

FX and OTC derivatives markets through the lens of the Triennial Survey¹

The 2019 BIS Triennial Central Bank Survey provided new insights about the boost that electronification gave to trading in FX and OTC derivatives markets, and the role of compression and clearing in containing the growth of outstanding derivatives exposures.

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This special issue of the *BIS Quarterly Review* analyses the results of the latest BIS Triennial Central Bank Survey of Foreign Exchange and Over-the-counter (OTC) Derivatives Markets (Triennial Survey). The collection of five articles explores what factors drove the recent growth of these markets and what those factors tell us about the evolution of the markets' structure. The message that emerges is that OTC markets are larger and more diversified than ever, owing in part to the rise of electronic and automated trading. Even as trading picked up, compression and clearing helped to contain the growth of outstanding derivatives exposures.

The Triennial Survey is the most comprehensive source of information on the size and structure of foreign exchange (FX) and OTC derivatives markets. The BIS coordinates it in cooperation with central banks worldwide under the guidance of the Markets Committee and the Committee on the Global Financial System. The survey has been conducted every three years since 1986. In 2019, almost 1,300 dealers (mainly banks) located in 53 countries participated. Data were collected in two stages: OTC trading of FX spot, FX derivatives and interest rate derivatives was surveyed in April 2019, and the outstanding notional amounts and gross market values of all OTC derivatives were surveyed at the end of June.²

Offshore markets propel trading growth

FX and OTC derivatives markets saw a marked pickup in trading between the 2016 and 2019 surveys. Following a dip in 2016, FX trading returned to its long-term

¹ The views expressed in this article are those of the author and do not necessarily reflect those of the Bank for International Settlements.

² For more information about the Triennial Survey and to explore the data, see www.bis.org/statistics/rpfx19.htm.

Key takeaways

- The 2019 BIS Triennial Central Bank Survey showed that FX and OTC derivatives markets were larger and more diversified than ever.
- Electronification propelled the growth of offshore trading and increased the diversity of market participants.
- In FX markets, the rise in trading was led by swaps, while settlement risk remains a major concern.

upward trend, rising to \$6.6 trillion per day in April 2019. Interest rate derivatives trading departed sharply from its previous trend, soaring to \$6.5 trillion.

The trading of short-term instruments grew faster than that of long-term instruments. This mechanically increased reported turnover because such contracts need to be replaced more often. Schrimpf and Sushko (2019a) emphasise that the trading of FX swaps, which is concentrated in maturities of less than a week, rose from \$2.4 trillion in April 2016 to \$3.2 trillion in April 2019 and accounted for most of the overall increase in FX trading. In interest rate derivatives markets historically, OTC contracts had mainly referenced long-term rates; contracts referencing short-term rates were traded on exchanges. Using overnight index swaps and forward rate agreements as a proxy for OTC derivatives referencing short-term interest rates, Ehlers and Hardy (2019) find that OTC trading of such derivatives probably surpassed that of derivatives on long-term rates in April 2019.

While globally trading continued to be dominated by the major currencies, in particular the US dollar and the euro, in FX markets the trading of emerging market currencies grew faster than that of major currencies. As discussed by Patel and Xia (2019), the share of emerging market currencies in global FX turnover rose to 23% in April 2019 from 19% in 2016 and 15% in 2013. In contrast, interest rate derivatives denominated in emerging market currencies saw their share of global activity decline. Aramonte and Huang (2019) highlight that the OTC derivatives exposures of dealers headquartered in emerging market economies were concentrated in FX instruments, whereas those of dealers from advanced economies were concentrated in interest rate instruments.

The pickup in turnover between 2016 and 2019 was especially marked in offshore markets. Trading tended to grow most for those currencies with greater increases in activity offshore than onshore. The Chinese renminbi illustrates this: subdued growth coincided with a decline in the share of offshore trading. The renminbi's rank as the eighth most traded currency was unchanged between 2016 and 2019 and, according to Packer et al (2019), turnover remained lower than expected, based on trade and GDP per capita.

Greater offshore trading went hand in hand with greater geographical concentration. In FX markets, London, New York, Singapore and Hong Kong SAR increased their collective share of global trading to 75% in April 2019, up from 71% in 2016 and 65% in 2010. Trading in OTC interest rate derivatives markets was also increasingly concentrated in a few financial centres, especially London. Schrimpf and Sushko (2019a) attribute this geographical concentration to network externalities. For example, it is more cost-effective to centralise counterparty and credit relationships, or technical and legal infrastructures, in a handful of hubs than to spread them across many countries. The faster pace of trading also increased the advantages of locating traders' IT systems physically close to those of the platforms on which they trade.

Even as trading became more concentrated geographically, it fragmented across platforms. Schrimpf and Sushko (2019b) explain how the distinction in FX markets

between the inter-dealer and dealer-customer segments is increasingly blurred. Principal trading firms (PTFs),³ in particular, made inroads into market-making activities, and the ways in which customers could conduct trades proliferated.

Electronification is reshaping markets

Turning to what factors drove the recent growth of FX and OTC derivatives markets, one stood out: the rise in electronic and automated trading, also referred to as electronification. By reducing transaction costs, electronification has boosted trading and changed price formation and liquidity provision. FX spot was one of the first OTC markets to go electronic, and the FX forwards market is quickly catching up, especially the market for non-deliverable FX forwards (NDFs). In contrast, as Schrimpf and Sushko (2019b) point out, the electronification of FX swaps lags because of their large size, complex pricing and the credit risk involved. OTC interest rate derivatives markets, too, are shifting from voice brokers to electronic platforms. Ehlers and Hardy (2019) cite electronification as a key reason for the faster growth of OTC trading relative to exchange trading of interest rate derivatives.

Another notable driver of growth was the increased diversity of market participants. Greater heterogeneity in participants' transaction needs and investment horizons has enhanced market liquidity and facilitated risk transfers. To some extent, greater diversity was linked to electronification. Electronification has enabled automated trading, in particular high-frequency trading. This, in turn, has made OTC markets more attractive to those engaged in such strategies, mainly hedge funds and PTFs.

The market for NDFs shows how electronification has stimulated trading and increased the diversity of market participants. Currencies that are not freely convertible were among those recording the fastest growth in FX turnover between the 2016 and 2019 surveys, including the Indian rupee, Indonesian rupiah and Philippine peso. Patel and Xia (2019) highlight that this growth was led by forwards, particularly NDFs traded in offshore markets.

Changes in the size, investment objectives and strategies of asset managers have also served to increase the diversity of OTC market participants. Since the Great Financial Crisis (GFC) of 2007–09, assets managed by investment funds, exchange-traded funds and other non-bank investors have expanded substantially. At the same time, low interest rates have encouraged riskier investments. According to Patel and Xia (2019), this has raised non-bank financial institutions' demand for emerging market assets. Similarly, Ehlers and Hardy (2019) emphasise that non-bank financial institutions have made more active use of OTC interest rate derivatives.

In addition to such market-wide structural changes, other factors have contributed to the growth of specific market segments. As Schrimpf and Sushko (2019a) explain, trading in FX swaps was boosted by banks' liquidity management as well as their arbitraging of interest rate differentials for funding in different currencies. Another driver of FX trading was the recovery in prime brokerage activities⁴ from the

³ PTFs are firms that invest, hedge or speculate for their own account. PTFs include high-frequency trading firms as well as electronic non-bank market-makers.

⁴ Prime brokerage refers to intermediation services that dealers provide to hedge funds, PTFs and other selected customers. Prime brokers are usually large highly rated banks. They enable selected

subdued levels of 2016, when losses on clients' trades following idiosyncratic events in FX markets had caused some banks to retrench. For OTC interest rate derivatives, Ehlers and Hardy (2019) highlight how changes in the level and volatility of US dollar interest rates boosted turnover in April 2019.

Compression and clearing mitigate exposures

The marked pickup in the trading of FX and OTC derivatives between the 2016 and 2019 surveys did not lead to an increase in outstanding exposures. To be sure, since 2015 the notional principal of outstanding OTC derivatives has trended upwards, and at end-June 2019 it reached its highest level since 2014. However, their gross market value – a more meaningful measure of amounts at risk than notional principal – has trended downward since 2012. As Aramonte and Huang (2019) highlight, the gross market value was \$12 trillion at end-June 2019, close to its level immediately before the GFC.

Compression and clearing helped to slow the growth of outstanding exposures. Compression eliminates economically redundant derivatives positions and thereby reduces outstanding contracts. Compression first took hold in the market for credit default swaps (CDS), where even before the GFC it contributed to a sharp reduction in notional principal. While it took longer to penetrate OTC interest rate derivatives markets, Ehlers and Hardy (2019) document that the frequency and amount of compression has increased in recent years, making it now commonplace. Compression, coupled with electronification and other changes, is reshaping OTC markets along the lines of exchanges.

Compression has been greatly facilitated by the expansion of central clearing. Clearing rates for CDS and OTC interest rate derivatives rose steadily between 2010 and 2017, though they have since levelled off. By 2019, derivatives subject to mandatory clearing, mainly forward rate agreements, interest rate swaps and CDS indices, were almost all centrally cleared. Aramonte and Huang (2019) find that, among derivatives not subject to mandatory clearing, some have migrated to central clearing voluntarily. The decision whether to migrate contracts depends on the benefits of lower margin requirements, potential gains from netting positions within the same asset class and relative liquidity conditions.

In contrast to trends in other segments of OTC markets, in FX markets initiatives to mitigate risk exposures appear to have stalled. Most FX instruments are deliverable contracts, which involve an exchange of principal. Thus, settlement risk – the risk that one counterparty fails to deliver after the other has delivered – is a major concern. In the 2000s, a number of initiatives, most notably the establishment of Continuous Linked Settlement, a specialist institution that settles FX transactions on a payment-versus-payment basis, led to a big reduction in FX settlement risk. However, Bech and Holden (2019) conclude that FX settlement risk has risen since 2013. In particular, the proportion of trades using payment-versus-payment systems has declined. Encouraging use of these systems and opening them to fast-growing emerging market currencies would help to reverse this trend.

customers to conduct trades, subject to credit limits, with a group of predetermined counterparties in the prime broker's name.

References

- Aramonte, S and W Huang (2019): "OTC derivatives: euro exposures rise and central clearing advances", *BIS Quarterly Review*, December, pp 83–93.
- Bech, M and H Holden (2019): "FX settlement risk remains significant", *BIS Quarterly Review*, December, pp 48–49.
- Ehlers, T and B Hardy (2019): "The evolution of OTC interest rate derivatives markets", *BIS Quarterly Review*, December, pp 69–82.
- Packer, F, A Schrimpf and V Sushko (2019): "Renminbi turnover tilts onshore", *BIS Quarterly Review*, December, pp 35–6.
- Patel, N and D Xia (2019): "Offshore markets drive trading in emerging market currencies", *BIS Quarterly Review*, pp 53–67.
- Schrimpf, A and V Sushko (2019a): "Sizing up global foreign exchange markets", *BIS Quarterly Review*, December pp 21–38.
- (2019b): "FX trade execution: highly complex and fragmented", *BIS Quarterly Review*, December, pp 39–51.