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Custodian Relations

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What is a Custodian?

The role of the "Custodian" has expanded with the developments of financial markets, payments and settlements systems across the world. A custodian can be defined as "Custody in essence a service consisting in holding (and normally administering) securities on behalf of third parties – has its roots in physical safekeeping. In the days when securities existed only in paper form, investors needed a safe place to keep these certificates of value. That safe place could either be their own premises (which however then needed to be adequately protected) or those of a safekeeping service provider (banks with their vaults were a natural choice at that time). Nowadays, custody is offered by a variety of institutions, primarily by brokers, commercial banks and investment banks. These providers have developed specialized services that cater to different customer segments"[1]. Accordingly, custodian plays a vital role in safekeeping of the securities and other assets of their clients. Further, a bank which is serving clients investing on a domestic or global scale may provide custody services internally or have resources to third-party providers for all or some of the markets. Such third-party providers are commonly identified as "Custodian Banks". The United States was the first market where custodian banks developed.[2]

Financial instruments such as equities, bonds, commodities, foreign exchange, derivatives, mutual funds and exchange-traded funds are held by the custodian banks. When these instruments are traded, custodian banks may arrange settlement and accounts reconciliation services as well. In addition to holding securities for safekeeping, most custodians also offer other services, such as account administration, transaction settlements, collection of dividends, interest payments, tax support, and foreign exchange etc. Since custodian banks provide services to their clients at a lower price than what the client would normally spend, and custodian banks offer fast and convenient services with minimum operational issues than if the clients would perform the same by themselves, participating institutions tend to seek the services of custodian banks.

1 Chan Diana & et.al., The Securities Custody Industry, European Central Bank,2007.

2 Chan Diana & et.al., The Securities Custody Industry, European Central Bank,2007.

Custodian banks are different from investment or commercial banks and they do not provide any services that directly help their clients and may provide a safekeeping function of the assets of clients by acting as a storage point. The staff cost and the cost of the technology required for offering custodian services are the major expenses of custodian banks. The fees charged by custodian may vary, based on the services that the client requests. Many firms charge quarterly custody fees that are based on the aggregate value of the holdings. Some custodian banks charge fees on monthly basis based on the transactions carried out by clients, and to also cover fixed costs.

A custodian may also have the right to assert possession over the assets, if required, often in conjunction with a power of attorney. This allows the custodian to perform actions in the client's name, such as making payments or changing investments. As the growth of the custodian banks totally depends on the development of their participating institutions, custodians need to improve assets under their custody to keep growing.

Global Custodian Bank

"Global custodians generally hold assets for their clients in multiple jurisdictions across the world, using their own local branch network or partnering with other local custodian banks in each market to hold accounts for their underlying clients".[3] Accordingly, a global custodian bank provides corresponding banking facility for banks and financial institutions in various countries across the world or offer custody services in different markets via service agreement for clients. The Bank of New York and Mellon Corporation (United States - US), Euroclear (Belgium), JP Morgan (US), State Street Corporation (US), Citi Group (US), BNP Paribas Securities Services (France) and HSBC Securities Services (US) are some of well-known global custodians who play a greater role in the custody industry in current context, based on the ranking done by 'The Asian Banker' by Assets Under Custody (AUC) i.e value of the assets managed by particular custodian bank in terms of US Doller million[4].

Local Custodian Bank

Local or domestic custodian banks hold assets for their own clients only in the domestic market. Further, they may or may not provide comprehensive services such as core banking facilities and other value-added financial services to their customers. However, a strong relationship with regional or global custodian banks is needed to access to the international markets. As this type of custodian bank decides to specialize in their home market to serve domestic customers and inflow investment from foreign customers, they are called single-market custodians as well[5].

Functions of Custodian Bank

Custodian banks provide wide array of services for participating institutions.

- Holding custody assets/securities such as bonds, stocks, commodities such as precious metals and currency (cash) both domestic and foreign
- Arrange settlement of any purchases and sales of bonds, foreign exchange and money markets
- Safekeeping functions i.e. ensure the safety of

3 The World Bank Treasury, Reserves Advisory & Management Program, (RAMP) Custody Services (Global Custodian vs. CSD's & Federal Reserve), 2019.

4 The Asian Banker, Custodians by Assets Under Custody (AUC) – Financial Markets, 2023, May

5 Chan Diana & et.al., The Securities Custody Industry, European Central Bank,2007.

customers' securities or cash maintained with custodian bank and maintain currency/cash bank accounts

- Provide information on the securities and their issuers such as annual general meetings and related proxies
- Provide daily activity/account statements, confirmations of transactions, trade status, cash projections, holdings report, reconciliation of bank accounts, execution of documents and reporting and fail management
- Provide value added services such as compliance reporting (exposure reporting, counterpart exposure, currency exposure, country exposure, issuer exposure),
- liquidity management (collateral optimization, custody related foreign exchange, cash management/payments and settlements services)
- Collect income from assets (dividends in the case of equities and coupons in the case of bonds) and administer tax withholding documents and foreign tax reclamation
- Perform additional oversight functions in relation to unit funds
- Provide credit risk taking service i.e. in markets with a central counterparty, custodian bank provides an intermediary service to trading firms that do not wish to access the central counterparty directly

Investor's Interactions with Custodian Banks

Institutional investors who hold securities directly tend to appoint their own custodian. It is beneficial to have custodian banks as they provide consolidated reporting across all portfolios managed by various investment managers.

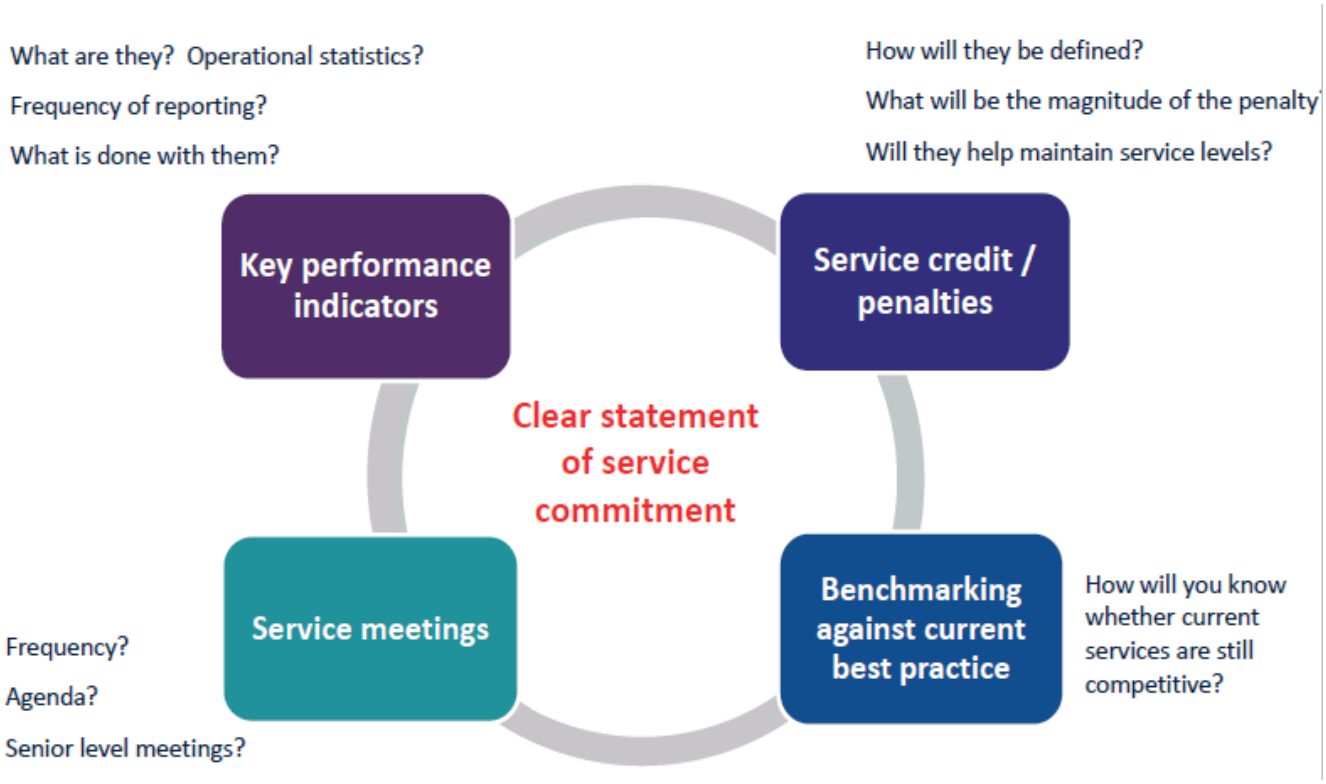
Some of the criteria when considering a custodian are as follows:

- Services required and available
- Financial stability of the firm
- Fees structure
- Ability to interact with the portfolio investment managers
- Technology/infrastructure
- Confirmation that the assets of the portfolio are segregated from the assets of the firm
- Strength of the network of sub-custodian i.e on behalf of the main custodian a sub-contractor appointed by a main custodian as part of its custody network, to hold securities/ assets of clients and sub custodian performs the functions that cannot be done by the main custodian
- Understanding of protection in the event of a default by any party to the chain of custody and legal/regulatory framework that they operate
- Review of an appropriate external auditor report

Managing and Monitoring the Custodian Bank

Many depositary banks will utilize a custodian(s) and/or other securities settlement intermediary to support all or part of their chosen markets of investment. Banks/financial institutions expect broad range of services at a competitive low cost while adhering to applicable rules and regulations imposed according to their jurisdictions when selecting custodians. When monitoring and managing the operations of custodian, the factors need to be considered are given in figure 1.

Figure 1: Criteria for Selecting a Custodian Bank



Source: RAMP, The World Bank, Treasury

Firms/entities that are obtaining custodian services face several challenges, such as difficulty of proactively managing the services of a growing number of providers of custodian services, building a strong partnership and communicating well with providers and providers keeping up with the pace of change in marketplace offerings and meeting their service level agreement requirements when executing their custodian relations. Further, sound controls and safeguards in place, clear proactive communication, accountability, knowledge and understanding of functions performed by the provider would lead to an effective monitoring process of custodian relationships. Investor protection is the other key factor that financial institutions need to consider. Post crisis reforms under Basel III, Basel Committee suggested changes to the methodology for Globally Systemically Important Banks and European Commission structural reform of banking through instance Capital Requirement Directive IV (CRDIV). These are some of regulatory measures adopted at global level to monitor global custodian relations.

Risks Faced by Custodian Banks

The custody industry is associated with various types of risks depending on the services provided by them and the nature of their customer base.

Operational risk: The risk of breakdown in the functioning of custodian business due to insufficient human capital, loss of internal processes or systems and any other autonomous factors such as external volatilities in macroeconomic conditions and market malpractices. Mainly, operational risks occur in relation to settlement and fund management activities and corporate actions provided by the custodian. A corporate action is an instance where

the issuer of a security gives rights in favor of the investor. Creation of an incorrect client account setup, issuance of a wrong standard settlement instructions and unexpected issues in operating systems are some examples of operational risks associated with corporate actions. Operational risks in both fund management and settlements may lead to financial and reputational losses to the custodian bank as all participating financial institutions expect proper management of their portfolios and perform payments and settlement functions for their transactions accurately on time. However, possible operational risks can be minimized by means of adopting proper controls and maintenance of operating systems and systematic methodology for double checking the accuracy of the transactions performed by custodian.

Credit risk: This is the risk of failure by the clients in meeting their financial obligation to the custodian. If clients do not pay back the funds they received from their custodian banks as a form of intraday liquidity or credit advances on time, such custodian banks may have to face credit risk. Custodian banks can impose terms and conditions and policy procedures to monitor and control the credit quality of participating institutions to eradicate possible credit risk. Clients on the other hand need to evaluate the credit worthiness of the custodian bank prior to appointing a bank as their custodian, in order to mitigate the credit risk that they may have to face.

Legal risk: This refers to the risk related to any losses arising due to laws and regulations being inappropriate/unenforceable or other legal circumstances. Main risk that the client faces is loss of entitlement to securities as a result of any legal issue. Further, any losses due to inapplicability of laws in multiple jurisdictions or unforeseen event risks arising as a result of legal matters may also have to face by both custodian and clients. Managing the custody industry, obtaining expert consultations on legal and compliance matters are essential to mitigate possible legal risks.

Systemic risk: This implies the risk associated with the complete failure of a particular business entity on the collapse of entire financial system. If operating and financial system may disturb due to any kind of risk that will lead to create entire systemic risk, irrespective of the level of financial businesses. Sound business practices on operational and financial management and proper business continuity planning will help to mitigate systemic risk associated with the custodian industry.

Country risk: Custodian industry by its nature is associated with multiple jurisdictions where various legal and operational practices exist. A similar custodian service may be treated different angels in line with the applicable laws, rules, regulations and market practices specific to the country or region. Therefore, in order to mitigate country risk, a broad base business management practice with a common set of applicable law enforcement needs to be imposed by the custodian bank.

Challenges in Custodian Industry

The 'Custodian Industry' is facing various types of challenges with the current market developments. Regulatory and supervisory challenges, competition among other participants, volatility in macroeconomic and market conditions, continuous changes in clients' requirements and appetite of clients in experiencing efficient and convenient services associated with the state-of-the-art technologies are major challenges faced by custodian industry. In addition, with the technological advancements and transformations

in clients' demand on innovative and complicated new financial instruments, have created significant challenges to custodian banks. Innovative and dynamic products that are connected to new technology in the financial markets are more prone to risks such as cybersecurity and financial disputes. Therefore, proper management of the custodian industry is vital to overcome possible financial misconducts and ensure smooth operations in the custodian industry.

Future of the Custodian Industry

Participating institution expect their custodians to keep up with emerging technology trends and automate wherever and however appropriate to enhance their service levels and to keep fees down. Expectations for their custodians basically mirror their own priorities: automation, operational efficiency and competent staff. In addition to anticipating T+1 settlement regime, it is required that the expensive on-boarding Anti-Money Laundering/Know Your Customer (AML/KYC) process be more automated and standardized to eradicate financial disputes or misconducts.

Having effectively emerged from the global financial crisis and the lean years that followed, assets under custody are on the increasing phase. This result can be attributed partially to market growth but also to the transformative steps taken to cut costs and increase scale. In the current context, banking and brokerage clients expect custodian banks to innovate and automate what is left of manual processes and to direct human capital and technical resources toward the end goals of providing superior customer service, knowing their clients' business and controlling costs. The notion of offering value-added services has given way to an expectation of those expanded products being essential. The sell-side firms i.e. sevice providers who are engaged in promoting or offering value added procucts to be made available to clients are clear in stating their own priorities, both technological and non-technical in nature. They may concern about cybersecurity as well and may want to provide their own clients with real-time access to their data and flexible reporting via the internet. They are working to integrate data from back-office systems onto a single platform. Accordingly, the future of the custody industry will be more competitive and dynamic in offering excellent customer experience. Further, complying with AML/KYC procedures and application of state-of-the-art technology that facilitates offering fast and convenient services for clients are vital to the existence of the custody industry.

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World-wide Implementation of ISO 20022 Messaging Standards for SWIFT Messages

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1. Introduction on ISO 20022 Messaging Standards

International trade and investments in the global economy have been facilitated through an international payments system that support businesses all over the world through financial messaging. Bulk of the messages sending instructions for cash account management, payments initiation, clearing, and settlements across borders use codes set by the global message network provider, the Society for Worldwide Interbank Financial Telecommunications (SWIFT). However, the formats supporting high value and cross-border payments have been fractured by the lack of common business terminology. The International Organization for Standardization (ISO) 20022 strived to resolve this issue by pushing for a common global standard for financial messaging, called ISO 20022. ISO 20022 is an internationally recognized open standard for payments messaging that has been designed to create consistency across financial messaging for payments aimed at enhancing communication interoperability between financial institutions, their market infrastructures, and the end-user communities. The development of standards across the financial industry messaging on payments, securities, trade services, payment related cards, and the foreign exchange business domains are expected to provide better structured, more meaningful data As ISO 20022 is mandated by SWIFT, messages for all cross-border payments related to SWIFT by all financial institutions (FIs) should be ISO 20022 compliant or denoted as MX, from March 2023 onwards and the migration to MX messaging is expected to be completed by end November 2025. ISO 20022 is expected to harmonize formats and data components from different payment methods that could not previously work together. FIs are coming under competitive pressure to move to the new universal financial messaging standard. Globally, 70+ countries are moving to use ISO 20022 in their domestic payment systems, including Switzerland, Japan, China, and India.

2. The Difference between Present SWIFT Messages (MT) and ISO 20022 standard SWIFT messages (MX).

The significant difference between SWIFT MT message formats and the new MX message format used for ISO 20022 is that MX message

formats are far richer in data and better structured, more granular, and easier to automate payment information. The Banks can leverage this data to enhance everything from sanctions and compliance processes to customer analytics. One of the dis-advantages of relying solely on MT-MX conversion to tackle ISO 20022 migration is that this richer data may be discarded when translating an MX message back into the MT format. Table 01 below provides the comparison between MT and MX formats.

messages including MT categories MT-1xx, MT-2xx and MT-9xx.

SWIFT MT 1 series – Customer payments message

SWIFT MT 2 series – Financial Institution payments message

SWIFT MT 9 series – Statements message

However, this does not apply to the other SWIFT MTs such as the 3, 4, 5, 6, 7 series.

Table-01 Comparison between MT and MX message Formats

MT Format	**MX Format**
Non-XML[1] proprietary message format	XML-based messages
Structured according to the specifications of the ISO 15022 standard	Structured according to the ISO 20022 standard
Use the FIN protocol[2]	Use the XML protocol
Less structured	More structured and rich data
MT messages are followed by a three-digit number: • 1st digit indicates the message category (1) • 2nd digit indicates the message group (0) • 3rd digit indicates the message type (3) **Eg: MT 103**	The MX messages are composed of four parts: • 4 alpha characters indicate the message type • 3 alphanumeric characters identify the message number • 3 numeric characters highlight the message variant • 2 numeric characters indicate the version number **Eg: pacs.008.001.0x**

1. XML stands for extensible Markup Language. XML was designed to store and transport data.

2.. Protocol is a set of rules for formatting and processing data.

3. The Plan for ISO 20022 Implementation

i. SWIFT expects to commence migration for cross-border payments in November 2022 for all payments and cash management

ii. Migration process involves coexistence phase for the period of approximately 4 years, and the users are allowed to use both MT and MX that is facilitated by translation

services provided by SWIFT that enable users to translate messages between ISO 20022 and their MT equivalents.

iii. At the end of the coexistence phase, all users are expected to have migrated to ISO 20022 and translation services will be removed and SWIFT also expects to withdraw support for the MT message Categories 1, 2 and 9 used in cross-border and correspondent banking payments

4. The Phases of ISO 20022 Messaging Standards

According to SWIFT, the implementation of ISO 20022 involves three phases:

Phase 1: March 2023 - ending 2023

i. Cash processing system will remain with MT format.

ii. Participants will be able to send both MT and MX format messages

Phase 2: From 2024 until November 2025

i. To avoid the risks associated with migration, FIs are expected to gradually move the cash processing to new MX format-based platform.

ii. Cash processing messages will become MX format based and will be able to send MX format instructions.

Phase 3: November 2025 and beyond

i. As of November 2025, cash processing messages will be fully on MX format based

ii. All FIs must send MX format instructions. It will no longer be able to send MT format instructions

5. Key benefits of ISO 20022 implementation

All FIs including banks plan their migration to ISO 20022 which will have a wide range of benefits. Further, it provides the complete transaction sequence for securities, payments, and certain trade transactions. Some of the benefit to FIs are as follows:

i. Highly structured and enriched data: ISO 20022 carries data in a more detailed and better-structured format. This well-structured format is used by many real-time, low-value, and high-value clearing systems around the world. Richer and highly structured and enriched data means fewer errors, less manual intervention, fewer delays for the end customer and ultimately more accurate and efficient, cost-effective, and higher quality payment system which do experience for all. Enriched data in a structured format enables the system to detect Anti-Money Laundering (AML), fraud, or sanctions and it will help to target financial crime and compliance.

ii. Higher Straight-Through Processing (STP) involves an automated process of electronic transfers with no manual intervention on financial messages that would further reduce the delays for the end customers. Use of ISO 20022 messages will eventually result in higher end to end STP rates, with fewer false positives arising from poor data quality risk bearing information in payment related exchanges.

iii. Flexibility ISO 20022 has a flexible framework which allows banks to adopt changes easily.

iv. Interoperability Interoperability is also an important feature. ISO 20022 promotes greater interoperability of messaging standards

to enhance cross-border payments and it can ensure better interoperability between different high value payments and domestic payment systems across the globe.

v. **Analytics and Automation** Enriched data helps in data analytics and creating automation which improves decision making and reduces processing time. The banks would be able to automate their daily complex activities like reconciliation and other back end operations. This is highly structured messaging formats. So, machines can read messages better with faster automation and resolution.

vi. **Worldwide Adoption:** About 70+ countries have already adopted ISO 20022 standards safer.

6. Key challenges of ISO 20022 implementation

Following are the few challenges faced by FIs with ISO 20022 migration.

i. Implementing ISO 20022 as a Messaging Standard

FIs that are dependent on legacy systems will need to map their current systems to ISO 20022 standard using some IT solution. This solution will help translate the financial message format as per the standards, perform all the required validation checks, and enrich the data in the financial message. Apart from this, there are other supplementary services that banks, or FIs will have to maintain mandatorily. They will need to upgrade their existing systems to support ISO 20022 message formats, systems, and other compliance checks.

ii. Upcoming Payment Market Practices

With the implementation of ISO 20022, all FIs have to face various kind of challenges to support upcoming payment market practices like Cross-border Payments and Reporting Plus (CBPR+), (High -Value Payment Systems (HVPS), and High-Value Payment Systems Plus (HVPS+. The market practices will follow ISO 20022 messaging standards, but there are differences in the Guidelines for implementing them.

iii. Global Implementation Timelines and Deadlines

SWIFT has proposed a 3-year timeline using ISO 20022 for the implementation of this standard across cross-border and reporting payments starting from March 2023. Firms that are operating payments across borders need to carefully plan their migration strategy with respect to different markets and settings to ensure the deadlines for ISO 20022 adoption are met on a timely basis The Federal Reserve Bank of New York, Bank of England, and Bank of Canada currently accept cross boarder MX messages However, the sending date of MX messages is not confirmed yet.

European Banking Authority (EBA) and UK financial authority are aligning with SWIFT ISO 20022 migration plans and schedules, adhering with SWIFT ISO 20022 Road Map. Further, in Australia, the local network participants have confirmed that they desire to migrate to ISO 20022 before end of 2023.

iv. Upgrading Current Infrastructure and implementation cost

Some ISO 20022 messages are enormous compared to SWIFT (MT messages for global payments), US Payments and other payment message formats. FIs will need to resize all current infrastructure to consider the storage of financial messages. This would increase their cost on infrastructure facilities

and services, which offers essential computer, storage, and networking resources on-demand. Outdated legacy systems that could not process or support the ISO 20022 format need to be updated, replaced, or converted. This of course, involves a cost, which needs to be agreed upon between FIs, stakeholders, and partners.

v. Managing additional information

ISO messages can be hundreds of times longer than standard payments messages. This dramatic expansion of data means that infrastructures will need to be re-defined to manage the additional ISO 20022 information. Every character within a message must be hundred percent aligned with the specifications. The format is validated at several steps along the communication channel chain on the sending and receiving sides.

7. ISO 20022 implementation in Sri Lanka

ISO 20022 has been implemented internationally by several key Financial Market Infrastructures (FMIs) for their High Value Payment Systems (HVPS) in Japan, Switzerland and China. Several other global FMIs are now on track to adopt ISO 20022 messaging over the next five years.

As per SWIFT Global timelines published with regard to ISO 20022 migration, Central Bank of Sri Lanka (CBSL) and other FIs in Sri Lanka are expecting to go live with MX payment messages and cash management messages (MT Category 1, 2 and 9 messages) by end December 2024 onwards. Other message types will remain as it is in the MT message formats unless there is a very rare requirement arising from the business units.

Migrating to ISO 20022 Messaging Standards for SWIFT messages is required to be established to support the implementation process from the CBSL side. ISO 20022 message formats are totally different from current message formats. However, to streamline the process and to work towards achieving the deadlines as a SWIFT member institution. The ISO Committee is responsible to devise an ISO 20022 migration plan for CBSL and implement the same to achieve the time targets stipulated by SWIFT. Currently CBSL are adhering ISO 20022 new message formats to testing in local and cross border. Further, ITD configuring the system platforms for SWIFT ISO 20022 global migration, SWIFT division officers worked as a team to research the new system without any consultancy unlike for RTGS or FX, by referring SWIFT smart courses and related documents provided by SWIFT com Web portal. As a team we successfully created MX messages and then tested in both internal and cross-border levels with zero errors.

The first key date of adoption was 20 March 2023 and that opens a co-existence period that will end in November 2025.

8. Summary

ISO 20022 messages play a vital role in the overall modernization of payment processes; especially by providing a structured and data-rich common language that could be readily exchanged among corporates and banking systems**.** The new standard allows banks and payment participants to include significantly more contextually relevant data related to payments in their messaging. It also provides rich structured party data, extended remittance information and allows for special characters and expanded character sets.

Overall, since the ISO 20022 adoption will provide benefits to the entire payment's ecosystem i.e.

banks, FIs, and customers, the SWIFT community would have to align with the ISO 20022 migration plans irrespective of the challenges. Globally, banks and FIs are currently in the process of transitioning their payment systems from MT to MX as they move towards the new ISO 20022 compliant era. Over the next three years there will be a co-existence window where both MT and MX message standards will be run concurrently. By 2025, ISO 20022 messaging standard will be the universal standard for high, or large-value payment systems of all reserve currencies. if any FIs are unable to adopt and are not ready for ISO 20022 messaging standard, they may have to discontinue their business operations, as payment instructions would not be coming forth from their correspondent parties to process the relevant transactions. Thus, it is better to get onboard than be left behind, in this global transition to ensure a better future for all, in international trade and investment.

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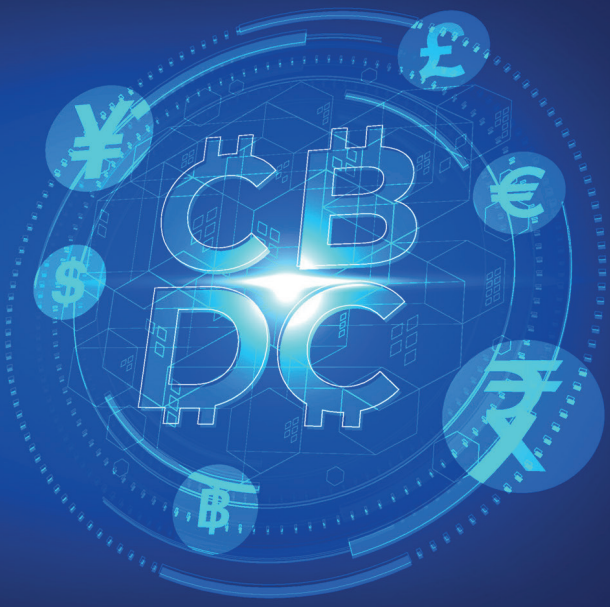
Towards Central Bank Digital Currencies (CBDC) in Sri Lanka



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1. Current situation of the Sri Lankan economy

The global economic growth is expected to weaken from 3.4 per cent in 2022 to 2.8 per cent in 2023, due to scarring impact of the COVID-19 pandemic, a slower pace of structural reforms,

as well as the rising threat of geoeconomic fragmentation which direct trade tensions, less direct investment, and a low growth of innovation and technology. Meanwhile, global growth also projected to rising modestly to to 3.0 per cent in 2024 as well. As per World Economic Outlook - April[1] 2023 (WEO) elevated inflation is expected to decrease, although more slowly than initially anticipated among advanced economies, emerging markets and developing economies (IMF, 2023). However, most of the countries continue to follow tight monetary policy stance to curb inflationary pressure. When advanced economies increase their policy rates, emerging markets and developing economies including Sri Lanka have encountered risks to financial stability such as, decrease in capital flows, devaluation of domestic currency, increase in debt levels etc. Further, domestic economic activities are also severely affected by rising commodity prices due to recent adverse developments in the global front, supply chain disruptions, geopolitical tensions in Eastern and domestic power interruptions. Accordingly, annual change in the Colombo Consumer Price Index (CCPI) increased significantly during 2022. However, year-on-year change in the CCPI decreased to 25.2% in May 2023 from 35.3% in April 2023. Further, both food inflation and non-food product inflation recorded 21.5 per cent and 27.0 per cent respectively (DCS, 2023).

2. Recent trend in money supply and Currency in Circulation (CIC) in Sri Lanka

2.1. Monetary Policy Actions

In times of Covid-19 pandemic, Central Banks expand the money supply through expansionary monetary policies to stimulate the economy and to provided much needed liquidity to banks and public. Following the health crisis, the money supply grew at historically high rates in most of the countries (Louis, et al., 2022). In Sri Lanka also maintained expansionary monetary policy by reducing policy rates and the Statutory Reserve

1 Global inflation will decrease, although more slowly than initially anticipated, from 8.7 percent in 2022 to 7.0 percent this year and 4.9 percent in 2024

Ratio (SRR) from the onset of the pandemic until scaled back in August 2021. Hence, Monetary aggregates expanded rapidly during the pandemic as private credit also started to rebound. However, in April 2022 Central Bank of Sri Lanka (CBSL) increased the Standing Deposit Facility Rate (SDFR) and the Standing Lending Facility Rate by seven hundred basis points to 13.50 per cent and 14.50 per cent, respectively, to address booming inflationary pressures.

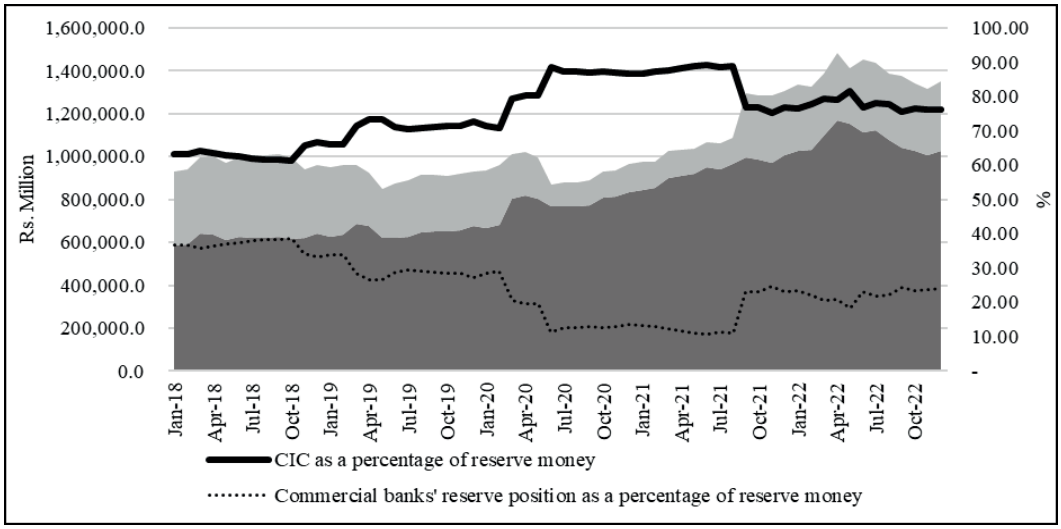
2.2. Behavior of Currency in Circulation during the period

The increase in reserve money was due to higher demand of cash in the prevailing COVID-19 pandemic and ongoing economic crisis. On average the contribution of Currency in Circulation (CIC) to the reserve money recorded more than 80.0 per cent since March 2020 and showed an increasing trend. Further, the sharp increase in currency demand started in mid-March 2020 (Chart 1).

This exceptional growth in CIC in Sri Lanka has been clear evidence of the tendency of the general public, business entities and financial institutions to hold cash in hand as a store of value during Covid-19 pandemic and during ongoing economic downturn. The low interest rate environment maintained until April 2022, that brought by the expansionary monetary policy stances taken by Central Bank of Sri Lanka (CBSL) to stimulate the economy also reduced the opportunity cost of holding banknotes and coins that people opted to hold more cash. In a normal year, CIC increases during festive periods[2] as it evident by the higher levels of cash withdrawals, which quickly subside as they are returned to the banking system soon afterwards. But during the pandemic, the public held more currency rather than returning it to the banking system. Further, the substantial reduction in the statutory reserve ratio applicable on all rupee deposit liabilities of licensed commercial banks,

Reserve Money	=	Currency issued by the Central Bank	+	Commercial banks' deposits with the Central Bank

Chart 1: Trend in money supply



Source: Central Bank of Sri Lanka

2 Mid-March to mid-April (Sinhala and Hindu new year festival) and during the month of December(Christmas)

also resulted in the injection of additional liquidity to the domestic money market (CBSL, 2022). However, upward revision in monetary policy rates was inadequate to attract deposits into the banking system from the excessive currency in circulation. That is mainly because ongoing inflationary[3] psychology led consumers to spend now rather than later, on the assumption waiting will cost more (Hawkins, 2022). Accordingly, depending upon all these facts, Sri Lanka's cash demand is in an increasing trend.

3. Cost of using paper currency to satisfy growing cash demand.

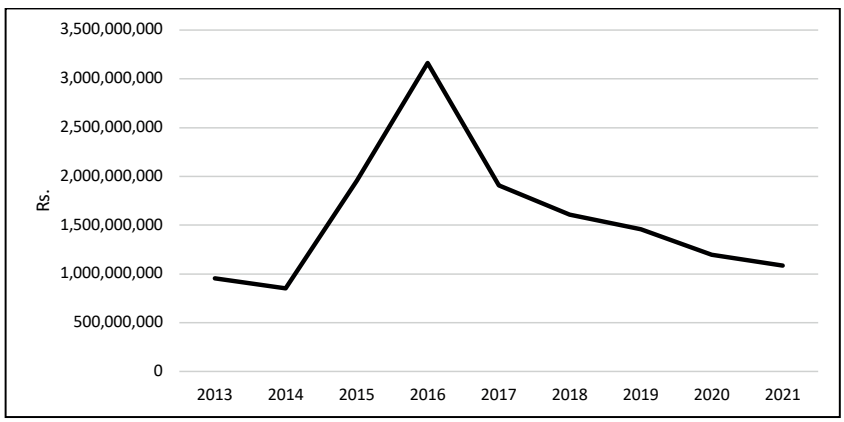
As most of the banknotes are made of paper, they are not strong enough and can be damaged. Further, paper currency is always exposed to the risk of counterfeiting. Most of the time, counterfeiting is motivated by personal gain. However, in some cases currency counterfeiting has also been used as a weapon to destabilise economic and political stance of countries (Finlay & Francis, 2019).

According to the empirical evidence, paper currency dilutes efficiency in monetary policy implementation in countries during severe downturns. With the existence of paper currency, it is difficult for Central Banks to take policy interest rates much below zero to fight against large deflationary pressure. However, if all Central Bank liabilities were based on electronic platforms, paying a negative interest on reserves would be much easier (Rogoff, 2014). Further, researchers conclude that, as paper currency facilitating anonymous transactions, there is a higher tendency of increasing illegal transactions which cannot trace by the tax or law enforcement authorities. Moreover, cash payments by employers to undocumented workers are a principal driver of illegal immigration.

3.1 Currency management of CBSL and cost of handling hard currency

The CBSL has legal monopolies over issuing currency in Sri Lanka which includes both currency notes and coins as specified in the Monetary Law Act No. 58 of 1949. Accordingly, CBSL is entrusted with designing, printing, minting, and distributing Sri Lanka's bank notes and coins. This leads to

Chart 2: Cost of Printing currency notes, for the year ended 31 December



Source: Central Bank of Sri Lanka

3 Further, global stagflation environment, higher commodity prices and shortages in food and fuel will continue to lead higher inflation and worsen current economic crisis. It proves that the monetary policy is less effective in a financial crisis, when impairments in the monetary transmission mechanism may occur. Hence, when the downturn is coupled with a financial crisis subsequent economic recovery is more elusive (Bech, Gambacorta, & Kharroubi, 2012).

ensure public confidence on banknotes as a means of payment and a secure store of wealth, while maintaining proper functioning of the economy. The Currency Department of the CBSL functions as the sole issuing authority of the legal tender in Sri Lanka. Printing of the currency notes is carried out by De La Rue Lanka Currency and Security Print (Pvt) Ltd. (Central Bank of Sri Lanka, 2022). Accordingly, CBSL spend a huge cost to print currency notes in each year *(chart 2)*.

In order to deliver an adequate supply of currency In order to deliver an adequate supply of currency notes / coins to meet the demand from the public and businesses, CBSL maintain stocks within the premises under high security environment. These currency notes are verified by the Currency Note Processing System (CNPS) through high-speed note processing machines and the unfit notes are shredded online while serviceable notes are processed and reissued to commercial banks. Notes counted using desktop counting machines are also issued to commercial banks for circulation, while unserviceable notes are destroyed by the CBSL. Accordingly, CBSL incurs huge costs on currency management every year with the increasing cash demand. Hence, considering the increasing cash demand, cost and other security issues, it's time for CBSL to research on alternatives for hard currency.

4. Less cash future

In many countries around the globe, the demand for paper currency has been diminishing rapidly as consumers have turned increasingly to using credit and debit cards as well as mobile phone and internet-based payment methods. Hence, this technological advancement has made possible ways of creating cost-effective digital alternatives to banknotes and coins, which have more advanced characteristics than traditional currency instruments. Accordingly, CBDC is potentially a new form of digital Central Bank money, which has emerged as a hot topic in the financial world.

4.1 What is CBDC?

With rapid and intense changes taking place in payment systems, most Central Banks have started considering the benefits and challenges of issuing a digital version of fiat currency. A CBDC, as the digital claim on a Central Bank, satisfies the major functions of money. Their value is linked to the issuing country's official currency. CBDC can function as a practical costless medium of exchange for goods and services, secure store of value and stable unit of account (Bordo & Levin, 2017).

4.2 What are the different types of CBDCs.

Wide variety of approaches are being piloted in various countries to introduce CBDC. CBDC tend to be categorised mainly based on their intended user base, underline format and distribution models.

Wholesale CBDCs are designed to be used by limited financial intermediaries such as limited groups of commercial banks and clearing institutions. Currently, wholesale efforts are more frequent in advanced economies that have more developed interbank systems and capital markets to settle wholesale transactions in central bank money in a digital manner.

Retail CBDCs are made available to a wider array of participants, constituting all economic agents in an economy, ranging from individual consumers to corporates. Retail CBDC projects are more common in emerging economies with financial inclusion expected as an outcome.

Account based CBDCs - ownership of the CBDC is linked to an identity whereby a transaction is

an update of payer and payee balance. This type of format resembles the systems we use today for sending digital payments.

Token based CBDCs - ownership of the CBDC is linked to proof. Along with other forms of tokenised money such as cryptocurrencies and stablecoins, token based CBDCs can be programmed in different logics.

Direct Model - Under this model, all parties involved in the transaction hold an account at the central bank. Payments will simply be a transfer from one account to the other and all claims will be backed by the central bank. Know Your Customer (KYC) and Anti-Money Laundering (AML) compliance requirements will be met by the Central Bank.

Indirect Model: In the indirect model, the central bank will pass the digital currency token to the commercial bank or a non-bank financial institution, which will then distribute the currency and handle KYC and AML requirements.

The Hybrid Model: A big proportion of Central Banks are working on a hybrid model, whereby the central bank distributes CBDC to a regulated intermediary such as a commercial bank or fintech, which handles the transaction and the KYC and AML requirements.

4.3 Benefits of CBDC

CBDC has the potential to reduce the cost of printing and minting notes and coins in the long run. The operating cost of CBDC would be cheaper to administrate in the long run compared to hard currency which requires regular replacement due to wear and tear, highly secured storing facilities and handling. Accordingly, Central Bank of Kenya expects substantial saving in the cost of printing hard currency with the implementation of a virtual shilling (Mwaniki, 2022).

Customers usually pay significant charges for withdrawing cash from Automated Teller Machines (ATM). Further, retail businesses spend substantial costs for sorting, cleaning, and verification of cash as well as interchange fees for taking payments via debit and credit cards. Compared to hard currency, establishing CBDC could be costless and provide substantial efficiency in payments as it elliminate above costs and steps(Bordo & Levin, 2017).

Central Banks are currently exploring precautions that could be built into any CBDC to address financial crisis. Accordingly, as per research findings the main reason that Central Banks would prefer CBDC over a bank account is that CBDC is not at risk when banks fail. In a systemic banking crisis, transfers from bank deposits into CBDC would face lower transaction costs than those associated with cash withdrawals that cost on going to the ATM, waiting in line, etc. Further, it would provide a safe-haven destination in the form of the Central Bank. The removal of that risk would be favorable to individuals and the economy equally (BIS, 2021).

The latest edition of the Global Findex shows 1.4 billion adults remain unbanked which is costly and affects economic growth and development. With the implementation of CBDC government can improve its service delivery to citizen[4], such as instance government to citizen payments, welfare disbursements and loan and subsidy programs. Thoughtfully designed CBDC can support expanding access to cheap and affordable financial tools and services. Further, research findings emphasize that CBDC could offer significant

4 Nearly 35 per cent of adults in low-income countries opened their first financial account to receive government payments

benefits for financial inclusion and public services in emerging and developing countries (Wright, Fingerhut, & Packard, 2022). In addition to that, implementation of CBDC can reduce inefficiency in taxation and improve welfare by discouraging tax evasion. Further, CBDC will strengthen fiscal resilience through tax revenue from previously unrecorded transactions. Record-keeping of such economic activity will minimize anti-money laundering and terrorist financing (Maryaningsih, Nazara, Kacarib, & Juhro, 2022). In addition to that CBDC-based solutions could reduce costs and significantly decrease the number of intermediaries involved in cross-border payments. Accordingly, the transfer of money across banks and country boundaries becomes much more straightforward with the implementation of CBDC. Hence, well designed CBDCs are likely to offer the best solution to the remittance problem as well.

Empirical studies proved that in aggregate levels, US economy will increase Gross Domestic Product (GDP) by 3.0 per cent with the adoption of CBDC permanently due to reductions in real interest rates, distortionary taxes, and monetary transaction costs (Barrdear & Kumhof, 2016). However, CBDC which is a version of "stablecoins"[5] would need careful design and implementation to allow time for financial system to adjust.

4.4 Challenges associate with CBDC

The legal and regulatory aspects are one of the key potential challenges coupled with CBDC implementation. Current legislation in some authorities may prevent or control the issuance of CBDCs.

Further, if it is not properly designed, the issuance of a CBDC may have major consequences in terms of financial stability and lead to serious consequences in the banking business. Such potential implications could spill over to the wider financial ecosystem and the macroeconomy.

Another major challenge is related to CBDC is technical infrastructure and application such as, where internet connectivity, especially in rural areas, interoperability with the existing systems, and cyber-attacks.

Financial literacy of the public is a serious challenge on issuing a CBDC. Even if a country's digitalisation in daily life and in the financial services industry has increased, this does not necessarily imply an increase in financial literacy among its population. It may make it even harder for specific segments of the population to access and use the new technologies and the related digital services, if it is not properly educated. This could result in financial exclusion of such groups.

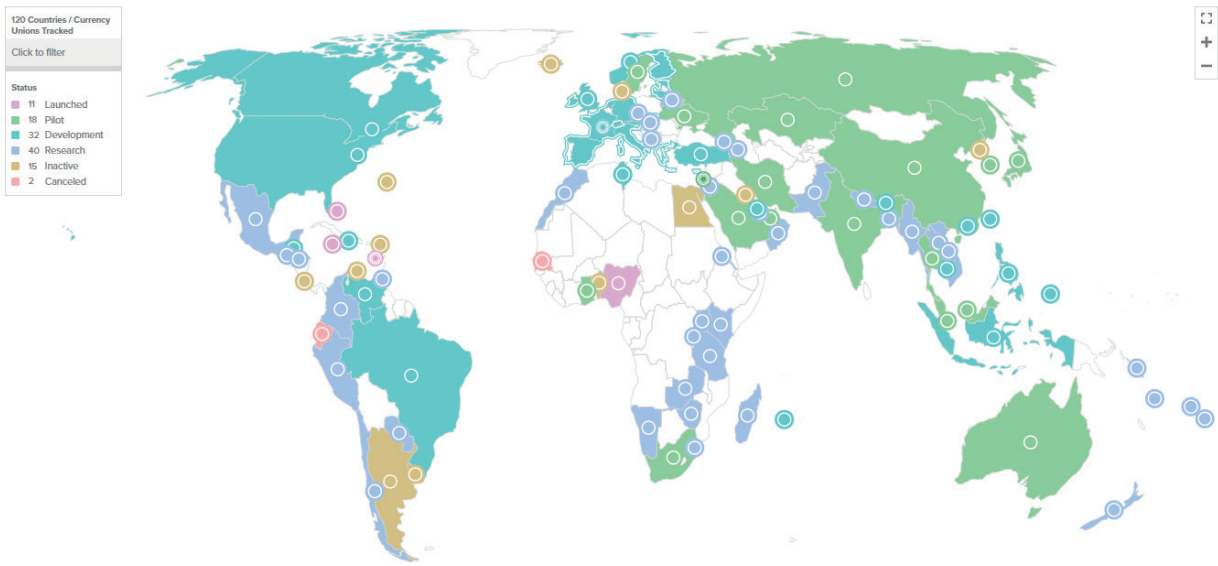
4.5 Global status of CBDC.

The number of countries considering launching a CBDC has soared in the past few years. Currently, Central Banks are going through various stages of development to assess the benefits and risks of CBDCs and consider how best to deploy them (Chart 3).

Sweden's Riksbank has developed a proof of concept and is exploring the technology and policy implications of CBDC. India, Australia, Japan, Philippines and Russia have already initiated the pilot project of CBDCs that are currently being tested. China's Central Bank started putting in place policies for a Digital Yuan, and they are currently conducting large-scale public trials in selected cities. Further, The European Commission is planning a bill to introduce a "Digital Euro" as

5 That is fully backed or collateralized by fiat currency — what some call "digital fiat currency."

Chart 3: Status of global CBDC implementation



Source: www.atlanticcouncil.org/cbdctracker

soon as 2023. The U.S. has no set plans to issue a CBDC, but the Federal Reserve recently invited the public to begin an open discussion about the value of a CBDC.

There are eleven countries that have fully launched CBDC including Nigeria, Bahamas, eight Eastern Caribbean countries and Jamaica. Nigeria and its e-Naira became the latest country to institute a CBDC. It is the first country in Africa to create a CBDC.

5. Sri Lanka and CBDC

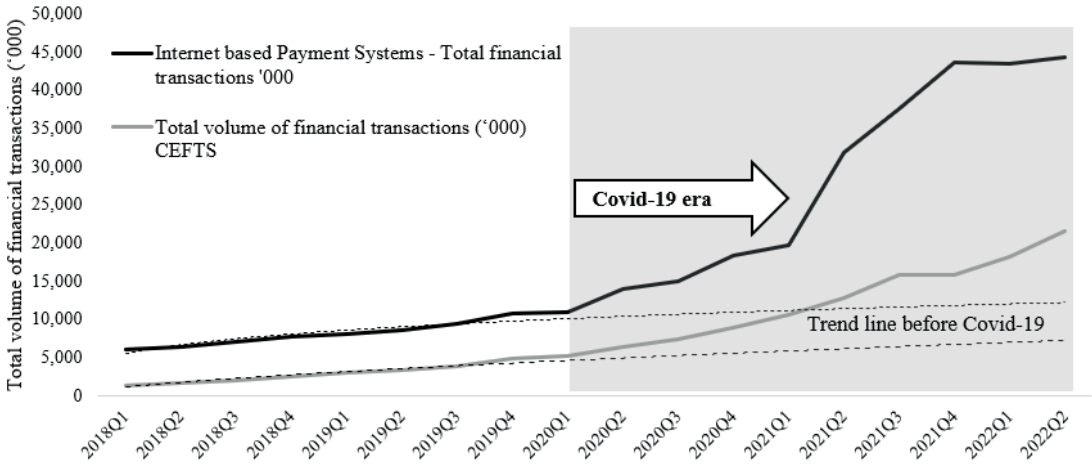
The COVID-19 pandemic has spurred digital financial inclusion – driving a significant increase in digital payments amid the global expansion of formal financial services. The number of noncash retail payment transactions have increased at a compound annual growth rate of 13.0 percent from 2018 to 2021, where emerging markets recorded 25.0 per cent.

The rapid growth in volume of transaction in internet-based payment systems[6] and total financial transactions of Common Electronic Fund Transfer Switch (CEFTS)[7] were observed in Sri Lanka also from April 2020 onwards in comparison to the pre-Covid-19 era (Chart 3). This trend was backed by implementation of the favorable regulations for digital payments by the CBSL. Further, Covid-19 pandemic hastened the decline in the use of cash as a medium of exchange due to the risk of transmission of Covid-19 Virus via banknotes and coins and lockdown and social distancing rules have led to a drop of cash withdrawals from ATM.

6 Internet banking allows bank customers to access banking services through Internet. In Sri Lanka, financial institutions facilitate customers to obtain account information, apply or subscribe for financial products/services, perform own account/ third party fund transfers and pay utility bills via Internet banking

7 Lankapay CEFTS provides the real-time, retail fund transfer facilities to customers of LankaPay CEFTS members through payment channels such as Internet Banking, Mobile Banking, Kiosks, Over the Counter (OTC) and Automated Teller Machines (ATM), was launched in 2015.

Chart 4: Internet based Payments and CEFT transactions



Source: Central Bank of Sri Lanka

Further, CBSL is continuously engaging in promoting digital payment systems to move Sri Lanka into a less-cash society. CBSL approved a 'Digital Road Map for 2020-2022', with the aim of expanding the potential of the interbank payment infrastructure, promoting e-payments, strengthening payment system security, and ensuring conducive regulatory environment. As mentioned above, Sri Lanka has already made a significant improvement in the digital payments and showed drastic digital financial inclusion along with that.

Further, during 2021 rapid growth in internet data usage was witnessed and internet connections per 100 persons, increased to 100.4 in 2021 compared to 79.9 recorded in 2020. In 2021, telephone penetration including cellular phones per 100 persons, registered 148.1 (CBSL, 2021). Such development also creates favorable environment to the implementation of CBDC and increase the popularity of it.

According to the Financial Literacy Survey Sri Lanka - 2021, 57.9 per cent of adults[8] were registered to be financially literate compared to the 35.0 percent reported by the GFLS[9] 2014. Accordingly, during last seven years financial literacy rate of Sri Lanka has increased by nearly 23.0 per cent. More importantly, survey proves that young adults in Sri Lanka are more financially literate than the elderly population and digital usage also having positive correlation with higher financial literacy. This positive scenario reveals that the population might be more financially resilient in the future (CBSL, 2022).

Workers' remittances have been a key pillar of Sri Lanka's foreign currency earnings and covering around 80.0 per cent of the annual trade deficit, on average, over the past two decades. During the pandemic, a recordable slowdown in workers' remittances was observed. The government and CBSL implemented several measures to induce worker remittance. CBDCs have the potential to enhance the efficiency of cross-border payments, with the selected design and degree of interoperability. Accordingly, the low speed and high costs of cross-border remittances in the traditional financial system provides an additional motivation for an arrangement of CBDCs.

8 aged over 18 and less than 80, nationally representative sample of 4,800 households.

9 Government Finance Statistics Manual

Under such favorable environment, CBSL is researching on implementation of CBDC in Sri Lanka. The establishment of a CBDC requires considerable expertise and a deep knowledge of the design choices to address possible issues, which will give rise during the process. After completing feasibility study, CBSL have to commence Proof of Concept (POC) on CBDC issuance and usage to identify preconditions for the implementation of CBDC in the country.

Further, it is necessary to establish proper regulatory framework to facilitate the issuance of CBDC and impact assessment to the macroeconomic variables/ monetary policy and the overall stability of the financial system of the country with such implementation. Meanwhile, as many other countries, CBSL requires to launch pilot project on CBDC under restricted environment. Later, with the lessons learnt from the POC and the pilot project, CBSL can determine how CBDC can be rolled out in Sri Lanka.

However, issuing a CBDC would not be an easy task. But there are ways to mitigate the challenges, while disseminating benefits for the broader population. Clear policy objectives, broad stakeholder support, strong legal framework, robust technology, and market readiness would be essential foundational elements for CBDC implementation.

6. Conclusion

The existence of a CBDC expands the international spillovers of standard macroeconomic shocks to a significant extent, while increasing international linkages. CBDC rises asymmetries in the international monetary system by reducing monetary policy autonomy in foreign economies, but not domestically, implies that establishing a CBDC earlier rather than later could give rise to a considerable first-mover advantage[10] (Ferrari & Stracca, 2022). To achieve such an advantage, CBSL also have an opportunity to move towards regulated stable digital fiat currency by conducting appropriate research, while taking the advantages of existing favorable environment.

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CLIMATE RISK – An Introduction

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Introduction

The global temperature has already risen 1^0 C above pre-industrial level due to Global Warming, and is expected to reach 1.5^0 C above pre-industrial level between 2030 to 2052 (IPCC, 2018). Warmer temperatures could cause the sea levels to rise, disrupting the balance of nature and affect weather patterns over time; increasing the frequency of extreme weather conditions such as flash floods and severe droughts. These pose significant challenges to the global ecosystem as well as to the socioeconomic and financial systems. In response to these challenges, policy makers are engaging in climate change mitigation and adoption efforts. One such major effort is led by the United Nations Climate Change Conference held in 2015, that resulted in the Paris Agreement (UNFCCC, 2015), under which 196 countries agreed to reduce the emission of Green House Gases (GHG), mainly CO_2, and to keep global warming below 2^0 C. The same goal is reaffirmed at the Climate Change Conference held in Glasgow in 2021 (UNFCCC, 2021). Climate change mitigation refers to the actions taken to reduce GHG and/or improve the carbon sinks that absorbs GHG, such as forests. Shifting away from fossil fuel to renewable energy, developing sustainable transport, and modifying the buildings to improve their energy efficiency are the measures taken to mitigate climate change. Climate change adoption measures such as protecting shorelines from flooding or developing drought-resistant corps improve the resilience to climate change while reducing the vulnerabilities to the adverse impacts of climate change.

With climate change, the frequency of occurrence of extreme weather events such as floods, droughts or storms, is expected to increase and their impacts are expected to be more severe. They could not only affect the capital stock and disrupt the economic activities but could result in significant loss of lives and livelihoods. These losses can pose a risk to financial institutions and to the financial system. For example, a reduction in harvest due to a severe drought may lower the ability of farmers to repay their debts, increasing the credit risk for the bank(s). It is not only the climate change that poses challenges to the economic and financial systems but the adoption of climate change mitigation policies could also pose challenges to the economic and financial systems. In order to achieve the

objective of the Paris Agreement of limiting the global warming below 2^0C, one third of the global oil reserves should remain underground (McGlade and Ekins, 2015) until 2050 and oil would become a stranded asset. If countries work towards achieving this goal, firms and countries which are owning oil reserves will face significant financial losses. Further, countries which are heavily rely on oil requires new capital to invest in alternative energy sources and could face financial difficulties. To implement climate change adoption measures also requires significant amount of capital and Glasgow Climate Pact (UNFCCC, 2021) has noted that the current provision of climate finance for adaptation remains insufficient to respond to worsening climate change impacts in developing countries.

Sri Lanka has also signed the Paris Agreement and very recently announced its willingness to become the first country in the region to adopt a green economy. If Sri Lanka is to become a green economy, it is required to implement drastic policy changes which will pose risks to the country. The country which is highly dependent on fossil fuel to fulfil its energy requirement may need to invest heavily in renewable energy sources. That may not only increase the borrowing costs of the government and/or corporates, but would also affect government income, as it may be compelled to provide some tax incentives to lure investors in renewable energy. Alternatively, the Government could increase the tax on fossil fuel to discourage the use of fossil fuel. However, taxing fossil fuel will increase cost of production and reduce the profitability of firms. While Sri Lanka is facing challenges in implementing climate change mitigation policies, it also faces challenges pose by ongoing climate changes. Sri Lanka is deemed to be highly vulnerable to climate change, as it faces significant threat from extreme heat which threatens human health, living standards, agricultural yields and with a possibility to have an adverse impact on the tourism sector of the country (Climate Risk Country Profile: Sri Lanka (2020)). In this context, this article intends to provide an introduction to climate risk, its drivers, its impact on monetary policy and financial markets and its transmission channels: ways through which a climate change could end up with materializing as a source of financial risk.

What is Climate Risk?

Climate scientists around the world agree that global temperature is increasing due to man-made GHG emission and global climate has been changing as a consequence of global warming. Change in climate pose significant risks to the global ecosystem, socioeconomics and financial system. In recognition of the risk of global warming and its impact, policy makers have started to respond by initiating climate change mitigation and adoption measures, which in turn poses risk to the global socioeconomics and financial system. Thus, climate risk is classified into two broad categories; the physical risk – resulting from climate change and the transitional risk – arising from the action taken to mitigate the climate change.

Physical Risk

Physical risk is the risk of damage to people and physical assets due to climate change. Physical risk may arise due to acute, i.e sudden and severe weather events such as floods, droughts, storms and landslides or it may be due to longer-term chronic impacts such as rising temperature and rising sea-level.

Transition Risk

Transition risks arises due to changes in climate policies, business and consumer sentiment or

technological developments to achieve a low-carbon economy, which may stress certain countries, industries and firms. For example, the oil and gas industry must refrain from tapping into 80% of the fossil fuel reserves, to achieve the global warming target of below 2^0 C, and those assets would become "stranded assets".

Four categories of transition risk have been identified by The Task Force on Climate-Related Disclosures (TCFD), which was established by Financial Stability Board of the Bank for International Settlement.

(a) Policy and Legal Risk:

In the process of transitioning to a low-carbon economy, policy makers will bring new policies and regulations which may be an additional burden on some companies and affect their competitiveness. Further, legal risks may arise from firms that face litigations in the event of failing to comply with the policies and regulations brought to mitigate climate change.

(b) Technology Risk

Technology risk arises from the uncertainty in the timing of development and deployment of low-carbon innovations or technological improvements by organizations, which may displace the existing technology. For example, shifting from fossil fuel energy to renewable energy such as solar power may affect the competitiveness of some firms and ultimately threaten the existence of such firms.

(c) Market Risk

With changes in consumer preferences towards greener solutions, the supply and demand for some of the existing products, commodities or services may be affected in the future, lowering revenue for some companies.

(d) Reputation Risk

Reputation of an organization can be damaged if that organization is judged unfavorably based on its climate change actions which may adversely affect demand for its products and its ability to attract new investments.

Since physical risks and transition risks are two sides of the same coin, if policy makers fail to address climate change then the probability of physical risks increase while the probability of transition risk decrease. However, the speed of responding to climate change would also matter. Drastic and rapid responses may lower the chances of physical risk but would increase the transition risk. On the other hand, a slow response to climate change today may lead to a sudden response later on, which would increase the physical risk while lowering the transition risk in near term, and increasing it in the long run. (*Bolton et al (2020)*).

However, with varying geographic areas, the level of industrialization and time frames under consideration, not each country, industry or firm is exposed to the same climate risk. Further, while climate risk may pose risks to some countries, industries or firms, it can provide an opportunity for others to take advantage of. According to TCFD, such areas of potential opportunity can be found by reducing operating costs by improving the efficiency in energy, materials, water and waste management. Technological innovations such as developing electric vehicles and improvements in LED lighting technology assist in this transition. Another area which provides an opportunity is that development of low emission energy sources such as wind, solar or bio-fuel. Organizations can increase their competitiveness by developing low-carbon products and services and take advantage of changes in consumer and producer preferences. All

these will provide opportunities to invest in new markets that will benefit from the transition.

Impact of Climate Risk on Monetary Policy

Climate related shocks will lead to supply-side and demand-side shocks, which are likely to have an impact on monetary policy and threaten the price stability objectives of central banks (*Bolton et al (2020)*). Climate change will increase the frequency and severity of extreme weather events such as droughts, storms and floods, and thereby affect the supply of agricultural products and energy, which are two main sources of inflation.

In addition to the short term supply shocks, there can also be long-standing impacts of climate change on production or productive capacity. For an example, heat waves may lead to loss of hours worked, reduce agricultural yields and shortages of other resources. All in all, the ultimate result would be a reduced output as these effects may lead to a reduction of stock of physical and human capital. Nevertheless, climate changes may reduce the household wealth and consumption that would result in demand shocks. As climate related supply shocks and demand shocks may have opposing impacts on inflation and output, the impacts of climate change on inflation remain unclear. However, it is clear that climate changes would bring new challenges for monetary policy, as it would be difficult for a central bank of a single country to react for a climate related inflationary pressure alone. Climate change is a global problem which requires a coordinated solution. Further, due to short-term climate shocks, central banks may have to deviate from its monetary policy stance which was implemented to address the prolong impacts of climate change, which may cause stagflationary supply shocks (*Villeroy de Galhau (2019)*).

Impact of Climate Risk on the Financial System

Even though the stakeholders mostly focus on the socioeconomic impact of climate change during the last decade, there is a growing concern over the challenges that climate change would pose to the financial system. Both physical risk and transitional risk can affect financial stability. Physical risk can cause the destruction of capital and may reduce the profitability of exposed organizations, which could in turn affect the household financial wealth and ultimately impact on demand and prices. For instance, increase in chance of flood in a certain area would have a negative impact on the prices of real estate causing negative wealth effect for the owners. Expectation on future losses would change the risk preferences and real estate in an exposed area will sell at a discounted price relative to real estate in an unexposed area. Further, in any event of weather related disaster, if the properties are not insured against such an event, then it can threaten the solvency of the property holders and thereby impact the financial institutions. If they are insured, then the impact would be felt by the insurer and the re-insurer, threatening their stability. Given the nature of the disaster, there could be instances where financial institutions might not have an adequate capital to absorb the losses, which could trigger a contagion effect across the financial system.

Transition risk, i.e. risks arising due to the transition to a low-emission economy also causes risks to the financial sector. As discussed already, some of the existing assets would become "stranded assets" with the transition to a low emission economy. Countries or organizations who owns such assets would be in trouble, or face financial distress when the demand for such assets decreases. That would have a ripple effect on the financial institutions that have invested in such organizations. On the other hand, the capital required for making investments

in alternative energy sources would increase. That also could increase the risks to the financial system. Further, some industries that add value to many economic sectors but depend on fossil fuel will probably be impacted. A good example is the automobile sector, as preference is shifting towards electric vehicles, demand for traditional vehicles decreases, threatening the profitability of vehicle manufacturers. In the long run, however, it could be a problem of existence for the sector, unless they invest in new technologies and improve their energy efficiency.

As both physical and transitional climate risk would have an adverse impact on the financial system, it is necessary to identify the exact causal chains linking climate risk drivers to the financial risk.

Climate Risk Transmission Channels

The ways through which a climate change could end up materializing as a source of financial risk are referred as transmission channels. The transition channels can be classified as microeconomic and macroeconomic transmission channels (BCBS (2021)). Microeconomic transmission channels describe the ways in which the effect of climate change is directly felt by financial institutions. This includes how climate change may affect individual counterparties of financial institutions, which has a potential to pose a financial risk to the financial institutions and to the financial system. Moreover, this channel captures the direct effects on the financial institutions arising from impacts on their operations and their ability to fund themselves. Further, indirect effects of holding financial assets such as name specific bonds, single-name Credit Default Swaps (CDS) and equities are included in this channel.

Transmission channels through which climate risk drivers affect macroeconomic factors and variables (e.g. economic growth, labour productivity, risk-free interest rate, inflation, commodity prices and foreign exchange rates) which in turn, may have an impact on financial institutions and the financial system are included in the macroeconomic transmission channels. However, literature suggests that the impact of these risk drivers on financial institutions can be translated into traditional financial risk categories, i.e: credit, market, liquidity, operational and reputational risks (BCBS (2021)).

Credit risk: Climate risk drivers, whether it is physical risk or the transition risk, can increase the credit risk of financial institutions as these risk drivers have a negative impact on household, corporate or sovereign income and/or wealth. A negative impact on a borrower's income will lower the borrower's ability to repay debt, thus increasing the probability of default and loss given default. Further, financial institution's ability to recover the loan in full will also be lowered due to the depreciation of pledged collateral, thereby increasing the credit risk.

Market risk: With new information revealed by physical risk or transitional risk about real assets or financial assets, volatility of their market prices may increase and could generate a downward pressure on their prices. Further, correlations between asset prices may weaken or completely breakdown, reducing the effectiveness of available hedges. As a consequence, financial institutions would find it difficult to actively manage their market risks. Volatility in the financial markets could increase with the high uncertainty about the timing, location and the intensity of any climate related disasters. Resultant loss may lead to fire sale of assets and

generate a spiraling effect, ultimately triggering a financial crisis. However, the mismatch in time horizons i.e. shorter time horizon for financial assets compared with the time taken to crystalize the effect of transition related climate risk has to be considered in assessing the market risk.

Liquidity risk: A financial institution which faces severe credit and/or market risk would not be in a position to refinance or liquidate its assets in the short run, increasing liquidity risk. Moreover, customers who are affected by a climate risk event may demand for funds, increasing the liquidity risk of the financial institution.

Operational risk: Operations of a financial institution may be disturbed by a climate risk event. Damages to buildings, or communication network failures due to natural disaster could disrupt the operations of the financial institution. As discussed in the transition risk, financial institutions may pose a legal and regulatory compliance risk arising from introduction of new polices to achieve low-carbon economy.

Reputational risk: Reputational risk of a financial institution may increase with the change in market and consumer sentiment. For an example, reputation of a financial firm, which has provided finance for a corporate that is engaging in high GHG emitting activities, may be at a risk.

Conclusion

In summary, there is growing recognition that climate change and society's reactions to it may have significant consequences for the economy and the financial sector. In response to the expectations of civil society and governments, as well as increased awareness of these risks by the financial sector, financial institutions have started analyzing climate-related risks and impacts and incorporating them in their decision-making and product offerings. In fact, central banks, regulators and supervisors in some countries have taken steps to integrate climate related risk in to prudential regulations as they recognized that climate risk can cause a systemic financial risk. However, this is not an easy task as it requires a coordinated action among regulators as climate risk is a global risk. Being a small island, Sri Lanka and its financial system is highly vulnerable to the climate risks. Therefore, a proper risk assessment should be carried out to identify the sources of climate risk and their transition channels that would have significant impact on economy and the financial system of Sri Lanka.

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Countercyclical Fiscal Policy Importance and Limitations

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Introduction

The countercyclical fiscal policy advocates expansionary policy stance in economic downturns and contractionary policy stance in economic booms. It aims to smooth out the business cycle fluctuations, thus keeping growth on a steady, less volatile and predictable path. Although this policy is effective under normal circumstances, several other factors are to be considered in exercising countercyclical policy during uncertain and anomalous periods, in order to ensure economic stability and growth. Accordingly, the implications and consequences of countercyclical fiscal policy have been discussed among policy circles and academics extensively, over the past several decades.

The origin of the countercyclical fiscal policy can be related to the Keynes theory which advocates higher deficit spending during economic downturns to boost the economic growth and employment. The USA and most of the Western countries practiced Keynesian policies during the Great Depression to stimulate their economies. Since then, they were applied in major economies several times and more recently during the periods of Global Financial Crisis (GFC) and Covid-19 pandemic. Table 1 depicts the fiscal stimulus packages introduced by a set of developed and developing countries during the GFC and Covid-19 pandemic to stimulate their economies with countercyclical fiscal measures.

The degree of cyclical performance of fiscal policy appears to vary depending on the level of development of a country. Over the past few decades, it has been observed that developed countries tend to follow countercyclical fiscal policy to a greater extent while most of the developing countries follow procyclical fiscal policy (i.e. the opposite of countercyclical fiscal policy - expansionary policy stance during the booms and contractionary policy stance during the busts in the business cycle). This was mainly due to the fact that in the developing countries the governments cannot prevent political pressure to spend more during booms where higher tax revenues are possible to be mobilised. On the contrary, government spending tends to shrink during the periods of recessionary pressure where mobilising revenue become challenging.

Countercyclical Fiscal Policy as a Stabilisation Tool

Boosting government expenditure or introducing tax cuts to stimulate aggregate demand in the

Table 1: Fiscal stimuli during GFC and Covid-19 pandemic (as a %of GDP)

Country	During GFC (in 2009)	During Covid-19 pandemic (since 2020 up to May 2021)
Argentina	3.9	12.0
Australia	2.5	20.0
Brazil	0.2	12.0
Canada	2.0	20.0
China	13.0	4.7
France	1.1	12.1
Germany	2.8	34.8
India	0.3	3.5
Indonesia	1.2	8.5
Italy	0.3	30.8
Japan	2.3	53.7
Russia	1.1	4.8
Saudi Arabia	11.3	2.7
United Kingdom	1.3	18.1
United States	5.6	26.5

Sources: International Institute for Labour Studies (IILS) and various web sources

economy are examples where fiscal policy can be used as a tool for countercyclical stabilisation.[1] Fiscal policy, in general, can work in two ways in stabilising the business cycle. One way is through automatic stabilisers. As fiscal stance depends naturally on the level of economic activity, tax revenue that depends on economic activities, for instance, declines with economic recessions providing relief to taxpayers. Similarly, those who qualify for transfer payments get such payments distributed as entitlements, in the form of unemployment benefits, welfare, food stamps or any other social security programmes tend to increase during a rescission. As a result, when the recipients qualifying for such assistance increases during an economic downturn, the volume of transfer payments goes up automatically, again offering a degree of stability through fiscal policy.

1 In the classical Keynesian framework, fiscal policy influences the aggregate demand by shifting the IS curve.

The EU (2002) explains automatic fiscal stabilisers as the reaction of the government budget to economic fluctuations in the absence of any government action. The stabilisers, in general, operate symmetrically over the business cycle, thereby moderating overheating in boom periods while stimulating economic activity during recessions, in principle, without affecting the underlying soundness of budgetary positions as long as fluctuations remain balanced. Especially in the Euro area where monetary policy is centralized, and discretionary fiscal policy making is constrained by the EU fiscal rules, knowing the size and the effectiveness of automatic stabilisers is crucial. The use of fiscal policy as a stabilisation tool is particularly evident in situations where monetary policy is either ineffective (due to the liquidity trap) or being aimed at alternative goals such as stabilisation of interest rates or the exchange rate.

Although the automatic stabilisers respond immediately, they tend to depend on the size of the government, and accordingly it implies that a large government could help reduce output fluctuations better than a smaller government (Gali, 1994). However, it is evident in many countries, particularly in developing countries, that the large governments are inefficient and contributed to drag growth over the decades. Further, automatic stabilisers can only work if it is feasible for the governmental unit to run ex-post deficits and surpluses. Since the automatic stabilisers are limited in scope (IMF, 2010) discretionary fiscal policy measures are often used as countercyclical tools[2] in practice. Further, referring to empirical evidence, Aghion and Kharroubi (2007) also state that counter-cyclicality stemming from discretionary fiscal policy is more important for growth than counter-cyclicality stemming from automatic stabilizers.

The discretionary fiscal policy which consists of changes in policies that alter government revenue, expenditures, and transfers is widely used in stabilising the business cycle. The automatic stabilisers discussed above alone may not be adequate to fully absorb economic shocks in severe recessions, although they can act as the first line of defense against economic fluctuations.[3] A discretionary fiscal stabilisation function at the level of a government could therefore complement the automatic stabilisers, particularly against of large shocks. As highlighted by the European Central Bank (EU, 2002), beyond fiscal stabilisation, a well-functioning market including product and labour markets, and private cross-country risk sharing can contribute to a better capacity of economies to absorb shocks. It is also found that countercyclical fiscal policy is more effective in downturns than in good times (Auerbach and Gorodnichenko, 2012).

Fiscal-Monetary Policy Coordination in Countercyclical Operations

Policy coordination plays a key role in smoothing out volatilities in output. Accordingly, if fiscal policy cannot be utilised during economic downturns, then monetary policy can be employed to fill the output gap given sluggish inflation. Taylor (1995, 2000), for instance argues that when fiscal policy is focused on a medium-term objective or is otherwise constrained by a rule, then central bank reaction function should have more weight to output stabilisation. Among others, Blinder (1981), however, highlights that fiscal and monetary policy may have to move together during the periods where uncertainty about the impacts of any one particular policy is high.

Mohanty and Scatigna (2003) state that a high degree of fiscal imbalance can pose a policy dilemma to the central bank. When the fiscal position is weak, an accommodative monetary policy could fuel inflation expectations and prove counterproductive to growth. A tighter monetary policy, on the other hand, could further deteriorate fiscal position, while resulting in a slow growth. Challenging monetary policy consequences of this nature are discussed by Sargent and Wallace (1981) in their well-known paper "unpleasant monetarist arithmetic". In a slightly different aspect, Blanchard (2004) argue that monetary policy efforts in inflation targeting would not be successful in a high debt environment. The Central Bank's efforts to increase real interest

2 However, governments' ability to deliver well-timed measures as well as the macroeconomic effects of discretionary fiscal measures and the longer-term implications for fiscal sustainability are questioned by skeptics (IMF, 2010).

3 Apart from the fiscal tools, monetary tools as well as exchange rate policy tools could be used to stabilize the economy, depending on the nature of the economic downturn.

rates to curtail inflation would aggravate debt levels through increased debt service payments unless the fiscal authority inclined for fiscal consolidation. In fact, amidst fiscal dominance, monetary policy will have little relevance for inflation, with the interest rate and money supply becoming endogenous to fiscal policy.

Mohanty and Scatigna (2003) highlight that when the primary budget balance evolves through a political process, and fiscal policy is not anchored by a medium-term fiscal rule, then the government's liabilities would explode, raising expectations that government debts would not be paid by raising future taxes and it creates the temptation to reduce the real value of government debt by inflation. On the contrary, if the fiscal authority is committed to maintaining fiscal solvency adhering to a fiscal rule, an independent central bank can respond to a rise in the deficit by raising interest rates. Thus, the central bank can dominate the fiscal authority and thereby force the government to adjust.

Fiscal and monetary policy responses in the business cycles of an economy gets more complicated where foreign shocks may be passed strongly into the domestic economy. However, the empirical evidence with respect to the link between fiscal policy and the exchange rate is generally ambiguous. Over the past few decades, it has been evident in many emerging economies that expansionary fiscal policy under high exposure to external borrowings and low fiscal discipline tends to depreciate exchange rate. However, fiscal consolidation efforts result in lower risk premiums and stability in exchange rate.

Global Experiences and Lessons Learnt

As revealed by academic literature, most of the countries around the globe, developing countries in particular, use suboptimal procyclical fiscal policy rather than countercyclical fiscal policy in managing their economic cycles, over the past decades. Using a case study of four developing countries in the Asian region, namely Malaysia, Indonesia, the Philippines, and Singapore, Mukherjee (2015), suggests several steps that countries might have taken to improve the impact of expansionary fiscal policy during future economic downturns: (i) embedding automatic stabilising impulses through the provision of social safety nets; (ii) increasing tax revenues collected from personal and corporate taxes, by reducing labor market informality through improvements in the business environment; (iii) safeguarding fiscal sustainability; (iv) rebalancing growth by strengthening other sectors of the economy; (v) reducing expenditures on subsidies; and (vi) ensuring smooth and efficient budget execution.

By utilising a comprehensive set of indicators from 114 countries for 1950–2010, McManus and Gulcin (2015), attempt to answer the question, whether the adaptation of a procyclical fiscal policy rather than a countercyclical policy by a country does matter? And the results produce a resounding 'yes' to this question. More importantly, they find that countries with procyclical fiscal policy have lower rates of economic growth, higher rates of output volatility and higher rates of inflation. Results further revealed that these effects are larger in less developed economies, which are found to be more fiscally procyclical.

In a study with Sub-Sahara African countries, Combes and Ouedraogo (2014) examine whether or not procyclical aid leads to procyclical fiscal policies in the recipient countries, employing panel data techniques covering 39 countries over the period 1985- 2012 and they find that results depend on the type of aid.

Strawczynski M. and Zeira J. (2011) confirm the previous finding of procyclicality with regard to investment expenditure in both developed and emerging countries. Further, procyclical policy in emerging countries is clearly noticed in total expenditure and government consumption and transfers. However, they have observed that there are signs of a upsurge in the extent of countercyclical expenditure policy in emerging countries with the increased globalization, after the 1990s. Moreover, it is also revealed that countries with a high level of Foreign Direct Investments (FDI), perform better countercyclical policy.

In an attempt to determine the level of cyclicality in fiscal policy in OECD countries, Lane (2002), shows that the level of cyclicality varies across spending categories and across the countries. In line with leading theories of fiscal cyclicality, they argue that countries with volatile output and dispersed political power are the most likely factors contributing to run procyclical fiscal policies.

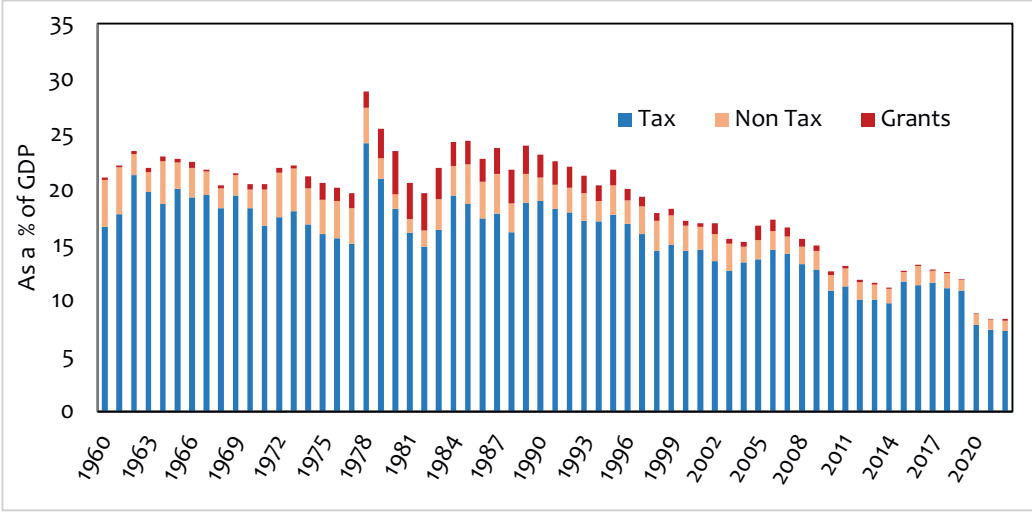
In an attempt to determine whether and how the cyclical pattern of macro policy can affect growth, using a sample of 16 countries consisting of the industrialized OECD countries and emerging markets, Aghion and Kharroubi (2007) provide evidence that (i) industries have grown faster in economies where fiscal policy has been more countercyclical, both in terms of output and productivity (ii) that the positive growth effects of fiscal policy counter-cyclicality have been larger for industries which rely proportionally more on external finance.

Sri Lankan Experiences in countercyclical policy

Historical Developments

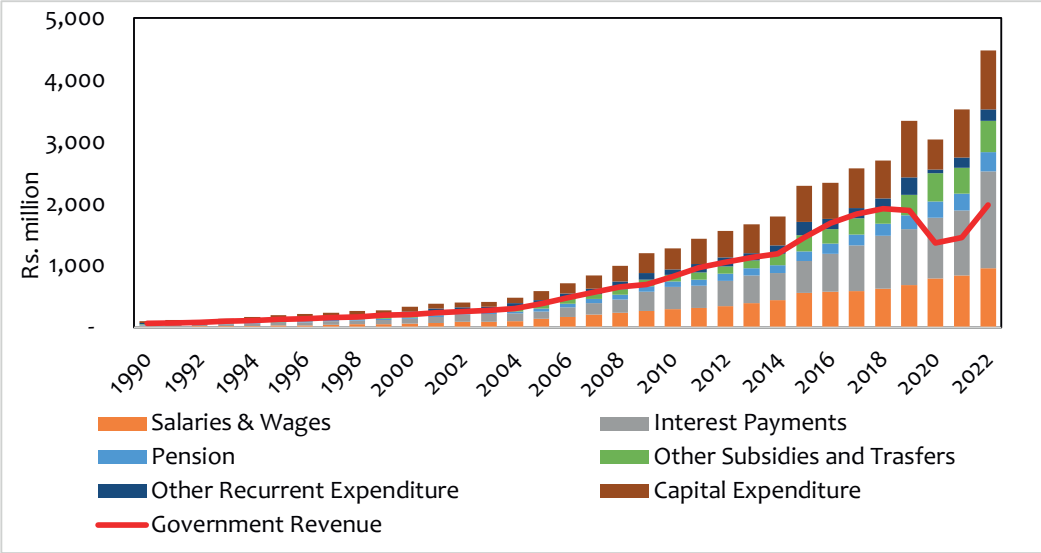
As indicated above, most of the developing countries have adopted procyclical fiscal policy rather than countercyclical fiscal policy and Sri Lanka is no exception. For instance, Ehelepola (2015), finds the procyclical fiscal policy in Sri Lanka over the period of 2003-2014. As indicated in Figure 1, persistently declining revenue mobilisation amidst high and rigid recurrent expenditure incurrence in Sri Lanka resulted in an expansion in the budget deficit, thereby squeezing out the fiscal space available for countercyclical fiscal operations.

Figure 1: Government Revenue and Grants in Sri Lanka



Source: Central Bank of Sri Lanka

Figure 2: Government Expenditure in Sri Lanka



Source: Central Bank of Sri Lanka

Above behaviour lead to chronic fiscal deficits, high debt levels and the high level of debt service payments which again contributed to amplified debt accumulation in Sri Lanka, creating a vicious cycle over the past several decades.

Recent Experiences

As a result of the restricted fiscal envelope, it has been challenging for the government of Sri Lanka to undertake ambitious fiscal stimulus during economic depressions such as the prevailing downturn amidst COVID-19 pandemic, in order to achieve fast recovery. If Sri Lanka had practiced countercyclical fiscal measures, on the contrary, by accumulating fiscal buffers during economic booms, such buffers would have been utilized effectively in the recovery from economic downturns. To rephrase it, a country can successfully exercise countercyclical fiscal policy in an economic downturn, only if it had already built-up necessary buffers to do so. Further, countercyclical fiscal operations in an economic bust are advisable only when inflation is not high and persistent. Otherwise, such expansionary fiscal measures could add to aggregate demand that dialup inflation further.

The Government announced substantial tax cuts in end 2019 and it further deteriorated already weak fiscal position. As such, amidst lower revenue mobilization, the Government continue to rely heavily on monetary financing the budget deficit, thereby fueling inflation. Meanwhile, Sri Lanka's international sovereign rating downgrades restricted access to global capital markets, thus amplifying the foreign exchange liquidity crunch in the domestic forex market. Against these developments, amidst significantly high debt service obligations fallen due in the period ahead, Sri Lankan government compelled to announce debt standstill in April 2022 to prevent a hard default. In the absence of fiscal buffers, the Government was expected to initiate fiscal consolidation measure in 2020-2021 period to face the situation without exacerbating inflation sharply. However, the delay in such fiscal responses, among others, necessitated the Central Bank to adopt tight monetary policy

stance with historically high interest rate hikes since April 2022 to tame inflation and thereby to ensure economic stability. Although high interest rates could possibly slowdown economic growth, it was more important to prevent very high inflationary episodes which would be extremely counterproductive to medium-to-long term growth. In the meantime, the Government intensified fiscal consolidation efforts since April 2022 since lowering fiscal deficits and preventing monetary financing are essential for price and economic stability. This is in line with what was advocated by Blinder (1981) that, *fiscal and monetary policy may have to move together during the periods where uncertainty about the impacts of any one particular policy is high*. Thus, it confirms that the country is having correct short-term policy mix in stabilizing the economy and positive signs of stbilisation are already visible. Since the country shows a certain degree of stability, now it is important to gradually adopt recovery and growth measures. When the economy returns back to high growth trajectory from 2024 onwards, it is vital to build up necessary fiscal buffers and to exercise countercyclical fiscal operations thereafter. It will not only expand the fiscal space, but also enables government to smoothen out business cycle fluctuations in the economy, facilitates stability to a greater extent and helps rapid recovery from economic downturns in future.

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