CLS and FX:

A pioneering partnership with pivotal purpose

As the trusted guardian of the foreign exchange (FX) market, CLS currently settles approximately USD7 trillion daily, across 18 of the world's most traded currencies. The journey to get here has been one of public private sector collaboration and evolution in an ever changing FX ecosystem. This paper elucidates the pivotal purpose of CLS, considers the historical context that drove its creation and subsequent growth, and finally ponders what could be next for the FX market.[1]

[1] This paper utilizes Dr. Alexandra Scriba's thesis published in 2007, entitled "Continuous Linked Settlement: History and Implications".

Crises and committees

The story of CLS began long before its 2002 go-live. In fact, its creation is deeply rooted in 1974, the year following the fall of the Bretton Woods system.[2] Attention sharply focused on settlement risk in FX transactions when Bankhaus Herstatt collapsed, the "first and most dramatic case of a bank failure where incomplete settlement of FX transactions caused severe problems in payment and settlement systems."[3] Although Herstatt was a medium sized German bank, it was a substantial player in the FX market, and its collapse was an "epochal event that sent shockwaves" through the FX market.[4]

Herstatt's closure caused a chain reaction as other banks refused to make their payments and closed their credit lines for banks that were suspected Herstatt counterparties. As it was unknown which banks had suffered losses, most banks were unwilling to meet their obligations unless they received confirmation that the counter-payment had been received. The USD/DEM (Deutsche mark) market collapsed. The New York interbank market nearly collapsed, and the recovery took several days.[5]

Herstatt's downfall created tremendous distrust among banks and widespread panic in the market. This marked the first time that settlement risk in FX trading had attracted major public attention, highlighting the threat of FX settlement risk to the global financial sector. Settlement risk is the risk that one party to an FX transaction delivers the currency it sold but does not receive the currency it bought, resulting in a loss of principal. To this day, settlement risk is often referred to as "Herstatt Risk".[6]

Following the Herstatt collapse, a series of "real losses and near misses"[7] occurred over the last quarter of 20th century, which time and time again highlighted the significance of settlement risk and its systemic implications in a growing FX ecosystem (figure 1). These incidents prompted two main threads of work by the global public policy community.

First, central banks focused on international cooperation to reduce risks in the FX market.[8] Second, global standards were established with the aim of ensuring that the infrastructure supporting global financial markets is robust and able to withstand financial shocks.[9]

In relation to the first thread of work, the Group of 10 (G10) central banks formed committees such as the Group of Experts on Payment Systems and the Committee on Interbank Netting Schemes to monitor these issues and provide future guidance and recommendations. The reports published by these forums provided guidance regarding developments of new settlement standards. In 1990, these committees were replaced by the Committee on Payment and Settlement Systems (CPSS), which continued and extended their work.[10] The CPSS was renamed, with a new mandate and charter, to the Committee on Payments and Market Infrastructures (CPMI) at the June 2014 central bank Governors of the Global Economy meeting.

Through the 1990s, a series of reports published by the CPSS (figure 2), entwined with various incidents that exposed the dangers of settlement risk (figure 3) led to a global effort to develop new settlement standards for FX transactions, and ultimately to the development of the CLS settlement system.

Figure 1: **Incidents affecting the FX market in the last quarter of the 20th century**

Year	Events	Cause
1974	Bankhaus Herstatt	Fraudulently concealed losses caused its banking license to be revoked, and all activities immediately shut down. Time lag issues and a chain reaction of banks refusing to make payments led to closed credit lines to suspected counterparties of Herstatt.
1990	Drexel Burnham Lambert Group (DBLG)	A series of events in 1989 led DBLG to file for bankruptcy. The financially sound subsidiaries of DBLG became financially gridlocked, as counterparties afraid of credit exposures during settlement ceased business with these subsidiaries.
1991	Bank for Credit and Commerce International (BCCI)	BCCI's complex corporate structure made it hard to regulate and monitor on a consolidated basis, and large-scale fraud was uncovered in 1991. Difficulties arose in shutting down BCCI due to FX activity that created time lags. Counterparties of BCCI suffered a loss of principal.
1991	Attempted Soviet Coup D'État	Settlement risk arose from unstable political environments. Market counterparties of Soviet institutions were unwilling to expose themselves to potential acute settlement risk, which in turn created liquidity risk for Soviet banks.
1995	Barings Bank	Fraud committed by a single rogue trader caused the collapse of Barings Bank. The event demonstrated that even a failure of a small number of transactions can create serious disruptions in a clearing system.

[2] See: cls_fx_policy_02_fall_of_bretton_woods_fx_50years_afloat_shapingfx_series_oct2023.pdf
[3] See: Settlement risk in foreign exchange markets and CLS Bank – BIS Quarterly Review, part 6, December 2002.
[4] "Herstatt risk" still has relevance half a century on from bank's demise – Banking Risk and Regulation, 2024.
[5] Dr. Alexandra Scriba, "Continuous Linked Settlement: History and Implications", 2007, p.33.
[6] See Sawaichiro Kamata, 1990. "Measuring "Herstatt Risk"," Monetary and Economic Studies, Institute for Monetary and Economic Studies, Bank of Japan, vol. 8(2), pages 59–74, September.
[7] Dr. Alexandra Scriba, "Continuous Linked Settlement: History and Implications", 2007, p.32.
[8] Dr. Alexandra Scriba, "Continuous Linked Settlement: History and Implications", 2007, p.33.
[9] International standards such as the "Core Principles for systemically important payment systems" were eventually established by the BIS Committee on Payment and Settlement Systems (CPSS) in 2001 and replaced by the "Principles for financial market infrastructures" (PFMI) in 2012.
[10] For more information on the history of the CPMI, see: History of the CPMI.

Figure 2: **Reports published by G10**

1989: Angell Report: Report on Netting Schemes[11]

Remit: Analysis of how far existing or future netting arrangements might contribute to the efficiency of the international financial markets and payment systems, and what effect they might have on counterparty credit and liquidity risks.

Key findings: Report found that banks have strong incentives to lower their credit exposure as well as interbank payment flows due to transaction costs and implicit or explicit costs of holding balances and obtaining credit to effect settlement.

Report highlighted the importance of balancing the efficiencies of netting solutions against the costs associated with applicable credit and liquidity risks.

1990: Lamfalussy Report: Report of the Committee on Interbank Netting Schemes of the Central Banks of the Group of Ten countries[12]

Remit: Analysis of the policy implications of cross-border and multicurrency netting arrangements identified by the Angell Report as being of particular concern to central banks collectively.

Key findings: Report concluded that netting systems could reduce the size of credit and liquidity exposures and thereby help to limit systemic risk.

Report set out six minimum standards for the design and operation of cross-border and multicurrency netting schemes, the "Lamfalussy-criteria":

1. Netting schemes should have a well-founded legal basis under all relevant jurisdictions.
2. Netting scheme participants should have a clear understanding of the scheme's impact on each of the financial risks affected by the netting process.
3. Multilateral netting systems should have clearly defined procedures for managing credit and liquidity risks which specify the respective responsibilities of the netting provider and the participants. These procedures should also ensure that all parties have both the incentives and capabilities to manage and contain the risks they bear and that limits are placed on the maximum credit exposure that can be produced by each participant.
4. Multilateral netting systems should, at a minimum, be capable of ensuring the timely completion of daily settlements in the event of an inability to settle by the participant with the largest single net debit position.
5. Multilateral netting systems should have objective and publicly disclosed criteria for admission, which permit fair and open access.
6. All netting schemes should ensure the operational reliability of technical systems and the availability of back-up facilities capable of completing daily processing requirements.

1993: Noël Report: Central Bank Payment and Settlement Services with Respect to Cross-Border and Multi-Currency Transactions[13]

Remit: Analysis to identify and enhance a common understanding of the advantages and disadvantages of different central bank services related to payment and settlement systems.

Key findings: The report analyzed the different central bank settlement services and found that each central bank will view issues from a different perspective determined by its individual circumstances.

The report highlighted the interrelation between domestic settlement system features with international settlement arrangements and emphasized the need for private sector efforts to reduce risks and advance efficiency of cross-border and multicurrency settlement.

1996: Allsopp Report: Settlement Risk in Foreign Exchange Transactions[14]

Remit: Analysis of existing arrangements for settling FX trades to assess the level of settlement risk in the FX market. Conducted a survey of 80 banks in G10 countries.

Key findings: The report for the first time provided a well-defined measure to quantify FX settlement exposure. It found that it usually takes more than three business days from when payment instructions are irrevocable until a bank knows with certainty that it has received the funds.

The report advised a three-track strategy to address settlement risk in the FX market, emphasizing the need for private/public sector coordination.

1. Individual bank action (applying an appropriate credit control process to settlement exposures).
2. Industry group action (encouraging the construction and implementation of settlement services, as it is believed that the private sector can provide these services more efficiently than the public sector).
3. Central bank action (inducing private sector progress).

1998: Progress Report: Reducing foreign exchange settlement risk[15]

Remit: Progress report on the CPSS three-track strategy outlined in the 1996 Allsopp Report.

Key findings: The report found progress had been made on all three tracks:

1. Individual institutions had enhanced the management of their FX settlement exposures.
2. Industry groups had made progress through advancing bilateral netting arrangements. The report mentions the company CLS Services which had been set up to develop plans for a "continuous linked settlement" bank (the CLS Bank) as a limited-purpose bank providing a form of payment-versus-payment (PvP) settlement for FX transactions.
3. Central banks had made progress in improving wholesale payment systems, for example extending operating hours.

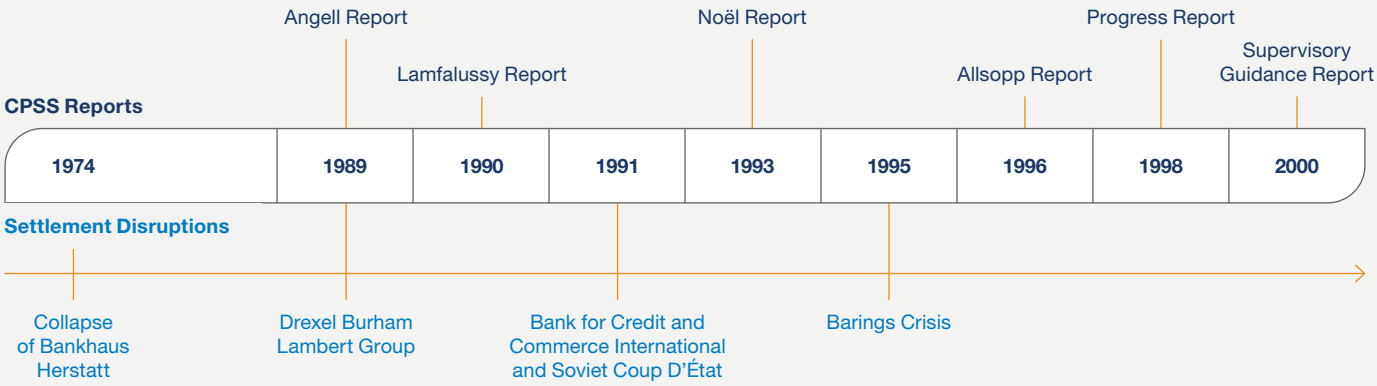
2000: Supervisory Guidance Report (BCBS)[16]

Remit: Report by the Basel Committee for Banking Supervision (BCBS) setting out supervisory guidance for managing settlement risk in FX transactions.

Key findings: The report sets out guidance to supervisors and banks on approaches for managing the risks associated with FX transactions and promoting the use of PvP arrangements where practicable to reduce principal risk.

[11] See 3: Report on netting schemes (Angell Report) – Feb 1989: bis.org
[12] See 5: Report of the Committee on Interbank Netting Schemes of the central banks of the Group of Ten countries (Lamfalussy Report) – November 1990: bis.org
[13] See 8: Central bank payment and settlement services with respect to cross-border and multi-currency transactions (Noël Report) – Oct 1993: bis.org
[14] See CPSS Publications – Settlement risk in foreign exchange transactions – Mar 1996: bis.org
[15] See CPSS Publications – Reducing foreign exchange settlement risk: a progress report – Jul 1998: bis.org
[16] See Supervisory guidance for managing risks associated with the settlement of foreign exchange transactions: bis.org This guidance was expanded on and replaced in 2013; see Supervisory guidance for managing risks associated with the settlement of foreign exchange transactions – Feb 2013: bis.org

Figure 3: **Crises and committees**



Source: Dr. Alexandra Scriba, thesis 'Continuous Linked Settlement: History and Implications', 2007

CLS is born (1994 to 2002)

CLS emerged from these collaborative efforts, report findings and recommendations of the G10. The published reports, particularly the Allsopp report in 1996, found it increasingly clear that action was needed through private/public sector coordination to reduce settlement risk in the global FX market. The Allsopp report found that private sector institutions had the potential to significantly reduce settlement risk in FX transactions, and this was received as a call to action across the industry.[17]

The mid-1990s saw the formation of the G20[18] – a common interest group of senior bankers from large international financial institutions active in the FX market.

With increasing fears that the Bank for International Settlements (BIS) might impose restrictions on banks in order to reduce settlement risk and thereby cause increased capital charges for outstanding FX settlements,[19] the G20 institutions initiated the development of a private sector solution to reduce settlement risk in FX transactions.[20] The G20 group formed the Operational Feasibility Working Group (OFWG) to explore potential solutions to solve the "Herstatt problem" in the FX market. Three models were proposed to the OFWG in late 1994 to assess feasibility (figure 4).

After model 1 was deemed inferior, the OFWG used the six Lamfalussy standards (described in figure 2), as well as criteria defined by the G20 themselves, to evaluate models 2 and 3. At a February meeting in 1996, the G20 voted to adopt model 3, the "continuous linked settlement" approach using PvP settlement. The ambitious plan was to implement the "continuous linked settlement" concept within just three years.[21]

Figure 4: **Models to solve the "Herstatt problem"**

1. Gross matching with earmarking

Settlement via national RTGS systems with final transfer of earmarked funds only if counterparty settles respectively. PvP is achieved by using message switching to coordinate the local payment systems in a way to ensure that a set of transactions are settled on an all-or-none basis. The concept is set up as a technological "superstructure" operating on the existing RTGS systems.

2. Matching with netting

Solution offering matching and reporting services combined with a multilateral net PvP mechanism via self-collateralization. Net debit participants are obligated to fulfill their pay-ins by a specified deadline. The system monitors payments received based on real-time information from the local RTGS systems and releases payments owed to participants that fulfill their obligations. Matched instructions are revocable during the pre-settlement period but become final with the start of the settlement period. Each participant settles directly with special accounts in its local RTGS system.

3. Clearing house bank

PvP mechanism with continuous real-time linked processing and item-by-item settlement through the posting of debits and credits to member accounts in a multicurrency clearing system. Later called CLS.

Source: Dr. Alexandra Scriba, thesis 'Continuous Linked Settlement: History and Implications', 2007

[17] See CPSS Publications – Settlement risk in foreign exchange transactions – Mar 1996: bis.org
[18] This group was made up of major foreign exchange market participants.
[19] See CPSS Publications – Settlement risk in foreign exchange transactions – Mar 1996: bis.org
[20] Dr. Alexandra Scriba, "Continuous Linked Settlement: History and Implications", 2007, p.48.
[21] Dr. Alexandra Scriba, "Continuous Linked Settlement: History and Implications", 2007, p.49.

Model 3 was considered the preferred solution because it combined the legal certainty of gross (transaction by transaction) settlement with the liquidity advantages of net funding. This was achieved by putting a bank at the center to hold accounts. In essence, model 3 embodied the premise "If I pay, I get paid". The model not only mitigates settlement risk (risk of loss of principal when one pays but does not receive the countervalue), but also of liquidity risk (risk of not receiving countervalue at the intended time).

Work on establishing CLS was well underway in 1996 and 1997, with specifications defining membership criteria, business requirements as well as RTGS system and central bank access rules (like extending RTGS system operating hours for AUD, JPY and CAD). After considering various jurisdictions, London and New York were both deemed suitable domiciles for the legal entity. Eventually, the G20 decided to make London the home of "CLS Services Ltd," which was established in July 1997 as the project's first legal entity.

Due to mounting pressure from central banks to tackle settlement risk in the FX market, the private sector developed various other initiatives to establish CLS. Following a period of discussion and deliberation, two of these initiatives (ECHO and Multinet) were acquired by CLS Services in late 1997[22] and combined to create a single industry facility to reduce settlement risk.

Progress on the CLS initiative was noted by the CPSS Progress Report of 1998 (described in figure 2), and in April of that year IBM was chosen as prime contractor to build the CLS system.

Key milestones were reached over the next four years. In 1999 the US Federal Reserve Board of Governors granted a banking license to 'CLS Bank International', a second legal entity established in New York as a special purpose, Edge Act corporation for the provision of the CLS settlement service, CLSSettlement.

In June 2001, the US Federal Reserve Board of Governors approved the CLS Group corporate structure including the formation of CLS Group Holdings AG in Switzerland which, together with its subsidiaries in London and New York, set the model for CLS's current structure.[23]

The CLSSettlement system went live in September 2002 with seven currencies (AUD, CAD, CHF, EUR, GBP, JPY, USD)[24] and 39 settlement members, "a result of unprecedented co-operation among the global FX community."[25] While the initial 1996 plan to launch in just three years proved overly optimistic, the global launch across multiple jurisdictions and markets was a remarkable achievement and a testament to the coordination and joint efforts by the public and private sectors.

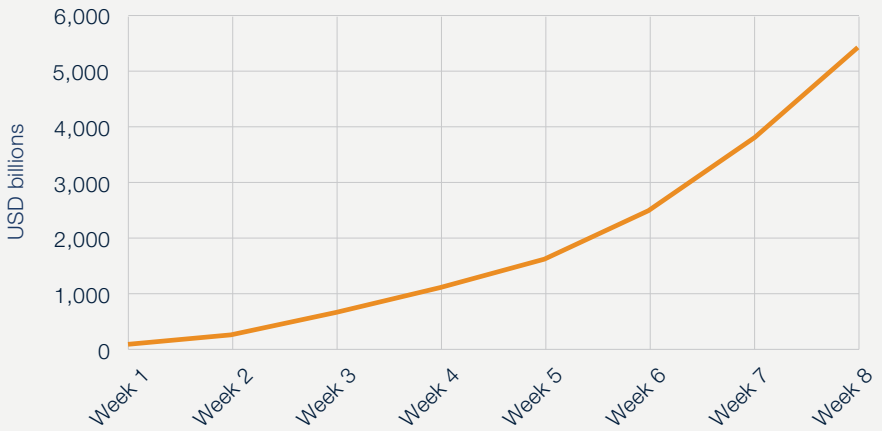
The pivotal purpose of CLSSettlement was, and still is, to mitigate FX settlement risk on a global scale. The CLSSettlement system does this by synchronizing (via PvP) the settlement of payment instructions for the two currency legs of a trade with finality and irrevocability (figure 5).[26]

Figure 5: **CLSSettlement flow**

Source: CLS

[22] See Press release: Central bankers encouraged by private sector progress on reducing FX settlement risk.
[23] CLS's current corporate governance is explained here: Corporate Governance | CLS Companies | CLS Group. CLS Group Holdings AG is the parent company of the CLS group of companies. It is incorporated in Switzerland and is regulated by the US Federal Reserve as if it were a bank holding company. CLS UK Intermediate Holdings Ltd. is organized under the laws of England and Wales and is located in London, with a representative office in Tokyo and a branch office in Hong Kong. The company acts as the intermediate holding company for CLS and provides corporate services to the CLS group of companies. It has four wholly-owned subsidiaries: CLS Services Ltd.; CLS Bank International; CLS US Services Inc.; and CLS Processing Solutions Ltd. CLS Bank International (CLS Bank) is an Edge Act corporation, which is a limited purpose institution regulated by the US Federal Reserve. CLS Bank, located in New York, provides the CLSSettlement service and, to do so, maintains a central bank account for each of the 18 eligible currencies. The Federal Reserve acts as the lead overseer of CLS Bank in a cooperative oversight arrangement with the central banks whose currencies are settled by CLS Bank.
[24] Australian dollar (AUD), Canadian dollar (CAD), Euro (EUR), Japanese yen (JPY), Swiss franc (CHF), UK pound sterling (GBP) and US dollar (USD).
[25] See About Us | CLS's Services, Products & Mission | CLS Group.
[26] See cls_shapingfx01_causeandfx_april2023.pdf

Figure 6: **Cumulative gross value of payment instructions settled in CLS bank in the first two months of operation in 2002**



Source: CLS

> "This multilateral netting yields significant liquidity benefits for CLS settlement members."

A key function of CLS came to be the tools to reduce strains on liquidity in the FX market, and these are of utmost importance for the RTGS settlement systems of each currency settled in CLS.[27] While settlement occurs on a gross basis, the corresponding funding process is multilaterally netted, delivering huge liquidity efficiencies and savings. Funding requirements for each settlement member are based on a multilateral net calculation of the expected positions in each CLS-eligible currency, resulting in liquidity savings of approximately 96%.

Today, pay-in obligations can be further reduced using an optional in/out swap service. As a result, CLS settlement members fund only around 1%[28] of the total value of their payment instructions on a typical day.

The volume of transactions settling through CLS increased rapidly over the first two months of operation (figure 6), and the system settled an average daily value of USD305 billion in 2002.

[27] See cls-shaping-fx-03-liquidity-benefits_do_not_settle_for_less.pdf

[28] An in/out swap is a swap transaction. The first leg settles inside CLS (the "in" part of the swap), and the second leg settles outside CLS (the "out" part of the swap). The effect of the swap is to reduce a participant's net short position in one currency that settles within CLS (with a corresponding reduction in the net short position in the counter currency for its counterparty), and therefore the funding required in CLS by each participant in the swap. While the "in" leg minimizes funding needs, the "out" leg must be settled outside CLSSettlement and thereby introduces settlement risk back into the market.

From then till now, the trusted guardian in an everchanging FX ecosystem

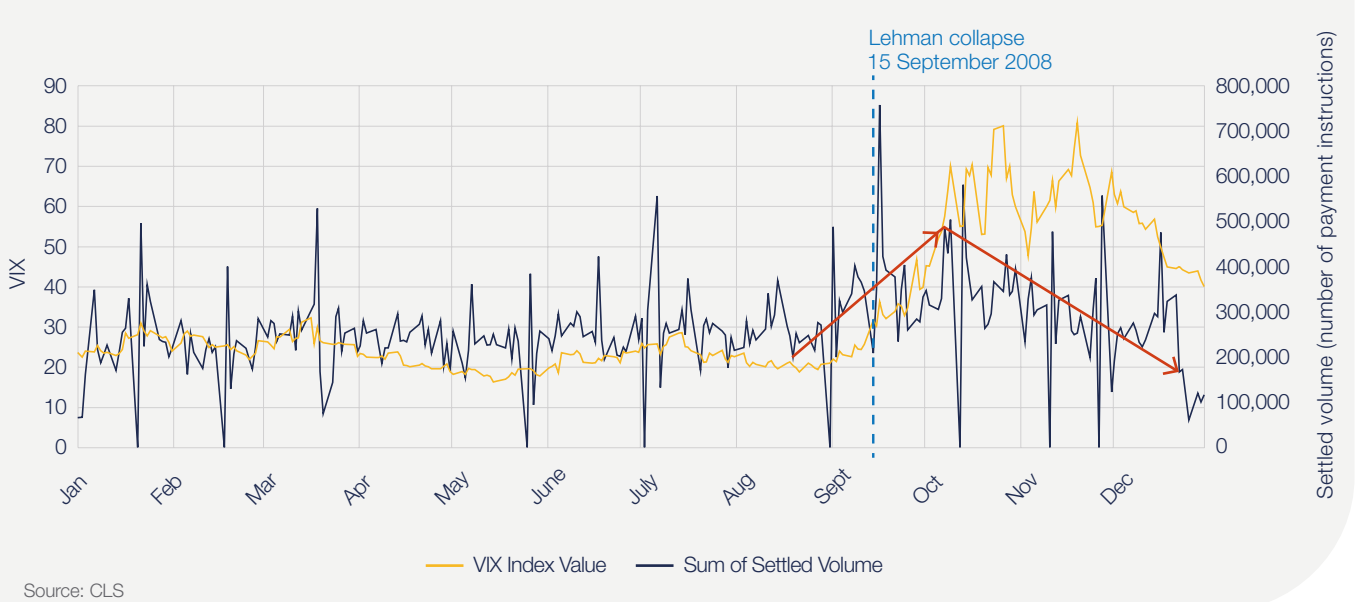
The world has changed a lot since 2002, as has the FX ecosystem (figure 8). Growth and globalization have transformed the global payment landscape, and the FX market today operates as the world's largest financial market, facilitating international trade, hedging and speculation. When Bankhaus Herstatt was active, the FX market's daily trading volume was below USD100 billion globally.[29] Between 1983 and today, FX market turnover surged from USD110 billion to around USD7.5 trillion per day.[30] To put this in perspective, in 1983, the FX throughput was around four times the (daily) global GDP, while in 2024, FX turnover was more than twenty-five times.[31]

So too has CLS grown to become the *de facto* market standard for mitigating settlement risk and facilitating connections across the ecosystem. It continues to sit at the center of an everchanging FX ecosystem, with more than 70 settlement members and 37,000+ third-party participants settling 18 of the world's most traded currencies. The creation of CLS significantly boosted FX market activity, as the settlement risk mitigation CLS delivers stimulated growth in FX market volumes, which in turn increased the need for CLS's settlement risk mitigation. CLSSettlement now settles an average of over USD7 trillion daily, and in March 2025 the average daily value (ADV) settled was a record USD8.7 trillion.

The CLSSettlement system has also proved its ability to successfully serve its main purpose of mitigating settlement risk even during unusual times. The stability CLS provides in turbulent times was evident throughout the global financial crisis of 2007–2008. The collapse of Lehman Brothers in September 2008 ushered in the largest bankruptcy in US history, causing the interbank lending market to dry up and prompting governments to step in to provide liquidity and guarantee deposits.[32] Lehman Brothers was a major player in global FX trading, yet its demise did not cause any disruption. The FX market remained vibrant; and in fact, volumes grew considerably due to increased volatility in exchange rates, and consequently market infrastructures like CLS processed unprecedented volumes (figure 7). This response from the market demonstrated that FX players knew and trusted CLS's PvP service as a safe mechanism for settling FX trades.

The recent past is characterized by repeated disruptions caused by economic events (like the Credit Suisse rescue or collapse of banks such as SVB, Signature Bank and Silvergate Capital) or non-economic shocks (like the Covid-19 pandemic, war in Ukraine and tensions in the Middle East). These crises, alongside the risk of irreversible climate change and other risks, have led commentators to describe today's world as on the brink of "polycrisis".[33] Moreover, various changes in the global economy are slowing down the internationalization of economic activities, often referred to as "slowbalization."[34]

Figure 7: **Volatility Index (VIX) and CLSSettlement volume 2008**



Source: CLS

[29] See DraKoln, N. (2004) Forex for small speculators.
[30] See Frankel, J. et al (1996) The microstructure of foreign exchange markets / chapter: Risk and Turnover in the Foreign Exchange market; BIS Triennial Central Bank Survey – Foreign exchange and derivatives market activity.
[31] See World Bank, World Development Indicators database: global GDP in 1983: USD11.84 trillion = ca. USD0.03 trillion per day; global GDP in 2024: US106.17 trillion per annum = USD0.29 trillion per day.
[32] ECB FX Contact Group and Operations Managers Group (2009). Report on Operational Lessons From the Demise of Lehman Brothers in Autumn 2008, March 2009.
[33] Polycrisis is "a cluster of related global risks with compounding effects, such that the overall impact exceeds the sum of each part"; see: World Economic Forum (2023).
[34] See Charting Globalization's Turn to Slowbalization After Global Financial Crisis.

Figure 8: **Growth and globalization since CLS go-live in 2002**

	2002	2025
What was happening in the world at this time?	• Euro banknotes and coins enter circulation • Nokia's 7650 arrived in June 2002 as Europe's first mobile phone with an integrated camera	• 94% of central banks are exploring central bank digital currencies • ChatGPT now has 1 billion weekly active users • Apple expected to launch the iPhone 17 in September 2025
CLS currency make up	• Seven currencies when CLS began operations – Australian dollar (AUD), Canadian dollar (CAD), Euro (EUR), Japanese yen (JPY), Swiss franc (CHF), UK pound sterling (GBP) and US dollar (USD)	• 18 of the world's most traded currencies: Australian dollar (AUD), Canadian dollar (CAD), Danish krone (DKK), Euro (EUR), Hong Kong dollar (HKD), Hungarian forint (HUF), Israeli shekel (ILS), Japanese yen (JPY), Korean won (KRW), Mexican peso (MXN), New Zealand dollar (NZD), Norwegian krone (NOK), Singapore dollar (SGD), South African rand (ZAR), Swedish krona (SEK), Swiss franc (CHF), UK pound sterling (GBP) and US dollar (USD)
Average daily turnover of global FX market	• FX average daily turnover reaches USD1.2 trillion (BIS 2001)	• FX average daily turnover of USD7.5 trillion (BIS 2022)
Average value settled USD/peak value (CLS)	• CLS settles USD305 billion average daily value (ADV) in CLS's first year of operation	• CLS settles ADV of over USD7 trillion • CLS settles record value of USD19.1 trillion on the 20 June 2024
Number of members (CLSSettlement)	• 39 settlement members	• Over 70 settlement members with 37,000+ third-party participants
Number of products /services offered by CLS	• CLSSettlement	• CLSSettlement (including in/out swaps), CLSNet, In/Out Swaps, CLSMarketData, CLSOptimization, CLSTradeMonitor, CLSClearedFX, Cross-currency swaps and settlement service model with the Depository Trust and Clearing Corporation (DTCC) for OTC derivatives instruments
FX ecosystem at the time	Results of the BIS Triennial Survey 2001:[35] • US dollar was on one side of 90% of all trades (because every FX trade involves two currencies, the total FX turnover equals 200%) • Emerging market and developing economy currencies (EMDE) accounted for around 5% of the activity in the FX market	Results of the BIS Triennial Survey 2022: • US dollar was on one side of 88% of all trades • Growth of EMDE currencies, particularly Chinese renminbi which is now the 5th most traded currency with 7% share in FX market

These developments have and will continue to contribute to elevated uncertainty and volatility in the FX market and other financial markets. CLS has consistently provided an anchor in stormy times, continually delivering excellence and ensuring that market turbulence does not lead to a systemic crash in the FX ecosystem.[36]

CLS has also expanded its product suite to a range of services beyond the settlement service, including:

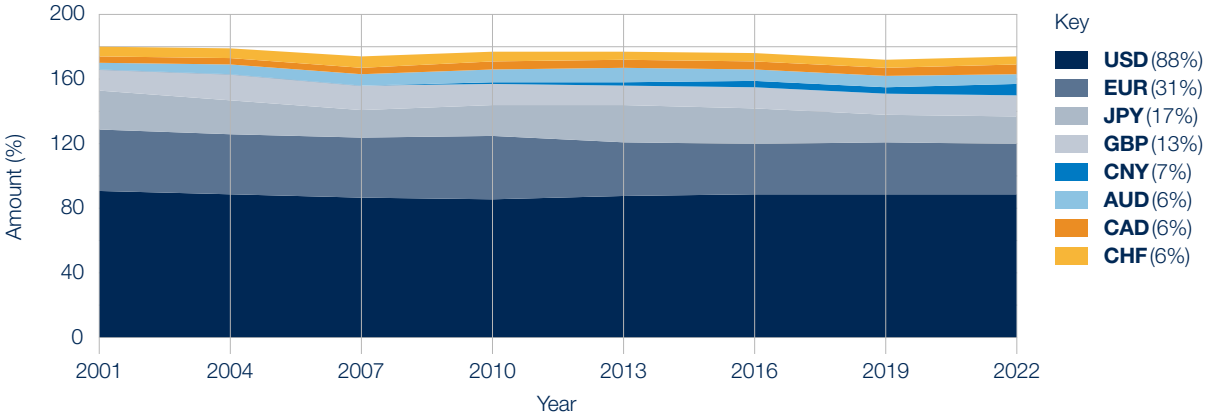
- Cross currency swaps
- Bilateral payment netting calculation
- Trade monitoring tools
- Suite of data products
- Settlement services for OTC derivatives and central counterparties

The FX market has changed not only in size over the first quarter of the 21st century, but also in composition. Over the years, the US dollar has been the most traded currency by far, being on one side of almost 90% of all trades (because every FX trade involves two currencies, the total FX turnover equals 200%).[37] Its unrivaled position can be attributed to its prominent role in offshore markets, international trade and global payments, and because it is used as a vehicle currency for FX transactions.[38]

Recent years have seen a rise in trading of EMDE currencies. Over the past two decades, the share of the Chinese renminbi[39] has grown from 1% to 7%, now making it the fifth most traded currency in the world (figure 9). All globally traded emerging market currencies have a strong international focus, with more than 80% of all such trading activity involving counterparties that reside outside the issuing country.[40]

[35] See Triennial Central Bank Survey 2001 – BIS – March 2002
[36] See whitepaper_04_the-fx_ecosystem_fx_in_times_of_crisis_nov2023.pdf
[37] The dominance of the dollar is due to market efficiency, as the use of one lead currency gives every currency traded the maximum market depth available.
[38] Maronoti, B. (2022) Revisiting the international role of the US dollar. BIS Quarterly Review, December 2022, Box A.
[39] The growth in Chinese renminbi over recent years has been in offshore renminbi (CNH), which can be differentiated from the onshore currency (CNY), which is traded only within mainland China.
[40] Caballero, J. et al (2022) The internationalisation of EME currency trading; BIS Quarterly review December 2022.

Figure 9: **Global FX market turnover by top eight currencies**



Source: BIS Triennial Survey 2022

The growth in EMDE currency trading has caused the proportion of FX trades not settled on a PvP basis to increase in recent years. According to the BIS 2022 Triennial Survey,[41] the share of the FX market without risk mitigation stands at 31% of trades. However, a more recent estimate puts this figure at 10–15%.[42]

This has led the FX market to renew its efforts to reduce FX settlement risk. One way to mitigate the outstanding settlement risk is to make PvP and other practices for risk mitigation, including netting, available to a broader range of currencies – particularly heavily traded EMDE currencies.

Extending PvP solutions comes with challenges, ranging from operational and technological to legal and regulatory, that must be carefully managed in the current geopolitical context. CLS actively supports several public/private sector initiatives around the globe exploring ways to further facilitate the reduction of FX settlement risk:

- Since 2019, CLS has provided an automated bilateral payment netting calculation service, CLSNet. This service helps market participants benefit from greater operational efficiency and enhanced risk mitigation for over 120 currencies, including currencies not supported by CLSSettlement. This service continues to grow, and its average daily netted value[43] was USD178 billion in Q1 2025, an increase of 28% from the same period in 2024. In December 2024 CLSNet saw a record daily netted value of USD620 billion.
- In October 2020, the Financial Stability Board published the G20 Roadmap for Enhancing Cross-Border Payments, an initiative addressing the challenges of cost, speed, transparency and access in cross-border payments. Building Block 9 of the G20 roadmap focuses on mitigating FX settlement risk for cross-border payments – a key challenge for the wholesale market – by encouraging the use of PvP arrangements. The G20 initiative acknowledges that while existing PvP systems like CLSSettlement have made significant progress in reducing settlement risk, there are still obstacles to broader PvP adoption.[44]
- During its first two years, the G20 roadmap initiative focused on stock-takes and analysis. On this basis, and in an effort to deliver tangible enhancements to cross-border payments by the end of the 2027, the project established a three-year prioritization plan and a public/private sector engagement model.[45] As a member of the CPMI-led Payments Interoperability and Extension (PIE) task force, CLS is working with a diverse group of public and private sector stakeholders to help achieve the G20 cross-border payments targets. CLS is helping the project explore ways to mitigate settlement risk for cross-border payments that cannot currently be settled via PvP.
- CLS also contributed to the three-year review and update of the December 2024 FX Global Code ('Code'), published in January 2025.[46] The Code is a set of global principles of good practice for the FX market, which *inter alia* 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). The changes to Principle 35 set out a hierarchy of settlement practices that mitigate FX settlement risk to varying degrees.[47] The Code describes this as a "waterfall" of cascading settlement practices, comprising for example PvP (CLSSettlement) and solutions like reducing payment obligations through bilateral netting before settlement.

[41] BIS Triennial Central Bank Survey: bis.org/statistics/rpfx22.htm
[42] See Once more unto the breach – speech by Philippe Lintern | Bank of England
[43] Netted value refers to bilateral net payment amounts calculated by CLSNet.
[44] CPMI (2023) Final Report – Facilitating Increased Adoption of PvP.
[45] See cls-fx-policy-01-navigating-the-fx-lane-shaping-fx-series-september-2023.pdf: cls-group.com
[46] See cls_fx_policy_03_update_to_the_fx_global_code_the_risk_waterfall_for_fx_flows.pdf
[47] See cls_shapingfx02_pvp_or_not_to_pvp_may2023.pdf: cls-group.com

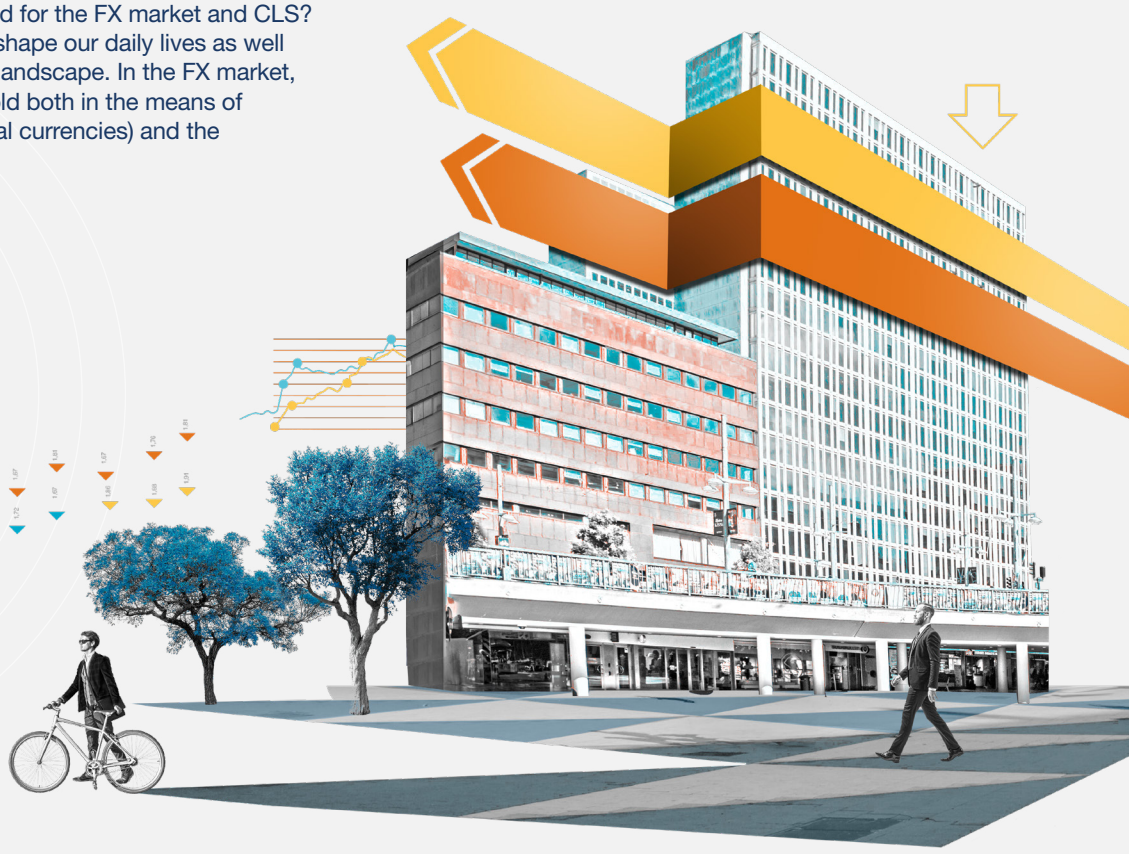
Looking ahead, what is next for the FX market?

Reflecting on an almost 23-year history, the success of the unprecedented CLS initiative is largely attributable to the public/private partnership that created it and the strong steer from both public policy makers and regulators. Although launch took longer than anticipated, aligning legal frameworks and technologies to go live across numerous countries and time zones was a great feat. Since its creation, CLS has helped reduce FX settlement risk substantially (from around 85%[48] of the FX market being exposed to FX settlement risk, to around 10–15%). Moreover, CLS has consistently provided strong stability in times of market turbulence such as the global financial crisis and Covid-19 pandemic, anchoring the wholesale FX market through every storm.

What could the next 23 years hold for the FX market and CLS? New technologies continue to reshape our daily lives as well as transform the global financial landscape. In the FX market, future fascinations have taken hold both in the means of transacting (fiat currency vs digital currencies) and the speed of settlement.

An increasing global interest in developments such as tokenization[49] and digital currencies,[50] including central bank digital currencies,[51] key market events such as the move to T+1 in the US and Canadian Securities market in May 2024[52] and the discussions around the need for same-day settlement services have led to deliberation around what the FX ecosystem could look like in the future.

Though it is not clear how these various trends could impact the FX market, we can rely on CLS to continue to provide the backbone of the wholesale FX market and work closely with the public and private sectors to evolve with an everchanging FX ecosystem.



[48] See Microsoft Word – Kos-Levich Settlement Risk in the Global FX Markets_161026.doc
[49] See cls_innovation_02_fx_tokenization.pdf
[50] Embracing diversity, advancing together – results of the 2023 BIS survey on central bank digital currencies and crypto
[51] cls_opinion_piece_cbdc_the_fx_game_changer_19mar2024.pdf
[52] See shapingfx06_part1_tplus1-the-fx-ecosystem-and-cls-what-difference-a-day-makes.pdf and shapingfx06_part2_tplus1-the-fx-ecosystem-and-cls-what-difference-has-a-day-made-so-far.pdf

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