Iñaki Aldasoro
*Inaki.Aldasoro@bis.org*

Giulio Cornelli
*Giulio.Cornelli@bis.org*

Jon Frost
*Jon.Frost@bis.org*

Priscilla Koo Wilkens
*Priscilla.KooWilkens@bis.org*

Ulf Lewrick
*Ulf.Lewrick@bis.org*

Vatsala Shreeti
*Vatsala.Shreeti@bis.org*

# Online appendix to BIS Bulletin no 107: Tokenisation of government bonds: assessment and roadmap

## Overview of tokenised bonds and matching procedure

Table A1 illustrates the diverse and evolving landscape of tokenised sovereign, supranational and agency (SSA) bonds. This highlights the significant variation in the recent experiments with regard to maturities, face values, infrastructure (ie type of platform used) and settlement assets where available. Maturities range from as short as a few months to over a decade. Face values are generally still modest, mostly on the order of a few tens of millions of US dollars – though some are much larger, with the largest bond (by the Bank of Thailand) reaching $1.6 billion. Similarly, settlement methods vary widely, including traditional fiat systems, blockchain-based settlements, tokenised cash solutions and even tokenised central bank reserves. The diversity in infrastructure is equally striking, with issuances leveraging both public and permissioned distributed ledger technology (DLT) operated by traditional financial intermediaries, such as investment banks.

Supranational institutions, such as the European Investment Bank (EIB), the World Bank and the Inter-American Development Bank (IDB), have been particularly active in this space. These bodies have issued bonds across multiple jurisdictions with innovative settlement mechanisms. In addition, treasuries and central banks in regions like Southeast Asia and Europe have embraced tokenised bonds, showcasing their potential for broader adoption. Notably, local and municipal entities, such as Swiss cantons and one US municipality, have also issued tokenised bonds, underscoring the increasing interest from smaller jurisdictions. This diversity of issuers and practices reflects the early experimental stage of tokenised bond markets as well as the fast-growing interest in these instruments.

Overview of sovereign, supranational and agency tokenised bonds — Table A1

| Issuer | Launch date | Maturity | Face value | Coupon | Infrastructure | Settlement |
|---|---|---|---|---|---|---|
| Governments and central banks | | | | | | |
| Bank of Thailand | Sep 2020 | | THB 50b (USD 1.6b) | 2.2% | IBM cloud and blockchain | na |
| Hong Kong SAR | Feb 2023 | Feb 2024 | HKD 800m (USD 102m) | 4.05% | Goldman Sachs private tokenisation platform | Central Moneymarkets Unit (CMU) of the HKMA |
| Hong Kong SAR | Feb 2024 | Feb 2026 | HKD 6b (USD 770m) | 2.9–4.75% | HSBC private tokenisation platform | CMU with links to Euroclear and Clearstream |
| Philippines Treasury | Nov 2023 | Nov 2024 | PHP 10b (USD 180m) | 6.50% | Treasury's DLT & Nat Registry of Scripless Securities (nRoSS) | nRoSS |
| Slovenia | Jul 2024 | Nov 2024 | EUR 30m (USD 32.5m) | 3.65% | BNP Paribas private tokenisation platform | BdF on-chain interoperable and tokenised cash solution (DL3S) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Supranationals | | | | | | |
| EIB | Apr 2021 | Apr 2023 | EUR 100m (USD 120m) | 0% | Ethereum public blockchain, SocGen private tokenisation platform | Blockchain payment in the form of tokenised reserves issued by BdF |
| - | Nov 2022 | Nov 2024 | EUR 100m (USD 102m) | 2.5% | Goldman Sachs private tokenisation platform | On blockchain in tokenised reserves issued by BdF |
| - | Jan 2023 | Feb 2025 | GBP 50m (USD 61m) | Floating | Private & public blockchains via HSBC private tokenisation platform | Settlement tokens rather than tokenised reserves |
| - | Jun 2023 | Jun 2025 | SEK 1b (USD 92.8m) | 3.64% | Public permissioned blockchain (PoCRNet) under the so\|bond model (Crédit Agricole CIB & SEB) | na |
| - | Nov 2024 | Nov 2027 | EUR 100m (USD 106m) | 2.36% | HSBC private tokenisation platform as digital bond issuance and tokenisation platform, interoperating with the DL3S platform in real time | France settling the digital bond issuance through exploratory cash tokens on BdF's DL3S platform |
| - | Nov 2024 | Nov 2029 | EUR 100m (USD 106m) | 2.55% | Goldman Sachs' private tokenisation platform | Cash tokens issued on DL3S platform by BdF, interoperable in real time with GS platform |
| IDB | Mar 2025 | Aug 2026 | GBP 5m (USD 6.5m) | 4.262% | HSBC private tokenisation platform | Blockchain-based settlements |
| World Bank/IBRD | Aug 2018 | Aug 2020 | AUD 110m (USD 80.6m) | 2.20% | Private, permissioned blockchain from CBA Innovation Lab's Blockchain Centre of Excellence | Traditional fiat |
| - | Aug 2019 | Aug 2020 | AUD 50m (USD 33.9m) | 2.20% | Private, permissioned blockchain from CBA Innovation Lab's Blockchain Centre of Excellence | Traditional fiat |
| - | Oct 2023 | Oct 2026 | EUR 100m (USD 106m) | 3.40% | Euroclear's private tokenisation platform | Euroclear's traditional settlement platform |
| - | Jun 2024 | Jun 2031 | CHF 200m (USD 224m) | 1.16% | SDX DLT platform | Tokenised reserves with SNB |
| Local/municipal entities | | | | | | |
| Basel-Stadt | Dec 2023 | Dec 2027 | CHF 105m (USD 121m) | 1.3% | SDX DLT platform | Tokenised reserves with SNB |
| City of Quincy, MA, USA | Apr 2024 | Apr 2031 | USD 10m | na | JPMorgan private tokenisation platform | na |
| Lugano | Jan 2023 | Jan 2029 | CHF 100m (USD 108m) | 1.63% | SDX DLT platform | Tokenised reserves with SNB |
| - | Jun 2025 | Jun 2032 | CHF 100m (USD 120.5) | 0.6125% | SDX DLT platform | Tokenised reserves with SNB |
| St Gallen | Mar 2024 | Mar 2027 | CHF 100m (USD 113m) | 1.25% | SDX DLT platform | Tokenised reserves with SNB |
| Zurich | Dec 2023 | Dec 2034 | CHF 100m (USD 115m) | 1.45% | SDX DLT platform | Tokenised reserves with SNB |

BdF = Banque de France; CBA = Commonwealth Bank of Australia; EIB = European Investment Bank; HKMA = Hong Kong Monetary Authority; IDB = Inter-American Development Bank; amounts: m = million, b = billion.

The table reports a selected list of tokenised bond and does not include other debt instruments such as notes and commercial paper.

Source: ICMA.

## Matching procedure for tokenised vs conventional bonds

The analysis in the Bulletin is based on a matching of each tokenised bond (*i*) with a conventional bond (*j*) from a sample of bonds from the same issuer, in the same currency and with the same coupon type. Specifically, we match each tokenised bond with a conventional one on three indicators through a propensity score matching procedure: first, the difference in issue date between bonds *i* and *j*; second, the difference in maturity; and third, the percentage difference in issuance size.

We select the nearest neighbour by estimating propensity scores with the following logit specification:

$$\phi(T_i) = \beta_1 + \beta_1 \Delta\, issue\ date_{i,j} + \beta_2 \Delta\, maturity_{i,j} + \beta_3 \Delta\, amount\ issued_{i,j} + \varepsilon_{i,j}$$

where $T_i$ is an indicator variable equal to one for tokenised bonds.

Ideally, the differences in the variables used to match tokenised and the selected conventional bonds should not be statistically different from zero. However, in our sample this holds for only one out of the three dimensions. This is probably driven by the small sample size of tokenised bonds and suggests that results should be interpreted with caution.