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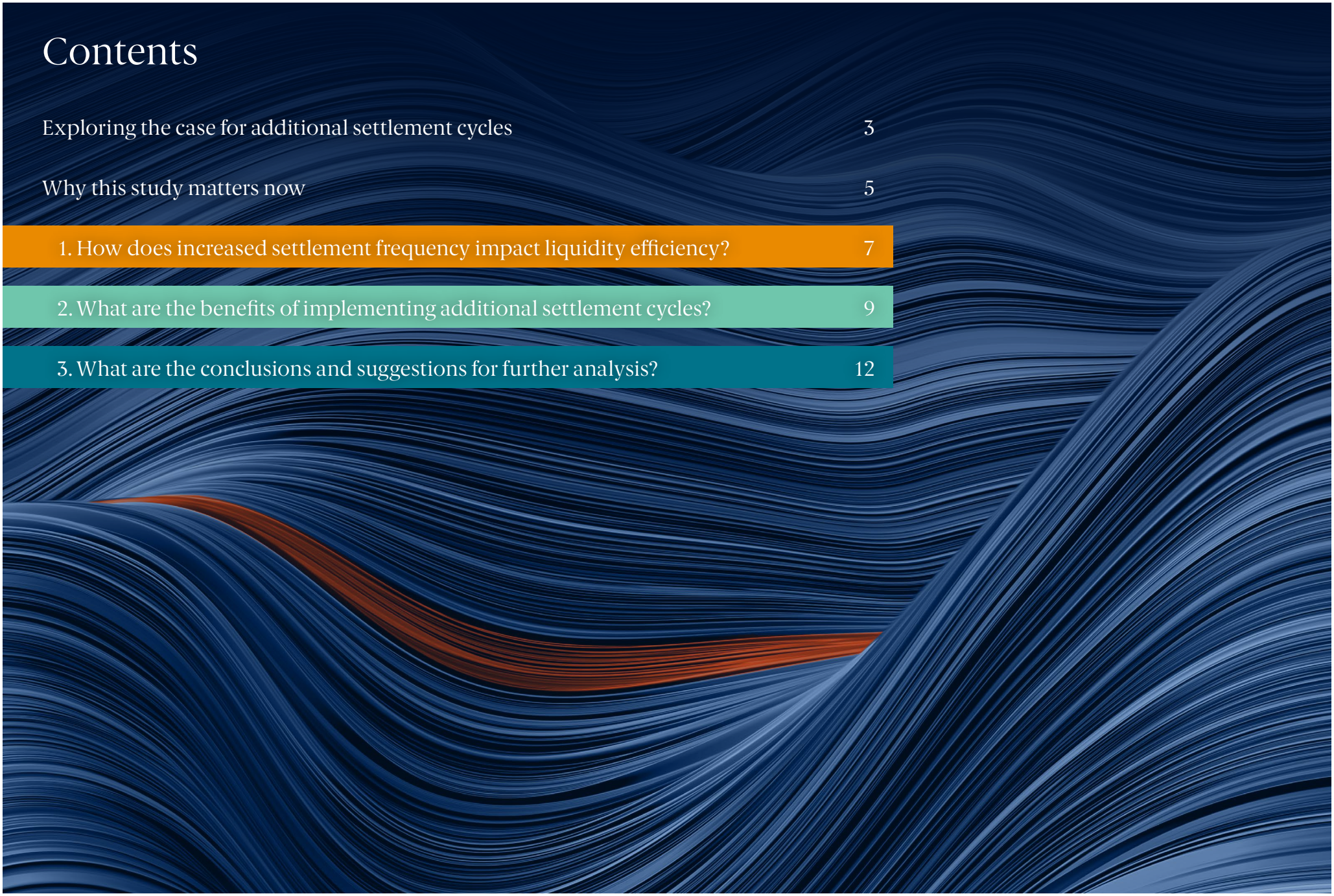
Reimagining same-day FX:

Exploring the case for additional settlement cycles

FNA

Contents



Exploring the case for additional settlement cycles

CLSSettlement is central to the efficient functioning of the global foreign exchange (FX) market: it provides payment-versus-payment (PvP) settlement for 18 of the world's most traded currencies[1] and settles an average daily value (ADV) of over USD7 trillion of payment instructions for more than 70 settlement members and over 37,000 indirect participants.[2] The CLSSettlement system operates a single settlement cycle each day (between 07:00–12:00 CET, 5.5 days a week). It achieves liquidity optimization by multilaterally netting[3] gross payments down by 96%, and with additional liquidity saving mechanisms, the total funding required is reduced by 99% on average. This means that settlement in CLS can be completed with only around 1% of the gross settlement value being paid in by CLS settlement members, making considerable liquidity available to the FX market.

Most FX payment instructions in CLSSettlement settle according to the market convention of two days after execution of the underlying trade (T+2), with a smaller portion settling next day (T+1) and only a very small number settling on the same day (T+0). Most of the same-day FX settlement market, estimated to be at least USD500 billion,[4] settles bilaterally and without PvP protection outside of CLSSettlement, but discussions around addressing same-day (as well as instant) volumes seem to be intensifying. This is evident in the growth of same-day volumes observed in CLS's bilateral netting calculation service, CLSNet,[5] and the growing number of global experiments in the central bank digital currency (CBDC) space, most of which emphasize the benefits of instant settlement.

However, commentators often neglect the critical trade-off between increasing settlement frequency (which facilitates more same-day or instant settlement) and reducing netting efficiency. For example, conducting multiple settlement cycles in a day lowers the likelihood of finding offsetting flows within a given cycle, and this can significantly increase liquidity requirements. This is a key reason why same-day FX solutions remain niche.

Although the inverse relationship between settlement frequency and netting efficiency is widely acknowledged, there are no public studies that analyze this trade-off using empirical FX market data. For example, how significantly does netting efficiency decline as the number of daily settlement cycles increases? How much additional liquidity would FX market participants require if they settled multiple times a day?

As a financial market infrastructure (FMI) operating in the largest market in the world (FX), CLS is uniquely positioned to offer insights on these previously unanswered questions. CLS partnered with FNA, a global leader in network analytics and simulation of financial market infrastructures, to study the liquidity implications and potential benefits of introducing additional settlement cycles per day in CLSSettlement.

> "Public discourse often neglects the critical trade-off between increasing settlement frequency and reducing netting efficiency."

[1] CLSSettlement settles 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).

[2] Indirect participants refer to financial institutions that do not have a direct membership in CLS, but still settle trades via CLSSettlement by relying on a direct participant (also known as a CLS settlement member).

[3] Netting services can be of a multilateral or bilateral nature. CLSSettlement combines FX settlement risk mitigation with multilateral netting, which is achieved by aggregating payment instructions to calculate each participant's net position across all counterparties and currencies. This results in a single net payment obligation per currency for each participant. Where multilateral netting is not possible and there is some degree of settlement risk, reducing payment obligations through bilateral netting can still help substantially reduce settlement risk.

[4] See Section 2: What are the benefits of implementing additional settlement cycles?

[5] CLS supports same-day settlement through CLSNet, which is a standardized, automated bilateral payment netting calculation service to support FX trades not settling in CLSSettlement. Participants can submit FX instructions to CLSNet for spot, tomorrow/next day, forwards, non-deliverable forwards (NDFs), swaps and same-day trades for over 120 currencies.

The study found that the opportunities and challenges depend not only on the number of additional settlement cycles per day, but also on their time of day.

- **Introducing earlier cycles:** Introducing up to two additional settlement cycles earlier in the day (before the existing 07:00 CET CLSSettlement cycle) would reduce netting efficiency only marginally, from approximately 96% to 95%. With current flows, CLS's settlement members would require an additional USD48 billion in daily liquidity to settle their FX obligations, though this could be reduced to USD16.9 billion after applying CLS's liquidity-saving mechanisms. The study found no evidence of market demand or benefits from introducing earlier cycles before 07:00 CET, and especially before 03:00 CET, when larger currencies like USD would be excluded due to real-time gross settlement (RTGS) system operating hour constraints. In addition, such changes could impact market dynamics and/or conflict with market preferences in certain jurisdictions, creating competing liquidity priorities with non-CLSSettlement obligations[6] that are currently settled earlier in the day.
- **Introducing later cycles:** In principle, introducing later cycles (after the current 07:00 CET CLSSettlement cycle) should not impact the liquidity efficiency of the existing CLSSettlement volumes settling in the current 07:00 CET cycle, provided that market behavior remains unchanged. However, should the availability of later cycles lead to a shift in volumes, netting efficiency would drop 1%, and an additional USD16.9 billion in liquidity would be needed for earlier cycles. Introducing up to two additional settlement cycles later in the day could make a substantial portion of the approximately USD500 billion of same-day FX market volumes eligible for settlement in CLSSettlement, and consequently could reduce systemic risk through the added PvP protection. Additionally, liquidity requirements could be reduced by up to USD240 billion through netting efficiency gains. Later cycles could also enable increased daily trading capacity, provide market participants with greater flexibility to settle later in the day, and extend CLSSettlement's operational efficiency benefits (e.g., straight-through processing and fewer failed trades) to the same-day FX market. Of course, the benefits of running such additional cycles must be weighed against the availability and cost of intra-day credit from nostros and other practicalities required to enable reliable, time-critical payments.

The study concluded that introducing two additional cycles later in the day could provide benefits that outweigh the liquidity trade-offs from reduced multilateral netting, but found that more than three cycles per day may not be operationally feasible for most if not all FX market participants.

The study had several limitations. The analysis used theoretical timings for the proposed additional cycles. Operational and commercial factors such as liquidity availability and failure management were not analyzed in depth. Also, the scope of the study did not include market participants' feedback, which is usually critical for aligning theoretical findings with practical application.

This study serves as a foundation for further reflection and discussion with CLS stakeholders and the broader FX ecosystem concerning the implications of same-day FX settlement solutions. While it highlights the potential benefits of introducing additional settlement cycles later in the day, it is only an empirical study and does not indicate a strategic direction for CLS or suggest plans for implementation.

[6] For example, certain Asian markets may prefer settling FX payment obligations later in the day. This is due to a number of factors, including alignment with global markets (i.e., settling later allows Asian financial institutions to synchronize with the operating hours of major financial centers in Europe and North America). Liquidity management (e.g., settling later in the day) may allow better management of liquidity positions, ensuring sufficient funds are available to meet all other non-CLS settlement obligations.

Why this study matters now

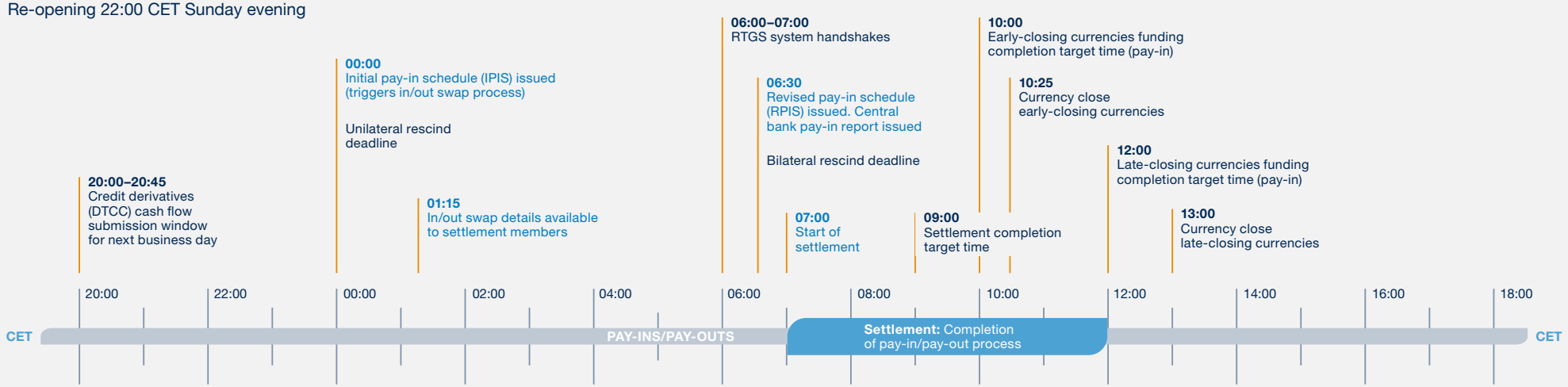
CLSSettlement provides the wholesale settlement backbone for the global FX market, offering risk-mitigating PvP[7] protection for 18 of the world's most traded currencies. The service settles over USD7 trillion of trades per day for over 70 settlement members and more than 37,000 indirect participants. Funding and settlement occur over a five-hour window when the 18 RTGS[8] systems of the CLS-eligible currencies have overlapping processing hours (07:00 to 12:00 CET[9] – see figure 1).

In CLSSettlement, the funding required for settlement is determined on a multilaterally netted basis, where each settlement member only transfers the net amount it owes in each currency, thereby reducing funding costs by 99% after in/out swap[10] liquidity saving mechanisms are applied. Accordingly, the average required funding is 1% (USD70 billion) of the total value of payment instructions on a typical business day.

The time lag between submission and the actual settlement of payment instructions in CLSSettlement typically follows the market convention of two days (T+2). Payment instructions for underlying FX trades could also settle on the next day (T+1), and T+1 volumes may increase following the recent shift to T+1 settlement in the securities space (e.g., in the US and Canadian securities market in May 2024, with a shift in Europe planned for October 2027).

Figure 1: **CLSSettlement operational timeline (1x settlement cycle/day)**

- Operating 24 hours a day, 5.5 days a week
- Closing 02:00 CET Saturday morning
- Re-opening 22:00 CET Sunday evening



[7] CLS operates a PvP multicurrency settlement system that mitigates FX settlement risk by synchronizing the settlement of payment instructions for the two currency legs of an FX trade with finality and irrevocability. CLS's PvP system ensures that a party's payment instruction in one currency is not settled unless the corresponding payment instruction in the counter currency is also settled.

[8] Real-time gross settlement (RTGS) systems provide the infrastructure that supports the settlement of payments in central bank money. These systems function as accounting platforms rather than payment systems themselves. Eligible institutions maintain settlement accounts within RTGS systems, which are debited or credited as central bank money is processed through various payment systems.

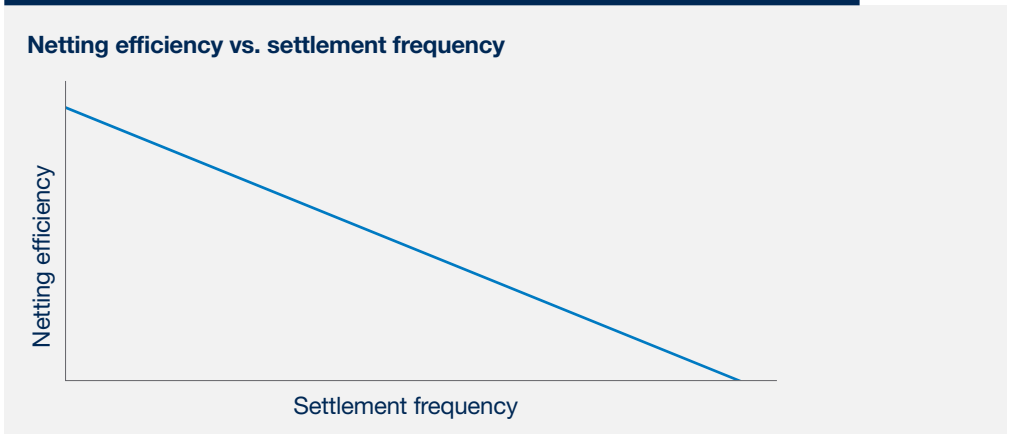
[9] Settlement takes place over a two-hour period (07:00 to 09:00 CET). CLS settles each payment instruction by making the appropriate debits and credits across the accounts of the relevant CLS settlement members on CLS's books. Funding occurs over a five-hour window (07:00 to 12:00 CET) in which the 18 RTGS systems of the CLS-eligible currencies have various overlapping processing hours.

[10] An in/out swap is a type of swap transaction between two settlement members consisting of two legs. The first leg, known as the "in" leg, is settled within CLSSettlement while the second leg, referred to as the "out" leg, is settled outside of CLSSettlement. This arrangement is designed to reduce each counterparty settlement member's net short position in one currency and net long position in another currency, thereby reducing the funding requirements for participating settlement members.

Beyond T+1, only a small number of payment instructions currently match and settle on the same-day (T+0). T+0 settlement could take place on a same-day basis or, in extremis, instantaneously – where trades are settled the instant they are received.[11] The FX same-day market helps banks to avoid overnight exposure to foreign exchange risk, optimize balance sheets and meet regulatory requirements. Although same-day and instant settlement solutions for FX are still considered a niche market,[12] CLS has observed increases in same-day activity within CLSNet, its bilateral payment netting calculation service for eligible FX trades that do not settle in CLSSettlement. At the same time, an increasing number of experiments around CBDCs, including cross-border use cases, are built on the premise of instant settlement. Finally, T+0 in the securities space is often described as the next logical step after the move to T+1 for securities in the US and other jurisdictions, which could have implications for the same-day segment of the FX market.

Given the large amounts at stake in the FX market, liquidity optimization through (multilateral) netting plays an important role in FX settlement. However, netting's pivotal role in liquidity efficiency – and its dependence on frequency of settlement – is generally ignored in discussions around same-day and instant settlement.

Figure 2: **Trade-off between settlement frequency and netting efficiency**



The inverse relationship between settlement frequency and netting or liquidity efficiency is well understood: higher settlement frequency yields faster settlement, but also requires more liquidity due to lower netting efficiency (see figure 2, which is illustrative and is intended to demonstrate this inverse relationship at a conceptual level only).

The bottom right point of the line in figure 2 corresponds to instantaneous real-time gross settlement, the fastest possible settlement, at the cost of maximum liquidity as it precludes netting. The top left point of the line corresponds to a single settlement cycle per day, which maximizes netting efficiency and minimizes liquidity requirements. Between the two extremes lies the option of multiple settlement cycles per day, expediting same-day settlement while allowing limited netting efficiencies. CLSSettlement currently sits at the leftmost point of the curve, maximizing netting efficiency by multilaterally netting and settling once per business day.

Introducing multiple shorter settlement cycles with some netting throughout the day could enable more same-day settlement without going to the extreme case of instant (gross) settlement. While increasing settlement frequency would decrease netting efficiency, further research is needed to assess how much and whether the benefits could outweigh the costs.

This study aims to offer insights about how multiple same-day settlement cycles could be designed in CLSSettlement. It should be viewed as an explorative study and not a plan or suggestion by CLS to adopt this approach.

The findings from this study provide a basis for discussion with CLS stakeholders and the wider FX ecosystem on the implications of same-day settlement, taking CLSSettlement as a baseline for the analysis. The study focuses on answering three questions:

1. How does increased settlement frequency impact liquidity efficiency?
2. What are the benefits of implementing additional settlement cycles?
3. What are the conclusions and suggestions for further analysis?

[11] "Same-day" and "instant" settlement represent distinct settlement processing timelines, each with unique implications. Same-day settlement refers to transactions that are executed and settled on the same calendar day, reducing the time window for settlement risk compared to longer settlement cycles (e.g., T+1 or T+2), but still involving some intra-day exposure. Instant settlement refers to transactions that are settled immediately upon execution, with the simultaneous exchange of currencies occurring in real-time. Instant settlement offers a higher reduction (if not entire elimination) of settlement risk but imposes more stringent operational and liquidity demands compared to same-day settlement.

[12] The same observation was made in a report from the Global Foreign Exchange Division (GFXD, part of the Global Financial Markets Association). According to the GFXD, "at this time, it is not clear if there is a market desire, or ability to move at scale, in a networked manner to T+0 and a world of instant settlement." See GFXD, July 2023: mag-accelerated-fx-settlement-final-july-2023.pdf: gfma.org

1. How does increased settlement frequency impact liquidity efficiency?

To understand the consequences of including additional settlement cycles in CLSSettlement, FNA used a 22-day sample of fully anonymized CLSSettlement data,[13] consisting of FX trade instructions with a settlement value date from 1–30 November 2023. This time period was chosen because of the absence of major market events that could potentially disrupt the settlement process and skew results, such as the quarterly International Money Market (IMM) events in March, June, September and December.

The dataset consisted of CLSSettlement instructions relating to underlying trades between pairs of seven currencies: Australian dollar (AUD), Canadian dollar (CAD), Euro (EUR), Japanese yen (JPY), Swiss franc (CHF), UK pound sterling (GBP) and US dollar (USD). These currencies were selected to simplify the study while providing a broad coverage of the FX market, as the FX pairs formed by these seven currencies represent 88% of all CLSSettlement average daily value.[14]

The dataset contained a total of over 9.4 million payment instructions, corresponding to on average over 425,000 payment instructions per day. The average daily total value of payment instructions was USD5.14 trillion. The average value of an individual payment instruction was USD6 million, and the median payment instruction value was USD530,000.

Three different groups of settlement scenarios were considered in the analysis: 1) a baseline scenario in which settlement takes place once per day (how CLSSettlement currently operates); 2) a group of scenarios where settlement takes place 2x/day; and 3) a group of scenarios where settlement takes place 3x/day.

The study did not simulate more than three settlement cycles per day, as it was considered too operationally challenging for FX market participants and their nostros to orchestrate time-critical payments more than three times per day in view of cost, resource and liquidity constraints.

Two metrics were considered for evaluating the netting efficiency versus settlement frequency tradeoff in CLSSettlement: 1) netting efficiency (i.e., what portion of gross value is netted out)[15] and 2) liquidity requirements (i.e., the portion of gross value that is netted down).

“The dataset contained a total of over 9.4 million payment instructions, corresponding to on average over 425,000 payment instructions per day.”

[13] The fully anonymized CLS data was disclosed to FNA in accordance with the CLS Data Disclosure Internal Standard requirements to maintain confidentiality.
[14] CLS Data Analytics (2025).
[15] Netting efficiency was calculated as [1- (Total Liquidity Used / Total Payment Value)]. For example, if CLS received FX instructions amounting to USD6.5 trillion in daily total payment value, and after multilateral netting, the resulting payment obligations totaled only USD250 billion, then the netting efficiency would equal 96% = [1- (USD250 billion / USD6.5 trillion)].

The results indicated a trend generally in line with expectations: the more settlement cycles per day, the higher the liquidity needs and hence the lower the netting efficiency. When moving from 1x to 3x settlement cycles per day, the netting efficiency decreased by 1% from the baseline netting efficiency (i.e., from 95.8% to 94.8%). In nominal terms, this translated into USD48.3 billion (+27%) of additional daily liquidity required by market participants to meet their FX obligations across the seven in-scope currencies (i.e., an increase from USD178.9 to USD227.2 billion – see figure 3).

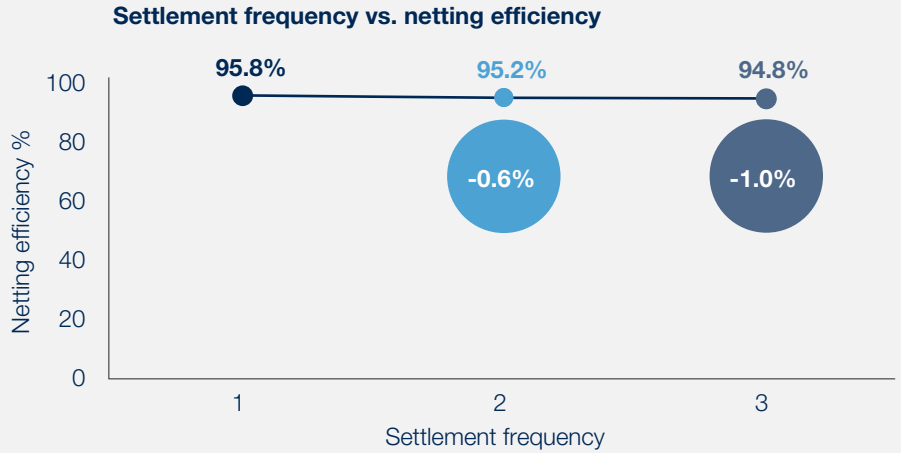
It should be noted, however, that the additional liquidity needed when introducing a second and third settlement cycle per day was calculated before applying the in/out swaps liquidity saving mechanism. Based on historic data, in/out swaps typically reduce liquidity needs by a further 65%. The study therefore estimated that after in/out swaps were applied, market participants would require approximately USD9.38 billion in additional liquidity when moving from 1x/day to 2x/day settlement cycles, or USD16.9 billion in additional liquidity when moving from 1x/day to 3x/day settlement cycles.

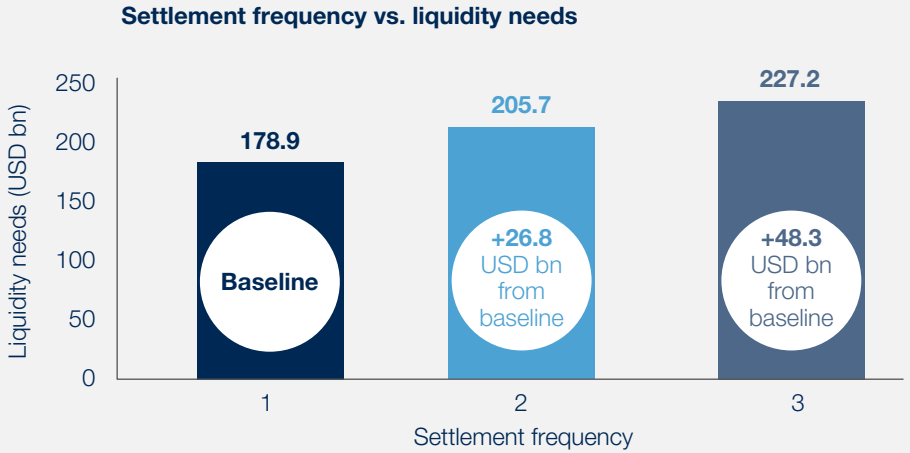
While this analysis only considered adding earlier settlement cycles (prior to the 07:00 CET cycle), the potential impact on liquidity arising from the introduction of later settlement cycles (post 07:00 CET) also warrants consideration. The impact of later cycles on liquidity could not be modeled in this analysis because it relied on CLSSettlement FX instruction data that matched and settled before the current 07:00 CET cycle.

Despite this data limitation, it was hypothesized that introducing later cycles would have no significant effect on existing netting efficiencies or liquidity requirements for volumes already settled in CLSSettlement. This assumption is based on the premise that current CLSSettlement volumes would continue to settle in the existing 07:00 CET cycle, while any additional volumes settled in later cycles would consist primarily of FX same-day flows that currently settle outside of CLSSettlement.

It was considered that the introduction of later cycles might incentivize market participants to alter their behavior and shift some of their volumes from the 07:00 CET cycle to later cycles. However, for the purposes of this study, it was assumed that such behavioral changes would be negligible, and the introduction of later settlement cycles would result in no appreciable impact to overall liquidity requirements (i.e., a maximum of 1% decrease in netting efficiency when settling three times per day).

Figure 3: **Liquidity impact when moving from 1x to 2x and 3x settlement cycles per day, before in/out swaps being applied. Circled values indicate change relative to baseline**





2. What are the benefits of implementing additional settlement cycles?

The potential benefits of introducing additional settlement cycles were explored through three sub-questions:

1. FX systemic risk: could the introduction of additional settlement cycles enable a portion of the same-day FX market, currently settling without PvP protection, to settle in CLSSettlement and thereby reduce systemic risk?
2. Liquidity optimization: could market participants optimize liquidity by leveraging multilateral netting for the same-day FX trades that would become eligible for CLSSettlement in the additional cycles?
3. Other benefits: could additional cycles bring further benefits such as increased trading capacity, increased flexibility or enhanced operational efficiency?

To estimate the size of the same-day FX market, where the execution and settlement dates of FX trades coincide on the same day, data from several sources was collected and analyzed. For example, a snapshot of same-day trade data was acquired from CLSNet across the same seven in-scope currencies (AUD, CAD, CHF, GBP, EUR, JPY and USD), covering a daily average value of approximately USD24 billion in trades processed from 23–27 September 2024. This five-business day range was selected to provide the most up-to-date estimate of same-day activity within CLSNet at the time of the study.

To confirm that the calculated daily average of approximately USD24 billion in September was representative of other months in 2024, this figure was compared to the total average daily values of same-day CLSNet trades across the same seven currency pairs for the months of January to July 2024. The average for this earlier period was approximately USD23 billion, which aligns with the USD24 billion daily average in September and supports its use as a baseline value.

A portion of the same-day FX market consists of in/out swaps. Therefore, a one-year extract of CLSSettlement in/out swap historical data was also reviewed to assess the volume of same-day out-leg swaps currently settled outside of CLSSettlement. It was calculated that the average daily in/out swaps activity over two months (September to October 2024) was USD163 billion.

However, the study recognized that CLS sees only part of the total same-day FX market, given that a larger portion of same-day trades are settled bilaterally between market participants and flow outside of CLS systems. Therefore, looking at CLSNet data and CLSSettlement in/out swap data would provide only a partial snapshot of the total same-day FX market. To estimate the market size, the study looked at three data sources, including historical settlement member surveys, public reports from the Bank for International Settlements (BIS) and insights from other financial market infrastructure firms, which estimated the same-day FX market to be at least approximately USD500 billion in 2024, based on various proxy indicators.

The study posited that introducing additional early cycles (pre-07:00 CET) was likely to provide limited benefits. Notably, the additional cycles would not address the same-day FX flows that match and settle after the existing 07:00 CET cycle. Given the expected limitations of earlier cycles, the study focused on the impact of introducing later cycles (post-07:00 CET) based on the premise that they could make a significant portion of the same-day FX market eligible to settle via CLSSettlement. Building on this premise, a hypothetical 3x/day settlement scenario was considered as the basis for analysis:

1. **Settlement cycle 1 (07:00 CET)**: The first cycle retained its timing at 07:00 CET and applied to all seven in-scope currencies. This cycle continued to settle all payment instructions matched and netted before 07:00 CET.
2. **Settlement cycle 2 (11:00 CET)**:[16] This second cycle included trades involving CHF, EUR, USD, GBP and CAD pairs. Payment instructions matched and netted between 07:00 CET and 11:00 CET were deemed to be settled during this second settlement cycle.
3. **Settlement cycle 3 (19:00 CET)**: Focusing on USD, CAD and CHF trades, this cycle was scheduled at 19:00 CET. This final cycle settled all transactions matched and netted between 11:00 CET and 19:00 CET.

[16] While the BOJ-NET (JPY) RTGS is open at 11am CET, JPY was excluded from Settlement Cycle 2 because BOJ-NET closes by 2pm CET, meaning the settlement cycles fall within the 3-hour operational buffer that is required for operational considerations like failure management.

FX systemic risk: to what extent could later cycles reduce FX systemic risk?

The analysis identified approximately USD24 billion in CLSNet same-day FX flows across the seven in-scope currencies for this study that could potentially become eligible for CLSSettlement. Approximately USD6 billion of this USD24 billion represented the out-leg of the in/out swap flows that currently net on a bilateral basis within CLSNet, while the remaining USD18 billion consisted of other same-day CLSNet activity.

Beyond that, an additional approximately USD157 billion of out-leg activity could become eligible for CLSSettlement within the second and third cycles (i.e., USD163 billion total in/out swaps minus the USD6 billion that is already counted in the USD24 billion CLSNet same-day activity). In conclusion, introducing two additional settlement cycles could mitigate settlement risk for approximately USD181 billion per day (USD24 billion + USD157 billion) by providing PvP settlement protection for these volumes where it does not currently exist.

While the portion of the same-day market visible to CLS amounted to approximately USD181 billion, the study acknowledged that this figure represents a fraction of the overall same-day FX market, estimated at approximately USD500 billion daily in 2024. Consequently, the potential reduction in FX settlement risk could range between approximately USD181 billion (based on flows visible to CLS) and USD500 billion per day (when considering the estimated same-day market size).

The study noted that the USD500 billion figure represents the upper limit of the same-day FX market that could theoretically settle via PvP settlement. In practice, various constraints may limit the extent to which these volumes can transition to CLSSettlement, including client eligibility requirements, the capabilities of nostro accounts to meet timed payments and other operational factors.

Liquidity optimization: to what extent could later cycles optimize liquidity?

The approximately USD18 billion portion of CLSNet same-day flows (USD24 billion minus the USD6 billion in/out swaps) was estimated to have an average bilateral netting efficiency of 23.5%,[17] leaving approximately USD13.8 billion in liquidity required to settle obligations after netting. If these trades transitioned to CLSSettlement, the study theorized that netting efficiency could increase to 94.57%[18] by pooling these volumes with a much larger group of offsetting flows within CLSSettlement. At this level of netting efficiency, only USD0.98 billion in liquidity would be required to settle the approximately USD18 billion of FX obligations, achieving approximately USD12.82 billion in liquidity savings for the market.

The USD163 billion same-day flows that correspond to out-leg swaps (including the USD6 billion from CLSNet) were deemed to consist of predominantly one-way trades, with limited offsetting opportunities even if pooled with the much larger set of payment instructions within CLSSettlement. Therefore, the study estimated a negligible impact on liquidity efficiency if this portion shifted to CLSSettlement.

Finally, the study estimated that the additional approximately USD319 billion in flows that were currently not visible to CLS today (USD500 billion same-day FX market minus the USD181 billion portion visible to CLS) could also benefit from improved liquidity efficiency. Anecdotal evidence suggests that FX market participants typically push same-day FX settlement obligations later in the day, thereby creating sufficient time for offsetting flows and bilateral netting. The bilateral netting efficiency between market participants settling outside of CLSNet was unknown. The study assumed the bilateral netting efficiency for same-day trades to be the same as the average CLSNet bilateral netting efficiency today (23.5%), acknowledging this could vary based on the size of the FX market participant, currency and other factors, and is likely to be lower than 23.5% in most instances. For example, due to each counterparty having different processes and timelines for netting, bilateral netting without a centralized platform like CLSNet is confined to a limited counterparty reach. At this level of bilateral netting efficiency, USD244.8 billion in liquidity would still be required after netting to settle market participants' total approximately USD319 billion same-day FX obligations. The study treated the USD244.8 billion in required liquidity as the baseline for comparison.

[17] As calculated by CLS, using a simplified netting methodology for the portion of CLSNet instructions on underlying FX transactions across the seven in-scope currencies across value dates 23 September and 27 September 2024 (e.g., assuming netting happens on value date, netting per currency pair, etc.)

[18] The 94.57% weighted average netting efficiency was calculated by combining two distinct components: 1) the USD5.14 trillion, which represents the average daily amount of instructions settled through CLSSettlement in November 2023, with a multilateral netting efficiency of 94.8% under the lowest 3x settlement per day scenario (scenario 11 in Section 3); and 2) USD18 billion, which corresponds to the same-day portion processed via CLSNet across the same seven in-scope currencies as in the USD5.14 trillion. For this portion, the multilateral netting efficiency was calculated to be 28.5%. The formula to calculate the 94.57% weighted average was $X = \frac{(USD5.14tn \times 94.8\%)+(USD18bn \times 28.5\%)}{USD5.14tn+USD18bn}$

Historical data from a same-day multilateral netting and settlement capability for USD/CAD currency pairs previously offered by CLS to its settlement members was examined. When active, this service achieved multilateral netting efficiency of up to 49.5%, providing a benchmark for multilateral netting efficiency levels. If this could be achieved in CLSSettlement, then market participants would need approximately USD161.6 billion in liquidity (66% less than the USD244.8 baseline) to settle their total USD319 billion same-day obligations, representing a USD83.2 billion reduction in liquidity needed for the FX market.

Given CLSSettlement's broader coverage of currencies and participants, the study also considered a more optimistic view that the multilateral netting efficiency could reach up to 94.57% (as modeled for the USD18 billion visible portion of CLSNet flows). At this efficiency level, only USD17.4 billion in liquidity (93% less than the USD244.8 billion baseline) would be needed to settle USD319 billion same-day obligations, representing a USD227.4 billion reduction in liquidity.

In conclusion, the study suggests that by moving same-day FX flows to CLSSettlement, liquidity efficiency gains could range anywhere between USD12.82 billion (based on the same-day portion of FX activity visible to CLS) to USD240 billion (USD12.82 billion + 227.4 billion same-day portion of FX activity not visible to CLS).

The study adopted a conservative stance by assuming that USD163 billion of same-day out-leg flows would not achieve material netting efficiencies through CLSSettlement. However, there is a strong possibility that as the overall volumes of same-day flows into CLSSettlement grow, the likelihood of identifying offsetting flows between the USD163 billion and other same-day flows within CLSSettlement would also become more likely. This could result in netting efficiency gains exceeding USD24 billion.

Other benefits: what other potential benefits could later cycles introduce?

The study also posited qualitative benefits that were not backed by empirical evidence but could warrant further analysis.

The reduction of settlement risk and added transparency that CLSSettlement could offer to the same-day FX market may potentially expand the daily trading capacity of FX market participants. In theory, the enhanced visibility and payment certainty may help market participants to restore their daily counterparty credit limits and facilitate increased bilateral trading activity, boosting activity in the FX market overall.

Additionally, certain FX participants do not use CLSSettlement due to insufficient liquidity in certain currencies (especially less liquid currencies like HUF and MXN) during the 07:00 CET settlement cycle and other challenges. This forces them to split flows and either wait for liquidity to materialize later in the day (missing the CLSSettlement window) or settle bilaterally without PvP protection, thus increasing risk. Introducing additional settlement cycles during the day could provide participants with more options to align settlement timings with liquidity availability, reduce the need for bilateral settlement without PvP protection and offer a more flexible framework for managing same-day trades.

Finally, CLS delivers significant operational efficiencies through its automation capabilities. From facilitating straight-through processing by matching settlement members' FX payment instructions to minimizing failed trades, the benefits to the back-office teams of CLS settlement members are well recognized. A recent survey of select settlement members found that while 50–60% of their FX settlement activities were processed through CLS, CLSSettlement-related activities required less than 10% of their back-office resources on average.

As later settlement cycles are introduced to address same-day FX activity, one might argue that similar operational efficiencies could also be realized for the approximately USD500 billion same-day FX market.

3. What are the conclusions and suggestions for further analysis?

The study concluded that if additional settlement cycles are introduced after the existing 07:00 CET cycle, there would likely be little to no impact on liquidity efficiency for the existing volumes in CLSSettlement, assuming no changes in participant behavior. However, if settlement cycles were introduced earlier in the day, an additional USD16.9 billion in liquidity would be required from FX market participants after applying liquidity-saving mechanisms (e.g., in/out swaps), resulting in a 1% reduction in netting efficiency for existing volumes.

The study concluded that introducing additional settlement cycles later in the day could effectively address key challenges in the same-day FX market by reducing systemic risk by up to USD500 billion and increasing liquidity efficiency by up to USD240 billion. Extra cycles could also bring qualitative benefits such as increased trading capacity and enhanced flexibility for participants, and this warrants further analysis. On the other hand, there was limited evidence of any benefit from introducing earlier cycles.

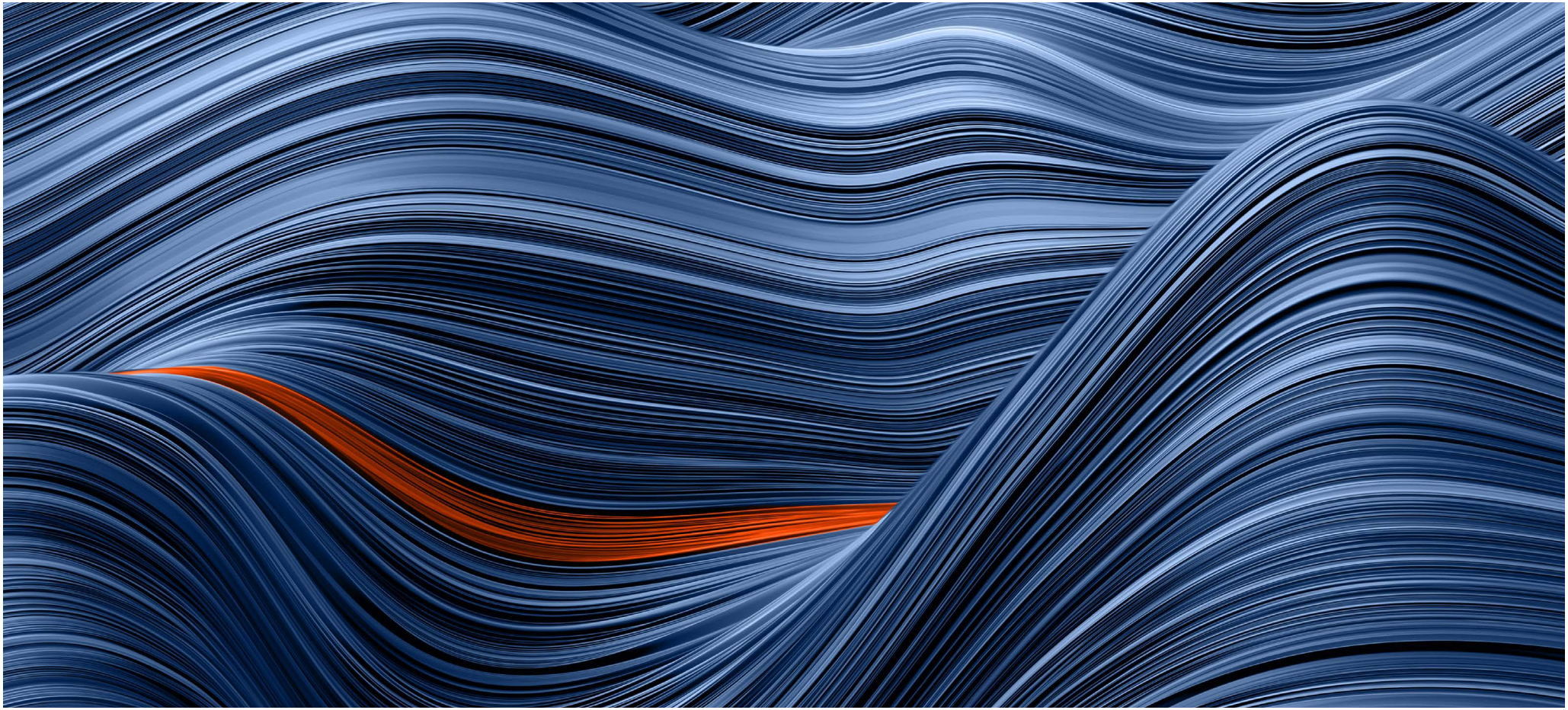
> “Introducing additional settlement cycles later in the day could effectively address key challenges in the same-day FX market by reducing systemic risk by up to USD500 billion and increasing liquidity efficiency by up to USD240 billion.”

The study concluded that in theory, the benefits of introducing additional settlement cycles later in the day would likely outweigh any potential reductions in liquidity efficiency. To refine and validate these findings, future studies could be expanded in a number of ways, including:

- **Currency expansion:** broaden the exercise to all CLS currencies or a wider set of currencies.
- **Data expansion:** examine a broader dataset spanning multiple years rather than focusing on limited time periods.
- **External validation:** incorporate data from external sources and data partners to validate assumptions.
- **Market feedback:** gather qualitative input from market participants to align hypothetical scenarios with industry needs and preferences, applying practical considerations to the theory. Additionally, consider how the introduction of later sessions might address market demands to drive adoption.
- **Exhaustive settlement scenarios**: define a more exhaustive set of settlement scenarios, testing multiple permutations of cycle timings.
- **Commercial and operational reality check:** assess the practicality of proposed scenarios by examining factors such as the distribution of submitted instructions by currency pair to determine optimal settlement times, market preferences across jurisdictions, liquidity sweet spots[19] in local markets, the cost of credit, and the capability of nostros to support timed payments later in the day to determine feasibility and operational considerations like failure management.

This examination of the potential benefits of introducing multiple settlement cycles is intended to contribute to the ongoing public discourse on same-day and instant FX settlement.

[19] In Real-Time Gross Settlement (RTGS) systems, the term “liquidity sweet spots” refers to specific times during the day when settling payments is most efficient based on available liquidity for RTGS participants. Throughout the day, liquidity levels fluctuate due to various factors, including the timing of large-value payments and market activities. Recognizing periods when liquidity is naturally higher enables RTGS-participating institutions to schedule settlements during these times, ensuring smoother processing.



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