CENTRAL BANK OF ESWATINI
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cenfri

# Eswatini CBDC Diagnostic Study

## Phase 1 findings

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# Table of contents



**List of figures**

# List of abbreviations

| | |
|---|---|
| ATM | Automated Teller Machine |
| B2B | Business-To-Business |
| CBDC | Central Bank Digital Currency |
| CBE | Central Bank f Eswatini |
| CICO | Cash-In and Cash-Out |
| CMA | Common Monetary Area |
| EFT | Electronic Fund Transfer |
| GDP | Gross Domestic Product |
| G2P | Government-To-Person |
| MMA | Multilateral Monetary Agreement |
| MMO | Mobile Money Operator |
| MSME | Micro, Small and Medium-Sized Enterprise |
| NPS | National Payment System |
| P2B | Person-To-Business |
| P2P | Person-To-Person |
| RTGS | Real-Time Gross Settlement |
| SAECH | Swaziland Automated Electronic Clearing House |
| SARB | South African Reserve Bank |
| SWIFT | Society for Worldwide Interbank Financial Telecommunication |
| SWIPSS | Swaziland Interbank and Settlement System |

# Foreword

**The Central Bank of Eswatini (CBE) is pleased to present a report on the first phase of our Central Bank Digital Currency (CBDC) Diagnostic Study. This report provides a summary of the findings of the diagnostic study which investigated the potential for a CBDC and the possible use cases for the implementation of a CBDC in Eswatini.**

Many Central Banks and regulators around the world are exploring the potential of CBDCs to address challenges such as payment efficiency, interoperability, financial inclusion and payment system resilience. Most regulators are researching and experimenting with different CBDC use cases to understand their potential to address inefficiencies and unlock new possibilities in payments. Similarly, the CBE has been investigating CBDCs through mainly desk research.

In June 2019, the CBE facilitated a consultative forum on CBDCs where the Bank engaged with industry stakeholders. The Bank understands the importance of engaging and consulting with the relevant stakeholders early when exploring CBDCs. Following the consultative forum, the Bank worked together with the Centre for Financial Regulation and Inclusion (Cenfri) to conduct the first phase of a diagnostic study to assess the potential of issuing a CBDC in Eswatini. This report, therefore, provides a summary of the key findings from this research project.

The CBE is currently working on a Payment Switch project to modernize the national payment system, improve time and cost efficiency, and interoperability. Following the implementation of the Payment Switch project, the bank will resume working on the remaining three phases of the study. These include the evaluation of key prerequisites for the CDBC implementation, gap analysis and feasibility assessment, and a roadmap for the potential implementation of a CBDC in Eswatini.

I hope that this report will give you insight into the work that the CBE has done concerning Central Bank Digital Currency, that is, it's research objectives and approach.

**Mr. Majozi V. Sithole**
The Governor, Central Bank of Eswatini

# Executive summary

***Digitisation lies at the heart of the Eswatini financial system.*** According to the 2018 FinScope Consumer Survey, over 80% of the population of the Kingdom of Eswatini (hereafter referred to as "Eswatini") are financially included (Finscope, 2019). Of this sizeable population, nearly 70% make use of digital channels to facilitate payment. While traditional bank accounts have contributed towards this uptake, over 70% of all digital payments in 2018 were made via a mobile money account (Finscope, 2019). With more mobile phones in the hands of Swazi citizens than ever before who are increasingly tech-savvy and demanding of financial solutions that are convenient , seamless and cost-effective, these findings evidently suggest that digital payments do not only currently form an important part of the Eswatini financial system, but also critically represents its future in the modern financial era.

***A central bank digital currency could represent the next frontier for digital payments.*** Central bank digital currencies have received significant hype since 2018 following its purported potential to enhance the efficiency of national payment systems, reduce cash preferences by making digital solutions faster and more cost-effective, and enhance the implementation of economic policies. However, while these benefits may be true, it does not necessarily follow that they would materialise in the Eswatini context or that a central bank digital currency would not impose significant risks to the Eswatini financial system.

***The objective of this note is to highlight and synthesise evidence for the use cases of central bank digital currencies in Eswatini***. In 2019, the Central Bank of Eswatini in collaboration with Cenfri, conducted the first phase of a CBDC country diagnostic study[1] in Eswatini to investigate and understand whether use cases existed for the implementation of central bank digital currencies. In other words, what value would this instrument contribute to the Eswatini financial system and is there sufficient evidence to justify further exploration into its potential pilot-testing? This analysis focused on investigating central bank digital currencies in relation to 3 core use cases: **consumer demand, national payment efficiency, and economic policy (monetary and fiscal policy)**. Key findings from this research are synthesised in this note for the consideration of the Board of the Central Bank of Eswatini and their evaluation as to whether further exploration under phase 2 of the country diagnostic is justified.

***Key synthesised findings.*** Analysis of all three use cases suggest that the **Payment use case** displays the strongest and most direct opportunity or need for the implementation of a retail CBDC. This opportunity stems from the relative constraints faced by the current retail payment clearing house to facilitate real time, ubiquitous and more intensely utilised digital payments. The **Consumer use case** additionally suggests an opportunity to leverage the benefits of CBDC for improved mobile money usage to deepen financial inclusion, though this outcome is less clear and more dependent upon satisfied demand prerequisites such as trust and merchant incentives. The benefits from CBDC are least clear for **the Economic Policy use** case as the effects of a CBDC are more likely to be either neutral or indirectly gained. More specifically, while CBDC is expected to have a minimal use case for monetary policy due to its Common Monetary Area (CMA) requirements, and its risks to financial stability possibly contained, only fiscal policy presents opportunities in which the visibility and

[1] See page 1-2 for further explanation of a CBDC country diagnostic

traceability of CBDC could aid government expenditure and revenue collection. The latter gain however is critically dependent on the existence of a robust, comprehensive and harmonised digital identity system. Based on the promising results of this phase 1, we recommend a thorough analysis of the prerequisites of a CBDC in Eswatini in phase 2.

***Note structure***. Chapter 1 introduces phase 1 of the CBDC country diagnostic. Chapter 2 provides a brief overview of the concept of retail and wholesale CBDC. Chapter 3 outlines the use cases and the respective opportunities emerging from introducing a CBDC. Chapter 4 concludes with an outline of key insights and recommendations for next steps.

# 1. Introduction

***We are entering a new financial era of digital currency.*** Central bank digital currencies (CBDCs), previously known as digital fiat currencies, enjoyed considerable attention in 2018 and 2019, as central banks around the world began to assess whether such an instrument could bring benefits to their respective countries' financial systems. In a 2018 speech on the topic of CBDC, Christine Lagarde (previous International Monetary Fund Chairperson) further stimulated global interest in this cash-like instrument through her endorsement of "consider[ing] the possibility to issue digital currency". There may be a role for the state to supply money to the digital economy" (Lagarde, 2018). As an increasing leader in digital financial services on the African continent, Eswatini is resultantly primed to consider the possibilities of CBDC for its own payment and financial context in the new digital era.

***Measured investigation is a key first step to considering CBDC issuance.*** While the benefits of CBDC have however been wildly circulated[2], it is becoming well-understood that the value or appropriateness of CBDC for any national economy and financial system is critically linked to the unique characteristics and needs of a given country. Similarly, the potential risks of introducing a new financial instrument are highly context specific. It is for this reason that, while supportive of the possibility of CBDC, Lagarde (2018) warns that its use case is not necessarily universal and warrants further investigation that is serious, careful and creative.

***Is there motivation for an Eswatini CBDC country diagnostic?*** In light of these conversations, the Central Bank of Eswatini (CBE) seeks to better understand the potential benefits and risks that CBDC could bring to its own context, as well as to determine Eswatini's level of readiness to eventually pilot test or introduce CBDC.

In this context, the CBE requested that Cenfri submit a proposal to conduct a full CBDC country diagnostic to assess the potential for CBDC in Eswatini. The four phases of a country diagnostic are illustrated in Figure 1. CBDC country diagnostic phases.

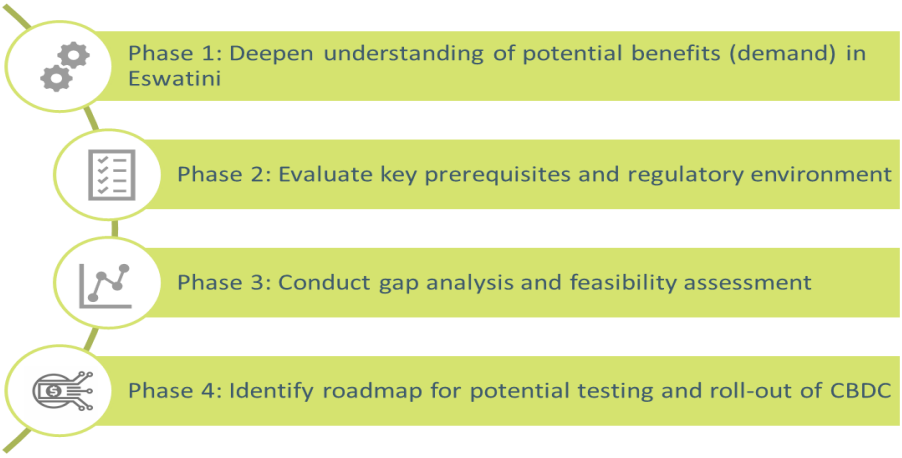


**Figure 1. CBDC country diagnostic phases**

*Source: Authors' own*

2 See Section 2

***Phase 1 was the diagnostic starting point.*** The CBE requested that Cenfri focus on Phase 1 of the diagnostic, aimed at determining what use cases could benefit the most from the potential introduction of CBDC in Eswatini. The findings of Phase 1 are essential, as they provide both evidence for the practical value that CBDC could offer the Eswatini economy and financial system based on assessed need, and justification for further investment into additional phases of the diagnostic.

***The purpose of this note is to deliver high-level synthesised findings from the Phase 1 investigation.*** The note aims to provide the CBE Board of Directors with necessary synthesised insights from Phase 1 to assess the potential use cases for introducing CBDC in Eswatini. This synthesis note should allow the Board of Directors to make an informed decision concerning the usefulness of further exploring Eswatini's readiness to introduce CBDC in terms of infrastructure and regulation (i.e. Phase 2 of the diagnostic).

The use cases assessed under Phase 1 of the CBDC diagnostic include the consumer use case, the payments use case as well as the economic policy (monetary and fiscal) use case. More specifically, the three use cases were analysed to answer the following questions:

i. **Consumer use case:** Is there an opportunity for consumers (individuals and micro, small and medium-sized enterprises [MSMEs]) to notably benefit from retail CBDC in terms of improving access to, and use of, financial services?
ii. **Payment use case:** Are there opportunities for wholesale or retail CBDC to enhance the efficiency and functionality of payment systems in Eswatini?
iii. **Economic policy use case:** Are there potential opportunities for CBDC to enhance the effectiveness of monetary and fiscal policy in Eswatini? What are the effects on financial stability?

# 2. What is CBDC?

This section briefly explains the concept of CBDC and provides an overview of the potential benefits it claims to offer various market participants.

**CBDC is a digital representation of sovereign currency.** CBDC is issued under the auspices of a central bank and possesses the same legal status as physical cash. Similar to physical fiat currency or cash, CBDC has three characteristics of a national currency (money):

- It is **universally accepted** as a medium of exchange, which means it is recognised by all individuals and merchants within national geographic boundaries as a valid payment instrument (Reiss, 2018).
- It can act as a **store of value** with which to transfer purchasing power from the present day into the future (Ali, et al., 2014).
- It represents a **unit of account**, or standardised unit of value, that can be used to value any item and facilitate price comparisons between items (Ali, et al., 2014).

The primary difference between CBDC and physical cash is that CBDC exists exclusively in digital or algorithmic format. Furthermore, CBDC is underpinned by technologies[3] that allow for seamless transactions across one integrated payment system by using a single standardised payment instrument (Raskin & Yermack, 2016). There is an array of technologies that could support CBDC, but common to each of them is the key ability to eliminate the role of unnecessary third-party payment intermediaries in settlement procedures (Accenture Consulting, 2017).

***CBDC can be designed and implemented in different ways.*** CBDC can be constructed as either a wholesale or a retail currency. In its retail form, CBDC is most similar to physical cash given its design to reside within either a wallet as a token or an account, and to be utilised for frequent and relatively low-to-medium-value transactions (Bech & Garratt, 2017). In its wholesale form, CBDC represents central bank money that is used to facilitate wholesale payments on national payment systems (NPSs), such as the current Real-Time Gross Settlement System (RTGS) (Bech & Garratt, 2017). These variants consequently enable authorities to design a CBDC that is fit for purpose and tailored for its context. Where relevant, both retail and wholesale CBDC were considered under Phase 1.

***Existing theoretical studies highlight significant cost savings from CBDC for key economic actors relative to cash.*** CBDC can reduce the cost of issuing, circulating and accessing cash as

3 CBDC can be implemented in various ways and underpinned by a number of different technologies. Technologies commonly suggested include ledger technologies that are open and distributed, open distributed and/or decentralised, closed and centralised, and centralised but decentralised in use, among others. For more information on the exact nature and operation of each of these systems, please see Accenture Consulting, 2017. As most NPSs already use some form of ledger technology, CBDC has the potential to run on existing payment rails or on updated technology systems that are identified as both necessary to achieve the benefits of CBDC and appropriate for a given country context by government authorities. Currency algorithmic tagging is an additional method in which CBDC may reside on and off ledger technologies but allow for integrated use across various systems. The concept of CBDC in this case is therefore technology agnostic. The choice of technology application depend only on how well it can facilitate the successful implementation of a desired CBDC and achieve its potential benefits.

either its complement or substitute (Fung & Halaburda, 2016). For financial service providers, this can imply lowered costs associated with bookkeeping and operational processes, as well as reduced payment reconciliation costs (Mainelle & Milne, 2016). Regulators may save through lower production and distribution costs associated with physical currency (Berger, 2017). Value chain actors may also reduce expenses relating to cash logistics. These expenses can include cash distribution, accounting between destinations and security associated with cash-in-transit between actors in a given value chain. Through the use of CBDC, consumers may also be able to enjoy minimised costs associated with ATM cash withdrawals, transport costs to encashment points, and high transaction fees relating to both domestic and international peer-to-peer transfers (Fung & Halaburda, 2016).

***The deployment of CBDC can trigger additional system-wide efficiencies, growth and payment security.*** CBDC-based monetary policy, if not fixed, can become better informed and targeted through greater oversight of liquidity flows offered via the traceability of CBDC (Berger, 2017). Fiscal authorities may further enjoy larger pools of revenue for social programmes. NPSs can be made more resilient against counterparty and liquidity risks typically associated with multiple-day settlement lags synonymous with traditional legacy systems (Bech & Garratt, 2017). By utilising CBDC instead, settlements can become near instantaneous given its necessary interoperability with all devices, platforms, schemes and institutions as a universally accepted medium of exchange.

***A country diagnostic is necessary to determine whether theoretical CBDC gains can become a reality in Eswatini.*** The gains hypothesised by studies from CBDC implementation, while well researched and understood, are often highly generalised and may not necessarily be true for all contexts. For example, although China may be capable of gaining from digitising cash through enforced CBDC use, this use case may be more constrained in more democratic countries. For Eswatini to accurately understand the real value that CBDC could offer its economy and financial system, a diagnostic is required that can evaluate how CBDC would fit into its context and where CBDC gains could exist.

# 3. Ranking of use cases

This section outlines findings from Phase 1 of the Eswatini CBDC diagnostic. These findings evaluate potential opportunities for a retail and/or wholesale CBDC to have a positive effect on the three different use cases assessed: consumer demand, national payment efficiency and economic policy.

***Approach to use case assessment.*** The research methodology designed to evaluate CBDC use cases in Eswatini relied on the analysis of primary quantitative data[4] requested from the CBE, and secondary data obtained through desktop research. Using the latest available data, each use case was first assessed by its current status. This was then followed by an examination of the current constraints or opportunities that exist to improve the current status. This evaluation subsequently formed the basis to consider where and how retail and/or CBDC could add value to a given use case. Findings represent the key take-aways from the three-stage analyses conducted per use case[5].

4 Quantitative data ranged from demand-side data, such as the 2018 FinScope consumer and MSME surveys, to the data extracted from departmental databases within the CBE. Central Bank data and inputs were received from the NPS department, the Financial Regulation department, Financial Markets Department and the economic policy, research and statistics department.

5 Phase 1 of the CBDC diagnostic in Eswatini was conducted in close partnership with the CBE. The CBE was instrumental not only in providing central bank data for analysis but also in contributing towards the analysis of given data to draw out key insights. All synthesised results presented in this note have therefore been rigorously interrogated with the help and support of the CBE team.

## Overview: CBDC use cases ranked by effect

**Payment system efficiency gaps:**
- Though robust, the existing retail payment system (SAECH) faces technical constraints.
- Constraints include low efficiency, lack of channel ubiquity and no instantaneous payment.

**Opportunity:** To enhance the efficiency, ubiquity and speed of current retail payment clearing and settlement processes by overlaying retail CBDC on proposed Switch-like architecture for more frictionless middle-mile settlement by CBE

**Probability of positive CBDC outcome:** **High**
**Type of effect:** **Direct**

**Consumer demand and financial inclusion gaps:**
- Cash remains king for all P2B, B2P and B2B expenses.
- P2P remittances are most successfully digitised through mobile money.
- Wider use of mobile money is inhibited by cost and convenience factors.

**Opportunity:** To deepen the use of mobile money for wider use cases by reducing middle-mile expenses and promoting mobile money interoperability by rolling out retail CBDC via mobile money rails

**Probability of positive CBDC outcome:** **Medium**
**Type of effect:** **Longer term and indirect**

**Economic policy gaps:**
- Discretionary monetary policy and its tools are bound by CMA membership.
- Financial system is relatively resilient.
- Fiscal policy constrained by wage bill and revenue leakages

**Most viable opportunity:** Utilise traceability of retail CBDC to remove ghost workers from wage bill, identify taxpayers and track illicit flows

**Probability of positive CBDC outcome:** **Medium**
**Type of effect:** **Longer term and indirect**

**Figure 2. CBDC use cases ranked effect (depending on variables highlighted by their respective analysis)**

*Source: Authors' own*

## 3.1. The payment system efficiency use case

**Research question:** Are there opportunities for wholesale/retail CBDC to enhance the efficiency and functionality of payment systems in Eswatini?

### The status quo

***The Eswatini NPS has two main components.*** The payment system comprises (i) the Swaziland Interbank and Settlement System (SWIPSS), which provides real-time gross settlement (RTGS) for high-value critical payments, and (ii) the Swaziland Automated Electronic Clearing House (SAECH), which processes interbank retail payments. SWIPSS is owned, managed and located within the CBE and directly serves the Treasury Department through the Minister of Finance and the four commercial banks in Eswatini, i.e. First National Bank, Standard Bank, Nedbank and Eswatini Bank. SAECH sits outside of the CBE but also serves the four major commercial banks.

***The Eswatini NPS infrastructure is relatively robust.*** The systemically important SWIPSS is a relatively robust system due to its compliance with stringent Society for Worldwide Interbank

Financial Telecommunication (SWIFT) requirements as a SWIFT-based RTGS[6]. Furthermore, the system experienced a downtime of approximately (only) three hours in the first quarter of 2018 and displayed an availability ratio of 96%[7] at the end of June 2019. SAECH is considered similarly robust due to its low probability of availability decreasing in the near future (CBE, 2019).

***Despite this robustness, recent performance suggests that the SWIPSS is underutilised.*** Optimal or efficient system utilisation is proxied by the ratio of processed digital transaction value to nominal gross domestic product (GDP). According to this proxy indicator, SWIPSS is currently significantly underutilised, with current RTGS payments only worth three times GDP in 2018. This result is notably less than the ratio of 24 times GDP produced by Brazil, Russia, India, China and South Africa (BRICS) in 2012, as well as more comparative economies, illustrated in Figure 3.

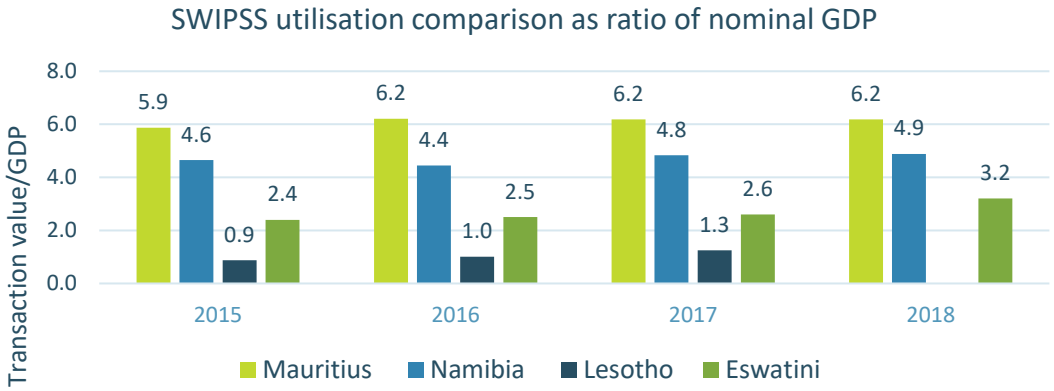


**Figure 3. SWIPSS utilisation compared to RTGS utilisation in Mauritius, Namibia and Lesotho**

*Source: Central Bank of Eswatini, 2019*

***It is unlikely that SWIPSS will reach satisfying utilisation levels.*** While SWIPSS utilisation has doubled in volume over the past decade, even more so in value[8], the heavy reliance on SWIFT, the small population size as well as the high costs of SWIPSS utilisation suggest that SWIPSS is unlikely to reach satisfying sustainability levels in the longer term.

***SAECH utilisation is hampered by inefficient processes and mobile money operator (MMO) exclusion.*** Similar to SWIPSS, SAECH displays relatively low utilisation levels. Between 2011 and 2018, the SAECH utilisation ratio amounted to only 1.07 times GDP on average, with utilisation rates of individual retail instruments such as debit and credit electronic fund transfers (EFTs) similarly low. Low utilisation is further characterised by the prohibited direct participation of MMOs, who instead rely on inefficient, closed-loop payment processes that require commercial bank escrow accounts and an inefficiently high number of reconciliation steps per transaction. The arduous and step-wise operating procedures related to SAECH

6 These requirements range from liquidity, security and connectivity infrastructure requirements, to requirements for sufficient technical capacity and irrevocability. For more detail of SWIPSS requirements, please see this link: https://www.centralbank.org.sz/nps/SWIPSS-Rules-Procedures.pdf

7 A ratio of the amount of time the system is actually available for use, to the amount of time it is supposed to be available (CBE, 2019)

8 SWIPSS utilisation has more than doubled in volume in the past 10 years and has grown by nearly 200% in terms of value (SWIFT,2014; Central Bank of Eswatini, 2019)

clearing and settlement processes further undermine incentives to optimally use the retail payment system.

***Instant payments are limited beyond mobile money usage.*** While the SWIPSS RTGS system offers instant payments at a cost, SAECH does not. Rather, it processes low-value retail payments in batches. Only MMOs currently offer real-time payments through their closed-loop systems. This implies that, while both SWIPSS and SAECH are characterised as relatively robust and secure, scale and trust in the system may be ultimately hampered by constraining EFTs to clearing and settlement windows and to bank operating hours.

***Interoperability[9] is lacking in Eswatini.*** The interoperable nature of payments is constrained in two critical ways:

- The absence of scheme interoperability between and within banks/mobile money products increases operational costs. The lack of interoperability between commercial banks and MMOs, and between the two large MMOs (MTN and Eswatini Mobile), exacerbates inefficiencies, as there needs to be step-by-step backend procedures to clear and settle different payment channels.
- A lack of network interoperability reduces transaction scale in local payment systems. Network interoperability does not exist between point of sale (POS) and automated teller machines (ATMs), which introduces a transaction cost for utilising card schemes or SASWITCH. The transactions are switched in South Africa, even if both issuer and acquirer are in Eswatini, thereby increasing operational costs and reducing scale in the local payment system.

***Channel ubiquity has not been enabled by adoption of IS020022.*** All payments in Eswatini are currently processed using the latest SWIFT messaging type standard. Although efforts are underway, the NPS has yet to adopt the latest SWIFT-endorsed ISO20022[10]. This implies that a common messaging standard that is shared by all instruments does not exist, therefore payment schemes and channels still require to be cleared separately due to their inherent differences from each other. This results in the inefficient use of payments infrastructure, high infrastructure operating costs, and the inability of payments to seamlessly interchange within a system (Dunn, et al., 2018). This, in turn, prevents the adoption of real-time retail payments, which are crucial for consumer trust and robust payments products.

***The high use of cash is expensive for the CBE.*** Both notes and coins are increasing in circulation; and compared to Namibia and Lesotho, cash moves considerably faster in the Eswatini economy. While the CBE has managed to reduce the cost of cash as a share of GDP considerably over the past four years, it remains expensive with 5% of Central Bank profits spent on cash handling in 2019 (CBE, 2019).

9 The Bank of International Settlements (BIS) Committee on Payments and Market Infrastructures (CPMI) defines interoperability as "the technical or legal compatibility that enables a system or mechanism to be used in conjunction with other systems or mechanisms. Interoperability allows participants in different systems to conduct, clear and settle payments or financial transactions across systems without participating in multiple systems". (BIS CPMI, 2016)

10 ISO 20022 is a global common standard for exchanging electronic messages between financial institutions. As a common standard, it is able to effectively synchronise the language used between new systems and traditional infrastructure to help realise end-to-end processing across domains and geographies, thus streamlining and harmonising clearing and settlement processes across and between payment channels (AccessPay, nb).

### The value and potential role of CBDC

***Gaps in the current Eswatini NPS highlight opportunity for intervention.*** Both SWIPSS and SAECH display a need to enhance their operational efficiency to support more optimal utilisation and cost-saving. However, in the case of SWIPSS, its real-time systemically important nature and the substantial support it receives from SWIFT indicate that urgent intervention by either wholesale or retail CBDC is not necessarily required. Alternatively, given that SAECH directly affects the retail lives of consumers and the smooth operation of businesses, intervention in Eswatini's interbank retail payment system may offer the greatest gains in terms of both agility and cost reduction.

***CBDC can support CBE ambitions for more agile retail payment systems.*** The CBE is currently considering the design and introduction of a fit-for-purpose national clearing and settlement architecture as a potential solution to SAECH, but also as an agile payment system to be compatible with future innovations. CBDC offers an excellent opportunity to support this initiative through the application of a retail CBDC design to the CBE-proposed system architecture. This approach will allow the nationally owned architecture to be designed in an infrastructure-light way that utilises CBDC algorithms and protocols to facilitate instant retail payments and encourage greater middle-mile efficiencies. The latter would notably be achieved by simplifying reconciliation backend processes for both bank and non-bank payment providers through instant clearing. However, gains in channel ubiquity may only appear if retail CBDC is also introduced to underpin all payment channels and instruments, including mobile money as a participant of the new proposed architecture.

***A CBDC solution promises a high likelihood of positive NPS outcomes.*** Constraints faced by SAECH in Eswatini are middle-mile and technical in nature. The application of retail and/or wholesale CBDC offers a technical solution to predominately backend processes, and if rolled out via existing payment rails, has the potential to directly promote real-time interoperable and cost-effective payments for current and future potential users of the NPS.

## 3.2. The consumer demand use case

**Research question:** Is there an opportunity for consumers (individuals and MSMEs) to notably benefit from retail CBDC in terms of improving access to, and use of, financial services?

### The status quo

***The vast majority of Eswatini population is financially included.*** The Kingdom of Eswatini is a highly financially included economy (87%) with an increasingly digitised society. According to the 2018 FinScope, 66% of the adult population made a digital payment within the past 12 months, 77% of which was through a mobile money account. Most financial access points are mobile money agents, expanding access considerably.

***But higher levels of exclusion and key demand factors undermine broader digital uptake.*** Twenty-two percent (22%) of the informally employed and 25% of government dependants, especially those in rural areas, are financially excluded. Additionally, rural and poorer

population segments have lower financial capabilities and transact more in cash. This is coupled with a reduced trust in formal financial services, reinforcing cash use. Lastly, merchants currently do not accept mobile money payments on a large scale, limiting the use case to person-to-person (P2P) payments. These factors require careful consideration when designing an inclusive retail CBDC that benefits all consumers.

***Mobile money is responsible for digital payment growth through remittances, yet cash dominates all other use cases.*** Mobile money is driving most of the growth in P2P payments and is the preferred channel for remittances, as seen in the footnote[11]. Yet, cash persistently dominates especially in merchant payments and day-to-day financial activity in Eswatini, with 98% of person-to-business (P2B) payments still conducted in cash (FinScope MSME, 2019). This is shown in Figure 4[12]. In addition, even the banked population still appears to rely on cash for many financial activities. The 2018 FinScope MSME survey indicates that 88% of MSMEs pay their employees in cash. This shows that mobile money is still seen as a complement to cash rather than replacing it on a larger scale.

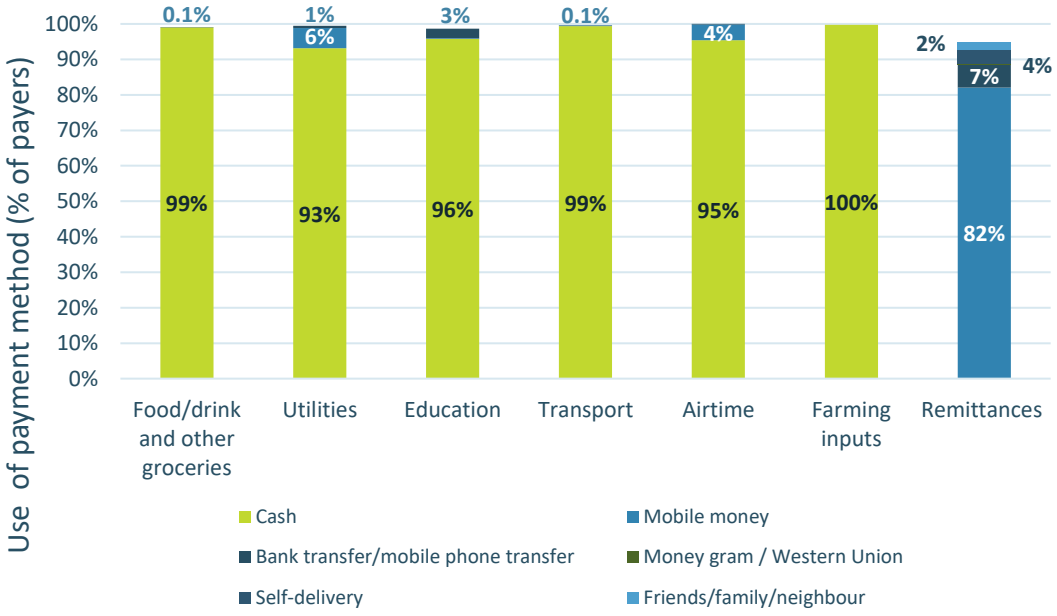


**Figure 4. Use of payment instrument per P2B and P2P use case**

*Source : MSME FinScope, 2018*

***The lack of value-chain digitisation limits expansion of business to business (B2B) payments.*** Over 80% of B2B payments in 2018 were made in cash instead of a digital channel, and 76% of business expenses were paid physically in or through a bank (FinScope MSME, 2019). There is a lack of digitised value chains that incentivise the uptake of digital B2B payments, reinforcing the reliance on cash.

***A lack of interoperability and high cash-in/cash-out costs inconvenience consumers.*** Mobile money in Eswatini is hampered by a lack of interoperability between providers as well as relatively high costs to cash in and particularly to cash out by consumers compared to formal

11 94% of remittances are domestic between urban and rural areas of Eswatini (FinScope, 2019).

12 Payment methods relating to shop payment, debit or credit card, payment by bus/taxi, money gram/western union and payment into bank account are excluded due to insignificant usage across use cases.

banking and Shoprite prices.[13] These constraints can limit the ability of mobile money to penetrate more use cases beyond P2P payments. To adopt mobile money for other use cases, consumers need to be able to switch seamlessly and cost-effectively between cash and digital channels to increase convenience and trust.

## The value and potential role of CBDC

***The value proposition to expand digitisation through retail CBDC exists.*** Although the majority of the population has access to financial services in Eswatini, the use of digital channels for payments remains relatively low compared to cash. Mobile money has, however, been a key power tool in deepening digital payments through its prevalent use by consumers for P2P remittances. Yet, the ability of mobile money to further digitise this payment channel, in addition to other payment use cases, appears hamstrung by constraints such as high transaction costs and lack of interoperability. These limitations consequently provide a unique opportunity for retail CBDC to assist MMOs to overcome these hurdles and, in so doing, support both deeper and wider use of digital payments in Eswatini.

***Underpinning mobile money in retail CBDC can lower supply cost drivers for improved demand and deeper use.*** Retail CBDC has the potential to reduce the constraints that mobile money currently faces to broaden its expansion by running on its existing rails and underpinning its design. By doing so, retail CBDC would promote lower operational expenses incurred by providers from protracted third-party intermediary backend reconciliation processes and would enable more convenience through inherent interoperability between MTN and Eswatini mobile money, and between commercial banks. If providers are correctly incentivised to pass on payment reconciliation cost-savings to consumers, mobile money users (including individuals and MSMEs currently digitally transacting) will gain from reduced cash-in and cash-out (CICO) costs that may be propped up by provider reconciliation costs.

***Defining mobile money in CBDC can also broaden its use cases.*** Utilising retail CBDC via mobile money makes particular sense for deepening digitisation, given its existing notable status in Eswatini. Over 80% of the national population sent or received remittances in 2018, most of which were via mobile money and likely by digitally literate consumers. This suggests that if CBDC can sufficiently reduce friction for mobile money remittances, most of the population is more likely to start exploring its benefits for other use cases, such as P2B. The large network of mobile money agents in Eswatini, together with the relatively flat learning curve for existing mobile money users, also means that CBDC could have the greatest potential of deepening consumer use of digital financial services away from cash.

***The financial inclusion promise of retail CBDC depends on an enabling environment.*** While a large share of the population already uses mobile money, the probability that retail CBDC will encourage deeper and additional use cases for mobile money is not straightforward. The value that CBDC can bring, despite running on existing mobile money rails, will critically hinge on whether merchant and MMO incentives are aligned to pass mobile money middle-mile cost-savings onto consumers, whether merchants are adequately incentivised to promote digital payment options over cash, and whether consumers have sufficient trust in mobile money to allow the added benefits of retail to have their desired effect. Factoring in a large range of contextual and demand-side factors such as financial capability among the predominantly

13 Costs based on lowest transaction value range by instrument i.e. Cost of mobile money transactions (MTN) based on maximum transfer from SZL2001-4000.00 SZL 4,000, and SZL 1 to SZL 4,000 for Shoprite transfers.

rural financially excluded, it is evident that – while retail CBDC may indirectly encourage more effective use of financial services among existing and potential mobile money users – the effect of retail CBDC on the broader population who are excluded or have opted out of mobile money is unclear.

## 3.3. The financial stability, monetary and fiscal policy use case

**Research question:** Are there potential opportunities for CBDC to enhance the effectiveness of monetary and fiscal policy in Eswatini? What is the impact on financial stability?

### The status quo

***Discretionary monetary policy is bound by CMA membership.*** Eswatini is a member state of the Common Monetary Agreement (CMA), a Southern African monetary union comprising Lesotho, Namibia and South Africa as fellow member states. Under the 1986 CMA agreement, all member states (including Eswatini but excluding South Africa) are required to maintain a one-to-one peg of their national sovereign currency to the South African rand. This means that, although each country is entitled to its own national currency[14] and has the sovereign right to implement independent monetary policy through its chosen instruments, these instruments and their trends are ultimately restricted to follow the movements of the South African Reserve Bank's (SARB) repo rate and to maintain currency parity through adequate foreign reserve accumulation.

***Monetary policy performance: price stability and peg are at risk from low official reserves.*** Price stability, as the CBE's primary objective, has been relatively well maintained despite notable but understandable lags between changes in the discount rate and expected changes in both money supply and headline inflation. However, the maintenance of the peg, an intermediate CBE price stability objective, has increasingly become at risk since 2018 following steadily declining gross foreign exchange reserves below the pursed international short-run target of three months import cover[15]. This trend is illustrated in Figure 5.

14 Article 2 of the Multilateral Monetary Agreement (MMA) of 1992 states that "contracting parties shall each have the right to issue currency in the form of national notes and coin; and commemorative coin." This right is subject to three stipulated requirements: 1) the need to peg the national currency at par with the South African rand by maintaining foreign (rand) reserve requirement of at least equal to their total local currencies in circulation 2) to ensure that "… any arrangements in respect of any national note and coin issues other than rand currency shall be subject to prior agreement between the Government of South Africa and the Issuing Government" (Article 2 of MMA, 1992), and 3) that "…notes and coin shall be clearly distinguishable in appearance from notes and coin of the other Contracting Parties".

15 The drivers for the depleting reserves include declining Southern African customs union (SACU) receipts, growing rand outflow by banks as well as increased fiscal expenditure (stakeholder interview, 2019).

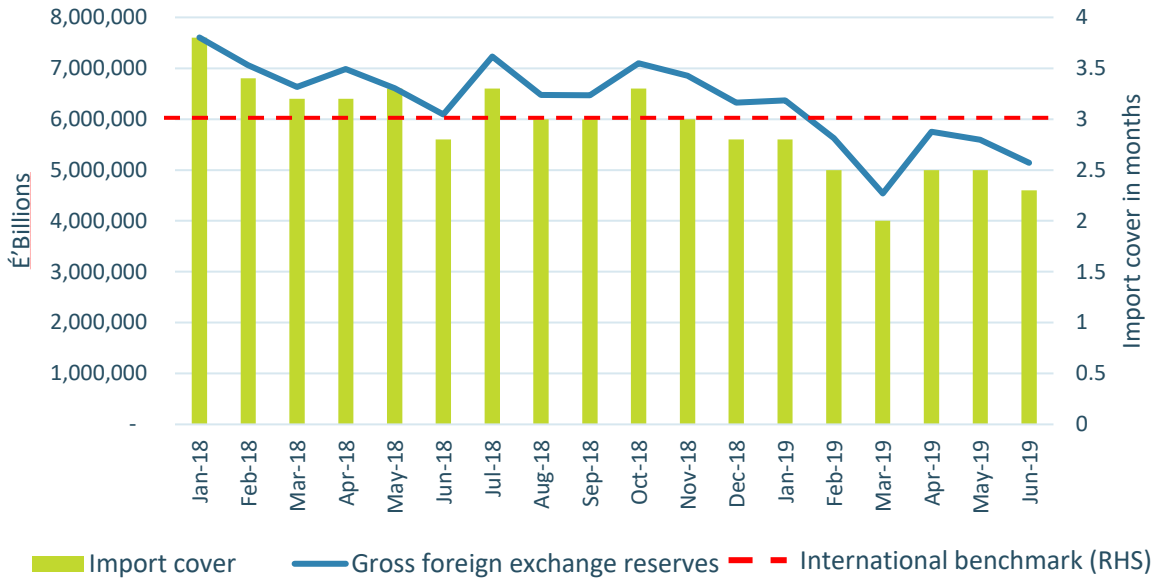


**Figure 5. Gross official reserves and import cover**

*Source: CBE monthly statistical reports and CBE internal data (2019), IMF Article IV (2019)*

***The financial stability performance is robust, but threats exist.*** In addition to price stability, the mandate of the CBE is to support and preserve a sound financial system. The CBE does so by supervising the market and actively engaging when there is a perceived threat by adjusting requirements and engaging macroprudential measures. From a financial stability perspective, the Eswatini economy appears to be relatively robust. High liquidity surplus ratios support 2019 CBE liquidity stress test[16] outcomes for the likely resilience of banks under times of liquidity distress (CBE, 2019). However, there is an increase in non-performing loans (9.2% in June 2019), as well as a notable asset, deposit and borrower concentration that could threaten financial stability (CBE, 2019).

***Fiscal policy: High fiscal spending and revenue leakages threaten the fiscus.*** Eswatini's fiscal spending has exceeded revenue since the fiscal year of 2014/2015. Salary and wage payments persistently account for more than 40% of government current expenditure. Ghost employees[17] are a considerable drain on resources: Losses are reported to have reached 0.2% of GDP in 2018 or 0.7% of total government revenue. Substantial losses have been similarly identified regarding reduced tax collection across various tax categories in 2018 (Auditor General of Eswatini, 2018). Drivers of dipping tax collection include inconsistent use of correct individual identifiers for income tax collection[18] and under-estimations of the company tax base due to limited coordination between the Eswatini revenue authority and the registrar of companies (Auditor General of Eswatini, 2018), among others. Lack of identity documents in

16 Stress-testing is a risk management technique that is used to evaluate the potential effect of a set of specified changes in risk factors on a financial system's condition. These tests are forward-looking and approached from a top-down perspective (CBE, 2019). Tests were conducted by the Financial Stability department of the CBE in 2019 as part of the third issue of the 2019 CBE Financial Stability Report. The potential implications of a CBDC introduction to the market were not considered in these tests.

17 "Ghost employees" refer to those individuals who receive salary payment despite 1) having resigned or exited the public service, 2) not reporting for work, 3) and/or having been suspended for a lengthy period.

18 Graded tax number versus income tax number

the informal sector is prevalent, and risks of illicit flows are notable as mis-invoicing amounts to nearly 50% of trade inflows and outflows (Global Financial Integrity , 2019).

## The value and potential role of CBDC

***Monetary policy: CBDC use for price stability is limited due to CMA membership.*** Many have argued that CBDC widens the range of options for monetary policy, since variable interest rates on CBDC would provide for a new policy instrument that would allow improving the overall effectiveness of monetary policy. However, although the actual design of CBDC in Eswatini is not yet known, it is unlikely that any design would affect the effectiveness of the CBE discount rate under the MMA. Irrespective of how it is used by the CBE, CBDC and the discount rate would still be led by SARB repo rate movements to maintain national currency parity. As this dynamic is unlikely to change in the near future under the MMA, a CBDC use case for improving the accuracy of monetary policy tools for price stability is highly limited.

***Monetary policy: Peg maintenance is likely to be unaffected in the short term.*** A prime consideration for the CBE regarding CBDC is whether it has the potential to destabilise or strengthen its ability to maintain the lilangeni–rand peg, given existing threats.

If the **CBE introduces a wholesale CBDC before the SARB**, its effect on the peg would not necessarily strengthen or pose a risk to the peg. This is because, although CBDC could theoretically move reserves faster and enable faster bond issuance, the quantity of CBDC would still be restricted under the MMA, i.e. for national currency issuance to fall into the notes and coins issuance quota agreed on with the SARB. The design and use of CBDC for peg maintenance would furthermore be under the prerogative of the CBE and national authorities, who are likely to be conservative in this area.

If the **SARB introduces a wholesale CBDC before or after the CBE issuance** in terms of cross-border exchange, the effect on the peg could be limited. Firstly, under 1992 MMA guidelines, any development of an Eswatini CBDC would involve the consultation of the CBE with the SARB to agree on the CBDC and manage any foreseeable risks posed to the peg. Secondly, while no clause under the MMA requires the CBE to adapt its electronic payments to the modalities of South African instruments, Article 5 does state that the CBE would be obliged to ensure that CBDC abides by existing South African controls regarding foreign exchange. Article 6 of the MMA further stipulates the need for coordinated NPSs and common implementation of rules and procedures regarding payment system infrastructure. This suggests that the current regulation Eswatini has in place to ensure accord between South Africa and Eswatini electronic transactions would still be applicable to CBDC cross-border transactions.

If Eswatini does not possess a comparable digital cash instrument at the time of a SARB CBDC, the economy could face risks of revenue leakage (particularly where it may offer better utility relative to the existing retail payments and cash options in Eswatini, thus encouraging use of extra-territorial instruments) and non-MMA compliance regarding foreign exchange. This scenario could potentially create risks to peg maintenance such as fiscal leakage, balance of payment losses, illicit flows and even problematic GDP accounting – thus accelerating the need for active measures to maintain the peg. However, if a CBE CBDC already exists, such intervention may not be necessary, as protocols could be programmed into its design to enable CBE CBDC to abide by, or even strengthen and smoothen, CBE exchanges with the SARB

CBDC. How these exchanges contribute to the peg depends on the approach CBE takes to CBDC and reserve management.

***Financial stability: The CBDC use case is limited but could speed up aggregate bank runs.*** CBDC could eventually represent an alternative mechanism to capital outflow from the system. In an individual bank run, the CBDC effect would be neutral, as customers would have sufficient mechanisms to move their deposits to different institutions, CBDC representing one of them. In an aggregate bank run, CBDC could potentially speed up the effects, as it could provide a faster mechanism to withdraw deposits from the system. This scenario is unlikely, given the current composition of the Eswatini financial system, and there are ways to design CBDC to mitigate this risk.

***Financial stability: Proactive measures can be used to mitigate risks.*** The latest liquidity stress tests from the 2019 CBE financial stability report suggest that the Eswatini financial system is not susceptible, but resilient to, a potential bank run in the near future[19]. However, in the unlikely event of an aggregate bank run occurring, the financial stability mandate of the CBE would empower it with proactive measures in its arsenal to counter any intensifying effects produced by retail CBDC.

- **From a design perspective:** Retail CBDC can be designed explicitly as a cash substitute, i.e. no interest is paid, thus making CBDC an unattractive option to store wealth relative to bank deposits. Alternatively, retail CBDC can be issued as an interest-earning asset against specific non-bank asset classes, thus capable of having its supply and demand influenced by CBE. Lastly, the CBE can design and apply CBDC caps on bank and mobile money wallets, as well as CBDC withdrawal limits to curtail the speed of capital flight.
- **From a regulatory perspective:** The CBE can prepare and hedge against potential CBDC risks by either adapting or adjusting regulation to account for CBDC in macroprudential reserve requirements to cope with potential of deposit outflow or to purchase CBDC. Regulation or guidelines can also be developed to prescribe active and explicit measurement and monitoring of CBDC, similar to other financial instruments.

It is relevant to note that to implement the first set of measures, the CBE will need to discuss and obtain approval from the SARB under the MMA. The second set of regulatory measures would imply greater involvement by the CBE in financial markets and risk management.

***Fiscal policy: CBDC case will indirectly reduce losses through ghost workers and tax evasion.*** Given the upward trend of resource leakage through government ghost employees and a large informal sector, a retail CBDC coupled with a robust digital identity system has great potential to increase the visibility of fund flows if government-to-person (G2P) payments and vice versa are made via retail CBDC. In a Nigerian example, following the advent of the Bank Verification Number (BVN), the mere deduplication of unique identities and the ability to link each identity to payroll payments has already had a marked impact on the economy. The application of CBDC would make such measures much more sophisticated and resistant to circumvention[20].

[19] See page 13 for further information on the status quo of Eswatini current state of financial stability.

[20] This level of sophistication could imply the embedding digital identity information into the automatic protocols of CBDC, thus allowing government departments to design a retail CBDC that prohibits wage disbursal if an employee's access and timeclock activity, using registered biometric information, does not show a sufficient amount of activity within a certain period of time at their respective office or site Additional qualifying information would need to be incorporated into the CBDC design however to ensure that protocols are not overly strict but dynamic and correct. Additional information might include the nature of employee work, current leave status, primary location of work and trend data on not only the employee's activity at work but office colleagues as well to acknowledge relevant contextual factors such as the failure of the biometric infrastructure. More

Tax revenue collection could be considerably improved as CBDC would inherently imply the digitisation and unification of tax collection systems and actors in Eswatini as key prerequisites to its effectiveness. Furthermore, by having these improved systems in place, illicit trade flows based in CBDC can potentially not only be detected faster but also traced for improved retrieval.

It is critically important to note, however, that these gains from CBDC are highly dependent on, and indirectly achieved through, the existence of a wide and comprehensive digital identity system that can enable the visibility and traceability of individual CBDC users. Although these gains do not fall directly under the purview of the CBE, they do boast potentially broader economic growth gains, such as foreign reserve accumulation, which is within the mandate and objectives of the Central Bank.

***Overall, the usefulness of CBDC for fiscal gains presents the clearest argument for CBDC policy intervention.*** CBDC is unlikely to have any substantial effect on the ability of the CBE to support price stability due to the limitations of Eswatini monetary policy under the MMA. Similarly, the ability of CBDC to support the peg ultimately depends on MMA guidelines and the approach of the CBE to use CBDC for the peg, thus highlighting the role of CBDC itself as neutral. It is unlikely that CBDC will directly enhance financial stability in Eswatini or introduce new vulnerabilities to the system[21]. It is only with regard to fiscal gains, in terms of reducing the wage bill and supporting revenue recovery, that CBDC is most likely to have a positive effect, albeit indirectly by leveraging the benefits of a robust, universal and comprehensive digital identity system.

sophisticated time and attendance systems, as well as biometric monitoring that uses keystroke biometrics linked to system user ID, could also be employed.

21 The exact propensity and nature of retail or wholesale CBDC risks depend greatly on the design, prudential regulation and context of the system when introduced. Stress tests and statistical modelling should therefore be conducted for each CBDC variant, controlling for regulatory and system context, to obtain accurate assessments of CBDC impact.

# 4. Conclusion

***The Phase 1 findings signal a greenlight for the next phase of the CBDC diagnostic.*** The objective of the first phase of the CBDC diagnostic was to evaluate whether clear use cases exist for the introduction of a retail and/or wholesale CBDC specifically within the context of Eswatini. Findings from the first phase of investigation indicate that there are indeed at least three potential use cases that motivate further consideration by the CBE Board of Directors for the possible pilot testing and introduction of CBDC within Eswatini. More specifically, since the strength of each use case is neither equal nor unconditional, Phase 1 findings suggest the need for further exploration under Phase 2 of the CDBDC diagnostic to determine whether Eswatini satisfies key prerequisites needed to make CBDC gains a reality.

***CBDC presents three use cases for the context of Eswatini with varying degrees of strength.*** These are:

1. **Payment system efficiency and functionality (strongest):**

   Though the current NPS in Eswatini is resilient and secure, its retail clearing house is notably under-utilised and currently lacks the functionality to enable real-time payments and payment channel ubiquity. Wholesale and/or retail CBDC can play a role in addressing these constraints in line with the current ambitions of the CBE to develop a fit-for-purpose national payment architecture, or switch. This could be achieved be specifically by designing the newly proposed payment architecture to be overlaid with retail (and potentially wholesale) CBDC.

   This solution offers the potential not only to increase consumer convenience through enabling channel/instrument interoperability and real-time payments, but also to considerably decrease reconciliation costs for providers, therefore improving operational efficiency and allowing lower prices for end consumers. Enhancing retail payment system interoperability, speed, inclusiveness (especially for presently excluded MMOs) and cost-effectiveness will provide more financial robustness and convenience for both providers and consumers, as well as encourage greater use of digital payments to increase the utilisation of NPS infrastructure.

2. **Deepening consumer demand and usage of digital financial services (intermediate):**

   Access to financial services in Eswatini is relatively high at 87% on aggregate, but the use of digital payment methods continues to be surpassed by cash across most P2B, B2P and B2B use cases (FinScope, 2019). Digital payments are playing a role in P2P remittances and the 18% of MSMEs who conduct B2B digitally. Mobile money has played a significant role in the former, with over 80% of remittances currently taking place through mobile money. Yet, despite the gains, mobile money still faces constraints to achieve greater usage across P2P and P2B use cases. These constraints include high CICO costs for consumers and a lack of interoperability with other providers, thus inhibiting greater ease of transfer for consumers. Retail CBDC presents a unique opportunity to assist MMOs to overcome these constraints.

By underpinning the design of all mobile money offerings and relying on the existing rails of mobile money, retail CBDC could potentially aid to reduce provider costs that are passed onto consumers/MSMEs and enable de facto interoperability between different mobile money services. Furthermore, given that mobile money already enjoys large penetration and trust from the population in Eswatini, the monetary and convenience gains that CBDC could provide should motivate deeper and enhanced use of mobile money for additional payment use cases.

It is important to note, however, that in order for retail CBDC to increase the use cases of mobile money beyond P2P towards P2B and B2B payments, a number of contextual and market factors may need to be addressed as prerequisites to implementation, thus making this use case less direct. Among others, these factors include (i) expensive merchant and mobile money agent business models around CICO fees at mobile money agents; (ii) the need to address value chain digitisation; and (iii) the risk of excluding currently marginalised population segments such as the rural people who depend on cash and may experience an increased digital divide.

3. **Economic policy strengthening (least compelling):**

The CBDC use cases for monetary (i.e. monetary: price and financial stability) and fiscal policy were evaluated in terms of assessing whether (i) there are opportunities or scope for CBDC to improve or strengthen current implementation, and whether (ii) there is any possibility that CBDC could undermine policy objectives.

Retail CBDC offers the clearest opportunity in terms of fiscal resources. If coupled with a robust digital identity system, CBDC can optimise both government spending and tax collection. Not only will government ghost workers be made visible, but taxpayers can be more easily traced in order to increase tax revenue.

A minimal use case exists for CBDC and monetary policy due to the limitations emerging from the MMA, which binds domestic monetary policy to the South African repo rate in terms of price stability. The actual effect of CBDC for peg maintenance, if it continues to satisfy the MMA, is likely to be neutral but ultimately depends on the approach chosen by the CBE in this regard. Similarly, while CBDC does not seem to offer a direct use case for or against financial stability, it is within the CBE mandate to determine how CBDC can be best designed and implemented to mitigate any potential risks to the financial system.

***What are the next steps on the journey to an Eswatini CBDC?*** The outcomes of Phase 1 of the CBDC diagnostic positively suggest that CBDC can add value to the Eswatini economy and financial system in three important ways: payment system efficiency, consumer demand and fiscal consolidation. This indicates that exploring the possibility to pilot-test or eventually implement a CBDC of some form in Eswatini is not only relevant but also beneficial for the country, and the CBE is tasked with promoting a sustainable, efficient, inclusive and modern financial system in line with long-run economic development.

However, while these results are positive, further research is warranted to investigate whether the necessary prerequisites are currently in place to enable the identified CBDC use cases. This investigation would therefore seek to:

- Identify whether key infrastructure and market prerequisites are in place to support the payment use case and the long-term gains on the fiscal policy side via existing identity systems.
- Identify whether key preconditions are present to encourage merchant and consumer acceptance/adoption of CBDC.
- Evaluate whether regulation and sufficient institutional capacity exist in Eswatini bring CBDC into effect in a safe and secure way, and to assess whether institutions are ready and capable of ensuring its success.

These research endeavours will form part of the second phase of the CBDC diagnostic, if chosen to be pursued by the CBE and its Board of Directors.

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