

TOWARDS AN EFFECTIVE REGULATORY AND GOVERNANCE FRAMEWORK FOR CENTRAL BANK DIGITAL CURRENCIES

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ABSTRACT

The issue and use of a central bank digital currency (“CBDC”) is presently being actively investigated by governments around the world. While the financial and technical discourse is relatively advanced, there is limited legal consideration of this critical matter. In particular, there is limited analysis of the regulatory and governance framework that should be applied to a CBDC. As a variety of common law jurisdictions are considering using distributed ledger technology (“DLT”) to issue a CBDC as a native currency, it is important to consider the impact of this disruptive technology on the present laws governing payments and markets infrastructures. In such a context, the objective of this paper is to critically analyse the current legal scholarship and legal reform discourse of nations around the world and present a taxonomy for measuring efficacy. To this end, the paper begins by developing a theoretical model for determining what constitutes effective CBDC regulation and governance. It then proceeds to apply this model to critically evaluate present CBDC laws, policies and reform discourse, focussing on those of the United States, the United Kingdom, Australia, Singapore, and Hong Kong. The paper concludes by applying the developed framework for effective regulation and governance to suggest future directions in this critical and emerging area of digital finance law.

INTRODUCTION

As nations around the world seek to strengthen the efficiency and security of their financial systems, the development of a central bank digital

currency (CBDC) has become of increasing interest.¹ A *central bank currency* can be defined as a central bank liability that is used as both a medium of exchange and a store of value, denominated into a unit of account.² CBDCs have the potential to transform financial infrastructure and systems due to their efficient transfers and real-time ledger reconciliations.³ They can, for instance, record transactions on a ledger and perform reconciliations of the ledger at the same time. CBDCs have the capacity to efficiently execute real-time transactions, commonly within a matter of seconds, and maintain immutable records. There has hence been wide international interest in the subject of CBDC issuance and usage, both at a wholesale and retail level. A variety of discussion papers, government investigations commissioned reports, prototypes and sandbox projects have been instigated around the world, with some instances of actual issuance and usage of CBDCs.⁴ Multiple proofs of concepts and prototypes have been

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This research is funded by the Digital Finance CRC supported by the Cooperative Research Centres program, an Australian Government initiative.

¹ U.K. GOV'T OFFICE FOR SCI., DISTRIBUTED LEDGER TECHNOLOGY: BEYOND BLOCK CHAIN (Mark Peplow ed., 2016), <https://www.gov.uk/government/publications/distributed-ledger-technology-blackett-review>; *see also* BANK OF CANADA, CONTINGENCY PLANNING FOR A CENTRAL BANK DIGITAL CURRENCY (2020), <https://www.bankofcanada.ca/2020/02/contingency-planning-central-bank-digital-currency/>; EURO. CENT. BANK, REPORT ON A DIGITAL EURO (2022), https://www.ecb.europa.eu/pub/pdf/other/Report_on_a_digital_euro~4d7268b458.en.pdf; SVERIGES RIKSBANK, E-KRONA PILOT: PHASE 2 (2022), <https://www.riksbank.se/globalassets/media/rapporter/e-krona/2022/e-krona-pilot-phase-2.pdf>; U.S. FED. RES. SYS., MONEY AND PAYMENTS: THE U.S. DOLLAR IN THE AGE OF DIGITAL TRANSFORMATION (2022), <https://www.federalreserve.gov/publications/files/money-and-payments-20220120.pdf>.

² BANK FOR INTERNATIONAL SETTLEMENTS, COMM. PAYMENTS & MARKET INFRA., CENTRAL BANK DIGITAL CURRENCIES (March 2018), <https://www.bis.org/cpmi/publ/d174.pdf>.

³ Trevor Kiviat, *Beyond Bitcoin: Issues in Regulating Blockchain Transactions*, 65 DUKE LAW J., 569 (2015), <https://scholarship.law.duke.edu/dlj/vol65/iss3/4/>; *see also* PHILIPP HACKER, STEFAN EICH & GEORGIOS DIMITROPOULOS, REGULATING BLOCKCHAIN: TECHNO-SOCIAL AND LEGAL CHALLENGES—AN INTRODUCTION (1st ed, 2019).

⁴ BANK OF JAPAN, THE BANK OF JAPAN'S APPROACH TO CENTRAL BANK DIGITAL CURRENCY (2020), https://www.boj.or.jp/en/about/release_2020/re1201009e.htm; *see also* TONY RICHARDS, CHRIS THOMPSON & CAMERON DARK, RESERVE BANK OF AUS., RETAIL CENTRAL DIGITAL BANK CURRENCY: DESIGN CONSIDERATIONS, RATIONALES AND IMPLICATIONS (2020), <https://www.rba.gov.au/publications/bulletin/2020/sep/retail-central-bank-digital-currency-design-considerations-rationales-and-implications.html>; RESERVE BANK OF AUS., PROJECT ATOM: EXPLORING A WHOLESALE CBDC FOR SYNDICATED LENDING (2021), <https://www.rba.gov.au/payments-and-infrastructure/central-bank-digital-currency/pdf/project-atom-report2021-12.pdf>; BANK OF ENGLAND, RESPONSES TO THE BANK OF ENGLAND'S MARCH 2020 DISCUSSION PAPER ON CBDC (2021), <https://www.bankofengland.co.uk/paper/2021/responses-to-the-bank-of-englands-march-2020-discussion->

developed and tested. Among these is Project Atom in Australia, which considers how to develop wholesale settlements systems,⁵ and Project Dunbar, a collaborative multi-jurisdiction project which investigates the development of multi-layered CBDCs for wholesale settlements.⁶

In such a context, the aim of this paper is to critically analyse what constitutes the effective regulation and governance CBDCs. The paper will begin by providing an overview of international developments in this area, including the evolution of law reform discourse and implementation

paper-on-cbdc; MONETARY AUTH. OF SINGAPORE, ECON. POL'Y GRP., A RETAIL CENTRAL BANK DIGITAL CURRENCY: ECONOMIC CONSIDERATIONS IN THE SINGAPORE CONTEXT (2021), <https://www.mas.gov.sg/-/media/MAS/EPG/Monographs-or-Information-Paper/A-retail-CBDC---Economic-Considerations-in-the-Singapore-Context.pdf>; TONY RICHARDS, RESERVE BANK OF AUS., THE FUTURE OF PAYMENTS: CRYPTOCURRENCIES, STABLECOINS OR CENTRAL BANK DIGITAL CURRENCIES? (2021), <https://www.rba.gov.au/speeches/2021/sp-so-2021-11-18.html>; BIS INNOVATION HUB, PROJECT DUNBAR: INTERNATIONAL SETTLEMENTS USING MULTI-CBDCs (2022), <https://www.rba.gov.au/payments-and-infrastructure/central-bank-digital-currency/pdf/project-dunbar-report-2022-03.pdf>; RESERVE BANK OF AUS. & DIGITAL FINANCE CRC, AUSTRALIAN CBDC PILOT FOR DIGITAL FINANCE INNOVATION: WHITE PAPER (2022), <https://www.rba.gov.au/payments-and-infrastructure/central-bank-digital-currency/pdf/australian-cbdc-pilot-for-digital-finance-innovation-white-paper.pdf>; *see also* TOMMASO MANCINI-GRIFFOLI ET AL., CASTING LIGHT ON CENTRAL BANK DIGITAL CURRENCY (2018), <https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2018/11/13/Casting-Light-on-Central-Bank-Digital-Currencies-46233>; ESWAR S. PRASAD, U.S. HOUSE FIN. SERVICES COMM., THE FUTURE OF MONEY: DIGITAL CURRENCY (2018), https://www.brookings.edu/wp-content/uploads/2018/07/Prasad-Testimony_HouseFSC_July-18.pdf (for overview of similar initiatives). In a survey of 63 central banks, one-third of them perceived CBDC as a possibility in the medium term. *See* Christian Barontini & Henry Holden, *Proceeding with Caution – A Survey on Central Bank Digital Currency* (Feb. 13, 2019), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3331590). Notably, the central banks of the Peoples Republic of China, Norway, Sweden, Ukraine, and Uruguay are actively investigating the possibility of introducing a CBDC for domestic retail payments. While the central banks of Ukraine and Uruguay have run successful pilots. *See* Mario Bergara & Jorge Ponce, *Central Bank Digital Currency: The Uruguayan E-Peso Case in Do We NEED CENTRAL BANK DIGITAL CURRENCY? ECONOMICS, TECHNOLOGY AND INSTITUTIONS* (Ernest Gnan & Donato Masciandaro eds., 2018); NAT'L BANK OF UKRAINE, ANALYTICAL REPORT ON THE E-HRYVIAN PILOT PROJECT (2019), https://bank.gov.ua/admin_uploads/article/Analytical%20Report%20on%20E-hryvnia.pdf?v=4; NORGES BANK, CENTRAL BANK DIGITAL CURRENCY (2022), <https://www.norges-bank.no/en/topics/financial-stability/central-bank-digital-currency>.

⁵ *See* TONY RICHARDS, CHRIS THOMPSON & CAMERON DARK, RESERVE BANK OF AUSTL., RETAIL CENTRAL DIGITAL BANK CURRENCY: DESIGN CONSIDERATIONS, RATIONALES AND IMPLICATIONS (2020), <https://www.rba.gov.au/publications/bulletin/2020/sep/retail-central-bank-digital-currency-design-considerations-rationales-and-implications.html>; RESERVE BANK OF AUS. & DIGITAL FINANCE CRC, AUSTRALIAN CBDC PILOT FOR DIGITAL FINANCE INNOVATION: WHITE PAPER (2022), <https://www.rba.gov.au/payments-and-infrastructure/central-bank-digital-currency/pdf/australian-cbdc-pilot-for-digital-finance-innovation-white-paper.pdf>.

⁶ *Id.*; BIS INNOVATION HUB, *supra* note 4.

strategies of the United States of America, United Kingdom, Australia, Singapore and Hong Kong. The paper will then provide a much-needed theoretical foundation for the regulation of CBDCs. As much of the CBDC discourse conflates the concepts of regulation and governance, the paper will delineate the meaning of each, and develop a novel theoretical model to provide criteria that can be used to determine what constitutes “effective” CBDC regulation and governance. Building on this theoretical foundation, the paper will critically analyse current national and international regulatory CBDC proposals and dialogue in this new and evolving area. The theoretical model will be used to evaluate the merits and potential weaknesses and risks implicit in the various proposals. It is hoped that this scholarship will be useful in shaping the law of nations around the world, highlighting the critical need for sound theoretical foundations, careful legal drafting and international harmonisation in this new and evolving area of digital finance law.

This paper forms one of the first legal scholarly inquiries into the effective regulation and governance of CBDCs. The research is significant in that it extends tools of critical analysis which have been developed in relation to designing effective regulatory and governance frameworks to the new and evolving challenge of CBDCs. It is also significant in integrating legal understanding with insights gained from the fields of information technology and finance. The paper thus seeks to articulate the strategies and operations of CBDCs and their platforms and seeks to develop an effective regulatory and governance framework to guide law and policy makers around the world as they respond to this new and disruptive technological development.

Even at this early stage of reform discourse, it is possible to discern a variety of differing approaches and methodologies to the development of CBDC law and policy. Certain jurisdictions, such as the UK and USA, commenced their approach by investigating the use of Distributed Ledger Technologies (“DLTs”) in tandem with existing financial systems. “DLT” can be defined as a distributed set of records held in common by a substantial proportion of network participants in what is commonly known as a peer-to-peer network.⁷ In contrast, other jurisdictions, such as Australia, South Africa, Israel and European Union, have commenced an examination of wholesale and retail CBDCs. The maturity and sophistication of CBDC development also varies among nations. The UK, for example, launched its investigations into these technologies back in 2015.⁸ The 2015 *Blackett Report* investigated DLTs and blockchain technologies and their use by the UK government—but did not go as far as investigating the issuance of

⁷ Michel Rauchs et al., *Distributed Ledger Technology Systems: A Conceptual Framework* (2018), <https://ssrn.com/abstract=3230013>.

⁸ U.K. GOV'T OFF. FOR SCI., *supra* note 1.

CBDCs for usage by the government and/or the public.⁹ However, in March 2020, the Bank of England (BoE) did issue a discussion paper on this topic of issuance of CBDCs by the bank and its potential uses.¹⁰ In June 2021, the BoE further published responses to its discussion paper,¹¹ outlining a number of principles that must be adhered to if CBDC issuance and usage goes ahead. North America followed suit, with the Bank of Canada, publishing its thoughts on the matter in January 2022,¹² and the USA publishing its discussion paper in the same month.¹³ Singapore, Japan, Israel and the European Central Bank soon followed suit, with the publication of various discussions papers requesting public feedback and other publications on the topic from various perspectives.¹⁴ It is important to note that all these nations have declined to commence issuing and using a CBDCs at this current time, arguing that a public interest case had not yet been made and favouring a “wait and see” approach to regulation.

In a marked contrast to the above nations who are in varying stages of investigation and testing, the Chinese Government has taken substantial steps towards developing its own central bank digital currency. This is in the form of electronic currency which is prepaid value stored on electronic media owned by consumers and used for general purposes.¹⁵ Electronic money includes both card-based electronic money and network-based electronic money.¹⁶ Card-based electronic money is commonly stored in chip cards, which include various smart cards (or debit cards) issued by financial institutions and various types of stored-value cards issued by non-financial institutions.¹⁷ There are two types of network-based electronic money: one in third-party payment platforms, and the other issued by major network service providers.¹⁸ China's proposal to issue its own digital currency was made in 2019 when it endorsed blockchain technology and announced the release of a new digital currency. This digital currency is proposed to be established as a two-tier structure that is labelled the digital currency/electronic payment (“DC/EP”) system. Thus, the digital Yuan will be a fully centralised digital currency with the justification that it will strengthen the fiat currency Yuan by allowing the Yuan to be easily spent anywhere in the world.

⁹ *Id.*

¹⁰ BANK OF ENGLAND, *supra* note 10, at 56.

¹¹ BANK OF ENGLAND, *supra* note 4.

¹² BANK OF CANADA, *supra* note 1.

¹³ *See* U.S. FED. RESERVE SYS., *supra* note 1.

¹⁴ *See* U.K., GOV'T OFF. FOR SCI., *supra* note 1; BANK OF JAPAN, *supra* note 4.

¹⁵ Qian Yao, *A Systematic Framework to Understand Central Bank Digital Currency*, 61 SCI. CHINA (Mar. 2018), <http://scis.scichina.com/en/2018/033101.pdf>.

¹⁶ *Id.*

¹⁷ *Id.*

¹⁸ *Id.*

Estonia has similarly journeyed beyond the investigative phases, announcing its findings on CBDC issuance research in 2021.¹⁹ Estonia’s aim was to evaluate whether a system based on digital bills can scale linearly to cover very high payment volumes.²⁰ Estonia had already introduced blockchain technologies to its public sector in the late 2000s and used electronic identity (“eID”) nationally since 1999. Estonia’s *Eesti Pank* states that these two factors paved the road for CBDC issuance because the required technological infrastructure had been laid and only improvements were necessary. The eID is used in the required know-your-customer (“KYC”) verifications while blockchains are used to provide cryptographic verifiability of the state and operation of the system without compromising user privacy, where the system is reported to be highly resilient and resistant to outsider attacks.

The Central Bank of Sweden (*Sveriges Riksbank*) has also progressed beyond the initial investigative phase and has completed its second phase of a “general purpose” *e-Krona Pilot* in April 2022.²¹ The pilot aimed at the continuation of development and testing of technical solutions and also to investigate a potential legal framework for the e-Krona.²² The legal investigation mainly focused on how information is shared on DLTs and how legislation would apply to information sharing while supporting confidentiality and data protection. The 2022 report on e-Krona also examined the type of asset that would underlie e-Krona.²³ The resulting legal analysis, which was based on the available technical solutions, suggests that the data shared on a platform is likely to be considered personal data that is subject to confidentiality and data protection regulation.²⁴ The e-Krona would hence form a complete replacement to current cash and coins used in Sweden.²⁵

However, while there is significant international public policy discourse in these above nations on how a CBDC should be issued, regulated and governed, there exists limited legal consideration as to what constitutes effective regulation of a CBDC. Legal and policy discourse has instead typically concentrated on the financial and technological aspects of

¹⁹ Rainer Olt et al., *Summary Report: Results of the Eesti Pank - Guardtime CBDC Research* (Dec. 2021), https://haldus.eestipank.ee/sites/default/files/2021-12/EP-Guardtime_CBDC_Research_2021_eng.pdf; see also C. Pfister, *A Central Bank Central Currency: Why? How? To What Effect?*, 39 BANKING AND FINANCIAL SERVICES POLICY REPORT 9-23 (2020).

²⁰ *Id.*

²¹ SVERIGES RIKSBANK, *E-KRONA PILOT: PHASE 2* (2022), <https://www.riksbank.se/en-gb/payments--cash/e-krona/e-krona-reports/e-krona-pilot-phase-2>.

²² *Id.*

²³ *Id.*

²⁴ *Id.* at 28-30.

²⁵ *Id.*

CBDC issuance and usage. For instance, Beck, Müller-Bloch and King emphasise the scarcity of research conducted into governance and regulation of DLTs and/or blockchain technologies.²⁶ Additionally, Hsieh, Vergne and Wang make a call for better understanding of the topic of blockchains governance,²⁷ with De Filippi and Loveluck further noting that there is little on the “what and how” of decision-making and enforcement mechanisms on blockchains platforms.²⁸ Conversely, while there is reasonable relevant literature on governance of databases in payment systems, and scholarly work on DLTs and blockchains,²⁹ smart contracts³⁰ and decentralised autonomous organisations (DAO),³¹ the regulation and governance of

²⁶ Roman Beck, Christoph Müller-Bloch & Leslie King, *Governance in the Blockchain Economy: A Framework and Research Agenda*, 19 J. ASSOC. INFO. SYS. 1020, 1020 (2018), <https://aisel.aisnet.org/jais/vol19/iss10/1/>; see also ITU-T, REGULATORY CHALLENGES AND RISKS FOR CENTRAL BANK DIGITAL CURRENCY (2019), https://www.itu.int/en/ITU-T/focusgroups/dfc/Documents/DFC-O-006_Report%20on%20Regulatory%20Challenges%20and%20Risks%20for%20Central%20Bank%20Digital%20Currency.pdf.

²⁷ Ying-Ying Hsieh, Jean-Philippe Vergne & Sha Wang, *The Internal and External Governance of Blockchain-Based Organisations: Evidence from Cryptocurrencies*, in BITCOIN AND BEYOND: CRYPTOCURRENCIES, BLOCKCHAINS AND GLOBAL GOVERNANCE 48 (Malcolm Campbell-Verduyn ed. 2017).

²⁸ Primavera De Filippi & Benjamin Loveluck, *The Invisible Politics of Bitcoin: Governance Crisis of a Decentralised Infrastructure*, 5 INTERNET POL'Y REV. 1, 4 (Oct. 17, 2016), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2852691; see also Alex Cukierman, *Reflections on Welfare and Political Economy Aspects of a Central Bank Digital Currency*, 88 MANCHESTER SCH.: PROCEEDINGS OF THE MONEY, MACROECON. & FINANCE RSCH. GRP. 114, 114-125 (July 9, 2020), <https://onlinelibrary.wiley.com/doi/full/10.1111/manc.12333>.

²⁹ Moritz Hütten, *The Soft Spot of Hard Code: Blockchain Technology, Network Governance and Pitfalls of Technological Utopianism*, 19 GLOBAL NETWORKS (Nov. 19, 2018), <https://onlinelibrary.wiley.com/doi/full/10.1111/glob.12217>; see also Katarzyna Ziolkowska, *Distributing Authority – State Sovereignty in the Age of Blockchains*, 35 INT'L REV. L., COMPUTS. & TECH. (Feb. 2021), https://www.researchgate.net/publication/349317568_Distributing_authority_-_state_sovereignty_in_the_age_of_blockchain; Christopher Millard, *Blockchain and Law: Incompatible Codes?* 34 COMPUT. L. & SEC. REP. (July 30, 2018), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3220406; Markos Zachariadis, Garrick Hileman & Susan Scott, *Governance and Control in Distributed Ledgers: Understanding the Challenges Facing Blockchain Technologies in Financial Services*, 29 INFO & ORG. (June 2019), 105, <https://www.sciencedirect.com/science/article/pii/S1471772719300284>.

³⁰ Joshua Fairfield & Niloufer Selvadurai, *Governing the Interface Between Natural and Formal Language in Smart Contracts*, 27 UC J.L. & Tech. 79 (2022), <https://scholarlycommons.law.wlu.edu/wlufac/710>.

³¹ Alexandra Sims, *Blockchains and Decentralized Autonomous Organizations: The Evolutions of Companies*, 28 NZ U. L. REV. (Nov. 1, 2019), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3524674; see also Kristopher Jones, *Blockchain In or As Governance? Evolutions in Experimentation, Social Impacts, and Prefigurative Practice in the Blockchain and Space*, 24 INFORMATION POLITY (Jan. 1, 2019 2019), <https://dl.acm.org/doi/abs/10.3233/IP-190157>; Samer Hassan & Primavera De Filippi, *Decentralised Autonomous Organisations*, 10(21) INTERNET POL'Y REV. (Apr. 20, 2021), <https://policyreview.info/pdf/policyreview-2021-2-1556.pdf>.

potential technologies used in wholesale central bank digital currency (“wCBDC”) and retail central bank digital currencies (“rCBDCs”) have not been the focus of scholarly literature. This paper will hence form one of the earliest legal considerations of the issue of CBDC regulation and governance, considering critical legal issues that relate to both the potential issue and use of such a currency.

I. A THEORETICAL MODEL FOR CBDC REGULATION AND GOVERNANCE

Prior to discussing the regulation and governance of CBDCs, it is valuable to develop a theoretical model that can be used to determine what constitutes effective CBDC regulation and governance. This model will provide criteria, such as the need for an integrated approach to regulation and governance, predictable implementation, clarity of rules and legislation, and a capacity for self-regulation, that can be applied to evaluate the relative merits of CBDC laws, policies and reform discourse around the world.

A. The Distinction between the Regulation and Governance of CBDCs

As the terms “regulation” and “governance” are often used interchangeably, it is useful to begin by defining and distinguishing these terms. This analysis is valuable because of the nature of the underlying technology and/or platforms that may be deployed to issue and use CBDCs. This distinction is often clear in the context of the regulation of firms and body corporates, as we separate regulation from corporate governance and responsibility. In this paper, it is argued that the same is true for CBDCs, although this may be achieved through differing mechanisms. By understanding the underlying technology, we are better placed to harness it to its maximum potential when seeking to develop effective regulation and governance frameworks for CBDCs.

“Regulation” may be defined as the administration of enforcement of rules and legislations.³² This involves the formulation of relevant regulation, and also the creation of regulatory authorities with jurisdiction to demand disclosures, initiate relevant investigations and necessary powers of enforcement.³³ The advent of digital currency, the most recent innovation that disrupts the established methodologies of currency and markets,

³² Vicky Comino, *Effective Regulation by the Australian Securities and Investments Commission: The Civil Penalty Problem*, 33 MELB. U. L. REV. 802-832 (Oct. 5, 2010), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1686927; see also John Wright & Brian Head, *Reconsidering Regulation and Governance Theory: A Learning Approach*, 31 U. DENV. L. & POL’Y 192-216 (2009); and John Braithwaite, John Walker & Peter Grabosky, *An Enforcement Taxonomy for Regulatory Agencies*, 9 LAW & POL’Y (1987).

³³ *Id.*

introduces fresh challenges for governments and regulators. While generating much needed additional competition to existing payment and currency systems operated by banks and traditional financial intermediaries through potentially greater speeds and lower costs, digital currencies also pose significant risks and problems.³⁴ These include financial risks for users of digital currency, as well as problems for law enforcement, given the potential for its use in anonymous trade in illegal goods and services, money laundering and terrorist financing.³⁵

While governments around the world have taken certain actions in relation to regulation for the benefit of investors in and users of digital currency,³⁶ the same cannot be said in the context of CBDCs. It is hence essential that an effective regulatory framework be developed to facilitate the issuance and usage of CBDCs internationally as this lack of State regulation presents a risk to society. As Black cogently argues, “[O]nce regulation is not seen as something tied exclusively or even predominantly to the State, it is not clear where its boundaries lie either as a social practice or an academic discipline.”³⁷ This lack of CBDC state regulation can present a direct challenge to State sovereignty because a State is sovereign when it enjoys full control over its territory, possess sole authority internally, and is independent of external authority.³⁸ Therefore, notwithstanding the fact that DLTs and blockchains are maturing technologies, known to have their own governance mechanisms, commonly known as consensus mechanisms, it is essential that states assert their sovereignty and control over them. In the present context, this involves designing effective framework to strategically regulate and govern CBDCs operations.

In contrast to the broad consensus as to the meaning of “regulation,” “governance” classifications are typically wider, more diverse, and more varied in nature. The meaning of “governance” in one context may be different in another.³⁹ Politicians, economists, managers, legal practitioners, and even not-for-profit organisations are interested in determining best way

³⁴ Paul Duffy & Michael Duffy, *Deconstructing Digital Currency and Its Risks: Why ASIC Must Rise to the Regulatory Challenge*, 47 FED. L. REV. 121 (Mar. 18, 2019), <https://journals.sagepub.com/doi/full/10.1177/0067205X18816237>.

³⁵ *Id.*

³⁶ *Id.*

³⁷ Julia Black & Dimity Kingsford Smith, *Critical Reflections on Regulation [Plus a Reply by Dimity Kingsford Smith]*, 27 AUSTL. J PHIL. 1 (2002), <http://www.austlii.edu.au/au/journals/AUJILegPhil/2002/1.pdf>.

³⁸ Katarzyna Ziolkowska, *Distributing Authority - State Sovereignty in the Age of Blockchain*, 35 INT’L REV. LAW. COMPUT. & TECH. 116 (Feb. 2021), https://www.researchgate.net/publication/349317568_Distributing_authority_-_state_sovereignty_in_the_age_of_blockchain.

³⁹ Brian Cheffins, *The History of Corporate Governance* (EGI Law Working Paper No 184, 2012), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1975404.

to govern organisations, institutions and indeed technologies.⁴⁰ An important reason for this is the need to resolve disputes while managing different motivations and agendas, particularly within technological platforms such as DLTs and blockchains.⁴¹ Reyes, Geslevich and Edwards suggest that corporate governance is composed of managerial accountability, board structure, and shareholder rights, where stakeholders seek collective consensus to oversee, execute, and maintain complex series of interacting agreements between them.⁴² In the context of economics, “transaction cost theory” is used to explain best possible governance in contracts and economics, as it considers uncertainty and opportunistic behaviour.⁴³ It is often argued that contractual relationships or market operations require trust, commonly known as “established character,” between the transacting parties.⁴⁴ Williamson suggests that having a hierarchy may provide protection against opportunism, especially when a person’s investment is based on transaction of assets and frequent trades.⁴⁵ Governance, in transaction cost theory, is considered most effective within the context of “contractual incompleteness” where contracts fail to define the relevant contingencies and enforceable rules.⁴⁶ Therefore, while the concept of governance is the subject to diverse definition, it essentially relates to the operations of the relevant laws and rules in any specific context.

Significantly, when it comes to the governance of emergent technologies, particularly with the advent of the internet, scholars have noted that developing trust between transacting parties over TCP/IP network has often been a challenge.⁴⁷ Edelman suggests that this has given rise to the emergence of “powerful intermediaries” who provide offerings of governance to coordinate trade relationships between users.⁴⁸ Additionally, Rochet and Tirole state that the internet became the foundations upon which digital technologies emerged.⁴⁹ One of the most significant of these emergent technologies is blockchain. Blockchain technologies, commonly

⁴⁰ *Id.*

⁴¹ *Id.*

⁴² Carla Reyes, Nizan Geslevich & Ben Edwards, *Distributed Governance*, 59 WM. & MARY L. REV. (Sept. 22, 2017), <https://scholarship.law.wm.edu/wmlronline/vol59/iss1/1>.

⁴³ NATURE OF THE FIRM: ORIGINS, EVOLUTION, AND DEVELOPMENT (Oliver Williamson & Sidney Winter eds., 1991).

⁴⁴ Oliver Williamson, *Transaction-Cost Economics: The Governance of Contractual Relations*, 22 J.L. & ECON. 233-261 (Oct. 1979), <https://www.jstor.org/stable/725118>.

⁴⁵ *Id.*

⁴⁶ *Id.*

⁴⁷ Benjamin Edelman, *Mastering the Intermediaries*, 92 HARV. BUS. REV. 86-138 (2014), <https://hbr.org/2014/06/mastering-the-intermediaries>.

⁴⁸ *Id.*

⁴⁹ Jean-Charles Rochet & Jean Tirole, *Platform Competition in Two-Sided Markets*, 1 J. EUR. ECON. ASSOC. 990, 990-1029 (June 2003), <https://www.jstor.org/stable/40005175>.

portrayed as the “next generation internet,”⁵⁰ have caught the attention of governments and the public alike and have been deployed in a variety of jurisdictions. However, this topic also suffers from a scarcity of legal scholarship.⁵¹ Blockchain governance can be defined as “the means of achieving a direction, control, and coordination of stakeholders within the context of a given blockchain project to which they jointly contribute.”⁵² Due to blockchains’ decentralized design and operational nature, its governance differs from centralized and hierarchical structures.⁵³ Effective blockchain governance is hence important to support technological adaptation, change and interactions.⁵⁴ Moreover, due the relatively substantial size of blockchain technology projects, governance is essential to control and direct blockchain communities towards the same goal.⁵⁵ A variety of studies indicate that there is evidence that governance of permissioned blockchains environment within organisations is an obstacle to progress that needs to be overcome.⁵⁶ Thus, such studies reveal that appropriate blockchain governance is a key aspect for all stakeholders in the new digital economy and demonstrate the pressing need for effective governance of emergent technologies and their applications.

B. What Constitutes “Effective” CBDC Regulation and Governance?

Building on the above discussion of the regulation and governance of CBDC, it is useful to now transition to considering what constitutes “effective” regulation and governance in the context of CBDCs. It will be here suggested that a variety of criteria can be used to identify effective regulation. First, it is essential to adopt an *integrated approach* to regulation whereby regulators adopt a risk-based proactive practice to regulation. This also entails developing appropriate compliance mechanisms for the regulated subjects. Second, effective regulation is characterised by *predictable implementation* of regulatory processes. This entails adoption of the *really-responsive implementation approach* that detects undesirable or

⁵⁰ Markos Zachariadis, Garrick Hileman & Susan Scott, *Governance and Control in Distributed Ledgers: Understanding the Challenges Facing Blockchain Technology in Financial Services*, 29 INFO. ORGAN. 105 (June 2019), <https://www.sciencedirect.com/science/article/pii/S1471772719300284>.

⁵¹ *Id.*

⁵² Oskar van Deventer, Christopher Brewster & Maarten Everts, *Governance and Business Models of Blockchain Technologies* TNO TECHNICAL REPORT (June 2017), <https://nn8.nl/publications/pdfs/Deventer2017GBM.pdf>.

⁵³ Rafael Ziolkowski et al., *Examining Gentle Rivalry: Decision-Making in Blockchain Systems*, 52ND ANNUAL HAWAII INT’L CONF. ON SYS. SCIS. (2019), 1.

⁵⁴ *Id.*

⁵⁵ *Id.*

⁵⁶ See Deventer, Brewster & Everts, *supra* note 52 at 87.

noncompliant behaviour, responding to behaviour by developing tools and strategies, enforcing those tools and strategies on the ground, assessing their successes and failures on a regular basis, and modifying tools and strategies accordingly. Third, effective regulation requires *clarity around rules and legislation*, and fourth, a capacity to support *self-regulation*.⁵⁷ It is useful to examine each of these criteria in further detail.

An integrated approach encourages proactive and responsive approaches to regulation—*proactive* in the sense that regulators need to consider all foreseeable risks and mitigate those risks by setting the relevant legal provisions in place, and *responsive* in the sense that it supports compliance with relevant legislative provisions and rules. It is suggested that when rules and regulations are devised by the relevant bodies, both these approaches need to be followed to set the foundations for effective regulation.⁵⁸

To ensure compliance, there is a need to establish a system for predictable implementation. If a regulatory body is unaware of how to implement regulatory processes, it is likely to form an impediment to a regulator’s ability to be agile, responsive and initiate proactive measures, causing the regulatory body to be reactive and leading to ineffective regulation.⁵⁹

Further, clarity around applicable rules and legislation is beneficial for both regulators and regulated entities. Clarity enables regulators, as they administer the enforcement of the rules, to do so efficiently and effectively. It also empowers regulated firms to understand and fully comprehend what is required of them to enable effective compliance.⁶⁰ Clarity of rules and legislation is of particular importance in the context of CBDCs given the technological platform through which they are issued and used. DLTs automated operations are run by smart contracts which are binary programming languages that use “if/then/else” statements. They do not understand natural language, nor can natural language be converted into smart contract code. A lack of legislative clarity can pose a serious problem, particularly when it comes to interpreting of how such rules apply in the complex and uncertain environment of DLT operations and CBDC issue and use.

⁵⁷ Nancy Michail, *Efficacy of the Australian Securities and Investments Commission in Regulating Illegal Phoenixing in the Australian Building and Construction Industry*, (2021) (Master of Research Thesis, Macquarie University), https://figshare.mq.edu.au/articles/thesis/Efficacy_of_the_Australian_Securities_and_Investments_Commission_in_regulating_illegal_phoenixing_in_the_Australian_building_and_construction_industry/21365862.

⁵⁸ *Id.*

⁵⁹ *Id.*

⁶⁰ *Id.*

Finally, while this model is for effective regulation, it encompasses within its ambit the criterion of self-regulation. Due to complex technological advancements, interdependence and globalisation, there is a need to look at governance mechanisms, standards and rules in a different, and perhaps more dynamic, way.⁶¹ In the broadest sense, self-regulation can form an alternative form of governance: decisions over who decides what behaviours, rules or standards are appropriate and how to enforce those rules.⁶²

Thus, this four-criteria model of effective regulation and governance presents a taxonomy by which we can both measure efficacy of regulation and governance in the context of CBDCs and design suggestions for law reforms and refinements. Building on this foundation, the remainder of the paper will examine the CBDC law, policy and reform discourse of five jurisdictions. It will apply this model to consider how to achieve not just efficiency, but also efficacy, in the regulation and governance of CBDCs.

II. ANALYSING THE EVOLVING CBDC LEGAL DISCOURSE AROUND THE WORLD

It is useful at this point to analyse in some detail the emerging scholarship, laws and policies on the issuance and usage of CBDCs. Such an analysis will help identify and synthesise valuable insights, arguments and information to better ascertain and evaluate the present direction of regulation and governance of CBDCs in five jurisdictions. The objective of this section of the paper is to critically examine the legal discourse on CBDCs in these selected jurisdictions using the above model of effective regulation and governance.

The jurisdictions of UK, Australia, Singapore, Hong Kong and USA have been selected for analysis because they have a sophisticated reform discourse on the regulation and governance of digital currencies. However, it is relevant to note that not all have mature CBDC proposals. For example, in the US, the Federal Reserve has not made any decisions on CBDC issuance and usage yet but have discussed the regulation of digital currencies. Similarly, if the Bank of England (BoE) ultimately concludes

⁶¹ Douglas Austrom & Lawrence Lad, *Issues Management Alliances: New Responses, New Logics*, 11 RSCH. IN CORP. SOC. PERF. & POL'Y 235, 235-55 (1989),

https://digitalcommons.butler.edu/cgi/viewcontent.cgi?article=1034&context=cob_papers; see also VIRGINIA POSTREL, *THE FUTURE AND ITS ENEMIES: THE GROWING CONFLICT OVER CREATIVITY, ENTERPRISE, AND PROGRESS* (1998).

⁶² Lawrence Lad & Craig Caldwell, *Collaborative Standards, Voluntary Codes and Industry Self-Regulation: The Role of Third-Party Organisations*, 35 J. CORP. CITIZENSHIP 67 (Autumn 2009), <https://www.jstor.org/stable/jcorpcti.35.67>.

that issuing a CBDC is a good idea, the earliest potential date for the launch of a CBDC is likely to be in the second half of the decade. However, there has been some related work done within the CBDC scope which we will draw on to conduct our analysis. The purpose of this analysis is therefore to identify concerns, consider the merits of emerging strategies, policies and laws and gain insights and lessons as to how to effectively regulate and govern CBDCs moving forward.

A. *The United Kingdom*

Communications from the BoE suggest that the UK is considering the issuance and usage of CBDCs, alongside cash currency, as they rebuild their payments systems infrastructure to address the demands of a changing digital finance environment.⁶³ In March 2020, the BoE published a discussion paper entitled *Discussion Paper—Central Bank Digital Currency: Opportunities, Challenges and Design* which outlined possible approaches for the design of CBDCs and sought feedback.⁶⁴ A subsequent report entitled *Responses to the Bank of England's March 2020 Discussion Paper on CBDC* was published in July 2021.⁶⁵ In April 2021, the BoE, with Her Majesty's Treasury ("HMT"), set up a Central Bank Digital Currency Taskforce to manage this work, stating that they were working closely with other public authorities. In June 2021, the BoE articulated their thinking on the possible opportunities and risks of the CBDCs in their discussion paper entitled *Discussion Paper on New Forms of Digital Money*.⁶⁶ In November 2021, together with HMT, BoE presented the pathway towards the establishment of a UK CBDC in a document entitled *The Next Steps for a UK CBDC*.⁶⁷ These next steps included a consultation in 2022 to assess the case for a UK CBDC. It was proposed that this consultation would also look at the merits of doing additional work to develop an operational and technology model for CBDCs.⁶⁸ However, despite this spate of policy papers, the regulatory discourse remains largely absent in BoE discussions, save as to mentioning the importance of compliance and the value of having

⁶³ BANK OF ENGLAND, *supra* note 10; BANK OF ENGLAND, *supra* note 4.

⁶⁴ BANK OF ENGLAND, Discussion Paper - Central Bank Digital Currency: Opportunities, Challenges and Design (Mar. 12, 2020), <https://www.bankofengland.co.uk/paper/2020/central-bank-digital-currency-opportunities-challenges-and-design-discussion-paper>.

⁶⁵ BANK OF ENGLAND, *supra* note 4.

⁶⁶ BANK OF ENGLAND, DISCUSSION PAPER: NEW FORMS OF DIGITAL MONEY (2021), <https://www.bankofengland.co.uk/paper/2021/new-forms-of-digital-money>.

⁶⁷ BANK OF ENGLAND, THE NEXT STEPS FOR A UK CBDC (2021), <https://www.bankofengland.co.uk/news/2021/november/statement-on-central-bank-digital-currency-next-steps>.

⁶⁸ *Id.*

robust regulatory systems for the issuance and usage of CBDCs.⁶⁹ The BoE notes the need for public authorities to commit to the use of this disruptive technology in a transparent and legally defined manner that protects individual rights and social values.⁷⁰

In addition to the BoE, the UK Treasury Committee of the House of Commons has investigated the future of financial services regulation.⁷¹ A *Future of Financial Services Regulation* report published in 2022 considers regulation of financial services at large, and briefly touches on CBDCs.⁷² The 2022 report recommends that the new regulatory framework should aim to enable regulators to respond more quickly and flexibly to new evidence about the effectiveness of regulation, and developments within financial markets.⁷³ Further, regulatory independence and strength of regulation were strong points of consideration, and it was recommended that these arrangements should not be tampered with in haste as harm may be caused to UK consumers and taxpayers.⁷⁴ A call for regulators to limit costs of compliance through communication and cooperation was made, and recommendation for clarity of regulators' objectives was strongly emphasised in the 2022 report.⁷⁵ Further, it recommended cooperation between regulators and the production of regular performance review reports.⁷⁶ Although these recommendations were made in the broader context of regulating financial services in the UK, many of these recommendations are also applicable in the more specific context of the effective regulation and governance of CBDCs.

Overall, while the UK has considered regulatory reforms in context of CBDCs, it has done so in the form of broad objectives and pronouncements rather than detailed strategies. The issues considered by the UK include whether such regulatory frameworks need to be technology-neutral and how to avoid abuse of powers. Further, the UK has emphasised that regulatory agencies need to be clear in their objectives and not be distracted by deregulation of certain industries to allow for innovation and competition in a free-market, considerations that other countries such as Singapore have embraced. And while the UK has considered regulatory certain principles, a

⁶⁹ G7 PUBLIC POLICY PRINCIPLES FOR RETAIL CENTRAL BANK DIGITAL CURRENCIES (2021), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1025235/G7_Public_Policy_Principles_for_Retail_CBDC_FINAL.pdf; *See also* BANK OF ENGLAND, *supra* note 66.

⁷⁰ *Id.* at 14.

⁷¹ TREASURY COMMITTEE, FUTURE OF FINANCIAL SERVICES REGULATION, HC 141-1, <https://publications.parliament.uk/pa/cm5803/cmsselect/cmtreasy/141/summary.html>.

⁷² *Id.*

⁷³ *Id.*

⁷⁴ *Id.*

⁷⁵ *Id.*

⁷⁶ *Id.*

clear and in-depth attempt at designing a regulatory and governance framework has not been attempted to date. This may be due to UK being uncertain regarding deploying and the effects of a CBDC on *e-Sterling*. Despite these concerns, it would be beneficial for the UK to comprehensively investigate CBDC law and policy prior to making any specific regulatory decisions as to the issue and use of CBDCs. A useful place to commence might be extending their above motioned discussion of technological neutrality and the need for laws to support technological innovation and progress in the digital finance sector.

B. Australia

A legal conversation regarding digital currencies commenced in Australia as early as 2014. The Australian Taxation Office (“ATO”) considered this issue for taxation purposes, and five rulings ensued. *GSTR 2014/* related to the goods and services tax (“GST”) and outlined the GST implications of transactions involving Bitcoin. It ruled that individuals will be charged GST when they buy digital currency, as with any other property. Businesses will charge GST when they supply digital currency and be charged GST when they buy digital currency. *TD 2014/25* related to income tax and stipulated that Bitcoin was a “foreign currency” for the purposes of Division 775 of the *Income Tax Assessment Act 1997* (Cth). *TD 2014/26* stipulated that Bitcoin a capital gains tax (“CGT”) asset for the purposes of subsection 108-5(1) of the *Income Tax Assessment Act 1997* and noted that those using digital currency for investment or business purposes may be subject to CGT when they dispose of digital currency, in the same way they would be for the disposal of shares or similar CGT assets. Individuals who make personal use of digital currency (for example, using digital currency to purchase items to buy a coffee), where the cost of the Bitcoin was less than AUD\$10,000, would have no CGT obligations. Further, *TD 2014/27* related to Bitcoin trading stock for the purposes of subsection 70-10(1) of the *Income Tax Assessment Act 1997*. It determined that businesses providing an exchange service, buying and selling digital currency, or mining Bitcoin will pay income tax on the profits. Businesses paid in Bitcoin would include the amount, valued in Australian currency, in assessable business income. Those trading digital currencies for profit would also be required to include the profits as part of their assessable income. Finally, *TD 2014/2* related to the fringe benefits tax and stipulated that the provision of Bitcoin by an employer to an employee in respect of their employment is a fringe benefit for the purposes of subsection 136(1) of the *Fringe Benefits Tax* (FBT)

Assessment Act 1986.⁷⁷ It further stipulated that remuneration paid in digital currency would be subject to FBT where the employee has a valid salary sacrifice arrangement.

Notwithstanding the fact that CBDCs have not yet been legally defined in Australia,⁷⁸ the 2015 Australian Senate Economics References Committee⁷⁹ (*SERC Report*) has adopted the Financial Action Task Force (FATF) definition of digital currencies (as digital representation of value that can be digitally traded and functions) as a medium of exchange, a unit of account; and/or a store of value. It notes however that such currency does not have legal tender status (i.e. when tendered to a creditor, is a valid and legal offer of payment) in any jurisdiction. It is not issued nor guaranteed by any jurisdiction, and it fulfils the above functions only by agreement within the community of users of the virtual currency. Virtual currency is distinguished from fiat currency, which is the coin and paper money of a country that is designated as its legal tender, circulates, and is customarily used and accepted as a medium of exchange in the issuing country. It is distinct from e-money which is a digital representation of fiat currency used to electronically transfer value denominated in fiat currency. E-money is a digital transfer mechanism for fiat currency. That is, it electronically transfers value that has legal tender status. Scholarly work to date suggests that in order for CBDCs to become legitimate currency they will need to: (a) be granted legal tender; (b) be the liability of a central bank; (c) act as a medium of exchange; (d) denominated in fiat currency; and (e) act as a store of value.⁸⁰

Further explanation of the importance of the need for CBDCs to exist within a national legal framework, especially so as to uphold State sovereignty, is provided by the Australian Taxation Commissioner in his determination *TD 2014/25*:⁸¹

[T]he meaning of ‘the currency of Australia’ (or ‘Australian currency’) under the Currency Act is the

⁷⁷ AUSTRALIAN TAX OFFICE, ATO RULINGS AND DETERMINATIONS - GENERAL (2014), <https://www.ato.gov.au/About-ATO/Commitments-and-reporting/In-detail/Senate-Procedural-Orders-of-Continuing-Effect-No--12/?page=17>.

⁷⁸ IMF, *Working Paper — Legal Aspects of Central Bank Digital Currency: Central Bank and Monetary Law Considerations*, WP/20/254, 51 (2020).

⁷⁹ AUSTRALIAN SENATE ECONOMIC REFERENCES COMMITTEE, DIGITAL CURRENCY - GAME CHANGER OR BIT PLAYER (2015), http://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Economics/Digital_currency/Report.

⁸⁰ Alan Tyree, *The Legal Nature of Electronic Money*, 10 J. BANKING & FINANCE L. & POL’Y 273 (Dec. 1, 1999), <https://search.informit.org/doi/abs/10.3316/agispt.20000471>.

⁸¹ AUSTRALIAN TAX OFFICE, TAXATION DETERMINATION: TD 2014/25 (2022), <https://www.ato.gov.au/law/view/document?LocID=%22TXD%2FTD201425%2FNAT%2FATO%22&PiT=999912>.

monetary unit established by that Act as the requisite unit of account, and means of discharging monetary obligations, for all transactions and payments that are not made according to the currency of another country... Therefore, the critical character of the Currency Act's concept of 'currency' is State recognition and adoption of a monetary unit under law. This approach under the Currency Act reflects the position taken in *Mann on the Legal Aspects of Money*, namely that money 'must exist within some form of legal framework, because it reflects an exercise of sovereignty by the State in question ... The Commissioner considers ... Parliament intended to use the term 'currency' in the same sense that 'currency' is used in the Currency Act—namely, a currency legally recognised and adopted under the laws of a country as the monetary unit and means of discharging monetary obligations for all transactions and payments in that country.⁸²

Consequently, the 2015 SERC report considered the existing regulatory framework, and investigated what changes, if any, need to occur, to better accommodate for digital currencies.⁸³ The 2015 Australian SERC report made several recommendations. While they were targeted at digital currencies generally, there are a few salient points that can more broadly apply to CBDCs. These include the need for regulatory clarity⁸⁴ and the need for government agencies to support self-regulation.⁸⁵ These two recommendations form two of the criteria for effective regulation and governance discussed above. It is worthy to note that although these recommendations were made in 2015, there has been no subsequent dialogue on this in the context of CBDCs regulations and governance, notwithstanding the implementation of wholesale CBDC projects and start of a pilot for retail CBDCs in Australia.

Australia has also seen an extensive discussion of the regulation of new and emerging technologies in the context of open banking. The 2020 Select Committee on Financial Technology and Regulatory Technology⁸⁶ made a variety of interesting recommendations in this area. Some of these

⁸² However, it is relevant to note that in October 2022, the Federal Budget Report 2 defined CBDCs as foreign currency for taxation purposes. See AUSTL FED. BUDGET, REPORT 2 (2022), <https://budget.gov.au/index.htm>.

⁸³ AUSTL. SENATE ECONOMIC REFS. COMM, *supra* note 79.

⁸⁴ *Id* at 37.

⁸⁵ *Id* at 51.

⁸⁶ AUSTL. SENATE: SELECT COMM. ON FIN. TECH. & REG. TECH., INTERIM REPORT, 281 (2020), https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Financial_Technology_and_Regulatory_Technology/FinancialRegulatoryTech/Interim_Report.

deliberations are also applicable to CBDCs. These include endorsing the adoption of self-regulation to encourage a culture of innovation and competition, regular reporting on the implementation progress of the roadmap of the New Payment Platform (NPP) to drive wider access to the NPP, and the establishment of a new national body to consolidate regulatory responsibilities in that space. Additionally, in their second interim report, the *Select Committee on Financial Technology and Regulatory Technology Committee* recommended that the government establish a “Rules as Code” innovation hub, accompanied by a regulatory sandbox, to advance legal coding approaches to Commonwealth legislation and regulation, as well as a Council of Financial Regulators Cyber Working Group to ensure that its work considers existing and emerging international data standards with respect to blockchain and smart contracts.⁸⁷ To this end, the Working Group should maintain open channels of communication with Standards Australia and the Australian Government consider how best to improve clarity with respect to the standing of smart contracts under Australian law as a matter of priority. Ultimately, in October 2021, the Committee published its final report on digital assets and recommended that the Treasury lead a policy review of the viability of a retail CBDC in Australia.⁸⁸ This final report recommended that the common access requirements for the NPP should be developed by the Reserve Bank of Australia in order to reduce the reliance of payments businesses on the major banks for the provision of banking services, and that the Australian Government establish a Global Markets Incentive to replace the Offshore Banking Unit regime. The inquiry highlights the need for self-regulation, clarity and regular reporting on implementation progress, albeit in the context of NPP. Additionally, the suggestion of ‘Rules as Code’ innovation hub emphasises the importance of learning how to effectively and efficiently use this new technology and integrate it into our existing legislative structure. These recommendations display an integrated regulatory approach and support predictable implementation and clarity, satisfying the criteria for effective regulation and governance developed in this paper.

Prior to the publication of the final report by the Select Committee on Financial Technology and Regulatory Technology,⁸⁹ the Farrell report on

⁸⁷ AUSTRALIAN SENATE: SELECT COMMITTEE ON FINANCIAL TECHNOLOGY AND REGULATORY TECHNOLOGY, SECOND INTERIM REPORT (2021),

https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Financial_Technology_and_Regulatory_Technology/FinancialRegulatoryTech/Interim_Report.

⁸⁸ AUSTRALIAN SENATE: SELECT COMMITTEE ON FINANCIAL TECHNOLOGY AND REGULATORY TECHNOLOGY, FINAL REPORT (2021), https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Financial_Technology_and_Regulatory_Technology/AusTechFinCentre/Final_report.

⁸⁹ *Id.*

NPP was released in June 2021.⁹⁰ The 2021 Farrell report made fifteen recommendations on the management of policy design and implementation of the NPP, focussing particularly on public interest and rights. Of particular importance to the present analysis is the first recommendation which stipulates that effective service involves considering the users of the payments ecosystem and taking into account their perspectives at every step of policy development and implementation. It also means recognising the important distinctions between the needs of consumers and businesses. The 2021 Farrell report further suggests that regulatory architecture should support three other key principles. Namely, strategy that prepares the ecosystem for future innovation and addresses challenges in a holistic manner, safety to protect the businesses and consumers that use the payments ecosystem, and simplicity to ensure consumers and business can understand their rights and obligations, thereby reducing regulatory barriers to entry for new firms offering new services to consumers and businesses.

Of particular interest to our framework is the Farrell report's highlighting of the importance of adopting an integrated approach to regulation and governance. As discussed, it is suggested that an integrated approach is critical to effective regulation and governance as it enables risks to be accurately identified across a spectrum of operations and activities and tantamount enables comprehensive and workable compliance management. As also discussed above, this strategic approach needs to be implemented, alongside predictable implementation. In addition, the 2021 Farrell report's call for simplicity and clarity supports the fourth element in the above model for effective regulation and governance. In this regard, the 2021 Farrell report states that this requirement for clarity helps ensure that consumers and businesses properly understand their rights and obligations. In the present context it is suggested that this is especially important for regulations governing technologies that enable the real-time issuance and usage of CBDCs.

Thus, the Australian conversation regarding CBDCs, commencing with the RBA's Governor's speech on *eAUD*⁹¹ and followed by several publications, reports, speeches and projects on CBDCs,⁹² forms a sophisticated consideration of the present issue. However, while this dialogue highlights the need for an investigation into legislative and regulatory provisions required for the issuance and usage of CBDCs in Australia, there continues to be an absence of significant targeted legal research in this space.

⁹⁰ SCOTT FARRELL, TREASURY AUSTRALIA, PAYMENTS SYSTEM REVIEW: FROM SYSTEM TO ECOSYSTEM (2021), <https://treasury.gov.au/sites/default/files/2021-08/p2021-198587.pdf>.

⁹¹ Philip Lowe, An eAUD?, Speech at the Australian Payment Summit, (Dec. 13, 2017), <https://www.rba.gov.au/speeches/2017/pdf/sp-gov-2017-12-13.pdf>.

⁹² BANK OF JAPAN, *supra* note 4.

C. Singapore

Singapore has undertaken a variety of substantial and detailed projects in the field of CBDC issue and use. In addition to participating in project Dunbar,⁹³ in 2021 Singapore published a report entitled *Retail Central Bank Digital Currency: Economic Considerations in the Singapore Context* on the potential issuance and usage of retail CBDC from economic perspective⁹⁴. Further, the Monetary Authority of Singapore (“MAS”) provided detailed reporting on *Project Orchid* in its 2022 report.⁹⁵ Significantly, the first two of these reports called for further research on legal and regulatory considerations for issuance and usage of CBDCs. A third report on project Orchid addresses the legal issue of ownership, albeit briefly and refers, generally, to jurisdictions around the globe who are looking closely at regulatory frameworks for CBDCs. Despite this mature policy discourse, to date, there have not been any publications on the enactment of CBDC specific regulation.

Notwithstanding this, it is worthy to emphasise that prior to considering the development of a CBDC, Singapore amended its *Payment Services Act 2019* (“PS Act”) to provide a framework for regulating digital payments token, and cross-border money transfer services and activities. While not directly related to CBDCs, there are general lessons to be learnt from the amended PS Act, especially relating to designing and implementing regulatory framework that deals with dynamic and robust fast changing payment services technologies and/or digital currencies. In the second reading of the *Payment Services Bill*⁹⁶ (“Bill”), it was explained that the role and powers of the MAS were to be consolidated in the PS Act. It was further asserted that the Singaporean legislature has adopted a “modular and risk-focused” regulatory structure.⁹⁷ Modular strategy facilitates the

⁹³ BIS INNOVATION HUB, *supra* note 6.

⁹⁴ MONETARY AUTH. OF SING., ECON. POL’Y GRP., A RETAIL CENTRAL BANK DIGITAL CURRENCY: ECONOMIC CONSIDERATIONS IN THE SINGAPORE CONTEXT 54 (2021), <https://www.mas.gov.sg/-/media/MAS/EPG/Monographs-or-Information-Paper/A-retail-CBDC---Economic-Considerations-in-the-Singapore-Context.pdf>; *see also* Christian Hofmann, *The Changing Concept of Money: A Threat to the Monetary System or an Opportunity for the Financial Sector*, 21 EUR. BUS. ORG. L. REV. 37, 37-68 (Mar. 1, 2020), <https://www.semanticscholar.org/paper/The-Changing-Concept-of-Money%3A-A-Threat-to-the-or-Hofmann/604ba3b3f058a8d91491d63bb2808fa1e6b1dac3>; Sergio Nández Alonso et al., *Reasons Fostering or Discouraging the Implementation of Central Bank Digital Currency: A Review*, 8 ECONOMIES (May 26, 2020), <https://www.mdpi.com/2227-7099/8/2/41>.

⁹⁵ MONETARY AUTH. OF SING., PROJECT ORCHID (2022), <https://www.mas.gov.sg/schemes-and-initiatives/project-orchid>.

⁹⁶ SING. GOV’T, PAYMENT SERVICES BILL (2019).

⁹⁷ *Id.*

tailoring of rules that match the scope of the subject of regulation, provides flexibility to regulate and provides the ability to respond quickly to fast changing environments. Adopting a risk-based approach further enables regulators to impose proportionate regulatory measures on each type of subject, depending on the nature and scale of their activities. This modular approach is unique to Singapore and seeks to address uncertainty in regulation caused by technology change. It seeks to cater for integrity of competition in its free market and support innovation. It therefore seems that this modular strategy lies on a spectrum between the “wait and see” viewpoint on regulation and risk-management based regulation and the *really-responsive regulation approach* discussed in the model above.⁹⁸

The modular strategy of Singapore is in marked contrast to the approaches adopted by the UK, Australia and the USA. The UK approach is encapsulated in the 2022 *Future of Financial Services Regulation* report.⁹⁹ This 2022 UK report considered the dynamic nature of technology and its influence but then concluded that legislation and regulation need to remain technology-neutral. This technology-neutral position also appears to be Australia’s current status, consistent with the 2021 Farrell report supporting flexibility in regulation when devising strategies and policies directed at the innovative ecosystem.¹⁰⁰ In comparison, the USA appears to have taken a route of investigative preparation for regulating CBDCs, as will be discussed below. However, while this investigative strategy appears to be proactive and errs towards caution, it is unclear if it is a “wait and see,” risk-based approach or a technology-neutral approach to regulation. Hong Kong seems to have taken the technology-neutral strategy only to discover the need for further requirements for counterfeiting legislative provisions and ownership legal concept in the context of CBDCs. This will be discussed further in the following section.

Indeed, Singapore appears to couple this modular strategy with risk-based approach to regulation. This strategy is a proactive and indeed creative adaptation of the “wait and see” approach to regulating technology, demonstrating preparedness to adapt and an understanding of the dynamic nature of technology and the fast pace at which it evolves. In terms of our above discussed model of effective CBD regulation and governance, Singapore is perhaps the nation that comes closest to satisfying the

⁹⁸ Julia Black & Robert Baldwin, *Really Responsive Risk-Based Regulation*, 32 LAW & POLICY 181 (Spring 2010), http://eprints.lse.ac.uk/27632/1/_lse.ac.uk_storage_LIBRARY_Secondary_libfile_shared_repository_Content_Black,%20J_Really%20responsive%20risk-based%20regulation_Black_Really%20responsive%20risk-based%20regulation_2014.pdf

⁹⁹ TREASURY COMMITTEE, *supra* note 71.

¹⁰⁰ TREASURY AUSTRALIA, *supra* note 90.

recommended criteria of adopting an integrated approach that supports compliance, predictable implementation and clarity.

D. Hong Kong

In Hong Kong, the CBDC journey began in 2017 when variety of seminal studies were completed.¹⁰¹ The outcome of the endeavours was labelled the *Aurum* system, described as:

The creation of a technology stack comprised of: (1) a wholesale interbank system in which the wholesale CBDC (wCBDC) is issued to banks for onward distribution to retail users, and (2) a retail e-wallet system in which the retail CBDC (rCBDC) circulates among retail users, we set a goal to bring to life two very different types of retail tokens: (a) intermediated CBDC, also referred to herein as CBDC-tokens, and (b) CBDC-backed stablecoins, or in short, stablecoins. Given the complexity of the endeavour, the project was executed in partnership with the Hong Kong Applied Science and Technology Research Institute (ASTRI).¹⁰²

Prior to completing the *Aurum* project, Hong Kong Monetary Authority (HKMA) released a 2022 discussion paper on policy issues associated with the issuance and use of e-HKD.¹⁰³ Although a call was made for legislative and regulatory provisions to remain technology-neutral in other common law jurisdictions,¹⁰⁴ Hong Kong argued that as design choices in relation to CBDC architecture will inevitably affect the legal analysis, assessment of how best to ensure that any e-HKD enjoys a robust legal foundation, and that it is advisable to enact specific legislation to support

¹⁰¹ See H.K. MONETARY AUTH., E-HKD: A TECHNICAL PERSPECTIVE (2021), https://www.hkma.gov.hk/media/eng/doc/key-functions/financial-infrastructure/e-HKDA_technical_perspective.pdf; H.K. MONETARY AUTH., E-HKD: A POLICY AND DESIGN PERSPECTIVE (2022), https://www.hkma.gov.hk/media/eng/doc/key-functions/financial-infrastructure/e-HKDAPolicyand_Design_Perspective.pdf; H.K. MONETARY AUTH., E-HKD - CHARTING THE NEXT STEPS (2022), <https://www.hkma.gov.hk/media/eng/doc/key-information/press-release/2022/20220920e4a1.pdf>.

¹⁰² H.K. MONETARY AUTH., PROJECT AURUM: A PROTOTYPE FOR TWO-TIER CENTRAL BANK DIGITAL CURRENCY (2022), <https://www.bis.org/publ/othp57.htm>; see also David Kuo Chuen Lee, Li Yan & Yu Wang, *A Global Perspective on Central Bank Digital Currency*, 14 CHINA ECON. J. 52 (Mar. 12, 2021), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3770537.

¹⁰³ https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3770537, E-HKD: A POLICY AND DESIGN PERSPECTIVE, *supra* note 101.

¹⁰⁴ TREASURY COMMITTEE, *supra* note 71.

public confidence and certainty.¹⁰⁵ Hong Kong policy considerations also extend to considering the issuing of e-HKD as ‘currency’. In doing so, Hong Kong has explained that the justification for doing so was the need to amend relevant legislation to provide e-HKD with legal tender status. This is in contrast to Australia where CBDCs are defined as foreign currency for only taxation purposes.¹⁰⁶ It also differs from the USA where the Federal Reserve Bank of the United States of America is unable to issue CBDCs without specific prior authorising legislation.¹⁰⁷

In considering CBDC regulation, Hong Kong is distinct in adopting a very wide frame of reference that also considered anti-money-laundering/counter-terrorism financing (AML/CTF) legislation, KYC and privacy matters. In response to this wide spectrum of concerns, Hong Kong proposed the ‘e-HKD’. It was proposed that a CBDC be offered as a tiered selection of digital wallets that hold e-HKD to provide greater anonymity for small-value payments (mimicking cash usage) whilst making higher-value payments traceable. The 2022 report also suggests a review of the AML/CFT Ordinance, to be conducted in the light of the architecture (including tiered thresholds), to ensure suitable coverage of e-HKD related activities. Further, the 2022 report recommends legislative reviews of the concepts of ownership and delivery pending design and architecture of e-HKD, as well as, preventing double-spending of the e-HKD and introducing counterfeiting legislation for digital currency. On the basis of this 2022 Aurum report, it seems that Hong Kong considers that there is a two-way relationship between law and architectural design of CBDCs. Consideration of such a relationship appears to be overlooked in Australia’s legal discourse on CBDCs that seems to suggest that achieving technology-neutral legislative provisions is possible. Additionally, the interplay between technology and the law in the context of the e-HKD appears to support MAS’s adaptation of modular and risk-based strategies.

Hong Kong’s *e-HKD* process is difficult to evaluate using the above criteria for effective regulation and governance. Hong Kong, as mentioned above, issued consultation papers after which they settled on the use of *e-HKD*. The process of consultation can be considered a research and risk-based process. Further, the process of identifying change required in legislation is aligned with our criteria relating to compliance. Hence, it

¹⁰⁵ H.K. MONETARY AUTH., *supra* note 103 at 34.

¹⁰⁶ AUSTL.GOV’T, FEDERAL BUDGET REPORT 2, (2022), <https://budget.gov.au/index.htm>.

¹⁰⁷ On October 5, 2022, House Financial Services Committee Republican Leader Patrick McHenry (NC-10), Rep. French Hill (AR-02), and all members of the Committee Republicans’ Digital Asset Working Group sent a letter to Attorney General Merrick Garland requesting his assessment of whether legislation was necessary for a US CBDC: https://republicans-financialservices.house.gov/uploadedfiles/2022-10-05_digital_assets_working_group_letter_on_cbdccassesmentfinalupdated.pdf

seems that Hong Kong is partially following an integration approach to the issuance and usage of CBDCs. However, it is suggested that this approach has neither led to all relevant risks being identified nor the development of a comprehensive mitigation plan. For example, the risks associated with contractual obligations connected with direct liability of central banks has not been expressly considered. Additionally, potential risks associated with insolvency and illegal *phoenix* activities that may be facilitated through the use of DLT have not been examined. Risks associated with human rights and exclusion of dissenters who protest, that may be associated with government's ability to freeze citizens accounts easily and efficiently as to prevent them from accessing their accounts and their livelihoods, have also not been addressed. In contrast, this issue of potential abuse of power was highlighted by Treasury Committee of the House of Commons in the UK in their 2022 report on the future of financial services.¹⁰⁸

Interestingly, in contrast to the above discussed nations, Hong Kong authorities appear to have gone straight into the technology architectural design and implementation phase to better ascertain the relevant legislative changes that need to occur, such as ownership and counterfeiting legislation for digital currencies. There were no suggestions made regarding how these legislative provisions need to change, particularly the legal concept of ownership. Additionally, there was no explanation provided as to reasons for needing to change the legislation as opposed to trying a different architectural technological solution for the *e-HKD*. Therefore, while Hong Kong's strategy and discourse seems aligned with above discussed criteria of integrated approach and predictable implementation, it does not seem to fulfill the further need for clarity of rules and legislations and self-regulation.

Finally, it is relevant to note that regulatory implementation processes—proactive and responsive regulation—are not discussed in the 2022 paper. Hence, the predictability of implementation criteria appears to be overlooked. The need for clarity and/or simplicity of legislation and rules, critical given the nature of DLTs and smart contracts, was also not addressed. Finally, the ability of DLTs to automate governance or self-regulation, and how this may be achieved, was not considered. These important considerations will therefore need to be addressed as Hong Kong progresses in its development of a CBDC.

E. United States of America

In 2016, the USA Research and Statistics and Monetary Affairs Divisions (“RSMAD”), under the direction of the Federal Reserve Bank of

¹⁰⁸ TREASURY COMMITTEE, *supra* note 71.

the United States of America (“FRBUSA”), conducted an investigation into DLTs to better ascertain its suitability as a new disruptive technology in the world of finance.¹⁰⁹ The RSMAD looked closely at the legal considerations associated with DLTs in payments clearing and settlement systems (“PCS”).¹¹⁰ The *Distributed Ledger Technology in Payments, Clearing, and Settlement* discussion paper considered the distributed structure of this disruptive technology and found that there are legal risks and considerations that need to be closely analysed prior to the usage of DLT.¹¹¹ First, it is necessary to assess an entity’s ability to meet any contractual obligations to the arrangement or to have proper business licenses to conduct business. Designing CBDCs that are fit for purpose and are legally authorised for issuance is key in this space, and if not noted, may give rise to many legal issues and consequences. Second, to effectively carry out the central counterparties function, some type of central legal entity appears to be necessary. In the context of CBDCs, this suggests the presence of central banks and/or intermediaries to strategically regulate the governance of the operations of CBDCs in particular. Third, there are risks relating to the form of asset that need to be addressed. Traditional financial assets such as securities are typically a liability of a legal entity, such as a government or corporation. In a DLT arrangement, decisions about what type of entities can issue what instruments on a distributed ledger may be important to provide a firm legal foundation for DLT activity. Fourth, there are risks related to organisation and governance that need to be addressed. There is a fundamental need for the coordination of joint action through new or existing legal entities to, at a minimum, provide appropriate organisation and governance. Fifth, legal requirements, such as those associated with KYC and AML/CTF compliance, need to be assured in the context of issuance and usage of CBDCs. Finally, physical commodities, where the legal framework may be different and the role of physical underlying assets, must be taken into account.¹¹²

After addressing the above matters, the authors called for further analysis of certain legal issues associated with financial markets infrastructures (“FMIs”) in context of decentralised technologies such as DLTs.¹¹³ The authors suggested that settlement finality and delivery versus payment need further investigations. Moreover, the authors proposed the

¹⁰⁹ David Mills et al., *Distributed Ledger Technology in Payments, Clearing, and Settlement*, FIN. & ECON. DISC. SERIES (2016), <https://www.federalreserve.gov/econresdata/feds/2016/files/2016095pap.pdf>; see also M.E. Tahyar et al., *Central Bank Digital Currency*, HARV. L. SCH.: THE CASE STUDIES (Jan. 2019), https://www.academia.edu/39237778/Harvard_Case_Study_Central_Bank_Digital_Currency.

¹¹⁰ *Id.*

¹¹¹ David Mills et al, *supra* note 109.

¹¹² *Id.*

¹¹³ *Id.*

need for credit and liquidity risks legal issues to be further considered. Another area proposed for further examination was netting. Security and stability were identified as requiring further analysis.¹¹⁴ The paper also raised a few legal issues for consideration. Issues such as reliability of the records kept on decentralised ledgers or change in laws to approve of DLT recordkeeping has not been yet officially considered by legislatures. Ownership rights and obligations of digital assets need to be contemplated and revisions of such entrenched concepts may be required to accommodate technological change. The authors also noted that the legal relevance and/or eligibility of smart contracts may need to be examined in order to ascertain if any existing rules, standards and/or legislation need to be adjusted to recognise these new tools. It was further noted that the licensing of differing types of intermediaries required attention.¹¹⁵ Finally, the authors called for sound governance arrangements to continue for DLT design, the development of rules regarding functionality, risk management, and access to the network, as well as clarity as to which entities are responsible for maintaining and modifying the protocol.¹¹⁶

With these above issues highlighted for further investigation,¹¹⁷ the Federal Reserve of Boston undertook *Project Hamilton* in 2022.¹¹⁸ *Project Hamilton* used modular technological design, in response to current risks and legislations that were identified through research and discussion papers. This is somewhat similar to Singapore that opted for modular and risk-based design of the regulator and/or legislative framework. However, the US approach appears to reflect the viewpoint that legislation is technology-neutral, while the approach of Singapore seems more agile and open to amending its regulation according to the dynamic nature of technology and adapting to the fast pace with which it moves. *Project Hamilton* also addresses the issues identified above regarding ownership. For example, as it allows end-users to have custodial arrangements of their monies through holding and controlling their encrypted private keys, and because of their

¹¹⁴ *Id.*

¹¹⁵ *Id.*

¹¹⁶ *Id.* at 30.

¹¹⁷ Jess Cheng & Joseph Torregrossa, *A Lawyer's Perspective on U.S. Payment System Evolution and Money in the Digital Age*, FEDS NOTES (Feb. 4, 2022), <https://www.federalreserve.gov/econres/notes/feds-notes/a-lawyers-perspective-on-us-payment-system-evolution-and-money-in-the-digital-age-20220204.html>; see also Alexander Lee, *What Is Programmable Money?*, FEDS NOTES (June 23, 2021), <https://www.federalreserve.gov/econres/notes/feds-notes/what-is-programmable-money-20210623.html>;

Benjamin Geva, Seraina Grunewald & Corinne Zellweger-Gutknecht, *The 'E-Banknote' as a 'Banknote': A Monetary Law Interpreted*, 41 OXFORD J. L. STUDS. 1119, 1119-1148 (May 5, 2021), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3838739

¹¹⁸ FEDERAL RESERVE BANK OF BOSTON, PROJECT HAMILTON PHASE 1 EXECUTIVE SUMMARY (2022), <https://www.bostonfed.org/publications/one-time-pubs/project-hamilton-phase-1-executive-summary.aspx>.

modular technological architectural design, it provides room to integrate new designs into the technology to better align it to current legislative and/or regulatory provisions. It is suggested that this modular technological design approach is highly innovative, and indeed a welcomed solution, given the dynamic nature of the platform upon which CBDCs reside.

Despite these various projects and investigations considered in the US discourse, a variety of legal CBDC issues remain unresolved. For example, end-users having control of private keys only gives them partial possession of their monies as public keys required for complete control are held by the government and/or their licensed agencies. This presents a problem for end-users in cases of tyranny, as discussed above with *e-HKD*, and also the more common challenges of ensuring cyber security and privacy. Finally, strategic work remains to be done by the legislatures in satisfaction of the effective regulation and governance criteria of CBDCs, including predictability of implementation, clarity of legislation and rules and self-regulation and governance which can be achieved in the context of CBDCs.

III. TOWARDS AN EFFECTIVE FRAMEWORK FOR CBDC REGULATION AND GOVERNANCE

The nations discussed above display a spectrum of different approaches to the regulation and governance of CBDCs. The requirement for an integrated approach in the above discussed effective regulation and governance model was identified and implemented in Singapore's reconsolidation of their *Payments Systems Act*. Singapore adopted both risk-based and modular strategies that allow for updating their rules and legislations, as and when they discover more about this new technology. Instead of adopting the usual 'wait and see' approach, the Singapore approach is agile and proactive. Where being proactive is achieved through a risk-based strategy and effective compliance is achieved through a modular strategy which allows for updating rules and legislations.

Additionally, it can be seen that the UK has identified the need for predictable implementation in their evaluation of the future of regulation of financial services and their consideration of these new technological advancements. The UK has highlighted the need for clear regulatory objectives to be implemented to ensure the integrity and democracy of regulation in society. It has emphasised the need for clear regulatory objectives and suggested that an absence of this may lead to corruption and loss of trust in regulatory agencies. The UK thus appears to maintain a position that effective regulation and governance is achieved in predefined implementation of regulation, despite the dynamic and uncertain nature of technological advancements and progression.

As to the requirement of clarity, which forms part of our taxonomy for effective regulation and governance, Australia makes a clear clarion call for clarity and simplicity of rules and legislations. The 2015 Australian SERC report discussed in detail contributions by participants who sought clarity of rules and legislations. Further, the 2021 Farrell report strongly recommended simplicity of rights, responsibilities, duties and obligations.

Finally, as to the need to support self-regulation, it is observed that the Australian Senate in their 2015 report documents participants' suggestions for self-regulation of digital currency.¹¹⁹ This report suggested that self-regulation and/or governance may be achieved through the workings of smart contracts and DAO settings where rules and regulations may be programmed in their simplest forms, as permitted by programming languages, and left to run the operations defined by regulators. While other nations have fleeting mentions of self-regulation, Australian has perhaps the strongest pronouncement in this area.

In closing it is important to note that when considering CBDCs, legal issues and considerations go beyond KYC, AML/CTF and consumer protection law. Close legal analysis of the effect of CBDCs on the entire legal system is required prior to the issuance and usage of CBDCs. This includes areas outside the ambit of the present article such as property law and intellectual property law. Additional matters to be addressed include developing clear and consistent definitions of relevant terminologies,¹²⁰ States' legal authorisation for issuance and usage of CBDCs,¹²¹ the application of private international law, the operation of contract law, any required amendments to criminal laws both nationally and internationally, and the effect on existing financial laws. Finally, considerations of the impact CBDCs may have on States' constitutions, social contracts and indeed human rights will also need to be addressed in greater detail going forward.

CONCLUSION

CBDCs and DLTs have captured the imagination of governments around the world, with common law jurisdictions first commencing substantive investigations and research in this milieu in 2014. Many jurisdictions have identified the conditions and requirements that need to be satisfied if CBDCs and DLTs are to be deployed. These include the need for a clear regulatory framework, and the creation of relevant regulatory

¹¹⁹ AUSTL. SENATE ECONOMIC REFS. COMM., *supra* note 79.

¹²⁰ Lee, *supra* note 117; *see also* Henri Venter, DIGITAL CURRENCY – A CASE FOR STANDARDS SETTING, A PERSPECTIVE BY THE AUSTRALIAN ACCOUNTING STANDARDS BOARD (2016), https://www.aasb.gov.au/admin/file/content102/c3/AASB_ASAB_DigitalCurrency.pdf.

¹²¹ TREASURY AUSTL., *supra* note 90.

agencies to review performance and regulate the regulators. However, to date, little work has been done on considering what constitutes effective regulation and governance of CBDCs. Given the significant economic and social importance of this subject matter, this void in understanding needs to be addressed. This paper has sought to address this gap in research and answer the common law jurisdictions' calls for a clear regulatory framework. The paper extends present scholarship on regulation and governance to develop a novel model for developing CBDC laws. This framework suggests that an integrated approach, predictable implementation, clarity of rules and legislations and a capacity for self-regulation are relevant criteria for achieving efficacy. When applying this model, it is important to observe that it is a holistic framework where all criteria are interconnected and work together. Applying the model, the paper then evaluated the effectiveness of CBDC laws, policies and reform discourse around the world. It is hoped that this evaluation of global developments, and the critical analysis of their relative merits, will guide law and policy makers around the world as they seek to develop and implement an effective regulatory and governance framework for CBDC issue and use. It is also hoped that this research will support the international harmonisation of CBDC regulation and governance frameworks. As CBDCs are digital currencies that have the potential to seamlessly traverse geographical and State boundaries, it is imperative that nations watch and learn from each other as they journey towards the development of effective CBDC policy and law.