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OTC foreign exchange and interest rate derivatives markets through the prism of the Triennial Survey[1]

Five articles in this special edition of the BIS Quarterly Review *provide new insights about foreign exchange (FX) and over-the-counter derivatives markets by drawing on the data compiled in the 2022 BIS Triennial Central Bank Survey. In the FX space, an accelerating shift towards less "visible" trading venues and bilateral trading may reduce the information content of prices and the network benefits of integrated markets. Trading of emerging market economy currencies has become more internationalised, increasingly resembling that of advanced economy currencies. At the same time, the incidence of settlement risk has remained obstinately high, and FX swap positions point to a growing volume of "missing" US dollar debt. In interest rate derivatives markets, the reform of benchmark interest rates has altered the risk landscape, giving rise to new types of derivatives as well as new challenges for risk management.*

JEL classification: F31, G15, G23

The BIS Triennial Central Bank Survey of Foreign Exchange (FX) and Over-the-counter (OTC) Derivatives Markets is the most comprehensive source of information on the size and structure of these markets.[2] This special issue of the *BIS Quarterly Review* draws on the data compiled by the 2022 edition of the Triennial Survey.

The five articles in this issue discuss a number of structural financial trends and their implications for the risk landscape. One trend is the migration of FX trading to less visible venues, which reduces the social benefits of integrated markets and adds to gaps in information on the scale and geography of dollar funding risks. Another relates to the heft of emerging market economy (EME) currencies, which are increasingly traded internationally, but with an elevated incidence of settlement risk. Finally, the reform of benchmark interest rates, which has transformed the interest rate derivatives markets, has reduced risks inherent to the Libor era but also introduced new risk management challenges that stem from the plethora of new reference rates.

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

[2] The BIS coordinates the Triennial Survey, conducted every three years since 1986, in cooperation with central banks worldwide under the guidance of the Markets Committee and the Committee on the Global Financial System. More than 1,200 dealers (mainly banks) located in 52 jurisdictions participated in the 2022 survey. Data were collected in two stages: OTC trading of FX spot, FX derivatives and interest rate derivatives was surveyed in April 2022, and the outstanding notional amounts and gross market values of all OTC derivatives were surveyed at end-June. For more information about the Survey and to explore the data, see www.bis.org/statistics/rpfx22.htm.

Key takeaways

- The 2022 BIS Triennial Central Bank Survey reveals a continued shift towards less "visible" FX trading venues, a large and growing volume of "missing" US dollar debt and a trend towards internationalising EME currencies.
- Risk management challenges identified by the Survey relate to reduced information in FX pricing, an obstinately high incidence of FX settlement risk and differences in the risk profiles of new benchmark interest rates.

FX market repositioning amidst high volatility

The latest Survey collects data for April 2022, a month that featured exceptionally volatile FX market conditions. Evolving perceptions about the future path of interest rates for major currencies, rising commodity prices and the war in Ukraine generated much volatility. The resulting risk-off environment led to a cautious approach to international investment and brought FX risk management to the fore.

Against this backdrop, turnover in FX markets continued its upward march at the global level but some key underlying trends came to a halt. Overall, turnover averaged $7.5 trillion per day in April 2022 – a volume 30 times greater than daily global GDP and 14% higher than in early 2019. At the same time, there was a pause in the decade-long rise of dealer banks' trading with "other financial institutions", eg asset managers and principal trading firms (PTFs). Drehmann and Sushko (2022) show evidence that asset managers' FX trading and hedging needs declined along with their international investments. Similarly, after having gained market share at the expense of bank dealers in previous years, PTFs did not make further inroads.

The 2022 Survey also confirmed the trend towards greater fragmentation in FX trading. This trend stemmed from bilateral forms of electronic execution replacing the "visible" trading on electronic limit order books. One driver is dealers' continued success in attracting trades to their proprietary platforms, which typically offer low trading costs. Another is dealers' increased capacity to manage inventory risk by matching offsetting customer trades and through trading with related parties. While it has not hampered market functioning so far, the fragmentation can impair price formation and undermine network synergies inherent to transparent markets. In the extreme, the available information may be simply insufficient for proper analyses of market conditions and financial vulnerabilities.

A key source of vulnerability is the dollar borrowing embedded in foreign exchange markets. Unlike most other types of derivatives, FX swaps, forwards and currency swaps involve the exchange of principal, and thus give rise to payment obligations equal to the full amount of the contract. Globally, dollar obligations amounted to over $80 trillion in mid-2022. Importantly, since these obligations are reported off-balance sheet, standard debt statistics fail to capture them. Such dollar debt is, in this sense, "missing".

The feature by Borio et al (2022) shows that the magnitude of missing dollar obligations is staggering. Among non-banks, those outside the United States had an estimated $26 trillion in off-balance sheet obligations at end-June 2022, or double

their on-balance sheet dollar debt. For their part, non-US banks, with limited access to credit from the Federal Reserve, had an estimated $39 trillion in such obligations, compared with "only" $15 trillion on their balance sheets.

Out of sight, however, should not mean out of mind. FX swap markets are vulnerable to funding squeezes, given the short-term maturity of the off-balance sheet obligations. In the Great Financial Crisis and the market turmoil of March 2020, swap markets emerged as flash points, prompting extraordinary policy actions in the form of central bank swap lines. In both episodes, policymakers were operating with little information about the scale and geography of the dollar rollover needs.

Internationalisation of EME currencies

Trading of EME currencies has become increasingly international, ie comprising transactions in which at least one party resides outside the currency-issuing jurisdiction. For example, the renminbi is now the fifth most actively traded currency largely because of greater trading with entities outside China. More generally, Caballero et al (2022) show that the share of international transactions in the overall trading of EME currencies has approached that for advanced economy (AE) currencies. A driver is a shift in the composition of capital flows to EMEs, from bank lending to portfolio investment.

The greater internationalisation of EME currencies poses policy challenges. For one, it implies that monetary policy transmission is increasingly influenced by conditions in markets abroad and by the behaviour of non-resident intermediaries, which are more difficult to monitor and steer. Central bank cooperation through data gathering efforts (such as the Triennial Survey) and higher-frequency monitoring initiatives (eg the BIS Innovation Hub's Project Rio) help overcome these gaps.

Financial deepening would improve EMEs' resilience to international spillovers. In this respect, Caballero et al (2022) find an indication that EMEs still need to catch up with AEs along one dimension. Specifically, trading of EME currencies remains subdued relative to economic activity, reflecting EMEs' smaller domestic investor base and less than full integration in global markets.

Greater internationalisation of EME currencies also underscores the importance of FX settlement risk, ie the risk that one party to a trade fails to deliver the currency owed. As Glowka and Nilsson (2022) show, trading of major currency pairs typically involves mechanisms that minimise settlement risk, notably payment versus payment. For many EME currencies, however, such mechanisms are not available or are prohibitively costly, despite public and private initiatives to broaden their adoption.

Benchmark reform reshapes fixed income markets

The reform of benchmark interest rates generated a seismic shift in the market for OTC interest rate derivatives. In a policy drive to establish benchmarks that accurately reflect market forces, London interbank offered rates (Libor) – survey-based estimates of funding costs – gave way to "nearly risk-free rates" (RFRs). While three- and six-month term Libor rates were most popular, RFRs are largely based on overnight transactions. The reform has altered the risk landscape and has brought a new mix of

traded instruments to the fore. With some instruments now redundant, the global turnover of interest rate derivatives has dropped by some 20% since the 2019 Survey.

Huang and Todorov (2022a) trace these shifts to the reduction of "fixing risk". This is the risk that long and short positions will not be well matched over an extended period if they refer to term Libor rates fixed on different dates. The transition to overnight RFRs reduced the relevance of this risk and hence the need to hedge it with forward rate agreements (FRAs). Trading of FRAs thus dropped by almost 75% between the 2019 and 2022 Surveys.

The drop had a significant impact on both the currency composition and geographic distribution of turnover in OTC interest rate derivatives. With trading in US dollar FRAs all but vanished, the two main jurisdictions that hosted it – the United States and the United Kingdom – saw their shares in global turnover decline. By contrast, the euro area gained share. This is partly because of a post-Brexit relocation of activity, but also because trading desks there use the reformed Euribor, which preserves the relevance of fixing risk and thus supports demand for euro FRAs.

The post-Libor era has generated new challenges for risk management. For one, as Huang and Todorov (2022b) discuss, the plethora of RFRs can give rise to various "bases" – ie differences between the floating rates that assets and liabilities reference. The differences can be material when short-term interest rates trend up or down, the evolution of interest rates surprises markets or perceived credit risk spikes. While the turnover of new types of basis swaps has picked up, the jury is still out on whether these instruments deliver effective hedges for the prevailing basis risks. Another challenge relates to the strong anchoring of OTC interest rate derivatives markets in RFRs that do not incorporate term, liquidity and credit risk premia. As these rates may not co-move closely with funding costs, financial intermediaries would need to rely on new risk management practices to hedge funding risks.

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