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The Legal & Regulatory Challenges of Blockchain & Cryptocurrency, Corporate Accountability, Financial Compliance and the Impact of Global Securities Laws

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ABSTRACT

This research critically explores the complex legal and regulatory challenges posed by the rapid global adoption of blockchain technology and cryptocurrencies, with a focus on corporate accountability, financial compliance, and the implications of global securities laws. As decentralized financial systems evolve, traditional legal structures have struggled to maintain pace, leading to fragmented regulatory frameworks, unclear asset classifications, jurisdictional arbitrage, and significant risks to consumer protection and financial stability. This study examines how crypto asset service providers operate in largely unregulated environments, exposing markets to insider trading, token manipulation, cyber fraud, and tax evasion. It further assesses cases such as the LIBRA token's speculative sniping scheme and the $1.5 billion Bybit exchange hack, highlighting vulnerabilities in legal oversight and custodial accountability. The paper also addresses the inadequacy of existing anti-money laundering (AML) and know-your-customer (KYC) frameworks, as well as the compliance burden posed by the pseudonymous and borderless nature of decentralized transactions. Additionally, environmental challenges associated with energy-intensive consensus mechanisms like Proof-of-Work are discussed, with a call for regulatory incentives favoring green alternatives like Proof-of-Stake. Through doctrinal, empirical, and comparative legal analysis, the study recommends the development of harmonized international taxonomies, risk-based licensing systems, regulatory sandboxes, and cross-border enforcement mechanisms. It emphasizes the need for evolving corporate governance laws to recognize the legal personality of decentralized autonomous organizations (DAOs), standardize smart contracts, and enforce fiduciary duties in tokenized ecosystems. The research concludes that a coordinated, principle-based, and forward-looking regulatory strategy is essential to align blockchain innovation with legal certainty, corporate transparency, environmental sustainability, and global investor protection.

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I. INTRODUCTION

The emergence of blockchain technology and cryptocurrencies has fundamentally transformed the architecture of global financial systems, digital economies, and legal frameworks, introducing complex and disruptive forces that challenge traditional regulatory paradigms. Initially conceived as a decentralized solution to bypass intermediaries in financial transactions, blockchain has since evolved into a sophisticated infrastructure supporting decentralized finance (DeFi), non-fungible tokens (NFTs), smart contracts, and borderless financial instruments. Cryptocurrencies such as Bitcoin, Ethereum, and stablecoins have surged in popularity, drawing both speculative investment and strategic institutional interest, thereby necessitating a closer examination of the legal, corporate, and regulatory landscape in which these technologies operate.

The decentralized, pseudonymous nature of crypto-assets raises significant challenges for law enforcement and financial compliance agencies, particularly concerning anti-money laundering (AML) standards, combating the financing of terrorism (CFT), data protection, cross-border enforcement, and tax evasion. The lack of uniformity in the regulatory treatment of digital currencies across jurisdictions has created regulatory arbitrage opportunities where firms relocate to countries with relaxed policies, such as Puerto Rico and the Cayman Islands, thus weakening international financial accountability and compliance standards. Furthermore, the volatility and speculative nature of crypto markets, evidenced by multiple exchange collapses, Ponzi schemes, and sudden token devaluations, expose investors to heightened risks without adequate consumer protection mechanisms.

The categorization of cryptocurrencies—as securities, commodities, property, or legal tender—remains hotly contested, with countries like the U.S., India, and the EU each applying varied interpretations under their financial and securities laws, thereby complicating global compliance norms for corporations. On one hand, blockchain promotes transparency, immutability, and auditability—potentially strengthening corporate governance and accountability. On the other hand, its application in anonymous transactions undermines traceability, complicating enforcement of fiduciary obligations, intellectual property rights, and audit trails. Globally, legal institutions are grappling with questions of jurisdiction,

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liability, data localization, and the enforceability of smart contracts. Corporate actors leveraging blockchain for tokenization of assets, decentralized fundraising via Initial Coin Offerings (ICOs), or decentralized autonomous organizations (DAOs) encounter ambiguous legal terrain on disclosure, governance, and taxation norms. Countries like El Salvador have adopted Bitcoin as legal tender to attract crypto capital, while others like China have implemented sweeping bans on mining and trading. Meanwhile, regulatory bodies like the U.S. SEC, India's RBI, and the European Securities and Markets Authority (ESMA) continue to release ad hoc advisories, circulars, and draft regulations without establishing holistic frameworks. The Financial Action Task Force (FATF) and the International Monetary Fund (IMF) have warned of risks to financial stability, capital flight, and systemic vulnerabilities if uniform international regulatory standards are not implemented.

From a corporate law perspective, the integration of blockchain introduces new vectors for shareholder engagement, voting rights through tokenization, smart governance, and automated compliance, but also opens avenues for fraudulent governance models and illicit fundraising. The General Data Protection Regulation (GDPR) in the EU is at odds with blockchain's immutability, raising critical questions about the right to be forgotten and data minimization principles. Similarly, taxation laws worldwide face obstacles in tracking gains from decentralized wallets and non-custodial exchanges. Intellectual property rights also face complications as NFTs blur the lines of ownership, licensing, and authenticity in digital creations. The advent of central bank digital currencies (CBDCs) by over 130 countries represents a state-led countermeasure to decentralized cryptocurrencies, aiming to retain monetary sovereignty while reaping blockchain's efficiency benefits. Against this backdrop, this research examines how blockchain and cryptocurrency ecosystems intersect with corporate accountability, financial compliance, and international securities laws.

The paper explores the fragmentation of global regulatory responses, evaluates their effectiveness in preventing financial crimes, and studies their adequacy in ensuring transparency, investor protection, and enforceability in the corporate domain. The growing tension between innovation and regulation underscores the urgent need for adaptive, principle-based frameworks that accommodate technological evolution while safeguarding legal order, corporate integrity, and financial system resilience. This study critically analyzes current global trends, institutional approaches, and legal reforms, offering insights into how corporate and financial law must adapt to the decentralized digital economy of the future.

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The introduction of an environmental impact tax or carbon footprint levy on energy-intensive blockchain operations could incentivize the adoption of greener alternatives, such as proof-of-stake (PoS) mechanisms.

A *digital or virtual currency* is defined as a form of currency that is not issued by any central authority, is intended to function as a medium of exchange, and employs encryption technologies to control the creation of monetary units, verify fund transfers, and prevent counterfeiting.

II. LITERATURE REVIEW

The burgeoning scholarship on blockchain and cryptocurrency regulation reflects the growing urgency to reconcile decentralized technologies with established legal and corporate governance frameworks. As Tapscott and Tapscott (2016) argue, blockchain's trustless architecture could revolutionize corporate governance by enhancing transparency, reducing fraud, and enabling real-time auditability; however, these potentials remain largely unrealized due to the absence of coherent regulatory frameworks. Zohar (2015) emphasizes that the pseudonymous nature of cryptocurrencies hinders traditional anti-money laundering (AML) and know-your-customer (KYC) mechanisms, making the sector susceptible to illicit transactions, terrorism financing, and untraceable wealth transfers. According to Yermack (2017), cryptocurrencies' classification challenges—whether as currency, security, or commodity—complicate regulatory jurisdiction and enforcement, especially when cross-border investments and transactions are involved.

De Filippi and Wright (2018) explore the contradictions between blockchain's immutability and data protection laws, particularly under the European Union's General Data Protection Regulation (GDPR), where the right to be forgotten directly clashes with blockchain's permanent ledger. Arner et al. (2017) point out that regulatory sandboxes adopted in countries like the UK, Singapore, and Australia aim to foster innovation while testing compliance mechanisms in controlled environments, yet remain fragmented in their efficacy and outreach. Gans (2019) explores the implications of Initial Coin Offerings (ICOs) and security token offerings (STOs), suggesting that the lack of uniform securities law interpretation across jurisdictions invites regulatory arbitrage and investor risk. Catalini and Gans (2016) highlight that while blockchain reduces the cost of verification and networking, it also introduces new forms of technical and legal vulnerabilities, especially in smart contracts that operate without a clear dispute resolution framework.

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Marian (2013) critiques the taxation ambiguities in decentralized crypto transactions, noting how governments struggle to monitor crypto-based capital gains, income flows, and tax liabilities in peer-to-peer systems. Meanwhile, Omarova (2020) addresses the systemic risk posed by unregulated DeFi platforms, likening them to shadow banks that operate outside the purview of central regulatory agencies. Scott (2019) and Allen (2020) document the rise of DAOs (Decentralized Autonomous Organizations), which lack legal personhood in many jurisdictions, making accountability, ownership, and liability difficult to attribute in case of breaches or malfeasance. Chiu and Koeppl (2019) analyze the effectiveness of the U.S. Securities and Exchange Commission (SEC) in prosecuting fraudulent ICOs under existing securities laws, while suggesting that the Howey Test—originally crafted in 1946—is insufficient for the complexity of modern token economies. Similarly, Fanusie and Robinson (2018) argue that law enforcement faces severe operational challenges in tracing illicit crypto flows through privacy coins like Monero and ZCash. The International Monetary Fund (2021) warns that unchecked crypto adoption can destabilize capital controls and facilitate cross-border tax evasion, urging for global coordination.

Mohanty (2021) documents India's regulatory flip-flop, from proposing a crypto ban to later implementing taxation under the Finance Bill 2022, which creates legal uncertainty for startups and investors alike. Meanwhile, the EU's Markets in Crypto-Assets (MiCA) Regulation attempts to standardize crypto asset regulation across member states, but scholars like Avgouleas (2022) question whether MiCA can keep pace with the rapidly evolving DeFi sector. Legal pluralism, as described by Teubner (1992), becomes evident in how different jurisdictions either embrace, resist, or hybridize blockchain regulations based on economic interests and legal culture. In terms of corporate accountability, Roe (2003) and Bebchuk and Fried (2004) argue that existing corporate governance models were not designed to accommodate decentralized ownership and shareholder anonymity, raising fundamental questions about board control, fiduciary duties, and conflict resolution.

Gans and Halaburda (2014) assert that token economics introduces incentive systems that often conflict with conventional regulatory objectives, such as capital protection and long-term investment stability. Casey and Vigna (2018) underscore the necessity of international cooperation, pointing to the inefficacy of unilateral regulations in a technology that inherently transcends borders. Legal scholars like Werbach (2018) advocate for a principles-based regulatory approach grounded in functionality rather than form, which would allow regulators to classify digital assets based on use-case rather than nomenclature. This aligns with arguments by Brummer (2019), who urges regulators to avoid knee-jerk prohibitionism and

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instead develop taxonomy and standards that evolve alongside technological advancement. The environmental impact of blockchain mining is another legal frontier, as highlighted by Krause and Tolaymat (2018), who quantify the carbon footprint of Proof-of-Work systems and call for sustainability mandates.

In response, some scholars such as Reijers et al. (2016) propose transitioning toward Proof-of-Stake models or green blockchain innovations to align with ESG compliance. As CBDCs begin to roll out in countries like China and the Bahamas, scholars like Auer and Böhme (2020) note that state-sponsored digital currencies may bring efficiency but also raise surveillance and privacy concerns that must be reconciled with constitutional rights. Overall, the literature illustrates a global regulatory landscape struggling to cope with a fast-moving, complex, and transnational innovation. There is a scholarly consensus on the need for harmonized international standards, dynamic legal definitions, and adaptive governance frameworks that balance innovation, consumer protection, and systemic stability. This literature review reveals significant theoretical gaps in how laws conceptualize digital assets, as well as practical limitations in enforcement, compliance, and corporate legal structure adaptation—thereby making it imperative for further legal scholarship and policy reforms focused on the convergence of blockchain technology with corporate and financial law.

Statement of the Research Problem

The central problem addressed in this study lies in the lag between the rapid evolution of blockchain-powered cryptocurrency ecosystems and the corresponding response from global and national legal and regulatory authorities. Despite the explosive growth and increasing adoption of cryptocurrencies and blockchain-based platforms, regulatory frameworks have remained inconsistent, fragmented, and largely reactive. This delay has led to a host of unresolved legal and compliance issues, including the potential misuse of cryptocurrencies for money laundering, challenges in ensuring consumer protection, ambiguities in the legal classification of digital offerings, and the complexity of determining the tax treatment and income categorization of crypto transactions. Furthermore, intellectual property rights (IPR) are increasingly under strain due to the rise of digital assets and non-fungible tokens (NFTs), while environmental concerns emerge from the energy-intensive processes involved in blockchain mining and token certification—particularly those based on proof-of-work (PoW) models. The projected global market capitalization of cryptocurrencies is estimated to reach USD 6.4 billion by 2025, with user participation expected to exceed 107.3 million globally (Forbes, 2024). The growing influence of smaller economies, such as Puerto Rico, in attracting crypto ventures by offering lenient regulatory environments and tax exemptions has

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also raised concerns about regulatory arbitrage and the undermining of global financial standards. In this context, the need for coherent and forward-looking legal frameworks that can ensure corporate accountability, financial compliance, and environmental sustainability within the crypto ecosystem becomes increasingly urgent.

III. LEGAL AND REGULATORY CHALLENGES

Before critically examining the legal and regulatory challenges associated with blockchain and cryptocurrency, it is essential to first understand the underlying *TechFin* concepts that form the basis of these technologies. According to the *Cambridge English Dictionary*, blockchain is defined as a system used to make a digital record of all the occasions a cryptocurrency (such as bitcoin) is bought or sold, and that is constantly growing as more blocks are added. Similarly, *cryptocurrency* is described as a digital currency produced by a public network, rather than by any government, that uses cryptography to ensure the secure sending and receiving of payments. The foundation for both of these concepts was laid in 2009, when an individual or group operating under the pseudonym *Satoshi Nakamoto* released a white paper that introduced *Bitcoin*—the first decentralized cryptocurrency—and detailed the architecture of the blockchain technology that underpins it. In order to fully grasp the legal and compliance challenges posed by this ecosystem, it is important to understand two additional technological components frequently employed within blockchain systems: *Merkle Trees* and *hashes*. In the context of blockchain, large datasets are often compressed into smaller, uniquely identifiable data outputs known as *hashes*, which are integral to peer-to-peer networks like Bitcoin, Git, and Tor. These hashes ensure data integrity and authentication within the distributed ledger. A *Merkle Tree*—named after computer scientist Ralph Merkle—is a hierarchical data structure that generalizes hash lists to efficiently summarize and verify the integrity of large data sets. It allows for quick and secure verification of the content within blockchain blocks and enhances the efficiency of the system by enabling partial data validation. Understanding these technological underpinnings is crucial for evaluating the regulatory complexities and compliance obligations associated with decentralized finance and crypto asset governance.

Ex. A generic version of a binary hash tree. Hashes 0-0 and 0-1 are the hash values of data blocks L1 and L2 respectively and hash 0 is the hash of the continuation of hashes 0-0 and 0-1.

Ralph Merkle patented it in 1979. The blockchain technology applies, to an excessive degree, the comprension step of the hash function, which is mitigated by The using Fast MerkleTrees

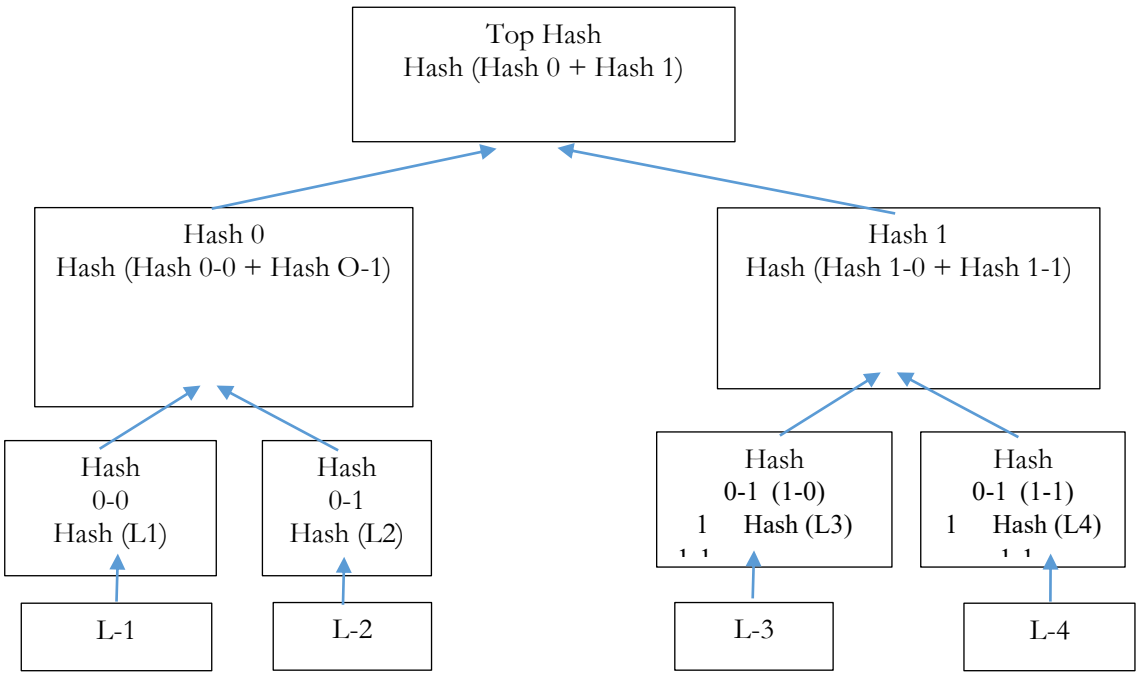

Fig. 1 (Data Blocks)

Any kind of data can be verified using this information technology tool, which are stored, handled and transferred in and between computers.

Merkle trees or Hash trees are used in, the Ethereum and Bitcoin peer-to-peer networks; the certificate Transparency framework; BitTorrent; Cryptography based on hash and IPFS (InterPlanetary File System) interalia.

The Growth of Digital money and Assets

It is this decentralized. secured fast, unlimited and almost incorruptible method of storing and sharing data which has led to phenomenal growth of digital money and asset creation and transaction globally. Supporting Crypto trading, lending, taxes, records, custody, valuation and other functions.

As per Forbes report published on Jan 28, 2025, 10: 00 a.m. EST and updated on March 17, 2025,04:40 pm EST the third annual Best crypto exchange running analyzing more than 200 firms, the first is $85 billion Chicago based CME Group regulated by CFIC. It traded 1.4 million in futures contracts for digital assets such as bitcoin or ether. At the second spot is also the US based Coinbase, it is a publicly traded cryptocurrency exchange in the U.S. with a market cap $70 billion, becoming the largest custodian of bitcoin in the world. Others are UK based Bitstamp, Binance and fifth Robinhood. In Japan they are Bitbank, bitflyer, and Coincheck while Revolut bitpenda, and Bituavo are top three in Europe. Together, the top 25 firms hold an estimated $1.2 trillion in client assets and their websites were frequented by 438 million users in November 2024.

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There are more than 600 Cryptocurrency exchanges worldwide inviting investors to trade in bitcoins, Ethereum and other digital assets. As per a Forbes report published on June16, 2023 (06:30 am) EDT and updated Jan 24, 2024 (05.16 p.) EST) – Washington owns more then $5 billion worth of seized bitcoin and has been reluctant to part with it. That may represent inertia more than strategy.

Global Population Statistics on use of cryptocurrency.

Nearly 600 million individuals or around 7% of the global population, own cryptocurrency. In general users fall into the population category of young, male, well educated, and relatively welloff. The age bracket of 25 to 34 accounts 34 % of users, 39 % are female and a big majority of 61 % are male (Various sources)

1. Major cryptocurrency scams

According to the *Forbes Crypto Confidential* newsletter published by Nina Bambysheva on February 24, 2025, a particularly troubling case of market manipulation and insider trading came to light involving the cryptocurrency token *LIBRA*. In the report, a key player named Davis disclosed that he had accumulated approximately $100 million through LIBRA and admitted to employing a tactic known as sniping. This controversial strategy involves insiders or automated bots purchasing newly launched tokens at significantly low prices before they are made available to the general public. This early access creates artificial scarcity, drives up demand and price, and allows the early actors to sell the tokens for massive profits. In conventional, regulated financial markets, such conduct would constitute *illegal front-running*—a form of market manipulation prohibited under securities laws. In the case of LIBRA, blockchain analytics revealed that an estimated 86% of investors who bought into the token suffered losses, with the total financial damage reaching approximately $25 million. Notably, this occurred in Argentina, underscoring the vulnerabilities that retail investors in emerging markets face in the absence of strong regulatory oversight. The same article also detailed a significant security breach involving *Bybit*, a Dubai-based cryptocurrency exchange. In what has now become the largest crypto theft recorded to date, Bybit reportedly lost around $1.5 billion in digital assets after hackers gained unauthorized access to one of its "cold wallets"—a form of offline storage intended to provide maximum security for crypto holdings. This incident highlights the persistent cybersecurity threats facing centralized exchanges and raises pressing legal questions about custodial responsibility, consumer protection, and liability in the context of digital asset storage. Both cases underscore the

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urgent need for enforceable global standards on insider trading, exchange security protocols, and investor risk disclosure within the crypto ecosystem.

The legal and regulatory challenges faced by Public Authorities across the globe may be listed as follows: (not a comprehensive list):

1) Legal classification of various digital Fintech offerings so as to enact suitable laws and rules for their proper regulation.
2) Regulation of Crypto exchanges operating from domestic base.
3) Regulation of transactions and investments done by general public through off - shore crypto exchanges;
4) Regulation of decentralized crypto networks;
5) How to regulate speculation, as these are totally demand and supply driven without any underlying backing by traditionally accepted assets in Finance such as Gold or sovereign guarantee;
6) The IPR related moral and ethical issues related to NFT'S (Non – Fungiable Tokens);
7) The environmental issues related to creation of NET's.
8) How to minimize and eliminate hacking related laws ?
9) To formulate domestic taxation laws;
10) To formulate and dessiminate Customer protection laws, rules and guidelines in crypto world;
11) To formulate strict know your customer (KYC) checks;
12) To formulate and enforce anti-money laundering measures;
13) The challenge of keeping up with rapid technological innovations in Blockchain, Crypto Currency, digital assets environment, so as to maintain and promote a secure and stable growth of this niche domain, in sync with overall Financial and economic growth trajectory.

2. Global Trends

Non-fungible tokens (NFT'S) offer a novel way to authenticate proprietorship of digital assets via blockchain technology, This digital innovation has rapidly transformed the online collectibles market and digital art.

Each NFT is unique, unlike Crypto Currencies and cannot be replicated making them highly

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sought after in the realms of art, gaming, music and other forms of digital media.

When a buyer purchases a NFT, He / She gets a Proof of ownership over a digital asset, but it doesn't always translate into control over the intellectual property (IP) rights of the content. The digital world offers no guarantees as to control of copying of NPT linked work, in some cases creations of IPR holders have been tokenized and sold to other parties, without their permission ".

This situation raises major concerns for protection of IPR's in digital Crypto world. Additionally, creation of a single token consumes enough electricity to power a domestic household for three days. This raises the issue of negative environmental impact of NFT's.

Same blockchain platforms are transitioning to more energy efficient consensus models like Proof of Stake (POS), from a sustainability stand point the current state of NFT minting remains problematic.

NFT space also raises concerns relating to cultural art created by marginalized communities, being commodified, without their consent and also artifacts and intangible cultural heritages of people's being commodified, for personal profit without proper legal consent of the rightful owners.

It has also been reported that works of some famous artists have been tokenized and sold to third persons, without their comments of prior knowledge.

As the NFT domain expands, the legal - ethical questions and dilemma thrown up by this innovative digital concept or asset need to be tackled with dynamic regulatory methods and laws, keeping pace with ever charging technology.

3. Global Legal & Regulatory Developments in Digital Currency Space:

The Shanghai Court Case: ……On August 19th 2024, the Supreme People's Court and the Supreme People's prosecutorate jointly issued the judicial Interpretation on criminal cases of Money Laundering which includes transferring or converting criminal proceeds and their gains through virtual online transactions and financial asset exchanges as a method of money laundering. This type of money laundering involving virtual assets is often related to virtual currency transactions, such as converting criminal proceeds into virtual Currency to evade judicial investigation….

In a second case relating to virtual currency, a case was published on Nov. 18, 2024, on the official WeChat publication of the Shanghai High People's Court which covered a dispute over a contract for virtual currency issuance and financing services, decided in the Shanghai

Songjiang District People's Court '. In this decision the court stated: "Virtual currency as a virtual commodity has property attributes, and it is not illegal for individuals to simply hold virtual currency.

It was a first clear statement by a Chinese court on legality of holding virtue currency.

Now in China, vide Order No. 32 dated December, 2024 the foreign exchange risk transactions defined in document includes illegal cross-border financial activities involving virtual currencies

4. Recent Legal Developments on Crypto in UK Courts (Lexology, May 7, 2008):

Digital assets are recognized as property by UK Couts now. So in cases of fraud or theft their owners can enforce property rights over their crypto assets. The property status recognized on crypto assets gives stronger legal protection to owners, including rights enforceable against third parties , not just those they deal with directly.

Though no final decision has been made yet on whether fiduciary duties apply the courts are starting to explore duties owed by developers and exchanges.

In the case of National Provincial Bank vs. Aimsworth, it was confirmed that crypto assets satisfy the criteria of property under Common law.

This affirmation was later reinforced in the subsequent case of A A Vs. Parsons, which recognized Bitcoin as property capable of being the subject of an injunction.

On the legal question of, whether software developers who manage Cryptocurrency exchanges owe fiduciary duties to cryptocurrency owners? The UK High Court, in the case of Tulip Trading Vs. Bitcoin, dismissed the case, ruling that software developers do not owe fiduciary duties to crypto-currency owners.

This decision was however later overturned by the Court of Appeal. The court stated that there was a serious issue to be determined regarding whether developers and / or crypto exchanges could owe a duty to act in the best interest of the cryptocurrency holders.

Later in the case of Boonycem Vs. Persons Unknown, the court that law should shart treating anything with real commercial value as property.

As the legal landscape in the field of cryptocurrencies evolve further clarifications are certain to come on the topics of:

a) 'fiduciary' responsibilities;

b) duties owed by exchanges and

c) adapting of common law principals to digital assets and cryptocurrencies.

Germany (Cases and Legal Evolution)

The Federal Financial court, the highest German tax court, has ruled that "privately hold cryptocurrencies such as Bitcoin (BTC), Ethereum (ETH) and Monero (XMR) are – notwithstanding the fact that there are no physical goods in which a traditional form of Lagal ownership can be established, are taxable assets for German Income tax purposes.

As a consequence, any gains from their acquisitions (against fiat currency or otherwise / and sale (or exchange) within a one year period will be taxable at the owners personal tax rate." If however, the relevant cryptocurrency has been held for more than one year, any gains will be tax exempt.

For these purposes, the holder of the "private key" will be considered as legal owner of the cryptocurrency. The tax treatment of a realization of an increase in value of cryptocurrencies is therefore, in Germany, substantially the same as for fiat currency. This decision of the Federal Financial Court, come on 14th February 2023. (National Law review, June 22 2015, volume xv, November 173).

In another case in Germany, relating to payment in cryptocurrency, particularly Ethereum, the subordinate, court held that it was not legal but on appeal to the higher court, the appellate court held that while sizeable amount of payment to an employee should be in fiat currency, a lesser performance related pay could be in cryptocurrency; and that the employee, could claim it's reimbursement from the employer, as it carried a certain value.

Developments in Japan.

Japan's Payment Services Act (PSA) regulates cryptocurrency, particularly focusing on Cryptocurrency exchange service providers.

The Act was revised in 2025 to enhance investor protection and align with global standards, introducing stricter guidelines for exchanges.

Key changes include enhanced KYC and AML measures, mandated reserves to cover potential losses, and a "domestic possession order" provision to prevent asset outflow risks.

The 2025 amendments also address Stablecoins, relaxing reserve requirements for trust type stablecoins and allowing issuers to hold a portion in low risk assets.

A new category of 'intermediary business' has been established, which allows business to introduce or act as liaisons between users and exchanges 'without needing to register on as exchange."

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Asset segregation is required to be done by crypto Asset Exchange Service Providers (CAESPs), which manage users fiat currency and crypto assets, from their own assets, holding them in trust with a trust bank or company to protect against bankruptcy.

For taxation, cryptocurrency gains are treated as miscellaneous income and are treated subject to income tax, with rates ranging from 15% to 55% depending on the individuals income bracket.

The Act, under the provision of domestic pronation order, allows the goverment to order order platforms. to keep a portion asset outflow risks.

In Act., under the provision of domestic possession order, allows the government to order platforms to keep a portion of users assets in Japan to prevent asset outflow risks.

In essence, the PSA in Japan provides a legal framework for crypto currency and aims to create or more secure and transparent environment for both investors and service providers.

European Union

As per "finance.ec.europa.eu", an official European Union Organization website, "Digitalization is transforming finance. This can lead to innovative new products, services, applications and business models. Digital applications finance has a key role to play in shaping a more competitive, sustainable, resilient economy and more inclusive, modern prosperous society".

The European Union, "Digital Finance Strategy 2020 " sets out four main priorities: a) removing fragmentation in the Digital Single market; b) adapting the EU regulatory framework to facilitate digital innovation; c) promoting a data driven finance and addressing the challenges and risks with digital transformation;d) including enhancing the digital operational resilience of the financial system.

The commission differentiates between those crypto - assets already governed by EU legislation and other crypto-assets.

For previously unregulated crypto-assets, including stablecoins, the commission proposes a bespoke regime. It proposes strict safeguards, including capital requirements, custody of assets, a mandatory complaint holder procedure, available to investors and rights of the investors against the issuer.

Issuers of significant asset-braked crypto –assets would be subject to more stringent capital requirements, liquidity management and inter -operability requirements.

A per European Securities and Market Authority (ESMA), The Markets in Crypto Assets

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regulation (MiCA) entered into force in June 2023. The regulation includes a substantial number of level 2 and Level 3 were purpose that what be developed before the entry into application of the new regime.

Timeline MiCA

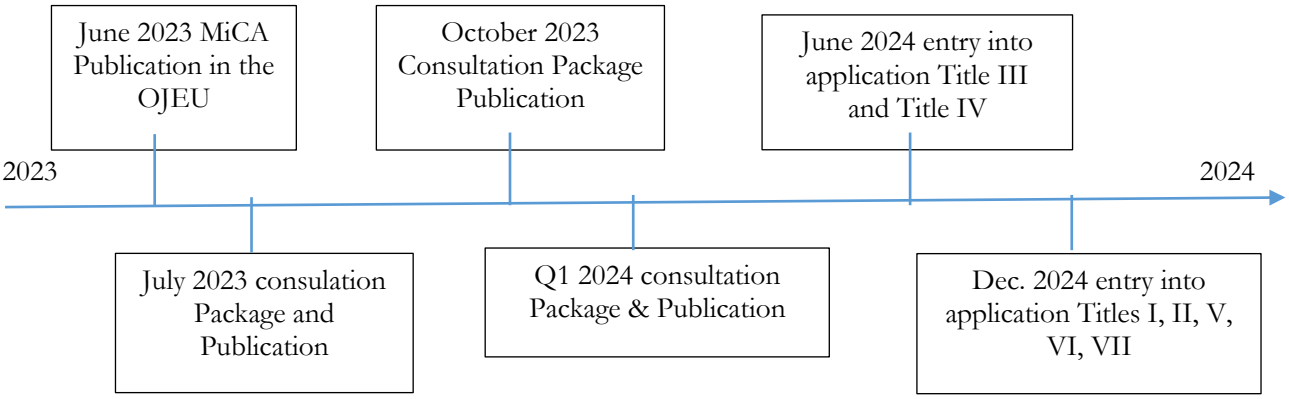

Fig. 2 - Timeline

In parallel to the drafting of technical standards, ESMA in working with the national competent authorities (NCAs) on convergent approach to authorizations of crypto-assets services providers (CASPs) during the transitional phase.

MiCA officially took effect on January 1, 2025, providing a single licensing framework for crypto firms operating across the European Union.

The regulation mandates:

a) 1: 1 stablecoin reserves;

b) mandatory audits;

c) clear disclosures, transparent fees and cooling off periods;

On April 24, 2025, it was announced by the Board of Governors of the Federal Reserve System together with the Federal Deposit Insurance Corporation and the Comptroller of the currency, that the 2023 statements jointly issued by the Federal bank regulatory agencies regarding banks crypto-asset activities and exposures stands withdrawn.

The supervisory Letter of 2023 regarding no objection process for state member bank engagement in dollar token activities stands withdrawn.

Many countries including India have adopted the concept of 'Permanent establishment (PE)' for the purpose of taxation on incomes generated in Digital Economy by entities operating form overseas jurisdictions.

India

Buying, selling, trading, mining and transferring cryptocurrencies, including Bitcoin, Pi Coin is legal in India under strict Anti-money Laundering (AML) and Know Your Customer (KYC) compliance.

Now there is a provision of 30 % capital gains tax, 10% TDS on gains through crypto trading or Investment.

The Ministry of Finance (MoF), the Securities and Exchange Board of India (SEBI) and Reserve Bank of India (RBI), all of them are playing their role in regulating cryptocurrency in India. The ban on Crypto trading and investing was lifted in the year 2018 by the Reserve Bame of India.

Telangana in India has launched a Web3 regulatory sandbox, to provide a controlled environment for testing Web3 Solutions, This sandbox focuses on startups with potential societal and governance impact and brings together various stakeholders like SEBI, RBI and IRDA.

As the taxation landscape for the digital economy evolves, various countries are implementing new tax measures and proposals. This includes Value Added Tax (VAT) and Digital Services Taxes (DST) regulations, and other tax reforms aimed at addressing the challenges posed by digital platforms.

The EU in exploring changes to VAT regulations concerning electronic marketplaces and digital services. Alternatives to DST are being considered, including a digital permanent establishment tax.

5. Global Securities Laws

The Bank for International Settlements, paper No. 156 dated 15 April 2025, mentions that while underlying economic drivers for Techfin are the same as for traditional fiance. (TradFi), but the distinctive features of Techfine introduce new financial stability risks. This is due to new forms of information asymmetries, market inefficiencies, and the risk of cryptoization in emerging markets.

The paper suggests regulatory interventions, such as embedding rules within smart contracts and strengthening the oversight of stable coins to manage financial stability rises.

As per the Basel Committee on Banking Supervision (BCBS) standards published on 17th July 2024. Stablecoins or digital securities issued on permissionless blockchains are in the high risk Group 2 category along with the cryptocurrencies. Private or consortium blockchain

tokens are the only ones that have the potential to qualify in the lower risk categories.

The Financial stability board (FSB) proposed framework for the international regulation of the cryptoasset activities gives recommendations on nine counts as listed under:

1) Regulatory powers and tools.
2) General regulatory framework;
3) Cross Border cooperation, co-ordination and information sharing;
4) Governance;
5) Risk Management;
6) Data collection, recording and reporting;
7) Disclosures;
8) Addressing financial stability risks arising from interconnections and interdependencies;
9) Comprehensive regulation of cryptoasset service providers with multiple functions.

The Financial Action Task Force (FATF) provides guidance and recommendations for regulating virtual assets (VAs) and virtual asset service provident (VASPs) to combat money laundering and terrorist financing. FATF Standards require countries to asses and mitigate risks associated with virtual assets and ensure VASPs are subject to AML obligations.

This encompasses measures' ike customer due diligence, record keeping, and reporting suspicious transactions. The FATF has also updated its guidance on the Travel Rule (Recommendation 16) to address the transfer of information alongside virtual asset transfers.

6. Challenges thrown up by Web3 technologies

Web3 technologies present a unique set of challenges to global regulatory bodies due to their the decentralized nature, rapid innovation, and global reach.

The domain presents regulatory uncertainty, cross-border issues, difficulty in applying traditional regulations and requirement for novel approaches to scam prevention and consumer protection.

The growth of Web3 presents multiple Challenges for regulatory authorities, which may be categorized as under:

Decentralization: The application of traditional regulatory frameworks designed for centralized systems becomes difficult in Web3 as the core principle here is Decentralization.

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Cross-Border transactions: Web3 operations often occur across borders, making it difficult to determine jurisdiction and enforce regulations.

Scam prevention: The speed and anonymity of Web3 transactions makes it challenging to identify and prevent fraudulent transactions and resultant scams.

Interoperability and scalability: Numerous protocols of Web3 face and interoperability and scalability challenges, which effects the adoption of these technologies and framing of standard regulations across jurisdictions.

Smart Contracts: The use of smart contracts raises questions about legal liability and enforceability.

NFTs and Digital Assets: Since legality of NFT's and other digital assets is still in the realm of un-certainty and gradually evolving, the participants face a great deal of uncertainty.

DAOs: Decentralized Autonomous Organizations (DAOs) present unique challenges to legal frameworks due to their decentralized governance structures.

The above listed characteristics of Web3 calls for assessing environmental impact of proof-of work blockchains, greater steps for effective global cooperation, quick adoption of tech driven regulations, proactive participation by industry along with welldesigned programmes for raising awareness about risks of participating in Digital assets through the medium of Web3.

Increasing policy and regulatory focus is being directed towards the carbon footprint impact of mining activity in blockchain. A 2022 data showed that the total energy consumption of the crypto industry was equal to the domestic energy consumption of 2 to 3 days by the nation of Sweden.

The point is that a totally speculative, demand supply based, non-fiat digital offering is consuming so much energy per unit and this is an ever increasing pattern.

One option to contain this trend is to incentivize Proof-of-Stake method over Proof – of – Work method through favourable laws and regulations.

Another option in the promotion of carbon trading of crypto securities through verified channels.

IV. METHODOLOGY

This research study adopts a doctrinal and analytical methodology, primarily grounded in **secondary data** sources to examine the legal and regulatory challenges posed by blockchain technologies and cryptocurrencies in the context of corporate accountability and financial

compliance. The research is descriptive, interpretative, and evaluative in nature, drawing extensively from academic literature, statutory materials, policy documents, judicial pronouncements, and institutional reports. A wide range of **books**, **peer-reviewed journal articles**, and **published legal commentaries** were reviewed to develop a theoretical understanding of the legal ambiguities surrounding decentralized financial systems. In addition, significant reliance was placed on **court decisions**, including landmark rulings from the United Kingdom, Germany, China, Japan, and India, to trace evolving judicial interpretations of digital assets and crypto-related disputes. Regulations, advisories, and circulars from key financial regulatory bodies such as the **Financial Action Task Force (FATF)**, **International Monetary Fund (IMF)**, **European Securities and Markets Authority (ESMA)**, and **Securities and Exchange Commission (SEC)** were examined to assess the fragmented global legal landscape. Reports from credible financial media such as Forbes and the Bank for International Settlements were incorporated to provide updated empirical context on exchange hacks, market manipulations, taxation reforms, and environmental implications. The study employed comparative legal analysis to juxtapose different national and supranational approaches toward regulating cryptocurrency exchanges, classifying tokens, ensuring AML/KYC compliance, and addressing issues related to smart contracts, DAOs, and NFTs. The method also included critical review of **legal reforms**, **regulatory sandboxes**, and **case-specific enforcement mechanisms**, enabling a holistic understanding of the interplay between law, policy, and technology. No primary data—such as interviews, surveys, or field observations—was used, and the analysis remains purely conceptual and policy-oriented, offering recommendations based on observed trends and scholarly discourse. The research adheres to a qualitative framework suited to assessing the normative and jurisprudential dimensions of emerging financial technologies.

V. DISCUSSION

The intersection of blockchain technology and cryptocurrency with corporate law and global financial regulation has emerged as one of the most complex legal arenas in recent years. At the heart of this complexity is the decentralized, pseudonymous, and borderless nature of blockchain systems, which stand in stark contrast to the jurisdiction-specific, identity-based, and centralized models of traditional legal and financial regulation. While blockchain holds immense potential for transforming corporate governance, enhancing transparency, reducing transaction costs, and automating compliance via smart contracts, it simultaneously introduces new layers of regulatory uncertainty, especially in areas such as securities classification, taxation, intellectual property, and environmental sustainability.

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The ambiguity surrounding whether crypto-assets should be treated as securities, commodities, or currencies has led to divergent interpretations among key jurisdictions such as the United States, European Union, and India, resulting in a fragmented and inconsistent global regulatory landscape. Furthermore, the proliferation of Initial Coin Offerings (ICOs) and Decentralized Autonomous Organizations (DAOs) has challenged traditional legal concepts of corporate personality, fiduciary duties, and director accountability. This regulatory vacuum has been exploited by market participants who engage in unethical practices such as sniping or insider front-running, leading to massive financial losses for retail investors, as evidenced in the LIBRA case. In addition, the lack of robust cybersecurity regulations, particularly for centralized exchanges, has resulted in record-setting digital heists, such as the Bybit breach. Another dimension of the legal challenge is compliance with anti-money laundering (AML) and counter-terrorism financing (CTF) norms.

The anonymity offered by many blockchain networks hampers enforcement agencies from tracking illicit flows, making Know Your Customer (KYC) and AML compliance both necessary and difficult to implement. On the environmental front, the high energy consumption of proof-of-work consensus mechanisms continues to draw criticism, especially as jurisdictions move toward climate-conscious regulatory frameworks. While proof-of-stake models offer a greener alternative, regulatory incentives to promote such sustainable technologies remain largely absent. Despite these challenges, countries like the UAE, Singapore, and the EU have taken proactive steps to create regulatory sandboxes, issue guidance on crypto taxation, and develop comprehensive frameworks like the Markets in Crypto-Assets (MiCA) Regulation. However, these efforts are far from uniform or universally adopted. The lack of international coordination continues to hinder the development of a cohesive regulatory framework that can effectively govern the rapidly evolving digital asset ecosystem. Within corporate law, the role of blockchain in automating shareholder voting, improving audit trails, and enforcing contractual obligations through smart contracts is being widely recognized.

Still, such developments necessitate parallel advancements in legal doctrines to ensure enforceability and protect stakeholders. Furthermore, intellectual property rights, especially in the context of NFTs and blockchain-based creative works, are increasingly difficult to enforce due to issues of digital provenance, licensing ambiguity, and jurisdictional inconsistencies. Overall, the discussion reflects a tension between the transformative capabilities of blockchain and cryptocurrency and the limitations of existing legal and institutional infrastructures. Legal systems must evolve to address this tension through harmonized frameworks, cross-border

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regulatory collaboration, and dynamic rule-making that reflects the pace of technological advancement.

VI. Conclusion

In conclusion, blockchain and cryptocurrency technologies represent both an unprecedented opportunity and an extraordinary challenge for contemporary legal, regulatory, and corporate governance frameworks. On one hand, these technologies enable decentralization, automation, transparency, and democratized financial inclusion. On the other, they expose glaring gaps in enforcement, create vectors for financial crime, raise novel intellectual property questions, and pose significant environmental concerns. The current state of regulation is fragmented and inconsistent, with different jurisdictions offering varying degrees of acceptance, regulation, prohibition, or experimentation. This divergence allows for regulatory arbitrage, where actors move operations to jurisdictions with lax oversight, thereby weakening the collective regulatory integrity of global financial markets. Corporate accountability within the crypto ecosystem remains loosely defined, particularly in cases involving DAOs, ICOs, and anonymous founders. The risks to investors are compounded by the speculative nature of the market, the lack of disclosures, and the absence of traditional investor protections.

The LIBRA case, in which insiders manipulated token prices through early access and then offloaded them at massive profits, resulting in $25 million in losses for retail investors, exemplifies how the absence of strict legal and regulatory oversight can cause systemic harm. Similarly, the $1.5 billion Bybit hack points to the vulnerabilities in crypto infrastructure and the urgency for imposing cybersecurity norms. Furthermore, the application of existing laws—such as those governing securities, contracts, data protection, and taxation—to blockchain-based entities remains inadequate and inconsistent. The technological complexity of blockchain also challenges conventional legal doctrines that rely on intermediaries, identifiable actors, and centralized authorities. Despite these obstacles, there are positive developments.

The European Union's MiCA Regulation is a landmark attempt to create a comprehensive legal framework for digital assets, while jurisdictions such as Singapore, Estonia, and the UAE are setting global benchmarks in crypto governance and innovation. However, these initiatives require replication and adaptation across the globe through coordinated multilateral efforts. The environmental critique of blockchain, especially due to proof-of-work models, must also be taken seriously, with the adoption of greener alternatives such as proof-of-stake mechanisms being encouraged through fiscal and legal incentives. In the final analysis, the

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transformation driven by blockchain and cryptocurrencies cannot be undone—it can only be guided. Legal systems must not merely react but proactively shape the future of decentralized finance through adaptive regulation, corporate accountability, and international cooperation. As blockchain becomes increasingly integrated into the financial, commercial, and governance systems of tomorrow, the legal and regulatory foundations laid today will determine whether it will evolve as a tool of empowerment or a mechanism of exploitation. A forward-looking approach, one that is grounded in legal clarity, technological understanding, and ethical foresight, is essential to ensure that innovation is balanced with accountability and that progress does not come at the cost of public trust and legal order.

VII. RECOMMENDATIONS

In order to create a stable, transparent, and accountable crypto ecosystem, a series of strategic legal and regulatory recommendations are imperative. First and foremost, there must be a global push to develop **harmonized taxonomies** and **cross-sectoral definitions** for crypto assets. This includes distinguishing between utility tokens, security tokens, payment tokens, and hybrid instruments in a manner that aligns with existing financial, corporate, and securities laws. Without such clarity, both compliance and enforcement remain ambiguous. Second, crypto asset service providers (CASPs)—including exchanges, custodial wallet operators, token issuers, and DeFi platforms—must be mandated to obtain **operational licenses** and register with relevant financial authorities. This will create legal accountability and ensure a minimum threshold of due diligence and compliance. Third, the implementation of **risk-based AML/KYC protocols** must become mandatory across all jurisdictions, supported by real-time analytics and blockchain forensics. Fourth, to encourage innovation while maintaining oversight, **regulatory sandboxes** should be expanded globally, allowing crypto startups to operate under controlled conditions where risks are managed collaboratively with regulators. Fifth, **investor education and awareness programs** must be institutionalized, with a special focus on emerging economies where retail investors are highly vulnerable. Token issuers must be compelled to provide whitepapers, disclosures, and audited documentation before public offerings.

Sixth, in view of repeated cybersecurity breaches, regulators should enforce **minimum cybersecurity standards** for all digital asset platforms, including mandatory third-party audits, insurance reserves, and disaster recovery mechanisms. Seventh, environmental considerations must be embedded into regulatory frameworks. Governments should offer tax breaks or carbon credits for blockchain networks adopting **Proof-of-Stake (PoS)** or **eco-**

friendly consensus protocols, thereby incentivizing sustainable technological development. Eighth, corporate laws must evolve to recognize and regulate **Decentralized Autonomous Organizations (DAOs)** by granting them conditional legal status and holding their smart contract creators liable for breaches. Ninth, to ensure legal certainty, **smart contracts** must be standardized and recognized under national contract laws, with clear provisions on enforceability, dispute resolution, and jurisdiction. Tenth, **international cooperation** is essential. Multilateral bodies like FATF, IOSCO, BIS, and the IMF must work together with national regulators to build interoperable compliance frameworks, cross-border enforcement protocols, and joint regulatory actions.

Eleventh, intellectual property laws must adapt to accommodate blockchain-based creative assets like NFTs, with robust digital rights management and legal remedies for infringement. Finally, a **crypto-environmental impact tax** can be considered for networks that continue to rely on energy-intensive operations, thereby internalizing their externalities and promoting climate-conscious development. These recommendations, if implemented in a coordinated and timely manner, can ensure that the benefits of blockchain and cryptocurrency are harnessed responsibly while minimizing systemic risks, legal ambiguity, and societal harm. Legal reform in this domain must be anticipatory, not merely reactive, so that innovation can be integrated with legal integrity, financial stability, and public interest.

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