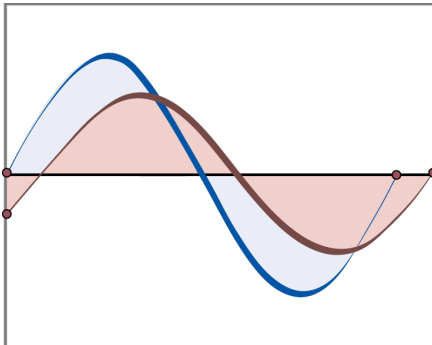


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Caribbean Currency Convertibility in an Era of Central Bank Digital Currency

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The wave of interest in Central Bank Digital Currencies (CBDCs) has reached the shores of the Caribbean. While the objectives in the regional context have focused on reducing cash usage and improving financial inclusion, this paper proposes the use of CBDCs to facilitate currency convertibility with the express purpose of promoting intra-regional trade. Currency convertibility would be achieved through a Caribbean Plurilateral CBDC Swap Arrangement (C-PSA) – a network of bilateral swap agreements in national currencies among selected Caribbean central banks – that will leverage the deployment of a two-tiered CBDC architecture. Assuming retail, intermediated, token-based CBDC design existed in participating countries, small traders, service entrepreneurs and others whose primary mode of payment is cash-based, would be able to use mobile wallets. Commercial banks would facilitate exchange payments received in one currency to their respective national currencies without using the US dollar as the vehicular currency. This reduces the call on precious foreign exchange reserves and, more importantly, moves a step closer to advancing the objective of deeper economic integration under the CARICOM Single Market and Economy (CSME).

JEL Classification: E42, E58, F13, F15, G21, O33

Keywords: Central Bank Digital Currency; Currency convertibility; Regional integration; Intra-regional trade.

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1. Introduction

Financial technology (“fintech”) can prospectively revolutionise the conduct of financial services and the underlying technology can provide solutions to longstanding societal challenges. Digital money and its variants (cryptocurrencies, stablecoins, etc.) have spawned the entry of new technology-centric private entities into the payments arena. However, early adopters have had to contend with huge speculative premiums attached, as the digital versions of money are seen as more of an asset class than a medium of exchange. Central Bank Digital Currencies (CBDCs) are part of the public response to private initiatives to modernise the financial payments sphere. At present, Caribbean cross-border payments are generally viewed as costly, inefficient and facilitated by a few multinational banks which dominate the correspondent banking sphere. Regarding the Caribbean Community (CARICOM), CBDCs are being explored for a variety of reasons such as to improve financial inclusion (in the case of The Bahamas) or to reduce the cost associated with heavy cash usage (in the case of the Organisation of Eastern Caribbean States [OECS]). While the objective of improved financial inclusion is preeminent in the international context, other objectives include: increasing payment system efficiency, improving monetary policy formulation and implementation, strengthening financial integrity, addressing potential issues related to private payment systems, and more recently following the COVID-19 global health crisis, expediting stimulus payments and making payment systems more resilient against shocks (Kiff, et al. 2020). However, the development of CBDCs can present even more gallant opportunities in the Caribbean context – perhaps providing the spark which reignites discussions towards deeper CARICOM trade and financial (monetary) integration. The objective of digital money fostering regional integration has not been fully explored in the international literature as yet. This paper seeks to contribute to the nascent interest in the area from the unique perspective of the Caribbean.

Deeper regional integration has been stymied by a lack of progress on key elements of the CARICOM Single Market and Economy (CSME)¹, particularly movement towards an economic union and ultimately a currency union. The idea of a single Caribbean currency has been divisive, but it is not novel. Barbados, Guyana, the OECS and Trinidad and Tobago shared the same currency in colonial times. In fact, the Trinidad and Tobago currency remained linked to the EC dollar under the Sterling Area Agreement². Notions of a single currency dimmed as national currencies were inextricably linked to sovereign identities. Instead, a system of bilateral central bank swap agreements was established

¹ The Revised Treaty of Chaguaramas established the CSME in 2001 and it came into force in 2006.

² The Agreement facilitated free currency convertibility among Commonwealth member states.

to ease the encumbrances of intra-regional transactions. For example, up to the 1970s the Intra-Regional Payments Scheme (IRPS) saw the offsetting of payments with periodic net settlements. This transitioned to the CARICOM Multilateral Clearing Facility (CMCF) in 1976. The CMCF lasted less than a decade before collapsing in 1983 due to sizeable unpaid balances by Guyana.

Interest in a common currency emerged once more in the 1990s, with the CARICOM Heads of Government (HOG) commissioning the CARICOM Central Bank Governors to prepare a report on Caribbean monetary integration. In July 1992, the HOG approved the recommendations of the Committee of Governors which revolved around the creation of supranational monetary authority and a single currency with a value linked to the US dollar. However, implementation stalled due in part to the amount of political capital such moves could consume. Hilaire (1992) examined the use of a Caribbean currency that functions exclusively as a unit of account for intra-regional transactions. While sound conceptually, separating the unit of account from the medium of exchange function of the Caribbean currency and the prerequisite to establish multiple layers of exchange rates (Caribbean currencies < unit of account > international currencies) appeared a challenging system to operationalise.

In the ensuing years, a number of thorny issues developed ranging from intra-regional trade imbalances to currency convertibility for small traders. On the latter, the inability of itinerant traders from St. Vincent and the Grenadines and Grenada to convert proceeds of their sales in Trinidad and Tobago to the EC dollar prompted the involvement of the respective governments and the implementation of countervailing measures by St. Vincent and the Grenadines in particular, which on March 1, 2018 saw all US dollar payments to Trinidad and Tobago requiring the prior approval of the Director of Finance and Planning³. Such incidents create both implicit and explicit barriers to trade and run counter to the spirit of the Revised Treaty of Chaguaramas from which the CSME draws its life.

At this time, in light of political economy considerations we concur that the pathway to full economic union need not run through a single currency as espoused in Blackman (1999). As such, the objective of this paper is to develop a framework that addresses the cash convertibility challenges experienced at the retail level through the use of a Caribbean Plurilateral CBDC Swap Arrangement (C-PSA). Convertibility is broadly viewed in the context of the ability to convert local currency for “hard” currency. However, for the purposes of this paper, convertibility refers to the exchange of national currencies in the Caribbean region. The use of conventional bilateral swap arrangements applied in the context of digital currencies sheds a different perspective on the convertibility issue. Improving currency convertibility has a few distinct advantages. Farrell and Worrell (1994) advanced that establishing convertibility can accelerate investment in tradeables by eliminating the incentive for capital flight by removing the need for inflation

³ “St. Vincent implements new rule for US\$ payments to Trinidad.” *iWitness News*, February 8, 2018. Accessed August 3, 2020. <https://www.iwitness.com/2018/02/08/st-vincent-implements-new-rule-for-us-payments-to-trinidad/>.

hedges, reducing information costs of exporting and eliminating the risks derived from changes in government's strategy for managing the exchange rate.

There is similar work being undertaken at the regional level. In 2019, the Caribbean Development Bank established a working group on cross-border digital payments to explore the feasibility of a Caribbean Settlement Network (CSN). The CSN aims to undertake intra-regional cross-border payments for trade and the settlement of remittances using digital versions of Caribbean currencies. However, there has not been significant advancement in defining the scope or the financial burden-sharing of this arrangement. The major difference between the CSN and what is proposed in this paper is that the former envisions creating a not-for-profit regional public entity where transactions would be conducted through bilateral digital currency swap agreements. Also, the use of Distributed Ledger Technology (DLT) is deemed the appropriate vehicle to reduce trade costs. We do not propose establishing an additional layer of bureaucracy but to leverage the existing payments infrastructure of central banks. Eventually, given the scalability of CBDCs and their potential benefits, a more omnipotent public digital currency may emerge, which reflects the aspirations of the CSME.

The paper is structured as follows: **section 2** would delve into the literature on currency convertibility in the Caribbean, central bank currency swaps and CBDCs. **Section 3** set the background for the study, while **section 4** outlines the conceptual framework for the C-PSA and discusses some of the implications. The paper concludes in **section 5**.

2. Literature Review

2.1 Currency Convertibility in the Caribbean

Boosting intra-regional trade has been elusive, as CARICOM import and export statistics have indicated that Caribbean jurisdictions have consistently had more open trade with the United States (US). High trade barriers have adversely impacted intra-regional trade, inclusive of excessive exchange rate volatility and the thin liquidity of Caribbean national currencies. As a result, much of the Caribbean trade literature has discussed measures to advance integration between economies and improve settlement systems, which in turn is expected to advance trade and economic development.

Clarke (1996) provides a comprehensive characterisation of currency convertibility. Convertibility is defined as the capacity to convert a domestic currency into an external “harder” currency⁴. Clarke (1996) further distinguishes between current account and capital account convertibility. Current account convertibility refers to the settlement

⁴ A “hard” currency in this context refers to a currency which is likely to maintain its value and not suffer significant price volatility. These are often referred to as reserve currencies and based on the IMF's Currency Composition of Official Foreign Exchange Reserves (COFER). Information from the COFER for the third quarter of 2019 highlights that the primary reserve currency is the US dollar (62 per cent), followed by the euro (20 per cent).

restrictions on trading goods and services and is a critical part of compliance with IMF Article VIII obligations. Capital account convertibility, conversely, involves the capital and financial flows freedom of movement, which is more difficult to attain even for developed countries, according to Clarke (1996). Thus, the majority of the literature tends to focus on the current account or, what is known as “partial currency” convertibility. The research indicates that while current account convertibility can benefit macroeconomic development and a nation’s competitive advantage, the short-term effects on domestic employment and current account imbalances can be detrimental. Clarke (1996) advocated that countries should have appropriate macroeconomic management, or they are likely to struggle with currency convertibility measures.

Over the past few decades, there have been several proposals for resolving the Caribbean’s intra-regional trade and currency conversion challenges. Some Caribbean researchers have advocated for monetary integration to increase competitiveness and trade, given the region’s small size and geographic proximity (Henry 2002). However, there has been little agreement on whether a common currency or coordinated exchange rates were the best option for monetary integration. Caribbean territories struggle with integration demands because it often limits countries’ fiscal and monetary independence (Farrell and Worrell 1994). Additionally, the combination of fixed and floating exchange regimes further undermines the prospects for successful integration.

The most comprehensive attempt at addressing currency convertibility was the advent of the CMCF in 1976. Primarily, the CMCF was designed to facilitate settlement of approved commercial trade between participating countries and circumvent the pressures on foreign reserves. Some goals of the CMCF were to assuage foreign exchange pressures, trade bureaucracy and improve monetary coordination. However, the CMCF had relatively weak enforcement mechanisms, which quickly lead to the abuse and subsequent dissolution of the facility. CMCF’s failure was attributed to member countries’ profligacy and the use of the facility to purchase goods that they could not afford. For example, Jamaica’s balance of payments needs alone far exceeded the capital of the facility (Blackman 1999).

More recently, developed country central banks have adopted bilateral currency swaps to aid in currency convertibility and liquidity support (Goldberg, Kennedy and Miu 2010) in the face of financial market imbalances. When countries engage in a bilateral swap, they agree to supply currency to another central bank at a contracted exchange rate. In the aftermath of the 2008 Global Financial Crisis (GFC), US Federal Reserve (Fed) swap lines were extended to both developing and emerging countries to meet currency demands (Bahaj and Reis 2018). However, while analyses indicate that these swaps were successful in maintaining liquidity, these facilities were only temporary measures to stabilise the price and value of the reserve currency in the respective countries.

2.2 CBDCs: The New Payments Frontier

2.2.1 *Virtual Currencies and Cross-Border Payments*

Correspondent banking relationships (CBRs) are vital to the Caribbean to facilitate international trade, foreign direct investment and remittances, but cross-border payments are typically slow, costly and opaque. Shortcomings have only been exacerbated in the Caribbean region by the withdrawal of CBRs on account of business profitability, reputational risk and regulatory risk related to anti-money laundering and terrorist financing.⁵ Where relationships have been maintained or new CBRs have been secured, banks have been subjected to increased administrative fees, longer processing times and added due diligence on transactions due to the elevated perception of risk (CFATF 2019, CBTT 2019). These concerns may push users toward unregulated payment options such as cryptocurrencies and stablecoins, which have been proffered as enablers of more efficient cross-border payments compared to correspondent banking models (Bank of England 2020). While they may facilitate faster and cheaper transfers, private virtual currencies may lack operational robustness, appropriate risk management, legal certainty and consumer protection (Cœuré 2019). Regulators have diverged in their response to the expansive growth of virtual currencies and their underlying disruptive technologies. While some have urged caution in their adoption, others have explored the technologies to provide a modern solution to traditional payment system challenges.

2.2.2 *The Emergence of CBDCs*

CBDCs have emerged as a legal-tender, digital payment alternative to the proliferation of private, non-fiat virtual currencies, which have infiltrated the payments market. A CBDC can be described as an electronic version of money that is created and issued by a monetary authority, but CBDC is not generally regarded as currency. Ideally, all CBDCs offer a stable unit of account and function as both a medium of exchange and a store of value, but may be broadly distinguished by accessibility – “wholesale” CBDCs are restricted to selected institutions for wholesale settlements (such as interbank payments), whereas “general purpose” or “retail” CBDCs are widely available to the public (much like physical cash) (Barontini and Holden 2019). Other design features proposed by Auer, Cornelli and Frost (2020a) include operational architecture (direct, hybrid, intermediated or indirect claims on the central bank); infrastructure (conventional or DLT-based); technology (token-based or account-based); and the possibility of cross-border linkages (**Table 1**).

⁵ As of November 2019, at least 16 banks in the Caribbean lost CBRs (CFATF 2019).

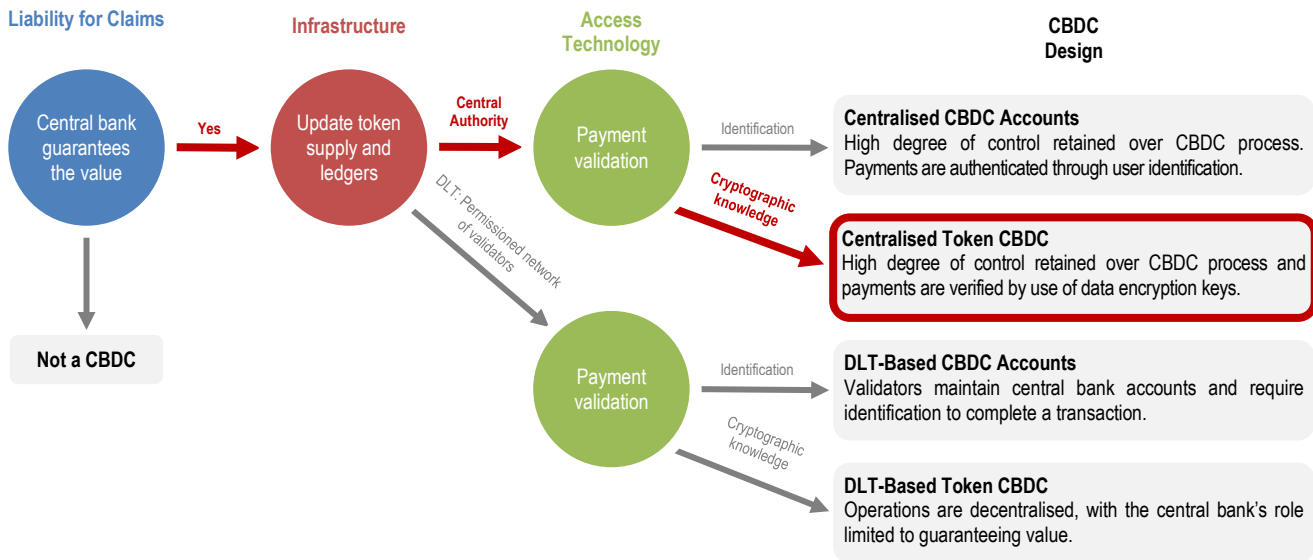
Table 1: CBDC Design Choices

Design Choice		Description	
Accessibility	<i>Retail</i>	Can be accessed directly by entities beyond commercial banks, including corporates and individuals.	
	<i>Wholesale</i>	Restricted to selected institutions for wholesale, interbank payment and settlement transactions.	
Operational Architecture	<i>Direct claims on central bank</i>		
	<i>Two-tiered CBDC</i>	<i>Hybrid</i>	An Intermediate solution where intermediaries handle payments, while providing for direct claims on the central bank; the central bank maintains a record of all retail transactions and operates a backup technical infrastructure allowing it to restart the payment system if intermediaries fail.
		<i>Intermediated</i>	An Intermediate solution where intermediaries handle payments, while providing for direct claims on the central bank. The Intermediated architecture is distinguished from the hybrid in that the central bank keeps track only of wholesale accounts.
	<i>Indirect claims on central bank</i>		The consumer has a claim on an intermediary which handles payments; liabilities to retail clients are fully backed with the intermediary's claims on the central bank; also known as "synthetic CBDC".
Infrastructure	<i>Conventional</i>		
	<i>Distributed Ledger Technology</i>		
Technology	<i>Token-based</i>		
	<i>Account-based</i>		
Cross-Border Interoperability		Relates to the retail and wholesale interlinkages in a CBDC's design and its accessibility for residents vs non-residents.	

Source: Auer and Böhme (2020), Auer, Cornelli and Frost (2020a), Mancini-Griffoli et al. (2018), World Economic Forum (2020).

Mancini-Griffoli, et al. (2018) indicated that CBDC design differs from one jurisdiction to the next depending on the unique needs of that jurisdiction and technological feasibility and costs. Central bank survey results suggest that there is an emerging trend regarding design preferences (**Figure 1**). However, except "synthetic CBDCs", a CBDC is a liability of the central bank (World Economic Forum 2020). This characteristic makes CBDCs intrinsically less risky than private virtual currencies.

Figure 1: CBDC Design Decision Tree



Source: Adapted from Auer and Böhme (2020).
 Note: Broader red line indicates the more popular central bank design choices.

2.2.3 Motivation for Issuing CBDCs

Against the backdrop of a dynamic technological landscape, regulatory interest in CBDCs has piqued across the globe and has engaged the attention of international bodies. In late 2019, the Bank for International Settlements (BIS) issued a survey to central banks representing three-quarters of the world’s population and found that 80 per cent of regulators were currently (or soon to be) engaged in CBDC work. Compared to 70 per cent one year earlier (Boar, Holden and Wadsworth 2020). While the survey results suggested that issuance of CBDCs in the short term was unlikely, emerging market economies (EMEs) were generally progressing faster than advanced economies (AEs) concerning experimentation. This was likely due to stronger motivating factors for EMEs including financial inclusion (retail); financial stability (wholesale); domestic payments efficiency (retail and wholesale); and payments safety (retail and wholesale). AEs likewise found payments safety to be “very important” for retail CBDCs, but considered cross-border payments efficiency the primary motivator for wholesale CBDCs. Both EMEs and AEs found cross-border payments efficiency to be “important”. Central banks may also be driven by declining use of cash; reducing costs associated with the distribution of cash; formalising the shadow economy and reducing tax evasion; and countering the growth of private forms of money (Engert and Fung 2017, Mancini-Griffoli, et al. 2018, CEMLA 2019).

2.2.4 Leveraging CBDCs for Cross-Currency, Cross-Border Transactions

Though it has not been the primary focus of domestic projects (Auer, Cornelli and Frost 2020b), several jurisdictions have been collaborating to explore CBDCs as it pertains to cross-currency and cross-border interoperability. The BIS,

together with six AE central banks⁶, formed a working group in early 2020 to share experiences on their independent assessments of domestic CBDC feasibility, including use cases, design choices and knowledge of emerging technologies (Bank of Canada 2020). In conjunction with the Board of Governors of the Federal Reserve System, the group published a report outlining the foundational principles and core features of CBDCs.⁷ The report indicated that further research on the implications of cross-border CBDC arrangements was necessary but suggested that central banks could design individual domestic CBDCs around a common set of standards, as well as harmonise legal and regulatory frameworks, to support the interoperability of CBDC systems. Kiff et al. (2020) supported this consideration in their research on retail CBDCs. Several multijurisdictional teams have aggregated resources to explore this possibility at the final stage of domestic projects. Experimentation and proofs of concept have largely considered wholesale CBDC solutions rooted in DLT. **Box 1** highlights notable projects.

⁶ Bank of Canada, Bank of England, Bank of Japan, European Central Bank, Sveriges Riksbank, Swiss National Bank.

⁷ Bank of Canada et al. (2020).

Box 1: CBDC PROJECTS WITH CROSS-BORDER APPLICATIONS

Bank of Canada, Bank of England, Monetary Authority of Singapore

In 2018, the Bank of Canada, Bank of England and the Monetary Authority of Singapore produced a report to understand the challenges associated with cross-border payments and settlements and to explore how innovative models could improve efficiencies in processing cross-border transactions. The report outlined three potential solutions or hypothetical future states, one of which provided three variations based on the issuance of wholesale CBDCs (Bank of Canada, Bank of England, Monetary Authority of Singapore 2018).¹ The first variation considered currency-specific, wholesale CBDCs which could only be transmitted and exchanged within the home jurisdiction through a wallet held at the home central bank. To hold foreign CBDCs, participants must therefore open wallets at different central banks. The second facilitated CBDC transactions across borders by allowing participants to hold multiple, currency-specific, wholesale CBDC wallets at their home central bank. This contrasts to the first variation, where the home central bank only supports the home CBDC. The final variation considered a single, universal, wholesale CBDC, that is backed by a basket of currencies and accepted by all participant central banks.

Jasper-Ubin Project (Bank of Canada and the Monetary Authority of Singapore)

Projects Jasper (Canada) and Ubin (Singapore) are independent initiatives, launched in 2016, which explored the use of wholesale CBDCs across DLT platforms to improve efficiency in interbank payments and settlements. Interoperability between different DLT platforms to facilitate a cross-border, cross-currency settlement system was considered in the latter stages of the respective initiatives. The feasibility was tested in 2019 via the Jasper-Ubin project (Bank of Canada and Monetary Authority of Singapore 2019). The Bank of Canada and the Monetary Authority of Singapore, with support from J.P. Morgan and Accenture, proposed three conceptual designs for cross-border payments. The intermediaries approach (where an intermediary has access to both the foreign and local networks); widened access to a network (where transacting parties have direct access to central bank liabilities on both networks); and multiple currency support within a network (where parties have direct access to foreign and local currencies on the domestic network). The proof of concept for the Jasper-Ubin experiment focused on the intermediary approach, and a Canadian Dollar-Singapore Dollar CBDC transaction was successfully completed across the respective DLT platforms based on atomic Hash Time-Locked Contracts (HTLC)².

Project Inthanon-LionRock (Bank of Thailand and Hong Kong Monetary Authority)

Project Inthanon-LionRock, introduced in 2019, offered the use of a cross-border, corridor network to bridge proposed DLT-based, wholesale CBDC networks Inthanon (Thailand) and LionRock (Hong Kong) to enable direct, real-time cross-border transactions amongst resident banks via CBDC tokens. The DLT-based model also facilitates foreign exchange price discovery on the corridor network to execute cross-border Thai Baht-Hong Kong Dollar transactions with atomic Payment-versus-Payment settlements³ (Bank of Thailand and Hong Kong Monetary Authority 2020). It is envisioned that the design of the novel corridor network model would improve cross-border settlement efficiency, liquidity management efficiency and local regulations compliance. The proof of concept describes a model with a corridor operating node (joint responsibility of the central banks), participating bank nodes and foreign exchange liquidity providers, alongside respective central banks which support token conversion between a domestic bank node and the corridor operating node. The usefulness of the proposed solution was presented in a case study of a trade-related exchange between a Thai corporation importing goods from a Hong Kong corporation. In 2021, the Bank of Thailand and the Hong Kong Monetary Authority entered the second

Box 1: CBDC Projects with Cross-Border Applications (cont'd)

phase of Project Inthanon-LionRock in collaboration with the People's Bank of China (Digital Currency Institute) and the Central Bank of the United Arab Emirates. The joint initiative has been renamed the Multiple CBDC (m-CBDC) Bridge Project and will explore cross-border foreign exchange payment in a multijurisdictional context (Hong Kong Monetary Authority 2021).

Project Aber (Saudi Central Bank and the Central Bank of the United Arab Emirates)

In January 2019, the Saudi Central Bank (SAMA) and the Central Bank of the United Arab Emirates (CBUAE) issued a joint statement declaring their intention to launch a joint digital currency, Aber (CBUAE 2019). Among other things, Aber is expected to improve the settlement of remittances between the two countries by enabling banks to directly engage with one another. The proof of concept and subsequent pilot project examined a DLT solution that could be accessed by a limited number of banks within each country. Three use cases were considered: the first case explored cross-border settlement between the two central banks; the second explored domestic settlement between three commercial banks in each country; and the third explored cross-border transactions between the commercial banks using the CBDC. The Project confirmed that the use of DLT to transact Aber was technically viable and offered notable improvement over centralised payment systems in the two countries (CBUAE and SAMA 2020).

¹ The group leveraged previous exploratory work undertaken in 2016 by the Bank of Canada and the Monetary Authority of Singapore on the issuance of wholesale CBDCs across DLT platforms to improve efficiency in interbank payments and settlements in the domestic payment system (Projects Jasper and Ubin, respectively).

² HTLC uses hash locks and time locks to ensure atomicity of a transaction over two DLT platforms, that is, either the transaction succeeds in its entirety or it fails and funds are returned to the sender. The receiver of the payment either acknowledges receiving the payment prior to a deadline (timeout) by generating cryptographic proof of payment (hash lock) or forfeits the ability to claim the payment, which results in the payment being returned to the payer (Bank of Canada and Monetary Authority of Singapore 2019).

³ Atomic Payment-versus-Payment settlements leverage smart contracts to ensure that the final transfer of a payment in one currency occurs if and only if the final transfer of a payment in another currency or currencies takes place.

2.3 Central Bank Currency Swaps

The IMF defines a currency swap as a financial transaction in which counterparties exchange two different currencies at the outset and contract to repay according to predetermined terms and conditions (Hooymann 1993). A wide range of institutions has used currency swaps to meet foreign currency needs but with varying purposes. The corporate sector tends to use currency swaps to facilitate trade and investment settlement, while hedging risk. On the other hand, countries use swaps primarily for economic stabilisation but specific applications have evolved over time. Bilateral swaps occur between two countries and are the most common, while multilateral swaps refer to currency arrangements among several countries through trade blocs or regional associations. Central banks or monetary authorities are generally responsible for the settlement of country currency swaps.

One school of thought suggests that central bank currency swaps were originally created to circumvent the exchange controls under the Bretton Woods system (Central Bank of Egypt 2017). The first swaps were issued by the World Bank in 1981, whereby German marks and Swiss francs were required and US dollars were provided by the IBM Corporation. Alternatively, McCauley and Schenk (2020) purported that the first formal bilateral swap lines could be traced back to the 1960s. The authors advance that the Fed arranged the introduction of dollar swap facilities with nine central banks and the BIS in \$50-\$100 million each. This partnership was expected to ease central bank reliance on gold reserves while improving foreign currency convertibility. McCauley and Schenk (2020) use this as evidence to suggest that episodic liquidity pressures were the prime motivation behind central bank swap lines.

Since then, the Fed has used dollar liquidity lines to assist countries with their reserves during periods of credit or liquidity pressures. Emerging economies have customarily been the most reliant on these dollar facilities, but since the 2008 GFC, developed countries have accessed these swap lines to mitigate liquidity risk. For example, the Fed suspended many of their swap facilities after Mexico's Tequila crisis in 1994 and the 1997 Asian Financial Crisis, only to resurrect them in 2008 with the European Central Bank and the Swiss National Bank (Fleming and Klagge 2010). Even the 2020 impact of the COVID-19 pandemic on global financial markets motivated the Fed to extend combined swap facilities of \$450 billion to nine developed and emerging market countries.⁸

The IMF sixth edition of the Balance of Payments and International Investment Position Manual (BPM6) classifies currency swaps using the following criteria: exchange by asset (cash for cash or cash for securities); exchange subject to triggers (conditional or unconditional swaps) and exchange by type of currency (reserve currencies on both sides, combination of reserve currency and non-reserve currency and non-reserve currencies on both sides). A swap agreement's use of a reserve currency or a non-reserve currency is commonly the most significant feature for countries

⁸ Schneider, Howard and Lindsay Dunsmuir. "Fed opens dollar swap lines for nine additional foreign central banks." *Reuters*, March 19, 2020. Accessed August 21, 2020. <https://www.reuters.com/article/us-health-coronavirus-fed-swaps-idUSKBN2162AX>.

with convertibility concerns. Although dollar swaps have stabilised several country's reserves, there is the criticism that these agreements increase global dollar dependence.

One solution to limit countries' vulnerability to US dollar volatility was the designation of swap contracts in national currencies (Lee and Park 2014). During the 2008 crisis, the People's Bank of China also extended swap lines to other East Asian countries, partly as funding support but also to increase the use of the renminbi. Furthermore, swaps that incorporate national currencies mean that international reserves could be preserved without disrupting trade and investment.

2.3.1 International Examples of Multilateral Financial Arrangements

Although multilateral national currency arrangements are limited, there are some examples. These include the Chiang Mai Multilateralisation Initiative (CMMI), the East African Payment System (EAPS) and the Arab Regional Payments System (ARPS). The CMMI is primarily for balance of payments liquidity needs, while the EAPS and ARPS facilitate intraregional settlement.

The CMMI is a multilateral currency swap arrangement with ASEAN+3 member countries and the Hong Kong Monetary Authority, which aims to address balance of payments and US dollar short-term liquidity difficulties in the region. The initial size of the CMMI Arrangement was US\$120 billion and comprised contributions from the CMMI members calculated using a formula. In 2012, the size of the facility was doubled and a crisis response feature was included. In 2014, the Asian Development Bank Institute proposed using national currency swaps for the CMMI to reduce the reliance on the US currency (Lee and Park 2014). The proposal suggested the use of the dominant regional currency, the renminbi, to act as the anchor currency for the swap lines on the basis of significant proportion of trade in the region accounted for by China.

The EAPS covers the East African Community, comprising of Burundi, Kenya, Rwanda, Tanzania and Uganda. The EAPS settles in the local currencies of participating countries and is based on the existing RTGS systems. The role of the respective countries' central banks is to provide the infrastructure and oversight for the system. The participants are the commercial banks and they are expected to hold pre-funded multicurrency accounts with the respective central bank.

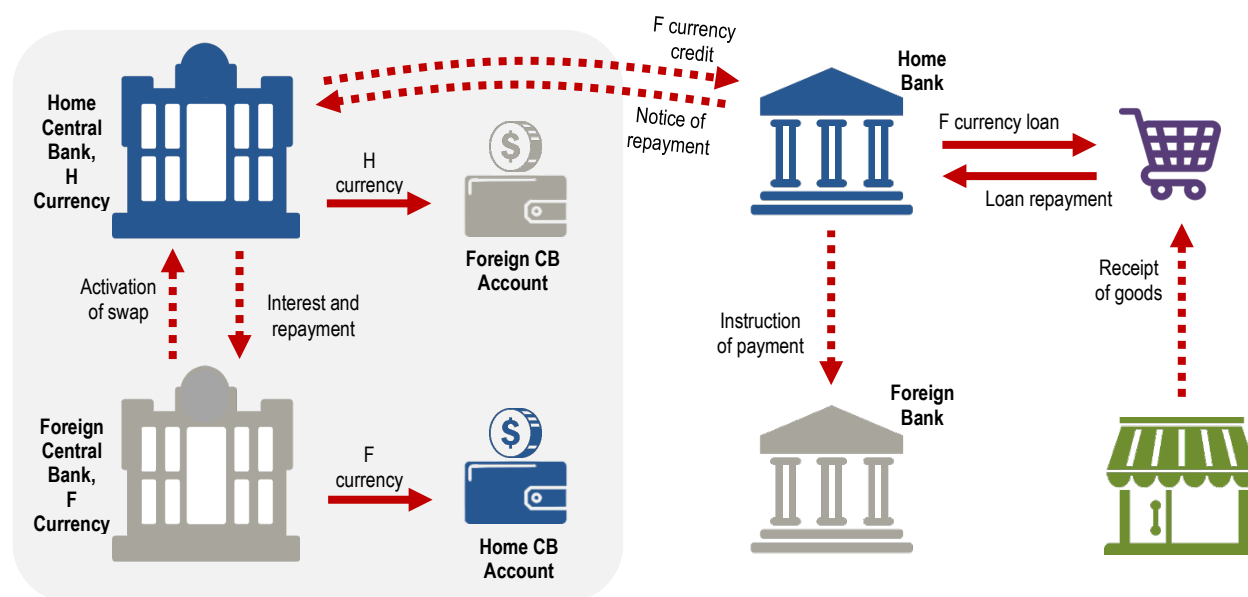
The Arab Regional Payment System (ARPS), also known as the Buna Payment Platform, promotes regional clearing and settlement of cross-border payments in Arab and international currencies. The pilot was launched in February 2020 and operations went live in December 2020. It is a centralised payment platform managed by the Arab Monetary Fund and coordinated with regional central banks. The objectives of the system include lower transaction costs, greater financial integration and shorter processing times with reduced reliance on correspondent banks (Committee on Payments and Market Infrastructures 2018). The authorised capital for the system is US\$100 million. Similar to the

EAPS, in the initial phases the ARPS will use a pre-funding mechanism with the expectation that this will eventually transition to a guarantee mechanism (Arab Monetary Fund 2018). The ARPS reduces operational risk by ensuring that the system is compliant with the minimum principles for financial market infrastructure (PFMI) and the international standards for AML/CFT.

3. Background

Swap facilities are created in advance of trade settlement and outlined by the schematic in **Figure 2**. Firstly, each central bank opens an account on its records for the counterparty and allocates a pre-arranged, equivalent amount in local currency. In this instance, the home central bank creates an account in the name of the foreign central bank and credits it with H currency. The foreign central bank does a mirror transaction on its own books.

Figure 2: Schematic of Central Bank Currency Swap between Two Non-Reserve Currencies



Source: Adapted from Central Bank of Egypt (2017).

When a domestic entity imports goods from a foreign-based store but needs to pay in F currency, the entity will request a line of F currency credit from a domestic commercial bank. The domestic bank will notify the home country central bank of the need for F currency. The home country central bank will credit the domestic bank with the appropriate amount of currency, once the bank provides collateral from its reserves held with the central bank or ascribing securities.

Once the domestic importer receives the goods and gives instructions to its bank for settlement, the domestic central bank will request that the foreign central bank transfers funds to the foreign commercial bank from its account, which

is then transferred to the foreign-based store. The domestic importer repays the loan plus interest at maturity date. The domestic bank will then advise the home central bank of the loan's maturity and the central bank will debit the commercial bank's account and release the collateral. If the swap facility matures, the central banks will nominally exchange the currency due and close the accounts.

After the dissolution of the CMCF, countries reverted to the original bilateral payment settlement mechanism, the IRPS. The IRPS was originally established in 1969 by the collaborative efforts of the central banks of Trinidad and Tobago, Guyana and Jamaica and grew in February 1970 with the entry of the East Caribbean Currency Authority. Regional central banks and monetary authorities proposed the bilateral payment mechanism to fulfil regional trade needs through periodic net settlements. In the earlier stages, settlement was reconciled quarterly but the post-CMCF IRPS opts for monthly account settlement instead.

The mechanism originates with documentation presented to a domestic commercial bank indicating that a debt is owed to a foreign business. The domestic commercial bank then notifies the domestic central bank of the payment, debits the customer's account and advises the domestic central bank. Once the payment is actioned, the domestic central bank notifies the foreign central bank of the payment and the corresponding foreign commercial bank settles the payment for the receiving business. In this manner, the IRPS was similar to the standard currency swap. However, the IRPS is cumbersome and unwieldy since each central bank must keep individual accounts for each trading partner. Furthermore, US accounts are used in the bilateral structure for settlement which represents a direct call on central banks' foreign reserves.

3.1 CBDC Development in the Caribbean

After launching a successful pilot in December 2019, the Central Bank of The Bahamas (CBoB) became the first in the world to issue a CBDC in October 2020⁹. The CBoB's Sand Dollar is a retail, token-based CBDC which was introduced as part of the Bahamian Payments System Modernisation Initiative to improve financial inclusion and access (CBoB 2019). The Sand Dollar represents a direct, legal claim on the CBoB. The mobile wallet application required to utilise the CBDC need not be linked to a deposit account at a commercial bank, unless the holder is a registered business or wants to perform higher-value transactions. To achieve interoperability among existing and newer payment channels, the platform hinges on an integration of DLT-based systems and communication network technologies (NZIA 2020). While the initial proposal limits the Sand Dollar to domestic use only, the infrastructure enables a smooth transition to cross-border applications.

⁹ Sinclair, Sebastian. "Central Bank of Bahamas Launches Landmark 'Sand Dollar' Digital Currency." *CoinDesk*, October 21, 2020. Accessed September 10, 2021. <https://www.coindesk.com/markets/2020/10/21/central-bank-of-bahamas-launches-landmark-sand-dollar-digital-currency/>.

The Eastern Caribbean Central Bank (ECCB) became the world's first formal currency union to launch a CBDC pilot in March 2021. The digital version of the Eastern Caribbean currency, the DCash, was first introduced in March 2019 with an aim to fostering economic growth and improving competitiveness by reducing domestic payment inefficiencies and promoting financial inclusion (ECCB 2020). The DCash is a retail, token-based CBDC which will be securely minted and issued by the ECCB and will be distributed by licensed bank and non-bank financial institutions in the Eastern Caribbean Currency Union (ECCU). Tokens will be made available through a mobile wallet application, which facilitates payments or transfers using smart devices. The infrastructure is DLT-based and tokens are transferred on a private, permissioned network. The DCash has been designed to be interoperable with other CBDCs. After completing preliminary live testing with selected stakeholder groups, the ECCB began a twelve-month pilot with four of the eight members of the ECCU in March 2021. An additional country was added to the pilot in June 2021 (ECCB 2021). At the conclusion of the pilot, the ECCB will assess the feasibility of a full commercial launch to all members.

After introducing a fintech regulatory sandbox in March 2020, the Bank of Jamaica (BoJ) formally invited interested CBDC providers to develop and test potential CBDC solutions in its latest efforts to explore the viability of issuing its own digital currency (BoJ 2020). A technology partner was selected and the BoJ minted its first batch of CBDC in August 2021. The CBDC will be issued to deposit-taking institutions and authorised payment service providers during the pilot ending in December 2021 (BoJ 2021). The BoJ's CBDC, which is motivated by increased financial inclusion and payments efficiency, is account-based and distributed in a two-tiered system, thus facilitating access to consumers. It will operate on traditional technology, in contrast to a distributed ledger, due to the former's simpler integration with the RTGS.¹⁰ National rollout is expected in the first quarter of 2022.

Other territories in the Caribbean have publicly discussed CBDC interest, though exploratory work is not as advanced. In 2018, the Centrale Bank van Curaçao en Sint Maarten (CBCS) signed a memorandum of understanding with fintech company Bitt Inc. to determine the feasibility of issuing a digital Curaçao en Sint Maarten Guilder. Motivating factors include reducing cash usage and facilitating more secure, compliant and efficient financial transactions within the monetary union (CBCS 2018). Meanwhile, in 2019 Bermuda welcomed the use of one-to-one backed US dollar digital currencies (licensed by the Bermuda Monetary Authority) to pay government taxes, services and fees. Still Premier David Burt stated that the risk of Bermuda launching its own CBDC outweighed the opportunities.¹¹ These sentiments were reiterated in 2020 when the Bermudan government, in partnership with a private stablecoin firm, accelerated the

¹⁰ Haynes, Natalie. "A primer on BOJ's central bank digital currency." *The Jamaica Observer*, March 21, 2021. Accessed September 10, 2021. https://www.jamaicaobserver.com/sunday-finance/a-primer-on-boj-s-central-bank-digital-currency_217519?profile=1056.

¹¹ Neil, Scott. "Bermuda gears up for digital currency payments." *The Royal Gazette*, October 16, 2019. Accessed March 11, 2020. <http://www.royalgazette.com/business/article/20191016/bermuda-gears-up-for-digital-currency-payments>.

launch of a digital stimulus token in light of the COVID-19 pandemic.¹² While there is no shortage of interest in CBDCs in the region, there is little coordination among Caribbean countries regarding the design and the ability to leverage any cross-currency benefits.

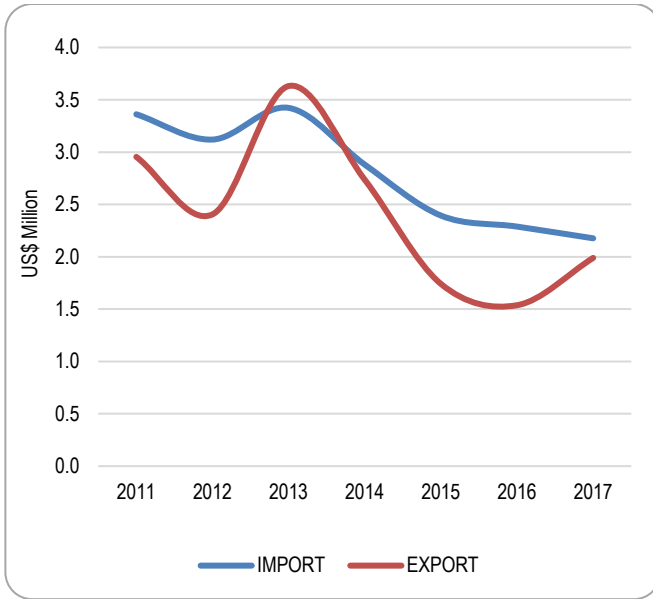
3.2 CARICOM Trade and Technology Developments

CARICOM has fifteen full members, five associate members and eight observers. According to the 2019 IMF Report on Exchange Arrangements, Jamaica is classified as a floating exchange rate regime based on an inflation-targeting framework. Fixed exchange rate systems include the members of the ECCU which uses a currency board, while Barbados and The Bahamas apply conventional pegs. Trinidad and Tobago and Guyana have stabilised arrangements tied to the US dollar. Additionally, Suriname also has a stabilised arrangement that is tied to a monetary aggregate target. Haiti is described as a “crawl-like” arrangement.

Intra-regional trade has been traditionally low, but of more importance to the OECS and Barbados. Trinidad and Tobago has dominated intra-regional trade, primarily due to energy exports. However, manufactured exports have also contributed to the imbalance. Intra-regional trade has been declining since 2013 and is dominated by a small number of countries (**Figure 3** and **Figure 4**). Caution should be applied in making conclusions, as during this period trade in services would have expanded. The statistics for trade in services have been less developed than that for the tradeable sectors. Nonetheless, the data suggests that there is considerable scope to widen and deepen intra-regional trade. Easier currency convertibility is a key enabler. Also, the rapid adoption of mobile technology in the region sets a useful platform to leverage the power of CBDCs. **Figure 5(a)** illustrates that mobile phone subscriptions per 100 persons in CARICOM have outpaced the world average from 2003-2017. Antigua and Barbuda, St. Kitts and Nevis, and Trinidad and Tobago have the highest subscription rates in the region (**Figure 5(b)**).

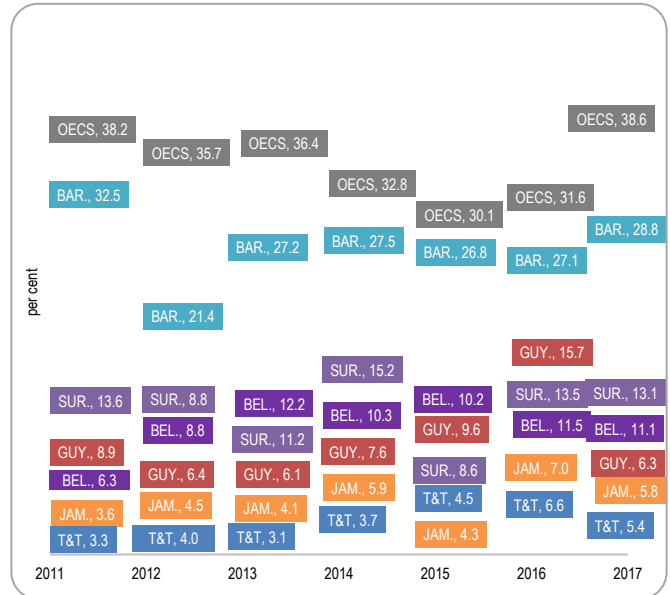
¹² Kaaru, Steve. “Bermuda launches stimulus token, but no plans for CBDC.” *CoinGeek*, September 5, 2020. Accessed September 7, 2020. <https://coingeek.com/bermuda-launches-stimulus-token-but-no-plans-for-cbdc/>.

Figure 3(a): CARICOM Intra-Regional Trade, 2011 - 2017



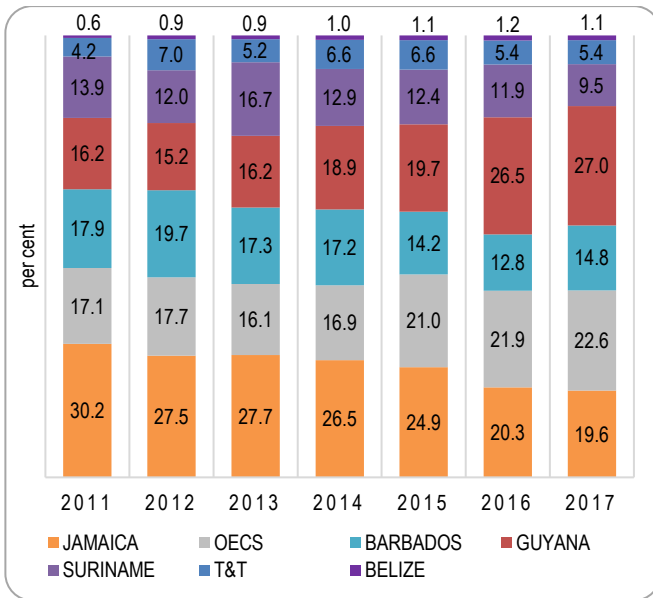
Source: CARICOM Secretariat.

Figure 3(b): Intra-Regional Trade as a Share of Total Country Trade, 2011 - 2017



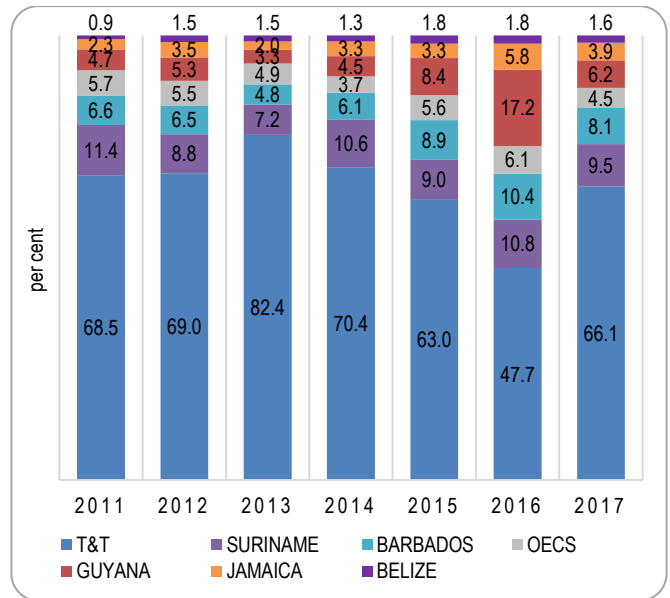
Source: CARICOM Secretariat.

Figure 4(a): CARICOM Intra-Regional Imports by Member, 2011 - 2017



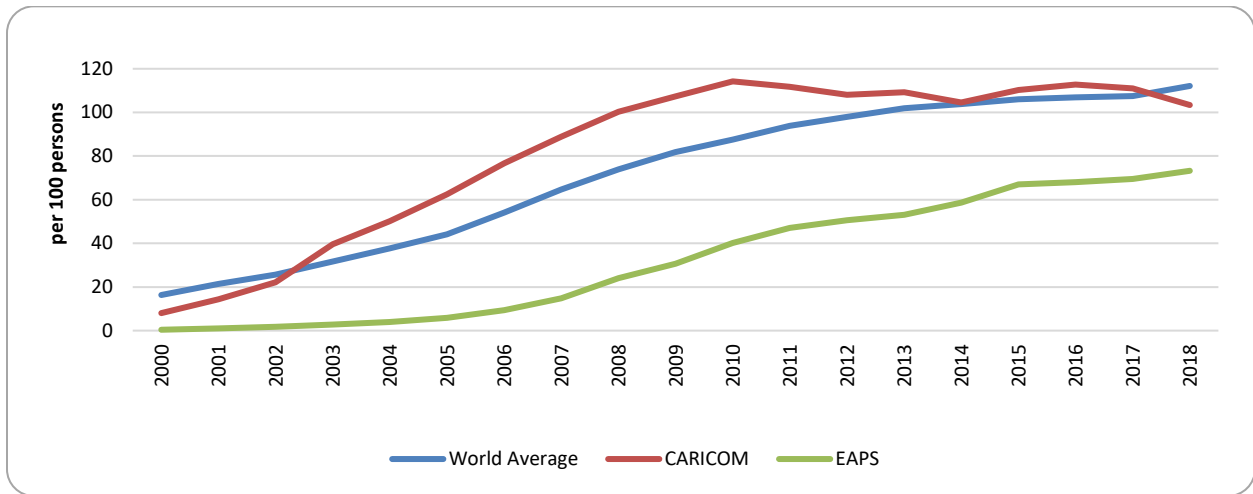
Source: CARICOM Secretariat.

Figure 4(b): CARICOM Intra-Regional Exports by Member, 2011 - 2017



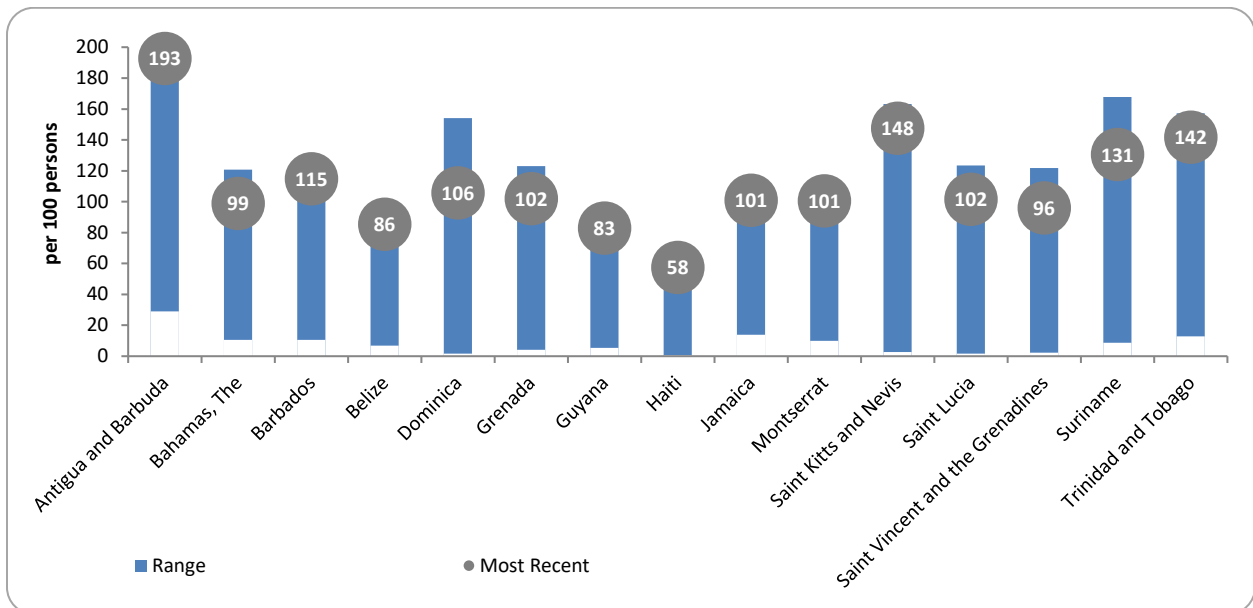
Source: CARICOM Secretariat.

Figure 5(a): Mobile Cellular Phone Subscriptions by Region, 2000 - 2018



Source: International Telecommunication Union.

Figure 5(b): CARICOM Mobile Cellular Phone Subscriptions, 2000 - 2018



Source: International Telecommunication Union.

4. Conceptual Framework for a Caribbean Plurilateral CBDC Swap Arrangement

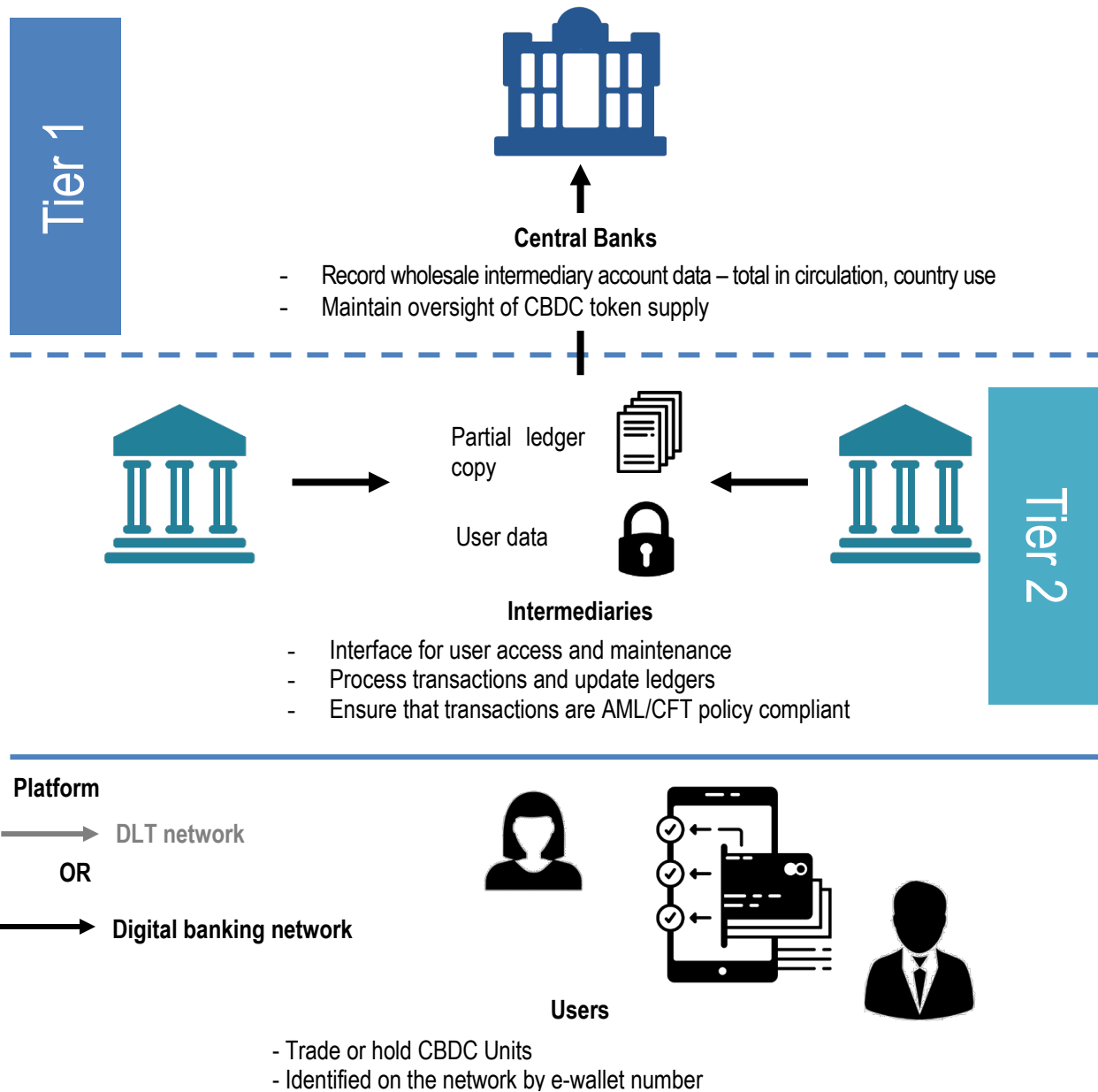
In the absence of a hegemonic digital Caribbean currency, the underlying design of each central bank's CBDC would be a jurisdictional decision. Although the ECCB and the CBoB are using blockchain technology to undergird their respective CBDCs, the findings of a Central Bank Digital Currency Survey (Central Banking, February 2020) are

instructive. Of the 46 respondent central banks, several important central banks are considering issuing CBDC in the next five years, but less than one-third are considering using DLT. “Central banks are increasingly exploring the desirability and feasibility of establishing their peer-to-peer systems through digital currencies,” (Auer and Böhme 2020). Also, 70 per cent of respondents believed retail uses are important and 58 per cent are leaning towards token-based systems (King 2020). Retail CBDC using mobile devices is also seen to support efforts to combat the COVID-19 pandemic by reducing the use of physical cash.

It is reasonable to assume that the successful execution of a C-PSA would benefit from some degree of commonality in CBDC design. While the concept of a fully-fledged CBDC, in which the central bank is the sole developer of services seems appealing, the early Caribbean entrants have adopted DLT supported by private sector partnerships and the issue of interoperability would come into question. For the purposes identified for this C-PSA, it has been determined that a retail, token-based CBDC would be the best option. For those jurisdictions that are yet to cement commitment to CBDC development, these considerations are apt. As such, some form of public-private partnership is envisaged that could smooth out some of the jurisdictional idiosyncrasies from the CBDC design perspective.

Two common models of public-private partnerships are the synthetic CBDC and the two-tiered CBDC (Adrian 2020). As described in the literature review, the former is backed by reserves held with the central bank but is a liability of the private entity, such as a commercial bank. Meanwhile, the two-tiered system puts central banks in charge of issuing a CBDC and transaction settlement (in this case between participating central banks), with technology likely to be updated occasionally. This paper subscribes to the two-tiered, intermediated CBDC design on a digital banking platform since that would be congruent with the objectives of the C-PSA (**Figure 6**).

Figure 6: Two-Tiered Intermediated CBDC Architecture



Source: Adapted from European Central Bank (2019).

4.1 Design of the C-PSA

In deciding on the key elements of the C-PSA structure, a similar decision-making framework used to weigh CBDC design options can be employed (**Figure 7(a)** and **7(b)**).

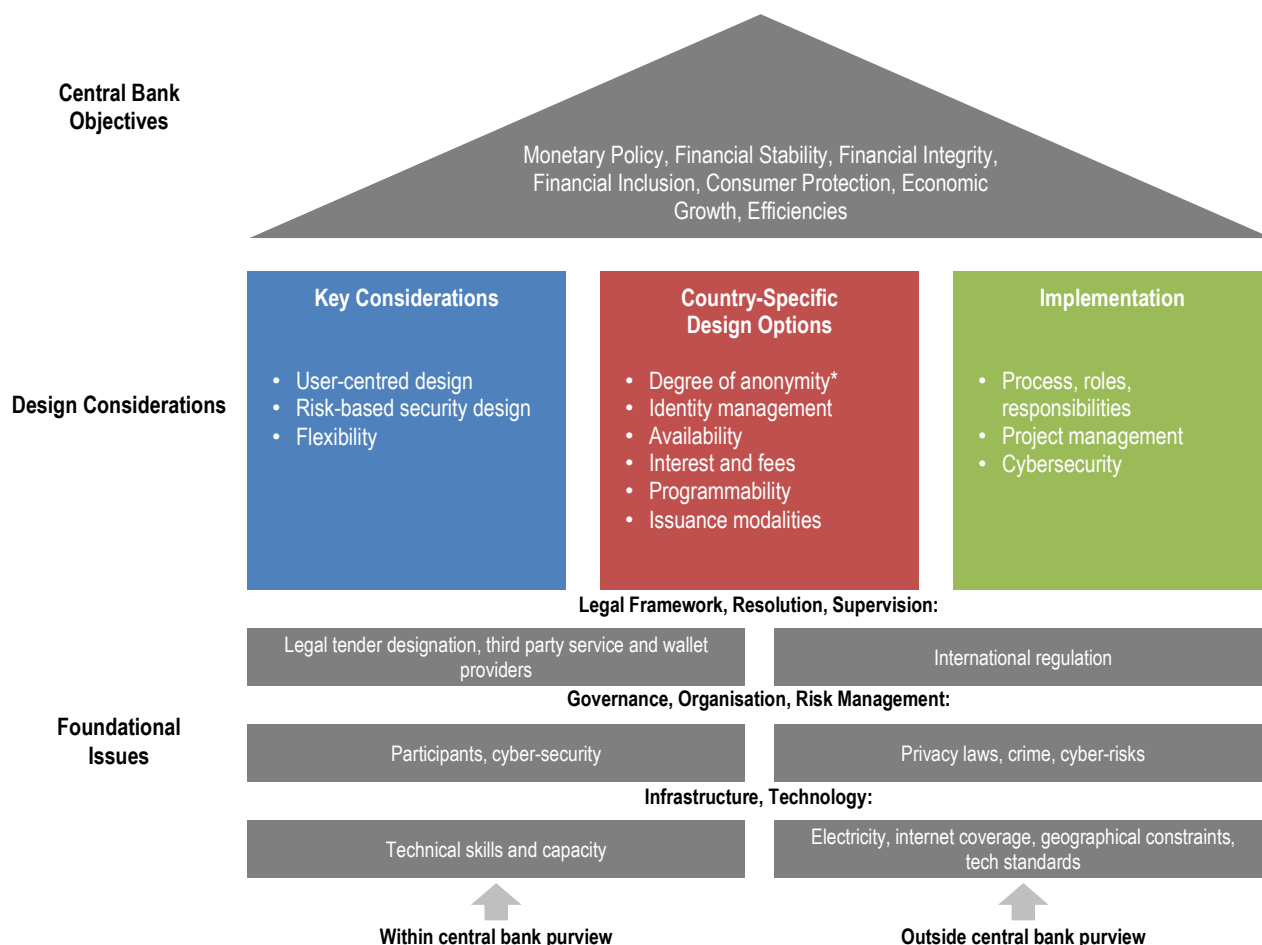
Using a deductive approach, the following considerations are taken into account:

1. Is the infrastructure and technology to support the C-PSA available?

2. Can central banks' existing governance, organisational and risk management arrangements exercise the required oversight?
3. Will the C-PSA pose any legal, regulatory or supervisory impediments?
4. Are there country-specific factors that can inhibit implementation?
5. Does the operation of the C-PSA impair or complement central bank objectives?
6. Can the C-PSA be a source of additional operational, financial and strategy and policy risks?

The circuit-breaker in this deductive approach is the existence of mature payment systems architecture in the larger Caribbean territories and active bilateral swap arrangements among the regional central banks, which portend that the abovementioned factors are not intractable. Early regional entrants into the CBDC arena and the quickly expanding regulatory approaches provide further guidance.

Figure 7(a): Key Considerations for the Design of the Caribbean Plurilateral CBDC Swap Arrangement



Source: Adapted from Kiff et al. (2020).

Note: * Both token-based and account-based forms of CBDC must comply with wider PFMI and AML/CFT requirements. Therefore, there is no full anonymity with either system (Bank of England 2020).

Figure 7(b): Caribbean Plurilateral CBDC Swap Arrangement Risk Landscape



Source: Adapted from Kiff et al. (2020).

The axis of risks – operational, financial and strategy and policy risks – also appears manageable. Given that the C-PSA proposes using central banks’ existing payments infrastructure, the robust risk management policies and procedures already in place (governed by international standards such as the PFMI) suggest operational risks are broadly contained. Heterogeneous policies across jurisdictions suggest the need to align risk mitigation practices for financial and strategy and policy risks. However, decades of cooperation among regional central banks through the Committee of CARICOM Central Bank Governors provides a mechanism to coordinate responses to these categories of risk.

4.2 Participants

It is suggested that the initial participants in the arrangement include the ECCB, the BoJ, the Central Bank of Barbados, the Bank of Guyana and the Central Bank of Trinidad and Tobago. The selections are informed by the significance of intra-regional trade flows alongside favourable conditions for CBDC adoption. Other jurisdictions that are in the process of building out their CBDCs or are not significant players in intra-regional trade, for example, Belize and Curaçao, could be incorporated in a later phase.

4.3 Size of the Facility

The size of the facility would be guided by intra-regional trade dynamics. Existing flows would suggest that the Trinidad and Tobago CBDC would be most frequently utilised, accounting for 70 per cent of regional exports in 2016. Even if energy exports are excluded, Trinidad and Tobago would be the dominant intra-regional trade player on the basis of manufactured exports. Given that transactions by small, itinerant traders account for a small fraction of intra-regional trade (some of which are undocumented) and IRPS transactions settled using SWIFT account for less than 1 per cent of the Central Bank of Trinidad and Tobago's liabilities, bilateral contracts are not expected to surpass the equivalent of US\$15 million in the first instance. However, if we include other goods and service entrepreneurs, an initial pre-set facility of CBDC tokens which is nominally equivalent to **US\$50 million** appears appropriate. While such a small value may be insufficient to justify proof of concept, particularly for CBDC development, commitment of public investment can be rationalised by global developments in the area which suggest rapid CBDC adoption and scalability are on the horizon. Some of these initiatives include the G20 workstream to develop a global roadmap for enhancing cross-border payments involving entities such as the Financial Stability Board and the BIS Committee on Payments and Market Infrastructures¹³.

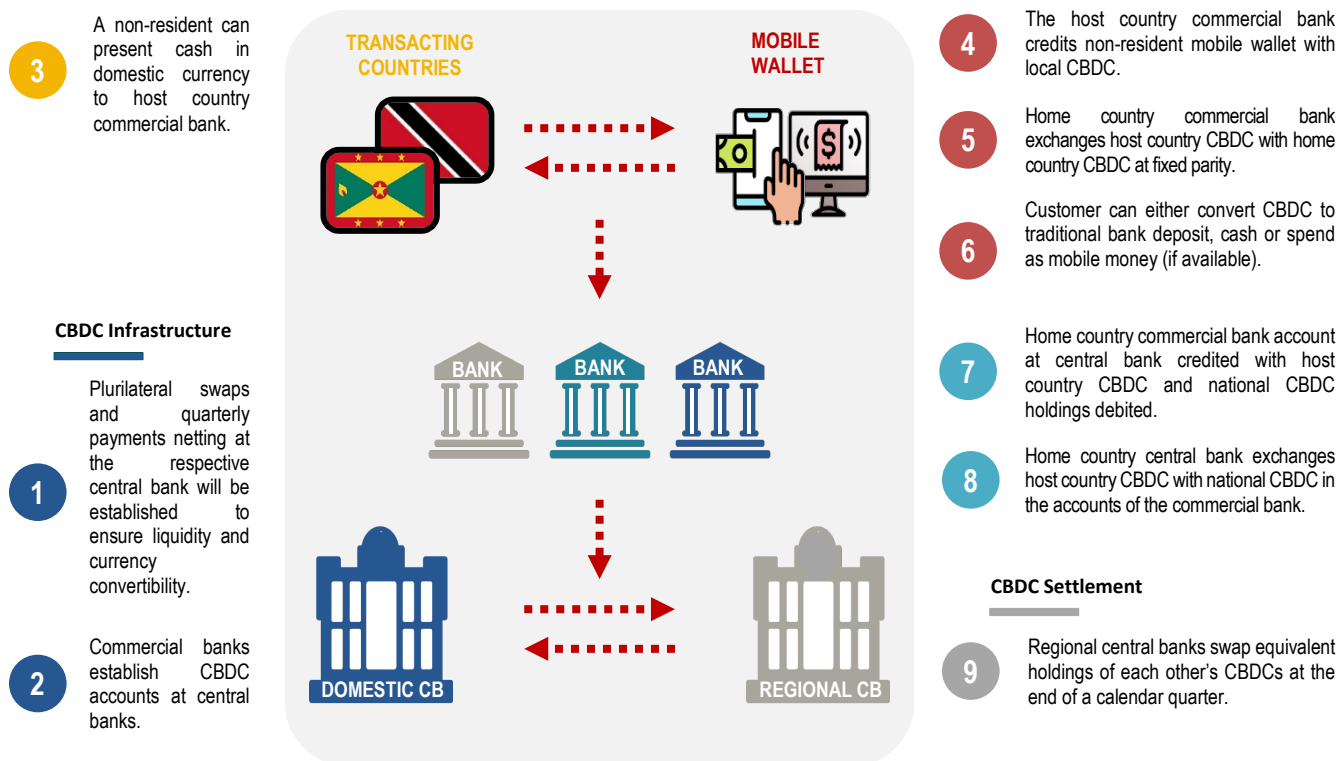
4.4 Operational Modalities

Figure 8 addresses the operational modalities in the CBDC process. CBDC accounts are established with the participating central banks. Each central bank will have a general CBDC account in its national currency and other accounts representing each bilateral counterparty's CBDC. It would be appealing to set the size of the accounts in the respective CBDCs according to the intra-regional trade shares. However, doing so could perpetuate current imbalances. Also, the uncertainty of trade volumes due to the lack of comprehensive data for this category of trade favours equal weighting at the outset, with ensuing settlement patterns allowing the discovery of natural equilibria as trade convergence occurs. Commercial bank CBDC accounts are established at the home country central bank. This would be distinct from their reserve accounts and will not count for the calculation of reserve requirements. The customer-commercial bank interface occurs in steps 3-6. A key assumption is that customers would have already registered for an e-wallet and token access granted in their respective jurisdictions. This is already a reality in countries that have tested CBDC. In other jurisdictions such as Trinidad and Tobago where CBDC is still at the conceptual stage, commercial bank acquisition activity suggests that they are retooling to support advancements in the digital currency sphere¹⁴.

¹³ Committee on Payments and Market Infrastructures. Enhancing cross-border payments: building blocks of a global roadmap: Stage 2 report to the G20. July 2020. <https://www.bis.org/cpmi/publ/d193.pdf>.

¹⁴ In October 2019, Republic Bank Limited agreed to acquire a 19.99 per cent equity stake in fintech firm Nobis BaaS, a subsidiary of WiPay Holdings Limited. <https://republictt.com/news/republic-bank-agrees-acquire-stake-nobis-baas>.

Figure 8: CARICOM Plurilateral CBDC Swap Process



Source: Authors.

The key activities occur on the settlement date where the participating central banks exchange CBDCs at a fixed parity and without interest costs, eliminating the need to go through the US dollar as the vehicular currency. The fixed rate of exchange also limits the incentive to hold one country's CBDC over another. The bilateral fixed exchange rates for CBDCs would be set at rates lower than the official exchange rates in order to incentivise intra-regional activity for select categories of goods and services traded by small and micro entrepreneurs.

While settlement is proposed to take place on a net basis, the likely imbalances in favour of those jurisdictions that account for a greater share of intra-regional trade, makes a compelling case for gross settlement. It is possible the C-PSA can commence with gross settlement and transition to a net settlement arrangement as intra-regional trade balances converge.

4.5 Policy Implications

Primarily, a cross-border CBDC can improve convertibility, increasing efficiency and lowers costs for intra-regional trade settlement. The C-PSA is also expected to lessen reliance on correspondent banks and other intermediaries, which brings down the effective exchange rate as fees and charges decline. With fewer barriers to trade and costs minimised, the C-PSA presents the potential for wider access to financial services and greater transparency and

accountability in payment systems and financial flows. Regulators can also benefit from these advancements since the C-PSA can augment central bank oversight of financial market infrastructure, alleviate pressures on US reserves and mitigate conventional payment system risks. Although the C-PSA can bring new challenges as it requires greater technical and regulatory complexity, it can resolve some of the challenges that hamper pre-existing attempts at currency convertibility.

4.5.1 *Monetary Policy*

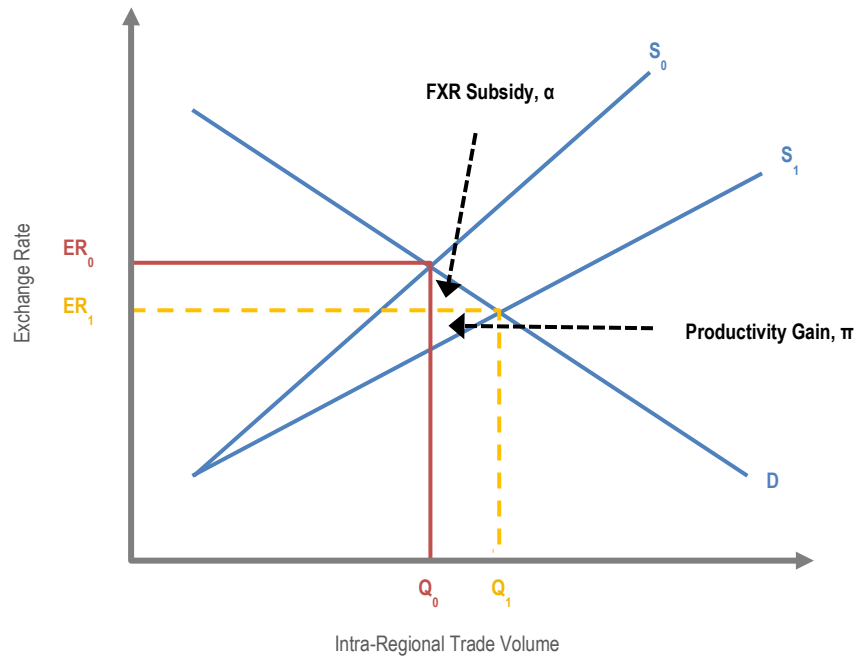
CBDC accounts held by commercial banks at the central bank will be unremunerated and therefore set an interest rate floor for central bank liabilities. It could be questioned if balances held for this purpose could be included in the money supply. Are the CBDCs used for purposes of the C-PSA a substitute for or a complement to cash? While these CBDCs may not be “actively in circulation” as per the conventional definition, by their very nature they are complements to cash and fulfil the functions of money (a unit of account and a medium of exchange). CBDCs therefore qualify to be included in the money supply and this may engender inflationary concerns. However, given the restrictive utilisation of the C-PSA in the first instance, this dedicated tranche of CBDCs will be insufficient to influence inflation dynamics and broader monetary conditions. Therefore, the spillbacks to monetary policy appear negligible.

4.5.2 *Trade Diversion and Exchange Rate Volatility*

According to Alleyne, Lorde, and Moore (2018 as quoted in Lopez et al. (2020)), almost 25 per cent of what member countries import from extra-regional sources can be obtained from within Belize, Jamaica and The Bahamas. Fixing exchange rates among regional currencies at levels that strip out the cyclical component of the floating rate currencies creates an incentive for inward trade diversion. Each pair of currencies will have a standardised exchange rate without reliance on US reserves or prices. The stability from having a lower and less volatile exchange rate arrangement among national currencies, particularly for the floating rate regimes in the region, represents a price subsidy of sorts¹⁵. This can give rise to a positive welfare gain as illustrated in **Figure 9**.

¹⁵ This rate can be interpreted as the price of the intra-regional trading token which stabilises price shocks in regional trade. It should not be misconstrued as the introduction of a fixed exchange rate for floating currencies. Furthermore, since the facility is limited to cross-border settlement with small, itinerant traders and entrepreneurs, this is likely to mitigate arbitrage of importing solely for export.

Figure 9: Welfare Gains from Fixed Parity CBDCs



Source: Authors.

Setting a CBDC rate of exchange at a lower level (ER_1) than the official exchange rate (ER_0) could initiate a pivot of intra-regional production (from Q_0 to Q_1) via a rotation of the supply curve from S_0 to S_1 . The supply response is a direct consequence of a more competitive exchange rate that lowers the cost of intra-regional exports in comparison to extra-regional imports. The total welfare gain comprises the exchange rate subsidy, α and the productivity gain, π . Fixing the exchange rate of national CBDCs within the context of overarching flexible exchange rate regimes risks violation of IMF Article VIII provisions under multiple currency practices. The creation of dual exchange rates could potentially be distortionary and even undermine confidence in the official rate. However, the CBDCs issued for use of the C-PSA are not necessarily fungible – they would be exclusively used to settle cross-border payments and not circulate in the domestic economies of the respective participants. In addition, the limited scope of economic activity to which the C-PSA is initially applied should not yield currency market disturbances. The calibration of the fixed exchange rate among CBDC-issued national currencies is beyond the scope of this paper. Further work on this would be required. Ultimately, as CBDCs proliferate and the arrangement expands, the impetus for a single Caribbean unit of account may emerge.

4.5.3 AML/CFT Compliance

Commercial banks would be responsible for customer due diligence in accordance with standard AML/CFT and KYC protocols. As regulatory regimes are built out, non-financial institutions (particularly in the provision of mobile wallets) could be on-boarded and vested with similar responsibilities.

4.5.4 *Operational Risk*

Cross-border arrangements inherently face greater risk of disruption due to infrastructure failure or, in the fate that has befallen some cryptocurrencies, cyber-attacks. Similar safeguards used to protect large-value payment systems such as the RTGS would be employed to mitigate operational risks. Another operational risk is the possible failure to close the swap on the settlement date due to deep transactional disparities where one country's CBDC has been more heavily utilised than the bilateral counterparty's CBDC. This has been a thorn for a few CARICOM central banks in similar previous initiatives, which can ultimately redound to a loss for a central bank if unsettled balances have to be written-off the central bank's balance sheet. The current intra-regional trade dynamics suggest such imbalances may continue. Once more, the small size of the facility and the constricted scope of economic activity to which the C-PSA applies to suggest that the accumulation of any unsettled balances on a central bank's balance sheet would be slow and of marginal amount. The C-PSA could be viewed as a development initiative for the Caribbean community, with broader socio-economic objectives which extend beyond the payments arena. Such initiatives may be assessed more favourably (including from an auditing standpoint) under new Environment, Social and Governance (ESG) principles.

4.5.5 *Tax Compliance*

Oftentimes the trading activities of small itinerant operators and entrepreneurs go undetected/undocumented and they subsequently fall outside of the tax net. Transaction data sharing with tax authorities could help improve tax compliance in the respective territories. However, this may require some legislative manoeuvring.

4.5.6 *Trade and Financial Inclusion*

Use of the C-PSA can help improve the quality of regional trade data statistics by including participants that were previously outside the official net. The necessity of a mobile wallet also helps those that may have been excluded from the formal financial sector and dealing primarily on a cash basis.

5. Conclusion and Recommendations

The COVID-19 pandemic has accelerated the pace of digitalisation in many economies, with digital money garnering significant attention from the private and public sectors. Disruptions to global supply chains and whisperings of de-globalisation are emerging trends the Caribbean cannot ignore. The availability of development financing and food security are topics high on the regional agenda. With the developed world preoccupied with sustaining their economies, it is incumbent on the region to develop home-grown solutions to safeguard the Caribbean's existence. One avenue is to deepen intra-regional trade among CARICOM members. Intra-regional trade has languished with available statistics

highlighting that values have fallen from 16 per cent of total trade in 2006 to around 14 per cent in 2017.¹⁶ With tariffs at already significantly low levels within CARICOM, the culprit for such underperformance on the intra-regional trade front appears to be non-tariff barriers (NTBs). Exchange rates and currency convertibility are notable NTBs. This paper examines the challenge of currency convertibility as a key inhibitor of intra-regional trade and proposes the use of CBDCs for trade facilitation through a Caribbean Plurilateral CBDC swap arrangement (C-PSA) among selected countries, with initial focus on small traders, service entrepreneurs and others for whom their primary mode of payment is cash-based.

Historically, a system of bilateral central bank swap agreements has been used to ease the encumbrances of intra-regional transactions. Up to the 1970s, the Intra-Regional Payments Scheme (IRPS) saw the offsetting of payments with periodic net settlements. This transitioned to the CARICOM Multilateral Clearing Facility (CMCF) in 1976. The CMCF lasted less than a decade before collapsing in 1983. Arrangements similar to the IRPS remain today. Despite the conceptualisation of a Caribbean Settlement Network based on DLT, there has been no discussion at the regional level on how investment in such a system would be financed and apportioned. Hence, at this juncture, we find it more practical and cost effective to use existing conventional central bank payments infrastructure to operationalise the C-PSA.

The size of the C-PSA will be initially set at the equivalent of **US\$50 million** and include participation by the Eastern Caribbean Central Bank, the Bank of Jamaica, the Bank of Guyana, the Central Bank of Barbados and the Central Bank of Trinidad and Tobago. Commercial banks would establish CBDC accounts at their respective central banks for the exclusive use of the C-PSA. Customer transactions would be facilitated by e-wallets, with commercial banks expected to carry out the necessary due diligence regarding AML/CFT and KYC requirements. The settlement period between central banks would take place quarterly.

The C-PSA can have substantial implications for monetary policy, AML/CFT compliance, tax compliance, multiple currency practices, trade diversion and financial inclusion. However, given the initial small size of the facility, the risks appear manageable. A key limitation would be the potential settlement risks outlined in *section 4.5.4*. We anticipate this would be corrected over the medium-term as convergence occurs between intra-regional trade surplus and deficit economies. In the interim, unsettled balances would have to employ an accounting solution whereby a CBDC suspense account is created and carried as an asset/liability on a central bank's balance sheet.

It is anticipated that as the use of the facility scales up, additional aspects of intra-regional trade can be accommodated. It is therefore recommended that the C-PSA be first operationalised in the context of a sandbox-type of arrangement. After a certain critical mass is achieved and the facility proves useful, a full-scale launch of the C-PSA could occur with

¹⁶ The level of regional trade is measured by intra-regional exports as a per cent of total regional exports and the data is sourced from the CARICOM Regional Statistics report.

adjustments made to the size of the facility among bilateral participants. Over the medium-term, the case could be made for investment in a DLT-based system for cross-border payments in general. Given the likely mixture of early entrants and laggards in the CBDC sphere, a long-run objective could be designing of a single Caribbean CBDC backed by a basket of national currencies. Herein we can have a technology-based solution that addresses a single currency's longstanding misgivings (such as loss of monetary independence) while retaining sovereign currency identities.

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