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NAVIGATING THE RISK OF REAL ESTATE TOKENISATION



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Introduction to Tokenisation

The concept of tokenisation is not new. It started with the US Dollar (USD) in July 2014 when iFinex launched RealCoin as a token on the blockchain to claim the US Dollars held in its bank accounts. RealCoin was subsequently rebranded as Tether, also known as USDT in November 2014. In September 2018, Circle launched USDC, a token to claim the US Dollars held in its bank accounts and in September 2019, Binance and Paxos launched BUSD to claim the US Dollars in their possession. Collectively, USDT, USDC, and Paxos tokenised more than USD120 billion worth of US Dollars as of 12 March 2023.

Since then, there have been many attempts to tokenise the US Dollar in different forms, from MakerDAO's attempts in December 2017 by minting a token to claim a portfolio of USDC, Pax Dollar (USDP), Ethereum (ETH), and Wrapped Bitcoin (WBTC), and other cryptocurrencies, to the notorious Iron Finance project and Terra Project to tokenise the US

Dollar algorithmically by way of the infamous Iron and UST Tokens in March 2021 and September 2020 respectively.

While there have been attempts to tokenise everything from gold, bonds, funds, companies, cars, yachts, wine, oil, carbon credits, and even stocks, none stand out as much as real estate in terms of potential market size.

According to Savills Research¹, the total value of global real estate reached USD326.5 trillion in 2020. In contrast, global fixed income markets stood at USD126.9 trillion in 2021², while the global equity markets were estimated at USD124.4 trillion in 2021³, and the total US Dollars in circulation stood at USD40.8 trillion in 2021⁴. The potential market value of real estate is 1.1 times the combined market value of global fixed income, global equities, and the US Dollar, making real estate the holy grail of any tokenisation project.

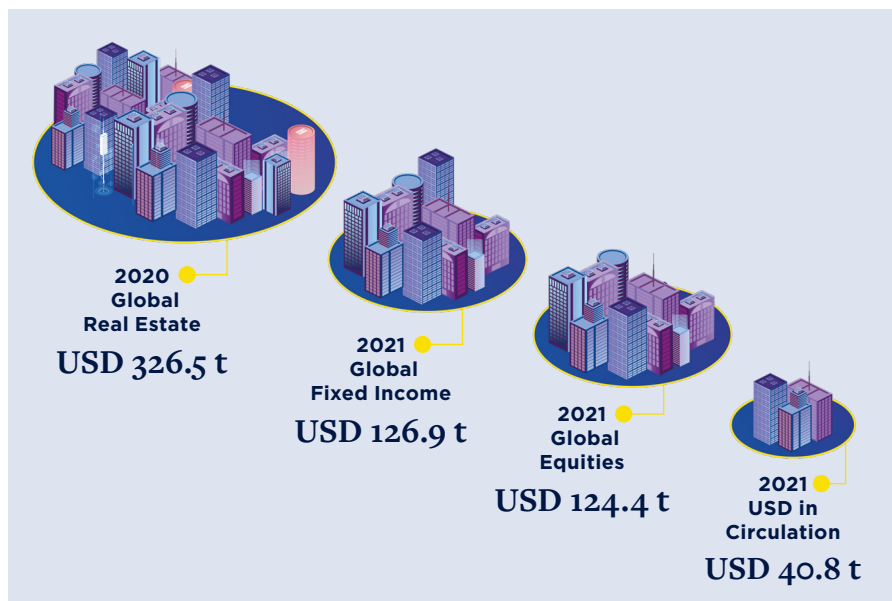
History of Real Estate Tokenisation

Real estate tokenisation came to the world's attention in 2018 with the tokenisation of St. Regis Aspen Resort by Elevated Returns⁵. The tokenisation exercise succeeded in raising USD18 million for 18.9 percent of the resort hotel with Aspen Coins and attracted a great deal of excitement. A similar real estate tokenisation project known as RealT followed in 2019 with over USD50 million in tokenised real estate assets across the United States in places like Detroit, Cleveland, Chicago, Toledo, and Florida. In 2022, a real estate tokenisation project known as CitaDAO leveraged decentralised finance (DeFi) and tokenised a Singapore property at a premium to its real world value; demonstrating that tokenised real estate could be valued higher than its real world equivalent.

Many other projects and consultants have tried to tokenise real estate in various forms, with projects such as ADDX, Centrifuge, CityDAO, DigiShares, Fraxtor, InvestaX, Kasa, Liquefy, Propy, Securitize, SDAX, SmartLand, Solid Blocks, RedSwan, Real Blocks, RobinLand, Tokeny, and among many similar projects.

These projects vary in terms of their geographical coverage, types of real estate, legal structure, liquidity, technological stack, counterparty, and capital stack while publicising the same benefits of lower entry barriers, diversification, efficiency and transparency.

Fig. 1 Comparison of Global Real Estate Value with other Market Sizes



¹ <https://www.savills.com/impacts/market-trends/the-total-value-of-global-real-estate.html>

² <https://www.sifma.org/resources/research/fact-book/>

³ <https://www.world-exchanges.org/our-work/articles/2021-annual-statistics-guide>

⁴ <https://www.federalreserve.gov/releases/h6/current/default.htm>

⁵ <https://venturebeat.com/business/elevated-returns-gets-18-million-for-st-regis-aspen-resort-tokenised-real-estate/>

Benefits of Real Estate Tokenisation

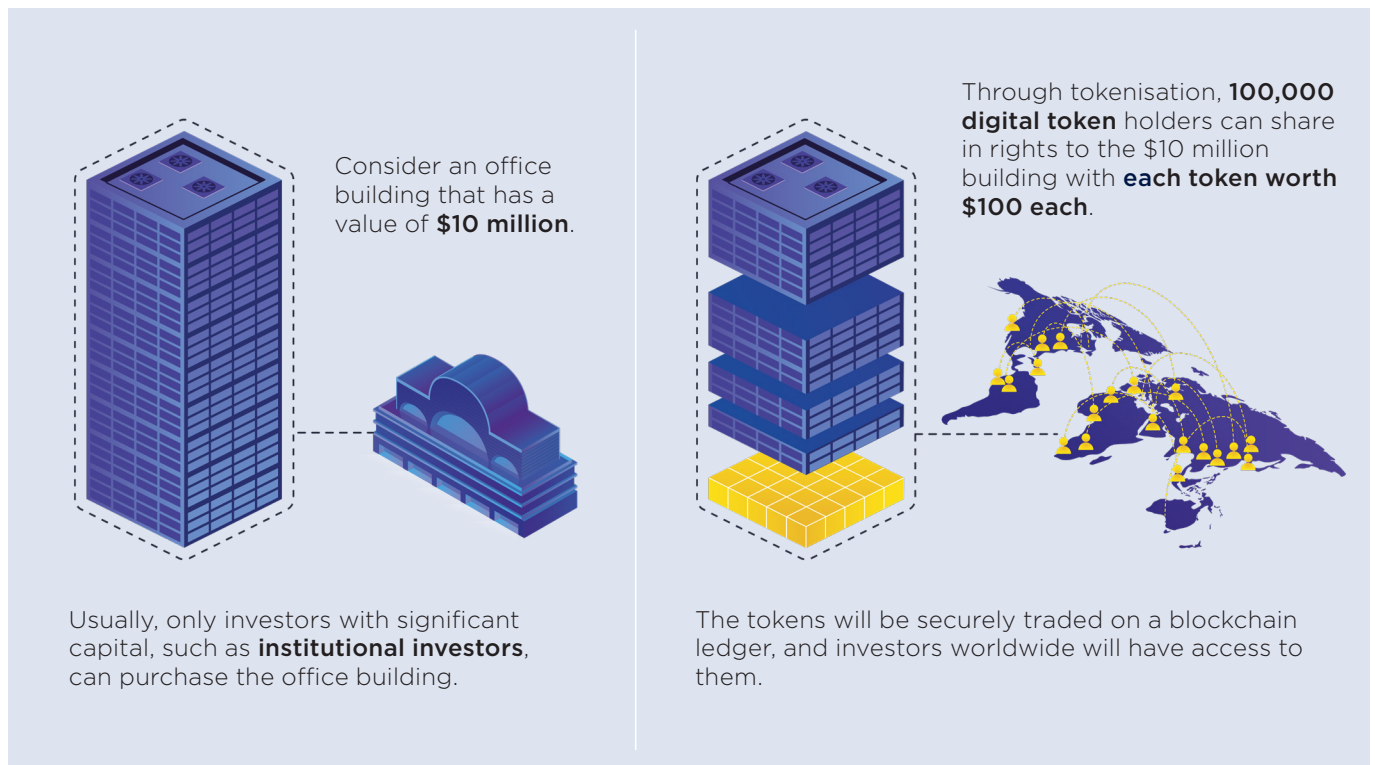
The benefits of real estate tokenisation are well-publicised. As properties are inherently illiquid assets, tokenisation's key benefit is in potentially injecting liquidity into the real estate market. A typical real estate transaction process, from listing to close, requires several weeks to conclude while whole building sales (an entire office building or retail complex) may take even longer.

Tokenisation allows anyone to buy and sell properties in smaller percentages potentially shortening the time needed to locate potential buyers for Real Estate Tokens as the investment quantum is much lower.

Real estate tokenisation democratises real estate investing. It enhances accessibility and opens up real estate investing to a much

broader investor base, removing a key obstacle to entering the real estate investment market due to the affordability of Real Estate Tokens. Tokenisation also offers investors easier access to global real estate markets. Moreover, transaction costs are also much lower.

Fig. 2 Tokenisation of Real Assets



Risks of Real Estate Tokenisation

While real estate tokenisation offers advantages, it also presents potential risks which can be gleaned from failed US Dollar tokenisation projects such as the Terra UST tokens. The following highlights the key risks identified by the Savills team for investors in Real Estate Tokens to consider before participating in a tokenisation exercise.

■ De-tokenisation Risk

De-tokenisation is an important concept which affects the ability of the token to hold its value.

Simply put, a token holder should always, without question, be able to redeem the underlying title deed to the real estate, debt, or equity with their token as long as they fulfil the standard know your customer (KYC) and anti-money laundering (AML) checks. They should be allowed to do so whenever they want to without requiring the permission of anyone to approve the redemption.

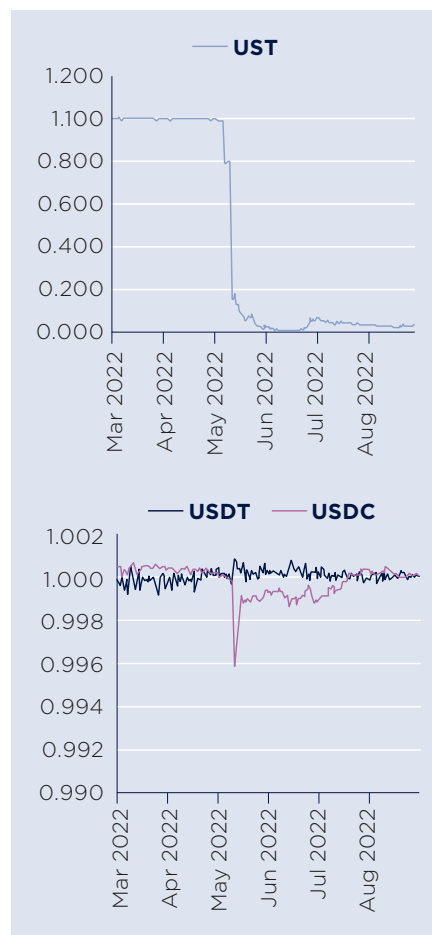
This ensures that the token will not fall significantly below the value of the underlying asset. If that were to happen, an arbitrageur will be motivated to pocket the difference in value by buying out the token at a discount to the asset value and redeeming the asset at fair value.

De-tokenisation is the litmus test for token holders to validate the legal structure by exercising their rights to redeem the underlying title deed anytime. This is critical to the integrity of the project because if the tokenised asset cannot be redeemed at will by token holders, the token values can potentially fall to zero.

This is epitomised by the infamous crash of Do Kwon's Terra Project in 2022. Do Kwon created the UST, a token which pegged its value against the US dollar based on algorithms. However, it was not backed by the US Dollar but by another token known as Luna which is priced in US Dollars. When UST was stress tested by massive selling pressure, it led to the collapse of the Luna token value, which eventually caused the downfall of UST. Over USD40 billion in value was lost in less than 72 hours⁶ when both Luna and UST gravitated towards zero.

In contrast, over the same period, when USDT and USDC came under similar selling pressure to that which led to the eventual demise of UST, they were both able to eventually regain their peg to the dollar when investors realised that they could buy the tokens at a discount and redeem one US Dollar in fiat currency for every USDT and USDC token they held.

Fig. 3
Price Movement of UST, USDT and USDC, March 2022-August 2022



Source: Yahoo Finance

There is no doubt that the same principle holds for Real Estate Tokens. Like USDT and USDC, Real Estate Token holders should be able to redeem the title deed of the

underlying real estate as and when they want to with their Real Estate Tokens.

De-tokenisation is a fundamental principle in tokenisation for the Real Estate Tokens to maintain their value. Investors should always question how the Real Estate Tokens can be used to redeem the title deed at will to mitigate the risk of their tokens suffering the same fate as Luna and UST Tokens in Do Kwon's Terra Project.

■ Counterparty Risk

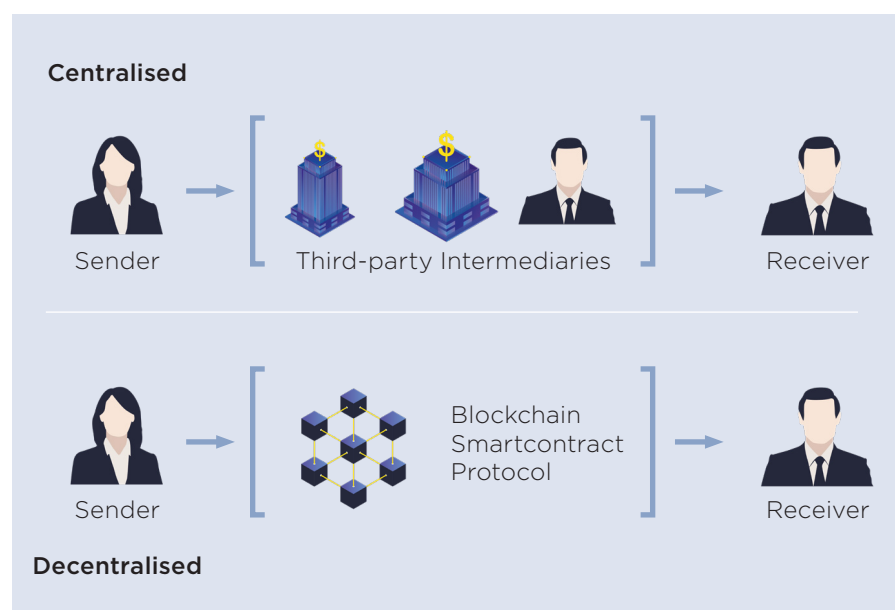
Counterparty Risk is the likelihood or probability that one or more parties in a transaction may not be able to honour their part of the deal and default on their contractual obligations. The recent failure of FTX, Celsius, Babel Finance, Voyager Finance, BlockFi, Hodinaut, 3 Arrow Capital, and many other similar platforms serve as a constant reminder of the counterparty risks of transacting with centralised finance (CeFi) platforms.

This is because CeFi platforms are not as transparent as blockchains. For example, the collapse of FTX emphasised the dangers of counterparty risk as customers' deposits were transferred to a related entity without the regulators' or customers' knowledge. A lack of transparency enabled these activities to take place despite FTX being a regulated platform.

This is not an isolated case. Time and again, regulated financial institutions such as Lehman Brothers, Bear Stearns, Merrill Lynch, and many others have capitalised on the lack of transparency in a CeFi structure to take risks with the assets under their custody with complete disregard for their fiduciary obligations.

⁶ <https://fortune.com/2023/02/16/terrausd-do-kwon-terraform-labs-sec-lawsuit/>

Fig. 4 CeFi versus DeFi Platforms



Centralised finance often uses third-party intermediaries, such as banks or payment processors, to facilitate transactions and manage user accounts.

When CeFi platforms implode and become insolvent, all the assets in custody with the CeFi platform will be at risk and subject to uncertainties and delayed redemptions while the insolvency proceedings work through the legal space.

The concept of DeFi is to reduce counterparty risk by enabling peer-to-peer transactions without having to involve a trusted third party intermediary in the custody of the tokens, unlike traditional finance (TradFi) structures that leverage heavily on CeFi platform.

DeFi platforms have lower counterparty risks than CeFi platforms as there are no trusted middlemen to default on their contractual obligations. Instead, DeFi relies on smart contracts to perform the custodian roles traditionally undertaken by TradFi and CeFi platforms. These smart contracts will self-execute the terms of the contract when a set of pre-agreed transparent criteria are met. This ensures that transactions are executed transparently and following the terms of the agreement which reduces counterparty risks significantly.

CeFi platforms aside, some risks stem from the type of asset which is tokenised. If the asset being tokenised is the special purpose vehicle (SPV) holding the assets or profits of the SPV, the counterparty risk will be very different from the scenario whereby the actual asset is being tokenised.

In the case of real estate tokenisation, the risk of tokenising the rights to the title deed versus tokenising the SPV or profits of the SPV becomes even more critical. Whereas the counterparty to the title deed is the government that issues the title deed, the counterparty to the SPV or profits of the SPV may be any preferred shareholder, trade creditor, mortgagor, senior creditor, mezzanine creditor, unsecured creditor etc.

Without definitively knowing the counterparty, it will be challenging to truly know the counterparty risk of any tokenised positions, and investors looking to buy Real Estate Tokens should always clarify who the counterparty of the tokenised real estate is before making any investment decisions to mitigate counterparty risks.

■ Liquidity Risk

Liquidity risk refers to the likelihood of an investor incurring a significant or complete loss when they attempt to convert an asset into cash on short notice. Slippage is used to measure the price change when converting cash into an asset, or an asset into cash.

The concept of liquidity is also associated with bank runs, as in the case of the most recent instances of Silvergate Bank and Silicon Valley Bank. Banks typically loan out most of their client deposits to earn interest to pay depositors, while leaving a minority of their client deposits in cash to facilitate operations.

However, in times of market stress when all the depositors want to withdraw their deposits simultaneously, the banks may not have sufficient cash on hand and may have to sell their loan portfolio to raise cash to meet their withdrawal obligations.

Loans are notoriously illiquid, and buyers of these loan portfolios expect significant discounts to buy them. In such instances, the banks cannot ignore the request for withdrawals and are forced to sell their illiquid loan portfolios at significant discounts to meet their withdrawal obligations. The difference between the fair value and the actual distressed sales price is known as slippage.

Real estate portfolios are even more illiquid than loan portfolios and typically take a long time to liquidate. Real estate tokenisation projects often tout how tokenised real estate is more liquid than the real estate itself because the tokens can be traded easily, just like the real estate investment trusts (REITs) traded on stock exchanges.

These projects also often cite how it costs as little as a dollar to purchase these Real Estate Tokens, so anyone can buy the tokens. The larger pool of potential Real Estate Token buyers, therefore, promises better liquidity than the actual real estate itself.

However, it is a fallacy to assume that just because the Real Estate Tokens are more affordable than the underlying real estate, that liquidity will magically materialise. In the case of REITs, liquidity is provided by market makers by leveraging the extensive infrastructure of stock exchanges, brokers, banks, and custodians. This liquidity is not free, and everyone from the exchange to the market makers is incentivised by a fee to provide the liquidity.

Therefore, unless liquidity is actively sourced and provided for, it will be difficult for Real Estate Token holders to achieve any form of liquidity in the secondary market. Without liquidity, slippages will be high. Imagine the price of the Real Estate Tokens falling by 30% when attempting to sell just \$100 of Real Estate Tokens in the secondary market, or not receiving any bid to sell your tokens at all.

Liquidity is the lifeblood of any tokenisation project. When there is a lack of liquidity, huge price swings create unrealistic volatility which increases the risk of holding Real Estate Tokens. In such instances, users may only receive liquidity when the underlying real estate is sold. However, if the real estate is never sold for any reason, the Real Estate Token holders may be stuck without any recourse. Therefore, the liquidity risks for Real Estate Token holders may be higher than typical creditors or minority shareholders who can exercise their rights enshrined in legislation to seek recourse.

It is therefore important for Real Estate Token investors to appreciate the liquidity risk of their Real Estate Tokens and always understand how liquidity is actively secured on the platform before making any investment decisions. Otherwise, it will be wiser to validate the liquidity on the secondary market before committing to any Real Estate Token investments.

■ Regulatory Risk

Regulators have taken a keen interest in digital assets recently given the spectacular failure of some platforms resulting in billions of dollars in losses. The result has been an increase in regulatory scrutiny and wide-ranging discussions over digital assets.

Most regulatory concerns surround the misuse of crypto assets for criminal purposes such as money laundering. AML and the Financial Action Task Force⁷ (FATF) requirements are non-negotiable and regulators have spent much of their effort focusing on this space to ensure that it does not jeopardise the traditional banking sector, leading to widespread systematic damage to financial institutions.

However, regulators are also increasingly concerned about platforms leveraging their reputation to market their products to lure unsuspecting retail investors with the promise that the platforms are safe because they obtained a license from the regulators.

Investors who mistakenly perceive that regulator-licensed crypto platforms are inherently secure will typically conduct less due diligence given that they are subject to regulatory scrutiny. However, when these platforms fail, the investors will end up blaming the regulators, placing an unfair burden on them.

Although licensing provides some level of regulatory supervision, investors need to understand what the platform is being regulated and licensed for and still conduct their own due diligence to determine the long-term viability of their investments.

Recent events have blindsided regulators when licensed projects have imploded, leaving the regulators to carry the awkward

burden of answering investors on how these platforms failed.

However, the hard truth is that regulators have not failed in their duties. Instead, their good name has been taken advantage of to lure unsophisticated and unsuspecting investors. These projects typically do not disclose how they are regulated and instead give the regulator license as the reason for investors to trust them wholeheartedly.

Therefore, investors need to understand regulations and perform due diligence to reduce the risk of over-relying on regulators when making investment decisions. Instead, due diligence should be conducted at the same level as an unregulated investment, and investors should actively question and understand what activities are being regulated so that they can make better informed decisions.

■ Infrastructure Risk

Infrastructure risk is the likelihood of failure in the underlying infrastructure supporting the platforms. This typically includes the risks associated with the technology that the platforms are built on.

Most tokenisation projects, unless they are heavily battle-tested and under public scrutiny, will typically be subjected to some form of infrastructure risk.

These risks may manifest themselves by way of hardware failure, software failure, or vulnerabilities which can be exploited by hackers.

Tokenisation projects touting the revolutionary benefits of blockchains are typically subject to their specific infrastructure risk and the actual blockchain infrastructure risk.

⁷FATF is an independent inter-governmental body that develops and promotes policies to protect the global financial system against money laundering, terrorist financing and the financing of proliferation of weapons of mass destruction.

Therefore, investors should always assess both the platform and blockchain-specific risks when determining the security of a real estate tokenisation project. These risks can be categorised into a few key elements.

1. Blockchain Specific Risk

- a. Private vs public blockchain.
- b. Level of decentralisation of the public blockchain based on the number and profile of the validator nodes.
- c. Bridge exposures for the chain.
- d. Scalability of the chain and whether it can be overwhelmed and taken down by distributed denial-of-service⁸ (DDoS) attacks etc.

2. Tokenisation Project Risk

- a. Audited vs unaudited codes.
- b. Smart contract custody risks.
- c. Front-end interface risks.
- d. Hardware risks.

Blockchain risks can be mitigated by conducting simple due diligence. For example, it will be wise to check on the number of validator nodes for the blockchain that the tokenisation project is built on to understand if the chain

is centralised. For centralised and private chains, it is important to identify the counterparty with the right to modify and control the blockchain and to determine if the counterparty risk is acceptable. For example, given that private blockchain relies on a limited number of trusted pool nodes, an attacker gaining control of a few of the trusted nodes would be able to compromise the entire network.

Where the blockchain involves multiple bridges, it is important to assess the vulnerability of these bridges because when hacks take place and attackers can commandeer a significant portion of the blockchain tokens from the hacks, they will be able to hijack the blockchain and compromise transactions on the blockchain.

Finally, it is also important to review if the blockchain is scalable and if it can cope with a high level of activity without being overwhelmed and taken down. This can be achieved by reviewing the track record of the blockchain during periods of high activity and ensuring that transactions are not time critical. For time-critical high-value transactions, it is always best practice to use a blockchain which is reliable and has a high uptime regardless of the transaction volume.

In terms of tokenisation projects, it is always important to ensure that a reliable and independent third party has reviewed and assessed the codes.

It is also important to understand when and where the project custodies the digital tokens it is entrusted with. The longer the project holds the digital tokens, and the larger the value of the tokens, the larger the risk of an attack.

Tokenisation projects are also subject to similar front-end attacks which compromise web pages and hijack user details, so it is important to always check the details of a transaction before executing. In the case of CeFi platforms, it is also important to ensure there is sufficient authentication (two-factor authentication) and alert mechanisms in place, such as a callback to confirm the transactions before each transaction is settled. This will help mitigate front-end risks.

Finally, regardless of the blockchain, it is also important to ensure that the project hardware architecture is reliable and does not subject users to downtime. This is especially important for time critical high-value transactions.

Summary

The concept of tokenisation is not new, and much success has been achieved in this space in a relatively short time and real estate tokenisation will no doubt usher in a new era of innovation for the real estate industry.

While the benefits which real estate tokenisation promises have been well promoted over the years, it is equally important to be aware of the risks to avoid getting blindsided by the same vulnerabilities which caused the downfall of Do Kwon's Terra Project or FTX.

The remaining reports in this series will seek to deep dive into the key real estate tokenisation risks highlighted in this report: de-tokenisation

risk; counterparty risk; liquidity risk; regulatory risk; and infrastructure risk.

Investors armed with this knowledge should, we hope, be more confident in their due diligence and make better-informed decisions when engaging with real estate tokenisation investment opportunities to mitigate their risks and improve their risk-adjusted returns.

⁸ An attempt to disrupt the normal traffic of a service or network by overwhelming them with flood of internet traffic



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