Taking a central role:

# Cause and FX

Change is the only constant, including in the FX world. Since its inception in 2002, CLS has grown and adapted to the needs of the FX market. In mitigating risk and bringing funding and operational efficiencies to market participants, CLS remains the trusted party at the center of the FX ecosystem.

> “The statement ‘change is the only constant’ very much applies to the FX market. Since its inception in 2002, CLS has proven to be the robust settlement backbone in a transforming environment.”

Marc Bayle de Jessé, CEO

**CLS went live in the year 2002 – a time when the internet was creating the ‘global village’,[1] smart phones became popular and social media platforms emerged. As society floored the accelerator of change, a public/private partnership forged a financial market infrastructure for FX settlement called CLS. The world has transformed significantly since then, including the FX ecosystem.**

[1] In 2002, 8.6% of the world’s population had access to the internet, compared to 68% in 2022 (source: internetworldstats.com)

# The invisible giant: How the FX market evolved over time

The FX market is a global, interdependent and decentralized market for currency trading. It is the world's largest financial market today, facilitating international trade, hedging and speculation. Over the years, the FX market has grown significantly, currencies from emerging countries have gained ground, and the FX ecosystem has become more complex.

### Size

FX market turnover has multiplied by a factor of five over the past two decades, from around USD1.5 trillion to approximately USD7.5 trillion per day (see Figure 1). The FX market is now 30 times greater than global gross domestic product.[2]

### Currencies

Throughout its evolution, several key currencies have comprised the bulk of FX trading, dominated by the US dollar, which facilitates offshore funding markets and serves as a base currency via which other currencies are exchanged indirectly.[3] The Chinese renminbi's share of the FX market has grown from 1% twenty years ago to 7% today, making it the fifth most actively traded currency (see Figure 2).

Figure 1: **Global FX market turnover by instrument**

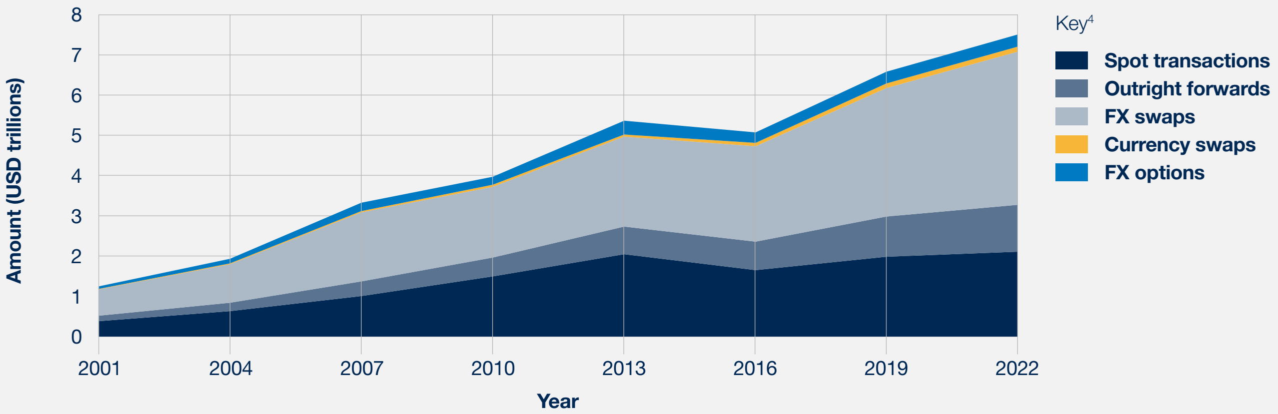
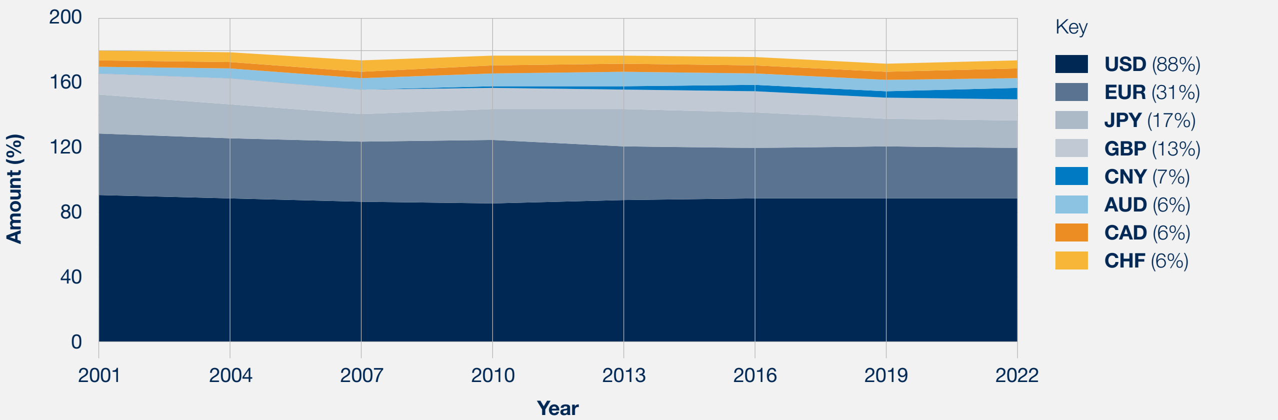



Figure 2: **Global FX market turnover by top eight currencies**




**Source:** Bank for International Settlements Triennial Central Bank Survey of foreign exchange and over-the-counter (OTC) derivatives markets in 2022 (BIS Triennial Survey 2022). Sum of shares in individual currencies totals 200% as two currencies are involved in each transaction.

[2] Global GDP is USD96.1 trillion per annum = USD0.26 trillion per day; source: World Bank, World Development Indicators database, July 2022.
[3] Marontoni, B. (2022) "Revisiting the international role of the US dollar", Box A, BIS Quarterly Review December 2022.
[4] **Spot transactions** are for immediate delivery, which is two business days for most currency pairs. **Outright forwards** settle for a later date. **FX swaps** combine a spot transaction with a forward and are a simultaneous purchase and sale of one currency for another with different value dates. **Currency swaps** involve the exchange of interest (and sometimes of principal) in one currency for the same in another currency. **FX options** give the right but not the obligation to exchange one currency into another.

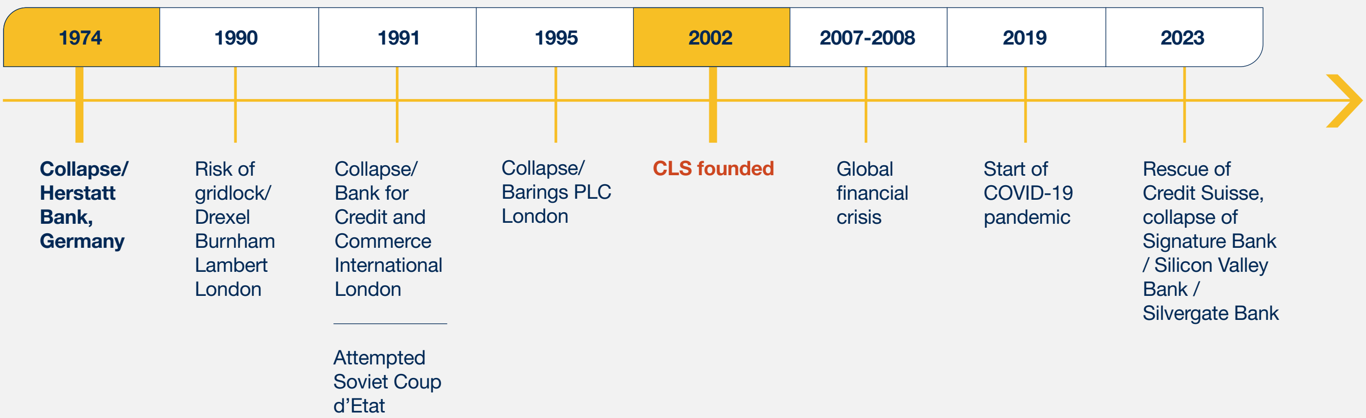
## FX ecosystem composition

FX trades are not made on a central exchange, but instead are arranged bilaterally between two counterparties in so-called over-the-counter (OTC) trading. The FX ecosystem comprises major banks that manage liquidity and risk for their clients and themselves (often referred to as brokers/dealers or market makers), other financial institutions (such as asset managers and hedge funds) and non-bank financial institutions (mainly corporates involved in international trade business). Over the past 20 years, the percentage of FX activity of ‘other financial institutions’ has doubled from around 30% to 60%, mainly at the expense of major banks.[5] The advent of prime brokerage significantly contributed to this development by enabling hedge funds to reach a wider range of counterparties.[6]

Despite its size, complexity and importance to international trade and finance, the FX market sits in the shade of public consciousness compared to the highly visible equity market. It only comes into the spotlight when its most significant risk materializes – the risk of loss of principal. This risk of an institutional participant paying the currency it sold but not receiving the currency it bought, also called settlement risk, can lead to the failure of market participants and trigger a chain reaction that could threaten the stability of the entire financial ecosystem. Settlement risk could materialize if the settlement of FX trades is not fully synchronized, for example due to time zone differences between the jurisdictions where the two payments are made. This risk materialized in 1974 when Bank Herstatt failed,[7] and since then, there have been a number of other failures and near misses, notably in the 1990s (see Figure 3).[8]

> “Settlement risk can lead to the failure of market participants and trigger a chain reaction that could threaten the stability of the entire financial ecosystem.”

Figure 3: **Frictions in the FX space**




**Source:** CLS.

[5] Chaboud, A. et al (2022) “The foreign exchange market”.

[6] Prime brokerage emerged in the late 1990s and is mainly offered by large FX banks to their clients, e.g. allowing the latter to make trades in the name of the former; it inter alia enables hedge funds to reach more counterparties in the FX market while leveraging (often more favorable) credit ratings of the FX banks that offer the service.

[7] In 1974, because of speculations in an environment with high USD volatility, Herstatt Bank had accumulated 470 million DEM/Deutsche Mark (ca. EUR240 million) in losses, compared with capital of only 44 million DEM. When German regulators closed down Herstatt Bank on 26 June 1974 at 16:30 (CET), counterparty banks incurred losses because Herstatt Bank had already received DEM payments and not yet initiated USD payments.

[8] For example: (i) Following the collapse of its parent group, unjustified concerns emerged over the solvency of Drexel Burnham Lambert Trading (DBLT) London. In February 1990, the Bank of England had to make available a settlement facility for DBLT to avoid a gridlock. (ii) July 1991, UK and Japanese FX counterparties incurred losses following the appointment of a liquidator for Bank for Credit and Commerce International in London. (iii) The attempted Soviet Coup d’Etat in August 1991 led to unwillingness of counterparties to expose themselves to risk in FX contracts with Russian counterparties. (iv) The sudden bankruptcy of Barings PLC London in February 1995 caused settlement issues in ECU clearing (which was a set of arrangements for the multilateral netting and settlement of inter-bank payments in the European Currency Unit, the predecessor of the euro).

# The settlement backbone: The role of CLS in the FX ecosystem

**Private sector answer to a public sector call**

The collapse of Herstatt Bank demonstrated that the failure of even a medium sized bank (35th largest in Germany in 1974) to make payments can cause a freezing of inter-bank lending, tremendous distrust among banks and widespread panic in the market. The crisis highlighted the threat of FX settlement risk to the global community of regulators and central banks, and even today settlement risk is still called "Herstatt risk".

The G10 central banks conducted various studies in the late 1980s and early 1990s,[9] which eventually led to a call on industry groups in 1996 to develop and provide risk-reducing services.[10] CLS was established in 2002 as a private sector response to these public sector clarion calls.

**Settlement backbone of the FX ecosystem**

CLS runs the world's largest multicurrency FX settlement system, CLSSettlement. It is part of what is often referred to as the 'unglamorous plumbing',[11] the pipe system that provides the backbone of the financial system, ensuring that money and other assets flow smoothly, safely and efficiently.

CLS mitigates FX settlement risk by synchronizing the settlement of payment instructions for the two currency legs of a trade with finality and irrevocability. It provides payment-versus-payment (PvP) functionality in which a party's payment instruction in one currency is not settled unless the corresponding payment instruction in the counter currency is also settled (see Figure 4). In other words: you get paid only if you pay!

Figure 4: **CLSSettlement flow**


**Source:** CLS.

9 Bank for International Settlement (1989) "Report on Netting Schemes"; BIS (1990) "Report of the Committee on Interbank Netting Schemes of the Central Banks of the Group of Ten countries"; Committee on Payment and Settlement Systems / CPSS (1993) "Central Bank Payment and Settlement Services with Respect to Cross-Border and Multi-Currency Transactions".

10 CPSS (1996) "Settlement Risk in Foreign Exchange Transactions", CPSS (1998) "Reducing Foreign Exchange Settlement Risk".

11 The former President of the Federal Reserve Bank of New York, Gerald Corrigan, was one of the first to use the term "plumbing." It was subsequently referred to in speeches by the former Executive Board member of the European Central Bank, Tomasso Padoa-Schioppa, and used ever since for visualizing payment processing.

12 The PvP cycle of CLSSettlement is based on two separate but linked processes: (i) Settlement takes place over a two-hour period (07:00 to 09:00 CET) on the accounts of the relevant settlement members on CLS's books. (ii) Funding occurs over a five-hour window (07:00 to 12:00 CET) in which the 18 RTGS systems of the CLS-eligible currencies have overlapping processing hours. Each CLS settlement member satisfies its funding obligations by making payments to CLS through the RTGS systems for each relevant currency (pay-ins). CLS, in turn, makes its payments to settlement members through the applicable RTGS systems (pay-outs).

These days, a lot of research and experimentation with new technologies (in particular blockchain / distributed ledger technologies) revolves around the value of ‘atomic settlement’. In essence, this is the simultaneous settlement that CLS offers.

During times of extreme volatility and sharp settlement volume increases, be it the 2007–2008 global financial crisis,[13] the COVID-19 pandemic or the more recent frictions in the financial sector (Credit Suisse rescue, collapse of Signature Bank, Silicon Valley Bank and Silvergate Bank), CLSSettlement processed the added volumes with no issues or delays. Banks turned to CLS knowing their FX payment instructions would settle on time and with finality. Given CLS’s role at the center of the FX world, it contributes to the robustness of the whole ecosystem and all its participants, providing what is -commonly referred to as a public good.

### The *de facto* market standard for addressing FX settlement risk

CLSSettlement has quickly become the *de facto* market standard for tackling FX settlement risk. This is recognized by recent public and private sector initiatives:

- In 2013, the Basel Committee on Banking Supervision (BCBS) issued guidance recommending using PvP settlement where practicable.[14] In 2020, the Chairs of the BCBS and the Committee on Payments and Market Infrastructure (CPMI) encouraged meeting the expectations agreed in 2013.[15]
- In 2020, the Financial Stability Board (FSB) published the G20 Roadmap for Enhancing Cross-Border Payments, which comprises a workstream (called Building Block 9) to facilitate increased adoption of PvP.[16] The CPMI subsequently engaged with public and private sector stakeholders to develop feasible options for increasing PvP adoption.[17]
- The 2021 update of the FX Global Code[18] encourages FX market participants to explore ways to further mitigate risk and reduce operational costs by adopting a best practice approach to FX settlement risk management and netting (principles 35 and 50).

Given the critical role CLS plays in maintaining the stability of the FX market and the wider financial industry as a whole, it is considered a systemically important financial market utility.[19] It is subject to the Principles for Financial Market Infrastructures (PFMI) published by the CPMI and the Technical Committee of the International Organization of Securities Commissions (IOSCO) in 2012.[20]

CLS is regulated and supervised by the Board of Governors of the Federal Reserve System and the Federal Reserve Bank of New York. The central banks whose currencies are eligible for settlement play an active role in the oversight of CLS.

Being mutually owned and globally regulated means CLS is uniquely positioned to bring the public and private sides together to develop effective, market-wide solutions that benefit the broader FX ecosystem.

[13] Levich (2009) “Why foreign exchange transactions did not freeze up during the global financial crisis: The role of the CLS Bank”.
[14] BCBS (2013) “Supervisory guidance for managing risks associated with the settlement of foreign exchange transactions”.
[15] bis.org/press/201217_letter.pdf
[16] FSB (2020) “Enhancing Cross-Border Payments: Stage 3 roadmap”; FSB (2022) “G20 Roadmap for Enhancing Cross-Border Payments: Consolidated progress report for 2022”; FSB (2023) “G20 Roadmap for Enhancing Cross-Border Payments - Priority actions for achieving the G20 targets”.
[17] CPMI (2023) “Final report - Facilitating increased adoption of payment versus payment (PvP)”.
[18] GFXC (2021) FX Global Code (a set of global principles of good practice that was developed by a partnership between central banks and market participants from 20 jurisdictions).
[19] By the United States Financial Stability Oversight Council under Title VIII of the Dodd-Frank Wall Street Reform and Consumer Protection Act (the “Dodd-Frank Act”).
[20] CPMI/IOSCO (2012) Principles for Financial Market Infrastructures (PFMI); bis.org/cpmi/publ/d101a.pdf

### Facilitating the network effect

The payments business generally benefits from network effects: expanding participation directly improves a payment system's value for all participants. The number of settlement members with direct access to CLSSettlement has increased from 39 at launch to 74 today, with the leading global and regional FX banks connected to the service alongside the largest custodian banks. In addition, more than 30,000 third parties access CLSSettlement indirectly via settlement members. Third-party participation has grown significantly over the years (see Figure 5), and the indirect participants span a wide range of banks, funds, non-bank financial institutions and multinational corporations.

Figure 5: **CLS participation**

| | 2004 | 2007 | 2010 | 2013 | 2016 | 2019 | 2022 |
|---|---|---|---|---|---|---|---|
| **Settlement members** | 48 | 49 | 59 | 63 | 67 | 72 | **74** |
| **Third-party service providers** | 22 | 25 | 34 | 26 | 29 | 27 | **31** |
| **Asset managers (third-party participants)** | n/a | n/a | n/a | 232 | 330 | 420 | **537** |
| **All third-party participants** | 250 | 2,009 | 8,642 | 15,767 | 23,472 | 27,657 | **34,523** |

**Source:** CLS.

### The place for settling the world's most traded currencies

The number of currencies settling in CLSSettlement increased from seven in 2002 (AUD, CAD, CHF, EUR, GBP, JPY and USD) to 18 today (see Figure 6). CLSSettlement-eligible currencies account for over 91% of the total global FX volumes. This percentage, however, should be regarded as an upper bound for two main reasons.[21] First, the system cannot settle FX payment instructions unless both of the currencies of the underlying trade are CLSSettlement-eligible. Calculations based on the 2022 BIS Survey suggest that for 20.7% of all trades, one or both legs are in a currency not supported by CLSSettlement (meaning that both currencies are CLSSettlement-eligible in only 79.3% of trades). Second, both counterparties need to be directly or indirectly connected to CLSSettlement, which is the case for most but not all FX volumes.

Figure 6: **FX market share of CLS-eligible currencies**

| | USD | EUR | JPY | GBP | AUD | CAD | CHF | HKD | SGD | SEK | KRW | NOK | NZD | MXN | ZAR | DKK | ILS | HUF | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Rank** | 1 | 2 | 3 | 4 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 16 | 18 | 20 | 23 | 28 | |
| **%** | 88.5 | 30.5 | 16.7 | 12.9 | 6.4 | 6.2 | 5.2 | 2.6 | 2.4 | 2.2 | 1.9 | 1.7 | 1.7 | 1.5 | 1.0 | 0.7 | 0.4 | 0.3 | **Total 182.8** |

Because every FX trade involves two currencies, the total turnover equals 200%. The data imply that the 18 CLS-eligible currencies account for 182.8 = 91.4% of the total global FX volumes. **Source**: BIS Triennial Survey (2022).

[21] Kos, D., Levich, R. (2016) "Settlement risk in the global FX market: how much remains?".

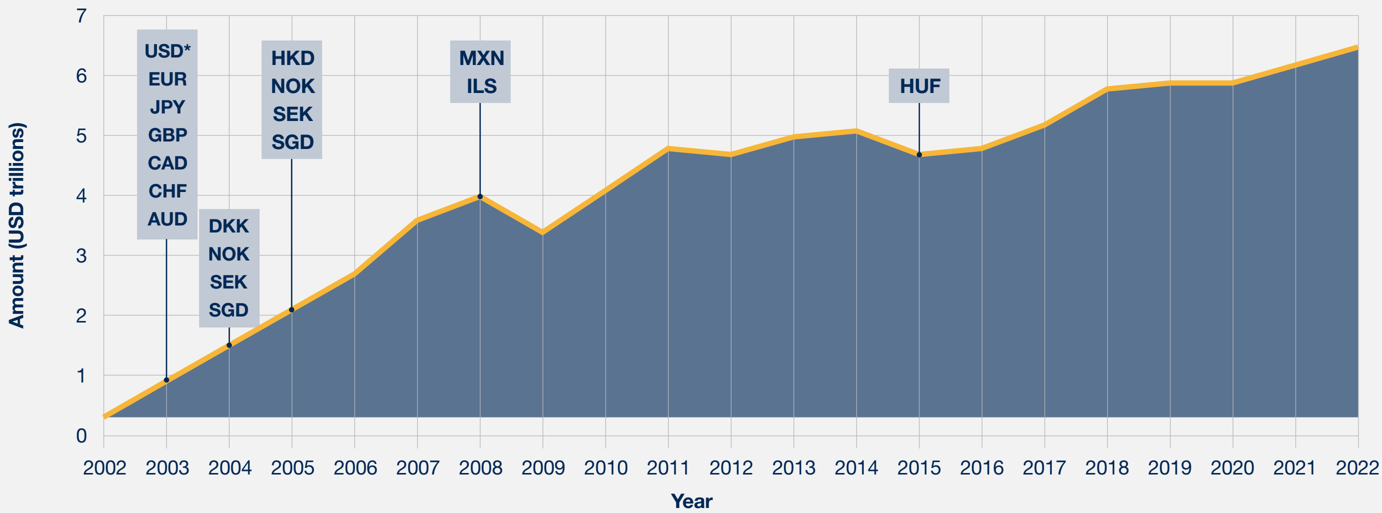
### The world's largest financial market infrastructure

In the early years, CLS saw a steep increase in average daily values settled (from USD0.3 trillion per day in 2002 to USD4.0 trillion per day in 2008) alongside the onboarding of additional currencies (see Figure 7). Over the last decade, average daily values settled have steadily increased, reaching approximately USD6.5 trillion[22] in the first half of 2022. The system has proven robust on peak days, with a record value of USD15.4 trillion settled without issue in December 2021.

Due to its unique position and role in the global FX market, CLS is not directly comparable to any other financial market infrastructure. However, to illustrate the magnitude of average daily turnover, it can be said that CLSSettlement handles almost twice the traffic of the US large-value payment system (Fedwire Funds Services: USD3.8 trillion per day in 2021)[23] and more than three times the turnover of the euro area's system (TARGET2: EUR1.8 trillion per day in 2021).[24]

> "Due to its unique position and role in the global FX market, CLS is not directly comparable to any other financial market infrastructure."

Figure 7: **CLS average daily turnover**




*Date when currencies joined CLS.

**Source:** CLS.

[22] USD6.5 trillion represents the payment obligations derived from the underlying trades. It should be noted that each spot trade and deliverable forward produces two payment instructions while each FX swap and currency swap requires the processing of four payment instructions.
[23] federalreserve.gov/paymentsystems/fedfunds_data.htm
[24] www.ecb.europa.eu/pub/pdf/targetar/ecb.targetar2021.en.pdf

# Accelerated change: How CLS remains the anchor in the FX space

Looking back is crucial to moving forward. The joint efforts of both the public and private sectors to mitigate FX settlement risk has come a long way. Over time, discussions sparked by the collapse of Herstatt Bank in 1974 converged to the common understanding that PvP is the best mechanism to address FX settlement risk.

CLS answers this call, providing PvP settlement on a global scale every day. It mitigates FX settlement risk and, as will be discussed in a forthcoming white paper, also delivers significant liquidity and operational efficiencies to participants — benefits which may amplify as the global interest rate environment changes.

The FX market will continue to evolve. Adapting to the changing needs and addressing risk is a joint effort of paramount importance. CLS stands ready to work on solutions with the community of regulators, central banks and its clients.


**For more information please email info@cls-group.com**

## FX Global Code

Using CLS products and services plays an integral part in helping you comply with the FX Global Code. Find out more at cls-group.com

Trusted by thousands of counterparties within the global FX ecosystem, CLS makes FX safer, smoother and more cost effective. Trillions of dollars' worth of currency flows through our systems each day.

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