The Digital Dollar Project

Retail Cross-Border Remittance Payments

AUGUST 2023

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Foreword

Western Union sends approximately $95B in remittances to customers every year. Each of these payments has a story–a migrant worker supporting their family back home, payment for critical medical care of a loved one, emergency support for a traveler who lost their luggage, and so many others. These payments are lifelines entrusted in the hands of providers like Western Union. For Western Union, our goal is to ensure that each payment reaches the hands of the recipient quickly and efficiently.

As we strive to achieve money in minutes for every one of our cross-border money transfers, it is not so easy. A continuing fragmentation of payment methods, institutions, digital platforms, and national infrastructure adds complexity to global person-to-person payments. Furthermore, the needs of our customers vary widely–from sending cash one day to using a digital wallet the next. In fact, nearly 30% of our customers have multi-channel payment relationships with us.

This white paper explores the potential of two interoperable CBDCs to provide seamless international money transfers from our senders in the United States to recipients in the Philippines. Western Union and our bank partner in the Philippines, BDO Unibank, have developed a technology pilot study to test this use case, working in a sandbox to enable these cross-border transactions on a shared ledger. We want to thank BDO Unibank, the Digital Dollar Project and Accenture for their collaboration.

Because CBDCs are not all designed the same, we highlight the assumptions and design decisions we made for this pilot. The customer was the core consideration in making decisions about privacy, interoperability, permissions, and regulatory responsibilities.

As we have for decades, Western Union strives to bring trusted and reliable cross-border money transfers to all our customers. Our customers will benefit from a well-designed, highly compliant CBDC. This white paper shares the benefits we have seen and the remaining questions.

Kevin Mole
Head of Global Digital Assets

Patrick Schumacher
Head of Foreign Exchange and International Treasury

Foreword

Remittances have always been a major contributor to the Philippines' GDP and play a crucial role in sustaining our economy. However, traditional remittance channels face challenges associated with speed and high cost, making it difficult for some Filipino families to receive timely financial support.

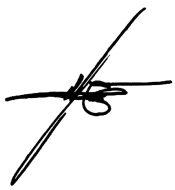
BDO Unibank is the largest bank in the Philippines, and BDO Remit is the global remittance service brand that caters to the overseas Filipino segment. BDO Remit extends beyond facilitating remittance transactions by constantly innovating to help our customers meet their financial needs.

To fulfill this objective, BDO Unibank joined the Digital Dollar Project, Western Union, and Accenture to explore the potential benefits of a digital dollar and PHP CBDC for retail cross-border transactions. Our goal was to provide policymakers, other industry leaders, and the general public with a better understanding of the possible opportunities the central bank digital currencies present in the cross-border remittance landscape.

While digital currencies are still a relatively new and evolving technology, it transforms how we think about remittances and financial inclusion. Based on this study, we observed that CBDCs have the potential to offer a new way to send remittances across borders faster and cost-efficiently and provide immediate settlement between parties—all of which are crucial to cross-border remittances for our customers.

As the Central Bank of the Philippines' top bank awardee for generating the largest overseas Filipino remittances since 2008, BDO Unibank is honored to have explored this possibility in partnership with Western Union, the Digital Dollar Project, and Accenture. This white paper summarizes our findings and presents a series of considerations for industry leaders and policymakers to consider as CBDC development continue worldwide.

Geneva Gloria
Senior Vice President,
Head of Remittances



Ferdinand Bacungan
Senior Vice President, Head of Business Development for Remittances

Foreword

THE
DIGITAL DOLLAR
PROJECT

The Digital Dollar Project is a non-profit organization devoted to catalyzing research and experimentation of the potential advantages and challenges of a U.S. CBDC. In 2021, the Digital Dollar Project launched a series of exploratory pilots that apply a CBDC to a range of real-world use cases and has outlined and scoped a series of retail CBDC tests. This pilot study is the first deliverable in a series of retail CBDC experiments.

This pilot, the first private sector-initiated experiment intended to inform the retail application of a potential U.S. CBDC, is a prime example of how the Digital Dollar Project works with industry stakeholders to bring a broad range of viewpoints to the exploration of a digital dollar. As outlined in this report, the pilot study demonstrates the ability of a simulated digital dollar, transacted on a DLT-based network, to lay the architectural foundation for a cross-border payments ecosystem. It confirms how a robust, secure and efficient cross-border payments settlement process working with a potential U.S. CBDC could provide benefits to improve transaction speed and efficiency, reduce risk and cost, and enhance customer experience through visibility of transactions. Understanding the impact of CBDC technology on this critical aspect of financial market infrastructure is imperative to the evolution of the U.S. payments system.

Through public-private partnerships, we can most effectively explore the many technical and policy dependencies and implications in the design of a CBDC, particularly for a retail digital dollar which ultimately measures trust between financial institutions, government, and the people. The Digital Dollar Project wishes to thank Western Union and BDO Unibank for their pilot leadership and offers this report as a resource to inform this critical public policy discussion.

The Digital Dollar Project Board of Directors

The Honorable J. Christopher Giancarlo
Executive Chairman

Jennifer Lassiter
Executive Director

Charles Giancarlo

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Executive Summary

This white paper explores how a central bank digital currency (CBDC) could mitigate retail customers' challenges when sending remittances across borders. Today, these transactions – a lifeline for many individuals worldwide and a key component of the domestic and global economy – are complicated by various challenges, including multi-party risk, limited interoperability, and a lack of transaction transparency. These challenges disproportionately impact un- and under-banked individuals and families and are largely caused by fragmented systems and varying jurisdictional rules and regulations.

To examine how CBDCs can address these challenges, Western Union and BDO Unibank, Inc, partnered with the Digital Dollar Project and Accenture to conduct a pilot study focused on whether and how a simulated retail United States CBDC (U.S. CBDC) or digital dollar, could improve remittances in the U.S.-Philippines corridor – one of the busiest corridors globally. Retail CBDCs, digital versions of a country's fiat currency available for everyday transactions, could significantly enhance cross-border payments' speed and efficiency. Distributed ledger technology (DLT) has the potential to reduce risk, optimize cost, enhance the customer experience, and improve the visibility of the state of transactions.

The pilot study found that CBDCs may improve remittance processing by settling a peer-to-peer payment in less than ten seconds, a significant improvement over most settlement mechanisms. A key driver behind this was atomic settlement, which reduced counterparty risk and optimized liquidity via streamlined foreign exchange (FX) spot orders and multi-party settlement. While the pre-funding model adopted by money transfer operators (MTOs) today ensures overnight liquidity for daily operations, opportunities exist to further maximize liquidity utilization.

Overall, this pilot study demonstrated that rather than displacing the service offerings of established financial institutions providing cross-border remittance services, CBDCs present an opportunity to modernize operational processes and expand financial access. Several topics have been identified for future experimentation, a critical next step to enable this vision: Inclusive Identity Attestation Models, Privacy for Cross-border Transactions, and Multi-Network Cross-border Interoperability.

This pilot study explored two process components to analyze impacts and identify benefits:

1. Issuance of CBDCs to financial institutions and their customers to lay the architectural foundation for a CBDC-based cross-border payments ecosystem

2. Peer-to-peer remittances to demonstrate the benefits of using a tokenized form of the US dollar and Philippine Peso (PHP) to the end customer

Outcomes

The pilot study uncovered four primary benefits of retail CBDCs in the context of cross-border remittances:

Reduced Risk: Instant settlement across multiple currencies reduces counterparty and credit risk for customers and their financial institutions.

***Optimized Cost*:** CBDC settlement allows for transferring value and message in a single transaction, settled atomically, alleviating the cost of capital held in pre-funded accounts.

Enhanced Customer Experience: A CBDC increases the accessibility and portability of central bank money in a digital form to benefit the unbanked and underbanked. A verified digital wallet helps reduces fraud, enables faster settlement, harmonizes jurisdictional requirements, and reduces failed transactions.

Improved Visibility: Using a permissioned ledger provides institutions and their customers with enhanced visibility into the stage of a transaction, which bolsters customer trust.

This pilot study demonstrated how retail CBDCs may alleviate certain current challenges customers face in cross-border remittance transactions; however, to fully understand the impact of CBDCs in the cross-border context, further research and experimentation are needed, ideally in the form of transparent public-private partnerships. This experiment is the first step in a long journey to advance public discussion and consideration of the benefits and challenges of CBDCs for cross-border remittances.

Terminology

An important foundational component of this pilot study was using common terminology and aligning on universally consistent definitions during the experiment. This report uses the following terms and abbreviations for ease and convenience.

Atomic Settlement	A settlement method that is often defined as including simultaneous and instant properties when transacting cash, securities, or other assets. This method can group multiple transactions into a single batch to ensure that all legs are successfully settled or none of them are settled at all.
Central Bank Digital Currency (CBDC)	A fiat currency that is digitally issued by the government's central bank, possessing the same legal status as physical bank notes, and being fully fungible with central bank notes and coins (or cash) and reserves.
Delivery-versus-Payment (DvP)	An atomic settlement method commonly used in securities transactions. It ensures that two or more legs of a transaction (e.g., cash and security) occur if and only if the corresponding payment is completed simultaneously.
Distributed Ledger Technology (DLT)	A decentralized digital system for recording transactions, typically on a shared ledger, between parties in multiple places simultaneously.
Payment-versus-Payment (PvP)	An atomic settlement method commonly used in foreign exchange transactions ensures that a payment (typically a currency) is delivered if and only if the corresponding payment is completed.
Remittance Payment	The retail transfer of money from one individual to another, usually across borders for personal or family reasons.
Retail CBDC (rCBDC)	A digital form of national currency, issued and controlled by a central bank, accessible to the general public for retail transactions. This pilot study often refers to a *digital dollar*, which in this context is a rCBDC.
Tokenization	The act of digitally representing information in a unique manner on a technology system, typically a distributed ledger.
Wholesale CBDC (wCBDC)	A digital form of national currency, issued and controlled by a central bank, designed for financial institutions and interbank transactions.

Foundation for Future Cross-border Experimentation

Exploration of a retail digital dollar requires a prudent approach to understanding the potential impacts and benefits on a wide set of stakeholders, including the general public. In contrast to wholesale banking, where wholesale CBDC (wCBDC) may play a crucial role in driving efficiencies for institutional transactions (bank-to-bank), a proposed retail CBDC (rCBDC) as a tokenized US dollar necessitates a multi-phased approach to ensure that insights are captured, understood, and accounted for at each step of the roadmap while continuously prioritizing the safety and protection of the individual end user.

This rCBDC pilot study identified and tested the foundational elements for experimentation on one of the most important retail applications of digital money: cross-border remittances for family and loved ones. The conceptual roadmap below recommends three key phases that experimentation should pursue when building upon the findings of this pilot study:

01

FOUNDATIONAL ELEMENTS

Establish the core elements of cross-border remittances:

- CBDC Issuance
- Treasury Management
- Transaction Management
- Hosted Customer Wallets
- Currency Exchange

THIS PILOT STUDY

02

CORRIDOR COMPLIANCE

Configure the platform to support corridor-specific requirements:

- KYC/AML
- Fraud Management
- Transaction Compliance
- Identity Management
- Currency Liquidity

03

CUSTOMER VALIDATION

Engage with end customers to confirm features and benefits:

- Improved Accessibility
- Increased Transaction Visibility
- Reduced Customer Cost

The Global Role of Cross-border Payments

Remittance payments, which involve transferring money from one individual to another, typically across borders for personal or family reasons, play a critical role in the domestic and global economy. Although individual remittances are low in relative value (between $200 to $300 per transaction), the cumulative value of such payments is significant and continues to grow. According to the World Bank, global remittances were estimated to have grown by 5% in 2022, reaching $626 billion, despite slowing economic activity. Remittance payments are frequently utilized by citizens and noncitizens alike in the United States.[1] In 2021, the total value of remittance payment outflow from the United States reached a record high of over $74 billion.[2]

Retail remittance payments are often a primary source of income for recipients, making financial inclusion, accessibility, and security critical considerations. In emerging market economies, these payments often amount to a significant part of a country's income and contribute to economic growth by fostering increased trade linkages and investments. According to the Federal Deposit Insurance Corporation (FDIC), 7% of all U.S. households and one in four foreign-born noncitizen households used money transfer services from companies like Western Union, often to send cross-border remittances. Among households that used nonbank money transfer services, which predominantly include underserved communities and foreign households, and those where members do not possess a high school diploma, approximately 40% of total transactions involved sending or receiving international remittances.[3]

1 World Bank Group, Remittances Grow 5% in 2022, Despite Global Headwinds
2 Statista Research Department, Leading Countries Worldwide, by Value of Migrant Remittance Outflows in 2021
3 Federal Deposit Insurance Corporation, 2021 FDIC National Survey of Unbanked and Underbanked Households

Today's Inefficiencies Borne by Customers

The Philippines is Asia's second-largest recipient of remittance payments, having received $36 billion in such payments in 2022, which represents approximately 8.9% of its GDP. Of the total amount of remittances, over 90% of these payments were made in cash.[4] Nearly three in four Filipino consumers receive money once a month or more, while 77% send money at the same pace. This frequency increases during special and festive occasions, as reported by 19% of receivers.[5]

These remittance payments hold immense significance as a critical financial lifeline for many individuals and families. However, the cost of sending remittance from the United States to the Philippines typically amounts to 4.4% of the total transaction value and 7.98% for bank account transfers for a $200 transaction in Q4 2022, posing a significant burden for many families.[6] While lower fees would greatly benefit these households, it's important to acknowledge that many of these costs are inherent in today's financial infrastructure required to ensure compliant and secure global money transfers.

Among remittance services providers (RSPs), MTOs rank most important, following commercial banks. Notably, cash transactions facilitated by MTOs, banks, or other regulated remittance service providers were reported as the most widely used payment instrument for remittances by 49% of the surveyed economies.[7] While MTOs play a significant role in the remittance ecosystem, they face high costs associated with complying with corridor- and channel-specific regulations, and these costs escalate as MTOs expand their global network to serve additional payment corridors. To ensure secure global money transfers, MTOs must collaborate with a network of intermediaries, including correspondent banks and an agent network. Additionally, a typical remittance transaction often includes fees related to payment operators, correspondent banking liquidity, compliance, currency exchange costs, network management, and operational overhead associated with maintaining an international network of agents and banking relationships.

4 Philstar Global, Remittances Hit Record High of $36.1 Billion in 2022

5 Western Union, Western Union Global Money Transfer Index: The Middle East and Asia Pacific Series Uncovering consumer expectations of the remittance industry

6 The World Bank, Sending Money from the United States to the Philippines

7 The World Bank, Payment Systems Worldwide

In addition to reducing costs, enhancing the customer experience involves two other crucial aspects: providing clear visibility into the progress of a remittance payment and expediting settlement times. One significant challenge customers face is the need for more visibility regarding the status of their remittance when sending money across borders, which often requires a long chain of intermediaries. Despite efforts by modern systems to address such complexities, instances of unnecessary flagging, payment reversals, and system glitches still arise, greatly affecting the payment experience. Furthermore, in the case of telegraphic transfers, representing a small percentage of overall remittances today, settlement times can take up to two days.

Another area of friction for customers relates to limited access to financial services. Globally, approximately 1.4 billion people remain unbanked.[8] As of 2021, an estimated 5.9 million American households were “unbanked,” meaning no household member had a checking or savings account. Another 18.7 million Americans were “underbanked,” meaning that while they had a checking or savings account with a bank, they relied heavily on products used by unbanked households, such as check cashing, rent-to-own services, and international remittances.[9] Individuals may be unbanked for many reasons, including a lack of official proof of identity, a lack of access to banking services in their region, or simply a function of personal preference. For example, the number of correspondent banks, which play a critical role in facilitating cross-border payments, fell by 22% between 2011 and 2019, even though the value of payments increased.[10] This gradual decline inevitably reduces overall accessibility to regulated financial services for customers worldwide. In fact, the BIS warned of an increase in the use of "shadow payments" (e.g., cryptocurrencies) for cross-border payments due to this decline in correspondent banking.[11]MTOs allow those without a bank account to access an international network of banks and agents for global money transfers.

Moreover, there is a need for more trust in digital money transfer services among customers. Approximately 23% of regular money recipients and 31% of senders cite this as their main reason for not using digital transfers. To address this issue, the Philippine government is actively promoting digital connectivity strategies as part of its broader National Strategy for Financial Inclusion, aiming to instill consumer confidence. Bangko Sentral ng Pilipinas, the Philippines Central Bank, aims to drive 50% of transactions to digital channels by the end of 2023.[12] The ability to choose the money transfer method remains crucial for customers, underscoring the importance of a digital dollar-backed model that delivers a positive customer experience.

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8 Official Monetary and Financial Institutions Forum, Banks' Financial Inclusion Initiatives Are Too Narrow
9 Federal Deposit Insurance Corporation, 2021 FDIC National Survey of Unbanked and Underbanked Households
10 Bank for International Settlement, New correspondent banking data - the decline continues at a slower pace
11 Bank for International Settlements, International banking and financial market developments
12 Western Union, Western Union Global Money Transfer Index: The Middle East and Asia Pacific Series Uncovering consumer expectations of the remittance industry

The Role a CBDC Could Play

There is a growing body of work evaluating the potential for CBDCs to improve cross-border payments, with a consensus forming that tokenized CBDCs can improve the speed and lower the cost of remittance payments. While much of the existing work has primarily focused on solutions at the wholesale level, this pilot study seeks to contribute to the literature by examining the potential benefits of retail CBDCs for consumers engaging in transactions between the United States and the Philippines.

As noted, one of the drivers of costs in remittance payments is the need for intermediaries to fulfill cross-border payments compliantly. DLT offers advantages for remittances through peer-to-peer (P2P) transactions, atomic settlement, and enhanced transparency. In this pilot study, DLT allowed for the design of a simulated rCBDC as a P2P tokenized bearer instrument, much like physical cash, which is the preferred payment instrument for remittances. Customer transactions proceeded with fewer intermediaries, improving speed and efficiency and reducing costs.

Importantly, DLT-based systems can help financial institutions achieve the remittance targets the Financial Stability Board (FSB) set forth in October 2021.[13, 14] The FSB has defined four targets for remittances: (1) Cost – driving substantial cost improvements by reducing frictions in remittance markets,[15] (2) Speed – encouraging service providers to process 75% of remittance payments so that recipients have funds available within one hour of payment initiation, (3) Access – enabling the vast majority of adults globally who send/receive remittances to make cross-border payments through services that conduct proper AML/CFT checks, and (4) Transparency – minimizing data requirements for cross-border remittances. This pilot study considered these targets established by the FSB and other standard-setting bodies to enhance cross-border payments.

13 The FSB coordinates at the international level the work of national financial authorities and international standard-setting bodies in order to develop and promote the implementation of effective regulatory, supervisory and other financial sector policies.

14 For further discussion on the cross-border payments targets set forth by the FSB, see Targets for Addressing the Four Challenges of Cross-Border Payments (2021)

15 Remittance fees vary by region; however, they are generally higher in cost than other payments. The vast majority of remittances are sent to emerging economies, which often have frictions, such as volatile currencies, many intermediaries, and legacy systems.

Identified Benefits of a DLT Infrastructure for CBDCs

Tokenized Digital Dollars

One of the key benefits of a CBDC is its ability to function as a bearer instrument, enabling settlement finality. Transactions typically involve two components: the transfer of messages and the transfer of value. While existing financial infrastructure can send messages globally within seconds (transfer of message), settlement finality (transfer of value) relies upon the correspondent banking system. This delay in the transfer of value introduced counterparty and credit risk in the context of remittance processing, as it is reliant on a set of correspondent banks to settle using intraday liquidity. By utilizing a tokenized digital dollar as a bearer instrument, both messages and value can be transferred simultaneously between parties, reducing settlement risk and dependence on large pre-funded accounts.

Atomic Settlement

Another benefit of DLT is atomic settlement, which refers to a settlement process where multiple transactions are settled as a single unit. This means that either all the transactions are successfully settled or none of them are settled at all, effectively eliminating counterparty and credit risk. Atomic settlement reduces the risk of incomplete or inconsistent settlements. During this pilot study, two forms of atomic settlement were observed: Delivery-versus-Payment (DvP) and Payment-versus-Payment (PvP).

- **DvP** ensures that the delivery of an asset occurs if and only if the corresponding payment is completed simultaneously. DvP was observed when central banks distributed CBDC to financial institutions in exchange for pledged digital collateral.
- **PvP** ensures that the payment is delivered if and only if the corresponding payment is made. PvP was observed during FX orders on the decentralized liquidity exchange (DEX), where Western Union purchases PHP CBDC with digital dollars.

Distributed Technology Architecture

The architectural nature of DLT is crucial to recognize when considering the benefits that a CBDC can bring, particularly the potential to transition toward distributed networks within a controlled and governable environment. As observed through the issuance of CBDC to financial institutions and their customers, distributed networks enable the streamlining of intermediaries and the facilitation of P2P transactions. By onboarding entities onto a shared ledger, there is a reduced need to reconcile books. The availability of a DEX can foster a competitive open market for currency pair exchanges, which may reduce FX costs.

CBDC as a Potential Catalyst for Financial Inclusion

rCBDCs could be one catalyst for financial inclusion, whereby the availability of a secure digital settlement medium may reduce costs and improve the availability of banking. As such, the focus should turn to deepening experimentation through public-private partnerships and regulatory and policy discussions to determine how to maximize a digital dollar's potential to widen financial inclusion for the cross-border remittances use case and beyond.

One area where CBDCs could complement existing efforts is the digitalization of banking, thereby removing the physical barriers to accessing internet-enabled computer and telephone banking. Recent years have witnessed the growing popularity of digital banks and fintechs, capturing nearly half (47%) of all new checking accounts opened in 2023. Non-traditional routes are increasingly favored by younger generations, with over a third of Gen Zers and Millennials, considering a fintech or digital bank as their primary checking account provider.[16] Many of the changes in the financial services landscape can be attributed to the increased payment optionality available and improved accessibility for individuals across all socioeconomic levels.

As noted during testimony from a Columbia Business School Adjunct Professor before the Financial Services Committee of the U.S. House of Representatives, in the context of stablecoins, opening a digital wallet can be far faster than opening a bank account because of less stringent requirements for customer onboarding. While a digital dollar infrastructure will likely require additional steps such as identity verification to create a digital wallet, a CBDC digital wallet should also aim to produce an easy and accessible customer onboarding experience in a compliant and secure manner. [17, 18]

Digital wallets could be central to increasing financial inclusion by addressing key reasons people remain unbanked. One of the biggest barriers to inclusion is the need for official proof of identity, often required to open a bank account. Digital identity frameworks developed by states and private entities could complement the adoption of CBDCs and help solve this problem.[19] An example of early-stage research can be observed in projects such as Estonia's e-ID, which aims to ensure that all Estonians have a state-issued digital identity accessible through mobile phones or Smart-ID applications.[20]

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16 Cornerstone Advisors, Banking and Fintech in 2022: A Recap of Cornerstone Advisor Research

17 U.S. House of Representatives, Testimony of J. Austin Campbell before the U.S. Subcommittee on Digital Assets, Financial Technology and Inclusion, 118th Cong. (2023

18 For further discussion on digital wallets, access and inclusion, see Digital Dollar Project's original white paper, Exploring a US CBDC

19 World Bank, The Global Findex Database 2021: Financial Inclusion, Digital Payments, and Resilience in the Age of COVID-19

20 For further discussion, see e-Estonia's e-ID Program

New technologies like decentralized identifiers (DIDs) and shared ledgers can streamline Anti-Money Laundering/Know Your Customer (AML/KYC) processes. Interoperable digital identity standards would enable an ecosystem of regulated identity attesters to provide user credentials based on varying levels of KYC across jurisdictions. This can benefit those who decide against opening a bank account or have limited access to banks and cash. By providing a secure means of identification, digital wallets and CBDCs could open financial services to millions of people excluded from the banking system. Developing interoperable digital identity standards and establishing a network of regulated identity attesters will require bilateral, if not multilateral, agreements between countries and institutions.

While financial inclusion is crucial, digital solutions should be gradually and intentionally approached to avoid market fragmentation. For MTOs and banks in remittance-receiving countries, CBDC design choices are related to their business models, with a preference for physical cash usage among unbanked and underbanked populations in top remittance-receiving countries a major consideration.[21] Cash acceptance should not be negatively affected by the introduction of CBDCs. Both payment methods should be equally acceptable to the public and the state. While a well-designed CBDC could enhance financial access, broader initiatives such as additional user-based research, public education and financial literacy efforts, and other incentives are critical.

21 For further discussion, see Global Finance Magazine's World's Most Unbanked Countries 2021

The Pilot Study

Objectives

The pilot study assessed the value of using a rCBDC for cross-border direct funds transfers by simulating a remittance transaction from a customer of a U.S. MTO, Western Union, to a customer of a commercial bank in the Philippines, BDO Unibank. Key pilot objectives included:

Increase the understanding and familiarity with digital dollars for policymakers and private sector stakeholders: The Digital Dollar Project introduced a series of potential pilots to understand the societal and economic benefits and challenges of a tokenized form of the US dollar. This pilot gathered empirical evidence to test hypotheses regarding the benefits of digital dollars in a cross-border remittance use case.

Utilize a CBDC sandbox to simulate the transfer of a tokenized digital dollar from a US-based MTO to a Philippine Bank to advance discussions of the potential impact of using retail digital dollars for cross-border remittances to:

- Reduce costs associated with transferring funds between correspondent banking relationships;
- Increase the speed and efficiency of remittance payment processing;
- Increase financial inclusion and access to digital remittance payments;
- Mitigate risks and delays in remittance transactions;
- Improve retail remittance payments experience in niche trade corridors; and
- Improve liquidity requirements via atomic settlement.

Inform future remittance transaction digital dollar use cases and business model opportunities by serving as a leading example for government agencies to understand design elements necessary for future efforts.

Refine the Digital Dollar Project's Champion Model to support the design and development of retail digital dollars in a cross-border remittance context.

Roles and Network Architecture

Intermediated Distribution Model
A privately designed platform hosted all the nodes of the participating financial institutions, including commercial banks and hypothetical central banks, with the central bank being the sole issuer of CBDCs. This model, in which commercial banks must pledge assets to receive CBDCs (and for CBDC redemption), was chosen to align with the current two-tier distribution model, where licensed commercial banks have direct access to their respective central banks. Western Union and BDO Unibank have specific requirements in this regard, with BDO Unibank having direct access to its central bank as a commercial bank and Western Union operating through a US commercial bank. This design was codified into the system.

Single Cloud Architecture
Participants on the permissioned network were represented by nodes and included simulated central banks and liquidity providers, commercial banks, and a money transmitter. To reduce technical complexities, the pilot has adopted a single-cloud architecture whereby the participants can access their nodes through secure credentials. However, participants could manage their cloud instances to host their nodes and other components, should decentralization be a desired core design element.

Multiple CBDC Network
The sandbox based its technical design on the multi-CBDC platform described by the Bank of International Settlements (BIS) to test interoperability and interconnectedness. This platform involves a jointly operated payment system hosting multiple CBDCs with PvP settlements as the default. This ensures that the final transfer of a payment in one currency occurs only if the final transfer of a payment in another currency takes place.[22] This design choice was made in recognition and given the understanding that a global CBDC arrangement is likely to introduce various jurisdictional and technical differences beyond the scope of this pilot study.

Network Operator
This pilot study did not explore a united network operator role in this phase; however, future efforts may focus on responsibilities such as participant onboarding, network operations, resiliency management, and security support.

22 Bank of International Settlements, Multi-CBDC arrangements and the future of cross-border payments, BIS Papers No. 115

Scope

The scope of the pilot study included testing the following key processes in the DLT sandbox environment:

- *Configuring and issuing CBDCs from central banks to commercial banks and regulated financial intermediaries*
- *Pledging digital collateral by regulated financial entities to acquire CBDC*
- *Onboarding retail customers to Western Union and BDO Unibank DLT nodes to simulate a retail wallet portal for transacting with CBDC*
- *Generating and accepting bulk-order FX spot prices, mirroring FX order generation processes of the current state*
- *Order Fulfilment of US CBDC for PHP CBDC through a DEX*
- *Exchanging US CBDC for PHP CBDC end-to-end from a sending retail customer of Western Union to a receiving retail customer of a commercial bank in the Philippines, BDO Unibank*
- *Auditing the end-to-end issuance through the redemption process for US and PHP CBDCs*

Out of Scope

- *Considerations for transaction privacy involved in a cross-border remittance were out of scope for this pilot study. However, the Digital Dollar Project has convened a series of roundtables with industry leaders on privacy, which will be more wholly addressed via a different workstream.*[23]
- *While the technical sandbox performed atomic settlement using simultaneous and instant properties, the advantages and tradeoffs associated with instant settlement's possible impact on currency liquidity management were not examined.*
- *The potential impacts on central banks' ability to administer monetary policy due to the underlying assumptions of this pilot study were excluded from this scope.*

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23 Digital Dollar Project, Summary Report of the Digital Dollar Project's Roundtable Discussions on Privacy

Assumptions

Given the many uncertainties regarding the ultimate design of any CBDC that someday might be introduced by the United States, a series of assumptions were made to establish the context of the simulation[24]:

- ***Simulated value:*** All tokens and assets used in this pilot study were simulated and not representative of real value.

- ***Two-tier distribution system:*** Following the Digital Dollar Project Champion Model [14], this pilot study tested a CBDC model where central banks issue CBDCs distributed to the public through commercial banks and regulated financial technology and payment intermediaries.[25]

- ***Digital and traditional collateral:*** Assuming that central banks are part of the network, digital assets such as digital bonds, in addition to other traditional forms of collateral such as fiat currency, may be used as collateral to be pledged in return for CBDC.

- ***Compliance checks performed off-ledger:*** The pilot study team assumes that customer onboarding and KYC/AML compliance checks are conducted off-network. In future iterations, customer data can be stored off-network and certification of those KYC/AML-compliant user credentials may be passed to permissioned parties to meet corridor-specific verification requirements.

- ***Financial institutions host customer wallets and custody CBDCs:*** The simulation assumes that BDO Unibank and Western Union host wallets and CBDCs on behalf of their customers as sub-accounts to their institutional wallet.

- ***Entities holding foreign CBDC to fulfill orders:*** This pilot assumes that financial institutions may transact in foreign currency (i.e., Western Union sending PHP to BDO Unibank), but their primary holdings will be in their domestic currency. Regulated financial institutions in this sandbox may hold foreign currency to place FX orders on behalf of the customer. In addition, commercial banks could serve as FX liquidity providers.

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24 Atlantic Council, Central Bank Digital Currency Tracker

25 For further discussion, see the Digital Dollar Project's Whitepaper 2.0: Champion Model

Approach

The pilot study envisaged a future state where CBDC-based remittances might be processed in an automated straight-through manner per the processes defined below. Upon initiation of a remittance, foreign currencies would be purchased on-demand (on a 24/7 basis, despite time zone differences) through a centralized or decentralized exchange that provides currency pair liquidity. The value of this enhanced FX trade and subsequent remittance improves the customer experience by reducing cost and improving transaction visibility and benefits institutions by reducing counterparty risk and minimizing liquidity cost and risk previously required under the pre-funding model. Having multiple liquidity providers on the network through a DEX can increase market competition and provide more favorable exchange rates by allowing for multiple liquidity providers.

To facilitate remittances to the Philippines today, Western Union forecasts and pre-funds their accounts with Philippine peso at average bulk or agreed-upon rates to ensure sufficient liquidity for transactions made during closed markets hours and holidays in the Philippines. With the ability to access digital dollars on-demand, Western Union can commit more discrete levels of liquidity, potentially on a transaction-by-transaction basis, to optimize liquidity and improve treasury and cash management functions.

Recognizing a natural progression of technology, the pilot study designed this first phase to reflect that Western Union would still purchase PHP and act as the agent for the customer. The purchase of the PHP in the pilot could be completed on-demand throughout the day, including on weekends. A DEX was selected as the component that provides a market for currency pair exchange to explore potential benefits associated with a decentralized marketplace to improve competition and price transparency.[26] Given that the pilot study was set up as Western Union purchasing PHP CBDC in advance of a customer remittance being initiated, it involved conducting two sequential simulations:

1. Issuance of CBDCs by Central Banks to Financial Institutions
2. Peer-to-Peer Remittance Payment

26 For further discussion, see the usage of DeFi in a CBDC context explored in Project Mariana

Issuance of CBDCs to Financial Institutions

The first simulation prepared the remittance-sending and receiving entities by obtaining the necessary assets. This involved acquiring digital bonds and CBDCs, configuring institutional member access to the permissioned network for CBDC distribution, and provisioning customer wallets to facilitate remittances. The simulation focused on the CBDC issuance process from a central bank's perspective, followed by its distribution to a commercial bank and then an MTO before finally being made available in a retail wallet.[27] This section of the experiment established the foundation for how an MTO and a commercial bank would have access to the digital settlement asset, which required making assumptions, further explored below, about the CBDC issuance process from a central bank's perspective.

Each jurisdiction's simulated central bank is represented as a node in the network. They are the only entity that can define the characteristics of an issue or burn CBDCs. The country-specific central bank node was selected to simulate the creation of its corresponding CBDC. The sandbox platform provided several controls within each central bank node. These features are not definitive but highlight the range of possible design choices throughout the CBDC issuance and distribution process:

- **Member network access:** The central bank controls who has access to their network via member access controls. Certain commercial banks may have direct access to the central bank, as they do today with commercial paper. Only entities granted member access may directly acquire CBDC from the central bank in exchange for digital collateral.

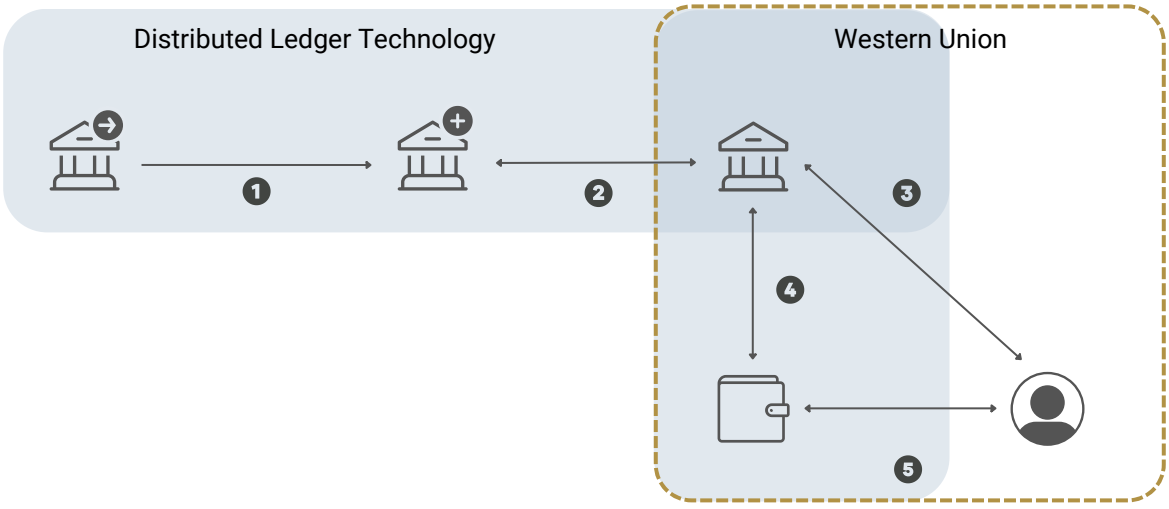
- **CBDC token characteristics:** In the simulation, the central bank can configure several characteristics of the CBDC. These are assumptions that the issuing central bank will ultimately determine. Configurability includes but is not limited to:
    - The number of decimal places supported
    - Whether the asset is interest-bearing
    - Maximum transaction limits
    - Token expiration date—the amount of time before a token needs to be re-issued with a new identifier to limit the data chain and improve security; and
    - Max usage—the number of transactions that use the token before it is re-issued with a new identifier to limit the data chain and improve security

27 Neither the United States Federal Reserve nor the Bangko Sentral ng Pilipinas were involved in this pilot study. Assumptions associated with the role of central banks are largely based on existing financial markets norms and practices.

- **Collateral pledging:** Collateral can be put up by a commercial bank in exchange for CBDC. Digital bonds were selected for the simulation, but other forms of collateral could be cash, tokenized deposits held at the central bank, or digital assets.

Once the CBDC token was designed and the access controls were set, the CBDC could be distributed to the second-tier financial entity and onwards to customers, as illustrated in Figure A. The MTO or commercial bank funds their respective customer wallets, assuming they have undergone an onboarding process and have wallet accounts created on the network. The funds held in a retail wallet were part of a sub-account to the MTO, which the commercial bank has visibility into. Once logged in, the customer could view transaction history, add payees, and send remittances.

Figure A: Issuance of CBDC to Financial Institutions



1. Central Bank issues digital dollars to commercial bank
2. Western Union's commercial bank provides access to digital dollars
3. Western Union conducts KYC/AML to onboard customer
4. Western Union hosts customer's wallet
5. Customer funds or withdraws traditional fiat in exchange for digital dollars

Peer-to-Peer Remittance Payment

Western Union purchases PHP CBDC before the remittance in this iteration, utilizing and holding a basket of currencies in its treasury. The next simulation showcased the P2P remittance transfer, whereby Western Union acquires PHP CBDC to facilitate the remittance transaction on behalf of a Western Union customer. Real-time FX rates were made available via a 3rd party integration to simulate exchange rates between USD and PHP. However, in a real-world scenario, the bulk of expected remittances in the US-Philippine corridor will occur during off-trading hours in Manila when PHP is not available for purchase, which introduces questions surrounding global currency exchange availability in an increasingly digitized and 24/7 online world.[28]

To acquire PHP CBDC, Western Union utilized a DEX to broadcast the number of digital dollars and the US-PHP exchange rate offered to network participants. These participants can include multiple liquidity providers onboarded and permissioned onto the network, which may improve market competitiveness and pricing. It can be an entity, such as a commercial bank, with competitive pricing or an exclusivity agreement. Permissioned network members who received the broadcasted currency exchange offer and had sufficient liquidity in the desired currency pair (e.g., USD and PHP) could choose to accept the full offer, in which case a transaction occurred between the digital dollar from Western Union and the PHP CBDC from the liquidity provider to Western Union. This FX spot transaction was done atomically through a PvP mechanism, removing most credit risk involved in the transaction. The pilot study individually evaluated the components for a straight-through processed remittance as part of this initial iteration. End-to-end automation of this process would be an ideal next step for further research. If this were automated and implemented, Western Union would not need to acquire PHP before a customer remittance request.

Assuming the Western Union node or set of accounts had sufficient PHP CBDC, a customer could add or select a payee to initiate a remittance from the U.S. utilizing real-time FX rates, which were configured into the simulation through an API. When the customer initiated a remittance transfer, they received a quote for the USD-PHP exchange rate (sourced from the last DEX steps). Upon confirmation of the payment, as Figure B illustrates, Western Union transferred the PHP CBDC to BDO Unibank against the customer account. Once the remittance recipient (i.e., BDO Unibank customer) received payment, Western Union received confirmation of the CBDC transfer and confirmed with the remittance sender.

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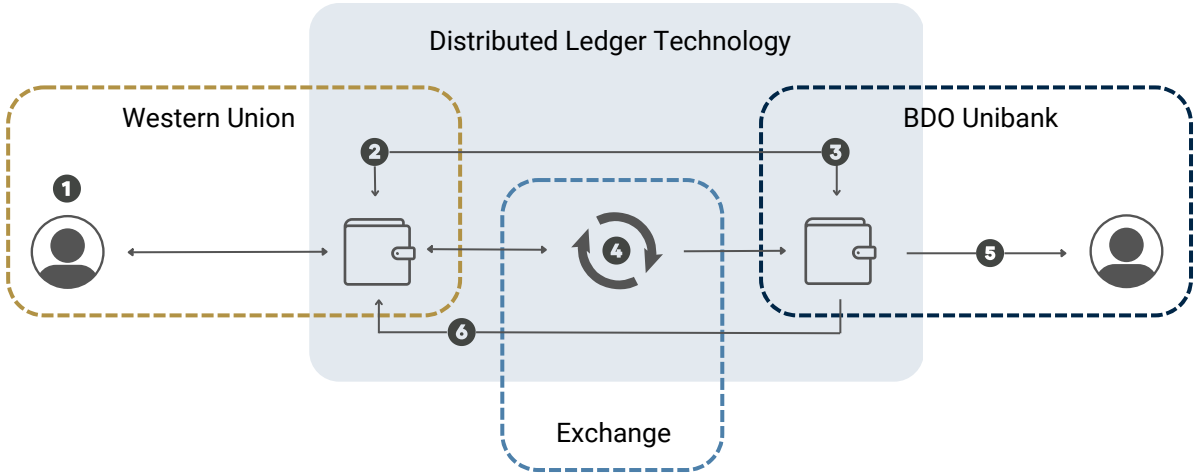
28 The bulk of remittances sent from the United States to the Philippines occurs during the late evening hours in Manila (3am to 8am), when PHP FX trading desks are closed. This is a constraint worth noting as future iterations of cross-border experiments should explore how congruence may be established between time zones, trading desk hours, and currency liquidity.

While transaction privacy considerations were not explicitly in scope for this paper, the pilot assumed that customers grant their financial institutions permission to hold and leverage their data, not the central bank. In this case, the handling of PI (Personal Information) and transaction data is owned by Western Union and BDO Unibank according to internal policies and systems.[29] As such, both BDO Unibank and Western Union have visibility into the transaction status and parties involved resulting in a reduced need for reconciliation efforts between both entities.

Figure B: P2P Remittance Transfer



1. Sender initiates payment, confirms details
2. Verification of balance in Sender's wallet
3. Verification of known Recipient
4. Value atomically exchanged between wallets
5. Recipient notified of payment
6. Confirmation sent back to Sender

29 For this phase of work, privacy elements, such as the detailed provisions for managing data in a multi-party arrangement, were not explored. However, it is the view of the participants that data privacy rules and regulations in the respective jurisdictions should be adhered to.

Findings

The pilot study successfully simulated a cross-border retail CBDC remittance between Western Union and BDO Unibank customers using a DLT-based sandbox. The sandbox illustrated the potential remittance flows, capabilities, and how the customer experience may be improved. The pilot study also highlighted additional critical considerations that should be explored following this establishment of foundational elements for cross-border remittance payment experimentation.

Creating a rCBDC that sets the industry standard requires striking a delicate balance between addressing consumer pain points, ensuring privacy and protection, and managing risk across the entire system. The pilot study revealed that enabling 24/7 settlement can significantly reduce credit risk, reconciliation, and related dispute management costs, ultimately benefiting end customers. Using a permissioned DLT network helps preserve consumer privacy by allowing for granular control over the level of consumer data sharing. Additionally, the shared ledger between Western Union and BDO Unibank increases transparency, resulting in greater certainty regarding transaction flows during and after the payment process. Overall, a successful retail CBDC design should prioritize consumer needs and safety while managing risks across the system. The key potential benefits to retail customers that the pilot study has highlighted include the following:

Reduced Risk: Instant settlement across multiple currencies reduces counterparty and credit risk for customers and their financial institutions.

Optimized Cost: CBDC settlement allows for transferring value and message in a single transaction, settled atomically, alleviating the cost of capital held in pre-funded accounts.

Enhanced Customer Experience: A tokenized digital dollar increases the accessibility and portability of money in a digital form to benefit the unbanked and underbanked. While only one component to a larger set of solutions, a erified digital wallet can help reduce fraud, enable faster settlement, harmonize jurisdictional requirements, and reduce failed transactions.

Improved Visibility: Using a permissioned ledger provides institutions and their customers with enhanced visibility into the stage of a transaction, which bolsters customer trust.

Policy Considerations

The pilot study made several underlying design assumptions that subsequently produced a set of policy considerations that are important to examine.

Central Bank Money for Retail Cross-border Remittances

Digital central bank money is typically reserved for wholesale banking, where large-value transactions require a riskless and efficient asset for settlement. The study assumed retail customers could use central bank money to send cross-border remittances. However, this represents a departure from common remittance practices today, whereby customers typically access and use commercial bank money through correspondent banking.[30] With trends toward digital currencies, a shift toward rCBDC is growing in plausibility.[31]

Policymakers should consider the advantages and trade-offs associated with the safety and soundness of using central bank money (vs. privately issued money) for P2P cross-border remittances.[32]

Foreign Holding of CBDCs

This pilot study assumed that a US MTO could hold and send PHP CBDC to fulfill customer remittance orders. While other projects have made similar assumptions to allow foreign banks and corporates to use CBDCs, without appropriate safeguards, cross-border use of CBDCs and broadening access to central bank money could hinder central banks' ability to maintain monetary policy.[33] Policymakers should consider the adaptations required to correspondent banking to accommodate foreign holding of CBDCs, including provisions establishing rules for who can hold what currency. [34, 35]

Foreign Exchange Liquidity Providers

A primary feature study was the decentralized liquidity exchange that, if scaled, could support many liquidity providers that offer currency pair liquidity, which could drive competition and transparency. To be congruent with today's FX practices, policymakers should explore the benefits and tradeoffs of granting regulated financial institutions the permission to buy and sell currencies on such distributed systems. Permitted agents should offer robust operational and compliance controls to prevent systemic issues and operate under local regulations.

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30 While most cross-border payments today are settled using commercial bank money, Continuous Linked Settlement (CLS) is an exception that settles FX transactions on a PvP basis and through accounts held at the relevant central banks.

31 For further discussion, see Central bank digital currencies: motives, economic implications and the research frontier

32 For further discussion, see Project Icebreaker

33 For further discussion, see Project mBridge

34 For further discussion, see Rep. Luetkemeyer's proposal to ban US money service businesses from holding China's digital yuan

35 For further discussion, see the Bank of England's consultation paper, which assumes foreign nationals could hold a digital pound.

Topics for Further Exploration

Below are several key areas where further research and testing are needed to determine the optimal path forward for developing and deploying CBDCs in a cross-border context. Ultimately, this initial pilot study demonstrated the potential for CBDC-based remittance transactions, but measuring the benefits and impacts of rCBDCs for remittances will require deeper experimentation:

Inclusive Identity Attestation Models: To promote financial inclusion, standards for customer verification and compliance checks across a distributed network should account for unbanked and underbanked customers without formal identification. Checks should balance ease of onboarding and access with the ability to flag activity from prohibited jurisdictions and sanctioned counterparties. DIDs offer a potential pathway to achieving this objective.

Privacy for Cross-border Transactions: Privacy considerations for CBDC-based remittances related to transaction visibility between financial institutions and their jurisdictions should be further explored and defined. Defining privacy standards for CBDC transactions will ensure secure cross-border transfers while protecting individual privacy rights. Trust can be fostered, CBDC adoption encouraged, and secure and confidential digital transactions enabled by prioritizing privacy requirements and implementing robust protocols.

Multi-Network Cross-border Interoperability: Working with multiple CBDCs requires a broader discussion on interoperability standards. This remains a question in the cross-border CBDC landscape. The pilot study assumed a single network with permissioned access for US and Philippines financial institutions and their retail customers. However, as most previous experiments were done from an institutional perspective, an alternative approach involving retail customers would provide value to the global discussion on CBDCs.

Refining the Digital Dollar Project Champion Model

This pilot study explored how the eight tenets of the Digital Dollar Project's Champion Model could be refined due to the findings produced. Additional context has been added to two tenets: ***Two-tier distribution model*** and ***Technology decisions and design choices driven by functional needs***.

Two-tier distribution model

A core tenet of the Digital Dollar Project Champion Model is that a digital dollar should be distributed to end users through the existing two-tiered architecture of commercial banks and regulated financial technology and payment intermediaries.

- This pilot study produced evidence that supports the Champion Model's position that regulated financial technology and payment intermediaries, including MTOs, are critical to the design and adoption of a potential U.S. CBDC.
- Given the important role that MTOs play with respect to global remittances, their unique needs should play a key role in any discussions regarding a digital dollar.
- With nearly 1.4B adults unbanked worldwide, whether by circumstance or choice, MTOs play a crucial role in providing financial services to remittance customers who prefer cash.[36]

Technology decisions and design choices driven by functional needs

Another core tenet of the Digital Dollar Project Champion Model is that functional needs should drive technology decisions and design choices. The policy and economic requirements, such as scalability, throughput, and data privacy, of a digital dollar should inform both the underlying technology and ultimate design choices.

- The pilot study raised the importance of adaptive identity attestation models to improve financial inclusion by providing optionality for customers to onboard.
- A digital dollar system should accommodate a wide set of customers, including those who lack formal identification, by ensuring the digital wallet infrastructure facilitates a fair and transparent onboarding process while promoting security.

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36 The World Bank, COVID-19 Boosted the Adoption of Digital Financial Services

Conclusion

The team designed and deployed this pilot to better understand the potential role of a digital dollar for cross-border remittance payments. The pilot demonstrated that rather than displacing the service offerings of Western Union and BDO Unibank, CBDCs present an opportunity to modernize processes and promote efficiencies for private sector companies and their customers. This pilot study indicated a clear potential for retail CBDCs, designed as tokenized bearer instruments and distributed to end users through banks and other regulated intermediaries, to improve cross-border remittance payments.

While deciding whether to design and deploy a U.S. CBDC and a Philippine CBDC rests with policymakers in each jurisdiction, the Digital Dollar Project will continue its philanthropic mission of fostering private-sector-led exploration of a U.S. CBDC, including the design benefits and challenges for a retail digital dollar. As noted, further research and experimentation are needed to understand the benefits and challenges of rCBDCs fully. This pilot study is an initial step in evaluating a key consideration for financial inclusion, improving the speed and lowering the cost of cross-border remittances.

Acronyms

AML - Anti Money Laundering
CBDC - Central Bank Digital Currency
DEX - Decentralized Exchange
DID - Decentralized Identifiers
DLT - Distributed Ledger Technology
DvP - Delivery-versus-Payment
FX - Foreign Exchange
FDIC - Federal Deposit Insurance Corporation
KYC - Know Your Customer
MTO - Money Transfer Operator
PHP - Philippine peso
PI - Personal Information
PvP - Payment-versus-Payment

Appendix

Cross-border CBDC exploratory work to date

As of July 2023, the central banks of 130 countries are exploring CBDCs.[37] Four central banks have already deployed CBDCs, while several major players are set to launch CBDCs in the coming years. Cross-border transactions are an important use case for CBDCs that has been studied by several pilots worldwide. While the cross-border pilots outlined below generally focused on technology- and governance-related issues from the perspective of central banks, this pilot study sought to provide insights from the perspective of private sector institutions that represent retail customers.

Most projects examined examine wholesale CBDCs – CBDCs available to financial institutions for large, bank-to-bank transactions. This pilot examined retail CBDCs, which are available for use by the public and generally distributed to end users via regulated intermediaries like banks and other financial companies. This pilot further extends cross-border CBDC research to the retail level.

By testing customers' transfer and reception of CBDCs through accounts at a financial services company and a commercial bank, this pilot explored complex public policy issues inherent to retail CBDCs. The findings from the project will also provide data for financial institutions to inform downstream CBDC preparation efforts, including technology and business transformation efforts.

37 Atlantic Council, Central Bank Digital Currency Tracker

Project	Publishing Date and Organization(s)	Jurisdiction/ Region	Scope
Jasper-Ubin	2019 – Bank of Canada, Monetary Authority of Singapore	Canada – Singapore	Exploration driven by central banks: Tested atomic settlement of cross-border, cross-currency, and cross-platform transactions using Hash Time Lock Contracts (HTLC).
Project Jura	2021 – Banque de France, BIS Innovation Hub, Swiss National Bank	France – Switzerland	Exploration driven by central banks in partnership with commercial banks: Tested direct transfer of euro and Swiss franc wCBDCs between French and Swiss commercial banks on a single DLT platform operated by a third party.
Project Dunbar	2022 – BIS Innovation Hub, Reserve Bank of Australia, Central Bank of Malaysia, Monetary Authority of Singapore, South African Reserve Bank	Australia – Malaysia – Singapore – South Africa	Exploration driven by central banks: Tested the speed and efficiency of direct cross-border transactions between financial institutions in different currencies using a shared multi-CBDC platform.
Project mBridge	2022 – BIS Innovation Hub, Hong Kong Monetary Authority, Bank of Thailand, People's Bank of China Digital Currency Institute, Central Bank of the United Arab Emirates	Hong Kong – Thailand – China – UAE	Exploration driven by central banks with commercial bank participation: Tested cross-border payments using a custom-built common platform based on DLT upon which multiple central banks can issue and exchange their respective central bank digital currencies (multi-CBDCs).
Project Icebreaker	2023 – BIS Innovation Hub Nordic Centre, Bank of Israel, Norges Bank, Sveriges Riksbank	Israel – Norway – Sweden	Exploration driven by central banks: Tested the technical feasibility of cross-border, cross-currency transactions across different potential retail CBDC systems.
Project Cedar Phase II x Ubin+	2023 – New York Federal Reserve, United States	US (NY Fed) – Singapore	Exploration driven by central banks: Tested DLT effectiveness in improving interoperability and speed in cross-border multi-currency payments.
Regulated Liabilities Network US Proof of Concept	2023 - Federal Reserve Bank of New York's Innovation Center	US (NY Fed)	Exploration driven by central banks: Tested shared ledger technology to settle the liabilities of regulated financial institutions through the transfer of central bank money.
The Digital Dollar Project: Cross-Border Remittance Payments	2023 – Western Union, B Unibank	US – Philippines	Exploration driven by private sector leaders: Tested rCBDC remittance from a U.S. MTO customer to a beneficiary in the Philippines. The pilot study produced findings to influence future policy, advance public awareness, and reflect the operational readiness of leading stakeholders.

Chart non-exhaustive

The Role of Western Union in Remittances

Western Union helps aspiring people and businesses worldwide save, spend, and transfer money—empowering more prosperous financial futures for their families, friends, and communities across borders. Our mission is to make financial services accessible to people everywhere. We build and offer easy-to-use products and services that bridge digital and physical to give customers choice, security, and reliability, no matter where they are.

Our leading cross-border, cross-currency money movement, payments, and digital financial services empower consumers, businesses, financial institutions, and governments—across more than 200 countries and territories and nearly 130 currencies—to connect with billions of bank accounts, millions of digital wallets and cards, and a global footprint of hundreds of thousands of retail locations.

Our position as a trusted financial services provider offers an exciting opportunity to significantly deepen customer relationships by offering additional digital products and services alongside our core money transfer services. From our earliest beginning, which goes back to the mid-1800s, we have advanced technology to connect people – always staying focused on connecting people closer to the places and loved ones that matter most to them, in good times and bad. CBDCs are one example of the many innovations we are exploring to empower our customers to take advantage of the latest technological advancements.

The Role of BDO Unibank in Remittances

BDO Unibank is the largest bank in the Philippines, operating in full service anytime, anywhere. From branches to ATMs, from assets to operations – with over 1,600 branches and more than 4,600 ATMs nationwide. This includes BDO Network Bank, BDO Unibank's rural bank subsidiary, built to provide access to financial services in rural areas. We have made banking services even more accessible with over 10,000 Cash Agad partner stores, allowing POS cash withdrawals and balance inquiries in underserved communities.

BDO Unibank, through its remittance service BDO Remit, operates in key areas where Overseas Filipinos are located, spread across Asia, the Middle East, the U.S.A., Canada, and Europe, serving as a bridge for global partners to better reach Filipinos working in these countries.

We are also a proud member of the SM Group, one of the country's strongest and biggest conglomerates in the Philippines. With over 80 mall branches located in key areas throughout the Philippines, open seven days a week, resulting in extended banking hours. BDO Remit allows beneficiaries to claim remittances seven days a week, including holidays.

We have the largest market share in remittances and deposits through BDO Kabayan Savings account. The Kabayan Savings account was created especially for Filipinos abroad and their families to enjoy the ease of opening an account and the affordability, which also comes with free life and accident insurance for remitters. For years, BDO Unibank has been developing an active and harmonious partnership with SM, the Philippines' largest chain of shopping malls, allowing our clients to enjoy its exclusive promos and events nationwide.

BDO Unibank also created various programs all catering to Filipinos working abroad, like the Pre-Departure Orientation Seminar (PDOS), where attendees can instantly open a BDO Kabayan Savings. And to reach out to more families in rural areas, BDO Unibank created a grassroots marketing program where we teach communities financial literacy, which we've started since 2014. We discuss tips on saving and investments to bring them closer to achieving their goals and caring for themselves while away from their families.

Today, BDO Unibank's remittance business has grown from simply being a way to send money to being key in building a better future for Filipino families. Amid the pandemic, our service also remained uninterrupted, making us a stronger bank of choice by both clients and partners. We envision our partners' commitment to making remittances more convenient and efficient, lasting for years.

The Pilot Study's Simulated CBDC Network

CBDC Overview

CBDC is a new digital currency format and payment network model that institutions and central banks around the world are exploring. The Digital Dollar Project believes that, if designed appropriately, CBDC could be the next major innovation in U.S. money and could provide a modernized currency for a token-based future. In the Digital Dollar Project's Champion Model, a U.S. CBDC, potentially issued by the Federal Reserve System, would enjoy the full faith and credit of the U.S. government to have the same legal status as physical bank notes and reserves. CBDC has the potential to be a natively digital solution that integrates efficiently with other DLT-based assets and infrastructures.

Digital Dollar Project’s Champion Model

The Digital Dollar Project has studied findings from global CBDC initiatives to develop a “Champion Model” that can be tested and refined through hands-on testing. The Digital Dollar Project recognizes that there are many unanswered questions regarding a U.S. CBDC. As global experimentation produces new findings and requirements, the Digital Dollar Projectintends to refine its champion model to incorporate the needs of various use cases.

Tenets of the Digital Dollar Project Champion Model[38]

Tokenization
A digital dollar would be a tokenized form of the U.S. dollar. Tokenization is the act of creating a digital representation of the information, rights, and ownership of an asset, good, right, or currency and using that digital representation to attest to facilitate transactions and ownership.

Third format of currency
A digital dollar would operate alongside existing fiat currency and commercial bank money. It will mirror many properties of physical money, including its ability to work alongside existing account-based systems. Existing money supply could be converted on a 1:1 basis into CBDC to ensure there is no new money creation.

Maintenance of the two-tiered banking system
A digital dollar would be distributed through the existing two-tiered architecture of commercial banks and regulated financial technology intermediaries.

Privacy
The digital dollar would support a balance between individual privacy rights, data confidentiality, and necessary compliance and regulatory processes, in accordance with democratic norms, and ultimately reflecting the jurisprudence around the Fourth Amendment of the U.S. Constitution.

Monetary policy-neutral
The introduction of a digital dollar would be a new representation of the U.S. dollar and would not change the money supply. The technology that underpins it, such as programmability, may open more opportunities for the Federal Reserve to transmit monetary policy but is subject to how a digital dollar is ultimately designed and implemented.

Technology decisions and design choices driven by functional needs
The policy and economic requirements, such as scalability, throughput, and data privacy, of a digital dollar would inform both the underlying technology and ultimate design choices.

Future-proofing the architecture through flexibility
The chosen technological architecture would offer the flexibility to adapt based on policy and economic considerations. A CBDC would be designed with the ability to be updated as technology advances.

Continued private sector innovation
A digital dollar would act as a catalyst for innovation and will not be antithetical to the development of private sector initiatives.

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38 For further discussion on the Digital Dollar Project's Champion Model, see *Revisiting the Digital Dollar Project's exploration of a U.S. central bank digital currency* (Digital Dollar Project Whitepaper 2.0)

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Note: The views expressed in this white paper are those of the authors and do not necessarily represent the views of the Digital Dollar Project Advisory Group, the Digital Dollar Project's participant community, or its working group members and affiliated entities.

About The Digital Dollar Project

A nonprofit organization, The Digital Dollar Project was created to encourage research and public discussion on the potential advantages and challenges of a U.S. CBDC — or a "digital dollar." The Digital Dollar Project will identify options for a CBDC solution to help enhance monetary policy effectiveness and financial stability; provide needed scalability, security and privacy in retail, wholesale and international payments; and integrate with existing financial infrastructures. The believes it is key and will facilitate opportunities for the U.S. to engage in international standard-setting regardless of whether the U.S. eventually issues a CBDC or not.

For more information on The Digital Dollar Project, please visit https://digitaldollarproject.org