# Digital bonds and the fixed income lifecycle

By **Rehan Ahmed**

**A F** In August 2020, SGX, Temasek and HSBC ran a successful pilot of a digitalised S$400 million bond issuance by Olam International on a fixed income digital asset issuance platform ("the Platform"). The pilot focused on automation of post trade and asset servicing processes, with operational efficiencies such as identifier creation, settlement cycle compression, streamlining issuance flows and payments automation.

Although there are several examples of asset digitalisation and/or use of DLT in the Asia bond markets (onshore China, Philippines, Thailand), none has focussed on syndicated public corporate bond issues. Validation of advantages that asset digitalisation, tokenisation and DLT can bring must be tried at scale to truly determine applicability to traditional capital markets.

## Parallel bond structure

The use of new technological applications and the need to compare issuance processes on the Platform versus current market practices required running the entire issuance process in its current form and comparing it to the Platform experience. This parallel approach ensured ecosystem comfort and minimal friction with current processes, allowing the team to validate efficiencies.

The bond was structured as a public deal clearing through the Central Depository Pte. Ltd (CDP), Singapore's central securities depository (CSD). The issuance process followed a standard mandate, book building and syndication process, following which issuance details were submitted to CDP through current means (paper, email, physical) and settlement instructions manually created by arranger banks and investors. On issue date, the arranger pays net bond proceeds to the issuer following which CDP triggers movement of securities from issuer to arranger bank to investor custodians (with cash movement from investors to B&D bank). Confirmation of custody and listing approval are done separately.

Current pain points include long ISIN generation lead time, the lack of real-time deal information for participants such as paying agents and law firms, physical paper trails, as well as challenges in reconciliation and generating settlement instructions.

## Platform infrastructure

The Platform is a fully integrated infrastructure that connects ecosystem participants such as issuers, arrangers, investors, lawyers, settlement and custodian banks. Key components include:

- *a web-based interface* for bond issuance and asset servicing processes; profiles for arrangers, investors, legal counsel and issuers;

- *smart contracts* to model rights and obligations of the bond such as ownership, payments due and managing transfer of securities and proceeds;

- *a ledger application* running on cloud-based infrastructure for record keeping.

## Digital bond issuance process

Arranger banks enter security information via the Platform, which is used for digital bond creation (acting as a digital term sheet); thereafter the CSD returns the ISIN for usage within the allocation process; the arranger continues the deal pricing process with bond attributes finalised at launch (size, price, coupon) and communicated to investors via the Platform. Settlement obligations are auto-generated (given availability of allocations). Issuance flows are triggered via the smart contracts (no manual entry or intervention required by issuer, arranger or investor) with HSBC's on-chain payments solution the first cash solution used for settlement on the Platform.

Digital bond and proceeds are transferred instantaneously between accounts belonging to the issuer, underwriter and investor custodian without any operational risk; the

transaction results in an ownership record on the underlying ledger, replacing the entire issuance flow with a single transaction.

## Asset servicing

A typical coupon payment process involves payment notification generation (e-mail, pdf) followed by coupon amount reconciliation, after which the issuer transfers payment to a paying agent that forwards it to the CSD. The digital bond can automate coupon or redemption payments via auto-generation of notifications and amounts, with the possibility for the issuer to automate the payments to the CSD.

## Summary of key efficiencies

- *Early security/ISIN creation* due to early receipt of deal information by CSD. This also allows for creation of the security in downstream systems.

- *Auto-generation of settlement instructions:* The Platform's auto-generation of settlement instructions reduces the operational burden; this does, however, require a shift to messaging generation by centralised market infrastructure such as CSDs to arranger and investor custodians.

- *Settlement time reduction:* New issue settlement is currently T+5 due to processes such as custody approval, deal documentation, settlement instruction generation and investor sub-allocations. Lead times for approval and completion of post-trade processes were significantly reduced, thereby enabling settlement by T+2.

- *Elimination of operational risk* as a result of collapsing the issuance flows into a single atomic transaction.

- *Independence from batch-driven settlement cycles:* The bond's settlement had no dependency on the CSD's batch settlement cycle given the settlement was triggered upon completion of conditions precedent.

- *Asset servicing automation:* As described in "asset servicing", such automation allows paying agents and trustees to focus on higher value-added activities for issuers and clients.

## Considerations for a future issuance-to-settlement digital infrastructure

*Regulation:* SGX continues to work with its legal and regulatory partners on an appropriate framework for bonds. Within Asia, both Philippines and Thailand have implemented electronic securities, while Germany has a draft Electronic Securities Act (a legal framework for issuance of paperless bearer bonds) in place.

*Modelling languages & DLT:* For the digital issuance process, the focus was on capturing the business logic of the bond lifecycle in smart contracts with DAML (digital assets modelling language) as the ledger-independent modelling language. For cost efficiency purposes, the bond was recorded on a conventional database rather than a distributed ledger. As DLT and its cost structures continue to evolve, this approach allowed all involved stakeholders to extract the highest value while preparing to integrate a DLT solution.

*Payment systems evolution:* The Platform used HSBC's on-chain payments solution and intends to add new settlement bank/payment networks to enhance liquidity options. Key catalysts here would be a major central bank digital currency or commercialisation of new payment networks. Successful trials such as Banque de France's recent issuance (settled through sovereign digital currency) serve as strong precedents.

## Key conclusions and next steps

The digital issuance process validated several downstream efficiencies, but the prospect for upstream efficiencies during the bond issuance process remains high, especially for new issue data, order taking, system integration and inclusion of other participants such as paying agents and legal counsel. Looking ahead, SGX intends to work with third-party platform partners to build an appropriate infrastructure.

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