THE CENTRAL BANK
OF THE REPUBLIC
OF UZBEKISTAN

UZBEKISTAN'S PATHWAY TO WHOLESALE CBDC: PRECONDITIONS, IMPACTS AND TRADE-OFFS

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Foreword

The Central Bank of the Republic of Uzbekistan is exploring the potential role of wholesale central bank digital currency as part of the continued development of the country's financial and payment infrastructure. This report assesses where wholesale CBDC could add value, the conditions required for its effective use, and the potential benefits, risks and trade-offs associated with different approaches.

Drawing on international experience, the study considers both domestic and cross-border use cases and examines wholesale CBDC alongside alternative solutions. The report is intended to provide an analytical basis for further consideration and does not predetermine a decision on the issuance or implementation of a wholesale CBDC.

About GFTN

The Global Finance & Technology Network (GFTN) is a Singapore-headquartered organisation that leverages technology and innovation to create more efficient, resilient and inclusive financial systems through global collaboration. GFTN hosts a worldwide network of forums, including its flagship event, the Singapore FinTech Festival; advises governments and companies on policies and the development of digital ecosystems and innovation within the financial sector; and offers digital infrastructure solutions.

About OMFIF

With a presence in London, Washington and New York, OMFIF is an independent forum for central banking, economic policy and public investment — a neutral platform for best practice in worldwide public-private sector exchanges. OMFIF's Digital Monetary Institute convenes the public and private sectors on the future of money, payments and financial markets.

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Executive Summary

The payments industry is undergoing a period of exceptionally rapid development, with new payment formats emerging, complete with new functionalities, but also novel risks. Policymakers must work to understand these changes and adapt to changing circumstances to ensure that they can still exercise the influence necessary to protect financial stability and promote innovation and economic prosperity through stable, efficient payments.

In this context, we analyse the process that should underpin the decision to launch a central bank digital currency (CBDC). This report will focus on CBDCs for wholesale purposes – primarily interbank settlement – rather than retail CBDCs, used by individuals and businesses for day-to-day payments activity.

This report will explore the advantages and disadvantages of wholesale CBDCs (wCBDCs). We divide them into features for domestic payments and for cross-border payments. The former includes future-proofing capital markets settlement, providing a settlement layer for tokenised bank money, operational resilience and strategic autonomy. The latter includes improved efficiency, strategic autonomy and censorship resistance, and reduced reliance on the dollar and lower foreign exchange volatility.

It is important to note that this report is not intended to provide a conclusive answer on whether the Central Bank of the Republic of Uzbekistan (CBU) should issue a wCBDC. It is rather an examination of the potential benefits and, crucially, the other factors (both economic and policy-related) on which those benefits are contingent.

Whether a wCBDC provides economic benefits ultimately depends on the way it is implemented, underlying economic conditions and the existing payments environment, as well as how decisionmakers perceive what the future might bring for them. This work aims to provide the CBU with an appreciation of the relevant factors and the tools necessary to make this decision.

1 | Domestic Payments

The term wCBDC is used by different people to refer to different concepts. Here, we use it to mean: a digital currency based on distributed ledger technology ("DLT"), issued by a central bank for use in settlement between banks and other payments institutions.

While DLT is not an absolutely necessary requirement for wCBDC, it is an element common to most central bank research and experimental projects in this area. It also differentiates it from existing traditional forms of central bank reserves, which are digital but do not use DLT.

It is also worth distinguishing wCBDC from retail CBDC. Although the same technology could underpin both retail CBDC and wCBDC, their purposes differ. While wCBDC is used for interbank settlement, retail CBDC is for individuals and businesses to pay for goods and servicttes.

While some central banks (including the European Central Bank) are pursuing retail CBDCs, many more have decided not to do so, following extensive research and experimentation. Although there are some potential advantages to retail CBDCs, there is ongoing debate as to whether these benefits can be effectively captured through other means. Since Uzbekistan has a functioning cash ecosystem, central bank money still plays a role in payments. It also has a modern and accessible card-based payment system, so the retail payment needs of the community are well-served, as well as a functioning instant payments system with plans for further expansion. Hence, without a clear added value for retail CBDC deployment in Uzbekistan, a comprehensive evaluation of the marginal benefits retail CBDC issuance could provide falls outside the scope of this report.

A wCBDC can be an important step in improving the domestic payments system of a country. However, simply implementing a wCBDC will not in itself bring about any improvements for Uzbekistan's economy. The potential economic benefits can only emerge when the wCBDC implementation is part of a broader payments strategy review that influences how money moves and strengthens financial market infrastructure. We understand Uzbekistan is working on a payments strategy to be implemented between 2028 and 2032. It may be possible to incorporate a wCBDC as a part of this overall strategy.

In this chapter, we examine the ways in which a wCBDC might form a component of a broader payments strategy and explore a methodology for calculating its cost-effectiveness.

Key findings

1. wCBDC can eliminate settlement risk and enhance the functioning of capital markets and futureproof market infrastructure.
2. Settlement risk could also be eliminated with other methods, like synchronisation with traditional RTGS systems. A careful cost/benefit analysis will be needed to choose the best solution and this will vary from country to country.
3. Stablecoins can provide a cash-on-chain solution for capital markets, but they introduce risks that do not apply with wCBDC.
4. wCBDC can also help with stablecoins when they function as retail payments instruments, since it can help to ensure they can easily be converted into public money.
5. Tokenised deposits have the potential to improve the efficiency of payments services and, while wCBDC is not a strictly necessary feature for settlement, its presence is likely to ensure the best outcome.
6. wCBDC can improve the operational resilience of Uzbekistan's payments landscape, because DLT removes the single point of failure, but it may not be the cost-effective way of doing so.
7. Since it operates 24/7, wCBDC can improve financial stability by making it possible to deliver emergency liquidity on an automated basis as needed.

1.1 Future-proofing capital markets settlement and eliminating settlement risk

Uzbek capital markets are set for an overhaul, thanks to a regulatory sandbox for stablecoins overseen by the National Agency of Perspective Projects (NAPP) and the CBU. This will include provision for both crypto asset trading and the tokenisation of traditional securities like stocks and bonds. If this overhaul is intended to promote capital markets development in Uzbekistan with new technical infrastructure, then wCBDC may be an important component in ensuring that the full benefits are realised.

In Uzbek capital markets, settlement typically takes one to two days depending on the asset class. During this time, it is possible for prices to change or for one of the parties to go bust. This could result in a situation where one party receives an asset but does not send payment or sends payment but does not receive the asset. Mitigating this settlement risk requires brokers to contribute to a guarantee fund. This is a cost for market participants that can be eliminated through conducting the transaction on DLT-based infrastructure.

The key benefit of DLT-based settlement is the elimination of settlement risk. The settlement of assets stored on distributed ledgers can take place instantly, without the need for intermediaries and without the risks attendant on traditional settlement systems. DLT-based transactions can be settled atomically – neither leg of the transaction will be settled without the other.

If the asset is tokenised – represented on a blockchain – then it is possible to ensure that transactions can be settled without settlement risk. Introducing a wCBDC is one method of providing settlement without settlement risk, but there are several other ways of achieving this without central bank money, the merits of which are discussed later. It is important to acknowledge first that the relative benefits accrued from the introduction of this kind of system depends on multiple inputs:

1. **wCBDC deployment cost:** how much will it cost to issue and operate a wCBDC system, both by the CBU and by market participants? Such costs include, inter alia, system development, integration and cybersecurity costs but should also take into account the cost of maintaining existing systems.
2. **The cost of settlement risk:** how expensive is the opportunity cost of the capital deployed in a guarantee fund and the cost of unwinding failed transactions? There are also less easily quantified costs, stemming from caps that limit banks' settlement risk exposure to each other and liquidity pools that help to buffer timing mismatches during the uncovered period between trade execution and final settlement. Where else could this capital be deployed and to what effect if these costs were eliminated, as well as reducing the amounts required to mitigate counterparty credit risk?
3. **The extent to which tokenisation of financial markets is adopted.** If only a small fraction of traditional assets moves on tokenised rails, the benefits of reducing settlement risk will be commensurately small.

It is also important to consider that, if wCBDC transactions must be pre-funded in order to achieve risk-free settlement, and the move to tokenised assets is only partial so that two settlement systems operate in parallel, then the liquidity cost of pre-funding wCBDC transactions may well offset the savings from removing settlement risk.

1.2 Traditional system synchronisation

A wCBDC is not the only way to deliver atomic settlement in central bank money for tokenised financial assets. It is therefore important to look at alternative solutions to evaluate if wCBDC is the most effective way to proceed.

Central banks are experimenting with ways to synchronise their existing real-time gross settlement (RTGS) systems (or other central bank operated payments systems) with transactions on distributed ledgers, eliminating settlement risk without introducing a CBDC.

The Bundesbank trialled a 'trigger solution' during the European Central Bank's (ECB) central bank money trials in 2024. Although the ECB is expected to introduce something much more similar to a wCBDC in 2026 as part of Project Pontes, it is still expected to incorporate a synchronisation solution to connect it to the Target 2 RTGS system, at least in the pilot phase. The ECB has laid out a roadmap for its Project Appia – its strategy to provide central bank money within tokenised wholesale financial markets.

The UK is also expected to introduce a synchronisation solution rather than a wCBDC. It is highly likely that developing and operating a synchronisation solution will be cheaper than issuing a wCBDC. Synchronisation solutions, because they use existing infrastructure also require less integration work by market participants. Central banks pursuing this avenue hope that it will provide a cheaper, simpler means of delivering atomic settlement in central bank money.

There are several downsides to relying on traditional settlement systems for tokenised wholesale settlement:

1. **Operating hours:** Uzbekistan's Settlement Centre and Depository are participants in its RTGS system. This system has extended operating hours but is not 24/7/365. Tokenised capital markets can operate non-stop. This means that there will at sometimes be a lag between the settlement of assets and the cash settlement process. This either reintroduces settlement risk or limits the operating hours of tokenised capital markets.
2. **Operational resilience:** Synchronising with existing payments systems means that the system is dependent both on the functioning of the RTGS system and on the functioning of the synchronisation operator. This introduces an additional component that is subject to risk of failure, and this risk compounds with existing risks.
3. **Latency:** Operating across two systems requires synchronisation mechanisms like hash time-locked contracts to lock up the asset side of the transaction, pending confirmation from the payments system. This can introduce delays that, while small, might create settlement risks or even risks of front-running.
4. **Composability:** Research has not yet concluded what additional functionality a wCBDC will provide that a synchronisation solution would lack. However, the Banque de France, a European pioneer of wCBDCs, believes that it will provide greater flexibility and potential for programmability. It will be difficult for synchronisation solutions to deliver composability where money can participate in several different smart contracts seamlessly.

Given these downsides, the CBU may prefer to look for a solution that provides a version of central bank money that exists natively on-chain, rather than synchronising with traditional payments systems.

1.3 Facilitating soum-denominated stablecoins with wCBDC

Cash already exists on chain in the form of stablecoins. Here, we use this term to mean a token on a blockchain with a value pegged to a fiat currency and backed one-for-one by reserves. The nature of these reserves and the requirements on issuers of these instruments are gradually being established in various jurisdictions.

Their use remains dominated by providing crypto-asset trading pairs, but they have an increasingly important role in other forms of payments as well, particularly cross-border payments.If stablecoins' use is to grow, then managing the risks they present and the needs of their users must become part of the central bank's strategy. To ensure that their use does not compromise the singleness of money, it must be possible to quickly and easily convert them into other forms of money. A wCBDC might help with this. It could be possible to back stablecoins with wCBDC tokens. This would ensure that they were risk-free and would, in effect, create a 'synthetic CBDC'.

Generally, however, stablecoins are backed by commercial bank deposits and short-term government bonds rather than central bank deposits, not least because this provides stablecoin issuers with an ongoing revenue stream. In this case, a liquidity pool for wCBDCs and government bonds could still provide convenient exit ramps. Soum-denominated stablecoin issuers can sell their reserves to a liquidity pool in exchange for wCBDC, then use the newly obtained wCBDC tokens to fund redemptions. The speed and surety of this system would enhance the stability of stablecoins and make them a more robust payment instrument.

If soum-denominated stablecoins are likely to form a major component of Uzbekistan's payments landscape in the future, then a wCBDC, either as a reserve asset, or as a means of ensuring the stablecoin's convertibility into central bank money, would enable it to play a role in anchoring the value of the currency.

While dollar stablecoins are becoming more popular, it would not be possible to back these with wCBDC since the reserves should always be denominated in the same currency as the stablecoin.

1.4 Stablecoins in capital markets

Despite the growth of stablecoin use, some jurisdictions feel that they represent a suboptimal solution for capital markets settlement.

The Bank for International Settlements' (BIS) Principles for Financial Market Infrastructure state that, wherever possible, central bank money should be used for institutional settlement. This is because it represents a risk-free form of money since it is a direct claim on the central bank, and therefore, the central bank can have direct influence on its actual supply.

Stablecoins typically represent a claim on the issuer, backed by the reserves. They are therefore only as safe as that claim. If the assets reserving the stablecoin drop in value, then stablecoins can suffer a run or a fire sale, resulting in them trading below par. When backed by very highly liquid assets such as short-dated US Treasury bills, this risk can be fairly small, but even high-quality stablecoins still frequently trade below par on exchanges. Stablecoins denominated in local

currencies, particularly if they are backed by more volatile debt products, might suffer from worse de-pegging events.

Although major dollar-denominated stablecoins are typically liquid on exchanges, this may not necessarily be the case with stablecoins denominated in local currencies. Most users cannot redeem stablecoins directly with the issuer and, even if they can, this can be subject to delays.

Stablecoins may also be subject to scaling concerns. The infrastructure must be able to provide sufficient stablecoin tokens to cope with the demand when large deals like the TBC Digital deal in February 2026 arrive, which led to some UZS4tr moving in the secondary market.

The demands will be higher if stablecoins are to provide the cash legs for foreign exchange and money markets. Money market volume in 2025 peaked in Q3 with some UZS256tr ($20.9bn). Estimating the appropriate size of float for an institutional stablecoin is complex.

Stablecoin supply needs to be elastic. Liquidity needs are not constant but tend to be concentrated around ta days or bond issuance. Maintaining a float capable of supporting peak volume all year round is inefficient, so institutional stablecoin reserves should be capable of rapid expansion in response to demand.

In general though, the float should be based on the expected daily volume and the velocity of money in the relevant markets. Central banks already make a similar calculation when assessing the appropriate liquidity balances commercial banks should maintain in reserve accounts.

The immediacy of tokenised settlement will mean that more transactions must be settled urgently without waiting for money to be received. However, the capacity to settle 24/7 allows transaction volume to be spread out over a longer period, lowering the demand for liquidity.

These features do not necessarily make stablecoins unusable as a tool for capital markets settlement, but they introduce risk factors that participants must price and which are not present in a wCBDC.

1.5 A settlement layer for tokenised bank money

Stablecoins are not the only possible providers of on-chain cash solutions. Commercial banks can tokenise their deposits, creating tokens backed not by a pool of reserves, but by the bank's balance sheet.

Banks around the world are creating tokenised versions of their forms of money as a means of improving payments. This means that tokenised bank money

could theoretically fill the role of the stablecoin in providing a payment instrument for the cash leg of tokenised capital markets transactions.
There are some key differences between tokenised bank money and stablecoins. Since tokenised bank money is backed by the issuing bank's balance sheet, the scale is not limited to the supply of short-dated government bonds but by the bank's balance sheet.

However, tokenised deposits are liabilities of the issuing bank and, at present, can only be used for intra-bank payments. Stablecoins, by contrast, are bearer instruments and can be used to pay people who have no relationship with the issuer.

Transitioning tokenised deposits from intra-bank payments to inter-bank payments is a complex proposition. One potential solution is for payments in tokenised deposits to be ultimately settled in central bank money. This is being tested in the UK by the GBTD project, formerly known as the Regulated Liability Network (RLN).

Under this conception, a transaction would look like the following:
1. Customer of Bank A pays 100 to customer of Bank B.
2. Bank A burns 100 of customer A's tokens. Bank B mints 100 new tokens in the wallet of customer B.
3. Bank A sends bank B 100 wCBDC tokens.

So while tokenised deposits could theoretically become used as a payments instrument for capital markets transactions, the question of final interbank settlement remains.

Wholesale CBDC is the solution presented above. However, in theory, the central bank money used for the interbank settlement in step 3 does not need to be a wCBDC. Central bank reserves are already digital. Provided the operating hours are extended to match the needs of the market and an effective synchronisation solution is in place, then final settlement in central bank money can be delivered. However, the experimentation phase of the RLN project concluded that settlement 'through RTGS or potentially using an omnibus account scheme' is possible 'if no wCBDC is available', but 'a wCBDC can offer enhanced settlement functionality... compared to existing RTGS integration'.

One example of the enhanced functionality this might include are liquidity savings mechanisms. Traditional systems can suffer from liquidity gridlock where one bank cannot pay another until it receives payment from a third. With wCBDC, there is a much clearer view of the market as these payments can be atomically settled instantly, reducing upfront liquidity needs.

It is also important to note that if a wCBDC shares the ledger with the asset (tokenised deposits), then since the ledger provides a single source of truth, there is no need for the costly process of end-of-day reconciliation.

It will also be possible to add payments logic to a wCBDC, opening up functionality like conditional payments. This is a function that means payments are only executed if certain conditions are met. This enables more complex and flexible payments operations than synchronisation.

If the CBU feels that tokenised deposits are likely to become an important component of its payments landscape, then the enhanced security and settlement functionality of a wCBDC might make it a good investment.

1.6 Assessing the benefits for operational resilience

A wCBDC can potentially improve the resilience of national payments infrastructure.

One potential approach to implementing wCBDC involves it functioning alongside the existing system as a back-up in the case of disruption to the traditional system. However, this relies on every participant in the traditional system being onboarded onto the wCBDC system and for the networks to operate independently. If wCBDC payments are routed through the national switch, it loses its value as a fall-back system.

However, given the cost of developing, introducing and operating a wholesale CBDC system in parallel to existing payments systems, it is unlikely to be a cost-effective measure for resilience compared to simpler and more traditional methods, such as offsite disaster recovery infrastructure.

Nonetheless, wCBDCs based on DLT do have a potential structural resilience advantage that could outweigh cost. Such networks rely on multiple nodes to process transactions but, crucially, can function effectively even when the operations of some nodes are disrupted. Removing the single point of failure makes DLT-based infrastructure inherently more resilient.

Many central banks feel that they should be in full control of any future wholesale settlement network, as they are with the present infrastructure. Such control is achievable with DLT-based infrastructure. The CBU could create a private DLT network and maintain all the nodes itself in geographically distributed areas, enhancing the resilience of the network without compromising its control.

Table 1 summarises the main domestic payment instruments against the four policy objectives discussed in this section: settlement finality and risk reduction, efficiency for tokenised finance, operational resilience, and financial stability. The comparison highlights that wholesale CBDC performs strongly against several of these objectives, particularly where native on chain settlement, continuous (24/7) operation, or enhanced operational resilience are valued. At the same time, the analysis in this section makes clear that wholesale CBDC is not a strictly necessary condition for meeting domestic payment needs. The benefits it offers are

contingent on adoption, cost effectiveness, and alignment with a broader payments strategy, and therefore need to be assessed alongside alternative approaches, including RTGS synchronisation, tokenised deposits, and domestic currency stablecoins.

Comparison Against Domestic Payment Objectives

Domestic payment objectives	Traditional RTGS / reserves	RTGS synchronisation	Tokenised deposits	Stablecoins (domestic currency)	Wholesale CBDC (wCBDC)
Settlement finality & risk reduction	✓ Settlement in central bank money ! Settlement risk during T+1 / T+2 cycles requiring guarantee funds and liquidity buffers	✓ Settlement risk can be eliminated through synchronisation mechanisms ! Requires careful coordination across systems	! Finality only assured intra bank ! Inter bank settlement still requires central bank money	! Settlement depends on issuer creditworthiness and reserve quality	✓ Atomic settlement in central bank money when assets and cash share the same ledger
Efficiency for tokenised finance	✗ Not native to DLT; requires reconciliation between systems	! Enables access to central bank money for tokenised assets but introduces latency and composability constraints	✓ Improves payments efficiency within banks ! Requires additional infrastructure for inter bank settlement	✓ Provides cash on chain functionality ! Scaling and liquidity management challenges remain	✓ Native on chain settlement enables atomic settlement and enhanced composability
Operational resilience	! Centralised infrastructure creates single points of failure	! Dependence on both RTGS and synchronisation mechanism increases complexity	! Resilience depends on individual bank systems	! Dependent on issuer, custodians, and supporting infrastructure	✓ DLT can remove single points of failure and improve structural resilience, though cost effectiveness is uncertain
Financial stability & emergency liquidity	! Liquidity operations constrained by system operating hours	N/A	(Not considered)	✗ No public money backstop. Financial stability risks associated with runs and de-pegging	✓ 24/7 operation enables automated delivery of emergency liquidity as needed

1.7 Assessing the impact of wCBDC on money supply

The issuance of CBDC will affect the composition of the money supply. In the context of wCBDC, this pertains particularly to the substitution of conventional central bank reserves for CBDC.

The extent of this effect depends on the overall demand for wCBDC. If tokenised deposits become popular, then the substitution of reserves will be stronger.

Research from the IMF indicates that, if CBDC is treated similarly to reserves in terms of regulatory treatment, remuneration and access, then substitution of traditional reserves by CBDC is unlikely to result in a change to short term rates. In essence, it is a substitution of one form of M0 for an equivalent.

As well as economic equivalence to reserves, the central bank should also ensure that users can seamlessly exchange traditional reserves for CBDC and vice versa to avoid liquidity fragmentation.

Insofar as wCBDC can facilitate liquidity management operations like enabling intra-day repo, it can improve the resilience and efficient use of liquidity in commercial banks.

1.8 Access models and competition

Wholesale CBDCs are primarily intended to improve inter-bank settlement. Accordingly, it is obvious that the banking community needs to have access to the instrument.

A reasonable default position is that any institution that has access to reserve accounts with the central bank should also have access to wCBDC. These might be considered tier one users, and therefore empowered to conduct large-scale repo and mint or burn tokenised deposits that will be settled in wCBDC.

A second tier of participants might be licensed exchanges and digital asset service providers. These market infrastructure providers should be able to facilitate capital markets transactions in tokenised securities and wCBDC.

Finally, there are payments service providers. While these institutions don't typically have access to central bank reserves accounts, they should be able to provide wallets and facilitate settlement in wCBDC, particularly when it comes to remittance corridors.

Participants in the first and second tiers should maintain operating liquidity buffers in order to ensure that they can deliver instant settlement and avoid deadlocks.

The above refers to a mature wCBDC operating system. Scaling will take place gradually, with participation first limited to a subset of tier one operators in the form of a sandbox, before being gradually expanded to include the rest of tier one. Opening access to tiers two and three could involve further analysis of the effects on the money supply.

2 | Cross-border payments

Improving cross-border payments is a key strategic aim for many countries. Cross-border payments are typically much more costly and slow than domestic payments. There are several reasons for this and the BIS' Committee on Payments Market Infrastructure has set standards and aims for addressing these issues.

In some corridors, the situation is worsening as the number of banks prepared to offer correspondent services falls. This results in weaker competition and reduced pressure to keep costs down.

Some $18.9bn of personal remittances were sent to Uzbek residents in 2025 – around 18% of GDP - up from $14.8bn in 2024. While remittances are typically a costly form of cross-border payment, it is important to highlight that remittances to Uzbekistan are typically cheaper than for many of its peers, suggesting that cost is not yet an acute concern. The most recently available data from the World Bank is 2021. It suggests that the average cost of a $200 remittance to Uzbekistan is around 2.1%-2.4%, well below the global average of 6.5%.

A wCBDC may be part of a solution to these challenges. However, as is the case for domestic payments, it can only deliver benefits if it is part of a coordinated approach. This will be more difficult to deliver in the context of cross-border payments since, to be effective, it depends on compatible policy approaches and interoperable infrastructure in other countries.

It is worth acknowledging that local currency regulations and capital controls are also important factors in determining the cost of cross-border payments and that no wCBDC-powered payments network will be circumvent these.

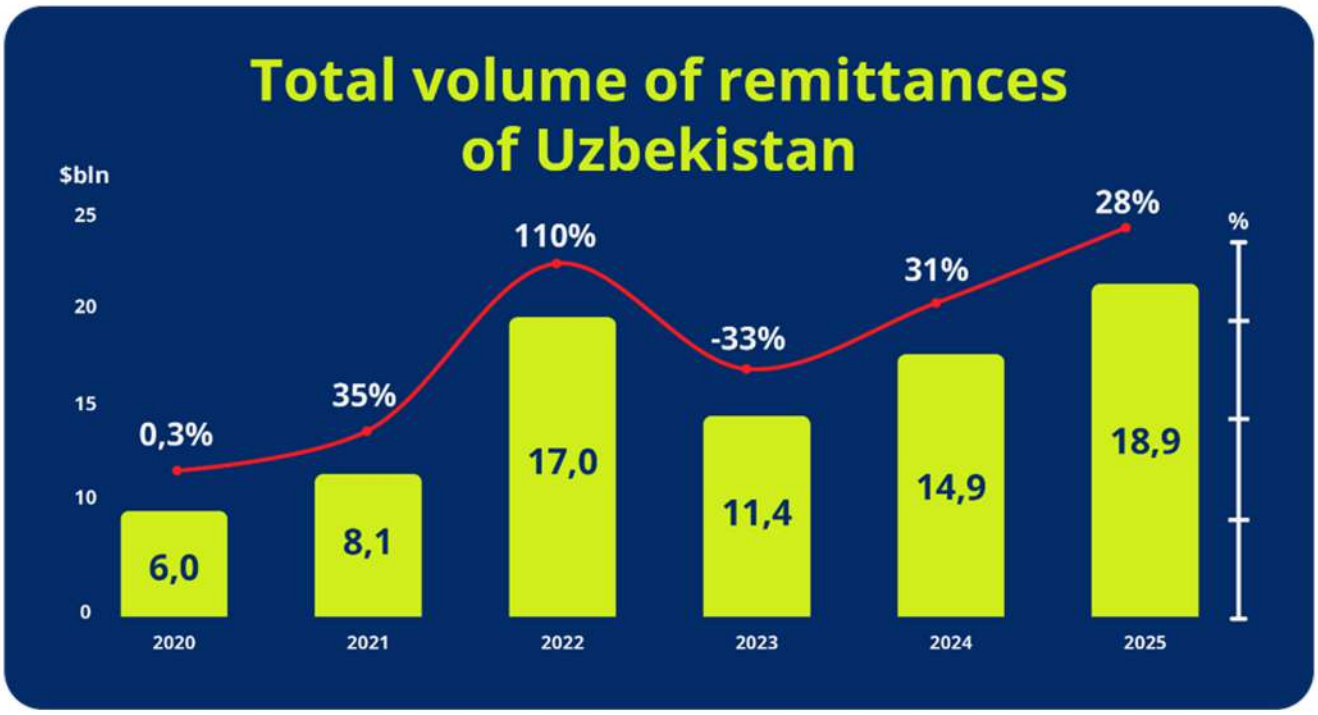
The unilateral introduction of a wCBDC will do little to benefit cross-border payments. However, if other countries, particularly key trading partners of Uzbekistan and countries with large populations of Uzbek migrants, also adopt compatible wCBDC strategies, then the benefits for cross-border payments could be important.

A decision to implement a wCBDC for cross-border use should therefore be made in consultation with potentially valuable monetary allies.

Key findings

1. wCBDC payments networks are promising ways of speeding up and reducing the cost of cross-border payments, but building these networks and getting alignment from other nations with whom Uzbekistan has important cross-border payments relationships will be critical.
2. Reliance on the dollar for cross-border payments is a problem many central banks are trying to tackle, and with stablecoin use growing, the problem may be exacerbated. wCBDC networks cannot solve this on their own but they can provide a platform for the efficient exchange of liquidity in local currencies.
3. Countries are increasingly concerned about protecting the sovereignty and autonomy of their payments systems, which are threatened both by geopolitical developments leading to sanctions and by cyber-attacks. wCBDCs can help to improve resilience against both threats.

Graph 1



Source: https://ffremittances.org/wp-content/uploads/2026/03/CBU-PPT-UZBEKISTAN.pdf

2.1 Reduced frictions in locally settled cross-border payments

There are costs and complexities associated with moving money across borders that policy-makers are keen to remove. A common platform shared between central banks of participating countries could help to reduce these costs. As with domestic payments, a key part of the value relates to the mitigation of settlement risk.

Projects pursuing this include the BIS' Project Agorá and the People's Bank of China's Project mBridge. Project mBridge has created a sandbox version that had processed around 4,000 transactions at the end of 2025, 95% of which made use of the eRMB (the PBoC's CBDC). Project Agorá is expected to reveal the results of its preliminary exploration in mid-2026.

The essential concept is a shared infrastructure collaboratively maintained by participating central banks. This would allow commercial banks in participating countries to directly exchange wCBDC tokens. Participants in mBridge are China (a key trading partner of Uzbekistan), Hong Kong, Thailand, United Arab Emirates and Saudi Arabia. There is a long list of observing participants, but it does not include any of Uzbekistan's top 10 trading partners.

Another component of the costs of all cross-border payments are the fees that arise from the use of multiple correspondent banks. This can push up the costs of remittances in particular, since they may not have access to the best rates.

A wCBDC platform that allows banks to settle directly on a shared ledger could reduce the number of intermediaries and bring down costs, as well as removing the delays of remittance payments.

Project Cedar, a collaborative project between the Federal Reserve Bank of New York and the Monetary Authority of Singapore, concluded that DLT-based wCBDCs could enhance FX liquidity by using a bridge currency between pairs of currencies with thin liquidity.

While the shared multi-currency infrastructure used in mBridge and others enables instant exchange of wCBDC with no Herstatt risk, it is also important to create an infrastructure for the pricing of exchange rates. In mBridge, foreign exchange liquidity is still provided by banks, who provide quotes on the mBridge platform and execute transactions there. The BIS has also conducted research on the use of automated market makers to improve the efficiency of the FX market.

While projects like mBridge and Agorá are promising demonstrations of the potential for shared ledger technology to improve cross-border payments, it is important to recognise that the issuance of a wCBDC is only a part of the challenge.

Project mBridge involves participants agreeing to a complex rulebook on know-your-customer standards and dispute resolution frameworks. Some observing members, rather than issuing a CBDC, empower their commercial banks to hold the CBDCs of other countries. This can improve the efficiency of cross-border transactions to some extent although, without issuing a CBDC, this will increase the use of foreign currencies in the observing economy, potentially opening up a risk of 'yuanisation'.

2.2 Reduced reliance on the dollar and resisting dollarisation

Many policy-makers are concerned about the extent to which their cross-border payments rely on the dollar. The vast majority of currency pairs are not served directly, meaning that the dollar ends up being part of around 90% of FX trades. While Uzbekistan has access to direct settlement in Chinese yuan and Kazakh tenge, a slim majority of its trade relies on the dollar.

This is also the case for some of Uzbekistan's remittances, a significant share of which is already settled directly in local currencies through correspondent bank relationships, while many of Uzbekistan's other remittance sources come via dollars.

If the aim of introducing a wCBDC for cross-border payments is to reduce the proportion of dollar settled payments, it might be possible to do so by participating in an existing programme like mBridge or by further developing

existing testbed initiatives such as Project Dunbar. This might improve trading opportunities and remittance conditions with the other participants.

This might also diversify Uzbekistan's trade connections and remittance sources, helping to reduce concentration risks and strengthen the resilience of cross-border payment flows.

By creating a platform for direct payment-versus-payment settlement without relying on dollar infrastructure, it can bring down the costs of cross-border trade if there are willing liquidity providers and may thereby create new business opportunities. However, because of the challenges and costs associated with participation, it would require an individual research project to assess if the potential trade benefits justify the expense.

Another solution might be to establish bilateral relationships with trading partners like the one Uzbekistan has with Kazakhstan. The establishment of a digital soum would allow Uzbekistan to engage with Kazakhstan's digital tenge on equal terms. At present, the soum/tenge settlement process still relies on Swift messaging and takes days to settle, tying up liquidity required to mitigate Herstatt risk. Drawing on newer technology such as automated market makers operating on a soum/tenge liquidity pool could lead to faster and more efficient settlement.

It remains to be seen whether the bilateral arrangement between Kazakhstan and Uzbekistan can be expanded into a payments network. Doing so would require both central banks to engage in FX reserves management to provide liquidity for direct settlement. This liquidity provision exercise would be costly and would require constant attention to be managed. The costs scale exponentially as the network grows, unless a bridge currency to provide liquidity is used.

There is also the question of ensuring that the technical architectures underpinning the CBDC frameworks are interoperable. This is relatively easy to accomplish on a bilateral basis but, as with FX liquidity provision, it becomes more complex as scale increases.

In essence, pursuing this would lead eventually to the creation of a platform similar to mBridge built around Uzbekistan's key trading partners. This would substantially reduce the cost of cross-border payments by creating a platform free of settlement risk. It may require public sector involvement to encourage participants to provide liquidity versus all the relevant currencies, but the platform should provide the foundational infrastructure for efficient FX liquidity provision. However, it requires the buy-in of multiple participants to agree on a rulebook and the technical architecture.

The presence of an on-chain settlement instrument might also synergise with blockchain-powered trade finance initiatives, where payments are sent only on blockchain-based cash, they become more seamless when a form of on-chain

cash is available. While stablecoins can fill this role, we have discussed above the reasons why a CBDC might be preferable.

While constructing a payments network for Uzbekistan's trading partners, particularly those in Central Asia, would be difficult, the rewards may be substantial. The removal of Herstatt risk and the creation of a simple platform for the exchange of value across borders will certainly boost trade opportunities. There may also be an opportunity for founding members to position themselves as the provider of a bridge currency, (if there is insufficient liquidity to support direct trading between all participants' currencies directly). This could reduce reliance on the dollar and ease the liquidity demands on participating central banks. This would boost demand for the bridge currency and assets denominated therein, cementing its role as a key enabler of regional financial activity.

2.3 Stablecoins as a vector for dollarisation

The spread of dollar stablecoins is a new vector for dollarisation. Stablecoins are substantially easier to access than dollar bank accounts even through correspondent banks, and provide low cost means of sending value across borders.

Several countries have expressed concern that this will lead to increased use of dollars in their economies and savings flight from banks.

This is a particular risk for cross-border payments and remittances. Mitigating this risk requires central banks to ensure that cheap, instant cross-border payments are easily accessible.

Several central banks including the Bank of Ghana are considering launching a retail CBDC to compete with the use of dollar-denominated stablecoins in their economy. If the CBU is concerned that dollar-denominated stablecoins are going to play a bigger role in cross-border payments and potentially cause dollarisation, then improving the cost and speed of non-stablecoin cross-border payments might be a way to forestall this. A wCBDC-enabled network might limit the attractiveness of stablecoins and slow down their adoption.

2.4 Nexus and interlinking instant payment systems

Many countries have developed instant payments systems for domestic payments, but by connecting up these platforms, it's possible to reduce the cost of cross-border payments and to make them available 24/7.

Inter-connecting real-time payments systems like this can be an extremely efficient way of facilitating payments between two economies that does not require a wCBDC to be issued. Several countries have demonstrated the

effectiveness of implementing cross-border instand payment connectivity, including Singapore and Thailand.

Making bilateral connections between each instant payment system is extremely demanding, however, since the number of connections scales exponentially to the number of participants. The BIS Innovation Hub has developed Project Nexus as a means of creating a standardised gateway.

This should allow participants to connect their IPS to its hub and, through this, to connect to every other Nexus participant.

2.5 Strategic autonomy and censorship resistance

While the problems of speed, transparency, cost and access for cross-border payments have been discussed for many years, a new issue has begun to take prominence over the last five years: strategic autonomy, sovereignty and censorship resistance.

Recent developments have also highlighted the importance of ensuring that critical payment infrastructure remains resilient, accessible and operational under a wide range of external circumstances. This has led many policy-makers and central banks to place greater emphasis on reducing concentration risks, strengthening operational independence and ensuring continuity of access to essential payment services.

It is also important to note that risks to autonomous and resilient payment systems are not limited to operational dependencies, but also include Advanced Persistent Threats (APTs): malicious actors that can compromise access to or integrity of payments services. The centralized nature of traditional messaging systems like SWIFT introduces a single point of failure that can be exploited by state and non-state actors alike. The 2016 Bangladesh Bank robbery—allegedly carried out by an APT with limited resources compared to major global powers—demonstrated that even the most established networks have vulnerabilities.

Even for countries for whom such operational disruptions may appear unlikely today, autonomy and sovereignty in payments have become key strategic priorities. In Europe, the European Central Bank's digital euro project is in large part motivated by a desire to reduce the bloc's reliance on Mastercard and Visa's card networks.

By removing reliance on a single centralised messaging hub and utilising a decentralised architecture, DLT-based infrastructures offer enhanced resilience. For many central banks, the shift to DLT represents a move toward a "hardened" autonomy, where the system is inherently more resistant to operational disruptions and sophisticated cyber-attacks.

2.6 Responding with CBDCs

Governments can respond to this risk in a number of ways. The obvious answer is to build a new payments network that does not depend on the forbearance of foreign operators. Although this sounds simple in theory, it is not so in practice.

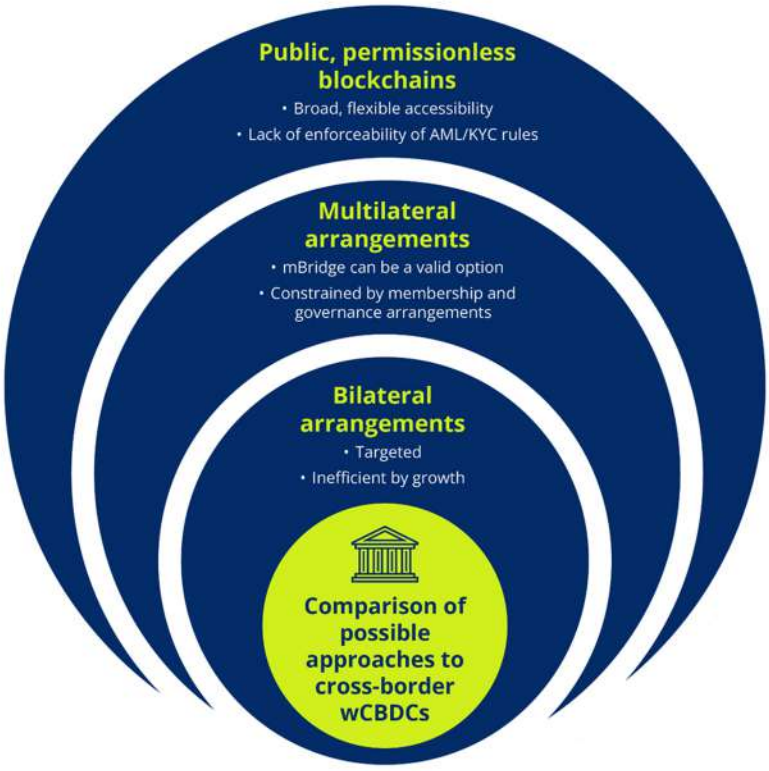
A cross-border network definitionally cannot be wholly sovereign for every participant since it involves multiple jurisdictions. Bilateral arrangements between countries are possible but they are inefficient because the number of connections grows exponentially as the number of system participants increases.

What is needed is a network that facilitates cross-border payments between counterparties of willing nations that cannot be impeded by nations outside that network.

Projects like mBridge are an alternative to US-controlled infrastructure. Members of mBridge can shut off transactions between each other – for example, Saudi Arabia could shut off trade between Thai banks and Saudi banks, but this would not affect Thai banks' ability to trade with Chinese banks. It is, however, possible to be removed from the mBridge platform entirely if a supermajority of the participants agrees.

The only truly censorship-resistant payments network would be built on public, permissionless blockchains where counterparties can transact pseudonymously without needing the permission of a central authority. This would be an extremely radical step and, since it makes it impossible to enforce AML/KYC rules, is unlikely to be suitable for institutional or official use.

Graph 2



3 | Decision points

This section sets out the key decision points for the CBU to assess whether to embark on creating a wCBDC. It sets out the different quantitative functions which could be used in both domestic and cross-border use to determine what the relative savings could be from a wCBDC. It also sets out key qualitative triggers that could inform the CBU on its journey.

3.1 Assessing the savings of a wCBDC for domestic use

There are different ways to assess the value a wCBDC can contribute to an economy. Some might include intangible factors, like the contribution to capital markets innovation that signalling the state's commitment to providing future-proof infrastructure can have.

However, there are also tangible savings and costs and a decision around whether to issue a wCBDC should be grounded in an assessment of these costs. This formula highlights some of the key variables that such an assessment should include.

$$S=P_m*(L_s+C_f+V_{ops})-(L_p+C_{ops}) + Legacy\_Shutdown$$

Variable definitions for domestic wCBDC return on investment analysis

The following variables are used to calculate the net annual savings (S) associated with the transition from legacy settlement systems to a domestic wCBDC infrastructure.

P_m (migration proportion): The percentage of total domestic market volume (by value) transitioned to the wCBDC platform. This acts as a scaling coefficient for variable benefits; savings only accrue on the portion of the market utilising the new rails.

L_s (legacy liquidity cost): The annual opportunity cost of liquidity currently deployed to mitigate settlement risk. This includes intraday liquidity buffers and capital held to cover the settlement gap inherent in T+1 or T+2 cycles.

C_f (cost of failed trades): The direct and indirect costs associated with domestic trade settlement failures, including manual intervention and remediation, interest claims and regulatory penalties.

V_{ops} (variable operational savings): Per-transaction efficiency gains achieved through atomic settlement (delivery versus payment). This includes reduced headcount requirements for manual reconciliation and exception handling for the specific volume migrated to the DLT.

L_p **(prefunding opportunity cost):** The opportunity cost of liquidity required to 'prefund' wCBDC wallets. Unlike netted legacy systems, atomic systems may require gross liquidity to be locked 24/7, potentially removing those funds from the overnight repurchase agreement market.

C_{ops} **(wCBDC operating costs):** The fixed and variable costs of maintaining the new infrastructure, including DLT node operation, cybersecurity protocols, application programming interface integrations and cloud hosting fees.

Legacy_Shutdown **(terminal decommissioning value):** A binary variable representing the massive fixed-cost reduction achieved only when P_m = 100%. This includes the total decommissioning of legacy mainframes, hardware and the specialised back-office teams required to run them.

A quantifiable and foreseeable portion of the savings generated by a wCBDC is equal to the proportion of eligible payments that migrate to the new system multiplied by the cost of liquidity locked up to mitigate settlement risk, the costs associated with failed trades and any other operational savings. Subtracted from this total should be the opportunity cost of tying up liquidity for pre-funding transactions in wCBDC and the operating costs of the system. If migration to the wCBDC is total and the legacy system can be shut down, then the reduction in operating costs can be added to the savings generated by a wCBDC.

These savings can be estimated for the Uzbek economy over a given period and set against the cost of developing and implementing a wCBDC.

3.2 Assessing the savings of a wCBDC for cross-border use

As with a domestic wCBDC, there are intangible considerations on the use of wCBDCs for cross-border payments. Notably, there is no simple way to value payments sovereignty and censorship resistant payments.

However, there are also tangible cost and efficiency savings that can be evaluated. A decision around whether to issue a wCBDC should be grounded in an assessment of these costs. This formula highlights some of the key variables that such an assessment should include.

$$S_{xb}=P_m \times (C_H+C_{fx}+E_a+L_{nostro}+C_{reg})-(C_{maint}+I_c)$$

S_{xb} **(Net cross-border savings):** The total annual financial benefit of the wCBDC implementation.

P_m **(Migration proportion):** The percentage of cross-border volume transitioned to the new DLT rails.

C_H **(Herstatt risk reduction):** Savings from eliminated settlement risk and reduced capital charges for uncollateralised exposure.

C_{fx} **(FX cost reduction):** Savings from reduced intermediary spreads and the removal of correspondent banking fees.

E_a **(Economic activity stimulus):** Revenue gains from 'unlocked' trade volume that was previously too expensive to process.

L_{nostro} **(Liquidity release):** *The opportunity cost savings from repatriating billions in 'trapped' capital currently sitting in foreign Nostro accounts.*

C_{reg} **(Embedded compliance):** *Operational savings from automating AML/KYC and sanctions screening via smart contracts.*

C_{maint} **(System maintenance):** The ongoing operating expenses for running the wCBDC nodes and security infrastructure.

I_c **(Interoperability Costs):** *The technical and legal costs of maintaining 'bridges' between different national CBDC platforms.*

The value of many of these variables will be determined not just by the preconditions of the Uzbek economy, but also the architectural decisions made both by the CBU and participating central banks when designing the platform.

There are some clear savings to be made from a wCBDC: the elimination of settlement risk and the resultant lower capital charges, as well as reduced exposure to high fee FX transactions. There are also potential revenue savings to be factored in as potential benefits in the form of liquidity unlocked from Nostro accounts.

There may also be operational savings gathered from improving the seamlessness of AML and KYC checks. These will be set against the costs of maintaining the infrastructure and connecting to those of other central banks.

3.3 Triggers for introducing a wCBDC

As well as evaluating the costs and savings involved in a wCBDC, we present the following summation of the report, presenting a series of triggers that may arise that might prompt the CBU to consider going ahead with a wCBDC:

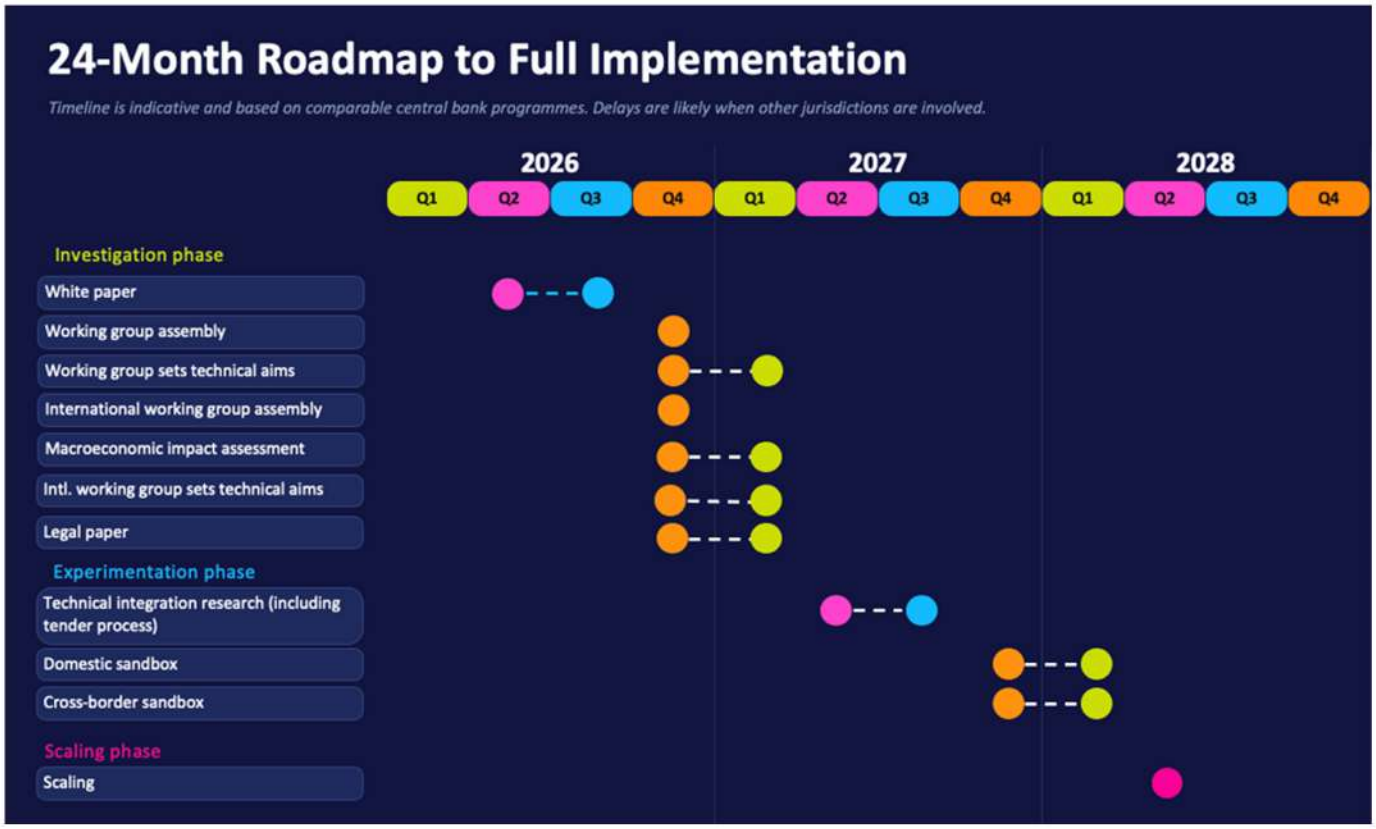
4 | Roadmap for wCBDC

The previous sections have addressed the strategic rationale for a CBDC and the conditions in which a wCBDC may or may not be warranted. The final section moves beyond the 'why' and defines the 'when' and the 'how' in the event the central bank decides to implement a wCBDC. The roadmap provides the CBU with a step-by-step guide, spanning a 24-month period towards a full implementation. It will bridge the gap between the theory and the reality of issuance.

The time for each stage is indicative and based on the time allotted by other central banks pursuing similar projects. However, these processes may suffer delays, particularly when they involve other stakeholders, especially when those other stakeholders are in other jurisdictions.

We have largely decoupled the process of assessing the value of a domestic wCBDC and a cross-border wCBDC. They solve different problems, provide different benefits and are subject to different challenges, so the process for assessing their value and pursuing implementation are naturally separate.

4.1 Roadmap to full implementation



4.1.1 Investigation phase

The table below sets out indicative timelines and focuses for the key thrusts and core initiatives over the next 24 months

Stage	Description
Whitepaper	A report on: Pathways to an Uzbekistan Wholesale CBDC: Preconditions, Impacts and Trade-offs
Domestic working group assembly	The CBU assembles a group of stakeholders representing the main users of wholesale payments in Uzbekistan and potential technology providers. This group will provide an important forum for the project, ensuring that the way in which it is being pursued adequately reflects the needs of the economy. These needs will include ensuring that the central bank's needs for transparency are met without exposing potentially market sensitive liquidity or operational data of commercial banks to other market participants.
International working group assembly	The CBU selects candidates for participation in an international working group. Like the domestic working group, this will include the key providers of cross-border payments services. However, it will also require representatives from other central banks, ideally representing countries with whom Uzbekistan would like to improve trading infrastructure. This may require research to identify the best trading opportunities. In the initial stage, this could be a bilateral partnership with a key trading partner. Provided the technical and governance features are designed for interoperability, other countries should be able to join at later stages. Success criterion: Assembly of diverse working group

Stage	Description
Domestic working group sets technical aims	Once assembled, the group should meet to determine, with as much precision as possible, the technical features the wCBDC will be required to exhibit and the operations it should be able to perform. The CBU should conduct an in-depth analysis of the technical considerations associated with CBDC issuance, including: • Architecture and platform design (on-premises, vs cloud vs distributed) • Vendor risks • Infrastructure pre-requisites • Detailed assessment of cybersecurity risks and governance strategies **Success criterion:** Clear establishment of the technical requirements of the project
International working group sets technical aims	Similarly, the international working group should meet to set expectations for the technical features it should exhibit and the basic architecture concepts **Success criterion:** Clear establishment of the technical requirements of the project
Macroeconomic impact assessment	More detailed assessment of the impact of wCBDC on the Uzbek economy, factoring in specific economic conditions. **Success criterion:** Clear, detailed picture of the economic impact of CBDC on all sectors of the Uzbek economy.

Stage	Description
Legal implications paper	The CBU should commission a legal analysis of the implications of a wCBDC to ensure that any legislative changes necessary are well-flagged and that the industry is prepared for adoption from a legal perspective. This should also include assessment of the legal status of automated repo transactions performed via smart contracts. Success criterion: Clear, detailed picture of the legal implications of wCBDC

4.1.2 Experimentation phase

Technical integration research	It will be important to conduct research on status quo payments systems, both international and domestic as well as the IT platforms used in the Uzbek banking industry to ensure that stakeholders are adequately prepared for the sort of work required to manage a wCBDC. Once the technical requirements have been determined, the next step is to build platforms to test these in practice. The CBU will need to issue a request for proposals clearly defining aims and soliciting service providers to build and operate wCBDC services.
Domestic sandbox	The CBU moves from its trial stages (strictly controlled, proof-of-concept transactions) to live market transactions but with a limited scope of participants in a sandbox. Success criteria: 1. Technical operations and resilience High success rate for settlement Synchronicity between traditional and tokenised systems High throughput Cyber-resilience 2. Liquidity multiplier met Demonstration of liquidity efficiency, resolution of gridlocks 3. Programmability Demonstrable ability to automate instrument lifecycle 4. Compliance: Transaction supervision capacity for central bank ID verification

Stage	Description
Cross-border sandbox	The CBU moves from its trial stages (strictly controlled, proof-of-concept transactions) to live market transactions but with a limited scope of participants in a sandbox. Success criteria: 1. Technical operations and resilience High success rate for settlement Synchronicity between traditional and tokenised systems High throughput Cyber-resilience 2. Liquidity multiplier met Demonstration of liquidity efficiency, resolution of gridlocks 3. Programmability Demonstrable ability to automate instrument lifecycle 4. Compliance: Transaction supervision capacity for central bank ID verification Compliance with FATF travel rule

4.1.3 Scaling phase

Scaling	Once the sandbox periods are complete and the systems are demonstrated to be operational, robust, efficient and secure, it is time to gradually open participation to the broader market. This may include a regime where those market participants who wish to conduct transactions in wCBDC apply for a license. In the case of cross-border CBDCs, this may include enabling other countries to begin the process of joining.

5 | International Experience with Wholesale CBDC

Projects

Section 2 set out the case for wCBDC in cross-border payments in general terms. This section complements that analysis with a survey of how wholesale CBDC and related settlement infrastructure programmes have actually progressed internationally, to ground the CBU's roadmap in observed international experience rather than in principle alone.

Key findings

1. The centre of gravity of global CBDC work has shifted decisively toward wholesale and cross-border applications, even as several advanced economies have paused or abandoned retail CBDC research.
2. Live cross-border wholesale platforms already settle tens of billions of dollars in value each year, but activity remains organised into distinct technical and political tracks rather than a single global standard.
3. Jurisdictions that began with narrow, tightly scoped wholesale or targeted pilots – rather than an immediate broad retail launch – have generally progressed furthest with the fewest setbacks.
4. In the most advanced programmes, a clear legal and regulatory foundation has consistently preceded large-scale technical piloting rather than following it.
5. Ambitious, fully bespoke distributed ledger builds carry real execution risk: at least one well-resourced central bank has scaled back its technical ambitions after encountering privacy, cost and governance obstacles.

5.1 Global Momentum toward Wholesale and Cross-Border CBDC

By mid-2026, 146 countries and currency unions – together accounting for more than 98% of global GDP – were exploring CBDC in some form, up from 87 jurisdictions in May 2022. Of these, 77 had reached an advanced stage of development, piloting or launch, with 41 pilots currently under way. Only three jurisdictions – the Bahamas (Sand Dollar), Jamaica (JAM-DEX) and Nigeria (eNaira) – have completed an unconditional, full public retail launch.

A clear divide has opened up between advanced and developing economies. Several advanced economies, including Canada, Australia, Norway and, more recently, Thailand, have paused or formally abandoned retail CBDC work; the United States has gone furthest, legislatively barring the Federal Reserve from issuing, piloting or even studying a retail CBDC.

Developing economies have generally continued to invest in retail or targeted CBDC formats, often citing the rapid spread of dollar-pegged stablecoins as a motivating factor, a dynamic also discussed in Section 2.3 above.

Even where retail ambitions have cooled, the centre of gravity in CBDC work has shifted decisively toward wholesale and cross-border applications. Flagship initiatives – including the European Central Bank's Project Pontes, Singapore's live wholesale CBDC issuance and Hong Kong's Project Ensemble – are focused on using tokenisation to modernise how central bank money moves between institutions, rather than on retail issuance to the public. There are now 13 cross-border wholesale CBDC projects under way, more than double the number active before 2022.

China's e-CNY remains by far the largest live CBDC pilot in the world, with cumulative transactions exceeding 3.48 billion, worth around CNY16.7 trillion (approximately $2.3 trillion), as of November 2025. In a significant architectural shift that took effect on 1 January 2026, the People's Bank of China reclassified e-CNY as a deposit liability of commercial banks rather than pure digital cash, allowing balances to earn interest, a change with implications for how other central banks may eventually redraw the boundary between CBDC and bank deposits.

5.2 Leading Cross-Border Wholesale Platforms

Two largely separate cross-border wholesale tracks currently dominate international activity, and the CBU should continue to monitor both closely without committing prematurely to either, consistent with the approach set out in Section 2.1 above.

1. **Project mBridge (China, Hong Kong, Thailand, the United Arab Emirates and Saudi Arabia):** the most active cross-border wholesale CBDC platform to date, having processed around $55.5 billion across more than 4,000 transactions, with the e-CNY accounting for roughly 95% of settlement volume. The BIS formally exited its operational role at the end of 2024, describing the project as having graduated to independent operation by its founding central banks.
2. **Project Agorá (the BIS and the Institute of International Finance):** convening the Bank of England, the Federal Reserve Bank of New York, the Banque de France on behalf of the Eurosystem, the Bank of Japan, the Bank of Korea, the Swiss National Bank and, since May 2026, the Bank of Canada, alongside more than 40 private financial institutions, the project published prototype results on 27 May 2026 demonstrating atomic, multi-currency settlement combining tokenised central bank reserves with tokenised commercial bank deposits. It is now moving to testing with real-value transactions.
3. **Project Aber (2019–2020, Saudi Arabia and the United Arab Emirates):** a historic bilateral pilot that established an early template for wholesale CBDC settlement between two central banks, directly shaping both countries' later participation in mBridge.

4. **Payment Connect and Project Ensemble (Hong Kong and Singapore):** Payment Connect links the two jurisdictions' retail instant payment systems, complementing the wholesale, tokenised-deposit settlement work under Hong Kong's Project Ensemble.

5.3 Domestic Wholesale Infrastructure and Settlement Programmes

Beyond cross-border platforms, a number of central banks have advanced wholesale CBDC or closely related tokenised settlement infrastructure domestically. Their experience is instructive for the design choices ahead of the CBU.

1. **European Central Bank – Project Pontes:** building on the trigger-solution trials discussed in Section 1.2 above, Pontes is due to launch in the third quarter of 2026 and is specifically designed to connect market DLT platforms to the Eurosystem's TARGET services, so that tokenised-asset transactions can settle in central bank money.
2. **Hong Kong – Project Ensemble and e-HKD+:** Project Ensemble and the parallel e-HKD+ programme, including work with BlackRock, are testing tokenised-deposit settlement for institutional use cases; in 2026 the Hong Kong Exchange piloted round-the-clock use of wholesale CBDC for over-the-counter derivatives margin payments.
3. **South Korea – Project Hangang:** a wholesale platform underpinning commercial bank deposit tokens, Hangang reached its second, expanded stage on 15 July 2026, growing from 100,000 users in its initial pilot to 500,000 users across nine participating banks, including live government subsidy disbursements. Large-scale operations are planned for September 2026, with a tokenised-bond and CBDC pilot to follow in 2027.
4. **Kazakhstan – digital tenge:** granted legal tender status on 18 July 2026 after more than 100 pilots and cumulative issuance of around KZT340 billion, with mandatory use across eight categories of state expenditure above KZT100 million. A tagged variant of the digital tenge tracks infrastructure budget disbursements, National Fund distributions and small business lending down the supply chain to verified end recipients, the most developed programmable-payments use case among the jurisdictions surveyed.
5. **Singapore:** already conducting live wholesale CBDC issuance alongside its longer-running Project Orchid work on programmable and purpose-bound digital money.

5.4 A Cautionary Precedent: Brazil's Drex

Not every ambitious wholesale CBDC programme has succeeded on its own terms. Brazil's Drex – once one of the most technically advanced wholesale CBDC

Drex has since been repositioned as a centralised, non-blockchain system focused on collateral management and reconciliation, integrated with Brazil's existing Pix payment system. This episode is a useful cautionary precedent for jurisdictions, including Uzbekistan, considering an ambitious bespoke DLT build from the outset, and reinforces the case, set out in Section 1.2 above, for weighing synchronisation and hybrid approaches alongside a fully native wCBDC.

5.5 Implications for Uzbekistan's wCBDC Roadmap

This international experience points to several considerations for the CBU as it develops its own wCBDC roadmap, discussed further in Sections 3 and 4 above.

1. **Sequencing:** the jurisdictions with the most successful and least risky trajectories, particularly Kazakhstan, began with narrowly scoped wholesale or targeted pilots rather than an immediate broad retail launch, reducing financial stability, cybersecurity and reputational risk while institutional and technical capacity is built up.
2. **Legal foundation first:** the European Central Bank's legislation-first approach and Kazakhstan's July 2026 legal tender amendment both show that a clear legislative basis – covering issuance authority, legal tender status, data protection and the AML/CFT regime – should precede large-scale technical piloting rather than follow it.
3. **Interoperability by design:** given Uzbekistan's reliance on remittance inflows and its role in an emerging regional dialogue on digital currencies with Central Asian neighbours, interoperability and cross-border functionality should be built into the wCBDC architecture from the first pilot stage, even if full cross-border functionality is realised later.
4. **Independent technical and security audit:** before any decision to scale beyond a sandbox, an independent, internationally recognised technical and security audit, along the lines of Kazakhstan's engagement of Deloitte to confirm ISO 27001 and FATF compliance, provides an important external check on readiness.
5. **Deliberate governance and data-visibility choices:** decisions on privacy and data visibility should be treated as an explicit policy choice made early, rather than a technical detail resolved late, and should be accompanied by early, structured engagement with the commercial banking sector to preserve rather than undermine banks' core deposit-taking function.

5.6 Alternative Technological Architectures for Implementing the Digital Soum

The DLT-based infrastructure discussed elsewhere in this report is not the only viable technological foundation for a wCBDC. The BIS's 2024 survey of 93 central banks found that DLT features in around 56% of advanced-economy wholesale

CBDC projects, but that centralised and distributed approaches are used in roughly equal measure for retail CBDC, where high throughput, privacy and regulatory control tend to be the binding constraints. A number of central banks and research institutions have built and tested non-DLT architectures capable of meeting, and in some cases exceeding, the performance of DLT-based designs.

1. **Centralised ledger architecture:** a single database, operated directly by the central bank, that is technically simple to build and govern and benefits from decades of mature relational-database and RTGS engineering. The Federal Reserve Bank of Boston and MIT's Project Hamilton found that a two-phase commit design could process 1.7 million transactions per second, with 99% of transactions finalised in under one second, while remaining resilient to the simultaneous failure of two data centres. Its main disadvantage is that it concentrates operational and cybersecurity risk in a single operator, and any change to wallet logic close to end users requires direct central bank involvement.
2. **Hybrid (platform) architecture:** the central bank retains an authoritative master ledger while licensed banks or payment providers manage user-facing wallets and transaction processing, without a distributed ledger between them. This is the most widely used architecture among live CBDCs: the People's Bank of China's e-CNY, the largest CBDC in the world by transaction volume, and India's e₹-R both use variants of this design. Its main advantage is that it distributes operational and compliance workload to licensed intermediaries while preserving the central bank's direct claim over user balances; its main disadvantage is the added complexity of keeping master and mirror ledgers synchronised and consistent across many operators.
3. **Tokenised database architecture:** central bank money is represented as cryptographically distinct digital tokens within a conventionally managed, centralised database, offering many of the programmability benefits associated with DLT tokens without a distributed consensus mechanism. Singapore's Project Orchid and its Purpose Bound Money model are a working example. This approach supports targeted, conditional payments well, but token-state management adds complexity relative to simple account-based systems, and it remains comparatively immature relative to conventional database or hybrid designs.
4. **Cloud-native architecture:** the CBDC system is built from independently scalable microservices using containerisation and orchestration tools, allowing elastic scaling and resilience through automated failover. It offers very high theoretical scalability and strong built-in security tooling, such as identity and access management, encryption and intrusion detection, but introduces dependency on cloud infrastructure and DevOps capabilities that a central bank may not yet have in-house; data sovereignty requirements can be addressed through sovereign or dedicated government cloud deployment.
5. **API-gateway architecture:** rather than a ledger design in its own right, this treats the interface between the central bank's core ledger and private-sector

service providers as the primary point of standardisation, and is deliberately agnostic to whether the underlying ledger is DLT-based or centralised. The Bank of England and BIS Innovation Hub's Project Rosalind demonstrated 33 API endpoints across more than 30 use cases and found that a well-designed API layer can work with a range of private-sector applications and central bank ledger designs alike. This makes it a natural complement to any of the architectures above rather than a substitute for one, though it shifts the burden of ongoing version management and backward compatibility onto the central bank.

Central banks are increasingly combining these building blocks rather than treating them as mutually exclusive options. Taken together, they indicate that DLT is not a precondition for a high-throughput, resilient wCBDC, and that in many designs the choice of ledger technology can be decoupled from the choice of API and distribution layer – an important consideration for the CBU as it weighs the technological options for the Digital Soum alongside the DLT-based approach discussed elsewhere in this report.