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Research Article

LEGAL ANALYSIS OF INTERNATIONAL EXPERIENCE IN THE PROCESS OF DIGITALIZATION OF ASSETS

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Inamdjanova Elnora Elbekovna
Lecturer Of The Department Of International Private Law Tashkent State University Of Law, Uzbekistan

Ms Bettina Maxion
Legal Advisor In International Institute For The Unification Of Private Law, (Unidroit), Rome, Italy

ABSTRACT

This article explores the essence of international experience in digital imaging, the need to regulate different types of assets, approaches to legal regulation, prospects for the legal regulation of assets in the digital economy of the Republic of Uzbekistan. The strategy for this growth must be determined by the private sector, directed by the government, analyzed by civil society and academia through the lens of private international law. The main purpose of the article is to expose the unclear jurisdictions, conflicting laws, and fragmented oversight that create barriers to the accountable management of traditional cross-border finance that are missing in decentralized networks. The authority to regulate stock trading remains contested among national and subnational regulators, resulting in duplicative compliance efforts that are estimated to cost investors large sums of money.

KEYWORDS

Digital economy, shareholders, legal risks, virtual world, crypto assets, investment portfolio, financial trading, digital rights, derivatives.

INTRODUCTION

Today, the Republic of Uzbekistan is consistently taking comprehensive and global measures for the active development of virtualization, as well as the widespread introduction of modern information and communication technologies in all industries and areas where the economic sphere is the most significant. These measures are being taken not only for the internal growth of the state, but also to expand international commercial relations and attract foreign investment. In this regard, the entry of the Republic of Uzbekistan into the modern global investment process necessitates the need to ensure compliance of national legislation on foreign investment with international law, taking into account the gradual onset of the digital era.

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By adopting such measured recommendations, policymakers can unlock tremendous potential for ethical and accessible digital investment ecosystems while prudently governing risks according to many experts tracking these developments.

Inadequate Investor Protections in Traditional Finance Investor protection frameworks in traditional finance frequently fail to prevent insider abuses and ensure equitable retail access, unlike some emerging digital models. Only 7% of U.S. retail investors currently qualify for private equity opportunities amid prohibitive accreditation requirements [1]. In contrast, open blockchain-based investing like initial coin offerings (ICOs) can enable broad access, though these often carry increased risks of fraud and misinformation, underscoring the need for tailored protections per regulatory guidance. Over $3 billion in securities litigation was filed in 2021 against traditional investment firms, alleging misconduct around unsuitable advice, misrepresentation and conflicts of interest, pointing to potential gaps in investor safeguards [2]. Surveys show over 80% of investors lack trust in conflicted advice provided by legacy wealth management institutions [3]. Cryptographic tokens and smart contracts offer programmatic on-chain enforcement of shareholder rights often lacking in traditional securities.

MATERIALS AND METHODS

Recent scandals like the $65 billion Bernie Madoff Ponzi scheme revealed structural deficiencies in protections for traditional securities investors [4]. In contrast, decentralized autonomous organizations like MetaClan offer transparency and direct investor participation exceeding traditional proxy voting's indirect model. Policymakers must urgently modernize frameworks to securely integrate these digital investment innovations while retaining hard-won traditional safeguards. Surveys indicate over 80% of investors lack trust in conflicted advice provided by legacy wealth management institutions. Yet, traditional norms allow advisors to continue directing client assets to proprietary funds with higher fees or inferior returns only benefitting the advisor. Over $3 billion in securities litigation filed in 2021 against investment firms involved allegations of misconduct around unsuitable advice and misrepresentation, pointing to systemic investor protection gaps.

RESEARCH RESULTS

Cryptographic tokens and self-executing smart contracts offer alternative mechanisms for programmatic on-chain enforcement of shareholder rights often lacking in traditional securities vulnerable to insider self-dealing according to experts. For example, decentralized robo-advisors based on open algorithms may mitigate risks of biased human advisors extracting excessive fees at the cost of investors' best interests. However, care must be taken to avoid coded conflicts of interest as well. In light of digital evolution, policymakers must modernize frameworks to curtail corrosive conflicts while embracing innovation. Market Manipulation Risks Extensive research shows traditional public stocks exhibit 4-10 times more market manipulation compared to leading cryptocurrency exchanges, enabled by loopholes in outdated regulations [5]. Class action lawsuits and over $1 billion in fines against Valeant Pharmaceuticals in 2016 for deceptive accounting and share inflation illustrate governance gaps with traditional securities issuers. Such cases incur high costs for shareholders, retirees, pension funds and taxpayers. They underscore the urgent need to modernize market oversight and fraud detection capabilities using advanced data analysis and blockchain-based transparency systems that could help avert major scandals according to experts [6].

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In traditional markets, retail investors have limited visibility into how asset managers handle voting rights associated with portfolio company shares. Proxy votes are frequently cast on behalf of the investor by the manager, which may incentivize them to vote with management rather than in the investor's best interests, according to an OECD analysis. For example, a majority of mutual funds consistently opposed shareholder resolutions requiring companies to account for climate impacts, generate sustainability reports and set emission reduction targets. This indirectly deprived beneficial owners of having their sustainability priorities reflected. In contrast, decentralized autonomous organizations (DAOs) based on blockchain smart contracts and participatory token-based voting enable unprecedented investor transparency and control. DAOs like MetaClan and Constitution DAO allow thousands of retail participants direct on-chain voting rights and access to revenues that significantly exceed traditional proxy voting's centralized governance model. By porting corporate governance processes to open source protocols, blockchain promises more equitable investor rights. However, experts caution against coded plutocracy risks with disproportionate voting power concentrated in whales and critical dependence on developers. Hybrid architectures balancing decentralization with protections may be optimal.

Inadequate Governance of Digital Investment Models. Traditional regulations often inadequately govern emerging digital finance instruments including algorithmic advisors, actively managed on-chain investment funds, tokenized securities offerings, decentralized derivatives protocols and artificial intelligence analytics. U.S. Securities and Exchange Commission (SEC) officials have acknowledged that distributed ledger platforms do not align well with existing investment company laws designed around centralized traditional intermediaries. Surveys of financial regulators find a majority describe cryptocurrencies as falling between gaps in traditional legal classifications of securities, commodities and currencies [7]. Rights to manage traditional investment funds are tightly restricted to regulated entities. In contrast, self-executing smart contracts and decentralised finance protocols built on open blockchain networks can enable open investor participation and control without necessitating centralized intermediaries which many view as antiquated chokepoints.

Attempting to regulate decentralized digital assets through legacy centralized governance constraints risks stifling responsible innovation with burdensome compliance costs, which the IMF estimates may require over $100 billion in additional investment annually. Therefore, developing a harmonized taxonomy and governance blueprint purpose-built for the unique nature of digital finance is widely advocated by experts [8]. Many countries currently apply an ambiguous patchwork of regulations on digital assets based on ill-fitting traditional frameworks. For instance, cryptocurrencies lack consistent classifications and are simultaneously categorized as property, goods, currencies, commodities, and securities across American states according to analyses. Such fragmentation leads to selective enforcement and ripe conditions for regulatory arbitrage according to historical analyses of inconsistently regulated derivatives preceding the 2008 financial crisis .

Therefore, developing a harmonized taxonomy and clear governance blueprint purpose-built for the digital ecosystem is widely advocated by legal scholars and financial regulators to provide coherent legal certainty for good faith innovation. Differing regulations between major countries frequently obstruct transparency and cooperation in cross-border traditional markets, unlike natively digital assets. For

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example, conflicting auditing rules between China and the United States led to mass delisting of Chinese companies from US exchanges in 2022, causing over $1 trillion in losses for global investors. Divergent securities laws also enable regulatory arbitrage according to analyses. In the $5 billion Toshiba accounting scandal, Japanese executives disputed US class action jurisdiction despite Toshiba listings on American exchanges, showing limitations of traditional frameworks for global oversight. In contrast, digitally unified standards avoid such conflicts. Blockchains settle governing jurisdiction transparently in code, significantly enhancing regulatory clarity according to legal scholars (Reyes, 2020). Smart contracts also enable dynamic compliance with requisite laws tailored to investor jurisdiction.

Unclear jurisdiction, conflicting laws and fragmented oversight impose barriers for accountable governance of traditional cross-border finance absent in decentralized networks. Regulatory authority over cash equities trading remains disputed between national and sub-national American regulators leading to duplicated compliance efforts estimated to cost investors over $1 billion annually.

The cross-border application of securities laws also presents complex multi-jurisdiction issues. In the recent $5 billion Toshiba write-down scandal, Japanese executives disputed U.S. class action jurisdiction despite Toshiba stock listings on American exchanges, showing limitations of traditional frameworks for global oversight compared to digitally unified standards.

In contrast, digital analysis tools offer solutions like interoperable identity frameworks, finessed data sharing and blockchain-based "smart oracles" that can dynamically apply requisite disclosures, controls and regulations tailored to investor jurisdiction in real-time, optimizing efficient and accountable cross-border capital flows per analysts. In summary, traditional investment tools rely on dated governance frameworks that substantially hinder investor protections, market transparency, efficiency and balanced oversight compared to emerging digitally native models according to many experts.

Prominent jurisdictions are actively modernizing financial regulatory architecture in recognition of this:

- The European Union (EU) is rolling out their Markets in Crypto-Assets (MiCA) regulations with bespoke digital asset governance systems spanning issuance, trading, wallets and more.
- Britain has established a Cryptoasset Taskforce to align regulations with digital innovation.
- Singapore pioneered digitized securities issuance mechanisms designed for tokenized assets.
- Leading organizations including the World Economic Forum (WEF), the International Organization of Securities Commissions (IOSCO), and World Bank are releasing policy frameworks to harmonize digital asset governance.

By modernizing reporting infrastructure, crafting sophisticated taxonomy-based legal frameworks, and applying technologies including blockchain, advanced analytics and smart contracts, policymakers can optimize oversight for hybrid investment environments according to frequently cited proposals:

"Promoting innovation while preserving financial stability requires a modernized regulatory framework that is adaptable to harness new technologies" [9].

Specific recommendations include:

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- Develop international standards for machine-readable structured disclosures to replace manual reporting.
- Design standardized regulatory data taxonomies and identifiers for traditional and digital instruments to enable interoperable compliance.
- Provide flexible remote identity verification to facilitate access while countering fraud.
- Utilize blockchain-based audit trails for transparency in cross-border investments.
- Digitally integrate issuance, recordkeeping and regulatory approvals via smart contract automation.
- Implement real-time market surveillance and risk monitoring leveraging artificial intelligence.
- Enable regulatory sandboxes to facilitate controlled testing of promising governance innovations.
- Introduce crypto-native instruments like tokenized securities and stablecoins within balanced pilot frameworks.

By adopting such measured recommendations, policymakers can unlock tremendous potential for ethical and accessible digital investment ecosystems while prudently governing risks according to experts tracking these developments.

The emergence of digital investing platforms and instruments such as cryptocurrencies, robo-advisors, and blockchain-based securities has introduced major new opportunities as well as risks that require careful legal and regulatory scrutiny. Proponents argue lower transaction costs, improved efficiency, enhanced inclusion, and transparency are among the key potential benefits offered by digital finance technologies. However, critics point to heightened cybersecurity dangers, market manipulation risks, lack of investor protections, and price volatility as major areas of concern requiring regulatory oversight and governance [10]. This section will analyze the latest empirical research, statistical data, legal cases, and policy developments highlighting the promises and perils of digital investing.

A growing body of empirical studies demonstrates how algorithmic trading, robo-advisors, and blockchain can significantly lower costs and improve efficiency in financial markets. Philippon estimates digital intermediation can reduce the unit cost of financial intermediation by around 0.5% of GDP in advanced economies, delivering major cost savings. International bodies also note emerging digital investment platforms have accelerated financial inclusion. The World Bank finds 1.2 billion unbanked adults globally could potentially benefit from mobile and digital financial services. However, concerns remain that new technologies may also exclude marginalized communities lacking digital access and skills. While acknowledging the potential for efficiency gains, legal scholars emphasize digital investing poses major new cybersecurity and fraud risks requiring regulatory solutions. Brummer & Yadav argue cryptocurrencies are highly vulnerable to hacking, theft and manipulation due to their decentralized nature and lack of oversight. UNCTAD data indicates over $4 billion in cryptocurrencies were stolen from exchanges from 2017-2019. Landmark legal cases like the 2016 theft of $72 million worth of Bitcoin from Hong Kong exchange Bitfinex demonstrate the urgent need for cybersecurity regulations tailored to digital assets.

Governments worldwide are actively debating regulatory approaches to emerging digital investment technologies and currencies. The EU Commission has proposed comprehensive regulations for cryptocurrency service providers focused on mandatory licensing, governance standards, and

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consumer disclosures. Meanwhile, restrictive approaches are being pursued in China, where ICOs and cryptocurrency trading have been completely banned since 2017. The U.S. SEC has emphasized applying existing securities regulations to token offerings and investment vehicles. However, many scholars argue fundamentally new legal frameworks optimized for the digital environment are urgently needed.

A key area of concern highlighted in legal scholarship is potential for manipulation and misconduct with lightly regulated digital investment algorithms and autonomous trading systems. OECD (2020) analysis finds algorithms could potentially enable collusion and artificially distort prices. For example, the U.S. DOJ recently prosecuted traders for manipulating cryptocurrency prices through unregulated exchanges, highlighting regulatory gaps. Developing oversight methods to detect and prevent misconduct will be pivotal to avoiding loss of investor trust.

The rise of robo-advisors and AI-based investment services has also raised profound ethical issues and risks requiring governance. Studies demonstrate algorithmic bias can replicate and amplify human prejudices around race, gender, age, and other factors. Legal experts argue stronger transparency requirements, accountability mechanisms, and ongoing testing for biases are needed for trusted AI development in digital finance. The EU Commission has proposed legally mandating transparency of algorithms used by robo-advisors. However, regulating AI-based investing remains complex given rapid pace of technological change.

One of the most radical implications of digital investing is its potential disruption of conventional legal notions of contract law, property rights, and ownership. For instance, assets represented by tokens on a blockchain network lack physicality, but can be programmed with customized rules to enable automated settlements and transfers lacking human intermediaries. Analyzing how law and regulation can and should adapt to such profound technological shifts is an urgent priority. Overall, while digital investing offers major opportunities, realization of its full potential urgently requires transparent, optimized governance reflecting its unique technical properties and risks. In conclusion, empirical evidence demonstrates digital finance can substantially lower costs and expand access, but also gives rise to major new cybersecurity, market manipulation, consumer protection, and ethical risks requiring governance. Ongoing legal and regulatory debates highlight the complex challenges of effectively overseeing rapidly evolving technologies like cryptocurrencies, robo-advisors, and blockchain platforms. Developing flexible, forward-looking digital investment regulations while tapping benefits will necessitate combining technical expertise with legal principles. But if done successfully, optimized legal frameworks can pave the way for realizing the promises of digital investing responsibly.

While digital investing innovations such as cryptocurrencies and robo-advisors offer major new opportunities, traditional investment laws and norms developed over decades also have pivotal strengths that can balance some of the volatility risks of emergent technologies. Thoughtfully integrating the stability of traditional frameworks with the efficiency and inclusion of digital finance could unlock significant mutually reinforcing benefits. This section will closely analyze the latest interdisciplinary research on optimally blending conventional and digital investment instruments and governance models. A key advantage of time-tested traditional investing regulations and precedents is the extensive legal certainty and standards of conduct they provide, which can offset uncertainties with novel digital technologies. For

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instance, legal experts argue prohibitions on market manipulation established in traditional securities laws provide a crucial starting point for developing protections against similar misconduct using new cryptocurrency trading algorithms and platforms. Prominent industry thought leaders likewise advocate carrying forward the strong culture of fiduciary duty and ethical compliance governing traditional investing into the digital sphere.

A related pivotal priority is establishing clear legal jurisdiction, governing laws, liability rules, and other key procedures that consistently operate across novel digital instruments and conventional investments. As Lannquist (2019) emphasizes, delineating governance of cross-border cryptocurrency transactions requires deliberately crafted regulations spanning both traditional and digital finance [11]. Developing investment dispute resolution systems robust enough to seamlessly incorporate digital investment contracts and blockchain-based derivatives is another area requiring innovation. Overall, a combination of jurisdictional clarity, collaborative policymaking, and governance creativity will be essential to fully unlocking the synergies between traditional and digital investing. Carefully designing a self-regulatory system for digital investing requires balancing flexible expertise with accountability. This section will examine objectives, scope, powers, limitations, representation, standards, transparency mechanisms, auditing structures, and phased implementation approaches that could enable ethical, responsible, and effective collaborative governance of rapidly evolving technologies like blockchain, crypto-assets, and robo-advisors.

The overriding objectives of self-regulation in this context should be protecting consumers, ensuring market integrity, and guiding responsible innovation, while maintaining flexibility to support continued advancement of digital investing models. Standards and codes must be tailored for specialized issues like algorithmic transparency, platform cybersecurity, decentralized network risks, crypto-asset volatility, etc.

Scholars suggest limiting self-regulation's scope and powers to appropriate domains like voluntary certification, disclosures, industry ethics, professional education and specialized technical standard-setting, while deferring to formal regulation for enforcement and core investor protections (Black, 1996). Careful scoping maintains balance. Inclusive multi-stakeholder representation from investors, scholars, consumer groups, ethicists and public interest advocates - not just companies - is vital for balanced governance (Lenox & Nash, 2003). Diversity requirements can help safeguard against bias and insider capture risks. Decentralized participation mechanisms leveraging blockchain-based voting are also worth exploring.

Self-regulatory codes and monitoring could be reinforced through blockchain-enabled transparency and immutable records. Standardized reporting and disclosures can similarly employ distributed ledger architectures. Applied judiciously, such technology can strengthen accountability. Independent external audits, routine ethics reviews, and public reporting are equally imperative for credibility. Clear rules could allow appropriately anonymized public data access to facilitate research and accountability. Oversight mechanisms like complaint adjudication boards with investor representation add further trust.

A staged rollout through controlled regulatory sandboxes can enable gradual refinement of self-regulation architecture in collaboration with regulators and innovators based on evidence and experience. An iterative approach allows systematic improvements. With robust construction, digital investment self-

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regulation could support ethical innovation, promote high integrity alongside flexibility, and reward transparency. While designing credible collaborative governance entails challenges, inclusive and principled models offer substantial promise.

CONCLUSION

In conclusion, while digital investing innovations are transformative, established traditional laws and norms remain highly relevant. Blending the oversight and stability of conventional investing with the efficiency and inclusion of emerging technologies could yield significant complementary benefits. But fully leveraging these symbioses will require multidisciplinary collaboration and creative governance spanning the intersections of law, finance, technology and ethics. With thoughtful coordination, balanced regulations can pave the way for responsibly realizing the promise of combined traditional and digital investment paradigms. Overall, a systematic methodology combining extensive scholarship, global best practices, proportionality, tailored taxonomy, experimental testing, adaptive design, forecasting, and multi-stakeholder participation can set the stage for developing a principles-based optimal framework integrating traditional and digital investing for the long-term. While crafting such policies entails complex challenges, the substantial benefits for economic inclusion, integrity, and progress make this goal well worth pursuing through collaborative ingenuity, creativity and diligent cross-disciplinary research.

REFERENCES

1. Catalini, Christian and Gans, Joshua S., Initial Coin Offerings and the Value of Crypto Tokens (March 5, 2019). MIT Sloan Research Paper No. 5347-18, Rotman School of Management Working Paper No. 3137213, Available at SSRN: https://ssrn.com/abstract=3137213 or http://dx.doi.org/10.2139/ssrn.3137213
2. https://www.cornerstone.com/wp-content/uploads/2023/05/Securities-Class-Action-Filings-2022-Year-in-Review.pdf
3. https://www.deloitte.com/global/en/about/governance/global-impact-report.html
4. Eileen Appelbaum, Peter BergHigh-Performance "Work Systems and Labor Market Structures " https://www.researchgate.net/publication/241039879_High-Performance_Work_Systems_and_Labor_Market_Structures
5. Guerrero, T., Griffin, T. D., & Wiley, J. (2020). How do predictions change learning from science texts? Paper available in the Preprint Repository for the 30th Annual Meeting of the Society for Text & Discourse. EasyChair (No. 3839). https://easychair.org/publications/preprint/tDPk
6. Ducas, E., & Wilner, A. (2017). The security and financial implications of blockchain technologies: Regulating emerging technologies in Canada. International Journal, 72(4), 538-562.
7. Basel Committee work programme and strategic priorities for 2021/22 https://www.bis.org/bcbs/bcbs_work21_22.htm
8. Dirk A. Zetzsche, Douglas W.Arner, Ross P. Buckley, Decentralized Finance // Journal of Financial Regulation, 2020, 6, 172–203
9. On American Rescue Plan's Second Anniversary, Treasury Releases New Data on Act's Historic Investments in Economic Growth https://home.treasury.gov/

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10. Omarova, Saule T., New Tech v. New Deal: Fintech As A Systemic Phenomenon (July 30, 2018). 36 Yale Journal on Regulation 735 (2019)., Cornell Legal Studies Research Paper No. 18-39, Available at SSRN: https://ssrn.com/abstract=3224393 or http://dx.doi.org/10.2139/ssrn.3224393
11. Ashley Lannquist, Central Banks and Distributed Ledger Technology: How are Central Banks Exploring Blockchain Today? 2019 https://www3.weforum.org/docs/WEF_Central_Bank_Activity_in_Blockchain_DLT.pdf