Beyond Disruption: Blockchain Technology and the New Financial Ethics

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This article critically re-examines the legal and ethical dimensions of Blockchain Technology (BT) in finance in a new and novel way, i.e., through the lens of the Social and Economic Contract Theory (SECT). Such a robust theoretical framework is useful considering how BT has proven to be a disruptive force in finance, offering significant transformative potential but raising complex legal and ethical challenges, such as risks to financial sector stability, integrity, and efficiency on the one hand, and concerns relating to security, privacy, transparency, and accountability. A SECT-based examination emphasises the balance between individual autonomy and societal obligations in the context of both decentralized finance (DeFi) projects and traditional finance (TradFi). Correspondingly, the article includes a multi-pronged approach based on a SECT analysis of the use of BT in finance, certain BT regulatory frameworks in select jurisdictions, and consideration of some of the emerging case law internationally. The article advocates for an adaptive, informed regulatory strategy that accommodates BT's evolving nature, proposing a harmonized legal framework guided by SECT principles. This approach seeks to align the individual benefits of BT with broader societal needs, ensuring that BT's development is consistent with its societal values and obligations. This article, equally applicable to BT in both TradFi and DeFi, contributes a unique perspective to BT's role in finance, calling for a forward-thinking legal response that addresses both current challenges and anticipates future developments.

Le présent article réexamine de manière critique les dimensions juridiques et éthiques de la technologie des chaînes de blocs (CB) dans le domaine de la finance d'une manière nouvelle et inédite, c'est-à-dire à travers le prisme de la théorie sociale et économique du contrat (TSEC). Un tel cadre théorique robuste est utile compte tenu de la façon dont les CB se sont avérées une force de rupture dans le domaine de la finance, offrant un potentiel de transformation considérable, mais soulevant des défis juridiques et éthiques complexes, tels que les risques à la stabilité, à l'intégrité et à l'efficacité du secteur financier d'une part, et les préoccupations relatives à la sécurité, à la protection de la vie privée, à la

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transparence et à la responsabilité d'autre part. Un examen basé sur la TSEC met l'accent sur l'équilibre entre l'autonomie individuelle et les obligations sociétales dans le contexte de projets de finance décentralisée et de finance traditionnelle. En conséquence, l'article comprend une approche à plusieurs volets se fondant sur une analyse de l'utilisation des CB dans le domaine de la finance en fonction de la TSEC, sur certains cadres réglementaires des CB dans des juridictions sélectionnées et sur l'examen d'une partie de la jurisprudence émergente au niveau international. L'article plaide en faveur d'une stratégie réglementaire adaptative et informée qui tienne compte de la nature évolutive des CB, en proposant un cadre juridique harmonisé guidé par les principes de la TSEC. Cette approche vise à arrimer les avantages individuels des CB aux besoins plus larges de la société, en veillant à ce que l'évolution des CB soit cohérente avec leurs valeurs et obligations sociétales. Cet article, qui s'applique aussi bien aux CB dans la finance traditionnelle que dans la finance décentralisée, apporte une perspective unique sur le rôle des CB dans le domaine de la finance, appelant à une réponse juridique tournée vers l'avenir qui, à la fois, réponde aux défis actuels et anticipe l'évolution future.

1. INTRODUCTION

Blockchain technology (BT) also called distributed ledger technology (DLT)[1] has emerged over the course of the last 15 years as a significant disruptor of the financial sector, which increasingly relies on digital solutions.[2] BT is revolutionizing financial operations through its gargantuan transformative potential, such as quicker, more stable, efficient, and resilient financial systems; enhanced transaction and data security; increased transparency; and heightened accountability. A basic definition of BT (emanating from the United States (US) Federal Reserve Bank) is a "combination of components, including peer-to-peer networking, distributed data storage, and cryptography, that, among other things, can potentially change the way in which storage, recordkeeping, and transfer of a digital asset is done. "[3]

However, BT is no longer a recent development, following 15 years of evolution, and policymakers and regulators in the financial sector have already had time to evaluate the implications of BT (and then regulate). Nevertheless,

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1 The term "Blockchain Technology (BT)" is preferred over "Distributed Ledger Technology (DLT)" throughout this article since BT is more specific (DLT encompasses a broader range of technologies, including blockchain). This specificity aids in maintaining clarity and focus in the discussion. Further, BT is also more commonly used in legal literature and policy discussions, particularly in the context of financial law, making it a more relatable and familiar term for the intended audience, which includes legal practitioners and scholars specialising in financial law and technology.

2 See e.g., Theo Lynn et al, *Disrupting Finance: FinTech and Strategy in the 21st Century* (Cham: Springer, 2019); R Pereira, I Bianchi & Á Rocha, eds., *Digital Technologies and Transformation in Business, Industry and Organizations* (Cham: Springer, 2022).

3 David Mills et al, *Distributed Ledger Technology in Payments, Clearing, and Settlement* (Washington: Board of Governors of the Federal Reserve System, 2016) at 10.

regulators have found it challenging to strike a difficult balance so as not to stifle innovation and the transformative potential of BT but to adequately address the legal and ethical concerns raised, which, if inadequately addressed, potentially have severe implications for financial entities, their patrons, and the wider economy. [4]

Furthermore, at the same time, BT is becoming ubiquitous, especially in the financial sector, making the distinctions between the BT sector and the non-BT sector, or BT in traditional finance (TradFi) vs. decentralized finance (DeFi), largely discussions of a semantic nature, for example, similar to how we can no longer isolate the digital economy from the non-digital economy for regulatory or tax purposes.[5] Therefore, while the focus of this article tends towards BT in DeFi projects, BT has also increasingly been applied in TradFi; therefore, the analysis in this article is equally applicable to both DeFi and TradFi. Nevertheless, wherever the authors find it necessary to distinguish between DeFi and TradFi we will.

The theoretical framework of Social and Economic Contract Theory (SECT) is used to reassess the legal and ethical implications of using BT in the financial sector.[6] SECT combines social contract theory[7] and economic contract theory to analyse the relationship between individuals, society, and the state from a legal perspective.[8] It is based on the idea that society is bound by a set of social and economic contracts, but individuals give up some of their rights and freedoms in exchange for protection and support from society. Legal scholars like Richard Posner, Guido Calabresi, and John Rawls provide the foundational insights into

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4 See also Peter Yeoh, "Regulatory Issues in Blockchain Technology" (2017) 25:2 Journal of Financial Regulation and Compliance 196; Dirk A Zetsche, Ross P Buckley & Douglas W Arner, "The Distributed Liability of Distributed Ledgers: Legal Risks of Blockchain" (2018) 4 U Ill L Rev 1361; Usha Rodrigues, "Law and the Blockchain" (2019) 104:2 Iowa L Rev 679; Mimi Zou, "Code, and Other Laws of Blockchain" (2020) 40:3 OJLS 645.

5 See Julien Chaisse & Jamieson Kirkwood, "Taxing The Future: Digital Stateless Income, Business Organisation, and the Search for a New Regulatory Paradigm" (2022) 2 Sing JLS 267.

6 See e.g., Patrick Bolton & Mathias Dewatripont, *Contract Theory* (Cambridge, Mass.: MIT Press 2005); Richard Craswell, "In that Case, What is the Question? Economics and the Demands of Contract Theory" (2003) 112:4 Yale LJ 903; Alan Schwartz & Robert E Scott, "Contract Theory and the Limits of Contract Law" (2004) 113:3 Yale LJ 541.

7 Social Contract Theory is the idea that society functions due to an implicit agreement among individuals to cooperate rather than compete and is rooted in the work of Thomas Hobbes, John Locke & Jean-Jacques Rousseau. See also Christopher W Morris, *The Social Contract Theorists: Critical Essays on Hobbes, Locke, and Rousseau* (Lanham, Md.: Rowman & Littlefield, 2000); Mark Goldie and Robert Wokler, "Social Contract Theory and Its Critics" in Patrick Riley (ed.), *The Cambridge History of Eighteenth-Century Political Thought* (Cambridge: CUP, 2008)

8 Economic Contract Theory is the idea that individuals and organisations enter into contracts, agreements, and arrangements in order to allocate resources, share risks, and create incentives.

SECT, which can guide the development of adaptive policies that balance innovation with the preservation of social and economic contracts, fostering a stable integration of blockchain technology. [9] By employing SECT, the article interrogates the compatibility of BT with fundamental societal agreements and norms, probing its potential to either disrupt or reinforce traditional financial structures and ethical standards. This exploration is set against the backdrop of an evolving digital economy, in which the fusion of technology and finance continually tests the robustness and adaptability of legal systems. [10]

The application of SECT to BT is justified for framing legal and regulatory responses to its disruptive potential. SECT, which examines the mutual obligations between individuals and society, is uniquely positioned to address blockchain's challenge to traditional financial governance. Blockchain's decentralization and transparency undermine conventional regulatory mechanisms, necessitating a re-evaluation of legal doctrines surrounding accountability, privacy, and financial stability. SECT provides a robust framework for this re-evaluation, allowing for the reconciliation of blockchain's innovative capacities with the principles of social justice and economic equilibrium. By leveraging SECT, it is possible to devise regulatory frameworks that ensure that blockchain's benefits, such as enhanced security and efficiency, are not overshadowed by risks such as market volatility and data breaches. This approach fosters a legal environment where technological advancement can be harmonized with the preservation of societal order and individual rights, ensuring that blockchain's integration into the financial system upholds the social contract that underpins economic and legal stability.

Our aim is to re-examine the legal and ethical challenges raised with regard to the transformative capacity of BT, further delineate these challenges, analyse regulatory responses, and argue for a more dynamic, adaptive, and informed regulatory approach that captures the evolving nuances of this technology (and

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[9] In relation to legal studies, the works of Richard Posner and Guido Calabresi are important. See, e.g., Richard Posner, *Economic Analysis of Law* (Boston: Little Brown,1977); Richard Posner, *The Problematics of Moral and Legal Theory* (Cambridge, Mass.: Harvard University Press, 1999); Richard Posner, *Law and Social Norms* (Cambridge, Mass.: Harvard University Press 2000); Guido Calabresi, *The Costs of Accidents: A Legal and Economic Analysis* (New Haven: Yale University Press 1970); Ronald Coase, "The Problem of Social Cost" (1960) 3 Journal of Law and Economics 1; Guido Calabresi, *A Common Law for the Age of Statutes* (Cambridge, Mass.: Harvard University Press 1982); Guido Calabresi, *The Future of Law and Economics: Essays in Reform and Recollection* (New Haven: Yale University Press 2016). SECT theory is also used in the work of John Rawls, Robert Nozick, Martha Nussbaum, Amartya Sen, Ronald Dworkin and Martha Fineman.

[10] See, e.g., Robert Herian, "The Politics of Blockchain" (2018) 29 Law and Critique 129; Mikayla Novak, "Crypto-friendliness: Understanding Blockchain Public Policy" (2020) 9:2 Journal of Entrepreneurship and Public Policy 165; Georgios Dimitropoulos, "The Law of Blockchain" (2020) 95:3 Wash L Rev 1117. See also Wessel Reijers, Fiachra O'Brolch in & Paul Haynes, "Governance in Blockchain Technologies & Social Contract Theories" (2016) 1 Ledger 134.

which is globally consistent). Our forward-looking analysis culminates in a set of strategic recommendations that aim to harmonise the innovative thrust of BT with the enduring principles of social and economic justice.

The Article begins in section 2 with a more detailed explanation of SECT and its application to BT in the financial sector. Section 3 presents the first part of the analysis based on SECT, which identifies key legal and ethical issues related to the application of BT in the financial sector. In section 4, the second part of the analysis based on SECT is presented with illustrations from the financial sector to add depth to the analysis. In Section 5, we utilise a comparative analysis to shed light on the varying responses within legal and regulatory frameworks. In particular, there is an examination of certain jurisdictions, principally the United States (US), the European Union (EU), and China, referred to as digital empires, highlighting the diverse approaches to regulating BT, along with their respective advantages and limitations.[11] In Section 6, we also consider some relevant international developments and case law, and finally provide specific recommendations to regulators, that is, new regulatory proposals to address the gaps highlighted in our article based on SECT. Finally, in Section 7, the article draws conclusions to advocate for a commensurately transformative shift in financial law to accommodate BT, emphasizing adaptive legal frameworks and a proactive, technology-first legal approach.

2. APPLYING SOCIAL AND ECONOMIC CONTRACT THEORY TO BLOCKCHAIN IN FINANCE

A study based on SECT can be used to evaluate the legitimacy of legal systems and government actions. For example, such a study can be used to examine the fairness of laws and regulations and to determine whether they adequately protect the rights and interests of individuals. A study based on SECT can also be used to analyse the role of the state in regulating and enforcing laws and whether it is fulfilling its obligations to the public. Additionally, the theory can be used to assess the impact of legal decisions on society as a whole, and whether they promote the social and economic well-being of individuals.[12]

SECT has been applied in many areas of law, including contract law (e.g. providing a basis for understanding freedom of contract and the role of contracts in promoting economic growth and stability), property law (e.g. providing a

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[11] These three jurisdictions were chosen based on the analysis in Anu Bradford's provocative study. Anu Bradford, *Digital Empires: The Global Battle to Regulate* Technology (Oxford: OUP, 2023).

[12] See also, e.g., Eric Brousseau & Jean-Michel Glachant, *The Economics of Contracts: Theories and Applications* (Cambridge: CUP, 2002); Mark D White, *Theoretical Foundations of Law and Economics* (New York: CUP 2009); Gerrit De Geest, *Contract Law and Economics,* 2nd ed. (Cheltenham: Edward Elgar Publishing, 2011); Philippe Aghion et al, eds., *The Impact of Incomplete Contracts on Economics* (New York: OUP, 2016); Sugata Bag, *Economic Analysis of Contract Law: Incomplete Contracts and Asymmetric Information* (Cham: Palgrave Macmillan, 2018).

basis for understanding the relationship between individuals and their property and the role of the government in protecting property rights), and constitutional law (e.g. providing a basis for understanding the legitimacy of government power and the relationship between the government and citizens).

There are also numerous practical examples of when the theory has been used, from the US Constitution (which outlines the social contract between citizens and the government that protects individual rights, promotes general welfare, and ensures equal protection under the law) to the United Nations' Universal Declaration of Human Rights (which asserts that all individuals are entitled to certain basic rights and freedoms, including social and economic rights, such as the right to work, education, and healthcare).[13] Or from the UN Sustainable Development Goals (SDGs) to the Social Contract Theory in Environmental Law.[14]

Guided by SECT's foundational principles of SECT, there is potential for crafting regulatory frameworks that are not merely reactionary. Instead, they can be visionary blueprints, ensuring that, as BT evolves, it remains tethered to values that safeguard both individual liberties and societal equilibrium. This approach underscores the symbiotic responsibilities of both public and private entities. In the BT arena, this translates into a collaborative effort: an undertaking that is not solely about harnessing a new technology, but about weaving it responsibly into our societal fabric. Such shared endeavours can foster financial ecosystems that are inclusive, giving prominence to the voices of underrepresented communities. Further, a SECT analysis also considers the implications for legal sovereignty, the globalization of finance, and the shifting dynamics of power and control in the digital age.

Finally, the dynamic realm of BT is ever-changing, and decisions taken at the present moment cast long shadows in the future. SECT, with its holistic approach, positions policymakers not merely to react, but to anticipate. It

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[13] See, e.g., Mark Hulliung, *The Social Contract in America: From the Revolution to the Present Age* (Lawrence: University Press of Kansas, 2007); Thomas B McAffee, "The Bill of Rights, Social Contract Theory, and the Rights 'Retained' by the People" (1992) 16 S Ill U LJ 617. See also, e.g., James W Nickel, *Making Sense of Human Rights: Philosophical Reflections on the Universal Declaration of Human Rights* (Berkeley: University of California Press, 1987); Javier Hern ndez & Santiago Dussan, "Hobbes and the Economic, Social and Cultural Rights of the Universal Declaration of Human Rights" (2021) 17 The Age of Human Rights 173.

[14] See e.g., Patrick Huntjens, "Sustainability Transition: Quest for a New Social Contract" in *Towards a Natural Social Contract* (Cham: Springer, 2021); Isabell Kempf & Kstja Hujo, "Why Recent Crises and SDG Implementation Demand a New Eco-Social Contract" in Andreas Antoniades, Alexander S Antonarakis & Isabell Kempf, eds., *Financial Crises, Poverty and Environmental Sustainability: Challenges in the Context of the SDGs and Covid-19 Recovery* (Cham: Springer, 2022). See also Richard A Epstein, "Regulation - and Contract - in Environmental Law" (1991) 93:4 W Va L Rev 859; Daniel Bodansky, "The Legitimacy of International Governance: A Coming Challenge for International Environmental Law?" (1999) 93:3 AJIL 596.

champions a forward-thinking ethos, prioritizing lasting societal reverberations over fleeting individual gains.

3. SECT ANALYSIS PART 1: KEY ISSUES OF BT IN GLOBAL FINANCE

In the following two sections, we conduct a SECT analysis. We do this by identifying and considering the key issues relating to the application of BT in global finance against the backdrop of the social and economic contracts created (i.e., the rights and obligations of individuals and financial institutions in relation to blockchain transactions). The key issues found are: financial market integrity; financial market stability; financial market efficiency; security; privacy; transparency; and, accountability. These 7 issues represent the major challenges presented when applying BT in global finance and set the stage for more detailed analysis.[15]

We consider for example, within the fast-evolving area of BT, that allure is evident: it promises its users heightened autonomy, a sense of decentralization, and an enhanced level of transactional privacy. However, SECT urges us to consider deeper implications. What might these individual boons signify as a broader collective? How might they ripple through our financial infrastructure, potentially unsettling stability and integrity?

However, SECT firmly anchors its ethical principles, prompting a reflective stance in an age captivated by BT's prospects. It is not merely about economic allure; it is a call to introspect on ethical ramifications. The decentralization of BT can empower individuals, but SECT compels us to also consider potential pitfalls: Could it inadvertently foster unethical financial undertakings or exacerbate economic divides?

(a) Financial Market Integrity, Financial Market Stability and Financial Market Efficiency

Financial market integrity is challenged by BT, as it provides a new way to execute and record transactions, posing novel problems. Firstly, blockchain's immutability means that once a transaction is recorded on the blockchain, it cannot be altered or deleted (potentially undermining integrity). Secondly, since most blockchains are intended to be decentralized, i.e., the ledgers are distributed across a network of computers, it also eliminates the requirement for a central authority to verify and process transactions (also potentially undermining integrity).[16]

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[15] Of course, when considering a domain as dynamic and evolutionary as BT it is practically impossible to analyze every possible issue.

[16] Note that different types of blockchains exist — see e.g., Antony Welfare, ed., "Types of Blockchain" in *Commercializing Blockchain: Strategic Applications in the Real World* (Chichester: John Wiley & Sons, 2019) at 37—66; William Mougayar, *The Business Blockchain: Promise, Practice, and Application of the Next Internet Technology*

Financial market stability is threatened by BT since "blockchain financial networks" endanger the stability of the wider market by "transmitting systemic risk, discriminating between market actors and facilitating illegal activity."[17] Firstly, the immutability of transactions recorded on the blockchain creates new risks and, when added to the fact that there is no central authority processing or verification of transactions (see above), removes the risk of a single point of failure in the financial system, but instead facilitates multiple points of potentially instantaneous failure—a so-called *flash crash* (potentially undermining stability).[18] Secondly, since BT enables the use of smart contracts, which are self-executing computer codes that can be programmed to execute automatically when certain conditions are met, the requirement for any intermediaries in financial transactions might be totally removed (also potentially undermining stability).[19]

Financial market efficiency is endangered by BT since, although larger transactions can be processed faster, more transparently, and (potentially) more securely, However, by removing the requirement for a central authority to verify and process transactions and removing intermediaries in the financial market, (both mentioned above), whilst this might enhance efficiency at face value, i.e., make the system more streamlined and less prone to errors and delays, this also carries the risk that, whilst speed might be increased—what is the cost? (potentially undermining efficiency if there are any errors). [20]

(Chichester: John Wiley & Sons, 2016); Daniel Drescher, *Blockchain Basics: A Non-Technical Introduction in 25 Steps* (Berkeley: Apress, 2017).

[17] Philipp Paech, "The Governance of Blockchain Financial Networks" (2017) 80:6 Mod L Rev. 1073.

[18] See, e.g., Irene Aldridge & Steven Krawciw, *Real-Time Risk: What Investors Should Know About Fintech, High-Frequency Trading, and Flash Crashes* (Hoboken, New Jersey: Wiley, 2017); Harsimar Dhanoa, "Making Mistakes with Machines" (2021) 37:1 Santa Clara Computer and High-technology Law Journal 97.

[19] There is still no settled definition for the term "smart contract" – see e.g., Riccardo de Caria, "Law and Autonomous Systems Series: Defining Smart Contracts — The Search for Workable Legal Categories" (*Oxford Business Law Blog*, 25 May 2018) <www.law.ox.ac.uk/business-law-blog/blog/2018/ 05/law-and-autonomous-systems-series-defining-smart-contracts-search>. See also Lauren Scholz, "Algorithmic Contracts and Consumer Privacy" in Larry DiMatteo, Michel Cannarsa & Cristina Poncibò, eds., *The Cambridge Handbook of Smart Contracts, Blockchain Technology and Digital Platforms* (Cambridge: CUP, 2019) at 256; who suggested for example that smart contracts should rather be treated merely as "computer code that helps to procedurally carry out agreements"; Jason Allen & Peter Hunn, eds., *Smart Legal Contracts : Computable Law in Theory and Practice* (Oxford: OUP, 2022) at 4.

[20] See, e.g., Shangrong Jiang, Yuze Li, Shuoyang Wang & Lin Zhao, "Blockchain Competition: The Tradeoff between Platform Stability and Efficiency" (2022) 296:3 European Journal of Operational Research 1084.

(b) Security, Privacy, Transparency and Accountability

Although security appears to be increased via BT, i.e., the risk of fraud, manipulation, and errors in financial transactions might be reduced, however, alternatively the use of BT can increase the risk of security failures and cyber-attack for the very same reasons, e.g. transactional data becoming transparent and immutable; or decentralized and distributed networks being potentially more resilient to cyber-attacks.[21] For instance, besides the general security concerns common to IT infrastructure, blockchains also pose additional and new security concerns, such as the security of the data contained within the blockchain, i.e., the technology can also create new risks of fraud, cyberattacks, and data breaches, which could compromise the privacy and security of individuals and organizations involved in these transactions.[22] Additionally, since the security of blockchain networks also relies on the strength of the cryptographic algorithms used to secure them, it may require financial institutions to implement technically complex (and possibly expensive) security measures to ensure the integrity of blockchain networks.

Privacy is also threatened by the use of BT in the financial sector. This is because the distributed nature of blockchain networks can facilitate the sharing of sensitive financial data between parties, which raises concerns regarding the collection, storage, and use of this data. Further, the increased transparency of financial transactions (i.e., since transactions are recorded on a blockchain and distributed across a network of computers) has the potential to reduce privacy in such transactions, i.e., with transactions having greater visibility and now becoming subject to advanced blockchain analytics techniques.[23] Furthermore, the use of smart contracts and other automated technologies (such as models powered by Artificial Intelligence (AI)) could potentially undermine traditional privacy protection, especially since this may lead to greater surveillance and monitoring of financial activity by both industry and regulators.[24] In addition, the transparency of blockchain networks means that transactions are visible to

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[21] See generally Lokke Moerel, "Blockchain & Data Protection . . . and Why They Are Not on a Collision Course" (2018) 26:6 ERPL 825; Oreste Pollicino & Giovanni De Gregorio, eds., *Blockchain and Public Law: Global Challenges in the Era of Decentralisation* (Northampton: Edward Elgar Publishing, 2021). See also Briseida Sofia Jim nez-Gomer, "Risks of Blockchain for Data Protection: A European Approach" (2019-2020) 36 Santa Clara High Tech Law Journal 281.

[22] See, e.g., Dipanka Dasgupta, John Shrein & Kishor Gupta, "A Survey of Blockchain from Security Perspective" (2019) 3 J of Banking and Financial Technology 1.

[23] See, e.g., Shraddha Kulhari, *Building-blocks of a Data Protection Revolution: The Uneasy Case for Blockchain Technology to Secure Privacy and Identity* (Nomos Verlagsgesellschaft, 2018).

[24] Sam Goundar, G Suseendran & R Anandan, eds., *The Convergence of Artificial Intelligence and Blockchain Technologies: Challenges and Opportunities* (New York: World Scientific, 2022); Rosario Girasa & Gino Scalabrini, *Regulation of Innovative Technologies: Blockchain, Artificial Intelligence and Quantum Computing* (Cham: Palgrave Macmillan, 2022); Tiago Fernandez-Caram s & Paula Fraga-Lamas, eds.,

all network participants. While this level of transparency can increase accountability, it can also compromise individuals' privacy.

The application of BT in finance also creates challenges in relation to transparency and accountability, e.g., in relation to compliance requirements, money laundering and tax evasion. Further, whilst transparency is potentially a significant advantage of BT as it increases accountability and might reduce the risk of fraud, the transparency of the blockchain network might also compromise the privacy of individuals (as stated above). Accountability is also threatened because removing both central authorities and financial intermediaries might raise new questions of how to allocate responsibility in financial transactions, e.g., the decentralized nature of blockchain networks makes it difficult to hold individuals or entities accountable for fraudulent activities.[25]

SECT bridges the gap between the interests of businesses vs consumers and individual interest's vs the collective interest, and its essence lies in striking a balance between the above-mentioned potential threats and the perceived broader societal good that comes from progress and innovation.

4. SECT ANALYSIS PART 2: INSIGHTS AND EXAMPLES

Our reflection offers a critical legal perspective that challenges conventional regulatory paradigms. It navigates the complexities of BT's role within the financial sector, not merely as a technological innovation but as a catalyst for redefining legal and ethical boundaries. For instance, the below examples are underpinned by a complex interplay between innovation and regulation, necessitating a re-evaluation of traditional legal paradigms. This is because BT's influence extends beyond mere technological disruption, challenging fundamental concepts and introducing a paradigm shift in financial transactions, where each key issue can be both damaged, but also improved by BT, making appropriate regulation crucial.

Example 1: by recording transactions on blockchains, central authorities might instead be better able to quickly monitor and detect potential threats to financial stability (especially when supplemented by RegTech techniques).[26]

Example 2: BT offers improvements in financial market integrity via both consumer protection, e.g., by providing individuals with more control over their financial transactions and reducing the risk of fraud and theft,[27] and governance,

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Advances in the Convergence of Blockchain and Artificial Intelligence (New York: IntechOpen, 2022).

[25] See, e.g., Kiran Sūda et al, eds., *Blockchain Technology in Corporate Governance: Transforming Business Industries* (Chichester: John Wiley & Sons, 2023).

[26] See, e.g., Janos Barberis, Douglas Arner & Ross Buckley, eds., *The Regtech Book: the Financial Technology Handbook for Investors, Entrepreneurs and Visionaries in Regulation* (Chichester: John Wiley & Sons, 2019). See also Xiangrui Chao et al, ''Regulatory Technology (Reg-Tech) in Financial Stability Supervision: Taxonomy, Key Methods, Applications and Future Directions'' (2022) 80 International Review of Financial Analysis 102023.

e.g., by the provision of a transparent and accountable platform for transactions.[28]

Example 3: the basic level of financial inclusion can be increased by providing individuals with access to secure and decentralized financial systems,[29] and also by providing individuals with greater access to more sophisticated financial services and products that can help them improve their economic prospects and build wealth, e.g., through tokenization.[30]

Example 4: international development can also be encouraged by providing a secure and decentralized platform for transactions and data exchange.[31]

Example 5: security can be increased because blockchain potentially provides both, a secure platform for transactions,[32] and an immutable record of transactions.[33]

Example 6: security can also be strengthened because blockchain has the potential to promote intellectual property rights by providing a secure and immutable platform for tracking and verifying ownership of digital assets.[34]

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[27] See e.g., David Shrier, Weige Wu & Alex Pentland, ''Blockchain & Infrastructure (Identity, Data Security)'', (2016) 1:3 Massachusetts Institute of Technology-Connection Science; Nirmalee Raddatz et al, ''Becoming a Blockchain User: Understanding Consumers' Benefits Realisation to Use Blockchain-Based Applications'' (2023) 32:2 European Journal of Information Systems 287.

[28] See, e.g., Benedetta Cappiello & Gherardo Carullo, eds., *Blockchain Law and Governance* (Cham: Springer, 2021).

[29] See e.g., Christian Hoffmann, ''Blockchain Use Cases Revisited: Micro-Lending Solutions for Retail Banking and Financial Inclusion'' (2021) 9:1 Journal of Systems Science and Information 1; Emily Lee, ''Technology-Driven Solutions to Banks' de-Risking Practices in Hong Kong: Fintech and Blockchain-Based Smart Contracts for Financial Inclusion'' (2022) 51:1-2 CL World Rev 83.

[30] See generally David Lee & Robert Deng, eds., *Handbook of Blockchain, Digital Finance, and Inclusion. Volume 1, Cryptocurrency, FinTech, InsurTech, and Regulation* (Elsvier Ltd.: Academic Press, 2017). See also Julien Chaisse & Jamieson Kirkwood, ''Tokenised Funding and Initial Litigation Offerings: the New Kids Putting Third-Party Funding on the Block'' (2022) 16:1-2 Law and Financial Markets Review 20.

[31] See, e.g., Victoria Tuomisto, ''Unblocking Cross-Border Trade: Facilitating International Movement of Goods via Blockchain Could Become a Reality for Developing Countries'' (2018) 1 International Trade Forum 34; Elham Seyedsayamdost & Peter Vanderwal, ''From Good Governance to Governance for Good: Blockchain for Social Impact'' (2020) 32:6 Journal of International Development 943.

[32] See, e.g., Kai Wang et al, ''Securing Data With Blockchain and AI'' (2019) 7 IEEE Access 77981.

[33] See, e.g., Victoria Lemieux & Chen Feng, *Building Decentralized Trust: Multidisciplinary Perspectives on the Design of Blockchains and Distributed Ledgers* (Cham: Springer, 2021).

[34] See, e.g., Marie Malaurie-Vignal, ''Blockchain, Intellectual Property and Fashion'' (2020) 15:2 Journal of Intellectual Property Law & Practice 92; Beniemin Shakhnazarov, ''Complex Interconnection of Blockchain Technology and Intellectual Property in Cross-Border Private Law Relations'' (2019) 5 Law Journal of the Higher School of Economics 121.

Example 7: as regards privacy, on the one hand, BT (via decentralization) can provide individuals with more control over their data and transactions.[35] However, on the other hand, since the use of BT relies on the collection and processing of personal data, this raises questions about data privacy and security.[36]

Example 8: the use of BT can *even* influence human rights, particularly in relation to privacy, freedom of expression, and access to information.[37]

Example 9: social responsibility can be improved by providing a transparent and accountable platform for commerce.[38]

The SECT analysis constantly showcases the double-edged sword where decentralization both enhances system resilience and complicates systemic risk management. Or similarly, how the immutable and transparent nature of blockchain paradoxically heightens security while amplifying privacy concerns, underscoring the need for a nuanced understanding of data protection in the digital age. This analysis illuminates the imperative for legal frameworks to evolve in tandem with technological advancements, balancing the drive for efficiency and innovation against the imperative for ethical and stable financial ecosystems. The integration of BT in the financial sector, therefore, is not just a technological or regulatory challenge, but a profound conceptual shift in understanding the legalities of the digital financial landscape.

By employing SECT, the article interrogates the compatibility of BT with fundamental societal agreements and norms, probing its potential to either disrupt or reinforce traditional financial structures and ethical standards. This exploration is set against the backdrop of an evolving digital economy, in which the fusion of technology and finance continually tests the robustness and adaptability of legal systems. [39]

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[35] See, e.g., B alázs Bodó, Jaya Brekke & Jaap-Henk Hoepman, ''Decentralisation in the Blockchain Space'' (2021) 10 Internet Policy Review 1; Lokke Moerel & M Storm, ''Blockchain Can Both Enhance and Undermine Compliance but Is Not Inherently at Odds with EU Privacy Laws'' (2021) 22:2 The Journal of Investment Compliance 122; Stanton Heister & Kristi Yuthas, ''How Blockchain and AI Enable Personal Data Privacy and Support Cybersecurity'' in Tiago Fernandez-Caramés & Paula Fraga-Lamas, eds., *Advances in the Convergence of Blockchain and Artificial Intelligence* (New York: IntechOpen, 2022).

[36] See also Matthias Berberich & Malgorzata Steiner, ''Practitioner's Corner Blockchain Technology and the GDPR — How to Reconcile Privacy and Distributed Ledgers?'' (2016) 2:3 European Data Protection Law Review 422; Unal Tatar, Yasir Gokce & Brian Nussbaum, ''Law Versus Technology: Blockchain, GDPR, and Tough Tradeoffs'' (2020) 38 Computer Law & Security Review 105454.

[37] See e.g., Kobina Hughes, ''Blockchain, The Greater Good, And Human And Civil Rights'' (2017) 48(5) Metaphilosophy 654.

[38] See, e.g., Elisa Bertino, Ahish Kundu & Zehra Sura, ''Data Transparency with Blockchain and AI Ethics'' (2019) 11:4 ACM Journal of Data and Information Quality 1; Bridget Tyma et al, ''Understanding Accountability in Blockchain Systems'' (2022) 35:7 Accounting, Auditing and Accountability Journal 1625.

[39] See, e.g., Robert Herian, ''The Politics of Blockchain'' (2018) 29 Law and Critique 129;

5. COMPARATIVE LEGAL ANALYSIS ACROSS JURISDICTIONS

The regulation of BT is complex and varies across jurisdictions, which can significantly impact the development and adoption of blockchain applications in the financial sector. In this section we consider three of the major jurisdictions—the US, the EU, and China—and look at the strengths, weaknesses and similarities of these jurisdictions.[40]

(a) Innovative and Complex: The US Regulatory Framework for Blockchain

The US has taken a cautious approach to regulating BT in the financial sector and has not regulated in this space to any significant extent. Consequently, innovation is championed, and the tech companies are encouraged to regulate themselves. For instance, the US Federal Trade Commission (FTC) established a Blockchain Working Group, whose main objective is to combat irregular and fraudulent business practices.[41] The US does have strong cybersecurity and antitrust laws and plans to strengthen these further (especially as regards public companies).[42] However, the absence of strict regulations relating to BT has resulted in a regulatory landscape that is complex and varies depending on the specific application of technology. For example, blockchain-based cryptocurrencies such as Bitcoin are (apparently) subject to different regulations than blockchain-based securities.[43] Further, it is also not clear as regards how the existing antitrust laws (which are rather old) will relate to BT.

Mikayla Novak, "Crypto-friendliness: Understanding Blockchain Public Policy" (2020) 9:2 Journal of Entrepreneurship and Public Policy 165; Georgios Dimitropoulos, "The Law of Blockchain" (2020) 95 (3) Washington Law Review 1117. See also Wessel Reijers, Fiachra O'Brolch in & Paul Haynes, "Governance in Blockchain Technologies & Social Contract Theories" (2016) 1 Ledger 134.

[40] Note that whilst we limited the focus of our study to these three jurisdictions, there are certainly other jurisdictions offering important regulatory innovations. See e.g., Rosario Girasa, *Regulation of Cryptocurrencies and Blockchain Technologies: National and International Perspectives* (Cham: Palgrave Macmillan, 2022); Agata Ferreira, "Emerging Regulatory Approaches to Blockchain Based Token Economy" (2020) 3:1 Journal of The British Blockchain Association 1.

[41] Neil Chilson and Acting Chief Technologist, "It's time for a FTC Blockchain Working Group" (16 March 2018), online: *Federal Trade Commission* < https://www.ftc.gov/policy/advocacy-research/tech-at-ftc/2018/03/its-time-ftc-blockchain-working-group > .

[42] See e.g., US Securities and Exchange Commission, "SEC Proposes Rules on Cybersecurity Risk Management, Strategy, Governance, and Incident Disclosure by Public Companies" (Release No. 2022-39) , online: *US Securities and Exchange Commission* < https://www.sec.gov/news/press-release/2022-39 > . The US regulates antitrust at a federal level by means of the *Sherman Antitrust Act of 1890*, the Clayton Act of 1914 and the Federal Trade Commission Act of 1914.

[43] See e.g., Wulf Kaal, "Initial Coin Offerings: The Top 25 Jurisdictions and Their Comparative Regulatory Responses" (2018) 1 Stan J Blockchain L & Policy 41 (confirms

The regulation of BT in the US is also rather convoluted. For instance, there are several agencies involved in the regulation of different aspects of BT, e.g., whilst the US Securities and Exchange Commission (SEC) has played a particularly active role in regulating blockchain-based securities, issuing guidance on initial coin offerings (ICOs), and prosecuting companies that violate securities laws,[44] there are also several other US bodies that have also asserted jurisdiction in this same space, such as the Commodities Futures Trading Commission (CFTC), Office of the Comptroller of the Currency and the Treasury Department.[45] In fact, regulation of BT in the US has consequently

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that since the 'DAO' report in July 2017, digital tokens may be viewed by the SEC as investment contracts and therefore securities subject to the regulation of the SEC, both in their initial sale and in secondary market trading). See also US Securities and Exchange Commission, "Report of Investigation Pursuant to Section 21(a) of the Securities Exchange Act of 1934: The DAO" (25 July 2017), online: < https://www.sec.gov/litigation/investreport/34-81207.pdf > .

[44] See e.g., Jay Clayton, "Statement on Cryptocurrencies and Initial Coin Offerings" (11 December 2017), online: *US Securities and Exchange Commission* < https://www.sec.gov/news/public-statement/statement-clayton-2017-12-11 > ; US Securities and Exchange Commission, "Framework for 'Investment Contract' Analysis of Digital Assets" (3 April 2019), online: *US Securities and Exchange Commission* < https://www.sec.gov/corpfin/framework-investment-contract-analysis-digital-assets > . Michael Mendelson, "From Initial Coin Offerings To Security Tokens: A U.S. Federal Securities Law Analysis" (2019) 22 Stan Tech L Rev 52. The SEC has already stopped ICOs which were not obviously related to "security tokens" — see e.g. Stan Higgins, "SEC Halts Multimillion-Dollar 'Munchee' ICO for Securities Violations" (12 December 2017), online: *CoinDesk* < https://www.coindesk.com/markets/2017/12/11/sec-halts-multimillion-dollar-munchee-ico-for-securities-violations/ > . See also US Securities and Exchange Commission, "SEC Files 13 Charges Against Binance Entities and Founder Changpeng Zhao" (5 June 2023), online: *US Securities and Exchange Commission* < https://www.sec.gov/news/press-release/2023-101 > ; Program on International Financial Systems, "A Review on Cryptoasset Market Structure and Regulation in the U.S. PIFS International" (February 2023), online: *PIFS* < https://www.pifsinternational.org/cryptoasset-market-structure-and-regulation-in-the-u-s > .

[45] See e.g., Stuart Levi & Jeongu Gim, "Federal Judge Rules Virtual Currencies Are Commodities Under the Commodity Exchange Act" (8 March 2018), online: *Skadden, Arps, Slate, Meagher & Flom LLP* < https://www.skadden.com/insights/publications/2018/03/federal-judge-rules-virtual-currencies > ; US Office of the Comptroller of the Currency, "OCC Clarifies Bank Authority to Engage in Certain Cryptocurrency Activities and Authority of OCC to Charter National Trust Banks" (23 November 2021) , online: *OCC* < https://www.occ.gov/news-issuances/news-releases/2021/nr-occ-2021-121.html > ; Thomas Franck, "U.S. Treasury Calls for Stricter Cryptocurrency Compliance with IRS, Says They Pose Tax Evasion Risk" (20 May 2021), online: *CNBC* < https://www.cnbc.com/2021/05/20/us-treasury-calls-for-stricter-cryptocurrency-compliance-with-irs.html > . See also US Department of the Treasury, Office of Foreign Assets Control, "Sanctions Compliance Guidance for the Virtual Currency Industry" (October 2021), online: *OFAC* < https://home.treasury.gov/system/files/126/virtual_currency_guidance_brochure.pdf > . There are also other agencies involved, including the US Federal Reserve Board, the Consumer Financial Protection Bureau, Office of Comptroller of the Currency, the Federal Trade Commission, the Federal

undergone a "regulation by enforcement" approach,[46] and such a convoluted legal framework for regulating BT, instead makes it difficult for businesses to navigate.

Until now there is no specific regulation in respect of BT in the US and it would appear that the piecemeal approach will continue with the US likely to regulate cryptocurrencies before anything else, e.g., President Biden signalled that the US government plans to bring in crypto regulations by an executive order on 9 March 2022[47] and by releasing an actual regulatory framework on 17 September 2022.[48]

(b) Progressive and Harmonized : Blockchain in the EU's Legal System

The EU has also taken a relatively cautious approach to regulating BT in the financial sector, although the EU has been more assertive and transparent than the US, especially vis-à-vis the protection of the consumer. For instance, with a proactive approach to regulating and observing the activities on the digital market, the EU has chosen a forward-looking posture in bringing blockchain and competition law into harmony. In order to encourage fair play in the digital market, the EU has put in place a number of laws, including the General Data Protection Regulation (GDPR),[49] the Digital Markets Act (DMA),[50] the Market in Crypto-assets Regulation (MiCA),[51] and Anti-Money Laundering (AML) and

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Deposit Insurance Corporation, and the North American Securities Administrators Association.

46 As regards "regulation by enforcement" in the US, Chris Brummer's view, is that, "in the absence of clear guidelines, regulation by enforcement is becoming increasingly likely as a clarity-inducing tool" – see Chris Brummer, "Disclosure, Dapps and DeFi" (2022) 5:2 Stanford J Blockchain L & Policy 137, 146.

47 Ryan Browne, "Biden Just Put Out an Executive Order on Cryptocurrencies — Here's Everything that's in It", (9 March 2022), online: *CNBC* < https://www.cnbc.com/2022/03/09/heres-whats-in-bidens-executive-order-on-crypto.html > .

48 Mackenzie Sigalos, "Biden White House Just Put Out a Framework on Regulating Crypto — Here's What's In It" (18 September 2022), online: *CNBC* < https://www.cnbc.com/2022/09/16/heres-whats-in-biden-framework-to-regulate-crypto.html > .

49 Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) [2016] OJ L 119/1.

50 Regulation (EU) 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828 [2022] OJ L265/1.

51 See Kai Zhang, Philip Morgan & Jeremy McLaughlin, "MICA — Overview of the New EU Crypto-Asset Regulatory Framework (Part 1)" (15 November 2022), online: *K & L Gates Hub* < https://www.klgates.com/mica-overview-of-the-new-eu-crypto-asset-regulatory-framework-part-1-11-15-2022 > ; European Council & the Council of the European Union, "Digital finance: agreement reached on European crypto-assets

Counter Terrorist Financing (CTF) legislation.[52] The GDPR is a major piece of EU legislation, which has implications for BT use in the financial sector. The GDPR gives individuals the right to have their personal data erased or corrected (although this could be challenging to achieve in a blockchain system where data are intended to be immutable). However, the GDPR also recognises the importance of BT and provides certain exemptions for blockchain systems that are used for specific purposes, such as financial transactions. MiCA (which was agreed upon in October 2022 and is predicted to come into force in 2024) introduces a licensing scheme for crypto intermediaries, prospectus rules, anti-market abuse and insider trading rules and bespoke legislation for stable coins.

The EU's regulatory framework is based on a principle of "technology neutrality," meaning that existing laws should be applied to blockchain applications in the financial sector unless there is a compelling reason to create new regulations.[53] The EU has also issued guidance on the regulation of cryptocurrencies and proposed new regulations for crowdfunding platforms that use BT. Nevertheless, there are also several agencies involved in BT regulation in the EU. For instance, the European Securities Market Authority (ESMA) has responsibility for regulating security tokens and issued detailed guidance on 7 February 2017, according to which it shall determine whether a token is deemed to be a financial instrument or not and subject to EU regulation.[54] Additionally the European Banking Authority (EBA) issued its "Report with advice for the

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regulation (MiCA)" (30 June 2022), online: *European Council & the Council of the European Union* <https://www.consilium.europa.eu/en/press/press-releases/2022/06/30/digital-finance-agreement-reached-on-european-crypto-assets-regulation-mica>; David Carlisle, "Crypto 2023 Predictions: MiCA Will be the Blueprint For Regulation Globally" (14 December 2022), online: *Elliptic Connect* <https://hub.elliptic.co/analysis/crypto-2023-predictions-mica-will-be-the-blueprint-for-regulation-globally>.

[52] Directive (EU) 2018/843 of the European Parliament and of the Council of 30 May 2018 amending Directive (EU) 2015/849 on the prevention of the use of the financial system for the purposes of money laundering or terrorist financing and amending Directives 2009/138/EC and 2013/36/EU 4 [2017] OJ L156/43.

[53] See, e.g., Gabriele Gagliani, "Cybersecurity, Technological Neutrality, and International Trade Law" (2020) 23:3 JIEL 723.

[54] European Securities Market Authority, "Report: The Distributed Ledger Technology Applied to Securities Markets" (7 Feb 2017), online: *ESMA* <https://www.esma.europa.eu/sites/default/files/library/dlt_report_-_esma50-1121423017-285.pdf> (The applicable EU regulation is contained in Directive 2003/71/EC (Prospectus Directive); Directive 2011/61/EU of the European Parliament and of the Council of 8 June 2011 on Alternative Investment Fund Managers [2011] OJ L174/1; Directive 2014/65/EU on Markets in Financial Instruments Directive [2014] OJ L173/349 ; and Directive 2015/849/EU on Anti-Money Laundering Directive [2015] OJ L141/73. See also Heikki Marjosola, "Security Tokens and the Future of EU Securities Law: Rethinking the Harmonisation Project" in Emilios Avgouleas & Heikki Marjosola, eds., *Digital Finance in Europe: Law, Regulation, and Governance* (De Gruyter, 2021) at 253; M Luchessi, "Crypto-assets: The Draft 'MICA' Regulation Aims for a New EU Regulation" (2021) 2 IBLJ 179.

European Commission: on crypto-assets" on 9 January 2019 (which report outlines how divergent approaches to the regulation of crypto-assets and BT is a threat to the EU and needs harmonization).[55] The EBA advised the European Commission in this report that a thorough cost-benefit analysis is necessary to determine what, if any, action is needed to address concerns about the opportunities and risks presented by crypto-asset activities and new technologies that may involve the use of crypto-assets. Hence, the EBA aims to ensure that the legal environment for EU financial services is open to innovation and does not obstruct the use of new technologies.

Another development was the EU's launch of the "Blockchain Observatory and Forum" in 2018, which forum has the purpose to, "highlight key developments of the blockchain technology, promote European actors and reinforce engagement with multiple stakeholders involved in blockchain activities."[56] This project is a public private partnership between the EU and ConsenSys, which is a global leader in the blockchain ecosystem.[57]

(c) Strategic and Authoritative: Navigating China's Blockchain Regulations

By contrast, China has adopted a more aggressive approach to regulating BT in the financial sector. The Chinese government has issued a series of regulations aimed at cracking down on practically all crypto related activities, including fraudulent ICOs and other blockchain-based financial scams.[58] It formally banned crypto transactions in 2017 via two official notices.[59] However, China also has the luxury of allowing its Special Administrative Region of Hong Kong operate as a "testing ground" for the mainland. For instance, Hong Kong is a

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[55] European Banking Authority, "Report with Advice for the European Commission: on Cryptoassets" (9 January 2019), online: *European Banking Authority* < https://www.eba.europa.eu/sites/default/documents/files/documents/10180/2545547/67493daa-85a8-4429-aa91-e9a5ed880684/EBA%20Report%20on%20crypto%20assets.pdf?retry=1 >; Niels Vandezande, "Regulating initial coin offerings and DAO tokens under the EU's financial instruments framework" (2020) 14:1 Law and Financial Markets Review 33.

[56] European Commission, "European Commission Launches the EU Blockchain Observatory and Forum" (1 February 2018), online: *European Commission* < http://europa.eu/rapid/press-release_IP-18-521_en.htm >.

[57] ConsenSys, online: < https://new.consensys.net/ >.

[58] See, e.g., Rain Xie, "Why China Had To 'Ban' Cryptocurrency But The U.S. Did Not: A Comparative Analysis Of Regulations On Crypto-Markets Between The U.S. And China" (2019) 18:2 Washington University Global Studies Law Review 457.

[59] "Notice of Seven Ministries Including the People's Bank of China on Guard against Risks of Token Offering and Finance (Joint Notice)" (2 September 2017) and "Notice on the Rectification of Token Offering and Financing Activities" (4 September 2017) — for details see Michael House, Geoffrey Vance & Huijie Shao, "China Halts ICOs and Token Sales and China-Based Trading Platforms Suspend Trading Amid Reports", (18 September 2017), online: *Perkins Cole* < https://www.virtualcurrencyreport.com/2017/09/china-halts-icos-and-token-sales-and-china-based-trading-platforms-suspend-trading-amid-reports-of-additional-government-restrictions/ >.

self-proclaimed leader in the crypto and blockchain space, e.g., Hong Kong has implemented a licensing system for crypto intermediaries: by application to Hong Kong's Securities and Futures Commission.[60]

Simultaneously, however, China has been actively promoting the development of BT in other areas, such as supply chain management.[61] This is because the ban on cryptocurrency transactions did not affect blockchain research.[62] Therefore, BT is being rapidly developed by both the public and the private sector. Indeed, in the private sector especially, BT is already used, for instance, in financial services, the food industry, logistics, legal services, intellectual property, and many other sectors.[63] China is also at the forefront of using BT in its justice system through developing smart courts e.g., as can be seen by considering the three internet courts operating in China since 2017.[64]

Finally, an important development as regards BT in China is the introduction of the e-CNY.[65] A leading researcher on the e-CNY (Richard Turrin) has said that a major purpose of the e-CNY is to enable a digital logistics system.[66] The e-CNY makes a significant difference because payments using a digital money can more easily be programmed so that the contract is truly self-enforcing, e.g., if the payment is made then the goods can be instantly shipped (by-passing customs clearance or financial intermediaries) etc.[67]

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[60] See, e.g., Charltons Law, "Hong Kong Licensing Regime for Virtual Asset Exchanges to Take Effect on 1 March 2023", (July 2022), online: *Charltons Law* < https://www.charltonslaw.com/hong-kong-licensing-regime-for-virtual-asset-exchanges-to-take-effect-on-1-march-2023 > .

[61] See, e.g., Zhilun Jiao, "Applications and Prospects of Blockchain Technology in China's Logistics Industry" in Zhilun Jiao et al, eds., *Contemporary Logistics in China* (Cham: Springer, 2021) 239. See also Qian Yao, *Blockchain-Based New Financial Infrastructures: Theory, Practice and Regulation* (Cham: Springer, 2022).

[62] See Jia Wang & Chen Lei, "Will Innovative Technology Result in Innovative Legal Frameworks? Smart Contracts in China" (2018) 26:6 European Review of Private Law 921 at 926. Wang & Lei state ("[I]n 2017, more than half of the world's approximately 400 blockchain-related patent applications originated from China").

[63] *See* Jia Wang & Chen Lei, "Will Innovative Technology Result in Innovative Legal Frameworks? Smart Contracts in China" (2018) 26:6 European Review of Private Law 921 at 927 ("In China, the blockchain technology is booming. Both public and private sectors have adopted smart contracts that are run on blockchain systems.").

[64] See e.g., Xuhui Fang, "Recent ODR Developments in China" (2017) 4:2 International Journal of Online Dispute Resolution 32; Julien Chaisse & Jamieson Kirkwood, "Smart Courts, Smart Contracts, and the Future of Online Dispute Resolution" (2022) 5:1 Stanford Journal of Blockchain Law & Policy 62-91.

[65] See e.g., Xia Mian, "In Search of the Perfect Coin: China's Approach towards Cryptocurrency and Its Own Central Bank Digital Currency" (2021) 36:3 Banking & Finance Law Review 419 (explores the history of digital money in China); Heng Wang, "China's Approach to Central Bank Digital Currency:: Selectively Reshaping International Financial Order?" (2022) 18:1 U Pa Asian L. Rev. 77.

[66] Richard Turrin, *Cashless: China's Digital Currency Revolution* (Authority Publishing, 2021).

(d) Synthesising Regulatory Models: SECT-Informed Insights and Implications

The three legal frameworks considered are found to vary significantly. For instance, while the US has taken the most cautious approach to regulation, the EU has taken a more balanced approach, and China has been more aggressive in its efforts to regulate blockchain-based financial activities (although Hong Kong currently has a "pro-crypto" environment). Although, these differences can be explained—with the US adopting a more market-driven approach, the EU focused on protecting the consumer, and regulation in China being state-led—the divergence in approaches also has significant implications on the development and adoption of blockchain applications in the financial sector.

The explanation sometimes given is that the US has a "market driven" model premised on the idea of the free internet, the free market and incentives to innovate, which reserves only a small role for the government and in practice hands over regulatory power to the tech companies; the EU has a "rights-driven" model reflected in a human-centric view of digital transformation where the protection of the individual rights of individuals and the protection of democratic structures takes priority; and China has a "state-driven" model focused on maximising the technological prowess of China and also leveraging technology as a tool to maintain political control and to ensure social stability.[68]

However, although the scope of regulation varies across the three jurisdictions, there are similarities. For instance, each jurisdiction recognises BT's potential to revolutionize the financial sector, resulting in increased investment and a range of regulatory initiatives to ensure its effective use. Further, neither of the jurisdictions have adopted comprehensive regulatory frameworks covering all aspects of BT in the financial sector, i.e., the regulations seen so far only focus on specific areas of concern, such as cybersecurity, data privacy, and financial stability.

Further, the similarities and differences in the approaches highlights the complex nature of regulating BT in the financial sector. This underscores the need for regulatory frameworks that strike a balance between promoting innovation and ensuring consumer protection and market stability. Therefore, continued collaboration and international cooperation in developing effective regulatory frameworks that support BT's growth while safeguarding against risks are crucial.

Additionally, the current approaches to addressing the legal and ethical implications of using BT in the financial sector in these three jurisdictions have

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[67] For instance, Turrin states, "The digital yuan is not just a currency. It should be seen as a digital ticket or entry token to China's smart blockchain and AI-enabled logistics system". See Pamela Lin, *China's Digital Yuan: How will it Decide the Future of Money?* (20 May 2021), online: *Lynk Global* < https://lynk.global/insights/china-digital-yuan-how-will-it-decide-the-future-of-money > .

[68] See Anu Bradford, *Digital Empires: The Global Battle to Regulate Technology* (Oxford: OUP, 2023).

had mixed success. While the EU has been successful in addressing some of the issues that arise from the use of BT, such as security and privacy concerns (e.g., the GDPR etc), other jurisdictions have fallen short of adequately addressing these issues (e.g., insufficient privacy regulations in the US). The GDPR also illustrates a key aspect of a comprehensive legal framework, which is that it should offer well-defined, precise legal structures, enabling businesses to operate in compliance with the law. The GDPR provides explicit guidelines on data privacy, holding businesses responsible for gathering, utilizing, and preserving personal information. However, despite this strength, the EU potentially faces challenges in keeping up with rapid technological advancements. For instance, whilst BT advances at a fast pace, legal frameworks may lag, resulting in legal ambiguities and misunderstandings. Thus, the potential rigidity of legal frameworks can be a double-edged sword as it may stifle innovation and the development of new technologies. This is especially true for BT, which is still in its infancy. Excessively rigid legal frameworks can limit the potential advantages of BT by imposing unwarranted regulatory burdens.

Furthermore, the differences across the three jurisdictions complicates matters for businesses operating in multiple locations and also creates challenges as regards the implementation of legal frameworks. Given that BT offers decentralized functionality across borders, regulators may have difficulty enforcing laws. This challenge becomes more evident when considering that businesses operating in jurisdictions with weaker legal frameworks may engage in unethical or unlawful activities without facing any consequences.

Hence, any lack of uniformity and consistency in legal frameworks can lead to a lack of clarity regarding the legal obligations and responsibilities of those involved in the use of BT in the financial sector. Consequently, it is increasingly difficult for regulators and other stakeholders to monitor and regulate the use of BT effectively. This difficulty is amplified considering BT has the potential to facilitate illegal or unethical activities such as money laundering, tax evasion, and terrorist financing. Although some jurisdictions have been successful in addressing some of these issues (e.g., perhaps the EU), others have been less effective in preventing such activities from occurring (especially external jurisdictions where legislation is possibly more lenient or not enforced, e.g., Bahamas etc).[69]

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[69] For instance FTX relocated its headquarters from Hong Kong to Bahamas in September 2021 — see Shalini Nagarajan, "Sam Bankman-Fried says FTX has moved its HQ from Hong Kong to the Bahamas because of its crypto framework" (27 September 2021), online: *Markets Insider* < https://markets.businessinsider.com/news/currencies/sam-bankman-fried-ftx-crypto-hong-kong-bahamas-relocates-headquarters-2021-9 > .

6. OTHER CONSIDERATIONS AND REGULATORY PROPOSALS

(a) International Developments

BT remains a relatively new phenomenon and hence is a *moving target*, i.e., since it is continuously evolving. As such ascertaining the latest international developments relevant to our article is a challenge. Nevertheless, in this subsection we highlight some coordinated international developments, such as the Financial Stability Board (FSB) and International Monetary Fund (IMF), as well as the Organization for Economic Cooperation and Development (OECD) and World Trade Organization (WTO). Further, we also discuss some case law.

As regards international developments, the extent of international coordination and cooperation in regulating BT in the financial sector is not yet well established. Some bodies such as the FSB, the IMF, the Bank for International Settlements (BIS) and the International Organization of Security Commissions (IOSCO) have promoted harmonization as regards the regulation of crypto assets but not yet as regards BT.[70] Additionally, the Financial Action Task Force (FATF) has issued standards in 2012 relating to AML and CFT and also an update in 2023 relating to virtual assets.[71] Additionally, the Basel Committee on Banking Supervision issued two consultative documents as regards the prudential treatment of crypto-assets (in 2021 and 2022).[72] Therefore,

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[70] e.g., IMF, "IMF Policy Paper Elements of Effective Policies For Crypto Assets" (Policy Paper No 2023/004, 23 February 2023), online: IMF <https://www.imf.org/en/Publications/Policy-Papers/Issues/2023/02/23/Elements-of-Effective-Policies-for-Crypto-Assets-530092>; Parma Bains *et al*, "Regulating the Crypto Ecosystem: The Case of Unbacked Crypto Assets" (26 September 2022), online: *IMF* <https://www.imf.org/en/Publications/fintech-notes/Issues/2022/09/26/Regulating-the-Crypto-Ecosystem-The-Case-of-Unbacked-Crypto-Assets-523715>; FSB, "Regulation, Supervision and Oversight of Crypto-Asset Activities and Markets: Consultative Document" (11 October 2022), online: *FSB* <https://www.fsb.org/wp-content/uploads/P111022-3.pdf>. Matteo Aquilina, Jon Frost & Andreas Schrimpf, "Addressing the Risks in Crypto: Laying out the Options" (12 January 2023), online: *BIS* <https://www.bis.org/publ/bisbull66.htm> accessed 29 April 2024; Raphael Auer & Stijn Claessens, "Regulating Cryptocurrencies: Assessing Market Reactions" (23 September 2018), online: *BIS* <https://www.bis.org/publ/qtrpdf/r_qt1809f.htm> accessed 29 April 2024.

[71] FATF, "International Standards on Combatting Money Laundering and the Financing of Terrorism and Proliferation" (16 February 2012), online: *FATF* < https://www.fatf-gafi.org/en/publications/Fatfrecommendations/Fatf-recommendations.html > accessed 29 April 2024; FATF, "Virtual Assets: Targeted Update on Implementation of the FATF Standards on Virtual Assets and Virtual Asset Service Providers" (27 June 2023), online: *FATF* < https://www.fatf-gafi.org/content/fatf-gafi/en/publications/Fatfrecommendations/targeted-update-virtual-assets-vasps-2023.html > accessed 29 April 2024.

[72] BIS, "Prudential Treatment of Cryptoasset Exposures - Second Consultation" (30 June 2022), online: *BIS* <https://www.bis.org/bcbs/publ/d533.htm>; DavisPolk, "Basel Committee Consultation on the Prudential Treatment of Cryptoassets" (17 June 2021), online: *DavisPolk* <https://www.davispolk.com/sites/def ault/files/2021-06/

it is not clear whether this harmonization as regards crypto-assets will extend to all aspects of BT.

Further, the WTO,[73] and the OECD,[74] have been active in making BT part of the international policy agenda, and hence it is possible we might see an internationally coordinated approach vis-à-vis BT in the future. The OECD has also been active in issuing various policy documents relating to BT.[75] Nevertheless, it also remains to be seen, whether the individual jurisdictions might pursue only a unilateral approach, as opposed to cooperating and harmonizing their regulations with those of other jurisdictions to promote the cross-border adoption of BT.

We also note the cooperation between the US and the EU in the "EU-US Joint Financial Regulatory Forum," whose most recent meeting took place in December 2023 in Washington and where matters relating to FinTech and Digital Finance were freely discussed.[76]

(b) International Case Law

Cases relating to BT are few and far between and mostly relate to disputes arising from cryptocurrency transactions e.g., *Tulip Trading Limited v Bitcoin Association & Others* (where the High Court in England and Wales was asked to intervene where it was alleged that the claimant lost money due to a hack and that the defendants were in breach of the common-law tort of fiduciary duty and thereby liable for the loss of the claimant's digital currency as a result of the alleged hack); [77] or the UK High Court's interim decision in *AA* regarding the use of English Law of the property concerning blockchain;[78] the New Zealand

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BCBS%20Consultation%20on%20Prudential%20Trea tment%20of%20Cryptoasset%20Exposures.pdf > (a detailed discussion of the Basel Committee's first consultation in 2021).

[73] WTO, "2021 Global Trade & Blockchain Forum", online < :https://www.wto.org/english/res_e/reser_e/blockchainforum2021_e.htm > .

[74] The OECD has been organizing an annual "OECD Global Blockchain Policy Forum" since 2018, online: *OECD* < https://www.oecd.org/finance/oecd-blockchain-policy-forum.htm > .

[75] See e.g., OECD, "Blockchain Technology and Competition Policy - Issues paper by the Secretariat" (8 June 2018), online: *OECD* < https://one.oecd.org/document/DAF/COMP/WD(2018)47/en/pdf > .

[76] See EU and US Department of the Treasury, "Joint Statement on the EU-U.S. Financial Regulatory Forum" (December 2023) , online: < https://finance.ec.europa.eu/system/files/2023-12/231208-eu-us-joint-financial-regulatory-forum-joint-statement_en.pdf > .

[77] Sophie Nappert & Elisabeth Everson, "Tulip Trading Limited v Bitcoin Association & Others: What Duties for Blockchain Platforms and Core Developers?" (1 June 2022), online: *Kluwer Arbitration Blog* < https://arbitrationblog.kluwerarbitration.com/2022/06/01/tulip-trading-limited-v-bitcoin-association-others-what-duties-for-blockchain-platforms-and-core-developers/ > .

[78] See Ian Mcdonald, Mark Stefanini & Findley Penn-Hughes, "English High Court Recognises Bitcoin As Property — A Look at the Decision in AA *v* Persons Unknown"

High Court case on *Ruscoe* applying the *Ainsworth* test to delineate blockchain's technological features as an identifiable property.[79] There have also been cases relating to Non-fungible Tokens (NFTs), such as *Soleymani v Nifty Gateway* (which reached the Court of Appeal in England and Wales and related to the claimants' request to avoid an arbitration claim against him in New York based on the terms and conditions of the respective crypto platform).[80] Additionally, in *D'Aloia v (1) Persons Unknown (2) Binance Holdings Limited and others* (another case in England and Wales), the court confirmed that legal proceedings could be served via an NFT.[81]

There are also cases in the US,[82] Canada,[83] and other jurisdictions, including the most recent Singaporean interlocutory judgment on NFTs as property.[84] Although these cases do not discuss in detail the technologies involved, they do

(3 February 2020), online: *Mayer Brown* < https://www.mayerbrown.com/en/insights/publications/2020/02/english-high-court-recognises-bitcoin-as-property–a-look-at-the-decision-in-aa-v-persons-unknown > .

79 See Jack Pembroke-Birss & Michael Sinclair, "Cryptocurrencies are Property Capable of Being Held on trust, New Zealand High Court Holds", (May 2020), online: *Norton Rose Fulbright* < https://www.nortonrosefulbright.com/en/knowledge/publications/d6ea37bd/cryptocurrencies-are-property-capable-of-being-held-on-trust-new-zealand-high-court-holds > .

80 Sagar Gupta, "Soleymani v Nifty Gateway: What's Next for Consumer Arbitration in the UK?" (19 October 2022), online: *Practical Law Arbitration Blog* < http://arbitrationblog.practicallaw.com/soleymani-v-nifty-gateway-whats-next-for-consumer-arbitration-in-the-uk/ > .

81 See Nina Lala & Adam Blanchard, "English Court Allows Service of Proceedings by Blockchain Technology Using a Non-Fungible Token (NFT)" (27 July, 2022), online: *Kennedys* < https://kennedyslaw.com/en/thought-leadership/case-review/english-court-allows-service-of-proceedings-by-blockchain-technology-using-a-non-fungible-token-nft/ > .

82 See e.g., *US v. Nathaniel Chastain*, No. 22-Cr-305 (S.D.N.Y., June 1, 2022), *U.S. v. Le Anh Tuan*, No. 2:22-cr-273 (C.D. Ca., June 28, 2022) *or U.S. v. Nguyen and Llacuna*, No. 1-22-MAG-02478 (March 15, 2022).

83 Jake Cabbot & Jason Uswak, "The Legal Treatment of Cryptocurrency in Canada: Recent Developments" (,9 November 2022), online: *BLG* < https://www.blg.com/en/insights/2022/11/the-legal-treatment-of-cryptocurrency-in-canada-recent-developments#:~:text = The%20court%20found%20that%20the,the%20jurisdiction%20of%20the%20court > .

84 See Thomas Choo & Zhen Guang Lam, "Singapore High Court Recognises NFTs as a Form of Property" (*Clyde & Co*, 21 Nov 2022), online: *Clyde & Co* < https://www.clydeco.com/en/insights/2022/11/singapore-high-court-recognises-nfts-as-a-form-of > . See also e.g., O'Melveny, "Hong Kong Court Rules that Cryptocurrencies are Property in Landmark Decision" (29 May 2023), online: *O'Melveny* < https://www.omm.com/resources/alerts-and-publications/alerts/hong-kong-court-rules-cryptocurrencies-as-property-in-landmark-decision/ > . There was also a NFT case in China recently (relating to IPR) - see Horace Lam & Allen Xu, "Chinese Court Rules in First NFT Copyright Infringement Case" (8 June 2022), online: *DLA Piper* < https://www.dlapiper.com/en-cn/insights/publications/2022/05/chinese-court-rules-in-first-nft-copyright-infringement-case > .

confirm both that, BT must operate within the law as it currently exists today (even if it is not always suitable) and that the courts will not shy away from assuming jurisdiction due to lack of technical expertise.

The limited but emerging case law, particularly in jurisdictions such as the US, the UK, and Canada, underscores the courts' willingness to engage with BT-related disputes, setting precedents that gradually shape the legal understanding of BT. These cases affirm that, while BT operates in a dynamic technological domain, it remains subject to the prevailing legal frameworks, which may not always be optimally suited for its unique characteristics. The necessity for legal systems to adapt to the complexities of BT, coupled with the potential for more coordinated international regulatory efforts, presents a pivotal opportunity to shape a robust and effective legal framework for BT in the financial sector.

(c) Strategic Recommendations from a SECT Standpoint

(i) Financial market integrity/stability/efficiency

It is suggested that both governments and the private sector are responsible for protecting the financial market by investing in BT, such that financial stability, integrity, and efficiency can be augmented by ensuring that the BTs used are both subject to appropriate regulations and oversight, and are safe and secure vis-à-vis consumers (i.e. ensuring that consumers are fully informed about the risks and benefits of using BT). Accordingly, there is also a joint duty of public entities and the private sector to advocate for and channel investments into the integration of BT within the financial industry.

(ii) Security/privacy/transparency/accountability

We again suggest that both governments and the private sector promote and invest in the use of BT in tandem. Enhanced security in transactions not only helps to protect individuals from cyber threats and financial fraud but can also simultaneously contribute to social and economic development (as well as protecting financial markets, as discussed above). Simultaneously, individuals have a clear right to privacy, and governments are responsible for protecting this right by implementing strong data protection laws and regulations. Furthermore, it is important that BT use is transparent and that BT providers and/or users are accountable.

(iii) Regulatory proposals

Integrating BT into the financial landscape requires a legal architecture that is as sophisticated as the technology itself. To effectively channel the transformative potential of BT while preserving the integrity and stability of financial markets and enhancing financial market efficiency, certain legal strategies and considerations are pivotal at both national and international levels.

A. ''Regulatory Impact Assessment" (RIA)

First, an RIA might be undertaken at the national level. This is a systemic approach to critically assess the positive and negative effects of proposed and existing regulations. By conducting RIA, stakeholders can understand the potential costs, benefits, and impacts of BT in the financial sector, offering insights into shaping a well-informed legal framework.

B. ''Financial Technology Regulatory Sandboxes"

Second, in view of potential improvements in financial market efficiency, ''Financial Technology Regulatory Sandboxes" might be established (or bolstered where they already exist).[85] These controlled environments will allow for the testing of new BT-driven financial products or services in a live setting but under regulatory supervision. By permitting innovations to be trialled without the immediate imposition of all the regular regulatory consequences, it creates a nurturing space for technological advancements while ensuring protection against potential fallouts.

C. ''Blockchain Transactional Integrity Laws" and ''Blockchain Cybersecurity Certifications"

Thirdly, national governments might introduce ''Blockchain Transactional Integrity Laws" (or similar) which mandate cryptographic standards for BT platforms, ensuring that transactions remain tamper-proof. Further, regulatory bodies should collaborate with the private sector to roll out ''Blockchain Cybersecurity Certifications, set a benchmark for security measures in place, and engender public trust in BT platforms. Only with a proactive and stringent legal approach can the transformative security propositions of BT be fully realized and protected.

D. ''Jurisprudential Guidelines"

Fourthly, the development of ''Jurisprudential Guidelines" on BT is recommended. ''Jurisprudential Guidelines" would entail high courts or apex legal bodies elucidating interpretative guidelines for existing laws in the light of BT's integration. These guidelines would serve as legal compasses for lower courts and entities, ensuring uniformity in legal interpretation and application.

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[85] A leading example is the UK's Regulatory Sandbox launched in 2016, see Financial Conduct Authority, ''Regulatory Sandbox" (27 March 2022) online: *Financial Conduct Authority* < https://www.fca.org.uk/firms/innovation/regulatory-sandbox > . Other examples include the 'Enhanced Regulatory Sandbox' in Australia, the 'Canadian Securities Administrators Regulatory Sandbox' in Canada, the 'International Financial Services Centres Authority Regulatory Sandbox' in India, the 'National Technology and Innovation Sandbox' in Malaysia and the 'Monetary Authority of Singapore Fintech Regulatory Sandbox' in Singapore.

E. ''BT Compliance and Oversight Body''

Fifth, a national ''BT Compliance and Oversight Body'' could be instituted. The regulatory body, which might ideally be a public-private partnership, would monitor BT-related activities in the financial sector, ensuring that they are conducted within the purview of the law. It would also be vested with the power to issue licences, ensuring that only compliant entities operate in BT space.

F. ''Digital Asset Registration Protocols''

Sixth, security may be enhanced vis-à-vis intellectual property rights (IPR), which can also promote social and economic development by protecting the rights of creators and innovators and promoting the growth of the digital economy. IPR is pivotal for a thriving digital economy and can be bolstered with ''Digital Asset Registration Protocols'' underpinned by blockchain, making it legally binding for digital creators to register assets, thus offering an immutable proof of ownership.

G. ''Inclusivity Impact Statements''

Concurrently, to address the equitable extension of BT's advantages across demographics, the law could mandate ''Inclusivity Impact Statements'' for major BT projects. Similar to environmental impact statements, these would evaluate and ensure that BT projects do not inadvertently marginalize or exclude underrepresented communities. This can help ensure that the advantages of BT are extended equitably across all demographics, with an emphasis on fostering inclusivity for underrepresented communities.

H. ''BT Social Responsibility Charter'' and ''Legally Endorsed BT Banking Charters''

Furthermore, governments could ensure that the use of BT is aligned with social and economic development objectives such as the UN SDGs. However, anchoring BT initiatives to broader developmental goals requires legal innovations. For instance, financial institutions could be bound by a ''BT Social Responsibility Charter'', modelled after corporate social responsibility (CSR) norms, or institutions leveraging BT could commit to dedicating a portion of their BT-related profits, or efforts, towards projects aligned with the UN SDGs. Another idea for promoting financial inclusion is that governments, in collaboration with central banks, should consider ''legally endorsed BT banking charts (or similar). By endorsing or setting up decentralized financial institutions, which specifically cater to underserved communities, the legal framework can champion not only technological integration but also socio-economic uplift.

I. ''Supranational Guidelines'' and ''International BT Transactional Accord''

At an international level, ''Supranational Guidelines'' could be promulgated. This would entail relevant international bodies such as the IMF, the FSB, or IOSCO introducing specific and detailed guidelines (as they have started to do in

relation to cryptos).[86] The guidelines must include a pathway towards the international coordination of BT-related activities in the financial sector and promote common standards and interoperability at an international level. Since international development can also be encouraged through BT, such as by reducing the costs and risks associated with international transactions and facilitating secure international transactions and data exchange, an "International BT Transactional Accord" could be negotiated among major financial institutions. This accord, ideally under the aegis of international bodies such as the IMF, the FSB or IOSCO (mentioned above), and the World Bank and the BIS, would set standardized legal and operational protocols for BT transactions across borders. Moreover, to align BT use with the UN SDGs, a legal requirement could be instituted for BT platforms and institutions to annually publish "BT Sustainability Reports." These would detail their contributions, whether direct or indirect, to global development goals and would ensure that these platforms operate with an awareness of their broader socioeconomic impact. In essence, for BT to genuinely enhance financial market efficiency with regard to international development, the law must pivot from being a mere reactive entity to a proactive catalyst—shaping, guiding, and refining technological evolution in tandem with societal objectives and ethical imperatives.

J. ''Blockchain Data Sovereignty Act", ''BT Transparency Protocols" and ''Digital Rights Review Board"

Governments might also consider enacting an additional "Blockchain Data Sovereignty Act." This legislation would champion an individual's right to data ownership and consent, ensuring that all BT platforms acquire explicit permissions before data collection.

Concurrently, "BT Transparency Protocols", which mandate platforms to reveal data usage patterns and fortify the right to access information, might also be promulgated. To safeguard freedom of expression and other human rights, a "Digital Rights Review Board can be established, periodically auditing BT platforms for compliance with international human rights standards.

K. ''Blockchain Accountability Mandate", ''BT Ethical Commerce Code" and ''Blockchain Whistleblower Scheme"

To actualize the potential of BT in bolstering transparency and accountability, governments might implement a "Blockchain Accountability Mandate." This would require all BT-enabled platforms to maintain public logs of significant transactions, ensuring an open audit trail. Coupled with this, a "BT Ethical Commerce Code" might be enacted, obliging businesses to disclose their sustainability and ethical practices through blockchain. Regulatory bodies could

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[86] See e.g., IMF and FSB, "Synthesis Paper: Policies For Crypto Assets" (23 September 2023), online: <https://www.fsb.org/wp-content/uploads/R070923-1.pdf>; IOSCO, "Policy Recommendations for Crypto and Digital Asset Markets: Consultation Report" (May 2023), online: <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD734.pdf>.

also consider introducing a "Blockchain Whistleblower Scheme" to reward individuals reporting discrepancies within BT and/or BT records.

7. CONCLUSION

By examining the intersection of BT and financial law through the lens of social and economic contract theory, this article sheds light on not only the transformative capacity of BT but also its significant legal ramifications. The insights drawn from this analysis suggest more than just adjustments in regulatory strategies or realignments in legal frameworks; they point towards a comprehensive rethinking of our approach to financial law in the era of digitalization.

First, the evolving nature of BT necessitates the transition of legal structures from rigid, predefined rules to more adaptive, evolving systems capable of responding promptly to technological developments. This requires a significant shift in legal paradigms, moving from established legal practices to more versatile, responsive legal methods reminiscent of programmable law, which are adept at navigating the ever-changing landscape of digital finance.

Second, this analysis highlights the imperative for a "technology-first" mindset in both legal academic work and policy formulation. Such a perspective demands that legal practitioners proactively engage with, and not just react to, technological innovations, establishing a reciprocal relationship between legal frameworks and technological advancements. It advocates for the emergence of legal professionals who are not only conversant with technology but can also predict and influence the legal domain alongside technological progression.

Third, this article proposes a critical reassessment of the core principles of SECT in light of the digital financial sphere. The established concepts of social and economic contracts, traditionally based on defined limits and static entities, face challenges from the fluid, distributed nature of BT. This calls for a reformulation of these contracts to align better with the decentralized and self-governing characteristics of blockchain platforms, potentially leading to innovative types of digital social contracts.

This article also serves as an invitation for further intellectual engagement with the fundamental aspects of legal theory as it intersects with emerging technologies. The dynamic and distributed characteristics of BT not only pose questions to conventional legal structures, but also create an opportunity to rethink the basic tenets of legal theory. Future research should explore how legal theory can adapt to the inherent dynamics and self-governance of digital finance. This journey could involve creating new legal terminologies and frameworks that reflect the distributed nature of blockchain, possibly forging a groundbreaking theoretical approach for interpreting legal duties and rights in a context marked by digital decentralization. Such scholarly endeavours would not only push the boundaries of legal research but also lay a solid theoretical foundation for addressing the practical legal complexities brought about by BT and related technologies, ensuring that our legal systems remain pertinent and efficient in a world increasingly shaped by digital innovation.