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Tokenized Bonds

The Cost of Faster Settlement

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Tokenized Bonds: The Cost of Faster Settlement

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Hong Kong's government digital-bond programme expanded from HKD 800 million in 2023 to approximately HKD 10 billion equivalent in 2025. That is evidence that a sovereign issuer and its intermediaries can execute larger tokenized transactions. It is not, by itself, evidence that tokenization reduces an issuer's all-in cost. This paper asks a more specific question: **which costs must fall, for whom, and over how many transactions, before a different settlement architecture pays for itself?**

We compare three government issuance announcements, then build two transparent scenarios. The first tests how repeated issuance amortizes integration costs. The second measures how an increase in the cash required for settlement can offset operating savings. The cases document execution; the scenarios identify economic thresholds. No private fee schedules, order-level trading data or controlled conventional-versus-digital experiment are available in the selected record.

1. A programme can scale before its savings are measured

For an issuer, a financing cost is not the same as a settlement cost. Coupon pricing reflects maturity, currency, credit, market conditions and investor demand. Legal work, platform integration, custody, reconciliation and paying-agent services are additional costs. A tokenized instrument can change some of those operating tasks while leaving the issuer's fundamental credit unchanged.

The first analytical step is to choose the unit of comparison. This paper uses the **incremental cost of operating a recurring issuance programme**, holding the economic terms of the bonds constant in the illustrative model. That choice avoids treating a different interest-rate environment as a technology benefit. It also makes clear why a small first issue and a large repeat programme can reach different conclusions with the same software.

A second boundary is the participant. A process that saves work for an issuer may require new custody or cash arrangements for an investor. A settlement agent can absorb complexity into a fee. A credible cost comparison should record those transfers before describing savings for the market as a whole. We do not assume that all benefits accrue to the party funding the integration.

2. What the three issuances actually show

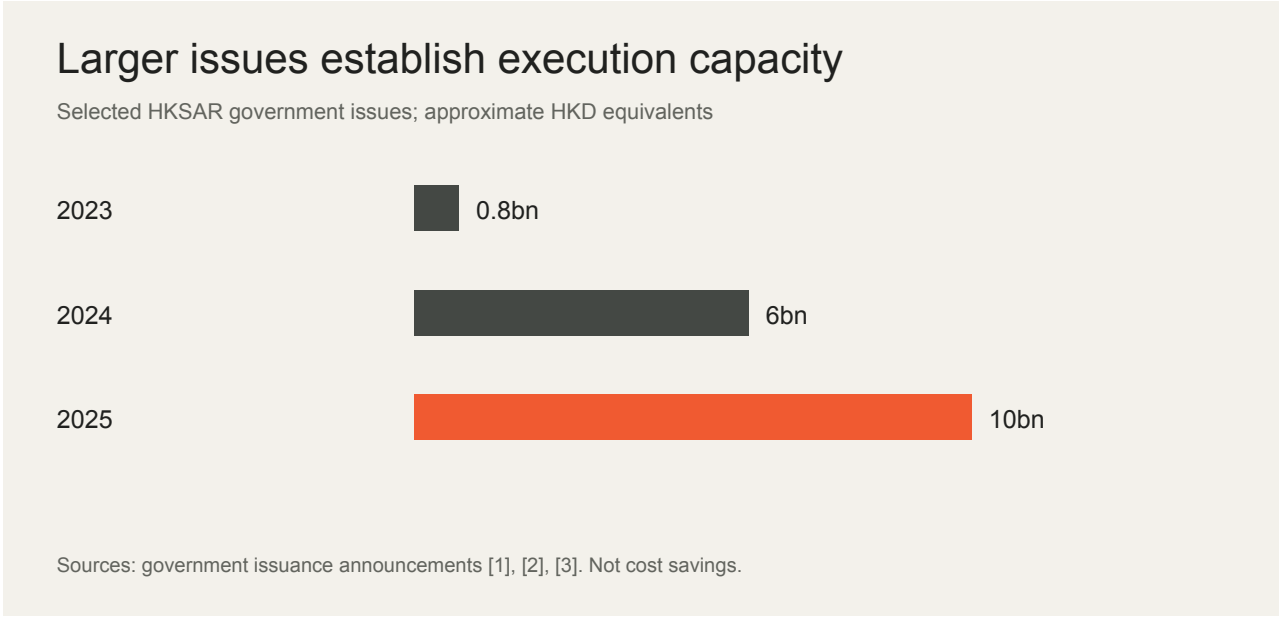
The February 2023 government announcement describes a one-year HKD 800 million tokenized green bond. Primary issuance used delivery versus payment between securities tokens and cash tokens representing an HKD claim against the HKMA, on a T+1 basis. CMU was the clearing and settlement system, using GS DAP. These are disclosed architecture and transaction facts, not a published invoice for the infrastructure. [1]

In February 2024, the government announced approximately HKD 6 billion equivalent of digital green bonds across HKD, RMB, USD and EUR. The official account highlights a digitally native format and the ability to access the bonds through traditional market infrastructure. Those features broaden the

question from whether a token can be issued to how investors reach it. They do not establish that every participant uses a direct blockchain account. [2]

The November 2025 announcement records approximately HKD 10 billion equivalent, again across four currencies, with a T+1 cycle. For the HKD and RMB tranches, tokenized central bank money was an option alongside traditional settlement rails in primary issuance. The announcement also describes links between token identifiers and conventional securities identifiers. It does not say that all four currency tranches settled exclusively in digital central bank money. [3]

Announcement	Approximate issue size, HKD equivalent	Disclosed development	Economic question left open
February 2023 [1]	0.8bn	Tokenized securities and cash in primary DvP	Incremental integration and operating cost
February 2024 [2]	6.0bn	Four currencies and digitally native issuance	Cost of supporting direct and traditional access
November 2025 [3]	10.0bn	Optional digital central bank money for two currencies	Participation and cost by settlement route



The progression is a selected series for one sovereign programme, not a measure of all Asian tokenized bonds. The approximate HKD equivalents are taken from announcements rather than retranslated at a common exchange rate. The three observations also share an issuer and an evolving institutional infrastructure. They cannot be treated as three independent experiments on technology performance.

A February 2026 government reply discusses further development of the bond market and the 2025 tokenized issuance. Its policy context reinforces that public infrastructure development has objectives beyond a single issuer's near-term invoice. We therefore separate demonstration value and market development from recurring commercial savings. Both can be valid objectives, but they require different measures. [7]

3. A shorter settlement interval is not automatically less funding

Delivery versus payment makes the exchange of securities and payment conditional on one another. That reduces exposure to completing only one side of an exchange. It does not answer how much cash each participant must have available at the moment of settlement, whether obligations can be netted, or what happens when a participant cannot deliver.

The BIS's 2020 analysis of securities settlement identifies an important trade-off: tokenized arrangements may increase gross settlement and fragment cash across ledgers, raising liquidity needs. Its 2023 monetary blueprint likewise notes that atomic settlement can need liquidity-saving mechanisms. We use these arguments as competing hypotheses about architecture, not as observations of the cash usage in Hong Kong's programme. [4] [5]

It follows that three clocks should be kept separate: the contractual settlement cycle, the elapsed time to complete an individual exchange, and the interval over which a participant must fund its obligation. T+1 identifies a cycle relative to a transaction date. A seconds-long execution at the end of that cycle does not establish that cash was required for only seconds.

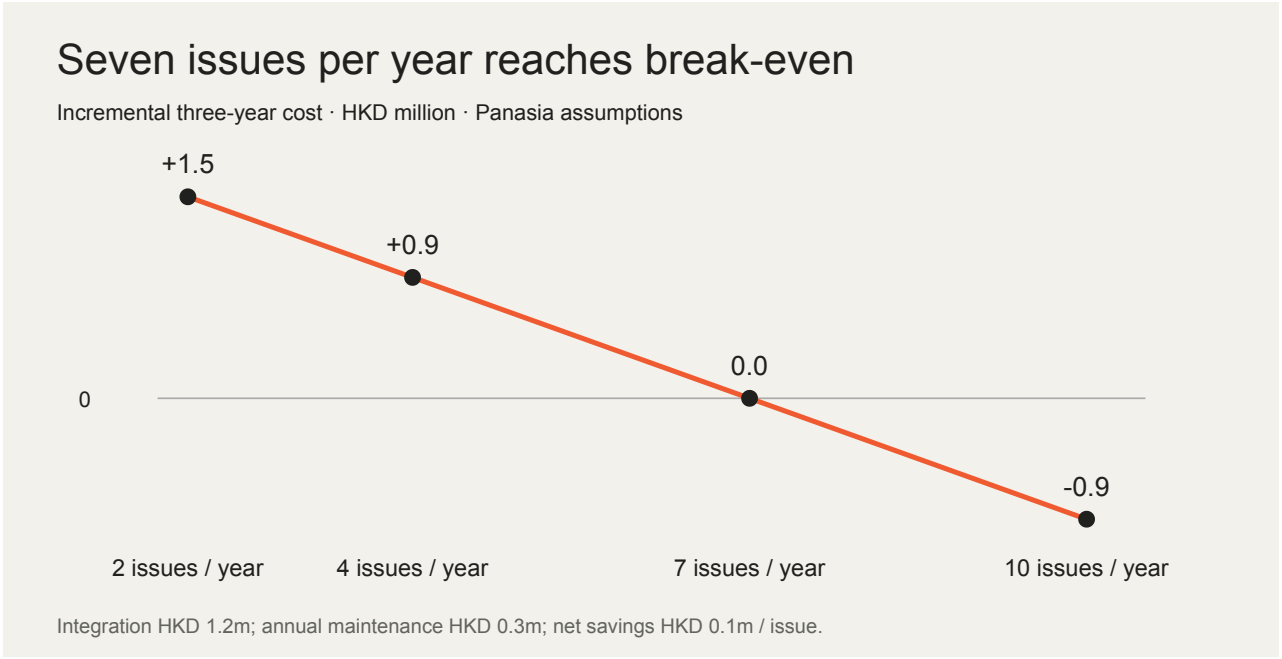
The counterfactual is therefore not simply slow versus fast. It is one complete funding and settlement arrangement against another. A conventional netting process can require less cash but defer final exchange. A gross atomic process can complete exchanges quickly but require cash in advance. A design that combines conditional execution with effective netting might improve both. The paper's evidence does not establish which outcome prevailed for every investor in the selected issues.

4. How repeated issuance changes the threshold

Consider a hypothetical programme with the same bond terms and investor access under two operating designs. Let F be an incremental integration cost of HKD 1.2 million, A an annual incremental maintenance cost of HKD 300,000, and H an evaluation period of three years. Assume each issue avoids HKD 180,000 of conventional processing work but adds HKD 80,000 of digital platform, custody and operating charges. Net variable savings S are HKD 100,000 per issue.

Ignoring discounting for this short illustrative comparison, the incremental three-year cost of the digital route is $\mathbf{F + H \times A - H \times N \times S}$, where N is issues per year. A negative number means savings relative to the defined alternative. Break-even issuance frequency is $\mathbf{N = (F/H + A) / S = 7}$ **issues per year**. These input values are selected assumptions, not fees reported by CMU, HSBC, Goldman Sachs or the government.

Issues per year	Three-year net variable savings	Integration plus maintenance	Incremental three-year cost
2	HKD 0.6m	HKD 2.1m	HKD 1.5m
4	HKD 1.2m	HKD 2.1m	HKD 0.9m
7	HKD 2.1m	HKD 2.1m	HKD 0.0m
10	HKD 3.0m	HKD 2.1m	HKD -0.9m



This simple result explains why an issue-by-issue comparison can mislead. Charging all integration work to the first bond understates the value of reuse. Assuming unlimited reuse understates the risk that a platform, legal structure or investor requirement changes. A defensible programme case needs a realistic schedule, consistent scope and a plan for the residual system if issuance stops.

The horizon is itself a sensitivity. With a one-year horizon, the same assumptions need 15 issues to break even. With five years, the annual threshold is 5.4 issues, which means at least six whole issues a year under a uniform schedule. The change is arithmetic, not a forecast of adoption. Technology replacement, maintenance escalation and discounting would make a long-horizon estimate more demanding.

Issue size matters only through the costs it actually changes. Doubling principal does not automatically double a fixed legal or integration saving. A percentage-based custody charge does scale with principal. Separate fixed, per-issue, per-investor and proportional costs rather than force them into one basis-point number. Otherwise a larger bond can look more efficient simply because a fixed cost was divided by a larger denominator.

5. Grants and economic savings should be reported separately

Hong Kong launched its Digital Bond Grant Scheme in November 2024, with a maximum grant of HKD 2.5 million per eligible issuance subject to the scheme's requirements. That is a policy instrument with eligibility conditions, not an automatic payment to every digital bond. Our model does not assume the maximum grant or determine whether an issuer qualifies. [6]

A subsidy can improve the issuer's cash economics while leaving the underlying resources consumed by the process unchanged. Report both numbers: the operating comparison before subsidy, and the issuer's out-of-pocket comparison after an actually approved amount. A business that only breaks even with support may still be worth piloting, but its recurring commercial case should not be presented as already proven.

For illustration only, a one-time HKD 600,000 contribution toward the model's integration cost would lower the three-year frequency threshold from seven to five issues per year. That is **(600,000 / 3 + 300,000) / 100,000** after reducing F to HKD 600,000. It is not an estimate of an award under the actual scheme. Timing of receipt and eligibility expenditure would need to be added to a real cash-flow model.

The same discipline applies to internal cross-subsidy. If a platform provider discounts an initial programme to establish market share, the buyer's current contract may be attractive. The undiscounted recurring service still needs a credible business model. Research should identify the contractual duration of the discount and show the threshold after it expires instead of treating a launch promotion as a permanent structural saving.

6. A liquidity sensitivity can reverse the operating result

Now isolate one investor's settlement funding. Suppose the old arrangement requires HKD 20 million of cash for one calendar day, while the new arrangement requires HKD 100 million for the same day. At an assumed annual funding rate of 4%, the additional funding cost is **(100m − 20m) × 4% / 365 = HKD 8,767.12**. The 80% reduction implicit in the old arrangement is an assumption used to test netting; it is not measured in the government issues.

If the new design shortens the period requiring the full HKD 100 million to 0.2 of a calendar day, the two arrangements have equal cash-time exposure in this simplified model. Shorter than that, the digital route uses less funded cash-time; longer than that, it uses more. A unit conversion is essential: calendar-day fractions in an ACT/365 calculation should not be substituted directly for a platform's operating hours or business-day cutoff.

New route funding interval	Cost on HKD 100m at 4%	Old route: HKD 20m for one day	Incremental funding cost
0.1 day	HKD 1,095.89	HKD 2,191.78	HKD -1,095.89
0.2 day	HKD 2,191.78	HKD 2,191.78	HKD 0.00
0.5 day	HKD 5,479.45	HKD 2,191.78	HKD 3,287.67
1.0 day	HKD 10,958.90	HKD 2,191.78	HKD 8,767.12

This sensitivity is a participant-level comparison. It should not be added mechanically to the issuer programme model because the costs may fall on different entities and because netting benefits can be redistributed. A market-wide study would consolidate participants, remove transfers such as one party's fee and another party's revenue where appropriate, and retain real resource and financing costs without double-counting.

A credit facility can also reduce prefunding without eliminating its price. Count commitment charges, drawn interest and collateral requirements. If funding is free only under a central bank pilot or an internal treasury policy, document that condition. The useful design question is how fast exchange, netting, collateral and cash availability work together, not whether an isolated ledger records transfers quickly.

7. The evidence needed to make a savings claim

A stronger empirical study would compare repeat issues with similar currency, tenor, size, rating, investor mix and market conditions. Collect legal and platform invoices, custody arrangements, internal staff time, failed-settlement interventions and paying-agent costs. Document whether any task has been eliminated, automated, shifted to another organization or retained as a parallel control.

Settlement data should include funding arrival, securities availability, final exchange and the time funds can be reused. Report the distribution, not only the best execution. Count exception cases and specify whether the obligation is gross or net. Separate primary issuance from secondary trading: a successful primary distribution cannot establish liquid resale markets or low bid-ask spreads afterwards.

For financing cost, match against a credible conventional benchmark rather than compare coupons from different years. A spread difference can reflect supply, scarcity, investor preferences or subsidy as well as process changes. If there is no convincing counterfactual, publish the spread as an observation and leave its cause open. A regression with too few or poorly matched issues would create apparent precision without identifying tokenization's effect.

The central hypothesis is testable: repeated use should improve economics where reusable fixed work is material and net variable savings remain positive. It would weaken if integrations had to be rebuilt for each issue or if investor-support costs rose enough to offset automation. The liquidity hypothesis would weaken where the new design preserves netting or sharply shortens required cash holding. Those are specific observations a subsequent study could obtain.

Method, limits and conclusion

The corpus consists of three official issuance accounts, one government policy reply, one grant announcement and two BIS analyses. The sources were reviewed on 12 September 2026. This is a purposive study of a Hong Kong programme, not an Asian market census. The announcements are informative about structure and scale but do not contain the cost dataset necessary for a causal estimate. Approximate issue sizes are deliberately not converted into a total-market growth rate.

All monetary scenarios are Panasia calculations. The downloadable CSV retains inputs, formulas and unrounded outputs. The models use simple ACT/365 funding cost, no compounding, a fixed issuance schedule and constant assumed fees. They omit taxes, credit losses, software replacement, legal changes and residual asset value. Their purpose is to show thresholds and accounting boundaries, not to predict the economics of a named platform.

The research does not establish that tokenization is cheaper or more expensive in general. It establishes why the answer depends on programme frequency, reusable work, investor access and cash-time exposure. The reviewed issuance record supports the ability to execute and extend tokenized structures. A publishable claim of savings requires the next layer of evidence: matched costs and funding outcomes over the full lifecycle, including the work that remains outside the ledger.

References

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[4] Bank for International Settlements. March 2020. *On the future of securities settlement*. BIS Quarterly Review analysis.

[5] Bank for International Settlements. June 2023. *Blueprint for the future monetary system: improving the old, enabling the new*. Annual Economic Report, chapter III.

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