalent portfolio in CME SPAN for listed options.

The simulated portfolio consisted of 30 randomly generated positions of three-month maturities in five currencies, across five counterparties, and just under \$1 billion gross notional exposure. The results showed that the listed portfolio generated 65% less margin requirement than the netted SIMM via PB, and 89% less than the bilateral SIMM. Their results confirm that clients potentially stand to benefit significantly from the powerful netting that occurs in listed products and from the advantageous margin period of risk (MPOR) used to calculate IM requirements.

The report also included a funding and capital cost analysis. The lower IM noted above and advantageous capital treatment under SA-CCR made

the listed options portfolio 55% more capital efficient than the bilateral portfolio netted through a PB, and 90% more efficient than an unhedged bilateral portfolio.

Reducing Execution Costs with Listed Options

It is becoming clear that the impact of capital and operational efficiencies will have a growing influence on trading decisions as UMR impact more counterparties and its effects begin to affect trading costs, operational processes and, where relevant, FXPB fees. Yet for many traders, the urgency to change will still be driven by the direct execution costs.

To examine the potential impact that shifting OTC options to the listed market will have, Greenwich Associates asked buy-side traders about several variables that impact their cost to trade FX options in the OTC market, and built an execution cost model that could be compared to observed liquidity available in listed options.

These variables include:

- The average size of a typical FX options trade
- Spreads for major currencies, organized by delta (out of the money vs. close to/at-the money) and duration (short-dated vs. long-dated)
- Proportion of trades offset before expiration
- Whether trades are typically offset with the original dealer or with other dealers
- Slippage when offsetting with original dealer
- How options quotes are typically requested

Summarizing the Results of the Buy-Side OTC Analysis

The results of the analysis provided several interesting observations regarding current pricing behavior in the OTC FX options market for buy-side accounts.

1. Client characteristics such as the organization type, total trading activity and average options trade size had little to no correlation with the quality of the liquidity received.

2. Clients are seeing larger spreads on out-the-money (OTM) than for at-the-money (ATM) options, even though OTM have lower total premiums, which implies a significant risk or transparency markup for OTM strikes.
3. Clients who always request two-sided quotes (as opposed to one-side only) from their dealers saw tighter liquidity ranging from -5% for ATM to -20% for OTM.
4. Nearly one-quarter of buy-siders experience trade rejection from their dealers. While this impacts a small number of trades, the cost implication is likely to be more significant as it typically occurs on the most critical trades.
5. Buy-side firms we interviewed have access to two-sided markets that are between 2.5 and 4.5 pips wide on average, depending on duration, with a best of 1 pip and a worst of 8 pips reported. The average liquidity by tenor and moneyness is shown below.

AVERAGE QUOTE SPREAD IN PIPS

| Short Dated | | Long Dated | |
|-------------|------|------------|------|
| OTM | ATM | OTM | ATM |
| 2.81 | 2.59 | 4.24 | 4.12 |

Source: Greenwich Associates 2019 FX Options Study and CME

6. Over 40% of trades are offset before expiration, and 40% of these trades are offset with the original counterparty. Participants reported experiencing an average price slippage of just over 30% on such trades.

Comparing CME with Buy-Side OTC Liquidity

Our analysis compared the average cost of trading bilaterally against trading on the CME's central order book (CME Globex). Clearly, bilateral liquidity is very different than that on an electronic order book (see callout box), and our analysis addressed two primary cost implications. First, an offsetting trade with an original counterparty usually leads to an extra cost, and second, that trading in all-to-all markets often occurs inside the bid/offer spread; the latter can lead to significant cost reductions.

As noted above, exchange-traded derivatives (ETD) participants reported that they execute 35% of their trades at mid-market. This was further corroborated by CME data showing 55% of non-member (buy-side) volume in FX options over the past six months was executed in "passive" mode, indicating a substantial amount of trading occurring at mid or better.

The analysis compared OTC pricing with the first level of the CME order book (the top-of-book) against the top two levels assuming a sweep. As one expects from electronic liquidity, the biggest benefit occurs when trading at the top-of-book, and most execution algorithms are designed to maximize the tendency for the top-of-book to reload rather than using aggressive sweeps.

OTC PRICING COMPARISON WITH CME ORDER BOOK

(Top-of-book vs. top two levels)

| | Short Dated | | Long Dated | |
|--------------------|-------------|---------|------------|---------|
| | OTM | ATM | OTM | ATM |
| AVG buyside | 1.58 | 1.47 | 2.29 | 2.23 |
| CME 1st level | 0.69 | 0.87 | 0.77 | 1.02 |
| % saving | 56% | 41% | 66% | 54% |
| CME 2nd level | 1.17 | 1.39 | 1.20 | 1.52 |
| % saving | 26% | 5% | 48% | 32% |
| Savings per Ticket | | | | |
| \$25,000,000 | \$2,226 | \$1,487 | \$3,796 | \$3,040 |
| \$50,000,000 | \$4,453 | \$1,938 | \$7,249 | \$4,619 |

Note: Transaction cost expressed as half the spread. Second level savings based on average cost of a sweep through levels one and two.

Source: Greenwich Associates 2019 FX Options Study and CME

As demonstrated above, the potential savings from trading on CME's electronic CLOB are significant, particularly when trading smaller clip sizes and OTM strikes. And since two-thirds of buy-side traders in the study reported average trade sizes of \$50 million and under, most market participants would see meaningful costs savings by trading on a CLOB—potentially up to 70% per trade.

For clients trading large sizes, there is an opportunity to modify trading behavior by using algorithms to split the execution and take advantage of the reloading that occurs in “lit” competitive CLOBs (as most have already done with their spot executions).

Conclusion

As we have shown throughout the report, when the full costs and requirements of UMR and other regulations are borne by the industry, FX traders will need to take a hard look at the costs of their trading behavior. For many, the listed market is already an attractive alternative to trading FX options over-the-counter. This is demonstrated by the model highlighted above, which shows meaningful savings in execution costs. Additionally, when the impacts of UMR and changing capital rules are fully priced into the marketplace, both through direct first-order effects or second-order impacts through changing bid-offer or FXPB fees, savings from trading listed FX options that clear against a

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regulated central counterparty become even more pronounced. For those counterparties who have not yet examined the costs of UMR, the time is running out to conduct this analysis and start preparing for its implementation.

Given the demonstrable savings from trading listed FX options and the investments exchanges have made to make the product more “OTC-like,” we expect there to be strong motivation for buy-side firms to take a more aggressive approach in investigating listed options as a viable complement to their OTC activity.

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