World Economic Forum Digital Currency Governance Consortium: Vision for 2021 Deliverables

BRIEFING PAPER

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Cover: Maxger, Getty Images

Contents

Introduction

The DCGC attempts to provide a neutral, objective and analytical perspective on the pertinent issues.

Digital currency is often hailed as a solution for long-standing challenges within the currency and payments ecosystem, yet little rigorous evaluation of its fitness for purpose and viability has been conducted. Critical issues related to digital currencies remain unresolved, ranging from consumer protection, education and privacy to technical and regulatory interoperability. The opportunities and risks for digital financial inclusion have yet to be fully evaluated.

With a variety of central banks now evaluating the notion of central bank digital currencies (CBDCs) in various forms and the independent emergence of "stablecoins", technological, governance and regulatory frameworks are needed to address gaps and guide digital currency choices and implementation. To establish these frameworks, careful assessment and dialogue are needed between critical actors and stakeholders.

The Digital Currency Governance Consortium (DCGC) was launched in early 2020 and brings together more than 80 organizations from the public and private sectors, civil society and academia to provide global perspectives in addressing key policy and governance issues. Over the past year, DCGC working groups have engaged in dialogue, research and issue scoping on a number of specific topics.

This document presents eight concept notes that outline the core themes and contributions towards digital currency policy and governance that the DCGC is developing in 2021. We welcome your feedback on these notes by emailing DCGC@weforum.org.

The concept notes detail eight priorities that will constitute the DCGC's written output in 2021. A separate DCGC working group will focus on each concept note, and their output will centre on either stablecoins or CBDCs, or both. While the two forms of digital currency are highly distinct, certain policy and governance discussions may relate to or involve both. Each concept note aims to describe an output's intended objectives, scope and key questions to be answered. Some of the notions discussed may evolve or change during the research and writing process.

The concept notes pertain to one of three high-level issue areas described below:

1. **Stablecoins' value proposition for under-served populations**. A key feature touted in favour of stablecoins is their ability to improve access to the financially under-served, relative to pre-existing options. It is important to explore the real-world value of these technologies for financial inclusion and wellness, and their viability for aid delivery and disbursement. This issue area begins with a focus on stablecoins, but may expand to develop research related to CBDCs in the future.

2. **Regulatory choices**. Fragmented regulations may leave vulnerabilities across jurisdictions that various actors can exploit. This can stifle innovation by well-intentioned actors who are reluctant to experiment without regulatory certainty. First, the roles of central banks and public financial institutions need to be considered, as well as available options for public-private and international cooperation. Second, consumer risks need mapping across different types of digital currency, comparing such risks with those of pre-existing alternatives. Third, gaps and incompatibilities in current regulatory guidelines on stablecoins and CBDCs need to be identified to avoid confusion and uncertainty.

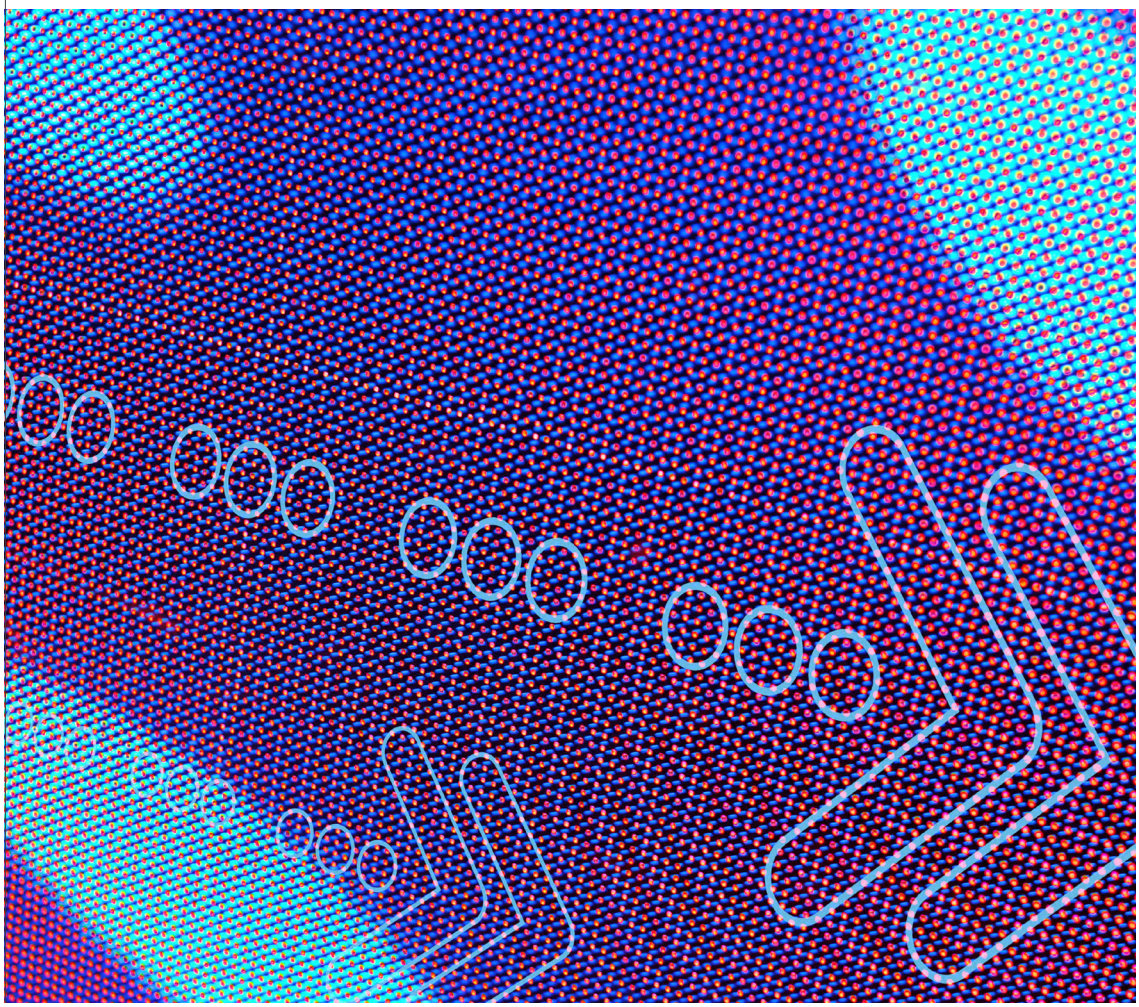
3. **Technology infrastructure and opportunities**. Central banks and governments will benefit from a framework that helps guide their choices on CBDC technology and platforms, highlighting relevant trade-offs and considering their unique policy and design goals. This framework should map the various privacy and confidentiality approaches that are technically feasible and available for digital currencies such as CBDCs. Clarity is needed on what it means for currencies to be considered interoperable, and on the impacts of various forms of interoperability on different stakeholders.

In addressing these issues, Digital Currency Governance Consortium members have reviewed a wide range of published material, including work by international and intergovernmental organizations. The DCGC acknowledges related initiatives in this space, such as the Financial Stability Board (FSB) and the Financial Action Task Force (FATF), many of which involve DCGC-member organizations, and the Consortium will seek to augment or amplify their work, as relevant. Above all, the DCGC attempts to provide a neutral, objective and analytical perspective on the pertinent issues. It takes a research-driven and risk-aware approach and does not seek to promote the development or use of CBDCs or stablecoins.

FIGURE 1 | **Digital Currency Governance Consortium: Issue Areas**

Below: Simon Carter, Getty Images

1 Stablecoins' value proposition for under-served populations



Concept note #1

Investigating the value proposition of stablecoins for financial inclusion

This deliverable investigates how stablecoins support financial inclusion or provide benefits to financially under-served populations relative to pre-existing forms of money. It explores how stablecoins could address common roadblocks to financial inclusion, how they unlock new opportunities and the limitations and risks they may introduce.

Introduction

Financial inclusion is a well-recognized global issue: 1.7 billion people are "underbanked", while small- and medium-sized businesses face challenges connecting with the financial system. Users may not be able to access financial services; if they can, those services may not be high quality, suitable or affordable. The World Bank defines financial inclusion as the ability for individuals and businesses to access useful and affordable financial products and services that meet their needs.

Stablecoins could potentially resolve challenges and unlock opportunities for financial inclusion around the world. However, a detailed analysis of their capabilities and limitations in this area has not yet been conducted. The DCGC will investigate the value proposition of stablecoins for supporting financial inclusion for under-served populations, using three to five diverse scenarios for individuals and small businesses. It will compare stablecoins' capabilities and limitations with those of pre-existing forms of money, both electronic and physical (i.e. cash). The aim is to provide policy-makers, businesses, civil society organizations and digital currency issuers with a better understanding of the potential value (or lack of value) that stablecoins bring to financial inclusion, to help focus efforts and enhance global understanding.

Objectives

The deliverable has the following objectives:

- Help policy-makers and stakeholders understand how stablecoins can stimulate financial inclusion (if at all) and provide benefits to the financially under-served, relative to pre-existing forms of money.
- Identify the instances where stablecoins do not clearly solve challenges with pre-existing forms of money; where they may introduce new limitations or risks (particularly to the financially vulnerable); or where they may aggravate the "digital divide."

In support of these objectives, the working group may explore the following primary topics:

- Key capabilities and limitations of stablecoins for supporting various financial activities that could involve the financially under-served, such as remittances and payments, savings and stores of value, and microlending or insurance.
- Opportunities or challenges related to "programmability" and digital identity.
- End-user experiences of stablecoins and pre-existing money options in terms of cost, access, reliability, consumer protections, settlement finality and other issues.
- A categorization of roadblocks, challenges and costs that create barriers to financial inclusion, such as processing speeds, connectivity and device requirements, technology gaps, total cost, identification and literacy.
- Notable government policy opportunities or challenges for achieving financial inclusion with stablecoins.

The topics below, while important, are beyond the scope of this initial phase of work:

- Macro-economic, monetary and financial-stability risks associated with high adoption of stablecoins for payments or as a store of value.
- Business models for stablecoins and pre-existing forms of money, and their impact on possibilities for access, inclusion and cost.
- Highly detailed analysis of distributed ledger technology (DLT), blockchain permissioning configurations (permissioned vs permissionless), or different forms of stablecoins, except to the extent it is pertinent.

Key questions to be answered

The central questions the working group will discuss and explore include the following:

- In what ways can stablecoins enable financial inclusion on absolute levels and relative to pre-existing forms of money?
- What are the limitations, roadblocks or challenges that stablecoins face with respect to achieving financial inclusion? Which can be addressed in the near or medium term and how? Which are too challenging to be addressed in the near or medium term?
- In what cases might stablecoins create noteworthy risks to the financially vulnerable? Can steps be taken to mitigate or address these risks?
- How could programmability support financial inclusion with stablecoins?
- How could stablecoins be integrated or interoperate with existing payment or other financial systems in a manner that supports financial inclusion?

Deliverable format

The format of this deliverable will likely be a brief analysis report. The report may include content from expert interviews and roundtable discussions. It will draw heavily on existing research where relevant. It may include graphics categorizing roadblocks from technology, policy, social and other sources or through comparing capabilities and limitations of various forms of digital money for serving underbanked populations.

Concept note #2

Investigating the value proposition of stablecoins for aid disbursement

This deliverable explores the viability of stablecoins for cross-border development and humanitarian aid delivery and disbursement.

Introduction

In 2019, the United Nations (UN) expected the world to be on track to end poverty by 2030. However, COVID-19 pushed over 71 million people into extreme poverty in 2020. Meanwhile, 3 billion people lack basic hand-washing facilities at home, one of the most effective methods for COVID-19 prevention. The pandemic has also interrupted childhood immunization programmes in around 70 countries.

Aid continues to be critically needed. This deliverable investigates whether stablecoins could improve the aid delivery and disbursement process. It focuses on multilateral, cross-border governmental and charitable aid, such as humanitarian aid to refugees or disaster-affected people. It also addresses programmatic aid issues involving multilateral development banks.

The primary audiences for this output are governmental, non-governmental and other organizations that deliver cross-border aid and that seek to address challenges in aid delivery, such as transparency and cost-efficiency. This deliverable may also provide valuable conclusions for health authorities, private sector and blended finance investors, technologists and other aid organizations that wish to learn about the value proposition of stablecoins for aid delivery and disbursement.

Objectives

The deliverable has the following objectives:

- Identification and exploration of the value proposition of stablecoins for aid delivery and disbursement, with a focus on risk-mitigation aspects and traceability features as well as an analysis of value relative to pre-existing solutions.

In support of these objectives, the working group may explore the following primary topics:

- Common obstacles and pain points to cross-border aid delivery and disbursement, including evaluation of how stablecoins could address those obstacles; new risks or challenges stablecoins might introduce; and new opportunities they might create for improving aid delivery.
- Lessons learned, common challenges and open questions from previous technical projects (e.g. by UNICEF, ConsenSys, World Economic Forum, Kiva, Mercy Corps, World Food Program, Danish Red Cross, World Bank).
- Viability of stablecoins for programmable disbursement of aid compared with other digital payment methods (e.g. bank payments, cash, e-money, pre-payment cards, mobile payments).
- Basic guiding principles for operational effectiveness with stablecoin-driven aid delivery and disbursement.
- Issues and requirements related to local acceptance and end-usage (e.g. the digital currency wallet, internet connectivity, considerations for vulnerable populations, literacy, local spending of the digital currency).
- Accounting for dignity of choice for aid recipients. Do stablecoins make the use of aid more restrictive than it is intended to be?
- Incentives for people to receive aid in the form of stablecoin, such as the ability to build a credit history.
- Barriers to use, related to digital literacy.
- Compliance requirements and thresholds for aid, including those related to identity.
- Total time and cost from aid payment to delivery.
- Traceability during the delivery and disbursement process.

– Extent to which aid distributed with digital currency could automate impact assessment in different situations (e.g. war refugees, natural disaster casualties, drought- and flood-affected people).

– Future opportunities related to cross-border CBDCs for aid.

The topics below, while important, are beyond the scope of this initial phase of work:

– Comparative analysis including CBDCs or non-stablecoin crypto-assets (e.g. bitcoin).

– Macro-economic and monetary, financial-stability or fiscal aspects of the use of stablecoins for aid disbursements.

– Detailed analysis of DLT and blockchain platforms and formats (permissioned vs permissionless).

– Domestic governmental aid support.

Key questions to be answered

The central questions the working group will discuss and explore include the following:

– Does distribution of aid via a stablecoin enable more traceability of the money to ensure it reaches the right hands? What are the legal and ethical considerations around traceability?

– Does distribution of aid via a stablecoin enable faster or instant delivery of funds across borders?

– If stablecoins are a feasible solution to most common causes of failures, then who would be operating, owning and building the DLT networks for aid delivery? What are related governance questions around the ownership of the platform? Can it be open-source and deployed within a tight timeframe?

– Are decentralization through distribution and built-in trust through transparency necessary features of the new technology?

– Would the system be a single closed-loop system, a multiple closed-loop system or an interoperable system?

– Do the features of the new technology comply with legal norms, humanitarian principles and professional codes of conduct?

– Might there be value in a consortium of global aid organizations creating a global stablecoin for aid disbursement?

Deliverable format

The final deliverable will consist of a report that details conclusions related to the value proposition of stablecoins for aid delivery and disbursement. It will include findings from interviews and roundtable meetings with experts. It may include a video that summarizes current efforts and key pain points around aid and disbursement, including the working group's conclusions for use of stablecoins for aid disbursement.

Below: Ryan Geller, Unsplash

2 Regulatory choices

Concept note #3

The role of the public sector and public-private cooperation in digital currency growth

This deliverable explores the roles that central banks and public institutions could take with respect to stablecoins and CBDCs. It also considers options for public-private and intergovernmental cooperation.

Introduction

With the rapid growth of CBDC and stablecoin activity around the world, some institutions are struggling to identify the roles they should play to support responsible innovation that protects citizens and the financial system from risks, while allowing for beneficial technological advances.

This deliverable aims to present a set of roles for policy-makers and public-sector institutions as they consider the CBDC and stablecoin models that might work best for their respective jurisdictions.

It will bear in mind the unique mandate the public sector bears to maintain financial stability and consumer protection while promoting fair competition. The deliverable will highlight areas for public-private collaboration, based on the assumption that the private sector is well-placed to offer innovative and technical solutions. Finally, it will highlight key areas for intergovernmental collaboration, such as regulation.

Objectives

The deliverable has the following objectives:

- Provide an option set for policy-makers and public-sector institutions (e.g. central banks, finance ministries, securities regulators) around the world to understand the actions they could take with respect to CBDC and stablecoin development, growth and innovation.
- Indicate high-potential areas for public-private collaboration, so the core competencies of the private sector can be leveraged to maximum benefit, without increasing risk.
- Indicate high-potential areas for cooperation between public-sector institutions in different countries to reduce the risks to and improve the benefits of CBDC and stablecoin development, growth and adoption.
- Identify where further research or experience are needed to inform decisions around the roles of public and private sectors or intergovernmental cooperation.
- Help the public sector to keep abreast of technological innovation and to undertake the necessary regulatory or technology decisions to ensure safe innovation and fair competition.

In support of these objectives, the working group may explore the following primary topics:

- Mandates and goals of public-sector financial instutions, particularly as they relate to CBDC and privately issued digital currency.
- The relationship between stablecoins and CBDCs.
- Archetypes of public-sector engagement and the key roles and choices of various public-sector financial institutions with respect to stablecoins (e.g. regulation or reserve access), “synthetic CBDCs” (e.g. sponsorship and reserve access) and CBDCs (e.g. decisions regarding issuance and design).
- Areas with high potential for public-private cooperation in the development and deployment of stablecoins, “synthetic CBDCs” and CBDCs.
- Areas for intergovernmental collaboration, including on regulation, operational supervision, consumer protection, technical interoperability and other issues.

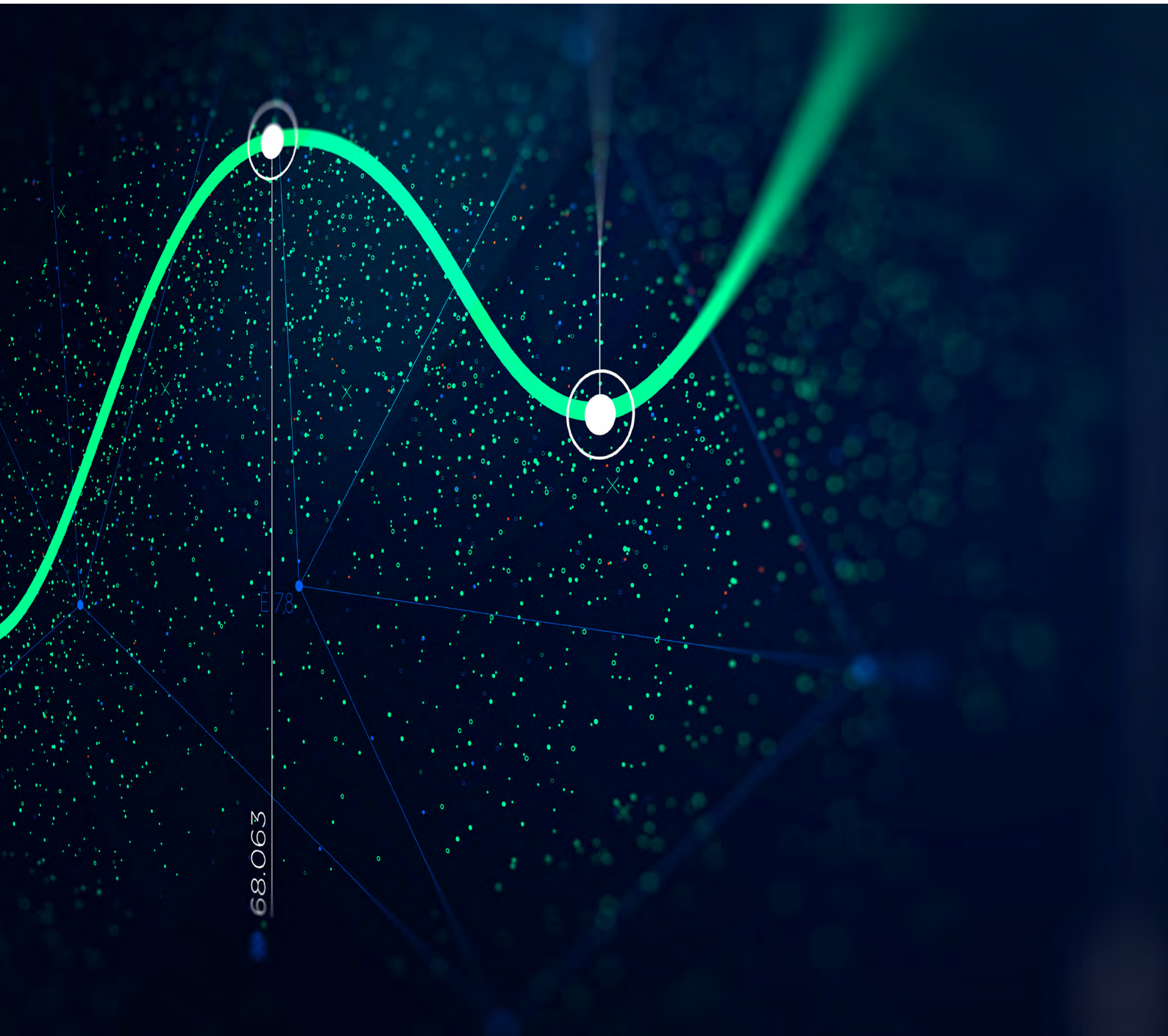
Key questions to be answered

The central questions the working group will discuss and explore include the following:

- What are the primary roles and responsibilities for public-sector financial institutions (e.g. central banks, finance ministries, regulatory agencies etc.) with respect to CBDCs and stablecoins?
- What are the key areas for public-private cooperation and why?
- What are the key areas for intergovernmental cooperation and why?
- What are the new roles that different institutions need to fill, and the cooperative approaches that can be taken, in light of risks and regulatory gaps associated with stablecoins?
- What are the characteristics or best practices of strong and inclusive public-private collaboration?

Deliverable format

The output may take the format of a framework or brief report that includes graphics mapping the roles of various public-sector institutions, public-private cooperation opportunities and intergovernmental cooperation opportunities. It may also include insights gained from a series of expert interviews or a virtual roundtable of experts in the first half of 2021.



Concept note #4

Regulatory and policy gaps of CBDCs and stablecoins

This deliverable evaluates where regulatory and policy guidelines on CBDCs and stablecoins are incompatible and may lead to confusion, and where there are significant regulatory or policy gaps.

Introduction

Designing a coherent and innovation-friendly regulatory landscape for digital currencies, including CBDCs and stablecoins, is a challenging task at both the global level and the level of individual jurisdictions. Many digital currencies were invented with the goal of bypassing intermediaries to reduce payment frictions, particularly cross-border payments where many intermediaries are involved in one transaction. However, digital currencies are often regulated at country or state levels, which inevitably results in regulatory gaps, inconsistencies and redundancies across jurisdictions. At the same time, some central banks may intend to issue CBDCs, potentially creating competition between CBDCs and stablecoins, as well as regulatory confusion and friction.

There may be conflicts between the design of regulations and policies and the design of technology norms. With technology changing at a rapid pace, governments are keen to stay ahead of innovations whose purported benefits are as unknown as their risks. However, the regulatory concerns of the technology builders innovating the payments ecosystem for the 21st century are just as compelling.

This working group intends to focus on potential risks that may arise where regulatory guidelines on stablecoins and CBDCs are incompatible and could lead to confusion, or where there may be significant regulatory gaps and loopholes that give rise to regulatory arbitrage. It will compare international guidelines with national regulations and indicate major inconsistencies. The deliverable will only touch briefly on financial and monetary stability issues, as these have already been discussed thoroughly by the Financial Stability Board and others. The objective is to build on existing literature to provide further information and guidance for policy-makers on issues to consider when designing new regulations or utilizing existing regulations and standards.

Objectives

The deliverable has the following objectives:

- Suggest measures to mitigate the risks to economies and users arising from incompatibilities and regulatory gaps associated with CBDCs and stablecoins.
- Accelerate the creation of regulatory guidance that could provide much-needed clarity on technical choices available to governments and entities issuing and building services upon CBDCs and stablecoins.
- Accelerate global coordination of the regulation and supervision of CBDCs and stablecoins.
- Provide tools for policy-makers to make the right decisions more quickly and to identify areas of risk and opportunity in an environment of fast-moving innovation and regulatory development.

In support of these objectives, the working group may explore the following primary topics:

- Mapping of international and regional organizations, their coverage of regulatory subject matter and gaps in their coverage.
- Policy and regulatory interconnectedness between CBDCs and stablecoins, as well as areas of divergence.
- Differences and similarities of definitions and regulatory treatment of stablecoins across international organizations, regional organizations and some major jurisdictions.
- High-risk activities resulting from regulatory and policy incompatibilities and gaps.
- Opportunities for high-value, cross-border alignment and domestic or cross-border policy definition.
- Suggestions made by international and regional organizations to address risks and incompatibilities.
- Recommendations on how to avoid or address incompatibilities and gaps when designing regulations and policies on CBDCs and stablecoins.

Key questions to be answered

The central questions the working group will discuss and explore include the following:

- How do major jurisdictions, international organizations and regional organizations differ in defining “synthetic CBDCs” and stablecoins? Is there a way to unify the definition and the taxonomy?
- What are the key policy and regulatory incompatibilities and gaps related to “synthetic CBDCs” and stablecoins across major economies? What are the risks and the extra-territorial impacts of those incompatibilities and gaps? Could they lead to regulatory arbitrage or vulnerabilities in cybersecurity or operational resilience?
- Are these policy and regulatory differences resulting in advancing or impeding technology development? If so, why?
- How can CBDCs and stablecoins be used to improve regulatory objectives? How could current regulations and changes to them impact the future evolution of CBDCs and stablecoins (especially around technology and market access)?
- What are the opportunities that addressing regulatory inconsistencies and gaps may offer for financial inclusion, such as serving the unbanked?
- For a globally coordinated approach that balances relevant trade-offs, which organizations should take a leading role in closing the gaps? Would it make sense to have a consortium of organizations to lead on this?

Deliverable format

The deliverable will consist of a brief report, using maps and graphics to highlight key ideas. The deliverable may also involve decision trees, diagrams or a checklist.

Concept note #5 | Consumer protection risk mapping

This deliverable maps similarities and differences in terms of risks to users of various forms of digital currency, compared with existing common forms of payment and currency. This could inform the drafting of principles for consumer protection for each type of digital currency.

Introduction

Currencies accrue significant value through trust – both in their ability to store value and as a safe medium of exchange. Trust in digital currencies is vital for their adoption, which is why consumer protection is a crucial matter to address.

The risk of bad practice and abuse could be high with digital currencies, because some private digital assets may couch themselves in terms borrowed from the financial sector while lacking many of the institutional frameworks and safeguards that underpin that sector. For example, a stablecoin issued by a private company could present technology risks, asset risks or privacy risks that are different from cash or e-money and which may require additional protections. Consumer access to digital currencies must come with adequate consumer education and protection. At the same time, the level of protection must be balanced with the need to support competition and innovation.

The diversity of digital currencies presents varying levels of risk from one kind of digital currency to another.

This deliverable will explore the consumer protection implications for CBDCs and privately-issued stablecoins. We plan to provide a typology of risks to users associated with different digital currencies and different technology and governance options (including centralized vs decentralized architectures). Relevant risks to consider include those to security, privacy, deposits, liquidity and redeemability, and fraud. We will draw comparisons with e-money and physical cash. Our goal is to help users, user-rights advocacy groups and regulators to understand better the risks of different types of digital currencies and to provide principles to help guide regulators in designing an effective and coordinated consumer protection system.

Objectives

The deliverable has the following objectives:

- Promote awareness of the importance of consumer protection within the industry and highlight the need for global coordination of oversight.
- Educate readers on varying types and levels of risk associated with different digital currencies.
- Guide the design of a balanced approach towards consumer protections for digital currencies.

In support of these objectives, the working group may explore the following primary topics:

- Background on existing consumer protection measures related to cash and e-money with respect to payments and deposits.
- Risks associated with different features of each type of digital currency, comparing them with pre-existing forms of money and currency.
- Risks at different stages of the digital currency lifecycle, from on-ramps, purchase and deposit-holding to off-ramps and general risks such as privacy and data collection.
- Recommended approaches with respect to:
  - The balance between consumer protection and innovation.
  - Entities in the ecosystem that should bear the burden of consumer disclosure and education, and respective liabilities.
  - Actions required from government agencies for a coordinated approach towards consumer protections, at domestic and international levels.

Key questions to be answered

The central questions the working group will discuss and explore include the following:

- What are the key consumer risks pertaining to various types of digital currency? How do those risks compare to those of traditional fiat currency or e-money?
- What are the principles for designing consumer protection and education regulations and policies?
- Which party in the ecosystem should bear the regulatory burden of consumer protection and education?
- Given that the use cases of digital currencies touch upon multiple disciplines, what should be done to avoid duplication or inconsistencies between multiple government agencies, while ensuring sufficient protection of users?
- As it becomes ever easier to conduct cross-border transactions, what is needed to coordinate and enforce consumer protection on a global level?

Deliverable format

The deliverable is likely to be in the form of a brief report that may include one or more matrixes consisting of the following:

- Similarities and differences of features across different types of digital currency, and compared to fiat and e-money.
- Risks associated with each feature, with colour-coding showing different levels of risk.
- Comparison of risks of each type of currency through its lifecycle.

The deliverable will include a checklist with principles to help guide regulators in designing consumer protection mechanisms for various types of digital currency.

Below: Andrey Suslov, Getty Images

3 Technology infrastructure and opportunities

Concept note #6 | CBDC technology decision framework

This deliverable develops a framework guiding central banks and other relevant decision-makers in their choices around CBDC technology platforms, technology trade-offs, policy and design goals, and security and technical requirements.

Introduction

As central banks explore the possibility of issuing CBDCs, it is important for them to understand the technology choices, trade-offs and options available that best meet their policy and design goals. Given the rapid pace of technological experimentation and development, and the multitude of variables at play, it can be difficult for central banks to assess the best technology choices and platforms for their CBDCs.

The proposed framework is intended to guide central banks through major technology options and decisions related to CBDC, based on their policy goals (e.g. financial inclusion) or design choices (e.g. tiered privacy). It will help inform their choices by mapping available options, key trade-offs and platform capabilities as they relate to delivering policy and design goals. This framework will ultimately help central banks build a potential CBDC based on a holistic approach. By offering a technology assessment framework, the deliverable will also facilitate discussions between public and private stakeholders to foster collaboration, and help the private sector understand CBDC requirements and language.

The framework can be approached as an extension of section 10 ("Technology choices, considerations and risks") of the World Economic Forum's white paper, Central Bank Digital Currency Policy-Maker Toolkit, published in January 2020. This approach assumes the decision-maker has identified a favorable value proposition for CBDC and addressed sections 1-9 of the toolkit, including specific policy goals the CBDC seeks to achieve (section 2), the CBDC form (section 3) and the CBDC design elements (section 9).

Objectives

The deliverable has the following objectives:

- Create a clear, navigable framework that helps central banks assess the CBDC technology solutions and platforms that would support their target CBDC form and design, and their main policy objectives.
- Map some of the main technology solutions for each CBDC functionality, including privacy, scalability, recoverability and other functionalities.
- Describe the major issues that central banks should consider related to technology platforms, features or functionalities, including the following:
  - Trade-offs between technology choices.
  - Risks associated with technology choices.
  - Feature maturity, particularly in terms of security and reliability.
  - Data and system interoperability (including with existing financial systems), and the potential development of a new digital ecosystem.
  - Cybersecurity.
  - Platform flexibility for evolving technology issues or policy goals.

Key questions to be answered

The central questions the working group will discuss and explore include the following:

- How should central banks approach CBDC technology choices, based on certain policy goals and design interests? What technical design might be preferred to support given objectives (e.g. compliance and anti-money laundering, access, privacy etc.)
- What are the key trade-offs between technology choices that meet various CBDC policy goals?
- What is the level of maturity of various technologies, especially regarding cybersecurity, privacy and scalability?
- Should technology platforms be open-source or closed-source?
- Should protocols be developed in-house or externally? Should they leverage existing internal or external protocols?

Deliverable format

The framework will centre on a set of tools (e.g. decision trees, mappings, diagrams), which guide the reader through the process of evaluating technology choices that meet a central bank's requirements for a CBDC.

Concept note #7 The spectrum of privacy and confidentiality options

This deliverable maps the spectrum of privacy and confidentiality options and approaches that are technically feasible and available for central banks for retail CBDC.

Introduction

As central banks globally evaluate the issuance of CBDC, they will consider consumer privacy, safety and anonymity. Central banks will need controls against black money, while making it easier and cheaper to move money around for legitimate transactions.

Preservation of privacy is a priority for central banks in many regions of the world. Yet a comprehensive framework that helps public institutions navigate the full set of privacy and confidentiality techniques does not yet exist. Given cryptography is continuously evolving, it can be a challenge for policy-makers to keep abreast of the latest technology options. If central banks were armed with a spectrum of privacy options, they would be better placed to decide whether to issue a CBDC. Many central banks will be closely weighing whether they can preserve privacy for their citizens while meeting "know your customer" (KYC) and anti-money laundering (AML) standards.

We anticipate our audience to be central banks, regulators and policy-makers. This deliverable will discuss the spectrum of privacy and confidentiality options that central banks can design for and will lay out the technology choices available now and in the future, which could enable various desirable privacy capabilities.

Objectives

The deliverable has the following objectives:

- Clearly outline for policy-makers and stakeholders the spectrum of privacy and confidentiality options and approaches that are technically feasible and available for central banks to implement for retail CBDC.
- Explore current central banks' concerns about privacy for the financial ecosystem, outline the development trend of key principles of privacy regulations/frameworks, and describe which privacy-enhancing techniques could address those concerns.
- Convey the privacy capabilities available today, those that are likely to improve and those that are on the applied innovation research frontier.
- Describe recommendations for future-proofing CBDC architectures so that privacy features can be designed with the future in mind.

In support of these objectives, the working group may explore the following primary topics:

- Definitions for "privacy," "anonymity" and "confidentiality" and the trend of key principles.
- Risk analysis of information to keep private and confidential.
- Mapping of which types of information could be kept private and from whom (e.g. from commercial and government entities).
- Mapping of existing and future CBDC transaction types, along with their privacy and confidentiality treatments and risks.
- User-adoption thresholds pertaining to privacy and ethical considerations, digital identity, and potentially false equivalencies related to the anonymity of cash.

- The readiness, trade-offs and capabilities of leading privacy-enhancing technologies (PETs) that can be used to ensure system-wide analytics, while maintaining privacy in various scenarios related to CBDC:
  - Differential privacy.
  - Federated analysis.
  - Homomorphic encryption.
  - Zero-knowledge proofs.
  - Secure multiparty computation.
  - Group signatures.
  - Secret sharing.
  - Trusted execution environments, secure enclaves and trusted encryption.
  - Data segregation/"Need to know basis."

Key questions to be answered

The central questions the working group will discuss and explore include the following:

- How can a central bank assess privacy preservation or enhancement for their CBDC and what technical choices do they have to enable it?
- What are the risks to privacy and which privacy preserving or enhancing technique can mitigate each risk?
- How are the policy choices for privacy shaped by the technology?

Deliverable format

The deliverable will take the form of a brief report, which first defines the terms of privacy, confidentiality and anonymity. It will then present privacy and confidentiality techniques and their feasibility across various time periods. It may include charts or graphics that present the array of techniques available, with various parameters (e.g. computational intensity, readiness etc.).

Concept note #8 | Defining interoperability

This deliverable explores various forms of interoperability and considers a definition for what it should mean for someone to say their system is interoperable. It considers the implications of various forms of interoperability for users and other stakeholders.

Introduction

CBDCs and stablecoins could offer a more efficient and secure way to provide domestic and cross-border payments. However, as various stablecoin providers and systems enter the market, and as countries begin to design and implement their own CBDCs, the challenge of how well these systems can interact, exchange and transact with each other will become ever more complex.

Interoperability is valuable in achieving the global efficiencies generally desired from digital currencies. However, there are trade-offs associated with interoperability, such as benefits or incentives to maintaining friction between systems, or the extra time it takes to develop and conform to software or data standards. Today, there are many definitions and interpretations of interoperability, which have led to the term being misunderstood and even contentious. This deliverable seeks to address this issue. By establishing a common understanding of interoperability, it will help stablecoin providers and central banks drive towards common goals in their development of digital currencies.

Objectives

The deliverable has the following objectives:

- Define what interoperability means in the context of CBDCs and stablecoins.
- Identify the goals, benefits, trade-offs and design principles for interoperability for CBDCs and stablecoins.
- Provide an overview of the areas where standards for interoperability for CBDCs and stablecoins are beneficial.
- Compare different contexts where interoperability is relevant (e.g. cross-border, domestic, integration with existing payment networks, RTGS integration etc.).
- Identify some players building interoperability for CBDC and stablecoins, to create a common understanding of progress in the field.
- Indicate where central banks, commercial banks and other financial institutions can contribute to the issue.
- Identify the main barriers to interoperability for CBDCs and stablecoins.

In support of these objectives, the working group may discuss various scenarios, such as:

- Transacting parties that are connected to (the same/different) blockchain(s) and want to transfer (the same or similar/different) stablecoins.
- Transacting parties that are connected to (the same/different) CBDC network(s) and want to transfer (the same or similar/different) CBDCs.

The deliverable may outline key design principles for interoperability, such as:

- Local efficiency: linking domestic CBDCs and stablecoins in a way that enables fast and efficient national payments, reduces transaction and set-up costs, and widens direct participation.
- International efficiency: efficient and more affordable cross-border payments, especially for emerging economies.
- Universality: broad acceptance (as individuals or as commercial entities) of payments in one's national currency.

– Resilience: enhanced resilience of payment settlements infrastructure, to survive shocks to the system comparable to current conditions or other extraordinary events.

– Multi-vendor: a level playing field for competition that avoids closed-loop payment systems in which payments can only be made between users of the same payments provider.

– Non-proprietary: avoiding locking into specific proprietary technologies or technology providers.

– Potentially reducing counterparty risk or need for counterparties.

This deliverable may also describe consumer needs and requirements regarding interoperability to enable efficient cross-border exchanges. It will consider consumer, business and legal or regulatory frameworks, such as:

– Compliance with AML/CFT and data protection regulations.

– Support for seamless digital ID authentication and digital onboarding.

– Data compatibility for seamless communication with other digital currency systems.

– Compatibility with domestic and international payment systems.

– Digital wallet compatibility: user ability to send and receive different types of digital currencies from their digital wallets.

Key questions to be answered

The central questions the working group will discuss and explore include the following:

– What are the requirements for a digital currency issuer to say that their system is interoperable?

– How to define interoperability for digital currency systems and what does this mean in terms of practical use cases?

– What are the various models of interoperability for CBDCs and other digital currencies?

– What role does interoperability play in digital currency wallets and consumer experience?

– What are the unique interoperability issues, if any, for digital currencies based on DLTs?

– What are the main recommendations from international standard-setting bodies, for example the Bank for International Settlements (BIS), the International Telecommunication Union (ITU) and the International Standards Organization (ISO), in the area of digital currency interoperability?

Deliverable format

The deliverable will consist of a report that speaks to the above issues with respect to interoperability. It will also draw insights from a virtual roundtable in the first half of 2021 with central banks, stablecoin operators, standard-setting bodies and platform providers where participants will discuss key challenges and issues for interoperability.

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Glossary

Anti-money laundering (AML) / Combating the financing of terrorism (CFT)
AML includes any policies, laws, regulations and protocols designed to combat the introduction of funds obtained from illicit activities (such as racketeering, corruption, drug trafficking and fraud) into legitimate money systems and exchanges. CFT consists of similar measures designed to prevent and combat the financing of terrorist activities. Both money laundering and terrorist finance activities generate financial flows that divert resources away from economically and socially productive uses, often with negative impacts on the financial sector and national fiscal stability. AML/CFT controls, when effectively implemented, mitigate the adverse effects of such criminal economic activity and promote integrity and stability in financial markets.

Blockchain
A form of distributed ledger technology (DLT) in which transactions are conducted in a peer-to-peer fashion and then broadcasted to the entire set of system participants, all or some of whom work to validate them in batches known as blocks. Such validation is executed using the system's consensus protocol (such as proof-of-work or proof-of-stake). Validated blocks are then cryptographically linked to a primary sequence of blocks, referred to as a blockchain.

Central bank digital currency (CBDC)
A digital form of central bank money that may be accessible to the public (general-purpose or retail CBDC), or to a select set of participants such as financial organizations (wholesale CBDC).

Digital currency
Typically used to refer to a currency that exists in digital or electronic form and that may or may not be available in physical form. Digital currencies often have some, but not all the characteristics of a currency, but may also have characteristics of a commodity or other asset.

Digital ID
A set of digital credentials used to represent and prove the identity of a real-world individual, organization or electronic device on electronic or online systems, and their right to access, for example, certain information and services. Today, these typically take the form of digital certificates created using public-key cryptography to bind together a public-key with identity details and other details, such as a private key and the owner's digital ID.

Digital token
A unit on a digital and typically decentralized ledger that is used to represent value, such as an asset or a basket of assets, including real-world assets such as commodities, stock or real-estate property. The token can be used to facilitate transactions and transfers of title to such underlying value or asset.

Digital wallet
A digital device, software-based system or online application for storing payment information such passwords and private keys, which when used in conjunction with a payment system can enable online payments. Digital wallets, sometimes referred to as cryptocurrency wallets, are also used as a mechanism to store private key information for users to access their digital assets, such as cryptocurrencies.

Distributed ledger technology (DLT)
An overarching term that includes blockchain technologies and refers to the protocols and supporting infrastructure that allow computers in different locations to propose and validate transactions on a ledger and update ledger records in a synchronized way across a network. Many DLTs are designed to function without a centralized trusted authority, relying instead on distributed consensus-based validation procedures combined with cryptographic signatures.

E-money
Value stored electronically in a device such as a chip card or a hard drive in a personal computer and used as a means of payment and a store of value. E-money systems vary across different jurisdictions, but they are often fully backed by fiat currency, denominated in the same currency as central bank or commercial bank money and exchangeable at par value for such money or redeemable in cash.

Fiat currency
A form of currency established by government decree and generally issued by a monetary authority such as a central bank. Fiat currencies can be distinguished from other forms of government-issued money by typically not being backed by a commodity such as gold or silver and not having their own intrinsic value. Fiat currency can take the form of physically issued bank notes and cash or it can be represented electronically, such as with bank credit or central bank reserves.

Financial inclusion
The ability of individuals and businesses to access useful and affordable financial products and services that meet their needs, such as payment, savings, credit and insurance services, taking into account a variety of factors impacting that access, such as affordability, access to technology, education, geographic accessibility and financial infrastructure.

Know your customer (KYC)
Processes and protocols, usually prescribed by law, that apply to certain accountable institutions, such as banks, obliging them to verify and keep records of the identities of their customers in line with strict global or national anti-money laundering, anti-terrorism and other laws and regulations.

Peer-to-peer
Refers to interactions between peers in a system, such as transactions or information exchange, which occur without the need of an intermediary. In banking, this has come to refer to systems that enable transfers of value without the need for an intermediary bank, utilising, for example, distributed ledger technology.

Privacy-enhancing technology (PET)
Technologies or systems that incorporate technical processes, methods or knowledge to achieve specific privacy or data protection functionality or that implement specific requirements of data protection laws and reduce the risks associated with processing personally identifiable information, such as the risk of data breaches.

Payment versus payment (PvP)
A settlement mechanism that ensures that the final transfer of a payment in one currency occurs only if the final transfer of a payment in another currency or currencies takes place. PvP transfers can occur within a jurisdiction or across borders.

Retail CBDC
A form of central bank digital currency (CBDC) that is accessible to the general public. Retail CBDCs may take a two-tiered structure, where citizens would hold CBDC balances with commercial banks or other customer-facing entities rather than directly with the central bank. A retail CBDC could be used both domestically and cross-border. Retail CBDCs are sometimes also referred to as general purpose CBDCs.

RTGS
Real-time gross settlement, which in the context of interbank settlement refers to systems for the continuous and real-time transmission of funds or securities individually on an order-by-order basis, without netting.

Smart contract
Self-executing agreements that are triggered based on pre-defined and agreed conditions without manual intervention. A smart contract may or may not be related to or constitute a legal contract. The term is often used to refer to smart contracts deployed in decentralized, distributed blockchain networks.

Special drawing right (SDR)
A supplementary foreign exchange reserve asset created and maintained by the IMF to supplement its member countries' official reserves. An SDR is neither a currency nor a claim on the IMF, but rather a potential claim on the freely usable currencies of IMF members, and is exchangeable for those currencies.

Stablecoin
A term used to refer to digital currencies, such as DLT-based cryptocurrencies, which are designed to maintain a stable value relative to another asset (typically a unit of currency or commodity) or a basket of assets. In order to do so, stablecoin value may, for example, be pegged to the value of fiat currency, other crypto-assets or commodities, or supported by algorithms. Depending on the effectiveness of the stabilization mechanism and backing, the digital currency may or may not hold a stable value relative to its reference asset.

"Synthetic CBDC"
Refers to a potential alternative framework for central bank digital currency (CBDC), under which private payment service providers hold reserves at the central bank that fully back the digital currency they issue to customers. The regulatory framework would guarantee that these providers' liabilities will always be fully matched by funds at the central bank, creating protection for users against issuer default. Such liabilities could share some of the characteristics of a CBDC issued by the central bank, but they could not constitute a "true" CBDC, as the end user would not hold a direct claim on the central bank. For this reason, "synthetic CBDCs" have been referred to as a form of "narrow-bank" money.

Unbanked
Refers to adults or households who do not utilize the services of a bank or similar financial organization for transactions or in any other capacity. Often such persons or households would make use of alternatives, such as cash or pre-paid vouchers to pay for goods or services.

Underbanked
Refers to persons or households that utilize the services of a bank or similar financial institution but rely to a larger extent on alternative financial services. Examples of such alternative financial services used by underbanked households include non-bank money orders, non-bank cheque-cashing services, non-bank remittances, payday loans, rent-to-own services, pawn shop loans, refund anticipation loans, or auto title loans.

Wholesale CBDC
A form of central bank digital currency (CBDC) that would be used among banks and other financial institutions who typically hold reserve deposits with a central bank for interbank payments and securities transactions. Wholesale CBDC could be used both domestically and cross-border. Domestic wholesale CBDC is akin or equivalent to the reserve accounts commercial banks often hold with central banks today.

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