

Tokenization of Real-World Assets and Its Implications for Capital Markets 2024

Anusha Nerella¹

Independent Researcher
Pennsylvania, USA
anerella30@gmail.com

Pratik Badri²

Independent Researcher
Pennsylvania, USA
Pratikbadri2@gmail.com

Abstract-This research analyses the impacts of Real-World Assets tokenisation of capital markets. This study has made use of exploratory design to understand the challenges, opportunities, values and risks associated with the use of tokenisation. The research clearly reveals the immutability and traceability of systems possible through tokenisation. However, the challenges of the applications are considerable. Adherence to standard procedures and resilient security systems are necessary across the organisations.

Index Words: real-world asset tokenisation, advantages tokenisation, impacts of tokenisation on capital market, impacts of tokenisation on global finances, challenges tokenisation

I. INTRODUCTION

A. Background of research

The tokenization of real-world assets is the process of using blockchain technology for converting assets to digital tokens. The ownership rights of assets are represented as on chain tokens. In this way, a digital representation of the asset is created leading to better management of assets ownership rights. It is helping to bridge the gap between physical and digital assets. There are high economic potentials being predicted for the real-world tokenisation of

assets including increased automation from assets programmability, efficiency gains, increased liquidity and reductions in any type of intermediation [1]. The blockchain-embedded representation of real-life securities is providing a distinct advantage over the traditional means of representations [2]. The impact of tokenisation on the capital market is yet to be researched. It is important to understand how the capital market can be impacted through the real-world asset tokenisation.

B. Overview

The tokenisation of real-world assets is a revolutionary step affecting the capital market. The tokenisation is being increasingly embraced globally as there is greater transparency regarding the history of ownership [3]. There are significant opportunities associated with tokenisation through newer forms of investment, increased financial accessibility and componentisation of tokenisation assets are contributing to its dynamic growth. There are crucial impacts on the financial market through fragmentation and compartmentalisation of assets. However, there are significant issues associated with decentralisation, security and scalability [3]. It is vital to attain cognisance of the influences on capital market to ensure operational efficiency.

C. Aims and Objectives

The study is concerned with achieving the following aims and objectives. 1) To examine the concepts of real-world asset tokenisation being adopted globally. 2) To analyse the impacts of such real-world asset tokenisation on the capital market. 3) To identify the various opportunities and challenges associated with utilising tokenisation of real-world assets. 4) To suggest the tokenisation regulatory rules and security measures needed for improved implementation.

D. Problem Statement

The real-world tokenisation is having multiple impacts on the capital market. There is more transparency and greater fragmentation of assets possible reducing any sort of inconsistencies. There are however critical issues associated with the application of tokenisation such as enterprise-grade security and privacy [4]. The regulatory uncertainties triggered by inconsistent global regulatory frameworks are a major hurdle. The vulnerabilities in smart contracts and cybersecurity concerns could undermine the trust in the system. The enhanced understanding of the market can lead to improved implementations of the tokenisation, overcoming obstacles. It can be derived how the use of tokenisation is leading to critical outcomes. For instance, the tokenisation may absorb the existing regulations on the transferring of property rights and replace it with new coded rules [15]. The changing landscape needs dynamic adaptation on the part of companies [15]. The strategic knowledge on scalability and security of the assets can be obtained with the research done.

E. Scope and Significance

The scope of the research is to understand the real-world asset tokenisation affecting the capital market. The greater transparency achieved and the control over assets is to be comprehended with evidence. The heavily regulated environment of asset tokenisation

and the opportunities for decentralisation will be comprehended through the application of evidence [4]. The study will strive to discern the opportunities and challenges. The research will delve into the best techniques that will assure the smooth adoption of real-world tokenisation.

The research is significant in bringing forth the various problems companies can face on real-world assets tokenisation. The tokenisation facilitating increased transparency and accessibility on the capital market helps businesses. There are significant governance and operational fragilities of real-world tokenisation demanding greater scrutiny [5]. The knowledge will aid organisations to better navigate the uncharted terrain and remain adequately prepared.

II. LITERATURE REVIEW

A. Benefits of real-world assets tokenisation

There are significant benefits associated with the application of tokenisation. The asset being tokenised acquires all the benefits of crypto token within a blockchain [6]. There is greater global access for investors, increased liquidity, reduced need for intermediaries, transparency and any type of immutability. The fractionalising of ownership, provides expanded opportunities to smaller investors to participate in the market [6]. There are important aspects associated with the use of tokenisation by the global trade institutions.

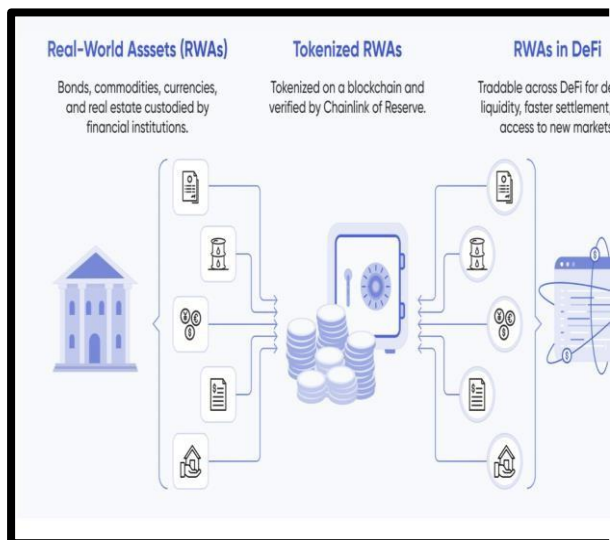


Figure 1: Real world asset tokenisation

(Source: [9])

There are various bonds, commodities, currencies and real estate that are being considered among the real-world assets that can be tokenised [9]. The tokenisation is increasingly deemed as an enabler for new services and frictionless collaborations in a novel sort of economy [7]. The digital content, digital resources and services can be tokenised within the digital transformation of the modern economy. Additionally, it can also be noted how tokenisation is able to create an effective incentive mechanism for the easy generation of ideas [7]. The tokenisation of real-world assets can lead to greater simplicity and traceability of the assets.

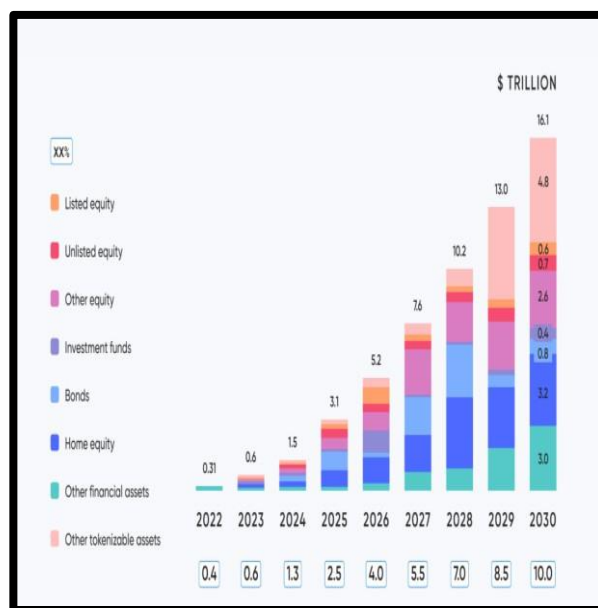


Figure 2: Estimates of assets tokenisation

(Source: [9])

There is wide adoption of real-world asset tokenisation owing to the high degrees of advantages and benefits. There are many factors that are contributing to the growth of cloudless future of a tokenised assets market [9]. From real estate properties to natural resources a new level of liquidity and operational efficiency obtained via tokenisation. The Real-World Assets token users can buy and sell their assets without the need for adhering to traditional hours of exchanges or transactions.

B. Implications of financial stability using tokenisation

The introduction of tokenisation of real-world assets can trigger grave financial implications on the market. With the tokenisation continuing to grow in scale and number, there can be fragilities in the crypto assets market. There can be financial stability vulnerabilities faced in the traditional market with the introduction of tokenisation. The crypto assets price is more volatile compared to real-world counterparts and the tokenisation may transmit the volatility to the traditional financial markets [8]. The capital market may become more volatile with the

introduction of tokenisation. It is also vital to note how the decentralised space increases the liquidity risks [9]. There are certain limitations associated with the utilisation of tokens across the innovative liquidity mechanisms. The studies reveal the need for hybrid solutions that integrate both centralised and decentralised trading frameworks [10]. The overall analysis reveals how tokenisation may be intertwined with certain complexities that need to be overcome.

The tokenisation is having different degrees of influence and impacts on the market. The Real World Asset Tokenisation of securities is making use of distributed ledger technologies. This is blurring the lines between private and public markets regarding the automation of capital market services. In the last few years, the security tokens have aided dozens of issuers belonging to both individuals and institutions to manage their securities in a fully digital manner [11]. The barriers to accessing capital markets and financial innovations are diminished with the use of tokenisation. The frictions in issuance of assets are considerably reduced with the inception of tokenisation [11]. There is consensus established in the traditional capital markets and the capital market is shifting towards being more decentralised.

C. Challenges associated with the use of RWA tokenisation

There are certain critical challenges associated with RWA tokenisation. The governance in traditional assets market is centralised with financial institutions and regulatory bodies with other intermediaries playing effective roles in monitoring and enforcing compliance. The tokenisation provides a distinct advantage in reducing the need for intermediaries. However, there are significant challenges associated with the application of tokenisation. The regulatory environment is ambiguous and the different jurisdictions with varying types of clarity can create confusion [12].

There are issues related to security and market manipulation that can severely thwart the growth of organisations. The uneven regulatory frameworks and the technical complexities of smart contracts increases the vulnerabilities associated with hacking, related to fraud and other security breaches [12].

Further studies conform the view of RWA tokenisation playing a strategic role in acquiring greater clarity over the assets. Tokenisation is perceived as unbeatable when it comes to tendering ownership over assets and creating an irrefutable identity [13]. However, just like cryptocurrency the tokenisation is subject to various vulnerabilities including attacks by malicious users. The very foundations of security are threatened through such attacks. The attacks have inflicted critical damage since they represent real-world assets that have physical importance [13]. There are immense challenges that need to be managed via effective means when making use of tokenisation.

The research till now reveals the wide adoption of Real-World tokenised assets owing to the critical advantages being provided by them. The tokenisation in blockchain has been identified as the next growth frontier with the total value locked surpassing \$ 2.5 billion [14]. The analysis of 39 mainstream RWA projects have revealed the critical risk deficiencies being faced by companies. There are issues being encountered on the aspects of stable coins, project teams and on-chain investors [14]. The RWA tokenisation needs to overcome the multiple challenges associated with its implementations.

D. International Financial Regulations for asset backed tokens

The crypto assets have recently attracted the attention of various national and international financial regulators. The research reveals significant gaps in accountability for the construction of permissionless blockchains [16]. There is

an unexpectedly high and completely unregulated amount of power in a decentralised network leading to negative outcomes. It can be noted how tokenisation is being impactful in democratising access to crucial investment opportunities empowering a wide range of individuals to participate in financial markets [17]. It is critical to take note of the changing environment and devise responsive measures.

III. METHODOLOGY

A. Research Design

The study uses an exploratory design to understand the impacts of Real-World Assets tokenisation on the capital market. With the advent of distributed ledgers and tokenisation, the way assets are handled have drastically changed [18]. Tokenisation is heralding an era of change with the decentralised alternatives to traditional financial systems [19]. An emerging field there is an exploratory research design essential for understanding how the financial systems and capital market are being revolutionised. The regulatory concerns and security issues as well as underlying opportunities can be grasped through an open-ended approach. The exploratory research design is able to tender the needed flexibility to a study. The inherent flexibility will aid in collecting in-depth insights on the subject. The broad approach evolving to become progressively narrower as the research progresses is a critical advantage [20]. The exploratory design has been used to assimilate salient knowledge on the subject.

B. Data Collection

The research uses data from qualitative and quantitative secondary sources to shape the global financial knowledge needed for the research. The qualitative data has been collected regarding how the tokenisation has changed the management and control of assets. The susceptibility to attacks and regulatory concerns have been

comprehended via the analysis of different sources. There has been secondary data collected to understand the challenges and opportunities associated with the study. The research has gathered graphs and charts to understand the critical trends in the tokenisation and digitalisation taking place. The conversion of real-world assets to digitised formats and the responsive measures necessary has been understood. The statistics and data have been used to study how the tokenisation is influencing the industry. There has been market research information scrutinised to assess the extrapolation of tokenisation and the inherent challenges that might impede growth.

C. Examples of applications and case studies

Case Study I: Rio Tinto

Rio Tinto one of the leading mining companies have launched their sustainability program START. The aim of START is to provide the traceability and ability for end customers to see how responsibly and sustainably the metal is being sourced [21]. A tokenisation is providing greater transparency as to the sourcing of the metals.

Case Study II: BlackRock

BlackRock too has introduced tokenised funds. The launching of BlackRock Digital Liquidity Fund tokenised by Securitise is leading to blockchain-based infrastructure across the ecosystems. The investors of BlackRock have access to new ecosystems and there are critical advantages of tokenisation being accomplished through it [22]. There is digital escrow held on the blockchains leading to enhanced outcomes.

D. Evaluation Metrics

The scrutiny of the study has been done based on recall measurements and the data collected. The analysis reveals the changing landscape and how the tokenisation is being widely embraced. The real-life assets

management and access to assets are being enabled through the system being able to understand control the traceability. The tokenisation is aiding in drafting unique and tailored products with the access to expanded group of investors, exiting opportunities and reduced risks of fraud [23]. The entire assessment reveals how the tokenisation of RWA is facilitating better management.

IV. RESULTS

A. Data Presentation

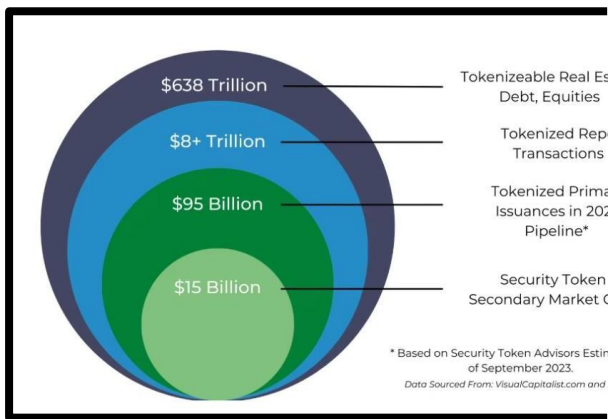


Figure 3: Assets that can be tokenised across the industry

(Source: [24])

The figure 3 clearly shows how a significant asset can be tokenised across the industry [24]. The primary issuance pipeline is up from zero during the pandemic. Thus, the global snowball regarding tokenisation is massive indicating the huge impacts on the capital market. With the fragmentation and compartmentalisation there is greater opportunities for smaller investors. Also, there is significant impacts in terms of retailers and investors holding tokenised assets.

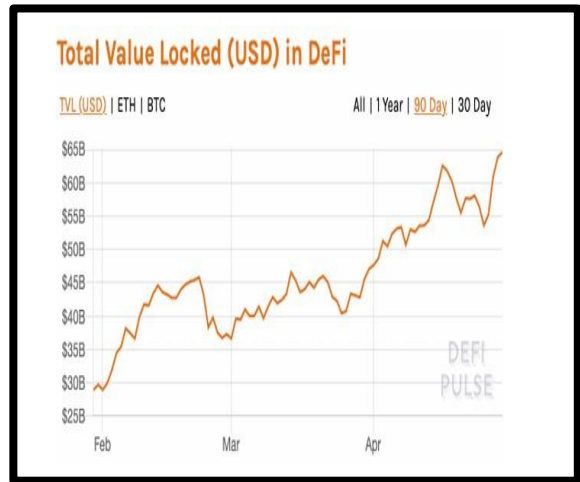


Figure 4: The total value locked in DeFi being \$ 61.81 billion

(Source: [25])

The figure 4 clearly denotes how the total value has been locked in tokenisation [25]. The decentralised trading possible through liquidity pools can be noted in the context of tokenisation. During the last 3 years there has been rapid adoption of tokenisation that is noted from the total value of DeFi. The Decentralised Finance or DeFi is the peer-to-peer financial system that makes use of blockchain technology to remove the need for traditional financial intermediaries. The total value invested reveals the rapid dynamics changes in the market.

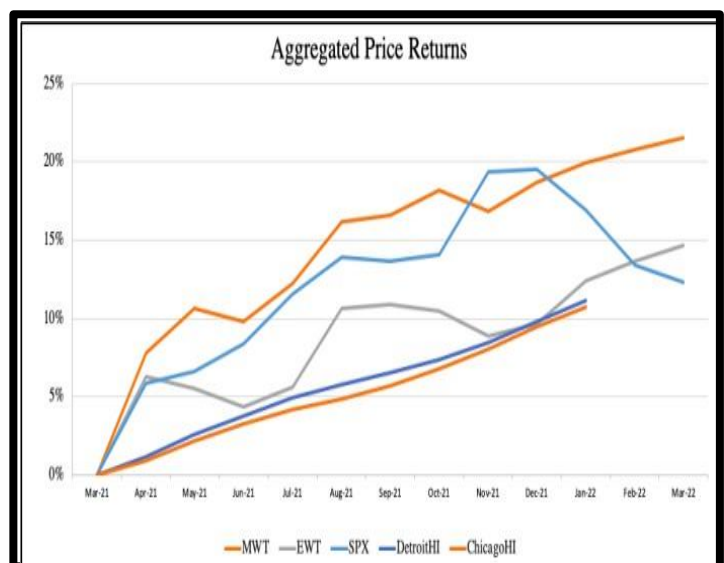


Figure 5: The aggregated returns gained for token price indices

(Source: [26])

The figure 5 reveals the aggregated returns acquired on the token price indexes. The tokens are revealing returns of 21.6% that are capable of yielding favourable performance [26]. There are investments being made across the industry implying positive impacts on the market on utilising the tokenisation.

B. Findings

The results show the capital market embracing tokenisation owing to the critical advantages obtained. The returns on token indexes for 21.6% is encouraging the needed investments for the industry. The TVL (Total Value Locked) in DeFi is indicative of the crucial investments made in the sector. The digitalisation is paving the way for fragmentation, accessibility and opportunities for smaller investors.

C. Case study outcomes

Case Study	Strategy	Impact	Outcomes
Rio Tinto	Making use of tokenisation for sourcing of aluminium and deploying it	Increase control over the sustainability and tracing of costs Increased transparency for stakeholders	Enhanced transparency and sustainable outcomes
BlackRock	Tokenisation of assets	There is increased investments and accessibility	Increase on-chain yield possible Ultra-fast and low-cost transacti

			ons possible
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Table 1: Case study outcomes

(Source: Self-created)

D. Analysis

Aspects of case study	Focus	Findings	Gaps
[1]	Gains from RWA tokenisation	Realistic annual gross gains by \$ 30 billion	No exploring of the various challenges
[2]	Fractionalisation of tokenisation	Increased opportunities for all investors	Reduced knowledge on the steps of tokenisation
[3]	Clarification of the different token classifications	The need for protocols in decentralised systems	Detailed assessments of protocols absent
[4]	Tokenisation platform	Introducing effective tokenisation platform	Limited analysis of the challenges matching the framework

[5]	Accessible and transparent systems obtained	Analysing the benefits of tokenisation	Lack of connection between the advantages and features of the system
[6]	Trading decisions affected by tokenisation	The relative low level of liquidity with tokenisation	The lack of exploring the market shocks
[7]	Analysing risk and values associated with tokenisation	Transaction efficiency, new value propositions	Limited discussion of challenges
[8]	Advantages obtained	Interconnections between digital and traditional systems	Reduced discussions on the volatility

Table 2: Comparative analysis

(Source: Self-created)

V. DISCUSSIONS

A. Interpretation of results

The data clearly reveals how the tokenisation is paving the way for greater traceability and fragmentation. There are more opportunities provided for investors. There is efficiency in transactions and the creation of new value propositions [12]. However, there are instances of outside attacks and the regulatory framework needed. The use of a platform underpinned by Hyperledger fabric operating system and enhanced scalable tokenisation can ensure

the needed security [4]. A standardised regulation can overcome the issues.

B. Practical implications

The use of tokenisation is aiding companies such as BlackRock to attract investors. Rio Tinto can attain greater control over their assets and tracing. The capital market is experiencing positive impacts with the huge level of investments. However, safeguarding of privacy is essential.

C. Challenges and limitations

There are severe challenges associated since the applications are dependent on effective regulatory frameworks [4]. There are instances of hacking and attacks that enhances the vulnerability of the system. There are higher degrees of volatility that can be challenging to manage. The lack of a standardised regulatory frameworks is one of the critical impediments to adopting the technology. There is lack of robust security systems as well.

D. Recommendations

As is evident from explored case studies organisations can strongly benefit from the use of tokenisation. However, there are robust security standards needed to overcome the obstacles. The organisations should safeguard against attacks and study the legal complexities during cross-border transactions. Increased vigilance is essential.

VI. CONCLUSION AND FUTURE WORK

The study reveals the hugely positive impacts of tokenisation on the capital market, increasing democratisation, accessibility and traceability. However, there are challenges of dealing with outside attacks and the regulatory frameworks. The shift is evident with 70% of respondents ready to transition towards tokenised assets with the needed security [4].

The future work should focus on the challenges of adopting tokenisation and how organisations can guard against the same. There is more in-depth analysis needed and quantitative data collected for developing responsive measures.

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