GFMA Global FX Division

First Steps Towards 24/7 FX Settlement Capabilities
- **Expanding Payment versus Payment (PvP) opportunities**

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Background on the Global Foreign Exchange Division

The Global Financial Markets Association's (GFMA) Global Foreign Exchange Division (GFXD) was formed in co-operation with the Association for Financial Markets in Europe (AFME), the Securities Industry and Financial Markets Association (SIFMA) and the Asia Securities Industry and Financial Markets Association (ASIFMA). Its members comprise 25 global foreign exchange (FX) market participants[1], collectively representing a significant portion of the FX inter-dealer market. Both the GFXD and its members are committed to ensuring a robust, open and fair marketplace and welcome the opportunity for continued dialogue with global regulators.

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[1] Bank of America, Bank of New York Mellon, Barclays, BNP Paribas, Citi, Credit Agricole, Credit Suisse, Deutsche Bank, Goldman Sachs, HSBC, JP Morgan, Lloyds, Mizuho, Morgan Stanley, MUFG, NatWest Markets, Nomura, Northern Trust, RBC, Scotiabank, Standard Chartered Bank, State Street, UBS, Wells Fargo and Westpac.

<u>Executive Summary</u>

- **The GFXD Market Architecture Group (MAG) believes that broader availability of Payment-versus-Payment (PvP) mechanisms could meaningfully reduce FX Settlement Risk**
- **For non-PvP transactions, an extension to the operating hours of the real-time gross settlement (RTGS) systems of one or more Central Banks is expected to provide greater overlap for simultaneous settlement**
- **The extension of RTGS operating hours is an important first step to enable an increase in PvP settlement and would also be a step towards 24/7 settlement of FX transactions**
- **Maximum benefits can be expected through coordinated industry action, including by/with Central Banks and RTGS operators**
- **Coordination could include reviewing and revising core operating principles and function of the market – such as the definition of Settlement Date – to enable broader transformation**
- **Market participants would likely migrate to any new solutions at different times, and thus the industry would likely see a phased adoption**
- **Supervisory guidelines promoting the management of FX Settlement Risk should consider the technical evolution of the wider market**

Introduction

This second paper in the GFXD MAG series analysing the developments within the settlement of wholesale FX transactions, is focused on the reduction of systemic Settlement Risk through the promotion of settling wholesale FX transactions on a Payment versus Payment (PvP) basis.

A more widespread use of PvP settlement is additionally expected to increase the availability of credit and liquidity within the wholesale FX market for all market participants, including the buy-side, regional and global banks.

The FX market is the world's largest financial market and the effective and efficient exchange of currencies underpins the international financial system. The FX market is also the basis of the global payments system, generating material transaction volume, with transactions often executed by market participants across geographical borders in support of the real economy.

Sovereign entities, central banks and other government-sponsored entities rely on the FX market to be well-functioning and liquid, and corporations and investors regularly participate in the market for important operational needs:

- to reduce risk by hedging currency exposures;
- to pay suppliers and to be paid for services outside their home market;
- to convert their returns from international investments into domestic currencies; and
- to make cross-border investments and raise funding outside home markets.

The settlement of each currency within a FX transaction is a vital process in the global FX market. It is defined by rules and procedures determined within individual Central Banks around the world and is enabled via these Central Banks' RTGS systems.

Given the importance of settlements to the overall functioning of the wholesale FX market, the GFXD MAG is keen to promote processes which increase efficiency and reduce systemic Settlement Risk, with specific reference to the guidelines in the 2013 BCBS '*Supervisory guidance for managing risks associated with the* *settlement of foreign exchange transactions'* [2] (BCBS Supervisory Guidance) and the principles and guidelines in the FX Global Code[3]. We also recognise the importance of the recent Financial Stability Board's (FSB) work programme for 2020[4] which references cross-border payment systems, specifically a desire to develop and deliver a G20 roadmap to enhance cross-border payments.

Commencing its analysis on developments within the settlement of wholesale FX transactions, the GFXD MAG published its first paper in September 2019 titled '*Considerations relevant to initiatives and developments in wholesale FX settlements'* [5].

That paper raised a series of points the GFXD MAG felt relevant for any market participants considering the introduction of changes to the wholesale FX settlement process, either via new technologies or via the improvement of existing processes, and discussed the potential challenges of the market adopting change at a varied pace. It discussed the systemic benefits of settling FX transactions on a PvP basis, recognising the role of CLS Bank International[6] in addressing Settlement Risk where possible, but also acknowledging that there remains a population of transactions which do not currently settle through CLS, for example transactions with non-CLS participants or in non-CLS currencies.

In the recent BIS Quarterly Review paper, the section '*FX settlement risk remains significant'* [7] helps to size the market settling outside of CLS or other similar settlement systems, discussing the positive impact on systemic risk of PvP for such transactions. With reference to the 2019 Triennial survey[8], the Quarterly Review paper states that the daily gross payment obligations for FX were \$18.7 trillion. After bilateral netting, the number was reduced to \$15.2 trillion of which approximately \$6.3 trillion was settled on a PvP basis, leaving approximately \$8.9 trillion which was not.

Such transactions that are not settled on a PvP basis are the focus of this second paper.

The first GFXD MAG paper noted that industry developments to increase the use of PvP in the settlement of wholesale FX transactions are dependent on multiple factors, such as the ability of the wider industry to adopt and use PvP at scale. While some developments may take time and coordination to implement, others may be phased in over shorter timeframes such as those evidenced by the recent publications from several Central Banks on developments to their RTGS systems, as well as developments for faster payments[9,10] and may positively contribute in wholesale markets following trends in retail and micro-payments, for faster, continuous settlement.

This follow-up paper builds on the first GFXD MAG paper, specifically focussing on the post-trade implications for the settlement of wholesale FX transactions should the RTGS operating hours of a single Central Bank be extended, though we note too that increased coordination across Central Banks in extending their RTGS operating hours may also lead to increased PvP opportunities. To achieve the PvP benefits discussed in this paper it is important that the two counterparties to the FX transaction being settled can access the respective RTGS systems.

It is assumed that such an extension will lead to a greater overlap with the RTGS operating hours of other Central Banks, therefore allowing greater flexibility, where relevant, for market participants to settle both sides of their transactions simultaneously, i.e. on a PvP basis, which would have the impact of reducing Settlement Risk. We acknowledge that the industry may require additional tools to effect the PvP process itself and, whilst not a topic of discussion in this paper, the GFXD MAG may look to assess this in future papers.

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[2] https://www.bis.org/publ/bcbs241.htm ("BCBS FX Supervisory Guidance")
[3] https://www.globalfxc.org/fx_global_code.htm
[4] https://www.fsb.org/2019/12/fsb-sets-out-2020-work-programme/
[5] https://www.gfma.org/wp-content/uploads/2019/09/developments-in-wholesale-fx-settlements-september-2019.pdf
[6] https://www.cls-group.com/
[7] https://www.bis.org/publ/qtrpdf/r_qt1912x.htm
[8] https://www.bis.org/statistics/rpfx19_fx.pdf
[9] https://www.federalreserve.gov/newsevents/pressreleases/other20190805a.htm
[10] https://www.bankofengland.co.uk/payment-and-settlement/rtgs-renewal-programme

It is expected that this analysis of an extension to the operating hours of a RTGS system will be of benefit to those market participants who are considering other technical developments that may ultimately lead to systemic 24/7 PvP settlement within the wholesale FX markets, such as Central Bank Digital Currencies. BIS also made similar reference in their December 2019 paper titled *'Wholesale digital tokens'* [11].

We believe that any migration to systemic 24/7 settlement will be a multi-phased, incremental exercise and that an extension to RTGS operating hours could be considered the first of such phases, noting the importance (and potential challenges[12]) of coordination between market participants, including Central Banks and RTGS Operators[13].

This paper is structured to enable the reader to understand both the dependencies in implementing extended RTGS operating hours and how those points relate to today's post-trade processes.

The GFXD MAG looks forward to engaging with regulators, supervisors and other market participants on these types of issues and the other topics raised in this paper.

1. Dependencies Impacting Increased PvP Settlement

The GFXD MAG assessed the dependencies that could impact the ability of a market participant to benefit from any increased PvP opportunities resulting from the extension of the operating hours of a RTGS system. Such dependencies were identified as being either internal or external in nature.

Internal dependencies, which for the purpose of this paper are defined as those relating to the operations of each market participant.

Process and Technology

The technologies used and the number/types of processes performed will obviously vary from organisation to organisation. A broad impact assessment should therefore be performed. Whilst this paper is focused on PvP benefits, we also suggest that it is worth considering other benefits that may arise from extended RTGS operating hours, which the GFXD MAG may discuss in future papers, such as the impact on credit provision. We note too that the industry could benefit from operating standards/best practices which would enable participants to migrate to any new models.

Location Strategy

It may be necessary for market participants (including the Central Bank whose RTGS hours are being extended) to review the geographical location where their functions are being performed. They may wish to consider the establishment of offices in new locations, or even a network of offices providing a 'follow-the-sun' model. The ability to deliver such change will be dependent on a multitude of factors, including but not limited to: cost, office location, regulation and legal and compliance requirements.

Staffing Model

Market participants will typically have developed staffing models to suit their existing businesses. Market participants may need to re-assess the numbers of personnel and the skills required in each location in order to support this.

[11] https://www.bis.org/cpmi/publ/d190.htm
[12] https://www.bis.org/publ/qtrpdf/r_qt2003.pdf 'Payment without Borders' pages 61 and 62
[13] https://www.bis.org/cpmi/publ/d174.pdf

External dependencies, which for the purpose of this paper are defined as those relating to the wider industry.

Network Effect

Any developments within the global FX market to facilitate wider risk-reduction activities, in this case settling more transactions on a PvP basis, will be dependent on the number and types of market participants who are able to leverage such opportunities. If only a small number of organisations can leverage extended RTGS operating hours, then the benefit will be greatly reduced.

Migration Strategy

Market participants should also be aware of the migration plans of the wider industry, as this will influence the pace at which any benefits of change will be materialised, noting too that alternative solutions (e.g. stablecoins) may be competing for participants' attention to achieve similar outcomes. Impacts across the full value chain, from the provision of liquidity through to achieving settlement finality[14], should be considered. Market participants should also consider the benefits of settling FX and any related transactions within the same settlement model, but we note that this too will be dependent on the migration strategy and that the full benefits may be realised over multiple phases.

Settlement Date

Given that the wholesale FX market is global in nature and operates across borders and time-zones, it may be necessary to reconsider the concept of Settlement Date (Value Date) for certain transactions, potentially even aligning with the concept of a 'global trading date' which is used in trading.

Currently the Settlement Date is applied to the local business day of each currency within the transaction and is therefore especially relevant when considering increased opportunities for PvP settlement, particularly when the Central Bank RTGS systems of the two currencies involved in the transaction may not overlap. For example, considering a transaction in AUDUSD settling on the 1 December, the AUD will settle on the 1 December in Australia, whilst the USD will settle on the 1 December in the United States, which due to the time-zone differences will actually be the next business day (i.e. 2 December) in Australia.

We note too that the challenges created through mismatches in RTGS operating hours was specifically discussed in the November 2018 paper published by the Bank of Canada, Bank of England and Monetary Authority of Singapore[15]. Some of the implications, such as increased liquidity management costs caused through pre-funding, have also been discussed by BIS in their March 2020 Quarterly Review under the section titled '*Payments without Borders'* [16].

Nostro Account Statements

Statements from Nostro providers showing daily activity are usually sent towards the end of Settlement Date and reconciled accordingly to identify any payments which have not been made or received. The point of reconciliation allows the movement of Central Bank monies to be evidenced, enabling the account holder to deem that settlement finality has occurred. Advancements in technologies are expected to enable this process to move towards real-time reconciliation of the movement of Central Bank monies, ultimately building to the determination of real-time settlement finality based on a single, referenceable universal timestamp, which will ensure certainty of money ownership amongst participants in various value chains who may be rapidly transferring goods, service and monies to each other.

[14] https://www.bis.org/cpmi/publ/d101a.pdf
[15] https://www.bankofengland.co.uk/-/media/boe/files/report/2018/cross-border-interbank-payments-and-settlements.pdf?la=en&hash=48AADDE3973FCB451E725CB70634A3AAFE7A45A3
[16] https://www.bis.org/publ/qtrpdf/r_qt2003.pdf

Local Regulatory Obligations

Some jurisdictions currently require the reporting of transactions/ positions to local supervisory authorities, which may be impacted by extended RTGS operating hours, especially if the concept of Settlement Date is harmonised to match the global trading day. Consideration should be given as to how these reporting obligations can be met, especially as the market migrates towards 24/7 settlement, noting that there may be an increase in activity near or at the time at which the reports are due to be generated.

2. Today's Post Trade Processes

In order to consider how an extension to the operating hours of an RTGS system may impact post-trade processes, (especially for those transactions which could be settled PvP) it is helpful first to identify and discuss those generic post trade processes within the wholesale FX markets.

Whilst each market participant will have their own proprietary processes to manage the confirmation and settlement of transactions, there are common types of functions that are performed throughout the day to ensure that the various risks that each participant faces are identified, assessed and minimised as much as possible. We have identified these generic processes in in Table 1.

Table 1: Generic FX post trade processes

When	What	Impacted by RTGS extension?
Value Date (VD)	Non- PvP transaction matching and confirmations	Likely
VD	Non- PvP net and gross settlements	Likely
VD	Intra-day controls and reconciliations	Likely
VD	Intra-day liquidity management	Likely
VD	Final checks prior to cut-off	Likely
VD/VD + 1	Regulatory reporting	Likely
VD	EOD batch processes: ledgers and statements	Likely
VD+1	Nostro reconciliations/EOD statements	Likely
VD+1	Use of funds	Likely

Most of the generic post-trade functions identified in Table 1 are considered to be time-specific in nature, i.e. they were designed to be performed at specific times of the day. These functions are usually driven by the existing RTGS operating hours in the specific currency involved. Transactions are confirmed and processed for settlement in good time to enable monies to be paid/received through the Central Bank system in the relevant currency before the specific RTGS system closes, noting that each Central Bank's RTGS system will have its own individual operating hours.

We therefore believe that it is likely that these functions could be impacted by an extension to the operating hours of a Central Banks RTGS system.

We will now discuss some of those post-trade impacts referenced above.

3. Impacts on Post-Trade Processes

We have identified that there are two considerations which apply to all processes. These are:

- Personnel: Do market participants have the right staffing model and skills in the right location(s) to accommodate a change to RTGS operating hours, especially if a follow-the-sun model is deployed?

- Network effect: It is likely that some market participants will be ready to accommodate extended RTGS operating hours before others and it is therefore necessary to expect some sort of staggered adoption by the market.

Non-PvP Transaction Matching, Confirmation and Settlement

We believe that transaction matching and confirmation processes will be required to be performed for a longer period during the day, essentially to accommodate a longer trading day.

Due to extended RTGS operating hours, transactions executed for same day value, including those eligible for PvP, will be able to be executed later in that day and will need to be confirmed prior to instructing settlement. Such trading activity is expected to be driven by both increased client demand, and the subsequent funding/hedging trading on the interbank market and despite a longer trading day will still require the counterparties to the transaction to confirm in a timely manner.

Intra-day controls and reconciliations

Market participants will be required to implement new controls and reconciliations to accommodate the potential increase in PvP settlement. The development of new controls and processes will be dependent on the migration plans of each organisation but is ultimately expected to require real-time reconciliations.

Intra-day Liquidity Management

We believe that the intra-day management of liquidity will be impacted by the extension of RTGS operating hours, especially as technology develops to enable more efficient recycling of balances following the determination of final settlement. Market participants can also be expected to develop new tools and instruments to project and manage intra-day liquidity.

Final Checks Prior to Cut-off

Due to the longer settlement hours, any final checks to ensure that all payments requiring processing have been made will need to be performed throughout the day, as well as later in the day, and any exceptions escalated for resolution, potentially to other departments. The ability to access staff in other relevant internal departments should therefore be considered.

Regulatory Reporting

Regulatory reporting, depending on the specific obligation, can be required to be performed pre-, at or post-trade; the data and reporting timeframes for the obligation dependant on the specific jurisdictional requirements. Any extension to RTGS operating hours will result in extended trading hours and therefore market participants should be prepared to ensure that their regulatory reporting obligations can be met.

End of Day Batch Processes

Market participants will have well-established and historically integrated processes to ensure that a business day can be deemed closed and the batch process run (e.g. to roll trading positions to the next business day and to send feeds to the books and records of the firm). How this batch process works will be market participant-specific and will depend on many variables, such as the technology used and the location of the entity in question. The batch process will impact many departments within a firm and is highly likely to be impacted by a change in the lengthening of a trading day, itself resulting from an increase in RTGS operating hours.

Consideration should also be made should an organisation be required to be 'offline' (i.e. access to some systems is limited) while the batch process is run and how this may impact any extended trading or settlement processes.

Nostro Reconciliations and End of Day Statements

Depending on the sophistication of the Nostro provider, it may currently be possible to reconcile monies being paid from and received to the Nostro account during the day. However, the majority of account balances are reconciled at the end of the Settlement Date via the statements of activity which are provided to the account holder and used to determine if settlement finality has occurred.

In the absence of additional technical developments, (such as real-time account balance management with universal timestamps) it is highly likely that an extension to RTGS operating hours will result in end of day statements for reconciliation being provided later in the day, and potentially into the next day (noting that this will depend on both the currency and the Nostro provider). This will impact the ability of a market participant to manage their Settlement Risk and could also impact their ability to benefit from increased PvP opportunities such as the management of capital allocated to Settlement Risk and is expected to be a driver for technical developments.

Should such benefits be realised, then there will likely be positive impacts on credit management (and therefore trading), in that client balances will be reconciled more quickly. This will enable faster decisions on extending credit for additional trading activity which, depending on the type of client, could mean that end users, e.g. corporates, have access to increased funds for investment purposes.

Use of Funds

Typically, interest on Nostro account long or short balances (e.g. due to a payment being received after the Settlement Date), is calculated daily and we do not expect that to change in the short-term. However, as technology develops, the market may be able to consider more time-precise, granular funding terms such as the payment of intra-day interest.

4. Open Questions

Whilst preparing this paper, the GFXD MAG identified a series of questions, which, while not addressed in this paper, were deemed to be of value and have therefore been included below. The GFXD MAG may re-visit these questions in further papers.

Market-wide Considerations

- If RTGS operating hours were extended, would the specific RTGS membership policies and procedures require amendments to ensure a steady flow of liquidity throughout the day?
- Are there considerable benefits of scale should multiple Central Banks look to extend their RTGS operating hours?
- Are market participants able to quantify the potential benefits across the whole value-chain (e.g. credit and capital benefits) against the changes which would be required to accommodate such changes (e.g. staffing models)?
- Given the incentives to settle on a PvP basis (e.g. credit/liquidity management), and the potential benefits of wider participation, would market participants look to settle all non-PvP transactions on a PvP basis or a sub-set of transactions and what is the impact of this?
- How to ensue that Nostro providers can take advantage of extended RTGS operating hours?

Funding

- FX as an asset class is often used to fund the purchase or sale of other assets, with the FX transaction normally settling on the same day as the asset. How would the market migrate to facilitate simultaneous settlement of the FX transaction and the underlying asset?
- Are the new solutions which are moving the industry towards 24/7 settlement interoperable, both within FX and cross-asset[17]?

Operating Practices

- Could existing regulatory requirements be accommodated (e.g. same day post-trade reporting), were trading to be extended to later in the day?
- If trading were to continue later in the day, would both counterparties to the transaction have staff available to resolve any issues on trade date, for example ensuring confirmation timeliness?
- Are there additional impacts to other processes e.g.
    - margin/collateral practices: for instance, would it be possible to post margin on the same day as the margin call has been calculated?
    - capital: for instance, how could the capital allocated for Settlement Risk be optimised?
    - liquidity: for instance, are liquidity profiles expected to change as RTGS operating hours extend, and will operational and business tools may be expected to change too?

5. Recommendations

For the wholesale FX market to benefit from developments facilitating increased PvP settlement, the GFXD recommends the following:

Recommendations for Supervisors and RTGS Operators

1. Coordinated Central Bank activity to:
    - identify and develop opportunities to increase the overlap of RTGS operating hours, noting that this may be through earlier opening or later closing times; and,
    - lead discussions on the concept of Settlement Date.
2. That supervisory guidelines promoting the management of FX Settlement Risk consider the technical evolution of the wider market and help promote the interoperability of solutions.
3. A focus on activity-based regulation/supervision to ensure that standards are maintained for new and existing market participants.

Recommendations for the Industry

1. That further analysis is performed to understand the benefits that increased PvP can have across the full FX value-chain and the dependencies (including legacy systems) which may limit/enhance such benefits.
2. That there is coordinated effort on providing new PvP solutions, followed by coordinated migration, thus creating an immediate networked benefit.
3. The promotion of interoperability between those solutions which result in the same outcome, in the case of this paper the outcome being increased PvP settlement.

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[17] See, for instance, GFXD's paper from September 2018 'GFXD recommendations for the promotion of interoperability between new technologies and service providers' https://www.gfma.org/wp-content/uploads/2018/09/recommendations-for-the-promotion-of-interoperability-between-new-technologies.pdf

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Annex: Glossary

Follow-the-sun	Workflow process where items are passed between offices to ensure continuous coverage.
FX Value Chain	The sequence of processes across the FX model from pre to post trade.
Global Trading Day	With respect to each Monday, the period commencing at 05:00 Australian Eastern Standard Time on Monday and ending at the following 17:00 Eastern Time (New York) and (ii) with respect to each other weekday, the period commencing at 17:00 Eastern Time (New York) and ending at the following 17:00 Eastern Time (New York).
Interest	Money charged by a bank for borrowing money.
Nostro Account *	A foreign currency-denominated account (usually at a foreign bank) where a domestic bank keeps reserves to maintain its balance in that currency and to make and receive payments.
Payment-versus-Payment (PvP) *	A settlement mechanism that ensures the final transfer of a payment in one currency if, and only if, a final transfer of a payment in another currency occurs.
Real-Time Gross Settlement (RTGS) *	The continuous (real-time) settlement of funds or securities on an order-by-order basis (without netting).
Settlement Date	The date the Transaction settles and any applicable payment is made by one party to the other party.
Settlement Risk *	Also known as Principal/Herstatt Risk. The risk of outright loss of the full value of a transaction resulting from the counterparty's failure to settle. This can arise from paying away the currency being sold, but failing to receive the currency being bought.

* https://www.bis.org/publ/bcbs241.htm Supervisory Guidance for Managing Settlement Risk in Foreign Exchange Transactions